

# GEOTECHNICAL ENGINEERING REPORT OXNARD HIGH SCHOOL NO. 8 NORTHEAST OF CAMINO DEL SOL AND NORTH ROSE AVENUE OXNARD, CALIFORNIA

August 31, 2018

Prepared for

Mr. James R. Steele Tetra Tech, Inc.

Prepared by

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File No.: 301953-002

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PROJECT:

OXNARD HIGH SCHOOL NO. 8

NORTHEAST OF CAMINO DEL SOL AND NORTH ROSE AVENUE

OXNARD, CALIFORNIA

SUBJECT:

**Geotechnical Engineering Report** 

REF:

Proposal to Provide a Geotechnical Engineering Report, Oxnard High School No. 8,

Northeast of Camino Del Sol and North Rose Avenue, Oxnard, California by Earth

Systems Pacific, dated June 27, 2018, Doc. No. 1806-063.PRP

Dear Mr. Steele:

In accordance with the authorization of the above-referenced proposal, this geotechnical engineering report has been prepared for use in the development of plans and specifications for the Oxnard High School No. 8 project. The school campus is located northeast of Camino Del Sol and North Rose Avenue in the City of Oxnard, California. Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, slabs-on-grade and exterior flatwork, pavement sections, drainage and maintenance, and construction observation and testing are presented herein. Two bound copies and an electronic copy of this report are being furnished for your use.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

No. 2586

Sincerely,

Earth Systems Pacific

Doug Dunham, GE Associate Engineer

Doc. No. 1808-091.SER/In



# **Table of Contents**

| COVE | R LETTER            | ii  |  |  |
|------|---------------------|---|--|--|
| 1.0  | INTRODUCTION        | 1   |  |  |
| 2.0  | SCOPE OF SERVICES   | 3   |  |  |
| 3.0  | SITE SETTING        | 4   |  |  |
| 4.0  | FIELD INVESTIGATION | I AND LABORATORY ANALYSIS5  |  |  |
| 5.0  | GENERAL SUBSURFAC   | CE PROFILE 7  |  |  |
| 6.0  | CONCLUSIONS         |   |  |  |
| 7.0  | PRELIMINARY GEOTE   | CHNICAL RECOMMENDATIONS13   |  |  |
|      | Definitions         |   |  |  |
|      | Site Preparation .  |   |  |  |
|      | Grading             |   |  |  |
|      | Utility Trenches    |   |  |  |
|      | Foundations         |   |  |  |
|      | Retaining Walls     | 21  |  |  |
|      | Slabs-on-Grade a    | nd Exterior Flatwork23  |  |  |
|      | Pavement Section    | ns26  |  |  |
|      | Drainage and Ma     | intenance28   |  |  |
|      | Construction Obs    | servation and Testing29   |  |  |
| 8.0  | CLOSURE             | 31  |  |  |
| TECH | INICAL REFERENCES   |   |  |  |
|      |                     | Appendices  |  |  |
|      | APPENDIX A          | Exploration Location Map Boring Log Legend and Boring Logs Graphical CPT Data |  |  |
|      | APPENDIX B          | Laboratory Test Results   |  |  |
|      | APPENDIX C          | Corrosion Evaluation Report Prepared by Cerco Analytical                      |  |  |
|      | APPENDIX D          | Liquefaction and Seismically Induced Settlement of Dry Sand<br>Analyses       |  |  |
|      | APPENDIX E          | Typical Detail A: Title 24 Pipe Placed Parallel to Foundations                |  |  |

Tremie Method

APPENDIX F

Allowable Axial Capacity for CIDH Piles in Compression Chart and



## 1.0 INTRODUCTION

Oxnard High School No. 8 is planned northeast of Camino Del Sol and North Rose Avenue in the City of Oxnard, California. The school campus is referred to herein as "the site." The site is shown on the Exploration Location Map presented in Appendix A.

We understand it is planned to construct the following buildings/structures, athletic facilities, and surface improvements.

# **Buildings/Structures**

| Buildings/Structures      | Building/Structure Footprint (feet <sup>2</sup> ) | Number of Stories |
|---------------------------|---|-------------------|
| Locker Room/Gymnasium     | 45,730  | 2                 |
| Performing Arts           | 26,500  | 2                 |
| Media/Administration      | 14,575  | 1                 |
| Shops 1                   | 14,025  | 2                 |
| Shops 2                   | 11,160  | 1                 |
| Academic Labs             | 17,400  | 2                 |
| Kitchen/Multipurpose Room | 17,770  | 1                 |
| Academic Classroom 1      | 5,380   | 2                 |
| Academic Classroom 2      | 5,690   | 2                 |
| Academic Classroom 3      | 14,470  | 2                 |
| Daycare                   | 2,900   | 1                 |
| Stadium Restroom 1        | 1,600   | 1                 |
| Stadium Restroom 2        | 1,600   | 1                 |
| Home Bleachers            | 15,175  | n/a               |
| Visitor Bleachers         | 7,500   | n/a               |

# **Athletic Facilities**

| Sports Facilities             | Facility Footprint (feet <sup>2</sup> ) | Surface Covering |
|-------------------------------|---|------------------|
| Track/Football Field          | 159,031                                 | Turf             |
| Varsity Baseball Field        | 135,347                                 | Turf             |
| Junior Varsity Baseball Field | 113,034                                 | Turf             |
| Varsity Softball Field        | 55,259                                  | Turf             |
| Junior Varsity Softball Field | 53,695                                  | Turf             |
| Soccer Field                  | 182,831                                 | Turf             |
| Basketball Courts             | 52,960                                  | Paved            |
| Tennis Courts                 | 43,590                                  | Paved            |

301953-002 1 1808-091.SER



# **Surface Improvements**

| Parking Lots        | Parking Lot Footprint (feet <sup>2</sup> ) | Number of Parking Spaces |  |
|---------------------|--|--------------------------|--|
| Staff               | 180,088                                    | 318                      |  |
| Student             | 123,300                                    | 305                      |  |
| Visitor             | 3,230                                      | 18                       |  |
| Northeast Joint Use | 33,115                                     | 89                       |  |
| Northwest Joint Use | 46,810                                     | 76                       |  |

As the project is in its preliminary design stages, we have assumed that: 1) the buildings/structures depending on size and usage will be of wood-frame, of steel-frame, of masonry, of Portland cement concrete (PCC) construction materials, or combinations thereof; 2) the buildings/structures will utilize PCC slabs-on-grade; 3) masonry or PCC retaining walls for site work but not forming part of a building and less than 6 feet in height may also be constructed; and 4) maximum line and point loads will be on the order of 4 kips/foot and 60 kips, respectively.

We have assumed surface improvements will consist of hot mix asphalt (HMA) and/or PCC pavement placed on aggregate base (AB) for vehicle use, and PCC flatwork placed on AB or compacted soils for pedestrian use. Subsurface improvements are assumed to be the underground municipal sewer, water, storm drain, power, and communication conduits that will provide utility service to the project. No on-site effluent disposal systems for sewage or Low Impact Development (LID) drainage improvements for runoff infiltration and/or filtering have been identified as part of the project; therefore, these items are not addressed within this report.

We have assumed the site will be mass graded to develop the building and surface improvement areas, to improve access, and to improve drainage. Due to the relatively level to very gently sloping topography at the site, grading cuts and fills are anticipated to be minimal to develop final grades; no slopes are anticipated.



### 2.0 SCOPE OF SERVICES

The scope of work for the geotechnical engineering report included a general site reconnaissance, subsurface exploration, laboratory testing of selected soil samples, geotechnical analysis of data, and preparation of this report. The analysis and subsequent recommendations were based, in part, upon information provided by the client.

This report and preliminary geotechnical recommendations are intended to comply with the considerations of the California Building Code (CBC) Sections 1803A.1 through 1803A.6, J104.3 and J104.4 (CBSCa, 2016), as applicable; the California Geological Survey (CGS) Note 48 (CGS, 2013); the California Code of Regulations Title 24 (CBSCb, 2016); and common geotechnical engineering practice in this area under similar conditions at this time. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical engineering practice in this area under similar conditions at this time.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, slabs-on-grade and exterior flatwork, pavement sections, drainage and maintenance, and construction observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used exclusively by the client to form the geotechnical basis of the design of the project and in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk. If future parties wish to use this report, such use may be allowed to the extent the report is applicable, only if the user agrees to be bound by the same contractual conditions as the original client, or contractual conditions that may be applicable at the time of the report use.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, dewatering, temporary slope angles, construction means and methods, etc. Analyses of the



soil for asbestos (either man-made or naturally occurring), radioisotopes, mold or other microbial content, hydrocarbons, lead, and/or other chemical properties (except for geotechnical corrosivity) are beyond the scope of this report. Ancillary features such as temporary access roads, fencing, flag and light poles, signage, LID drainage improvements, effluent disposal systems; and nonstructural fills and slopes are not within our scope and are also not addressed.

As there may be unresolved geotechnical issues with respect to this project, the geotechnical engineer should be retained to provide consultation as the design progresses, and to review project plans as they near completion to assist in verifying that pertinent geotechnical issues have been addressed and to aid in conformance with the intent of this report. In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are verified or modified by the geotechnical engineer in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the geotechnical engineer in the field during construction, and the recommendations have been verified as appropriate or are modified by the geotechnical engineer in writing.

### 3.0 SITE SETTING

The site is located northeast of the intersection of Camino Del Sol and North Rose Avenue within the northeast sector of the City of Oxnard, California. The site is currently accessed off of Camino Del Sol. The approximate central coordinates and elevation from the Google Earth website (Google, 2018) where a majority of the campus buildings are currently planned are latitude 34.2077 degrees north, longitude 119.1554 degrees west, and 56 feet.



At the writing of this report, the site is being utilized for agriculture purposes; however, it was temporarily devoid of vegetation during our subsurface exploration program due to the crop rotation process. Surface and subsurface improvements associated with the agriculture operations exist within the site. Topographically, the site is relatively level to very gently sloping. Drainage is by sheet flow to south-southwest.

### 4.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS

On April 10, 2018 and between July 16 to 26, 2018, fifty-three exploratory borings were drilled at the site to depths ranging from approximately 10 to 51.5 feet below the existing ground surface. The borings were drilled with a Mobile Drill Model B-53 drill rig, equipped with 6-inch outside diameter hollow stem auger and an automatic trip hammer for sampling. On April 20, 2018 and July 16, 2018, ten cone penetrometer test (CPT) soundings were also performed at the site. The CPT soundings were advanced to depths ranging from approximately 11 to 60 feet below the existing ground surface. Three of the CPT soundings met refusal at relatively shallow depths; therefore, those soundings are not included within this report. We have only included and analyzed the CPT soundings that extend to depths of approximately 45 feet or deeper below the existing ground surface. The approximate locations of the borings and CPT soundings are shown on the Exploration Location Map presented in Appendix A.

Soils encountered in the exploratory borings were categorized and logged in general accordance with the Unified Soil Classification System and ASTM D2488-17. Copies of the boring logs and a Boring Log Legend are included in Appendix A. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only, and there are a number of conditions that may influence the soil characteristics as observed during drilling. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors.

August 31, 2018

Consequently, the logger must exercise judgment in interpreting the subsurface characteristics, possibly resulting in descriptions that vary somewhat from the legend.

The CPT soundings were conducted in general accordance with ASTM D5778-12 and D3441-16 using an electric cone penetrometer. Copies of the graphical CPT data can also be found in Appendix A.

As the exploratory borings were drilled, soil samples were obtained using a ring-lined barrel sampler (ASTM D3550-17, with shoe similar to D2937-17) and Standard Penetration Tests (SPT) were conducted at selected depths within the borings (ASTM D1586-11). Bulk soil samples were also obtained from the auger cuttings.

Ring samples were tested for bulk density per ASTM D2937-17 (modified for ring liners). Four bulk samples were tested for maximum density and optimum moisture content (ASTM D1557-12). Direct shear tests (ASTM D3080/D3080M-11) were conducted on the same four bulk samples after they were remolded to approximately 90 percent of maximum dry density. Six one-dimensional consolidation tests (ASTM D2435/D2435M-11) were performed on ring samples. Particle size tests (ASTM D422-63/07 and D1140-17) were conducted on fourteen bulk and ring samples. The expansion index (ASTM D4829-11) was determined for one bulk sample. For use in the development of pavement design criteria, two bulk samples were tested for R-value (ASTM D2844/D2844M-13). Four bulk samples were also sent to Cerco Analytical of Concord, California for use in preparing a corrosion evaluation report. The evaluation and associated test results are for use by the architect/engineer in determining appropriate corrosion mitigation measures. The laboratory test results and the corrosion evaluation report prepared by Cerco Analytical are presented in Appendices B and C, respectively.



# Sampler Blow Counts in Granular Alluvial Soils

The majority of the alluvial soils observed in the borings were generally classified as sands, and some of the sand layers had variable amounts of rocks (from 0 to approximately 17 percent) that ranged from fine gravel to cobble in size. Where these sand soils were below the existing groundwater elevations, flow sands were encountered at isolated depths in some of the deeper borings. These conditions can have an influence on the sampler blow counts.

Using our knowledge of the subsurface conditions in Oxnard, we implemented a drilling and sample acquisition monitoring program with respect to addressing the influence that rocks and flow sands could have on the sampler blow counts. All drilling and sampling operations were closely monitored. We further utilized drilling fluid in the deeper borings below the groundwater surface to reduce the potential for flow sands to intrude into the bottom of the hollow stem drill auger. The specific depths where the sampler blow counts appeared to be comprised by rocks or by flow sands are noted within the boring logs. Because of the potential uncertainties of some of the sampler blow counts, we exclusively used the CPT data for estimating the magnitude of liquefaction and seismically induced settlement of dry sand presented later in this report.

### 5.0 GENERAL SUBSURFACE PROFILE

The general subsurface profile observed in the borings consisted of layered alluvial sand soils with varying amounts of silt and clay. The only exceptions were relatively thin isolated silt and clay soil layers encountered at various elevations within several of the borings. The sand soils were in a slightly moist to wet condition with a loose to dense consistency. The silt and clay soils were moist to wet and very soft to very stiff. Several of the sand soil layers also had varying amounts of fine to coarse gravel and cobbles. Subsurface water was encountered between the depths of approximately 20 to 25 feet below the existing ground surface in the deeper borings. Please refer to the boring logs and graphical CPT data for a more complete description of the subsurface conditions. It should be noted that the CPT soil behavior data



correlated fairly well to the soil conditions observed in the deeper borings drilled in close proximity to each of the CPT Soundings. Based on the subsurface soil profile described above, the Site Class per Chapter 20 Table 20.3-1 (ASCE, 2013) is "D", a "Stiff Soil Profile".

### 6.0 CONCLUSIONS

In our opinion, the site is suitable, from a geotechnical engineering standpoint, for the planned buildings/structures and improvements as described in the "Introduction" section of this report, provided the recommendations contained herein are implemented in the design and construction. The upper site soils were tested and found to be generally nonexpansive; therefore, no special measures with respect to expansive soils are considered necessary. Assuming the site is designed and prepared in accordance with the "Preliminary Geotechnical Recommendations" section of this report, the buildings and other ancillary structures may be supported by shallow conventional continuous and spread (pad) footings, and structures such as stadium light standards, scoreboards, etc. may alternatively be supported by deeper castin-drilled-hole (CIDH) piles.

The primary geotechnical engineering concerns at the site are the potential for settlement, the excavation characteristics of the soils, the suitability of the soils for use as fill and backfill, the stability of the soils during grading, the corrosive nature of the soils, the erodible nature of the soils, and the potential for liquefaction and seismically induced settlement of dry sand.

# **Settlement Potential**

Settlement (total and differential) can occur when foundations and surface improvements span soil materials having variable moisture and density characteristics. Such a situation could stress and possibly damage foundations and surface improvements, often resulting in severe cracks and displacement. To reduce this settlement potential, it is necessary for all foundations and surface improvements to bear on material that is as uniform as practicable. A program of overexcavation, scarification, moisture conditioning, and compaction of the



August 31, 2018

upper soils in the building and the surface improvement areas is recommended to provide more uniform soil moisture and density, and appropriate support.

## **Excavation Characteristics**

The site soils are anticipated to be readily excavatable with conventional earthmoving equipment; however, the stability of excavations is a concern. Additionally, various size rocks were noted within some of the soil layers. Based on our preliminary testing, the soils are considered to be "Type C" per the 2007 Cal/OSHA classification system. This classification should be verified by the contractor's "Competent Person" at the time of construction. Excavation sloping and shoring will be needed to safely work in and to restrict the size of the excavations, and to reduce the potential for falling rock hazards. As with all construction safety issues, the methods of excavation stabilization, sloping, and/or shoring are ultimately the responsibility of the contractor.

# Suitability of the Soils for Use as Fill and Backfill

We anticipate that the majority, if not all, of the soils excavated at the site will be acceptable from a geotechnical viewpoint for reuse as compacted fill and backfill. However, special requirements for utility trench bedding and shading per the specifications of the City of Oxnard, the conduit manufacturer, and the utility companies should be anticipated.

## Stability of the Soils During Grading

The site soils may be susceptible to temporary high soil moisture contents, especially during or soon after the rainy season. Attempting to compact the soils in an overly moist condition may create unstable conditions in the form of pumping, yielding, shearing, and/or rutting. These conditions will not allow proper compaction and are inappropriate for continued fill placement. Therefore, the construction schedule should allow adequate time during grading for aerating and drying the soils to near optimum moisture content prior to compaction. If



August 31, 2018

unstable conditions occur, the geotechnical engineer should be consulted to provide recommendations for correction of the conditions.

## **Corrosive Soils**

Based on the testing performed by Cerco Analytical, the upper site soils were classified as "corrosive" to certain construction materials that will be in contact with the soils. The architect/engineer should refer to the Cerco Analytical report presented in Appendix C for use in determining appropriate mitigation measures for the soil's corrosivity.

## Soil Erosion

The site soils are considered to be highly erodible. Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during* and *following* construction is essential to reduce the potential of erosion damage. Care should be taken to establish and maintain proper drainage around the structures and improvements.

# Liquefaction and Seismically Induced Settlement of Dry Sand

Liquefaction is the loss of soil strength caused by a significant seismic event. It occurs primarily in loose, fine to medium-grained sands, and in very soft to medium stiff silts that are saturated by groundwater. During a major earthquake, the saturated sands and silts tend to compress and the void spaces between the soil particles that are filled with water decrease in volume. This causes the pore water pressure to build up in the soils. Then if the water does drain away rapidly, the soils may lose their strength and transition into a liquefied state.

Seismically induced settlement of dry sand is also caused by a significant seismic event which could occur in lower density sand and silt soils that are not saturated by groundwater. During a major earthquake, the air void spaces between the unsaturated soil particles tend to compress which translates to a decrease in volume or settlement.



In order to assess the potential for liquefaction and seismically induced settlement of dry sand to occur at the site, we reviewed the boring data and utilized methods suggested by the Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117a (CDMG, 2008). Considering the presence of groundwater in the upper 50 feet of soil (measured at 20 to 25 feet below the existing ground surface) and the density of sand and silt soils, there appears to be a potential for both liquefaction and seismically induced settlement of dry sand to occur at the site.

To further understand the effects of liquefaction, we performed analyses of the CPT data using the site-specific PGA of 0.969g (provided by the client from their site specific ground motion analysis), an earthquake modal magnitude of 6.77 (USGS, 2018), an assumed historical high groundwater depth of 8 feet below the existing ground surface (provided by the client), and the approximate existing groundwater depth of approximately 20 feet below the existing ground surface. Based on the analyses presented in Appendix D, it appears liquefaction occurs in relatively thin discontinuous soil layers. Total liquefaction induced dynamic settlement assuming a groundwater depth of 8 feet ranged between 0.2 to 1.2 inches, and 0.1 to 0.6 inches for a groundwater depth of 20 feet. The summary of the liquefaction induced dynamic settlement is shown on the Tables below.

As part of the liquefaction evaluation, seismically induced settlement of dry sand was also analyzed. To perform those analyses, we utilized a reduced or modified PGA value of 2/3 (0.969g) = 0.646g. Additionally, the upper 30 inches of soil were neglected in the analyses. The reasoning being that the upper 2 to 3 feet of the surface soils had been recently ripped and plowed as part of the on-going agriculture operations at the site, and these soils will ultimately be removed and replaced as moisture conditioned compacted fill as part of future site development as recommended later in the "Grading" section of this report. Total seismically induced settlement of dry sand assuming a groundwater depth of 8 feet ranged between 0 to 0.2 inches, and 0.1 to 0.2 inches for a groundwater depth of 20 feet. The

August 31, 2018



summary of seismically induced settlement of dry sand calculated is shown on the Tables below.

### **Groundwater at 8 feet**

| CPT<br>Number | Total<br>Liquefiable<br>Thickness (feet) | Dynamic<br>Settlement<br>(inches) | Dry Sand<br>Settlement<br>(inches) | Total Seismic<br>Settlement<br>(inches) |
|---------------|--|-----------------------------------|------------------------------------|---|
| 1             | 1.6                                      | 0.2                               | 0.1                                | 0.3                                     |
| 2A            | 3.8                                      | 0.6                               | 0.1                                | 0.7                                     |
| 3             | 2.3                                      | 0.3                               | 0                                  | 0.3                                     |
| 4             | 7.2                                      | 1.2                               | 0                                  | 1.2                                     |
| 5             | 5.7                                      | 0.8                               | 0.1                                | 0.9                                     |
| 6A            | 2.1                                      | 0.3                               | 0.1                                | 0.4                                     |
| 7             | 3.1                                      | 0.4                               | 0.2                                | 0.6                                     |

### **Groundwater at 20 feet**

| CPT<br>Number | Total<br>Liquefiable<br>Thickness (feet) | Dynamic<br>Settlement<br>(inches) | Dry Sand<br>Settlement<br>(inches) | Total Seismic<br>Settlement<br>(inches) |
|---------------|--|-----------------------------------|------------------------------------|---|
| 1             | 1.1                                      | 0.1                               | 0.1                                | 0.2                                     |
| 2A            | 3.8                                      | 0.6                               | 0.2                                | 0.8                                     |
| 3             | 2.3                                      | 0.3                               | 0.1                                | 0.4                                     |
| 4             | 3.8                                      | 0.5                               | 0.2                                | 0.7                                     |
| 5             | 1.8                                      | 0.2                               | 0.2                                | 0.4                                     |
| 6A            | 2.1                                      | 0.3                               | 0.1                                | 0.4                                     |
| 7             | 1.3                                      | 0.1                               | 0.2                                | 0.3                                     |

In summary, total and differential settlement attributed to liquefaction induced dynamic settlement in conjunction with seismically induced settlement of dry sand is not anticipated to exceed 1.5 inches and 0.75 inches, respectively.

Based on the results of the liquefaction analysis, the potential for loss of soil bearing strength and lateral spreading was determined to be very low. The assessment for loss of soil bearing strength was developed by comparing the thickness of the overlying non-liquefiable soils with respect to the depth, the relatively thin thickness, and the discontinuous nature of the



underlying liquefiable soils. Lateral spreading can occur when a soil mass either slides laterally on liquefied soil layers towards a free slope face, or when a soil mass moves downslope on sloping ground. Since a free slope face does not exist within or near the site, we focused on the sloping ground aspect of lateral spreading. Based on the Google Earth website (Google, 2018), the site slopes at approximately 0.35 percent from the north to the south. The assessment for lateral spreading was developed by considering the relatively flat to very gently sloping ground surface with respect to the discontinuous nature of the underlying liquefiable soils. The conditions needed for lateral spreading to occur do not appear to exist at the site.

Based on the information presented above, it is our opinion that no special measures will be needed to protect the structures and improvements from either liquefaction or seismically induced settlement of dry sand.

### 7.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The following preliminary geotechnical recommendations are applicable to the planned buildings/structures and improvements as described in the "Introduction" section of this report and assume that all floors will be above grade. If taller buildings, basements, or other features are incorporated into site development, this firm should be contacted for individual assessment.

# **Definitions**

Unless otherwise noted, the following definitions are used in these recommendations. Where specific terms are not defined, common definitions used in the construction industry are intended.

• **Building Area:** The area within and extending a minimum of 5 feet beyond the perimeter of the foundations for a structure. The building area also includes the



d High School No. 8 August 31, 2018

foundation areas (plus 5 feet to each side) of any ancillary structure that will be rigidly attached to the main structure and is expected to perform in the same manner as the main structure. Such structures could include staircases, covered walkways, covered work areas, patio covers, arbors, etc.

- Surface Improvement Area: The area within and extending a minimum of 2 feet beyond the perimeter of the surface improvement.
- **Scarified**: Ripping the exposed soil surface in two orthogonal directions to a minimum depth of 12 inches.
- **Moisture Conditioning:** Adjusting the soil moisture to optimum moisture content or slightly above, prior to the application of compaction effort.
- Compacted or Recompacted: Soils placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 90 percent of maximum dry density. A minimum of 95 percent will be required in the upper 1-foot of subgrade below vehicle pavement and in all AB. The standard tests used to define maximum dry density and field density should be ASTM D1557-12 and ASTM D6938-17a, respectively, or by other methods acceptable to the geotechnical engineer and the governing jurisdiction.

# **Site Preparation**

1. The existing ground surface in the building and surface improvements areas should be prepared for construction by removing existing improvements, vegetation, large roots, debris, and other deleterious material. Any existing fill soils should be completely removed and replaced as compacted fill. Any existing utilities that will not remain in service should be removed or properly abandoned. The appropriate



August 31, 2018

method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

Voids created by the removal of materials or utilities, and extending below the recommended overexcavation depth, should be immediately called to the attention of the geotechnical engineer. No fill should be placed unless the geotechnical engineer has observed the underlying soil.

# Grading

- 1. Following site preparation, the soils in the building area should be removed on a level plane to a depth of 4 feet below the bottom of the deepest foundation element or 6 feet below existing grade, whichever is deeper. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.
- 2. Following site preparation, the soils in the surface improvement area should be removed to a minimum depth of 2 feet below subgrade or 3 feet below existing grade, whichever is deeper. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.
- 3. Following site preparation, the soils in fill areas beyond the building and surface improvement areas should be removed to a depth of 3 feet below existing grade. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.



August 31, 2018

- Voids created by dislodging cobbles and/or debris during scarification should be backfilled and compacted, and the dislodged materials should be removed from the area of work.
- 5. On-site material and approved import materials may be used as general fill. All imported soil should be nonexpansive. Nonexpansive material is defined as being a coarse-grained soil (ASTM D2487-17) and having an expansion index of 10 or less (ASTM D4829-11). The proposed imported soils should be evaluated by the geotechnical engineer before being used, and on an intermittent basis during placement on the site.
- 6. All materials used as fill should be cleaned of any debris and rocks larger than 6 inches in diameter. No rocks larger than 3 inches in diameter should be used within the upper 3 feet of finish grade. When fill material includes rocks, the rocks should be placed in a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.
- 7. The on-site soils are estimated to shrink by approximately 15 to 20 percent when prepared and graded as recommended above.

# **Utility Trenches**

- Unless otherwise recommended, utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown on Typical Detail A presented in Appendix E.
- 2. Utilities that must pass beneath foundations should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.



August 31, 2018

- 3. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utilities. Generally, the soil found at the site may be used for trench backfill above the select material.
- 4. Utility trench backfill should be moisture conditioned and compacted; however, a minimum compaction of 95 percent of maximum dry density in trench backfill in existing or future public roadway areas. A minimum of 95 percent of maximum dry density should also be obtained where trench backfill comprises the upper 1-foot of subgrade beneath vehicle pavement, and in all AB. A minimum of 85 percent of maximum dry density will generally be sufficient where trench backfill is located in landscaped or other unimproved areas where settlement of trench backfill would not be detrimental.
- 5. Jetting of trench backfill should generally not be allowed as a means of backfill densification. However, to aid in *encasing* utility conduits, particularly corrugated conduits and multiple closely spaced conduits in a single trench, jetting or flooding may be useful. Jetting or flooding should only be attempted with extreme caution, and any jetting or flooding operation should be subject to review by the geotechnical engineer.
- 6. The Corrosion Evaluation Report prepared by CERCO Analytical and presented in Appendix C should be used by the architect/engineer in specifying appropriate corrosion protection measures for the utility improvements.
- 7. The recommendations of this section are minimums only and may be superseded by the architect/engineer based upon the soil corrosivity, or the requirements of the pipe manufacturer, the utility companies, or the governing jurisdiction.

301953-002 17 1808-091.SER



## **Foundations**

### **Shallow Foundations**

- 1. Shallow conventional continuous and spread footings bearing on soil compacted per the "Grading" section of this report may be used to support the buildings/structures. Grade beams should also be placed across all large entrances into the buildings/structures. Footings and grade beams should have a minimum depth of 18 inches below lowest adjacent grade, and footing and grade beam dimensions should also conform to the applicable requirements of CBC Section 1809A (CBSCa, 2016). All spread footings should be a minimum of 2 feet square. Grade beams should also interconnect with spread footings that are less than 3 feet by 3 feet in size on at least two sides. Footing and grade beamreinforcement should be in accordance with the requirements of the architect/engineer; minimum continuous footing and grade beam reinforcement should consist of two No. 4 rebar, one near the top and one near the bottom of the footing or grade beam.
- 2. Footings should be designed using a maximum allowable bearing capacity of 2,000 psf dead plus live load. The allowable bearing capacity may be increased by 200 psf for each additional 6 inches of embedment below a depth of 18 inches below lowest adjacent grade. The allowable bearing capacity should not exceed 3,000 psf dead plus live loads.
- 3. Rigid mat foundations should be designed using an allowable bearing capacity of 400 psf dead plus live load for loads distributed over the foundation footprint. They may also be designed using a modulus of subgrade reaction of 50 psi/inch.
- 4. Using the criteria in the previous two paragraphs, maximum total and differential settlement under static conditions are expected to be on the order of 0.75 inches and 0.25 inches in 40 feet, respectively. Foundations should also be designed to accommodate total and differential settlement due to liquefaction and seismically

301953-002 18 1808-091.SER



August 31, 2018

induced settlement of dry sand of 1.5 inches and 0.75 inches across the largest building footprint dimension, respectively.

5. Lateral loads may be resisted by soil friction and by passive resistance of the soil acting on foundations. Lateral capacity is based on the assumption that backfill adjacent to foundations is properly compacted. A passive equivalent fluid pressure of 300 pcf and a coefficient of friction of 0.35 may be used in design. These are ultimate values as no factors of safety, load factors, and/or other factors have been applied to any of the values.

# **Deep Foundations**

- 6. CIDH piles should have a minimum diameter of 24 inches, should have a minimum depth of 10 feet below lowest adjacent grade, and should not be constructed closer than three pile diameters (clear span) to each other without approval from the geotechnical engineer.
- 7. Allowable skin friction values for compression are shown on the Allowable Axial Capacity for CIDH Piles in Compression Chart presented in Appendix F and should be used for the soil; all end bearing capacity should be neglected. The allowable tension values may be determined using two-thirds of the compression values. Using these criteria, individual pile settlement should not exceed 0.5 inches, and differential settlement between the piles should not exceed 0.125 inches.
- 8. An ultimate passive equivalent fluid pressure of 300 pcf for soil should be used to determine the lateral capacity of the piles. This ultimate value may require application of appropriate factors of safety, load factors, and/or other factors as deemed appropriate by the architect/engineer.
- 9. The upper soils may not stand vertically during pile construction. Casing, drill fluid, or other means of keeping the holes open could be necessary.



August 31, 2018

- 10. Depending on the location and depth of the piles and the weather conditions at and preceding the time of construction, subsurface water could be encountered during pile drilling operations. Therefore, pile reinforcing should be designed to accommodate a minimum 5-inch diameter tremie pipe. Any water encountered should be removed from the hole prior to placing PCC, or the PCC should be tremied. The recommended Tremie Method is presented in Appendix F.
- 11. As the piles will utilize skin friction for support, it is not necessary to thoroughly clean the bottoms of the excavations, although excessive loose debris and slough material should be removed. As stated earlier, use of any end bearing capacity is not recommended.
- 12. PCC used in the piles should be placed at a slump between 4 and 6 inches in dry excavations and between 7 and 9 inches when placed under water.
- 13. The piles should not deviate from a plumb line taken from the center of the pile by more than 2 percent of the pile length, from the top to the point of interest. Adequate pile oversize may be assumed to provide required tolerance.

## General Recommendations and Comments for Shallow and Deep Foundations

- 14. The allowable bearing and friction capacities may be increased by one-third when transient loads such as wind or seismicity are included. The foundations should be designed using the seismic parameters presented within the Tetra Tech, Inc. Engineering Geology report.
- 15. Due to the sandy soil conditions at the site, settlement is expected to occur over a very short period of time after the loads on the foundations are applied; long term settlements are not anticipated to be significant.

301953-002 20 1808-091.SER



August 31, 2018

- 16. Foundation excavations should be observed by the geotechnical engineer prior to placement of reinforcing steel or any formwork. Foundation excavations should be thoroughly moistened prior to PCC placement and no desiccation cracks should be present.
- 17. The Corrosion Evaluation Report prepared by CERCO Analytical and presented in Appendix C should be used by the architect/engineer in specifying appropriate corrosion protection measures for all foundation elements.

# **Retaining Walls**

- All retaining wall foundations should be founded in soil compacted as recommended in the "Grading" section of this report and should be designed per the recommendations presented in the "Foundation" section of this report. It is assumed that retaining walls will not exceed 6 feet in height.
- 2. As we have assumed that retaining wall heights will not exceed a height of 6 feet, seismic design per CBC Section 1803A.5.12.1 (CBSCa, 2016) is not required. If retaining walls will retain more than 6 feet of soil, seismic design will be required by the geotechnical engineer.
- 3. Wall design should be based on the following parameters:



August 31, 2018

- 4. No surcharges are taken into consideration in the above values. The maximum toe pressure is an *allowable* value to which a factor of safety has been applied. No factors of safety, load factors, and/or other factors have been applied to any of the remaining values.
- 5. The above pressures are applicable to a horizontal retained surface behind the wall. Walls having a retained surface that slopes upward from the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every degree of slope inclination.
- 6. The active and at-rest values presented above are for drained conditions. Consequently, retaining walls should be drained with rigid perforated pipe encased in a free draining gravel blanket. The pipe should be placed perforations downward and should discharge in a nonerosive manner away from foundations and other improvements. The gravel blanket should have a width of approximately 1-foot and should extend upward to approximately 1-foot from the top of the wall. The upper foot should be backfilled with on-site soil, except in areas where a slab or pavement will abut the top of the wall. In such cases, the gravel backfill should extend up to the material that supports the slab or pavement. To reduce infiltration of the soil into the gravel, a permeable synthetic fabric conforming to the Standard Specifications Section 96-1.02B - Class "C," (Caltrans, 2015) should be placed between the two. Manufactured geocomposite wall drains conforming to the Standard Specifications Section 96-1.02C (Caltrans, 2015) are acceptable alternatives to the use of gravel, provided that they are installed in accordance with the recommendations of the manufacturer. Where drainage can be properly controlled, weep holes on maximum 4-foot centers may be used in lieu of perforated pipe. A filter fabric as described above should be placed between the weep holes and the drain gravel.

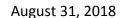


August 31, 2018

- 7. Retaining walls where moisture transmission through the wall would be undesirable should be *thoroughly* waterproofed in accordance with the specifications of the architect/engineer.
- 8. The architect/engineer should bear in mind that retaining walls by their nature are flexible structures, and that surface treatments on walls often crack. Where walls are to be plastered or otherwise have a finish applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical control joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

### Slabs-on-Grade and Exterior Flatwork

- 1. Conventional interior light duty PCC slabs-on-grade and exterior flatwork should have a minimum thickness of 4 full inches; however, the thickness of heavy duty slabs and flatwork should be specified by the architect/engineer. Conventional foundation slabs-on-grade should be doweled to footings and grade beams with dowels.
- 2. Reinforcement size, placement, and dowels should be as directed by the architect/engineer. Light duty exterior flatwork should be reinforced, at a minimum, with No. 3 rebar at 24 inches on-center each way. Heavy duty exterior flatwork should have minimum rebar sizing and spacing that meets the criteria of American Concrete Institute (ACI) 318, Section 7.12.2 (ACI, 2014). A modulus of subgrade reaction (K<sub>30</sub>) of 50 psi/inch may be used in the design of heavy duty slabs-on-grade founded on compacted native soil. The modulus of subgrade reaction (K<sub>30</sub>) may be increased to 150 psi/inch if the slab is underlain with a minimum of 6 inches of compacted Class 2 AB (Caltrans, 2015), and to 250 psi/inch if the slab is underlain with a minimum of 12 inches of compacted Class 2 AB.





- 3. Due to the current use of impermeable floor coverings, water-soluble flooring adhesives, and the speed at which buildings are now constructed, moisture vapor transmission through slabs is a much more common problem than in past years. Where moisture vapor transmitted from the underlying soil would be undesirable, the slabs should be protected from subsurface moisture vapor. A number of options for vapor protection are discussed below; however, the means of vapor protection, including the type and thickness of the vapor retarder, if specified, are left to the discretion of the architect/engineer.
- 4. Where specified, vapor retarders should conform to ASTM E1745-17. This standard specifies properties for three performance classes, Class "A", "B" and "C". The appropriate class should be selected based on the sensitivity of floor coverings to moisture intrusion and the potential for damage to the vapor retarder during placement of slab reinforcement and concrete.
- 5. Several recent studies, including those of ACI Document 302.1R-15 (ACI, 2015), have concluded that excess water above the vapor retarder increases the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial contamination. The studies also concluded that it is preferable to eliminate the typical sand layer beneath the slab and place the slab concrete in direct contact with a Class "A" vapor retarder, particularly during wet weather construction. However, placing the concrete directly on the vapor retarder requires special attention to using the proper vapor retarder, a very low water-cement ratio in the concrete mix, and special finishing and curing techniques.
- 6. Probably the next most effective option would be the use of vapor-inhibiting admixtures in the slab concrete mix and/or application of a sealer to the surface of the slab. This would also require special concrete mixes and placement procedures, depending upon the recommendations of the admixture or sealer manufacturer.

301953-002 24 1808-091.SER



August 31, 2018

- 7. Another option that may be a reasonable compromise between effectiveness and cost considerations is the use of a subslab vapor retarder protected by a sand layer, however this would increase the potential for moisture damage to floor coverings and for mold growth or other microbiological contamination. If a Class "A" vapor retarder is specified, the retarder can be placed directly on the material at pad grade. The retarder should be covered with a minimum 2 inches of clean sand. If a less durable vapor retarder is specified (Class "B" or "C"), a minimum of 4 inches of clean sand should be provided on top of the material at pad grade, and the retarder should be placed in the center of the clean sand layer. Clean sand is defined as well or poorly graded sand (ASTM D2487-17) of which less than 3 percent passes the No. 200 sieve. The site soils do not fulfill the criteria to be considered "clean" sand.
- 8. Regardless of the underslab vapor retarder selected, proper installation of the retarder is critical for optimum performance. All seams must be properly lapped, and all seams and utility penetrations properly sealed in accordance with the vapor retarder manufacturer's recommendations. Installation should conform to ASTM E1643-18a.
- 9. If sand is used between the vapor retarder and the slab, it should be moistened only as necessary to promote concrete curing; saturation of the sand should be avoided, as the excess moisture would be on top of the vapor retarder, potentially resulting in vapor transmission through the slab for months or years.
- 10. In conventional construction, it is common to use four to six inches of sand beneath exterior flatwork. Another measure that can be taken to reduce the risk of movement of flatwork is to provide thickened edges or grade beams around the perimeters of the flatwork. The thickened edges or grade beams could be up to 12 inches deep, with the deeper edges or grade beams providing better protection. At a minimum,

301953-002 25 1808-091.SER



August 31, 2018

the thickened edge or grade beam should be reinforced by two No. 4 rebar, one near the top and one near the bottom.

- 11. Flatwork should be constructed with frequent joints to allow articulation as flatwork moves in response to seasonal moisture and/or temperature variations causing minor expansion and contraction of the soil, or variable bearing conditions. The soil in the subgrade should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to casting the flatwork.
- 12. Where maintaining the elevation of the flatwork is desired, the flatwork should be doweled to the perimeter foundation as specified by the architect/engineer. In other areas, the flatwork may be doweled to the foundation or the flatwork may be allowed to "float free," at the discretion of the architect/engineer. Flatwork that is intended to float free should be separated from foundations by a felt joint or other means.
- 13. To reduce shrinkage cracks in PCC, the PCC aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the PCC should be properly placed and finished, contraction joints should be installed, and the PCC should be properly cured. PCC materials, placement, and curing specifications should be at the direction of the architect/engineer. The Guide for Concrete Floor and Slab Construction (ACI, 2015) is suggested as a resource for the architect/engineer in preparing such specifications.

### **Pavement Sections**

Two bulk samples were tested for R-value per ASTM D2488/D2488M-13. The two tests yielded R-values of 9 and 12. These R-value test results indicate that the upper site soils have a very low resistance to the types of loads imposed by traffic.

301953-002 26 1808-091.SER



The following preliminary pavement structural sections are based on an average R-value of 10, and should be used for preliminary cost estimating purposes only. After the site soils are graded and placed up to near the subgrade elevation, the upper soils exposed within the access driveways and parking areas should then be tested for R-value to verify that these preliminary pavement structural sections are appropriate; otherwise, revised pavement sections should be prepared. Preliminary pavement structural sections are provided for Traffic Indices (TI) of 4.5, 5.0, 5.5, 6.0, 6.5, and 7.0. Determination of the appropriate TI for specific areas is left to others. The pavement sections were calculated in accordance with the Highway Design Manual (Caltrans, 2016). The calculated AB and HMA thickness are for compacted material. Normal Caltrans construction tolerances should apply.

## **Preliminary Pavement Structural Sections**

| R-value | TI  | HMA (inches) | Class 2 AB (inches) |
|---------|-----|--------------|---------------------|
| 10      | 4.5 | 2.50         | 8.50                |
| 10      | 5.0 | 2.75         | 9.50                |
| 10      | 5.5 | 3.00         | 11.00               |
| 10      | 6.0 | 3.25         | 12.00               |
| 10      | 6.5 | 3.75         | 13.50               |
| 10      | 7.0 | 4.00         | 14.50               |

- 1. The upper 12 inches of subgrade and all AB should be compacted to a minimum of 95 percent of maximum dry density.
- 2. Subgrade and AB should be firm and unyielding when proof-rolled by heavy rubber-tired equipment prior to paving.
- 3. Where HMA will lie within 5 feet of landscape or drainage improvements, the HMA should be separated from these improvements by deepened curbs or other means that will reduce the potential for moisture fluctuations in the soils beneath the HMA and improve the stability of the curbs.



August 31, 2018

4. Finished HMA surfaces should slope toward drainage facilities such that rapid runoff will occur and no ponding is allowed on or adjacent to the HMA.

# **Drainage and Maintenance**

- 1. Per CBC Section 1804A.4 (CBSCa, 2016) unpaved ground surfaces should be *finish* graded to direct surface runoff away from foundations and other improvements at a minimum 5 percent grade for a minimum distance of 10 feet. The site should be similarly sloped to drain away from foundations, and other improvements during construction. Where this is not practicable due to property lines, other structures or improvements, etc., swales with improved surfaces, area drains, or other drainage facilities, should be used to collect and discharge runoff.
- 2. The eaves of the new building/structure roofs should be fitted with gutters. Runoff from flatwork, roof gutters, downspouts, planter drains, area drains, etc. should discharge in a nonerosive manner away from foundations and other improvements in accordance with the requirements of the governing agencies. Erosion protection should be placed at all discharge points unless the discharge is on a pavement surface.
- 3. To reduce the potential for planter drainage gaining access to subslab areas, any raised planter boxes adjacent to foundations should be installed with drains and sealed sides and bottoms. Drains should also be provided for areas adjacent to the structure and in landscape areas that would not otherwise freely drain.
- 4. The site soils are highly erodible. If the soils are disturbed during construction, stabilization of the soils by vegetation or other means, during and following construction, is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be planned and installed to maintain the surface drainage recommended above. Surface drainage should also be maintained during construction.

301953-002 28 1808-091.SER



August 31, 2018

- 5. Maintenance of drainage improvements and other surface improvements is critical to the long-term stability of the site and the integrity of the buildings/structures. Site improvements should be maintained on a regular basis.
- 6. Finished flatwork surfaces should be sloped to freely drain toward appropriate drainage facilities. Water should not be allowed to stand or pond on or adjacent to exterior pedestrian flatwork, or other improvements as it could infiltrate into the AB and/or the subgrade soils, causing premature deterioration of pavement, flatwork, or other improvements. Any cracks that develop in the pavement and flatwork should be promptly sealed.
- 7. All exterior drains and drain outlets should be maintained to be free-flowing. Care should be taken to establish and maintain vegetation. Vegetation and erosion matting (if utilized) should be maintained or augmented as needed. Irrigation systems should be maintained so that soils around structures are maintained at a relatively uniform year-round moisture content, and are neither over-watered nor allowed to dry and desiccate.
- 8. The owner or site maintenance personnel should periodically observe the areas within and around the site for indications of rodent activity and soil instability. The owner or site maintenance personnel should also implement an aggressive program for controlling the rodent activity in the general area.

## **Construction Observation and Testing**

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings and CPT soundings, and rely on continuity of the subsurface conditions encountered. It is assumed that the geotechnical engineer will be retained to provide consultation during the design phase, to review final plans once



August 31, 2018

they are available, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

- 2. At a minimum, the geotechnical engineer should be retained to provide:
  - Review of final grading, utility, and foundation plans
  - Professional observation during grading, foundation excavations, and trench backfill
  - Oversight of compaction testing during grading
  - Oversight of special inspection during grading
- 3. Special inspection of grading should be provided as per CBC Section 1705A.6 and CBC Table 1705A.6 (CBSCa, 2016). Deep foundation construction should be considered to fall under CBC Section 1705A.8 (CBSCa, 2016) "Cast-in-Place Deep Foundations." Special inspection of the installation of CIDH piles should be provided as per CBC Table 1705A.8 (CBSCa, 2016). The special inspector should be under the direction of the geotechnical engineer. In our opinion, all construction associated with the deep foundations should be subject to continuous special inspection. It is our opinion that none of the grading construction is of a nature that should warrant continuous special inspection; periodic special inspection should suffice. Subject to approval by the Building Official, the exception to continuous special inspection is described in CBC Section 1704A.2 (CBSCa, 2016) and should be specified by the architect/engineer and periodic special inspection of the following items should be provided by the special inspector.
  - Stripping and clearing of vegetation
  - Overexcavation to the recommended depths
  - Scarification, moisture conditioning, and compaction of the soil
  - Fill quality, placement, and compaction
  - Utility trench backfill
  - Retaining wall drains and backfill



- Foundation excavations
- Subgrade and AB compaction and proofrolling
- 4. A program of quality control should be developed prior to beginning grading. The contractor or project manager should determine any additional inspection items required by the architect/engineer or the governing jurisdiction.
- 5. Locations and frequency of compaction tests should be as per the recommendation of the geotechnical engineer at the time of construction. The recommended test location and frequency may be subject to modification by the geotechnical engineer, based upon soil and moisture conditions encountered, size and type of equipment used by the contractor, the general trend of the results of compaction tests, or other factors.
- 6. A preconstruction conference among the school district, the DSA project inspector, the geotechnical engineer, the City of Oxnard, the special inspector, the architect/engineer, and contractors is recommended to discuss planned construction procedures and quality control requirements.
- 7. The geotechnical engineer should be notified at least 48 hours prior to beginning construction operations. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising therefrom.

### 8.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either

301953-002 31 1808-091.SER





expressed or implied. This report is intended for the exclusive use by the client as discussed in the "Scope of Services" section. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge.

If changes with respect to the project become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report should comply with the CBC of other applicable standards, and the requirements of the governing jurisdiction.

The preliminary recommendations presented in this report are based upon the geotechnical conditions encountered at the site, and may be augmented by additional requirements of the client, or by additional recommendations provided by the geotechnical engineer based on peer or jurisdiction reviews, or conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.



# Oxnard High School No. 8

August 31, 2018

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text



#### Oxnard High School No. 8

#### **TECHINICAL REFERENCES**

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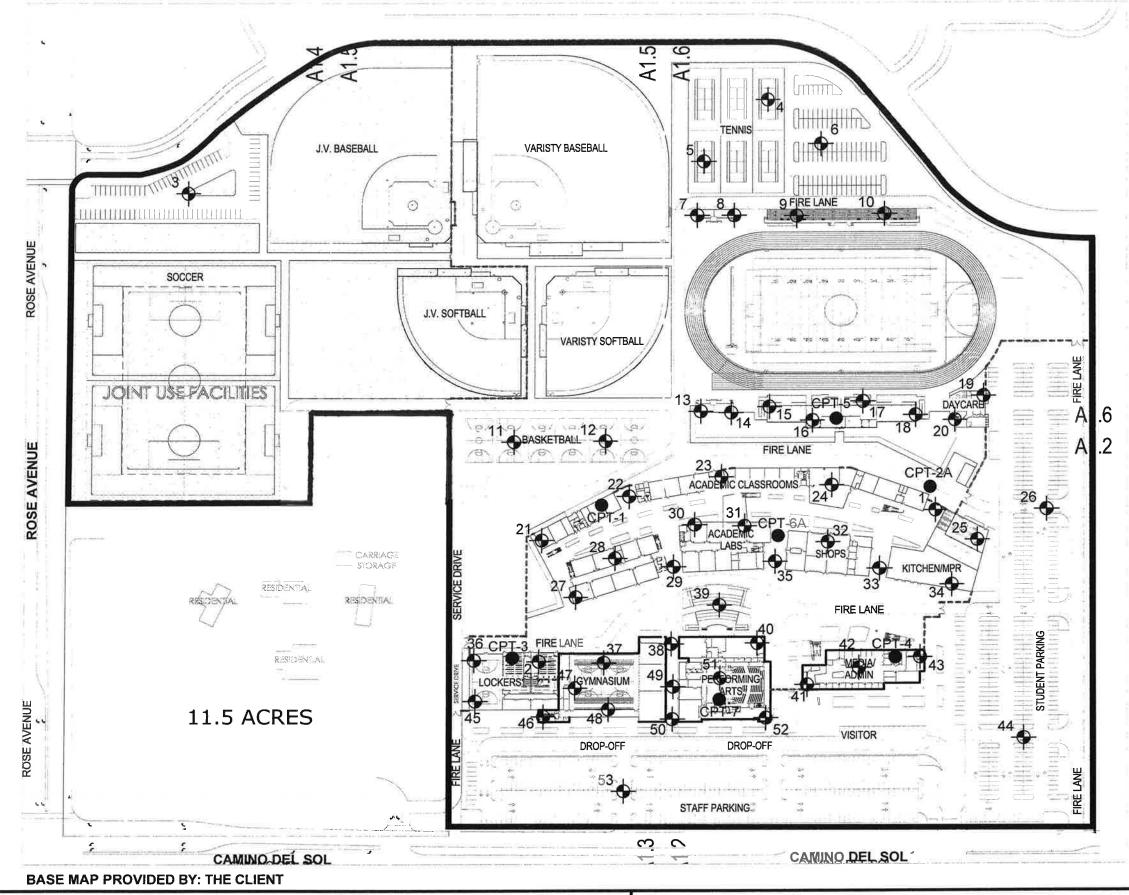
#### **APPENDIX A**

Exploration Location Map

Boring Log Legend

Boring Logs

Graphical CPT Data



**LEGEND** 

Boring Location (Approx.)

CPT-7 CPT Test Location (Approx.)



**NOT TO SCALE** 

**Earth Systems**2049 Preisker Lane, Suite E, Santa Maria, CA 93454 www.earthsystems.com (805) 928-2991 • Fax (805) 928-9253

**EXPLORATION LOCATION MAP OXNARD HIGH SCHOOL NO. 8** 

Northeast of Camino Del Sol and North Rose Avenue Oxnard, California

Date August 31, 2018

Project No. 301953-002

|                                     |                                | UN   | IFIED S            | SOIL CLA                 | SSIFICAT                              | TON SYS               | TEM (AS     | STM D 2487       | )                |
|-------------------------------------|--------------------------------|--|--------------------|--------------------------|---------------------------------------|-----------------------|-------------|------------------|------------------|
| Earth System                        | s Pacific                      | MAJOR<br>DIVISIONS   | GROUP<br>SYMBOL    |                          | TYPICA                                | L DESCRIP             | TIONS       |                  | GRAPH.<br>SYMBOL |
|                                     |                                | S  | GW                 | WELL GRAD<br>NO FINES    | ED GRAVELS                            | S, GRAVEL-S           | AND MIXTUR  | RES, LITTLE OR   | 200000           |
|                                     |                                | SOILS  | GP                 | POORLY GR                | ADED GRAVI                            |                       | VEL-SAND    |                  | b 0 0 0          |
| PODIN                               | C                              | D S  | GM                 | SILTY GRAV               |                                       |                       | MIXTURES,   | NON-PLASTIC      |                  |
| BORIN                               | G                              | N H  | GC                 |                          | AVELS, GRA                            | /EL-SAND-CI           | AY MIXTUR   | ES, PLASTIC      | TO OF            |
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| LEGEN                               | ID                             | /  | SP                 |                          | · · · · · · · · · · · · · · · · · · · |                       |             | LITTLE OR NO     |                  |
|                                     |                                | RSE  |                    | FINES                    |                                       |                       |             |                  | (3.3%)           |
|                                     |                                | COARSE   | SM                 |                          | S, SAND-SIL                           |                       |             |                  |                  |
| SAMPLE / SUBSURFAC<br>WATER SYMBOLS | E GRAPH<br>SYMBOI              |  | SC                 |                          | NDS, SAND-C                           |                       |             |                  |                  |
| CALIFORNIA MODIFIED                 |                                | ES   | ML                 | FINE SANDS               | OR CLAYEY                             | SILTS WITH            | SLIGHT PLA  |                  |                  |
| STANDARD PENETRATION TEST           | (SPT)                          | SOIL   | CL                 | CLAYS, SAN               | IDY CLAYS, S                          | SILTY CLAYS,          | LEAN CLAY   |                  |                  |
| SHELBY TUBE                         |                                | ED F MA-   | OL                 | PLASTICITY               | LTS AND OR                            |                       |             |                  |                  |
| BULK                                |                                | GRAINED SOI OR MORE OF MATERIAL SMALLER THAN #200 SIEVE SIZE | МН                 | INORGANIC<br>OR SILTY SO | SILTS, MICAO<br>DILS, ELASTIO         | CEOUS OR D<br>C SILTS | IATOMACEO   | OUS FINE SAND    |                  |
| SUBSURFACE WATER                    |                                | GR MK  | СН                 | INORGANIC                | CLAYS OF H                            | IGH PLASTIC           | ITY, FAT CL | AYS              | IIII             |
| DURING DRILLING                     | ¥                              | FINE<br>HALF   | ОН                 | ORGANIC CI<br>SILTS      | LAYS OF MEI                           | DIUM TO HIG           | H PLASTICIT | Y, ORGANIC       |                  |
| SUBSURFACE WATER<br>AFTER DRILLING  | $\sqsubseteq$                  | □  | PT                 | PEAT AND C               | OTHER HIGHL                           | Y ORGANIC             | SOILS       |                  | $\triangle$      |
|                                     |                                | OBSE   | RVED I             | MOISTUR                  | E CONDI                               | TION                  |             |                  |                  |
| DRY SI                              | IGHTLY M                       | OIST   | МО                 | IST                      | VEI                                   | RY MOIS               | T W         | ET (SATUR        | ATED)            |
|                                     |                                | (  | CONSIS             | STENCY                   |                                       |                       |             |                  |                  |
|                                     | RAINED SO                      | ILS  |                    |                          |                                       | INE GRAII             | NED SOIL    | -S               |                  |
| BLOWS/FOOT CAS                      | SAMPLER                        | DESCRIPTIV   | E TERM             | SP                       | BLOWS<br>T                            | S/FOOT<br>CA SAN      | MPLER       | DESCRIPTIV       | E TERM           |
|                                     | 7-50                           | LOOSE<br>MEDIUM DE   |                    | 0-2<br>3-4               |                                       | 0-3<br>4-1            |             | VERY SO          |                  |
| 31-50 5                             | 1-83                           | DENSE  | DENSE 5-8 8-13 MED |                          |                                       | MEDIUM S<br>STIFF     | TIFF        |                  |                  |
| OVER 50 OV                          | ER 83                          | VERTUE   | NOE                | 16-3                     | 30                                    | 26-                   | 50          | VERY ST          | IFF              |
|                                     |                                |  | CDAIN              | SIZES                    | ₹ 30                                  | OVER                  | ₹ 50        | HARD             |                  |
| IIS ST                              | ANDARD SI                      | FRIES SIEV   |                    | JIZLS                    | CLEA                                  | R SOLIAR              | E SIEVE (   | OPENING          |                  |
|                                     | # <b>4</b> 0                   | # 10   |                    | 4                        | 3/4"                                  | 3                     | _           | 12"              |                  |
| 11 200                              | SAND                           | " 10   |                    |                          | GRAVEL                                |                       |             | 12               |                  |
| SILT & CLAY FINE                    | MEDIUN                         | 4 604  | ARSE               | FINE                     |                                       | DARSE                 | COBBL       | ES BOUL          | DERS             |
| TINE                                | WILDION                        |  |                    |                          |                                       | JANGE                 |             |                  |                  |
| MA IOD DIVIDIONO                    |                                | TYPICAL  |                    |                          |                                       | IONC                  |             |                  |                  |
| MAJOR DIVISIONS COR                 | F FRAGMENT                     | OR EXPOSITE  |                    | YPICAL D                 |                                       |                       | SE BICK: CV | N ONLY BE CHIF   | PPED             |
| EXTREMELT HARD WITH                 | H REPEATED HE                  | EAVY HAMMER  | BLOWS              |                          |                                       |                       |             | EPEATED HEAV     |                  |
| VERY HARD HAM                       | MER BLOWS                      |  |                    | ,                        |                                       |                       |             |                  |                  |
|                                     |                                |  |                    |                          |                                       |                       |             | VY HAMMER BL     |                  |
|                                     |                                |  |                    |                          |                                       |                       |             | ESSURE; CORE     |                  |
|                                     |                                |  |                    |                          |                                       |                       |             | AN BE SCRATCH    |                  |
| VERY SOFT CAN LIGH                  | BE READILY INI<br>T MANUAL PRE | SSURE GROU   | JVED OR (          | GOUGED WIT               | H FINGERNA                            | IIL, OR CARV          | ED WITH KN  | IIFE; BREAKS W   | пн               |
| 1714.6                              | •                              | TYPICAL E  | BEDRO              | CK WEAT                  | HERING                                |                       |             |                  |                  |
| MAJOR DIVISIONS                     |                                |  | Т                  | YPICAL D                 | ESCRIPT                               | ONS                   |             |                  |                  |
| D                                   | ISCOLORATION OF                | *  |                    | TO 01105 4 6 5           | 05 05 01:0                            | DT DICTANO            | E EDOM 53   | ACTURES SS:      | 4=               |
| Ţ                                   |                                |  |                    |                          |                                       |                       |             | ACTURES: SOM     |                  |
| WEATHERED "RUS                      | STY", FELDSPAF                 | R CRYSTALS AF  | RE "CLOUI          | DY"                      |                                       |                       |             | g MINERALS AF    | KE               |
|                                     | OLORATION OF<br>OME EXTENT, (  |  |                    |                          |                                       |                       |             |                  |                  |
| .=u                                 | OLORATION OF<br>SPAR AND Fe-1  |  |                    | NIT DUT DEC              | THE THAT TO S                         | DALC CHCL             | AC OLLADE   | Z NANV DE LINIAL | TEDED:           |



Boring No. 1 PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 04-10-2018

|   | ASS        | OXNARD HIGH SCHOOL NO. 8 |  | SAI                | MPLE C         | DATA                 |                 |                    |
|---|------------|--------------------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet)                                     | USCS CLASS | SYMBOL                   | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California         | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   |            |                          | SOIL DESCRIPTION   | Z                  | S              | DRY                  | M               | ш а                |
| 1 - 2 - 3   | SM         |                          | SILTY SAND: brown, loose, moist (Alluvium)  thin lens of sandy silt                | 0-4                | 0              |                      |                 |                    |
| -<br>4<br>-<br>5<br>-<br>6<br>-<br>7<br>-<br>8      | SP         |                          | POORLY GRADED SAND: light brown/orange brown mottled, loose, moist, medium grained | 5.0-6.5            | -              | 98.0                 | 3.5             | 2<br>4<br>6        |
| 9 - 10 - 11 - 12 -                                  | SW         |                          | WELL GRADED SAND: gray brown, medium dense, moist                                  | 10.0-11.5          | -              | 108.6                | 3.1             | 5<br>10<br>15      |
| 13 - 14 - 15 - 16 - 17 -                            |            |                          | trace fine to coarse gravel  | 15.0-16.5          | -              | 115.0                | 3.5             | 9<br>20<br>24      |
| 18<br>-<br>19<br>-<br>20<br>-<br>21<br>-<br>22<br>- |            |                          |  | 20.0-21.5          | •              |                      |                 | 9<br>16<br>21      |
| 23<br>-<br>24<br>-<br>25<br>-<br>26<br>-            |            |                          | —————————————————————————————————————  |                    |                |                      |                 |                    |



Boring No. 1

PAGE 2 OF 2 JOB NO.: 301953-002 DATE: 04/10/2018

|                 | SLASS      |        | OXNARD HIGH SCHOOL NO. 8   |                    | SAI            | MPLE [               |                 | 0 17 10/2010       |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
| 0.7             | SN         |        | SOIL DESCRIPTION   | N<br>N             | SA             | DRY I                | MOI             | BI<br>PE           |
| -27             | SW         |        | WELL GRADED SAND: as above   |                    |                |                      |                 |                    |
| 28              |            |        |  |                    |                |                      |                 |                    |
| 29              |            |        |  |                    |                |                      |                 | 6                  |
| 30              | SW-<br>SM  |        | WELL GRADED SAND WITH SILT AND GRAVEL: gray                                | 30.0-31.5          |                |                      |                 | 17<br>20           |
| 31              | SM         |        | brown, dense, wet, fine to coarse gravel                                   |                    |                |                      |                 | 20                 |
| 32              |            |        |  |                    |                |                      |                 |                    |
| 33              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 34              |            |        |  |                    |                |                      |                 |                    |
| 35              |            |        |  |                    |                |                      |                 |                    |
| 36              |            |        |  |                    |                |                      |                 |                    |
| 37              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 38              |            |        |  |                    |                |                      |                 |                    |
| 39              |            |        |  |                    |                |                      |                 | 3                  |
| 40              |            |        | medium dense, thin discontinuous lenses of fine to very                    | 40.0-41.5          |                |                      |                 | 4                  |
| 41              |            |        | fine grained silty sand  |                    |                |                      |                 | 12                 |
| <b>-</b><br>42  |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 43              |            |        |  |                    |                |                      |                 |                    |
| 44              |            |        |  |                    |                |                      |                 |                    |
| 45              |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>46  |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 47              |            |        |  |                    |                |                      |                 |                    |
| 48              |            |        |  |                    |                |                      |                 |                    |
| 49              |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>50  |            |        | dense  | 50.0-51.5          |                |                      |                 | 8<br>15            |
| - 51            |            |        |  |                    |                |                      |                 | 21                 |
| 51<br>-         |            |        | End of Daring @ E4 El  |                    |                |                      |                 |                    |
| 52<br>-         |            |        | End of Boring @ 51.5'<br>Subsurface water encountered @ 24.5'              |                    |                |                      |                 |                    |
| 53              |            |        |  |                    |                |                      |                 |                    |
|                 |            |        |  |                    |                |                      |                 |                    |



Boring No. 2

PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 04-10-2018

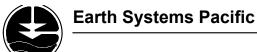
|                               | <u> </u>   |        | OVNARRABBLIGHT SCHOOL NO. 6  |                    | 0.4.           | 4D: E =              |                 | 04-10-2018         |
|-------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                               | က္က        |        | OXNARD HIGH SCHOOL NO. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet)               | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California     | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                               | ) 5<br>    |        | SOIL DESCRIPTION   | Ξ                  | S.             | DRY                  | MC              | B B                |
| 1 - 2                         | SM         |        | SILTY SAND: brown, loose, moist (Alluvium)                                     | 0-2.5              | 0              |                      |                 |                    |
| 3 - 4                         | ML         |        | SANDY SILT: gray brown, medium stiff, moist, trace clay                        | 2.5-5              | 0              |                      |                 | 4                  |
| 5 -                           | SP         |        | POORLY GRADED SAND: light brown/orange brown                                   | 5.0-6.5            |                | 99.5                 | 7.3             | 5<br>9             |
| 6<br>-<br>7<br>-<br>8         |            |        | mottled, loose, moist, medium grained  | 5-9                | 0              |                      |                 |                    |
| <b>-</b><br>9                 |            |        | gray brown modium donos  |                    |                |                      |                 |                    |
| -<br>10<br>-<br>11            |            |        | gray brown, medium dense   | 10.0-11.5          | -              | 110.6                | 4.9             | 7<br>14<br>21      |
| 12<br>-<br>13<br>-            | sw         |        | WELL GRADED SAND: gray brown, medium dense, moist, trace fine to coarse gravel |                    |                |                      |                 |                    |
| 14<br>-<br>15<br>-<br>16<br>- |            |        |  | 15.0-16.5          | -              | 106.2                | 3.9             | 9<br>16<br>25      |
| 18<br>-<br>19<br>-            |            |        |  |                    |                |                      |                 | 3                  |
| 20<br>-                       |            |        | _  | 20.0-21.5          |                |                      |                 | 5<br>6             |
| 21 -                          |            |        | — ———————————————————————————————————  |                    |                |                      |                 |                    |
| 22<br>-<br>23                 |            |        |  |                    |                |                      |                 |                    |
| 24                            |            |        |  |                    |                |                      |                 |                    |
| 25<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 26<br>-                       |            |        |  |                    |                |                      |                 |                    |



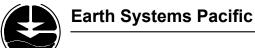
Boring No. 2

LOGGED BY: R. Wagner PAGE 2 OF 2
DRILL RIG: Mobile B-53
AUGER TYPE: 6" Hollow Stem
PAGE 2 OF 2
JOB NO.: 301953-002
DATE: 04/10/2018

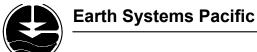
|   |                |        | R TYPE: 6" Hollow Stem   |                    |                |                      |                 | 04/10/2018         |  |
|---|----------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
|   | S              |        | OXNARD HIGH SCHOOL NO. 8   |                    | SAI            | MPLE [               | DATA            |                    |  |
| DEPTH<br>(feet)                                     | USCS CLASS     | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California   | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
| 27  | ñ              |        | SOIL DESCRIPTION   | N<br>N             | S/             | DRY                  | MO              | B B                |  |
| 27<br>-<br>28<br>-<br>29<br>-<br>30<br>-<br>31<br>- | SP             |        | POORLY GRADED SAND: brown, medium dense, wet, medium grained, trace fine to coarse gravel, thin lenses of sandy silt | 30.0-31.5          | •              |                      |                 | 4<br>7<br>9        |  |
| 32 -<br>33 -<br>34                                  | - — -<br>L — - |        | some gravel  |                    |                |                      |                 |                    |  |
| -<br>35<br>-<br>36<br>-<br>37<br>-<br>38            | SW-<br>SM      |        | WELL GRADED SAND WITH SILT: gray brown, medium dense, wet, trace fine to coarse gravel                               |                    |                |                      |                 |                    |  |
| 39 - 40 - 41 - 42 - 43 - 45 - 46 - 47 - 40          |                |        | gray   | 40.0-41.5          |                |                      |                 | 7<br>9<br>11       |  |
| 48<br>-<br>49<br>-<br>50<br>-<br>51                 | SM             |        | SILTY SAND: gray, medium dense, wet, fine grained  | 50.0-51.5          | •              |                      |                 | 5<br>7<br>12       |  |
| 52<br>-<br>53<br>-                                  |                |        | End of Boring @ 51.5'<br>Subsurface water encountered @ 21.0'  |                    |                |                      |                 |                    |  |



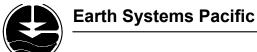
|                 | , \ <u>U</u> |            | OXNARD HIGH SCHOOL No. 8                                 |                    | C / I          | MPLE D               |                 | 07-20-2018         |
|-----------------|--------------|------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | SS           |            | Northeast of Camino Del Sol                              |                    | SAI            |                      | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS   | SYMBOL     | and North Rose Avenue<br>Oxnard, California              | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | î            |            | SOIL DESCRIPTION   | LNI                | /S             | DRY                  | ОМ              | BI<br>PE           |
| - 1             | SM           |            | SILTY SAND: brown, loose, slightly moist (Alluvium)      | 0-4                | 0              |                      |                 |                    |
| 2               |              |            | moist  | 2.0-3.5            |                | 101.5                | 7.3             | 2<br>4             |
| -<br>3<br>-     |              |            |  |                    |                |                      |                 | 4                  |
| 4 -             | SP           | 2) 212) 21 | POORLY GRADED SAND: light brown, loose, moist            | 5.0-6.5            |                | 97.0                 | 7.8             | 3<br>6             |
| 5<br>-<br>6     |              |            |  |                    |                | 37.0                 | 7.0             | 9                  |
| -<br>7          |              |            |  |                    |                |                      |                 |                    |
| - 8             |              |            |  |                    |                |                      |                 |                    |
| 9               |              |            |  |                    |                |                      |                 |                    |
| 10              |              |            |  | 10.0-11.5          |                |                      |                 | 2<br>6             |
| 11              |              |            | medium dense   |                    |                |                      |                 | 9                  |
| 12<br>-<br>13   |              |            | End of Boring @ 11.5'<br>No Subsurface Water Encountered |                    |                |                      |                 |                    |
| - 14            |              |            |  |                    |                |                      |                 |                    |
| <b>-</b><br>15  |              |            |  |                    |                |                      |                 |                    |
| <b>-</b><br>16  |              |            |  |                    |                |                      |                 |                    |
| 17              |              |            |  |                    |                |                      |                 |                    |
| 18              |              |            |  |                    |                |                      |                 |                    |
| 19<br>-         |              |            |  |                    |                |                      |                 |                    |
| 20              |              |            |  |                    |                |                      |                 |                    |
| 21<br>-         |              |            |  |                    |                |                      |                 |                    |
| 22<br>-         |              |            |  |                    |                |                      |                 |                    |
| 23<br>-<br>24   |              |            |  |                    |                |                      |                 |                    |
| -<br>25         |              |            |  |                    |                |                      |                 |                    |
| <b>-</b> 26     |              |            |  |                    |                |                      |                 |                    |
|                 |              |            |  |                    |                |                      |                 |                    |



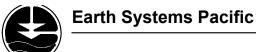
|   | OYNAPD HIGH SCHOOL No. 8 | SAMPLE DATA |  |                    |                |                      |                 |                    |
|---|--------------------------|-------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|   | ပ္လ                      |             | OXNARD HIGH SCHOOL No. 8   |                    | SAI            |                      | DATA            |                    |
| DEPTH<br>(feet)   | USCS CLASS               | SYMBOL      | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   | ñ                        |             | SOIL DESCRIPTION   | N<br>N             | /S             | DRY                  | MO              | B 8                |
| - 0 1 - 2 - 3 - 3   | SM                       |             | SILTY SAND: brown, loose, moist<br>(Alluvium)                              | 2.0-3.5            |                | 98.8                 | 11.9            | 1<br>2<br>3        |
| 4<br>-<br>5<br>-<br>6<br>-<br>7   | SP                       |             | POORLY GRADED SAND: light brown, loose, moist, trace gravel                | 5.0-6.5            | -              | 94.1                 | 5.8             | 3<br>6<br>7        |
| 8<br>-<br>9<br>-<br>10  | sw                       |             | WELL GRADED SAND: light brown, loose, moist                                | 8.5-10.0           | •              |                      |                 | 3 6                |
| -111 -12 -133 -144 -155 -166 -177 -188 -199 -120 -121 -122 -123 -125 -126 -126 -1 |                          |             | End of Boring @ 10.0' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |



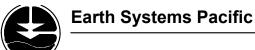
|                  | AUGER TYPE: 6" Hollow Stem DATE: 07-16-2018 |        |  |                    |                |                      |                 |                    |
|------------------|---|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                  | ပ္ပ   |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet)  | USCS CLASS                                  | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                  | ຶ   |        | SOIL DESCRIPTION   | Z ·                | s'             | DRY                  | МО              | 8 H                |
| 1 -              | SM  |        | SILTY SAND: light brown, loose, slightly moist (Alluvium)                  |                    |                |                      |                 | 1                  |
| 2 -              |   |        | very moist, trace clay, decreasing silt content                            | 2.0-3.5            |                | 95.4                 | 17.0            | 2 2                |
| 3<br>-<br>4<br>- |   |        |  | 2-5                | 0              |                      |                 | 2                  |
| 5 -              | SP  |        | POORLY GRADED SAND: light brown, loose, moist                              | 5.0-6.5            |                | 96.0                 | 10.0            | 4 8                |
| 6 - 7            |   |        |  |                    |                |                      |                 |                    |
| 8 -              | sw  |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 8.5-10.0           |                |                      |                 | 4<br>6             |
| 9 -              |   |        |  |                    |                |                      |                 | 7                  |
| -<br>11          |   |        | End of Boring @ 10.0' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| 12               |   |        |  |                    |                |                      |                 |                    |
| 13               |   |        |  |                    |                |                      |                 |                    |
| 14<br>-<br>15    |   |        |  |                    |                |                      |                 |                    |
| -<br>16<br>-     |   |        |  |                    |                |                      |                 |                    |
| 17               |   |        |  |                    |                |                      |                 |                    |
| 18<br>-<br>19    |   |        |  |                    |                |                      |                 |                    |
| 20               |   |        |  |                    |                |                      |                 |                    |
| 21               |   |        |  |                    |                |                      |                 |                    |
| 22<br>-          |   |        |  |                    |                |                      |                 |                    |
| 23<br>-<br>24    |   |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>25   |   |        |  |                    |                |                      |                 |                    |
| 26<br>-          |   |        |  |                    |                |                      |                 |                    |



|                 | OYNAPD HIGH SCHOOL No. 8 | SAMPLE DATA |  |                    |                |                      |                 |                    |
|-----------------|--------------------------|-------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | S                        |             | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS               | SYMBOL      | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | sn                       |             | SOIL DESCRIPTION   | <u>N</u>           | SA             | )<br>  ABO           | ЮМ              | BI<br>PE           |
| - 1             | SM                       |             | SILTY SAND: light brown, loose, slightly moist (Alluvium)                  |                    |                |                      |                 |                    |
| 2               |                          |             | moist  | 2.0-3.5            |                | 97.9                 | 9.3             | 2<br>2<br>3        |
| 3 -             |                          |             |  |                    |                |                      |                 | 3                  |
| 4<br>-<br>5     | ML                       | 111111      | SANDY SILT: brown to light brown, soft, very moist                         | 5.0-6.5            |                | 89.3                 | 30.5            | 1 3                |
| 6               |                          |             |  | 4-7                | 0              |                      |                 | 4                  |
| 7 .             | SP                       |             | POORLY GRADED SAND: light brown, loose, moist                              |                    |                |                      |                 |                    |
| 8 - 9 -         |                          |             |  | 8.5-10.0           | •              |                      |                 | 4<br>5<br>6        |
| 10              |                          | <br>a 5 / 1 | medium dense   |                    |                |                      |                 |                    |
| 11              |                          |             | End of Boring @ 10.0'<br>No Subsurface Water Encountered                   |                    |                |                      |                 |                    |
| 12              |                          |             |  |                    |                |                      |                 |                    |
| 13              |                          |             |  |                    |                |                      |                 |                    |
| 14<br>-<br>15   |                          |             |  |                    |                |                      |                 |                    |
| -<br>16<br>-    |                          |             |  |                    |                |                      |                 |                    |
| 17<br>-         |                          |             |  |                    |                |                      |                 |                    |
| 18<br>-<br>19   |                          |             |  |                    |                |                      |                 |                    |
| <b>-</b> 20     |                          |             |  |                    |                |                      |                 |                    |
| 21              |                          |             |  |                    |                |                      |                 |                    |
| -<br>22<br>-    |                          |             |  |                    |                |                      |                 |                    |
| 23<br>-<br>24   |                          |             |  |                    |                |                      |                 |                    |
| -<br>25         |                          |             |  |                    |                |                      |                 |                    |
| 26              |                          |             |  |                    |                |                      |                 |                    |
|                 | L                        |             |  |                    |                |                      |                 |                    |



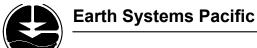
|                 |            |        | OVNARRAMENTAL COLOCA No. 2   |                    |                | VDI = 5              |                 | 07-10-2018         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | တ္တ        |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | SO         |        | SOIL DESCRIPTION   | N Z                | S/             | DRY                  | MO              | BI<br>PE           |
| -<br>1          | SM         |        | SILTY SAND: light brown to brown, loose, slightly moist (Alluvium)         |                    |                |                      |                 |                    |
| - 2             |            | <br>   |  |                    |                |                      |                 |                    |
| 3               |            |        |  |                    |                |                      |                 |                    |
| 4               |            |        |  |                    |                |                      |                 | 2                  |
| 5               | SP         |        | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel           | 5.0-6.5            |                | 90.9                 | 5.4             | 3<br>6             |
| 6 -             |            |        |  |                    |                |                      |                 |                    |
| 7 -             |            |        |  |                    |                |                      |                 |                    |
| 8<br>-<br>9     |            |        |  |                    |                |                      |                 |                    |
| 10              | sw         |        | WELL GRADED SAND: light brown, medium dense,                               | 10.0-11.5          |                | 105.8                | 4.2             | 4<br>10            |
| -<br>11         |            |        | moist, trace fine gravel   |                    |                |                      |                 | 11                 |
| 12              |            |        |  |                    |                |                      |                 |                    |
| 13              |            |        |  |                    |                |                      |                 |                    |
| 14              |            |        |  | 15.0-16.5          |                |                      |                 | 4<br>8             |
| 15<br>-         |            |        |  | 10.0 10.0          |                |                      |                 | 10                 |
| 16<br>-<br>17   |            |        | End of Boring @ 16.5'  |                    |                |                      |                 |                    |
| <b>-</b><br>18  |            |        | No Subsurface Water Encountered  |                    |                |                      |                 |                    |
| 19              |            |        |  |                    |                |                      |                 |                    |
| 20              |            |        |  |                    |                |                      |                 |                    |
| 21              |            |        |  |                    |                |                      |                 |                    |
| 22<br>-         |            |        |  |                    |                |                      |                 |                    |
| 23              |            |        |  |                    |                |                      |                 |                    |
| 24<br>-<br>25   |            |        |  |                    |                |                      |                 |                    |
| <b>-</b> 26     |            |        |  |                    |                |                      |                 |                    |
|                 |            |        |  |                    |                |                      |                 |                    |



|                 |            |         | OVNARD HIGH SCHOOL No. 9   |                    | CVI            | МОГГ                 |                 | 07-10-2010            |
|-----------------|------------|---------|--|--------------------|----------------|----------------------|-----------------|-----------------------|
|                 | SS         |         | OXNARD HIGH SCHOOL No. 8  Northeast of Camino Del Sol            |                    | SAI            | MPLE [               | DATA            | 2 5 7 7 12 12 15 9 10 |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL  | and North Rose Avenue Oxnard, California                         | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | OWS<br>R 6 IN.        |
|                 | SN         |         | SOIL DESCRIPTION   | N                  | S/<br>L        | DRY                  | MO              | ᆱ                     |
| -0-             | SM         |         | SILTY SAND: brown, loose, slightly moist (Alluvium)              |                    |                |                      |                 |                       |
| 1 -             |            |         | moist, trace clay  |                    |                |                      |                 |                       |
| 2 -             |            |         |  |                    |                |                      |                 |                       |
| 3 -             |            |         |  |                    |                |                      |                 |                       |
| 4               | SP         |         | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel | 5.0-6.5            |                | 95.8                 | 5.9             |                       |
| 5<br>-          |            |         | trace line graver  | 0.0 0.0            |                | 95.6                 | 5.9             |                       |
| 6 -             |            |         |  |                    |                |                      |                 |                       |
| 7 -             |            |         |  |                    |                |                      |                 |                       |
| 8 -             |            |         |  |                    |                |                      |                 |                       |
| 9               |            |         | medium dense   |                    |                |                      |                 | 7                     |
| 10              |            |         |  | 10.0-11.5          |                | 101.2                | 7.4             |                       |
| 11              |            |         |  |                    |                |                      |                 |                       |
| 12              | SW         | L X     | WELL GRADED SAND: light brown, medium dense,                     |                    |                |                      |                 |                       |
| 13              |            |         | moist, trace fine gravel, trace clay                             |                    |                |                      |                 |                       |
| 14              |            |         |  |                    |                |                      |                 | 5                     |
| <b>-</b><br>15  |            |         |  | 15.0-16.5          |                |                      |                 | 9                     |
| -<br>16         |            |         |  |                    |                |                      |                 |                       |
| 17              |            | 15/22-5 | End of Boring @ 16.5'  |                    |                |                      |                 |                       |
| <b>-</b><br>18  |            |         | No Subsurface Water Encountered                                  |                    |                |                      |                 |                       |
| <b>-</b><br>19  |            |         |  |                    |                |                      |                 |                       |
| <b>-</b><br>20  |            |         |  |                    |                |                      |                 |                       |
| <b>-</b><br>21  |            |         |  |                    |                |                      |                 |                       |
| - 22            |            |         |  |                    |                |                      |                 |                       |
| -<br>23         |            |         |  |                    |                |                      |                 |                       |
| -               |            |         |  |                    |                |                      |                 |                       |
| 24<br>-         |            |         |  |                    |                |                      |                 |                       |
| 25<br>-         |            |         |  |                    |                |                      |                 |                       |
| 26<br>-         |            |         |  |                    |                |                      |                 |                       |

LEGEND: Ring Sample Grab Sample Shelby Tube Sample SPT

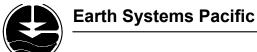
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.



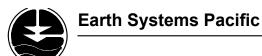
|                 |            |        | OXNARD HIGH SCHOOL No. 8  |                                       | SAI            | MPLE [               |              | 07-10-2010         |
|-----------------|------------|--------|---|---------------------------------------|----------------|----------------------|--------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California                  | INTERVAL<br>(feet)                    | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE (%) | BLOWS<br>PER 6 IN. |
|                 | NS         | 0)     | SOIL DESCRIPTION  | N N N N N N N N N N N N N N N N N N N | SAI            | DRY C                | MOIS         | BL<br>PEF          |
| - 0             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)   |                                       |                |                      |              |                    |
| - 2             |            |        | moist, trace clay   |                                       |                |                      |              |                    |
| -<br>3<br>-     |            |        |   |                                       |                |                      |              |                    |
| 4 -             | SP         |        | POORLY GRADED SAND: light brown, loose, very moist, trace fine gravel                       | 5.0-6.5                               |                | 96.2                 | 16.3         | 2                  |
| 5               |            |        | trace line graver   | 0.0 0.0                               |                | 90.2                 | 10.5         | 5                  |
| 6               |            |        |   |                                       |                |                      |              |                    |
| 7               |            |        |   |                                       |                |                      |              |                    |
| 8<br>-<br>9     |            |        |   |                                       |                |                      |              |                    |
| -<br>10         |            |        |   | 10.0-11.5                             |                | 98.9                 | 3.6          | 7<br>11            |
| -<br>11         |            |        | medium dense, moist   | 10.0 11.0                             | _              | 90.9                 | 3.0          | 13                 |
| - 12            |            |        |   |                                       |                |                      |              |                    |
| - 13            | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine to coarse gravel, trace clay |                                       |                |                      |              |                    |
| - 14            |            |        |   |                                       |                |                      |              | _                  |
| <b>-</b><br>15  |            |        |   | 15.0-16.5                             |                | 116.1                | 3.9          | 5<br>9             |
| <b>-</b><br>16  |            |        |   |                                       |                |                      |              | 16                 |
| -<br>17         |            |        |   |                                       |                |                      |              |                    |
| <b>-</b><br>18  |            |        |   |                                       |                |                      |              |                    |
| <b>-</b><br>19  |            |        | trace cobbles   |                                       |                |                      |              |                    |
| <b>-</b><br>20  |            |        |   | 20.0-21.5                             |                |                      |              | 7<br>14            |
| <b>-</b><br>21  |            |        | dense   | 20.0-21.5                             |                |                      |              | 18                 |
| <b>-</b><br>22  |            |        |   |                                       |                |                      |              |                    |
| <b>-</b> 23     |            |        |   |                                       |                |                      |              |                    |
| <b>-</b><br>24  |            |        |   |                                       |                |                      |              |                    |
| -<br>25<br>-    | - CL       |        | LEAN CLAY: brown to gray brown, very soft, very moist, trace silt                           | 25.0-26.5                             | ullet          |                      |              | 0 1                |
| 26<br>-         |            |        | End of Boring @ 26.5'<br>No Subsurface Water Encountered                                    |                                       |                |                      |              | 1                  |

LEGEND: Ring Sample Grab Sample Shelby Tube Sample SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

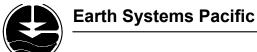


|   |            |        | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-16-2018         |
|---|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|   | S          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet)                                     | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   |            |        | SOIL DESCRIPTION   | LNI                | Ś              | DRY                  | MC              | B<br>PE            |
| -<br>1  | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 2<br>-<br>3<br>-<br>4<br>-<br>5                     |            |        | moist  | 5.0-6.5            |                | 87.0                 | 31.2            | 1<br>2             |
| -<br>6<br>-<br>7                                    |            |        | very moist   |                    |                |                      |                 | 2                  |
| -<br>8<br>-<br>9                                    | SP         |        | POORLY GRADED SAND: light brown, loose, moist                              | 10.0-11.5          |                | 105.7                | 2.5             | 6                  |
| 10<br>-<br>11<br>-<br>12<br>-<br>13<br>-<br>14<br>- | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 10.0-11.5          |                | 105.7                | 3.5             | 17<br>22<br>4      |
| 15<br>-<br>16<br>-                                  | sc         |        | CLAYEY SAND: brown, loose, very moist, trace fine gravel                   | 15.0-16.5          | •              |                      |                 | 5<br>6             |
| 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26     |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |

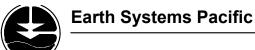


Boring No.: 11 PAGE 1 OF 1 JOB NO.: 301953-002

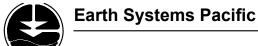
|  |            |        | TYPE: 6 Hollow Stelli  | SAMPLE DATA        |                |                      | 07-20-2018      |                    |
|--|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|  | ြ          |        | OXNARD HIGH SCHOOL No. 8   |                    |                |                      |                 |                    |
| DEPTH<br>(feet)  | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|  | ñ          |        | SOIL DESCRIPTION   | N<br>N             | S/             | DRY                  | MO              | B 34               |
| -<br>1   | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 | 2                  |
| 2<br>-<br>3<br>-<br>4  |            |        | moist  | 2.0-3.5            |                | 97.6                 | 11.9            | 3<br>4<br>2        |
| 5<br>-<br>6<br>-<br>7<br>-<br>8                                | SP         |        | POORLY GRADED SAND: light brown, loose, moist                              | 5.0-6.5            |                | 101.9                | 6.6             | 5<br>9             |
| 9 - 10 - 11 -  | sw         |        | WELL GRADED SAND: light brown, medium dense,<br>moist                      | 10.0-11.5          | •              |                      |                 | 6<br>9<br>12       |
| 12 - 13 - 14 - 15 - 16 - 17 - 18 - 20 - 21 - 22 - 23 - 24 - 25 |            |        | End of Boring @ 11.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| -<br>26<br>-   |            |        |  |                    |                |                      |                 |                    |



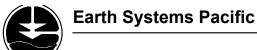
|                                 | $\overline{}$ |        | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-17-2018         |
|---------------------------------|---------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                                 | ဟ             |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet)                 | USCS CLASS    | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                                 | 'n            |        | SOIL DESCRIPTION   | LNI                | 'S             | YAO                  | OM              | 3d<br>8            |
| - 1                             | SM            |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 2 - 3 -                         |               |        | very moist   | 2.0-3.5            | _              | 94.0                 | 17.7            | 1<br>3<br>4        |
| 4<br>-<br>5<br>-<br>6<br>-<br>7 | SW            |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 5.0-6.5            | -              | 98.4                 | 4.2             | 4<br>8<br>10       |
| 9<br>-<br>10                    |               |        |  | 8.5-10.0           | •              |                      |                 | 3<br>4<br>8        |
| -<br>11<br>-                    |               |        | End of Boring @ 10.0'<br>No Subsurface Water Encountered                   |                    |                |                      |                 |                    |
| 12<br>-                         |               |        |  |                    |                |                      |                 |                    |
| 13<br>-<br>14                   |               |        |  |                    |                |                      |                 |                    |
| -<br>15                         |               |        |  |                    |                |                      |                 |                    |
| 16<br>-                         |               |        |  |                    |                |                      |                 |                    |
| 17<br>-                         |               |        |  |                    |                |                      |                 |                    |
| 18<br>-<br>19                   |               |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>20                  |               |        |  |                    |                |                      |                 |                    |
| 21<br>-                         |               |        |  |                    |                |                      |                 |                    |
| 22<br>-                         |               |        |  |                    |                |                      |                 |                    |
| 23<br>-<br>24                   |               |        |  |                    |                |                      |                 |                    |
| -<br>25                         |               |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>26                  |               |        |  |                    |                |                      |                 |                    |
| -                               |               |        |  |                    |                |                      |                 |                    |



|                 |            |         | OXNARD HIGH SCHOOL No. 8                             |                    | 0 4 1          | MDI E 5              |                 | 07-19-2018         |
|-----------------|------------|---------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | က္ခ        |         | Northeast of Camino Del Sol                          | SAMPLE DATA        |                |                      |                 |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL  | and North Rose Avenue Oxnard, California             | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 |            |         | SOIL DESCRIPTION                                     | LNI                | /S             | DRY                  | ОМ              | B<br>PE            |
| - 0             | SM         |         | SILTY SAND: brown, loose, slightly moist (Alluvium)  |                    |                |                      |                 |                    |
| - 2             |            | · · · · | moist  |                    |                |                      |                 |                    |
| -<br>3<br>-     |            |         |  |                    |                |                      |                 |                    |
| 4<br>-<br>5     | sw         |         | WELL GRADED SAND: light brown, medium dense, moist   | 5.0-6.5            |                | 97.3                 | 3.9             | 4<br>6             |
| -<br>6          |            |         |  |                    |                |                      |                 | 11                 |
| 7               |            |         |  |                    |                |                      |                 |                    |
| 8               |            |         |  |                    |                |                      |                 |                    |
| 9               |            |         |  |                    |                |                      |                 | 2                  |
| 10 -            |            |         | thin lense of very moist silty sand ~ 2" to 3" thick | 10.0-11.5          |                | 106.4                | 4.5             | 7<br>17            |
| 11<br>-         |            |         |  |                    |                |                      |                 |                    |
| 12              |            |         |  |                    |                |                      |                 |                    |
| 13              |            |         |  |                    |                |                      |                 |                    |
| 14<br>-<br>15   |            |         |  | 15.0-16.5          |                |                      |                 | 7                  |
| <b>-</b><br>16  |            |         | dense  | 13.0-10.3          |                |                      |                 | 15<br>18           |
| 17              |            | 0504-5  | End of Boring @ 16.5'                                |                    |                |                      |                 |                    |
| 18              |            |         | No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| 19              |            |         |  |                    |                |                      |                 |                    |
| 20              |            |         |  |                    |                |                      |                 |                    |
| 21<br>-         |            |         |  |                    |                |                      |                 |                    |
| 22<br>-         |            |         |  |                    |                |                      |                 |                    |
| 23<br>-<br>24   |            |         |  |                    |                |                      |                 |                    |
| <b>-</b> 25     |            |         |  |                    |                |                      |                 |                    |
| <b>-</b><br>26  |            |         |  |                    |                |                      |                 |                    |
|                 |            |         |  |                    |                |                      |                 |                    |



|                 | , \ <u>\</u> |        | TYPE: 6 Hollow Stern   |                    |                |                      |                 | 07-23-2018         |
|-----------------|--------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | ၂ တ          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS   | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | n ns         |        | SOIL DESCRIPTION   | N<br>N             | S/             | DRY                  | MO              | B H                |
| -               | SM           |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 -             |              |        | (Alluvium)   |                    |                |                      |                 |                    |
| 2               |              |        |  |                    |                |                      |                 |                    |
| 3               |              |        |  |                    |                |                      |                 |                    |
| 4               | sw           |        | WELL GRADED SAND: light brown, loose, moist                                |                    |                |                      |                 |                    |
| <b>-</b> 5      |              |        |  | 5.0-6.5            |                | 100.1                | 3.7             | 4<br>7             |
|                 |              |        | trace fine gravel  |                    |                |                      |                 | 8                  |
| 6 -             |              |        | trace line graver  |                    |                |                      |                 |                    |
| 7 -             |              |        |  |                    |                |                      |                 |                    |
| 8               |              |        |  |                    |                |                      |                 |                    |
| 9               | L<br>        |        |  |                    |                |                      |                 |                    |
| 10              |              |        | lense of poorly graded sand  | 10.0-11.5          |                | 89.6                 | 15.7            | 0<br>2             |
| -               |              |        |  |                    |                |                      |                 | 7                  |
| -               |              |        |  |                    |                |                      |                 |                    |
| 12              |              |        |  |                    |                |                      |                 |                    |
| 13              |              |        |  |                    |                |                      |                 |                    |
| 14              |              |        |  |                    |                |                      |                 | 8                  |
| -<br>15         | L            |        | trace cobbles  | 15.0-16.5          |                | 105.1                | 9.4             | 21<br>28           |
| <b>-</b><br>16  |              |        | dense  |                    |                |                      |                 | 20                 |
| -               |              |        |  |                    |                |                      |                 |                    |
| 17              |              |        |  |                    |                |                      |                 |                    |
| 18              |              |        |  |                    |                |                      |                 |                    |
| 19              |              |        |  |                    |                |                      |                 |                    |
| 20              |              |        |  | 20.0-21.5          |                |                      |                 | 7<br>17            |
| -<br>21         |              |        |  | 20.0-21.3          |                |                      |                 | 16                 |
| -               |              |        |  |                    |                |                      |                 |                    |
| 22<br>-         | <u> </u>     |        | <u>_</u>   |                    |                |                      |                 |                    |
| 23              |              |        | wet, flow sands  |                    |                |                      |                 |                    |
| 24              |              |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>25  |              |        | blow count from 26.0' to 26.5' not reliable due to flow sands              | 25.0-26.5          |                |                      |                 | 10<br>17           |
| <b>-</b><br>26  |              |        | End of Boring @ 26.5'  |                    |                |                      |                 | 22                 |
|                 |              |        | No Subsurface Water Encountered  |                    |                |                      |                 |                    |



|                 |            |              | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               |                 | 07 10 2010         |
|-----------------|------------|--------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL       | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | ñ          |              | SOIL DESCRIPTION   |                    | S.             | DRY                  | MO              | B<br>PE            |
| -0              | SM         |              | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| -               |            | <del> </del> | moist  |                    |                |                      |                 |                    |
| 2<br>-          |            |              | increasing silt content  |                    |                |                      |                 |                    |
| 3               |            |              |  |                    |                |                      |                 |                    |
| 4 -             | sw         |              | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 5.0-6.5            |                | 109.4                | 6.3             | 3<br>8             |
| 5               |            |              | 3  |                    |                | 100.4                | 0.0             | 10                 |
| 6               |            |              |  |                    |                |                      |                 |                    |
| 7               |            |              |  |                    |                |                      |                 |                    |
| 8 -             |            |              |  |                    |                |                      |                 |                    |
| 9 -             |            |              |  |                    |                |                      |                 | 7                  |
| 10              |            |              |  | 10.0-11.5          |                | 98.4                 | 6.2             | 10<br>17           |
| 11 -            |            |              |  |                    |                |                      |                 |                    |
| 12<br>-         |            |              |  |                    |                |                      |                 |                    |
| 13<br>-         |            |              |  |                    |                |                      |                 |                    |
| 14<br>-         |            |              |  |                    |                |                      |                 | 1                  |
| 15<br>-         |            |              |  | 15.0-16.5          |                |                      |                 | 4 9                |
| 16<br>-         |            |              |  |                    |                |                      |                 | 3                  |
| 17<br>-         |            |              | End of Boring @ 16.5'<br>No Subsurface Water Encountered                   |                    |                |                      |                 |                    |
| 18              |            |              |  |                    |                |                      |                 |                    |
| 19<br>-         |            |              |  |                    |                |                      |                 |                    |
| 20              |            |              |  |                    |                |                      |                 |                    |
| 21              |            |              |  |                    |                |                      |                 |                    |
| 22              |            |              |  |                    |                |                      |                 |                    |
| 23              |            |              |  |                    |                |                      |                 |                    |
| 24              |            |              |  |                    |                |                      |                 |                    |
| 25              |            |              |  |                    |                |                      |                 |                    |
| 26              |            |              |  |                    |                |                      |                 |                    |
| -               |            |              |  | A ODT              |                |                      |                 |                    |

LEGEND: Ring Sample Grab Sample Shelby Tube Sample SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.



Boring No. 16 PAGE 1 OF 2

PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 07-23-2018

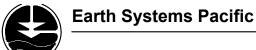
|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               |                 | 07-23-2010         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | Š          |        | SOIL DESCRIPTION   | Ξ                  | S'             | DRY                  | MO              | B H                |
| -0              | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 -             |            |        |  |                    |                |                      |                 |                    |
| 2 -             |            |        | det  |                    |                |                      |                 |                    |
| 3 -             |            |        |  |                    |                |                      |                 |                    |
| 4 -             | SP         |        | POORLY GRADED SAND: light brown, loose, moist                              |                    |                |                      |                 | 3                  |
| 5               |            |        |  | 5.0-6.5            |                | 92.5                 | 5.5             | 5 8                |
| 6               |            | y. 1   |  |                    |                |                      |                 | 0                  |
| 7               |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>8   |            |        |  |                    |                |                      |                 |                    |
| -<br>9          | SW         |        | WELL GRADED SAND: light brown, medium dense, moist                         |                    |                |                      |                 |                    |
| 10              |            |        |  | 10.0-11.5          |                | 98.6                 | 4.4             | 5<br>11            |
| -               |            |        |  | 10.0-11.3          | _              | 00.0                 | 7.7             | 23                 |
| -               |            |        |  |                    |                |                      |                 |                    |
| 12<br>-         |            |        |  |                    |                |                      |                 |                    |
| 13              |            |        |  |                    |                |                      |                 |                    |
| 14              |            |        |  |                    |                |                      |                 | 11                 |
| 15 .            |            |        | dense  | 15.0-16.5          |                | 112.6                | 4.7             | 24                 |
| -<br>16         |            |        | dense  |                    |                |                      |                 | 36                 |
| -<br>17         | <u> </u>   |        | trace fine gravel  |                    |                |                      |                 |                    |
| <b>-</b><br>18  |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 19<br>-         |            |        |  |                    |                |                      |                 | 8                  |
| 20              |            |        | medium dense   | 20.0-21.5          |                |                      |                 | 11<br>14           |
| 21              |            |        | very moist   |                    |                |                      |                 |                    |
| 22              | L_         |        |  |                    |                |                      |                 |                    |
| 23              |            |        | wet, flow sands  |                    |                |                      |                 |                    |
| 24              |            |        |  |                    |                |                      |                 | 7                  |
| <b>-</b><br>25  | L_         |        |  | 25.0-26.5          |                |                      |                 | 14<br>17           |
| <b>-</b><br>26  |            |        | dense  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |



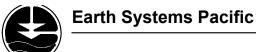
Boring No. 16

LOGGED BY: R. Wagner PAGE 2 OF 2
DRILL RIG: Mobile B-53
AUGER TYPE: 6" Hollow Stem
PAGE 2 OF 2
JOB NO.: 301953-002
DATE: 07/23/2018

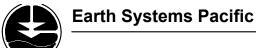
|                 |            |        | OYMARD HIGH COLLOCK No. 2   |                    | 041            | MDI E S              |                 | 07/23/2018         |
|-----------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | ပ္လ        |        | OXNARD HIGH SCHOOL No. 8  |                    | SAI            | MPLE [               | JAIA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue  | INTERVAL<br>(feet) |                | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | S Z                |
| DE<br>(fe       | scs        | SYN    | Oxnard, California  | ER\<br>feet        | SAMPLE<br>TYPE | DEN<br>(pcf)         | IST(%)          | BLOWS<br>PER 6 IN. |
| 0.7             | S<br>S     |        | SOIL DESCRIPTION  | N                  | S/<br>L        | DRY                  | MO              | = = #              |
| -27             | SW         |        | WELL GRADED SAND: as above  |                    |                |                      |                 |                    |
| 28              |            |        |   |                    |                |                      |                 |                    |
| 29              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 | 10                 |
| 30              |            |        |   | 30.0-31.5          |                |                      |                 | 17<br>23           |
| 31              |            |        |   |                    |                |                      |                 | 20                 |
| -               |            |        | trace fine to coarse gravel and cobbles, blow count from 31.0' to 31.5' not reliable due to rocks |                    |                |                      |                 |                    |
| 32              |            |        |   |                    |                |                      |                 |                    |
| 33              |            |        |   |                    |                |                      |                 |                    |
| 34              |            |        |   |                    |                |                      |                 | 45                 |
| -               |            |        |   |                    |                |                      |                 | 15<br>15           |
| 35              |            |        | cobbles end   | 35.0-36.5          |                |                      |                 | 18                 |
| 36              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 37              |            |        |   |                    |                |                      |                 |                    |
| 38              |            |        |   |                    |                |                      |                 |                    |
| 39              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 | 5                  |
| 40              |            |        |   | 40.0-41.5          |                |                      |                 | 20                 |
| 41              |            |        |   |                    |                |                      |                 | 23                 |
| -               |            |        |   |                    |                |                      |                 |                    |
| 42              | L          |        |   |                    |                |                      |                 |                    |
| 43              |            |        | trace cobbles   |                    |                |                      |                 |                    |
| <b>-</b>        |            |        |   |                    |                |                      |                 |                    |
| 44<br>-         |            |        |   |                    |                |                      |                 | 18                 |
| 45              |            |        |   | 45.0-46.0          |                |                      |                 | 50/6.0"            |
| 46              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        | End of Boring @ 46.0' Due to Refusal<br>Subsurface water encountered @ 22.5'                      |                    |                |                      |                 |                    |
| 47              |            |        | Subsurface water efficultified (# 22.3  |                    |                |                      |                 |                    |
| 48              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 49              |            |        |   |                    |                |                      |                 |                    |
| 50              |            |        |   |                    |                |                      |                 |                    |
| <b>-</b><br>51  |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 52              |            |        |   |                    |                |                      |                 |                    |
| <b>-</b><br>53  |            |        |   |                    |                |                      |                 |                    |
|                 |            |        |   |                    |                |                      |                 |                    |



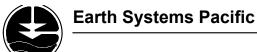
|                       |            |           | TYPE: 6 Hollow Stern   |                    |                | 451 = -              |               | 07-23-2010              |
|-----------------------|------------|-----------|--|--------------------|----------------|----------------------|---------------|-------------------------|
|                       | ၂ တ        |           | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA          | (%) (%) BLOWS PER 6 IN. |
| DEPTH<br>(feet)       | USCS CLASS | SYMBOL    | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California           | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | ISTURE<br>(%) | LOWS<br>R 6 IN.         |
|                       | ŝn         |           | SOIL DESCRIPTION   | LNI                | /S             | DRY                  | ОМ            | 3d<br>18                |
| -<br>1                | SM         |           | SILTY SAND: brown, loose, slightly moist (Alluvium)                                  |                    |                |                      |               |                         |
| 2                     |            | <br><br>  | moist  |                    |                |                      |               |                         |
| 3 -                   |            | · · · · · | increasing silt content  |                    |                |                      |               |                         |
| 4<br>-<br>5<br>-<br>6 |            |           |  | 5.0-6.5            | _              | 103.3                | 7.6           | 4                       |
| 7 - 8                 | sw         |           | WELL GRADED SAND: light brown, loose, moist, trace fine to coarse gravel and cobbles |                    |                |                      |               |                         |
| 9<br>-                |            |           |  | 40.0.44.5          |                |                      |               |                         |
| 10<br>-<br>11<br>-    |            |           | medium dense   | 10.0-11.5          |                | 104.7                | 3.4           |                         |
| 12<br>-<br>13         |            |           |  |                    |                |                      |               |                         |
| -<br>14<br>-          |            |           |  |                    |                |                      |               | Q                       |
| 15                    |            |           |  | 15.0-16.5          |                |                      |               | 11                      |
| 16                    |            |           | thin silt lense ~2" thick  |                    |                |                      |               |                         |
| 17<br>-               |            |           | End of Boring @ 16.5' No Subsurface Water Encountered                                |                    |                |                      |               |                         |
| 18<br>-<br>19         |            |           |  |                    |                |                      |               |                         |
| <b>-</b><br>20        |            |           |  |                    |                |                      |               |                         |
| 21                    |            |           |  |                    |                |                      |               |                         |
| 22                    |            |           |  |                    |                |                      |               |                         |
| 23                    |            |           |  |                    |                |                      |               |                         |
| 24<br>-               |            |           |  |                    |                |                      |               |                         |
| 25<br>-               |            |           |  |                    |                |                      |               |                         |
| 26<br>-               |            |           |  |                    |                |                      |               |                         |



|                          | OXNARD HIGH SCHOOL No. 8 |                    |  |                    |                | MD: = =              |                 | BLOWS<br>BLOWS<br>PER 6 IN. |  |  |  |  |  |
|--------------------------|--------------------------|--------------------|--|--------------------|----------------|----------------------|-----------------|-----------------------------|--|--|--|--|--|
|                          | ၂ တ                      |                    | OXNARD HIGH SCHOOL No. 8   |                    | SAN            | MPLE [               | DATA            |                             |  |  |  |  |  |
| DEPTH<br>(feet)          | USCS CLASS               | SYMBOL             | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | LOWS<br>:R 6 IN.            |  |  |  |  |  |
|                          | ñ                        |                    | SOIL DESCRIPTION   | LNI                | /S             | DRY                  | MO              | a<br>B                      |  |  |  |  |  |
| 1                        | SM                       |                    | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                             |  |  |  |  |  |
| 2                        |                          | <br><br>           | moist  |                    |                |                      |                 |                             |  |  |  |  |  |
| 3 -                      |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 5 - 6                    | ML                       |                    | SANDY SILT: brown, very soft, very moist                                   | 5.0-6.5            | -              | 80.5                 | 36.1            | 1<br>1<br>2                 |  |  |  |  |  |
| 7 - 8                    | SP                       |                    | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel           |                    |                |                      |                 |                             |  |  |  |  |  |
| 9 -                      | sw                       | হুকুত্ব<br>কুকুত্ব | WELL ORADED OAND I'LL  |                    |                |                      |                 | 6                           |  |  |  |  |  |
| 10 - 11 - 40             | 300                      |                    | WELL GRADED SAND: light brown, medium dense, moist                         | 10.0-11.5          |                | 117.5                | 3.2             | 11<br>15                    |  |  |  |  |  |
| 12<br>-<br>13<br>-<br>14 |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 15<br>-<br>16            |                          |                    | trace fine gravel  | 15.0-16.5          | •              |                      |                 | 2<br>5<br>7                 |  |  |  |  |  |
| 17<br>-<br>18            |                          |                    | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                             |  |  |  |  |  |
| 19<br>-<br>20            |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| -<br>21                  |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 22                       |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 23                       |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 24<br>-                  |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
| 25<br>-<br>26            |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |
|                          |                          |                    |  |                    |                |                      |                 |                             |  |  |  |  |  |



|   |            |        | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-20-2018         |
|---|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|   | ၂ တ        |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet)                                     | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   |            |        | SOIL DESCRIPTION   | LNI                | /S             | DRY                  | MO              | B<br>PE            |
| -<br>1  | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| -<br>2<br>-<br>3<br>-<br>4                          |            |        | moist  |                    |                |                      |                 |                    |
| -<br>5<br>-<br>6<br>-<br>7                          |            |        | very moist, increasing silt content  | 5.0-6.5            |                | 93.4                 | 25.6            | 1<br>2<br>2        |
| -<br>8<br>-<br>9<br>-                               | sw         |        | WELL GRADED SAND: light brown, loose, moist                                | 10.0-11.5          |                | 103.5                | 2.8             | 5<br>10            |
| 10<br>-<br>11<br>-<br>12<br>-<br>13<br>-<br>14<br>- |            |        | medium dense, slightly moist, trace fine gravel                            | 10.0-11.5          |                | 103.5                | 2.8             | 15                 |
| 15<br>-<br>16<br>-                                  |            |        | moist  | 15.0-16.5          | •              |                      |                 | 11<br>12           |
| 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26 -   |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |



|                 | AU         | GEN      | TYPE: 6" Hollow Stem   |                     |                |                      |                 | 07-20-2018         |
|-----------------|------------|----------|--|---------------------|----------------|----------------------|-----------------|--------------------|
|                 | S          |          | OXNARD HIGH SCHOOL No. 8   |                     | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL   | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet)  | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 |            |          | SOIL DESCRIPTION   | Z                   | 0              | DRY                  | Ĭ               | ш а                |
| -0              | SM         |          | SILTY SAND: brown, loose, slightly moist                                   |                     |                |                      |                 |                    |
| 1 -             |            |          | (Alluvium)<br>moist  |                     |                |                      |                 |                    |
| 2               |            |          |  |                     |                |                      |                 |                    |
| 3               |            |          |  |                     |                |                      |                 |                    |
| -               |            |          |  |                     |                |                      |                 |                    |
| 4 -             |            |          | increasing silt content  |                     |                |                      |                 | 1                  |
| 5               |            |          | very moist   | 5.0-6.5             |                | 90.8                 | 26.2            | 1<br>2             |
| 6               |            |          | voly most  |                     |                |                      |                 | _                  |
| -               |            |          |  | 4-7                 |                |                      |                 |                    |
| 7 -             |            |          |  |                     |                |                      |                 |                    |
| 8               |            | <u> </u> |  |                     |                |                      |                 |                    |
| 9               | SW         |          | WELL GRADED SAND: light brown, loose, moist                                |                     |                |                      |                 | 4                  |
| 10              |            |          |  | 10.0-11.5           |                | 109.7                | 4.3             | 1<br>1             |
| -               |            |          |  |                     | _              |                      |                 | 1                  |
| 11 -            |            |          |  |                     |                |                      |                 |                    |
| 12              |            |          | thin ~2" thick lense of sandy silt   |                     |                |                      |                 |                    |
| 13              |            |          |  |                     |                |                      |                 |                    |
| -               |            |          | medium dense   |                     |                |                      |                 |                    |
| 14              |            |          |  | 15.0-16.5           |                | 108.8                | 3.9             | 10<br>23           |
| 15<br>-         |            |          | dense, trace fine to coarse gravel   |                     | _              |                      |                 | 27                 |
| 16              |            |          |  |                     |                |                      |                 |                    |
| 17              |            |          |  |                     |                |                      |                 |                    |
| -               |            |          |  |                     |                |                      |                 |                    |
| 18              |            |          |  |                     |                |                      |                 |                    |
| 19<br>-         |            |          | trace cobbles  |                     |                |                      |                 | 1                  |
| 20              |            |          |  | 20.0-21.5           |                |                      |                 | 1<br>1             |
| 21              |            |          | loose, very moist, thin lense of silty sand ~1" to 2" thick                |                     |                |                      |                 | 3                  |
| -               |            |          |  |                     |                |                      |                 |                    |
| 22<br>-         |            |          |  |                     |                |                      |                 |                    |
| 23              |            |          |  |                     |                |                      |                 |                    |
| 24              |            |          |  |                     |                |                      |                 |                    |
| -<br>25         | L          |          | wet. medium dense _ =  | 25.0-26.5           |                |                      |                 | 5                  |
| -               |            |          |  | ===== <b>=</b> ==== |                |                      |                 | 12<br>16           |
| 26<br>-         |            | ×.;/     | End of Boring @ 26.5'<br>Subsurface Water Encountered at 25.0'             |                     |                |                      |                 | .3                 |
|                 |            |          | Cascando Water Endountered at 20.0   |                     |                |                      | ı               |                    |



Boring No.: 21 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-26-2018

DRILL RIG: Mobile B-53 AUGER TYPE: 6" Hollow Stem

|                 |            |          | OXNARD HIGH SCHOOL No. 8   |                    | SAMPLE DATA    |                      |                 |                    |  |  |
|-----------------|------------|----------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|--|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL   | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |  |
|                 | SN         | 0,       | SOIL DESCRIPTION   | N<br>E #)          | SA             | DRY (                | MOI             | BL                 |  |  |
| - 0             | SM         |          | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |  |  |
| <b>-</b> 2      |            |          |  |                    |                |                      |                 |                    |  |  |
| 3               |            |          |  |                    |                |                      |                 |                    |  |  |
| 4               |            |          | increasing silt content  |                    |                |                      |                 | 2                  |  |  |
| 5               |            | <u> </u> | decreasing silt content  | 5.0-6.5            |                | 99.8                 | 9.2             | 3<br>7             |  |  |
| 6               |            |          |  |                    |                |                      |                 |                    |  |  |
| 7 -             | SP         |          | POORLY GRADED SAND: light brown, loose, moist                              |                    |                |                      |                 |                    |  |  |
| 8 -             |            |          |  |                    |                |                      |                 |                    |  |  |
| 9 -             |            |          |  | 10.0-11.5          | _              | 111.2                | 4.8             | 6<br>12            |  |  |
| -<br>11         |            |          | medium dense   | 10.0 11.0          |                | 111.2                | 4.0             | 29                 |  |  |
| <b>-</b><br>12  | SW         |          | WELL GRADED SAND: light brown, medium dense,                               |                    |                |                      |                 |                    |  |  |
| 13              |            |          | moist, trace fine gravel   |                    |                |                      |                 |                    |  |  |
| 14              |            |          |  |                    |                |                      |                 |                    |  |  |
| 15              |            |          | thin lense of silt and clay ~4" thick                                      | 15.0-16.5          |                |                      |                 | 12                 |  |  |
| 16<br>-         |            |          |  |                    |                |                      |                 | 13                 |  |  |
| 17<br>-         |            |          | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |  |  |
| 18              |            |          |  |                    |                |                      |                 |                    |  |  |
| 19<br>-<br>20   |            |          |  |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>21  |            |          |  |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>22  |            |          |  |                    |                |                      |                 |                    |  |  |
| 23              |            |          |  |                    |                |                      |                 |                    |  |  |
| 24              |            |          |  |                    |                |                      |                 |                    |  |  |
| 25<br>-         |            |          |  |                    |                |                      |                 |                    |  |  |
| 26<br>-         |            |          |  |                    |                |                      |                 |                    |  |  |



Boring No. 22

PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 07-18-2018

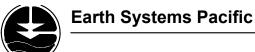
|                 | S          |              | OXNARD HIGH SCHOOL No. 8  |                    | SAI            | MPLE D               | DATA            |                    |
|-----------------|------------|--------------|---|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL       | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California    | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
| 0               | Û          |              | SOIL DESCRIPTION  | Z .                | S              | DRY                  | MO              | B                  |
| -0              | SM         |              | SILTY SAND: brown, loose, slightly moist (Alluvium)                           |                    |                |                      |                 |                    |
| 1 -             |            |              | moist   |                    |                |                      |                 |                    |
| 2               |            |              |   |                    |                |                      |                 |                    |
| 3               |            |              |   |                    |                |                      |                 |                    |
| 4               | SP         | <u>: : :</u> | POORLY GRADED SAND: light brown, loose, very moist                            |                    |                |                      |                 |                    |
| <b>-</b><br>5   | Oi         |              | 1 GONET GIVIDED GAND. IIgitt Brown, 10000, very molec                         | 5.0-6.5            |                | 95.1                 | 16.5            | 4<br>6             |
| -               |            | 7. T         |   |                    |                |                      |                 | 8                  |
| 6<br>-          |            |              |   |                    |                |                      |                 |                    |
| 7 -             |            |              |   |                    |                |                      |                 |                    |
| 8               |            |              |   |                    |                |                      |                 |                    |
| 9               |            |              |   |                    |                |                      |                 |                    |
| -<br>10         |            |              |   | 10.0-11.5          |                | 104.5                | 8.6             | 7<br>11            |
| -               |            | . 4          | medium dense, moist   | 10.0 11.0          |                |                      |                 | 13                 |
| 11 -            |            |              |   |                    |                |                      |                 |                    |
| 12<br>-         |            |              |   |                    |                |                      |                 |                    |
| 13              |            |              |   |                    |                |                      |                 |                    |
| -<br>14         |            | erenen       |   |                    |                |                      |                 |                    |
| -<br>15         | SW         |              | WELL GRADED SAND: light brown, loose, very moist, trace fine to coarse gravel | 15.0-16.5          |                | 83.5                 | 36.5            | 5<br>6             |
| -               |            |              | •   | 10.0 10.0          |                | 00.0                 | 00.0            | 8                  |
| 16<br>-         |            |              |   |                    |                |                      |                 |                    |
| 17              |            |              |   |                    |                |                      |                 |                    |
| 18              |            |              | trace fine to coarse gravel and cobbles                                       |                    |                |                      |                 |                    |
| -<br>19         |            |              | trace fine to coarse gravel and cobbles                                       |                    |                |                      |                 |                    |
| -<br>20         |            |              |   | 20.0-21.5          |                |                      |                 | 8<br>12            |
| -               |            |              | <b>—</b>  | 20.0 21.0          |                |                      |                 | 14                 |
| 21 -            |            |              | medium dense, wet =   |                    |                |                      |                 |                    |
| 22              |            |              |   |                    |                |                      |                 |                    |
| 23              |            |              |   |                    |                |                      |                 |                    |
| <b>-</b><br>24  |            |              |   |                    |                |                      |                 | 11                 |
| -               |            |              |   | 25.0-26.5          |                |                      |                 | 11<br>16           |
| 25<br>-         |            |              | trace fine gravel, flow sands   | 20.0-20.0          |                |                      |                 | 10                 |
| 26<br>-         |            |              |   |                    |                |                      |                 |                    |
| ——              |            | 1. 1. N. S.  |   |                    |                |                      |                 |                    |



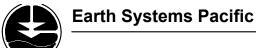
Boring No. 22

PAGE 2 OF 2 JOB NO.: 301953-002 DATE: 07/18/2018

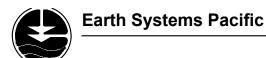
|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | ns         |        | SOIL DESCRIPTION   | N<br>E.)           | SA             | DRY (                | MOI             | BI<br>PE           |
| -27             | SW         |        | WELL GRADED SAND: as above   |                    |                |                      |                 |                    |
| 28<br>-         |            |        |  |                    |                |                      |                 |                    |
| 29<br>-         |            |        |  |                    |                |                      |                 | 1                  |
| 30              |            |        |  | 30.0-31.5          |                |                      |                 | 7<br>12            |
| 31              |            |        |  |                    |                |                      |                 |                    |
| 32              |            |        |  |                    |                |                      |                 |                    |
| 33              |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>34  |            |        |  |                    |                |                      |                 | 5                  |
| <b>-</b><br>35  |            |        |  | 35.0-36.5          |                |                      |                 | 10                 |
| -               |            |        |  | 35.0-36.5          |                |                      |                 | 15                 |
| 36              | SP         |        | POORLY GRADED SAND: light brown, medium dense, wet                         |                    |                |                      |                 |                    |
| 37<br>-         |            |        | ***************************************                                    |                    |                |                      |                 |                    |
| 38              |            |        |  |                    |                |                      |                 |                    |
| 39              |            |        |  |                    |                |                      |                 | 0                  |
| 40              |            |        | thin lenses of very fine grained silty sand                                | 40.0-41.5          |                |                      |                 | 0<br>5             |
| 41              |            |        |  |                    |                |                      |                 | 16                 |
| <b>-</b><br>42  | SW         |        | WELL GRADED SAND: light brown, medium dense, wet, trace fine gravel        |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 43<br>-         |            |        |  |                    |                |                      |                 |                    |
| 44<br>-         |            |        |  |                    |                |                      |                 | 3<br>10            |
| 45<br>-         |            |        |  | 45.0-46.5          |                |                      |                 | 22                 |
| 46              |            |        |  |                    |                |                      |                 |                    |
| 47              |            |        | dense  |                    |                |                      |                 |                    |
| 48              |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>49  |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>50  |            |        |  | 50.0-51.5          |                |                      |                 | 6<br>13            |
| -               |            |        | medium dense   | 30.0-31.3          |                |                      |                 | 13                 |
| 51<br>-         |            |        | Find of Daving @ 54.51   | =                  |                |                      |                 |                    |
| 52<br>-         |            |        | End of Boring @ 51.5'<br>Subsurface water encountered @ 21.0'              |                    |                |                      |                 |                    |
| 53              |            |        |  |                    |                |                      |                 |                    |
|                 |            |        |  |                    |                | <u> </u>             |                 |                    |



|                 | AUGE!                |                                       | OXNARD HIGH SCHOOL No. 8                                |                    | SAMPLE DATA    |                      |                 |                    |  |  |
|-----------------|----------------------|---------------------------------------|---|--------------------|----------------|----------------------|-----------------|--------------------|--|--|
|                 | ပ္လ                  | Northeast of Coming Dal Sal           |   |                    |                |                      |                 |                    |  |  |
| DEPTH<br>(feet) | USCS CLASS<br>SYMBOL | SYMBOL                                | and North Rose Avenue Oxnard, California                | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |  |
|                 | ñ                    |                                       | SOIL DESCRIPTION  | Z .                | S              | DRY                  | MO              | B                  |  |  |
| - 0             | SM                   |                                       | SILTY SAND: brown, loose, slightly moist (Alluvium)     |                    |                |                      |                 |                    |  |  |
| 1 -             |                      | : : : : : : : : : : : : : : : : : : : |   |                    |                |                      |                 |                    |  |  |
| 2 -             |                      |                                       | moist   |                    |                |                      |                 |                    |  |  |
| 3 -             |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 4               |                      |                                       |   |                    |                |                      |                 | 1                  |  |  |
| 5               |                      |                                       | very moist  | 5.0-6.5            |                | 83.1                 | 23.4            | 1 3                |  |  |
| 6               |                      |                                       | very moist  |                    |                |                      |                 |                    |  |  |
| 7               |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| - 8             |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>9   |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| -               | sw                   |                                       | WELL GRADED SAND WITH GRAVEL: light brown, loose, moist | 10.0-11.5          |                | 05.0                 | 05.0            | 3                  |  |  |
| 10              | L<br>                |                                       |   | 10.0-11.5          |                | 85.9                 | 35.2            | 1<br>5             |  |  |
| 11 -            |                      |                                       | thin lense of very moist sandy silt                     |                    |                |                      |                 |                    |  |  |
| 12              | L                    |                                       |   |                    |                |                      |                 |                    |  |  |
| 13              |                      |                                       | decreasing gravel content                               |                    |                |                      |                 |                    |  |  |
| 14              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>15  |                      |                                       | medium dense  | 15.0-16.5          |                |                      |                 | 8<br>11            |  |  |
| <b>-</b><br>16  |                      |                                       |   |                    |                |                      |                 | 15                 |  |  |
| <b>-</b> 17     |                      |                                       | Find of Paring @ 16 El                                  |                    |                |                      |                 |                    |  |  |
| -               |                      |                                       | End of Boring @ 16.5' No Subsurface Water Encountered   |                    |                |                      |                 |                    |  |  |
| 18              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 19<br>-         |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 20              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 21              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 22              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| 23              |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>24  |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| <b>-</b><br>25  |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| <b>-</b> 26     |                      |                                       |   |                    |                |                      |                 |                    |  |  |
| -               |                      |                                       |   |                    |                |                      |                 |                    |  |  |



|                 | -                 | GLI  | TYPE: 6" Hollow Stem   |                |                      |                 |                    | 07-24-2018  |
|-----------------|-------------------|--|--|----------------|----------------------|-----------------|--------------------|-------------|
|                 | S                 | OXNARD HIGH SCHOOL No. 8  Northeast of Camino Del Sol  and North Rose Avenue  Oxnard, California |  |                | SAI                  | MPLE [          | DATA               |             |
| DEPTH<br>(feet) | USCS CLASS SYMBOL |  | INTERVAL<br>(feet)   | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |             |
|                 | ŝn                |  | SOIL DESCRIPTION   | Z C            | /S                   | DRY             | MO                 | BI<br>PE    |
| -               | SM                |  | SILTY SAND: brown, loose, slightly moist (Alluvium)            |                |                      |                 |                    |             |
| 2 - 3           |                   |  | moist  |                |                      |                 |                    |             |
| -               |                   |  | thin lense of sandy silt                                       |                |                      |                 |                    |             |
| 5               | SP                |  | POORLY GRADED SAND: light brown, loose, moist                  | 5.0-6.5        | _                    | 91.2            | 5.5                | 3<br>4<br>6 |
| 6               |                   |  |  |                |                      |                 |                    |             |
| 7 - 8           | sw                |  | WELL GRADED SAND: light brown, loose, moist, trace fine gravel |                |                      |                 |                    |             |
| 9 -             |                   |  |  | 10.0-11.5      | _                    | 404.0           | 4.4                | 3<br>5      |
| 10<br>-<br>11   |                   |  |  | 10.0-11.5      |                      | 101.0           | 4.4                | 8           |
| 12<br>-         |                   |  |  |                |                      |                 |                    |             |
| 13<br>-<br>14   |                   |  |  |                |                      |                 |                    | 6           |
| -<br>15 ·       |                   |  | medium dense, slightly moist                                   | 15.0-16.5      | -                    | 103.0           | 2.4                | 14<br>18    |
| 16<br>-<br>17   |                   |  |  |                |                      |                 |                    |             |
| <b>-</b><br>18  |                   |  |  |                |                      |                 |                    |             |
| 19<br>-         |                   |  |  |                |                      |                 |                    | 8           |
| 20<br>-<br>21   |                   |  | dense, moist   | 20.0-21.5      |                      |                 |                    | 14<br>18    |
| -<br>22<br>-    |                   |  |  |                |                      |                 |                    |             |
| 23<br>-<br>24   |                   |  |  |                |                      |                 |                    |             |
| 25              |                   |  | wet, medium dense =  | 25.0-26.5      | ullet                |                 |                    | 6<br>11     |
| 26<br>-         |                   |  | End of Boring @ 26.5'<br>Subsurface Water Encountered at 24.5' |                |                      |                 |                    | 15          |



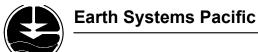
Boring No.: 25 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-20-2018

|                          |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAMPLE DATA    |                      |                 |                    |  |  |
|--------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|--|
| DEPTH<br>(feet)          | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |  |
|                          | SN         | o,     | SOIL DESCRIPTION   | N<br>N             | SA             | DRY (                | MOI             | BL                 |  |  |
| - 0 1 - 2 - 3 - 4        | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium) moist                  | 5.0-6.5            |                |                      | 10.0            | 2 2                |  |  |
| 5<br>-<br>6<br>-<br>7    |            |        | thin lense of very moist sandy silt  | 3.0-0.3            |                | 87.5                 | 18.9            | 4                  |  |  |
| -<br>8<br>-<br>9         | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      |                    |                |                      |                 | 4                  |  |  |
| 10<br>-<br>11<br>-       |            |        |  | 10.0-11.5          |                | 103.6                | 5.8             | 8<br>14            |  |  |
| -<br>13<br>-<br>14       |            |        |  | 45.405             |                |                      |                 | 16                 |  |  |
| 15<br>-<br>16<br>-       |            |        | dense  | 15.0-16.5          |                |                      |                 | 17<br>21           |  |  |
| 17<br>-<br>18<br>-<br>19 |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |  |  |
| -<br>20<br>-<br>21       |            |        |  |                    |                |                      |                 |                    |  |  |
| 22<br>-<br>23<br>-       |            |        |  |                    |                |                      |                 |                    |  |  |
| 24<br>-<br>25<br>-<br>26 |            |        |  |                    |                |                      |                 |                    |  |  |
| _                        |            |        |  |                    |                |                      |                 |                    |  |  |



Boring No.: 26 PAGE 1 OF 1 JOB NO.: 301953-002

|                 |            |                      | OXNARD HIGH SCHOOL No. 8                      | SAMPLE DATA    |                |  |                                     |                 |                    |
|-----------------|------------|----------------------|---|----------------|----------------|--|-------------------------------------|-----------------|--------------------|
|                 | SS         |                      | Northeast of Camino Del Sol                   |                |                |  |                                     |                 |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL               | and North Rose Avenue<br>Oxnard, California   | ERVAL<br>feet) | ERVAL<br>feet) | SAMPLE<br>TYPE<br>DRY DENSITY<br>(pcf) | (feet) SAMPLE TYPE TYPE (pcf) (pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 |            |                      | SOIL DESCRIPTION                              | LNI<br>)       | SA             | DRY I                                  | MOI                                 | BI<br>PE        |                    |
| -               | SM         |                      | SILTY SAND: brown, loose, moist (Alluvium)    |                |                |  |                                     |                 |                    |
| 1 -             |            |                      | (Alluvium)                                    |                |                |  |                                     | 0               |                    |
| 2               |            | <del>: : : : :</del> | very moist                                    | 2.0-3.5        |                | 93.1                                   | 21.8                                | 2 3             |                    |
| 3               |            |                      | (a), made                                     |                |                |  |                                     |                 |                    |
| 4               | L          |                      |   |                |                |  |                                     |                 |                    |
| -               | SP         |                      | POORLY GRADED SAND: light brown, loose, moist | 5.0-6.5        |                | 98.6                                   | 3.7                                 | 2<br>7          |                    |
| 5               |            |                      |   | 0.0 0.0        | _              | 00.0                                   | 0.7                                 | 7               |                    |
| 6               |            | y                    |   |                |                |  |                                     |                 |                    |
| 7               |            |                      |   |                |                |  |                                     |                 |                    |
| -<br>8          |            |                      |   |                |                |  |                                     | 3               |                    |
|                 |            |                      | medium dense                                  | 8.5-10.0       | .0             |  |                                     | 6<br>8          |                    |
| 9 -             |            | 20164)<br>4 8 8      |   |                |                |  |                                     | 0               |                    |
| 10              |            | :                    | End of Boring @ 10.0'                         |                |                |  |                                     |                 |                    |
| 11              |            |                      | No Subsurface Water Encountered               |                |                |  |                                     |                 |                    |
| 12              |            |                      |   |                |                |  |                                     |                 |                    |
| -<br>13         |            |                      |   |                |                |  |                                     |                 |                    |
| -               |            |                      |   |                |                |  |                                     |                 |                    |
| 14              |            |                      |   |                |                |  |                                     |                 |                    |
| 15              |            |                      |   |                |                |  |                                     |                 |                    |
| 16              |            |                      |   |                |                |  |                                     |                 |                    |
| -<br>17         |            |                      |   |                |                |  |                                     |                 |                    |
| -               |            |                      |   |                |                |  |                                     |                 |                    |
| 18              |            |                      |   |                |                |  |                                     |                 |                    |
| 19<br>-         |            |                      |   |                |                |  |                                     |                 |                    |
| 20              |            |                      |   |                |                |  |                                     |                 |                    |
| 21              |            |                      |   |                |                |  |                                     |                 |                    |
| -               |            |                      |   |                |                |  |                                     |                 |                    |
| 22<br>-         |            |                      |   |                |                |  |                                     |                 |                    |
| 23              |            |                      |   |                |                |  |                                     |                 |                    |
| 24              |            |                      |   |                |                |  |                                     |                 |                    |
| <b>-</b><br>25  |            |                      |   |                |                |  |                                     |                 |                    |
| <b>-</b><br>26  |            |                      |   |                |                |  |                                     |                 |                    |
| -               |            |                      |   |                |                |  |                                     |                 |                    |



|                 | 7.0        |              | TYPE: 6 Hollow Stem  | SAMPLE DATA        |                |                      |                 |                    |  |
|-----------------|------------|--------------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
|                 | S          |              | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE L               | DATA            |                    |  |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL       | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                 | sn         |              | SOIL DESCRIPTION   | Z                  | S              | DRY                  | MO              | B                  |  |
| -               | SM         |              | SILTY SAND: brown, loose, slightly moist                                   |                    |                |                      |                 |                    |  |
| 1               |            |              | (Alluvium) moist   |                    |                |                      |                 |                    |  |
| 2               |            |              | Hoist  |                    |                |                      |                 |                    |  |
| -               |            | : : : :      |  |                    |                |                      |                 |                    |  |
| 3               |            |              | group brown increasing ailt content  |                    |                |                      |                 |                    |  |
| -               |            |              | gray brown, increasing silt content  |                    |                |                      |                 |                    |  |
| 4               |            |              |  |                    |                |                      |                 | 3                  |  |
| 5               | <br>SP     |              | DOODLY ORADED CAND, Sold become for the second                             | 5.0-6.5            |                | 101.9                | 8.2             | 5 7                |  |
| -               | 51         |              | POORLY GRADED SAND: light brown/orange brown mottled, loose, moist         |                    |                |                      |                 | 7                  |  |
| 6               |            |              |  |                    |                |                      |                 |                    |  |
| 7               |            |              |  |                    |                |                      |                 |                    |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 8               |            |              |  |                    |                |                      |                 |                    |  |
| 9               |            |              |  |                    |                |                      |                 |                    |  |
| -               |            | 3 5 3.       | medium dense   |                    |                |                      |                 | 8                  |  |
| 10              | SW         |              | WELL GRADED SAND: light brown, medium dense,                               | . 10.0-11.5        |                | 112.0                | 5.8             | 16 23              |  |
| 11              |            |              | moist  |                    |                |                      |                 | 25                 |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 12              |            |              |  |                    |                |                      |                 |                    |  |
| 13              |            |              |  |                    |                |                      |                 |                    |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 14              |            |              |  |                    |                |                      |                 | 9                  |  |
| -               |            |              | trace fine gravel  | 15.0-16.5          |                | 98.7                 | 4.0             | 21                 |  |
| 15<br>-         |            |              |  |                    |                |                      |                 | 27                 |  |
| 16              |            |              |  |                    |                |                      |                 |                    |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 17              |            |              |  |                    |                |                      |                 |                    |  |
| 18              |            |              |  |                    |                |                      |                 |                    |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 19              |            |              |  |                    |                |                      |                 |                    |  |
| 20              |            |              |  | 00 0 04 5          |                |                      |                 | 2                  |  |
| -               |            |              | <u>\</u>   | 20.0-21.5          |                |                      |                 | 3 4                |  |
| 21              |            |              | wet, loose, thin lenses ~2" thick of sandy silt                            |                    |                |                      |                 |                    |  |
| 22              |            |              |  |                    |                |                      |                 |                    |  |
| -               |            |              |  |                    |                |                      |                 |                    |  |
| 23              |            | 繁            |  |                    |                |                      |                 |                    |  |
| -               |            | 3555<br>3555 |  |                    |                |                      |                 |                    |  |
| 24<br>-         |            |              |  |                    |                |                      |                 |                    |  |
| 25              |            |              |  | 25.0-26.5          |                |                      |                 | 13<br>14           |  |
| -               |            |              |  |                    |                |                      |                 | 21                 |  |
| 26              |            |              | End of Boring @ 26.5'<br>Subsurface Water Encountered at 20.5'             |                    |                |                      |                 |                    |  |
| لــــَـــا      |            |              |  |                    |                |                      |                 |                    |  |



LOGGED BY: R. Wagner DRILL RIG: Mobile B-53

Boring No.: 28 PAGE 1 OF 1 JOB NO.: 301953-002 AUGER TYPE: 6" Hollow Stem DATE: 07-17-2018

|                    |            |        | OXNARD HIGH SCHOOL No. 8  |                    | CAI            | MDLC                 |                 | 07-17-2018         |
|--------------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                    | SS         |        | Northeast of Camino Del Sol   |                    | SAI            | MPLE [               | JATA            |                    |
| DEPTH<br>(feet)    | USCS CLASS | SYMBOL | and North Rose Avenue Oxnard, California  | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                    | sn         |        | SOIL DESCRIPTION  | LNI                | S/             | DRY                  | MO              | BI<br>PE           |
| - 1                | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                               |                    |                |                      |                 |                    |
|                    |            |        |   |                    |                |                      |                 |                    |
| 3 -                |            |        |   |                    |                |                      |                 |                    |
| 4 -<br>5           | SP         |        | POORLY GRADED SAND: light brown/orange brown mottled, loose, moist                | 5.0-6.5            |                | 98.0                 | 7.9             | 3<br>5             |
| <b>-</b>           |            | V. *   |   |                    |                |                      |                 | 5                  |
| 7                  |            |        |   |                    |                |                      |                 |                    |
| 8                  |            |        |   |                    |                |                      |                 |                    |
| 9                  |            |        |   |                    |                |                      |                 | 7                  |
| 10                 |            |        | medium dense  | 10.0-11.5          |                | 108.0                | 6.6             | ,<br>15<br>20      |
| 11                 |            |        |   |                    |                |                      |                 | 25                 |
| 12                 |            |        |   |                    |                |                      |                 |                    |
| 13                 |            |        |   |                    |                |                      |                 |                    |
| 14                 |            |        |   |                    |                |                      |                 | 7                  |
| 15<br>-<br>16<br>- | sw         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel, trace clay | 15.0-16.5          |                |                      |                 | 10<br>8            |
| 17<br>-<br>18      |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                             |                    |                |                      |                 |                    |
| <b>-</b><br>19     |            |        |   |                    |                |                      |                 |                    |
| 20                 |            |        |   |                    |                |                      |                 |                    |
| 21                 |            |        |   |                    |                |                      |                 |                    |
| 22                 |            |        |   |                    |                |                      |                 |                    |
| 23                 |            |        |   |                    |                |                      |                 |                    |
| 24                 |            |        |   |                    |                |                      |                 |                    |
| 25<br>-            |            |        |   |                    |                |                      |                 |                    |
| 26<br>-            |            |        |   |                    |                |                      |                 |                    |



Boring No.: 29 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-18-2018

|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               |                 | 07 10 2010         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | SN         |        | SOIL DESCRIPTION   | N<br>N             | SA             | DRY (                | MOI             | BI<br>PE           |
| - 1             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| <b>-</b> .      |            |        | moist  |                    |                |                      |                 |                    |
| 3               |            |        |  |                    |                |                      |                 |                    |
| 4 -             | SP         |        | POORLY GRADED SAND: light brown/orange brown                               | 5005               |                |                      |                 | 3                  |
| 5               |            |        | mottled, loose, moist  | 5.0-6.5            |                | 96.9                 | 8.1             | 6<br>8             |
| 6<br>-<br>7     |            |        |  |                    |                |                      |                 |                    |
| -<br>8          |            |        |  |                    |                |                      |                 |                    |
| 9               |            |        |  |                    |                |                      |                 | 6                  |
| 10              |            |        |  | 10.0-11.5          |                | 107.4                | 3.9             | 6<br>10<br>13      |
| 11 -            | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      |                    |                |                      |                 |                    |
| 12              |            |        |  |                    |                |                      |                 |                    |
| 13              |            |        |  |                    |                |                      |                 |                    |
| 14<br>-<br>15   |            |        |  | 15.0-16.5          |                |                      |                 | 6<br>13            |
| -<br>16         |            |        |  |                    |                |                      |                 | 11                 |
| 17              |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| 18              |            |        | no custanase mais: Enecanterea   |                    |                |                      |                 |                    |
| 19<br>-         |            |        |  |                    |                |                      |                 |                    |
| 20<br>-<br>21   |            |        |  |                    |                |                      |                 |                    |
| <b>-</b> 22     |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>23  |            |        |  |                    |                |                      |                 |                    |
| 24              |            |        |  |                    |                |                      |                 |                    |
| 25<br>-         |            |        |  |                    |                |                      |                 |                    |
| 26<br>-         |            |        |  |                    |                |                      |                 |                    |



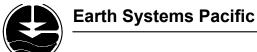
Boring No.: 30 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-17-2018

|                                 | S          |        | OXNARD HIGH SCHOOL No. 8   | SAMPLE DATA        |                |                      |                 |                    |
|---------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet)                 | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                                 | Ď          |        | SOIL DESCRIPTION   | Ξ                  | S.             | DRY                  | MC              | B<br>B             |
| 0<br>1<br>2<br>3                | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 4<br>-<br>5<br>-                | SP         |        | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel           | 5.0-6.5            | _              | 95.4                 | 5.2             | 3<br>6<br>7        |
| 6<br>-<br>7<br>-<br>8<br>-<br>9 | sw         |        | WELL GRADED SAND: light brown, loose, moist, trace fine gravel             |                    |                |                      |                 | 6                  |
| 10 - 11 - 12 - 13 - 14          |            |        | medium dense   | 10.0-11.5          |                | 105.9                | 5.8             | 13<br>18           |
| -<br>15<br>-<br>16<br>-         |            |        |  | 15.0-16.5          | •              |                      |                 | 12<br>13<br>17     |
| 17                              |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |



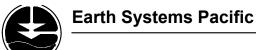
Boring No.: 31 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-24-2018

|  | S          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
|--|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet)  | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California                           | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|  | sn         |        | SOIL DESCRIPTION   | LNI<br>)           | S/             | DRY                  | OW              | 18 B               |
| 1 - 2 - 3  | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium) moist  |                    |                |                      |                 |                    |
| 4<br>-<br>5<br>-<br>6<br>-<br>7<br>-<br>8<br>-<br>9                            | sw         |        | WELL GRADED SAND: light brown, medium dense, slightly moist, trace fine to coarse gravel and cobbles | 5.0-6.5            | •              | 125.5                | 2.5             | 4<br>7<br>11       |
| 10<br>-<br>11<br>-<br>12<br>-<br>13<br>-<br>14<br>-                            |            |        | moist  interbedded with thin lenses of poorly graded sand  | 10.0-11.5          |                | 103.2                | 4.1             | 9<br>15            |
| 15<br>-<br>16<br>-<br>17<br>-  |            |        | End of Boring @ 16.5' No Subsurface Water Encountered  | 15.0-16.5          | •              |                      |                 | 9<br>13            |
| -<br>19<br>-<br>20<br>-<br>21<br>-<br>22<br>-<br>23<br>-<br>24<br>-<br>25<br>- |            |        |  |                    |                |                      |                 |                    |
| 25   |            |        |  |                    |                |                      |                 |                    |



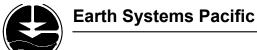
LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-24-2018

|                 | AU         |        | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-24-2018         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | Ŋ          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | $\supset$  |        | SOIL DESCRIPTION   | Z                  | S              | DRY                  | M               | ш <u>с</u>         |
| -0              | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 -             |            |        | moist  |                    |                |                      |                 |                    |
| 2               |            |        |  |                    |                |                      |                 |                    |
| 3 -             | ML         |        | SANDY SILT: light brown, soft, moist                                       |                    |                |                      |                 |                    |
| 4 -             | SP         |        | POORLY GRADED SAND: light brown, loose, moist                              | 5005               |                |                      |                 | 3                  |
| 5               |            |        |  | 5.0-6.5            |                | 90.3                 | 4.0             | 6<br>11            |
| 6               |            | y. '   | medium dense   |                    |                |                      |                 |                    |
| 7               |            |        |  |                    |                |                      |                 |                    |
| 8               | sw         | N.     | WELL GRADED SAND: light brown, loose, moist, trace                         |                    |                |                      |                 |                    |
| -               |            |        | fine gravel  |                    |                |                      |                 |                    |
| 9 -             |            |        |  |                    |                |                      |                 | 3                  |
| 10              |            |        |  | 10.0-11.5          |                | 97.8                 | 3.2             | 5<br>8             |
| 11              |            |        |  |                    |                |                      |                 |                    |
| 12              |            |        |  |                    |                |                      |                 |                    |
| 13              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        | trace cobbles  |                    |                |                      |                 |                    |
| 14              |            |        |  |                    |                |                      |                 | 5                  |
| 15<br>-         |            |        | medium dense   | 15.0-16.5          |                |                      |                 | 10<br>11           |
| 16              |            |        |  |                    |                |                      |                 |                    |
| 17              |            |        | End of Boring @ 16.5'  |                    |                |                      |                 |                    |
| 18              |            |        | No Subsurface Water Encountered  |                    |                |                      |                 |                    |
| -<br>19         |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 20<br>-         |            |        |  |                    |                |                      |                 |                    |
| 21              |            |        |  |                    |                |                      |                 |                    |
| 22              |            |        |  |                    |                |                      |                 |                    |
| 23              |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>24  |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 25<br>-         |            |        |  |                    |                |                      |                 |                    |
| 26<br>-         |            |        |  |                    |                |                      |                 |                    |
|                 |            |        | _  |                    |                |                      |                 |                    |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-25-2018

|                 |            |        | OXNARD HIGH SCHOOL No. 8  |                    | SAI            | MPLE D               |                 | 07-23-2010         |
|-----------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | ASS        | 7      | Northeast of Camino Del Sol   |                    |                |                      |                 |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | and North Rose Avenue<br>Oxnard, California   | ۷۷AL<br>et)        | PLE<br>PE      | ENSI.                | TURE            | WS<br>6 IN.        |
|                 | nsc        | S      | SOIL DESCRIPTION  | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
| 0 —             | SM         |        | SILTY SAND: brown, loose, slightly moist  |                    |                |                      |                 |                    |
| 1 -             |            |        | (Alluvium)<br>moist   |                    |                |                      |                 |                    |
| 2               |            |        |   |                    |                |                      |                 |                    |
| 3               |            |        |   |                    |                |                      |                 |                    |
| - 4             |            |        |   |                    |                |                      |                 |                    |
| -               | SP         |        | POORLY GRADED SAND: light brown, loose, moist                                       | 5.0-6.5            |                | 110.3                | 4.6             | 3<br>4             |
| 5               |            |        |   |                    | _              | 110.0                | 4.0             | 6                  |
| 6 -             |            |        |   |                    |                |                      |                 |                    |
| 7               |            |        |   |                    |                |                      |                 |                    |
| 8               |            |        | trace fine gravel and cobbles   |                    |                |                      |                 |                    |
| 9               | SW         | 240712 | WELL CRAPED CAND light house loans distributes into                                 |                    |                |                      |                 |                    |
| 10              | SVV        |        | WELL GRADED SAND: light brown, loose, slightly moist, trace fine gravel and cobbles | 10.0-11.5          |                | 96.1                 | 2.6             | 2<br>5             |
| - 11            |            |        |   |                    |                |                      | 2.0             | 8                  |
| -               |            |        |   |                    |                |                      |                 |                    |
| 12<br>-         |            |        |   |                    |                |                      |                 |                    |
| 13              |            |        |   |                    |                |                      |                 |                    |
| 14              |            |        |   |                    |                |                      |                 |                    |
| 15              | L — -      |        |   | 15.0-16.5          |                |                      |                 | 3<br>6             |
| -<br>16         |            |        | medium dense, moist   |                    |                |                      |                 | 9                  |
| 17              |            |        | End of Boring @ 16.5'   |                    |                |                      |                 |                    |
| -               |            |        | No Subsurface Water Encountered   |                    |                |                      |                 |                    |
| 18              |            |        |   |                    |                |                      |                 |                    |
| 19<br>-         |            |        |   |                    |                |                      |                 |                    |
| 20              |            |        |   |                    |                |                      |                 |                    |
| 21              |            |        |   |                    |                |                      |                 |                    |
| 22              |            |        |   |                    |                |                      |                 |                    |
| <b>-</b><br>23  |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 24<br>-         |            |        |   |                    |                |                      |                 |                    |
| 25<br>-         |            |        |   |                    |                |                      |                 |                    |
| 26<br>-         |            |        |   |                    |                |                      |                 |                    |
|                 |            |        |   |                    |                |                      |                 |                    |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-25-2018

|   | AUGER TYPE: 6" Hollow Stem DATE: 07-25-201 |          |  |                    |                |                      |                 |                    |
|---|--|----------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|   | ္က   |          | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet)                             | USCS CLASS                                 | SYMBOL   | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California           | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   | ĭ  |          | SOIL DESCRIPTION   | <u>Z</u>           | S'             | DRY                  | MO              | B H                |
| -<br>1                                      | SM   |          | SILTY SAND: brown, loose, slightly moist (Alluvium)                                  |                    |                |                      |                 |                    |
| 2 - 3                                       |  |          | moist  |                    |                |                      |                 |                    |
| 5 -   | ML   |          | SANDY SILT: light brown, soft, moist   | 5.0-6.5            | _              | 113.6                | 6.5             | 1<br>4<br>7        |
| 6 - 7 -                                     | SM   |          | SILTY SAND: light brown, loose, moist  | 6-8                |                |                      |                 |                    |
| 8<br>-<br>9<br>-                            |  |          |  | . 10.0-11.5        |                | 86.9                 | 24.6            | 8<br>12            |
| 11 - 12 - 13 -                              | SW   |          | WELL GRADED SAND: light brown, medium dense, very moist, trace fine to coarse gravel | . 10.0-11.0        |                | 00.9                 | 24.0            | 19                 |
| 14 -<br>-<br>15 -<br>16 -<br>17 -<br>18 -   |  |          | moist, trace cobbles, blow counts from 15.5' to 16.5' not reliable due to rocks      | 15.0-16.5          |                | 95.2                 | 7.0             | 10<br>21<br>25     |
| 19<br>-<br>20 -<br>21<br>-<br>22<br>-<br>23 |  |          | thin ~2" thick lense of sandy silt   | 20.0-21.5          | •              |                      |                 | 5<br>8<br>11       |
| 24<br>-<br>25<br>-                          |  |          | wet, thin ~6" thick lense of poorly graded sand                                      | 25.0-26.5          |                |                      |                 | 6<br>10<br>12      |
| 26  |  | <i>"</i> | End of Boring @ 26.5'<br>Subsurface Water Encountered at 24.5'                       |                    |                |                      |                 | 14                 |



#### **Earth Systems Pacific**

Boring No. 35

PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 07-24-2018

DRILL RIG: Mobile B-53 AUGER TYPE: 6" Hollow Stem

|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               |                 | 07-24-2010         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | )SN        | 0)     | SOIL DESCRIPTION   | IN TE              | SAI            | DRY C                | MOIS<br>)       | BL                 |
| - 0             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 -             |            |        | moist  |                    |                |                      |                 |                    |
| 2 -             |            |        |  |                    |                |                      |                 |                    |
| 3 -             | SP         |        | POORLY GRADED SAND: light brown, slightly loose,                           |                    |                |                      |                 |                    |
| 4               |            |        | moist, trace fine to coarse gravel and cobbles                             |                    |                |                      |                 | 9                  |
| 5               |            |        |  | 5.0-6.5            |                | 102.4                | 2.8             | 9 10               |
| 6               |            |        | medium dense   |                    |                |                      |                 | 10                 |
| 7               |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>8   |            |        |  |                    |                |                      |                 |                    |
| 9               |            | 7 200A |  |                    |                |                      |                 |                    |
| <b>-</b><br>10  | sw         |        | WELL GRADED SAND: light brown, loose, slightly moist, trace fine gravel    | 10.0-11.5          |                | 109.4                | 2.9             | 5<br>8             |
| -               |            |        |  | 10.0-11.5          | _              | 100.4                | 2.0             | 8                  |
| 11 -            |            |        |  |                    |                |                      |                 |                    |
| 12              |            |        |  |                    |                |                      |                 |                    |
| 13              |            |        | medium dense, moist  |                    |                |                      |                 |                    |
| 14              |            |        |  |                    |                |                      |                 | 8                  |
| 15              |            |        |  | 15.0-16.5          |                | 104.2                | 4.0             | 15<br>18           |
| 16              |            |        |  |                    |                |                      |                 | 10                 |
| 17              | <u> </u>   |        | trace cobbles  |                    |                |                      |                 |                    |
| -<br>18         |            |        | 1335 5555.55   |                    |                |                      |                 |                    |
| <b>-</b><br>19  |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>20  |            |        |  | 20.0-21.5          |                |                      |                 | 8<br>14            |
| - 21            |            |        |  |                    |                |                      |                 | 16                 |
| -               | <u> </u>   |        | very moist wet, flow sands   |                    |                |                      |                 |                    |
| 22<br>-         |            |        | Tot, non ounce   |                    |                |                      |                 |                    |
| 23<br>-         |            |        |  |                    |                |                      |                 |                    |
| 24              |            |        |  |                    |                |                      |                 | 10<br>15           |
| 25              | L_         |        |  | 25.0-26.5          |                |                      |                 | 19                 |
| 26              |            |        | dense  |                    |                |                      |                 |                    |
|                 |            |        |  |                    |                |                      |                 |                    |



#### **Earth Systems Pacific**

Boring No. 35

DATE: 07/24/2018

PAGE 2 OF 2 JOB NO.: 301953-002

|                 |            |        | OVNARD HIGH SCHOOL No. 9                                | SAMPLE DATA        |                |                      |                 |                    |
|-----------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | SS         |        | OXNARD HIGH SCHOOL No. 8  Northeast of Camino Del Sol   |                    | SAI            |                      | JAIA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | and North Rose Avenue                                   | , AL               | Щ              | SITY                 | RE              | <u></u> <u>Σ</u>   |
| DEF<br>(fe      | SS         | SYM    | Oxnard, California                                      | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DEN<br>(pcf)         | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | SN         |        | SOIL DESCRIPTION  | Z<br>Z             | SA             | DRY DENSITY<br>(pcf) | MOI             | BI<br>PE           |
| -27             | SW         |        | WELL GRADED SAND: as above                              |                    |                |                      |                 |                    |
| 28              |            |        |   |                    |                |                      |                 |                    |
| 29              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   | 30.0-31.5          |                |                      |                 | 10                 |
| 30              |            |        | thin lense of clayey sand ~3" to 4" thick               | 30.0-31.3          |                |                      |                 | 15<br>19           |
| 31              |            |        |   |                    |                |                      |                 |                    |
| 32              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 33              |            |        |   |                    |                |                      |                 |                    |
| 34              |            |        |   |                    |                |                      |                 | 10                 |
| 35              |            |        |   | 35.0-36.5          |                |                      |                 | 14<br>27           |
| -               |            |        | gray  | 00.0 00.0          |                |                      |                 | 21                 |
| 36<br>-         |            |        |   |                    |                |                      |                 |                    |
| 37              |            |        |   |                    |                |                      |                 |                    |
| 38              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 39<br>-         |            |        |   |                    |                |                      |                 | 7                  |
| 40              |            |        | blow count from 41.0' to 41.5' not reliable due to flow | 40.0-41.5          |                |                      |                 | 21                 |
| 41              |            |        | sands   |                    |                |                      |                 | 30                 |
| -               |            |        |   |                    |                |                      |                 |                    |
| 42              |            |        |   |                    |                |                      |                 |                    |
| 43              |            |        |   |                    |                |                      |                 |                    |
| -<br>44         |            |        |   |                    |                |                      |                 |                    |
| -               |            |        | SANDY SILT: gray brown, very soft, wet                  |                    |                |                      |                 | 0 0                |
| 45<br>-         |            |        |   | 45.0-46.5          |                |                      |                 | 6                  |
| 46              | SP-<br>SM  |        | POORLY GRADED SAND WITH SILT: light brown, loose, wet   |                    |                |                      |                 |                    |
| <b>-</b><br>47  | 0111       |        | wer   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 48              |            |        |   |                    |                |                      |                 |                    |
| 49              |            |        |   |                    |                |                      |                 |                    |
| -               |            |        |   |                    |                |                      |                 |                    |
| 50<br>-         |            |        |   |                    |                |                      |                 |                    |
| 51              |            |        |   |                    |                |                      |                 |                    |
| 52              |            |        | End of Boring @ 50.0'                                   | <b>‡</b>           |                |                      |                 |                    |
| -               |            |        | Subsurface water encountered @ 21.5'                    |                    |                |                      |                 |                    |
| 53<br><b>-</b>  |            |        |   |                    |                |                      |                 |                    |
|                 |            |        |   |                    |                |                      | •               |                    |



Boring No.: 36 PAGE 1 OF 1 JOB NO.: 301953-002

|                                     |            |        | OXNARD HIGH SCHOOL No. 8  |                    | C 4 *          | MDI E 5              |                 | 07-20-2018         |
|-------------------------------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                                     | ပ္လ        |        | Northeast of Camino Del Sol   |                    | SAI            | MPLE D               | JATA            |                    |
| DEPTH<br>(feet)                     | USCS CLASS | SYMBOL | and North Rose Avenue Oxnard, California  | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                                     | ŝn         |        | SOIL DESCRIPTION  | INI<br>)           | S/             | DRY                  | MO              | BI<br>PE           |
| 1                                   | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                                 |                    |                |                      |                 |                    |
| 2 -                                 |            |        | moist   |                    |                |                      |                 |                    |
| 3<br>-<br>4                         | ML         |        | SANDY SILT: gray brown, soft, moist   |                    |                |                      |                 | 3                  |
| 5<br>-<br>6<br>-<br>7               | SP         |        | POORLY GRADED SAND: light brown, medium dense, moist, trace fine gravel, trace silt | 5.0-6.5            | -              | 92.6                 | 9.4             | 6 11               |
| 8 - 9                               | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel and cobbles   |                    |                |                      |                 | 7                  |
| 10                                  |            |        |   | 10.0-11.5          |                | 114.0                | 5.2             | 22<br>31           |
| 11<br>-<br>12<br>-<br>13<br>-<br>14 |            |        | blow counts from 10.5' to 11.5' not reliable due to rocks                           |                    |                |                      |                 | 6                  |
| 15<br>-<br>16                       |            |        | dense   | 15.0-16.5          | •              |                      |                 | 13<br>18           |
| 17<br>-<br>18<br>-                  |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                               |                    |                |                      |                 |                    |
| 19<br>-<br>20                       |            |        |   |                    |                |                      |                 |                    |
| -<br>21<br>-                        |            |        |   |                    |                |                      |                 |                    |
| 22                                  |            |        |   |                    |                |                      |                 |                    |
| 23                                  |            |        |   |                    |                |                      |                 |                    |
| 24<br>-<br>25                       |            |        |   |                    |                |                      |                 |                    |
| <b>-</b> 26                         |            |        |   |                    |                |                      |                 |                    |
|                                     |            |        |   |                    |                |                      |                 |                    |



Boring No.: 37
PAGE 1 OF 1
JOB NO.: 301953-002
DATE: 07-17-2018

|   | S          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | MOISTURE (%) BLOWS PER 6 IN. |                  |
|---|------------|--------|--|--------------------|----------------|----------------------|------------------------------|------------------|
| DEPTH<br>(feet)                                 | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | ISTURE<br>(%)                | LOWS<br>:R 6 IN. |
|   | n          |        | SOIL DESCRIPTION   | Z Z                | /S             | DRY                  | MO                           |                  |
| - 0 - 1 - 2                                     | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium) moist                  |                    |                |                      |                              |                  |
| 3<br>-<br>4                                     | ML         |        | SANDY SILT: brown, soft, moist, trace clay                                 |                    |                |                      |                              | 4                |
| 5<br>-<br>6                                     | SP         |        | POORLY GRADED SAND: light brown/orange brown mottled, medium dense, moist  | 5.0-6.5            |                | 93.9                 | 10.6                         | 8<br>10          |
| 7 - 8 - 9 - 10                                  |            |        | trace clay   | 10.0-11.5          |                | 111.2                | 6.6                          | 6<br>10          |
| -<br>11<br>-<br>12<br>-<br>13                   | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 10.0 11.0          |                | 111.2                | 0.0                          | 17               |
| 14<br>-<br>15<br>-<br>16                        |            |        | trace cobbles  dense   | 15.0-16.5          | •              |                      |                              | 7<br>14<br>18    |
| 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26 |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                              |                  |

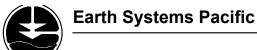


LOGGED BY: R. Wagner DRILL RIG: Mobile B-53

AUGER TYPE: 6" Hollow Stem

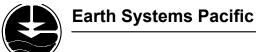
Boring No.: 38 PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-18-2018

|                 |            |  | OXNARD HIGH SCHOOL No. 8   | SAMPLE DATA        |                |                      |                 |                    |
|-----------------|------------|--|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | SS         |  | Northeast of Camino Del Sol  |                    | SAI            |                      | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL                                   | and North Rose Avenue Oxnard, California                           | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | SO         |  | SOIL DESCRIPTION   | N<br>L             | S/             | DRY                  | MO              | BI 34              |
| -0              | SM         |  | SILTY SAND: brown, loose, slightly moist (Alluvium)                |                    |                |                      |                 |                    |
| 1 -             |            |  | (Alluvium)   |                    |                |                      |                 |                    |
| 2               |            |  | moist  |                    |                |                      |                 |                    |
| 3               |            |  |  |                    |                |                      |                 |                    |
| 4               |            |  |  |                    |                |                      |                 |                    |
| -               | SP         |  | POORLY GRADED SAND: light brown/orange brown mottled, loose, moist | 5.0-6.5            |                | 101.9                | 10.9            | 3<br>5             |
| 5               |            |  | ,,   |                    |                | 101.0                | 10.5            | 8                  |
| 6               |            | ¥.<br>                                   |  |                    |                |                      |                 |                    |
| 7               |            |  |  |                    |                |                      |                 |                    |
| -<br>8          |            |  |  |                    |                |                      |                 |                    |
| -               |            |  |  |                    |                |                      |                 |                    |
| 9               |            |  |  |                    |                |                      |                 | 7                  |
| 10 .            | +          |  | medium dense, light brown  | 10.0-11.5          |                | 106.1                | 6.2             | 13<br>16           |
| 11              |            |  |  |                    |                |                      |                 |                    |
| 12              |            |  |  |                    |                |                      |                 |                    |
| -<br>13         |            |  |  |                    |                |                      |                 |                    |
|                 | sw         |  | WELL GRADED SAND: light brown, medium dense,                       |                    |                |                      |                 |                    |
| 14              | 344        |  | moist, trace fine gravel   |                    |                |                      |                 | 6                  |
| 15              |            |  |  | 15.0-16.5          |                |                      |                 | 9<br>7             |
| 16              |            |  |  |                    |                |                      |                 | ,                  |
| 17              |            | (1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)( | End of Boring @ 16.5'  |                    |                |                      |                 |                    |
| -               |            |  | No Subsurface Water Encountered                                    |                    |                |                      |                 |                    |
| 18<br>-         |            |  |  |                    |                |                      |                 |                    |
| 19<br>-         |            |  |  |                    |                |                      |                 |                    |
| 20              |            |  |  |                    |                |                      |                 |                    |
| 21              |            |  |  |                    |                |                      |                 |                    |
| <b>-</b><br>22  |            |  |  |                    |                |                      |                 |                    |
| -               |            |  |  |                    |                |                      |                 |                    |
| 23<br>-         |            |  |  |                    |                |                      |                 |                    |
| 24              |            |  |  |                    |                |                      |                 |                    |
| <b>-</b><br>25  |            |  |  |                    |                |                      |                 |                    |
| <b>-</b><br>26  |            |  |  |                    |                |                      |                 |                    |
|                 |            |  |  |                    |                |                      |                 |                    |



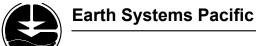
LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-19-2018

|                               |            |        |  |                    |                |                      |                 | 07-19-2018         |  |
|-------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
|                               | S          |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            | ATA                |  |
| DEPTH<br>(feet)               | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                               | 'n         |        | SOIL DESCRIPTION   | LNI                | 'S             | DRY                  | MO              | B<br>PE            |  |
| -                             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |  |
| 2 - 3                         |            |        | moist  |                    |                |                      |                 |                    |  |
| 4                             | ML         |        | SANDY SILT: brown, soft, moist   |                    |                |                      |                 | 1                  |  |
| 5<br>-<br>6                   | SM         |        | SILTY SAND: gray brown, loose, moist                                       | 5.0-6.5            |                | 103.5                | 15.1            | 4<br>6             |  |
| 7<br>-<br>8<br>-<br>9         | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      |                    |                |                      |                 | 8                  |  |
| 10<br>-<br>11<br>-<br>12<br>- |            |        |  | 10.0-11.5          | -              | 121.2                | 4.6             | 12<br>15           |  |
| 13<br>-<br>14<br>-<br>15<br>- |            |        | trace cobbles  | 15.0-16.5          | •              |                      |                 | 6<br>9<br>12       |  |
| 17<br>-<br>18<br>-<br>19      |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |  |
| 20<br>-<br>21<br>-            |            |        |  |                    |                |                      |                 |                    |  |
| 22<br>-<br>23<br>-            |            |        |  |                    |                |                      |                 |                    |  |
| 24<br>-<br>25<br>-            |            |        |  |                    |                |                      |                 |                    |  |
| 26<br>-                       |            |        |  |                    |                |                      |                 |                    |  |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-25-2018

|                               | _ AU       | GEN    | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-25-2018         |
|-------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                               | ဖ<br>တ     |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet)               | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                               |            |        | SOIL DESCRIPTION   | <u>.</u>           | S              | DRY                  | MC              | B<br>Pf            |
| - 1                           | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| -<br>2<br>-<br>3              |            |        | moist  |                    |                |                      |                 |                    |
| 4                             | ML         |        | SANDY SILT: brown, medium stiff, moist                                     |                    |                |                      |                 | 2                  |
| 5                             |            |        |  | 5.0-6.5            |                | 99.0                 | 6.7             | 3 4                |
| 6 - 7 -                       | SP         |        | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel           |                    |                |                      |                 |                    |
| 8<br>-<br>9                   |            |        |  |                    |                |                      |                 | 6                  |
| 10<br>-<br>11<br>-<br>12<br>- | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | . 10.0-11.5        |                | 106.9                | 3.6             | 10<br>15           |
| 13<br>-<br>14<br>-<br>15      |            |        |  | 15.0-16.5          | •              |                      |                 | 6<br>11<br>14      |
| 16<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 17<br>-<br>18<br>-            |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| 19<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 20<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 21<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 22<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 23                            |            |        |  |                    |                |                      |                 |                    |
| 24<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 25<br>-                       |            |        |  |                    |                |                      |                 |                    |
| 26<br>-                       |            |        |  |                    |                |                      |                 |                    |
|                               |            |        |  |                    |                |                      |                 |                    |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-25-2018

|   |            | GER    | R TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07-25-2018         |
|---|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|   | l o        |        | OXNARD HIGH SCHOOL No. 8   | SAMPLE DATA        |                |                      |                 |                    |
| DEPTH<br>(feet)                                     | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|   | ⊃          |        | SOIL DESCRIPTION   | Z                  | S              | DRY                  | M               | ш Е                |
| - 0<br>1  | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 2<br>-<br>3<br>-<br>4                               |            |        | moist  |                    |                |                      |                 |                    |
| 5<br>-<br>6<br>-<br>7                               | SW         |        | WELL GRADED SAND: light brown, loose, moist, trace fine to coarse gravel   | 5.0-6.5            | -              | 100.2                | 3.0             | 4<br>7<br>9        |
| 8<br>-<br>9<br>-<br>10<br>-<br>11<br>-              |            |        | <br>medium dense   | 10.0-11.5          | -              | 102.8                | 3.5             | 7<br>12<br>10      |
| 12<br>-<br>13<br>-<br>14<br>-<br>15<br>-<br>16<br>- |            |        | trace cobbles  thin clay lense   | 15.0-16.5          | -              | 95.1                 | 16.3            | 5<br>11<br>22      |
| 18 - 19 - 20 - 21 - 22 -                            |            |        | <u>▼</u><br>wet  | 20.0-21.5          | •              |                      |                 | 10<br>14<br>16     |
| 23<br>-<br>24<br>-<br>25<br>-<br>26<br>-            |            |        | End of Boring @ 26.5'<br>Subsurface Water Encountered at 21.5'             | 25.0-26.5<br>:     | •              |                      |                 | 5<br>10<br>16      |



Boring No.: 42 PAGE 1 OF 1 JOB NO.: 301953-002

|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               |              | 07-23-2010         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|--------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE (%) | BLOWS<br>PER 6 IN. |
|                 | SN         | 0)     | SOIL DESCRIPTION   | INI<br>T)          | SA             | DRY (                | MOI          | BL                 |
| -               | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |              |                    |
| 1<br>-<br>2     |            |        | moist  |                    |                |                      |              |                    |
| - 3             |            |        |  |                    |                |                      |              |                    |
| -<br>4          | SP         |        | POORLY GRADED SAND: light brown, loose, moist, trace fine gravel           |                    |                |                      |              |                    |
| <b>-</b> 5      |            |        |  | 5.0-6.5            |                | 98.0                 | 8.6          | 2 3                |
| <b>-</b>        |            |        |  |                    |                |                      |              | 5                  |
| 7               |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>8   |            | nort.s |  |                    |                |                      |              |                    |
| <b>-</b><br>9   | SW         |        | WELL GRADED SAND: light brown, loose, moist, trace fine gravel             |                    |                |                      |              |                    |
| -<br>10         |            |        |  | 10.0-11.5          |                | 102.9                | 5.8          | 4<br>10            |
| -<br>11         |            |        | medium dense   |                    |                |                      |              | 22                 |
| -<br>12         |            |        |  |                    |                |                      |              |                    |
| -<br>13         |            |        |  |                    |                |                      |              |                    |
| -<br>14         |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>15  |            |        |  | 15.0-16.5          |                |                      |              | 5<br>8             |
| -<br>16         |            |        |  |                    |                |                      |              | 13                 |
| -<br>17         |            |        | End of Boring @ 16.5'  |                    |                |                      |              |                    |
| -<br>18         |            |        | No Subsurface Water Encountered  |                    |                |                      |              |                    |
| <b>-</b><br>19  |            |        |  |                    |                |                      |              |                    |
| 20              |            |        |  |                    |                |                      |              |                    |
| 21              |            |        |  |                    |                |                      |              |                    |
| 22              |            |        |  |                    |                |                      |              |                    |
| 23              |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>24  |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>25  |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>26  |            |        |  |                    |                |                      |              |                    |
| -               |            |        |  |                    |                |                      |              |                    |



#### **Earth Systems Pacific**

Boring No. 43

PAGE 1 OF 2 JOB NO.: 301953-002 DATE: 07-25-2018

|                 |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               |              | 07-23-2010         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|--------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE (%) | BLOWS<br>PER 6 IN. |
|                 | SN         |        | SOIL DESCRIPTION   | IN<br>IT (†)       | SA             | DRY [                | MOI          | BL                 |
| - 0             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |              |                    |
| - 2             |            |        | moist  |                    |                |                      |              |                    |
| 3               |            |        |  |                    |                |                      |              |                    |
| - 4             |            |        |  |                    |                |                      |              |                    |
| <b>-</b>        | L          |        | increasing silt content  | 5.0-6.5            |                | 96.5                 | 6.9          | 2 5                |
| <b>-</b>        | ML         |        | SANDY SILT: light brown, stiff, moist                                      |                    | _              | 00.0                 |              | 9                  |
| 7               | SP         |        | POORLY GRADED SAND: light brown, loose, moist                              |                    |                |                      |              |                    |
| <b>-</b><br>8   |            |        |  |                    |                |                      |              |                    |
| 9               | sw         | 3359   |  |                    |                |                      |              |                    |
| 10              | SVV        |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel      | 10.0-11.5          |                | 105.5                | 4.6          | 8<br>11            |
| -<br>11         |            |        |  |                    |                |                      |              | 19                 |
| <b>-</b><br>12  |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>13  |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>14  |            |        |  |                    |                |                      |              |                    |
| <b>-</b><br>15  |            |        |  | 15.0-16.5          |                | 114.4                | 4.0          | 7<br>19            |
| <b>-</b><br>16  |            |        |  |                    |                |                      |              | 22                 |
| <b>-</b><br>17  |            |        |  |                    |                |                      |              |                    |
| <u>-</u><br>18  |            |        | trace fine to coarse gravel and cobbles                                    |                    |                |                      |              |                    |
| <b>-</b><br>19  |            |        |  |                    |                |                      |              |                    |
| 20              |            |        |  | 20.0-21.5          |                |                      |              | 0<br>5             |
| 21              |            |        | thin lense of soft clay ~ 4" thick   |                    |                |                      |              | 10                 |
| - 22            |            |        | very moist, cobbles end  |                    |                |                      |              |                    |
| - 23            |            |        |  |                    |                |                      |              |                    |
| -<br>24         |            |        | ▼  |                    |                |                      |              | 8                  |
| -<br>25         |            |        | gray brown, dense, wet   | 25.0-26.5          |                |                      |              | 15<br>23           |
| -<br>26         |            |        |  | 0.0                |                |                      |              | _                  |
| -               |            |        |  |                    |                |                      |              |                    |

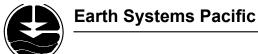


#### **Earth Systems Pacific**

Boring No. 43

LOGGED BY: R. Wagner PAGE 2 OF 2
DRILL RIG: Mobile B-53
AUGER TYPE: 6" Hollow Stem
PAGE 2 OF 2
JOB NO.: 301953-002
DATE: 07/25/2018

|                 | _ AU       | GEN    | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07/25/2018         |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | က္ခ        |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
| 27              | S)         |        | SOIL DESCRIPTION   | <u>N</u>           | S.             | DRY                  | MO              | BI<br>PE           |
| -27             | SW         |        | WELL GRADED SAND: as above   |                    |                |                      |                 |                    |
| 28              |            |        |  |                    |                |                      |                 |                    |
| 29              |            |        |  |                    |                |                      |                 |                    |
| 30              | L          |        |  | 30.0-31.5          |                |                      |                 | 2<br>8             |
| -               |            |        | gray, medium dense, thick silt/clay lense ~8" to 10"                       |                    |                |                      |                 | 14                 |
| 31              |            |        |  |                    |                |                      |                 |                    |
| 32              |            |        |  |                    |                |                      |                 |                    |
| 33              |            |        |  |                    |                |                      |                 |                    |
| 34              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 35              |            |        | no sampling at 35.0' due to flow sands                                     |                    |                |                      |                 |                    |
| 36              |            |        |  |                    |                |                      |                 |                    |
| 37              |            |        |  |                    |                |                      |                 |                    |
| 38              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 39              |            |        |  |                    |                |                      |                 | 6                  |
| 40              | <br>SW-    |        | WELL GRADED SAND WITH SILT: gray brown, dense,                             | 40.0-41.5          |                |                      |                 | 14<br>17           |
| 41              | SM         |        | wet  |                    |                |                      |                 | .,,                |
| 42              |            |        |  |                    |                |                      |                 |                    |
| -               |            |        |  |                    |                |                      |                 |                    |
| 43              |            |        |  |                    |                |                      |                 |                    |
| 44              |            |        |  |                    |                |                      |                 | 5                  |
| 45              |            |        |  | 45.0-46.5          |                |                      |                 | 9<br>12            |
| 46              | <br>       |        |  |                    |                |                      |                 |                    |
| -               | SW         |        | WELL GRADED SAND: gray brown, medium dense, wet                            |                    |                |                      |                 |                    |
| 47              |            |        |  |                    |                |                      |                 |                    |
| 48<br>-         |            |        |  |                    |                |                      |                 |                    |
| 49              |            |        |  |                    |                |                      |                 |                    |
| 50              | L          |        |  |                    |                |                      |                 |                    |
| -               |            |        | no sampling at 50.0' due to flow sands                                     |                    |                |                      |                 |                    |
| 51              |            |        |  |                    |                |                      |                 |                    |
| 52<br>-         |            |        | End of Boring @ 50.0'<br>Subsurface water encountered @ 24.0'              |                    |                |                      |                 |                    |
| 53              |            |        | -  |                    |                |                      |                 |                    |
|                 |            |        |  |                    |                |                      |                 |                    |



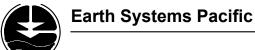
AUGER TYPE: 6" Hollow Stem

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53
JC

PAGE 1 OF 1 JOB NO.: 301953-002 DATE: 07-16-2018

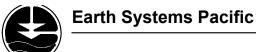
Boring No.: 44

|                                      | (0)        |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               |                 | 07 10 2010         |
|--------------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet)                      | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                                      | SO         |        | SOIL DESCRIPTION   | N<br>L             | S.             | DRY                  | MO              | 18 H               |
| -<br>1<br>-                          | ML         |        | SANDY SILT: light brown, soft, slightly moist, trace clay (Alluvium)       | 0-4                | 0              |                      |                 | 1                  |
| 2 - 3                                |            |        | moist  | 2.0-3.5            |                | 104.6                | 15.8            | 2 2                |
| -<br>4<br>-<br>5<br>-<br>6<br>-<br>7 | SW         |        | WELL GRADED SAND: light brown, loose, slightly moist, trace fine gravel    | 5.0-6.5            | -              | 99.6                 | 2.4             | 3<br>6<br>9        |
| -<br>8<br>-<br>9<br>-                |            |        | medium dense, moist  | 8.5-10.0           | •              |                      |                 | 4<br>7<br>12       |
| -<br>11<br>-                         |            |        | End of Boring @ 10.0<br>No Subsurface Water Encountered                    |                    |                |                      |                 |                    |
| 12<br>-<br>13                        |            |        |  |                    |                |                      |                 |                    |
| 14 -                                 |            |        |  |                    |                |                      |                 |                    |
| 15<br>-<br>16<br>-                   |            |        |  |                    |                |                      |                 |                    |
| 17<br>-<br>18                        |            |        |  |                    |                |                      |                 |                    |
| -<br>19<br>-                         |            |        |  |                    |                |                      |                 |                    |
| 20<br>-<br>21                        |            |        |  |                    |                |                      |                 |                    |
| -<br>22<br>-                         |            |        |  |                    |                |                      |                 |                    |
| 23<br>-<br>24                        |            |        |  |                    |                |                      |                 |                    |
| -<br>25<br>-                         |            |        |  |                    |                |                      |                 |                    |
| 26<br>-                              |            |        |  | - ODT              |                |                      |                 |                    |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-26-2018

|                 | , i i      |        | OVALED HOLLOCHED N. C.  |                    |                | MD: = =              |                 | 07-20-2018         |
|-----------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | ြ          |        | OXNARD HIGH SCHOOL No. 8  |                    | SAI            | MPLE [               | DATA            |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California                      | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | <u>5</u>   |        | SOIL DESCRIPTION  | INI<br>            | /S             | DRY                  | MO              | B                  |
| -<br>1          | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)   |                    |                |                      |                 |                    |
| 2 - 3           |            |        | moist   | 0-5                | 0              |                      |                 |                    |
| 4               |            |        | increasing silt content   |                    |                |                      |                 | 5                  |
| 5<br>-<br>6     | SP         |        | POORLY GRADED SAND: light brown, medium dense, moist  | 5.0-6.5            |                | 99.1                 | 8.3             | 6<br>13            |
| 7               |            |        |   |                    |                |                      |                 |                    |
| 8 -             | L          | Dieses |   |                    |                |                      |                 |                    |
| 9<br>-<br>10    | SW         |        | WELL GRADED SAND: light brown, medium dense, moist, trace silt, trace coarse gravel and cobbles | 10.0-11.5          |                | 118.1                | 5.1             | 6<br>18            |
| 11 -            |            |        |   |                    |                |                      |                 | 24                 |
| 12<br>-<br>13   |            |        |   |                    |                |                      |                 |                    |
| 14<br>-         |            |        |   | 15.0-16.5          |                | 121.4                | 4.5             | 10<br>27           |
| 15<br>-<br>16   |            |        | dense   |                    |                |                      |                 | 34                 |
| 17              |            |        |   |                    |                |                      |                 |                    |
| 18<br>-<br>19   |            |        |   |                    |                |                      |                 |                    |
| 20              |            |        | silt ends, wet, medium dense  | 20.0-21.5          | •              |                      |                 | 6<br>13<br>15      |
| 21<br>-<br>22   |            |        |   |                    |                |                      |                 |                    |
| 23              |            |        |   |                    |                |                      |                 |                    |
| 24<br>-<br>25   | CL         |        | SANDY LEAN CLAY: gray, very soft, moist, trace silt   | 25.0-26.5          | •              |                      |                 | 0<br>1             |
| -<br>26<br>-    |            |        | End of Boring @ 26.5'<br>Subsurface Water Encountered Between 20.0' and 24.0'                   |                    |                |                      |                 | 1                  |



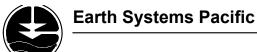
LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-26-2018

|                    |            |        | OXNARD HIGH SCHOOL No. 8  |                    | C 4 *          | MDI E 5              |                 | 07-20-2018         |
|--------------------|------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|
|                    | က္ခ        |        | Northeast of Camino Del Sol   |                    | SAI            | MPLE D               | DATA            |                    |
| DEPTH<br>(feet)    | USCS CLASS | SYMBOL | and North Rose Avenue Oxnard, California                                    | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                    | ŝn         |        | SOIL DESCRIPTION  | INI                | /S             | DRY                  | MO              | BI<br>PE           |
| - 1                | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                         |                    |                |                      |                 |                    |
| 2                  |            |        | moist   |                    |                |                      |                 |                    |
| 3                  | <br>ML     |        | SANDY SILT: brown, soft, moist  | •                  |                |                      |                 |                    |
| 4                  | L          |        | O THE FOREIT SIGNIT, COIL, MICHEL   |                    |                |                      |                 |                    |
| -<br>5<br>-        | SP         |        | POORLY GRADED SAND: light brown, medium dense, moist                        | 5.0-6.5            | _              | 101.6                | 11.4            | 4<br>18<br>25      |
| 6                  |            |        | trace fine to medium gravel and cobbles                                     |                    |                |                      |                 |                    |
| 7<br>-<br>8        |            |        | g   |                    |                |                      |                 |                    |
| -<br>9             |            |        |   |                    |                |                      |                 |                    |
| 10                 |            |        |   | 10.0-11.5          |                | 103.3                | 18.1            | 5<br>10            |
| -<br>11            |            |        | very moist, trace silt  |                    |                |                      |                 | 17                 |
| 12                 |            |        |   |                    |                |                      |                 |                    |
| 13<br>-<br>14      | sw         |        | WELL GRADED SAND: brown, medium dense, moist, trace fine gravel, trace silt |                    |                |                      |                 |                    |
| 15<br>-<br>16      |            |        |   | 15.0-16.5          | •              |                      |                 | 8<br>11<br>17      |
| -<br>17<br>-<br>18 |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                       |                    |                |                      |                 |                    |
| <b>-</b>           |            |        |   |                    |                |                      |                 |                    |
| <b>-</b><br>20     |            |        |   |                    |                |                      |                 |                    |
| 21                 |            |        |   |                    |                |                      |                 |                    |
| 22<br>-            |            |        |   |                    |                |                      |                 |                    |
| 23                 |            |        |   |                    |                |                      |                 |                    |
| 24<br>-            |            |        |   |                    |                |                      |                 |                    |
| 25<br>-<br>26      |            |        |   |                    |                |                      |                 |                    |
| -                  |            |        |   |                    |                |                      |                 |                    |



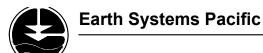
Boring No.: 47
PAGE 1 OF 1
JOB NO.: 301953-002
DATE: 07-17-2018

|                 |                 |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               |                 | 7 17 2010          |
|-----------------|-----------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet) | USCS CLASS      | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | SN              |        | SOIL DESCRIPTION   | E)                 | SA             | DRY (                | MOI             | BI<br>PE           |
| -0              | SM              |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 - 2           |                 |        | moist, increasing silt content   |                    |                |                      |                 |                    |
| 3 -             | ML              |        | SANDY SILT: brown, soft, moist, trace clay                                 |                    |                |                      |                 |                    |
| 4 -             | - <del></del> - |        |  | 5.0-6.5            |                | 100.0                | 0.4             | 3                  |
| 5               | SP              |        | POORLY GRADED SAND: light brown/orange brown mottled, medium dense, moist  | 5.0-6.5            |                | 103.0                | 9.4             | 9<br>12            |
| 6               |                 | y.     |  |                    |                |                      |                 |                    |
| 7 -             |                 |        |  |                    |                |                      |                 |                    |
| 8 -             |                 |        |  |                    |                |                      |                 |                    |
| 9               |                 |        |  |                    |                |                      |                 | 10                 |
| 10              |                 |        |  | 10.0-11.5          |                | 107.0                | 6.3             | 16<br>24           |
| 11              |                 |        |  |                    |                |                      |                 |                    |
| 12              |                 |        | trace fine to coarse gravel  |                    |                |                      |                 |                    |
| 13              |                 |        | 3.2.C  |                    |                |                      |                 |                    |
| 14              |                 |        | trace cobbles, dense   |                    |                |                      |                 | 15                 |
| 15              |                 |        | race commes, derise  | 15.0-16.5          |                |                      |                 | 15<br>18           |
| 16              |                 |        | blow counts from 15.5' to 16.5' not reliable due to rocks                  |                    |                |                      |                 | 19                 |
| 17<br>-         |                 |        | End of Boring @ 16.5'<br>No Subsurface Water Encountered                   |                    |                |                      |                 |                    |
| 18              |                 |        |  |                    |                |                      |                 |                    |
| 19              |                 |        |  |                    |                |                      |                 |                    |
| 20<br>-         |                 |        |  |                    |                |                      |                 |                    |
| 21<br>-         |                 |        |  |                    |                |                      |                 |                    |
| 22<br>-         |                 |        |  |                    |                |                      |                 |                    |
| 23              |                 |        |  |                    |                |                      |                 |                    |
| 24              |                 |        |  |                    |                |                      |                 |                    |
| 25<br>-         |                 |        |  |                    |                |                      |                 |                    |
| 26<br>-         |                 |        |  |                    |                |                      |                 |                    |



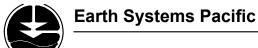
LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-17-2018

|                 | , \ <u>U</u> |                      | OVNARD HIGH SCHOOL No. 9   |                    |                | MDI = 5              |                 | 07-17-2018         |
|-----------------|--------------|----------------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | ဟု           |                      | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE D               | AIA             |                    |
| DEPTH<br>(feet) | USCS CLASS   | SYMBOL               | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | ŝn           |                      | SOIL DESCRIPTION   | INI                | S/             | DRY                  | MO              | BI<br>PE           |
| -               | SM           |                      | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| 1 -             |              | <del></del>          | moist  |                    |                |                      |                 |                    |
| 2               |              |                      |  |                    |                |                      |                 |                    |
| 3               |              | <del>: : : :</del> : | increasing silt content  |                    |                |                      |                 |                    |
| -               |              |                      |  |                    |                |                      |                 |                    |
| 4               |              |                      |  | 5005               |                |                      |                 | 3                  |
| 5               | SP           |                      | POORLY GRADED SAND: light brown/orange brown mottled, loose, moist         | 5.0-6.5            |                | 100.7                | 8.6             | 4<br>7             |
| 6               |              |                      |  |                    |                |                      |                 |                    |
| 7               |              |                      |  |                    |                |                      |                 |                    |
| -               |              |                      |  |                    |                |                      |                 |                    |
| 8 -             |              |                      | trace fine gravel  |                    |                |                      |                 |                    |
| 9               |              |                      |  |                    |                |                      |                 | 7                  |
| 10              |              |                      |  | 10.0-11.5          |                | 110.1                | 6.0             | 16                 |
| 11              |              |                      | medium dense   |                    |                |                      |                 | 22                 |
| -               |              |                      |  |                    |                |                      |                 |                    |
| 12              |              |                      |  |                    |                |                      |                 |                    |
| 13              |              |                      |  |                    |                |                      |                 |                    |
| 14              |              | ere ere e            |  | -                  |                |                      |                 |                    |
| -<br>15         | SW           |                      | WELL GRADED SAND: light brown, dense, moist, trace fine to coarse gravel   | 15.0-16.5          |                |                      |                 | 9<br>13            |
| -               |              |                      | , mile to seemed grants  | 15.0-16.5          |                |                      |                 | 19                 |
| 16              |              |                      |  |                    |                |                      |                 |                    |
| 17              |              |                      | End of Boring @ 16.5'  |                    |                |                      |                 |                    |
| 18              |              |                      | No Subsurface Water Encountered  |                    |                |                      |                 |                    |
| -               |              |                      |  |                    |                |                      |                 |                    |
| 19              |              |                      |  |                    |                |                      |                 |                    |
| 20              |              |                      |  |                    |                |                      |                 |                    |
| 21              |              |                      |  |                    |                |                      |                 |                    |
| -<br>22         |              |                      |  |                    |                |                      |                 |                    |
| -               |              |                      |  |                    |                |                      |                 |                    |
| 23              |              |                      |  |                    |                |                      |                 |                    |
| 24              |              |                      |  |                    |                |                      |                 |                    |
| 25              |              |                      |  |                    |                |                      |                 |                    |
| -<br>26         |              |                      |  |                    |                |                      |                 |                    |
|                 |              |                      |  |                    |                |                      |                 |                    |



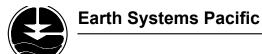
Boring No.: 49 PAGE 1 OF 1 JOB NO.: 301953-002

|                                      |            |        | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               |                 | 07 10 2010         |
|--------------------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|
| DEPTH<br>(feet)                      | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                                      | SN         |        | SOIL DESCRIPTION   | EN.)               | SA             | DRY (                | MO              | BI                 |
| -0                                   | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |
| -                                    |            |        | gray brown, moist  |                    |                |                      |                 |                    |
| 2<br>-<br>3<br>-<br>4                |            |        |  |                    |                |                      |                 | 2                  |
| <b>-</b><br>5                        |            |        |  | 5.0-6.5            |                | 98.1                 | 15.5            | 3 4 _              |
| -<br>6<br>-<br>7<br>-<br>8<br>-<br>9 |            |        | thin sandy silt lense  |                    |                |                      |                 | 7                  |
| 10                                   | sw         |        | WELL GRADED SAND: light brown, medium dense,                               | 10.0-11.5          |                | No R                 | eturn           | 16<br>19           |
| 11<br>-<br>12<br>-<br>13<br>-        |            |        | moist, trace fine to coarse gravel   |                    |                |                      |                 |                    |
| 15                                   |            |        |  | 15.0-16.5          |                |                      |                 | 5<br>12            |
| 16                                   |            |        | blow counts from 16.0' to 16.5' not reliable due to rocks                  |                    |                |                      |                 | 20                 |
| 17<br>-<br>18                        |            |        | End of Boring @ 16.5' No Subsurface Water Encountered                      |                    |                |                      |                 |                    |
| 19                                   |            |        |  |                    |                |                      |                 |                    |
| 20                                   |            |        |  |                    |                |                      |                 |                    |
| 21                                   |            |        |  |                    |                |                      |                 |                    |
| 22                                   |            |        |  |                    |                |                      |                 |                    |
| 23                                   |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>24                       |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>25                       |            |        |  |                    |                |                      |                 |                    |
| <b>-</b><br>26                       |            |        |  |                    |                |                      |                 |                    |
|                                      |            |        |  |                    |                |                      |                 |                    |



LOGGED BY: R. Wagner PAGE 1 OF 1
DRILL RIG: Mobile B-53 JOB NO.: 301953-002
AUGER TYPE: 6" Hollow Stem DATE: 07-18-2018

|                 |            | OVNARRA HIGH SCHOOL No. 9 |  | SAMPLE DATA        |                |                      |                 |                    |  |
|-----------------|------------|---------------------------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
|                 | ္က         |                           | OXNARD HIGH SCHOOL No. 8   |                    | SAI            | MPLE [               | DATA            |                    |  |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL                    | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                 | :n         |                           | SOIL DESCRIPTION   | LNI                | 'S             | DRY                  | MC              | B B                |  |
| -               | SM         |                           | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |  |
| 1               |            | +:+:+                     | moist  |                    |                |                      |                 |                    |  |
| 2               |            |                           |  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 3               | L          |                           |  |                    |                |                      |                 |                    |  |
| 4               | ML         |                           | SANDY SILT: brown, soft, moist   |                    |                |                      |                 |                    |  |
| -               |            |                           |  | 5.0-6.5            |                | 00.0                 | 0.0             | 7                  |  |
| 5               | SP         | -  -                      | POORLY GRADED SAND: light brown/orange brown                               | 3.0-0.3            |                | 98.9                 | 8.0             | 9                  |  |
| 6               | O.         | i vi                      | mottled, loose, moist  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 7               |            | ar Ni                     |  |                    |                |                      |                 |                    |  |
| 8               |            |                           |  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 9               |            |                           |  |                    |                |                      |                 | 8                  |  |
| 10              |            |                           |  | 10.0-11.5          |                | 116.1                | 11.7            | 18                 |  |
| -               |            |                           | medium dense, trace silt   |                    | -              |                      |                 | 24                 |  |
| 11              |            |                           |  |                    |                |                      |                 |                    |  |
| 12              |            |                           |  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 13              |            |                           |  |                    |                |                      |                 |                    |  |
| 14              | sw         |                           | WELL GRADED SAND: light brown, medium dense,                               |                    |                |                      |                 | ,,                 |  |
| -               |            |                           | moist, trace fine to coarse gravel and cobbles                             | 15.0-16.0          |                | 109.5                | 5.5             | 12<br>50/5.0"      |  |
| 15              |            |                           |  | 13.0-10.0          | _              | 109.5                | 3.5             | 30/3.0             |  |
| 16              |            |                           | blow counts from 15.5' to 16.0' not reliable due to rocks                  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 17              |            |                           |  |                    |                |                      |                 |                    |  |
| 18              |            |                           |  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 19              |            |                           |  |                    |                |                      |                 |                    |  |
| 20              |            |                           |  |                    |                |                      |                 | 8                  |  |
|                 |            |                           | <b>_</b>   | 20.0-21.5          |                |                      |                 | 13<br>18           |  |
| 21              |            |                           | wet =  |                    |                |                      |                 |                    |  |
| 22              |            |                           |  |                    |                |                      |                 |                    |  |
| -               |            |                           |  |                    |                |                      |                 |                    |  |
| 23              |            | <b>X</b>                  |  |                    |                |                      |                 |                    |  |
| - 24            |            | 3355<br>3355              |  |                    |                |                      |                 |                    |  |
| 24<br>-         |            |                           |  |                    |                |                      |                 |                    |  |
| 25              |            |                           |  | 25.0-26.5          |                |                      |                 | 5  <br>16          |  |
| -               |            |                           | End of Boring @ 26.5'  |                    |                |                      |                 | 32                 |  |
| 26<br>-         |            |                           | Subsurface Water Encountered Between 20.0' and 24.0'                       |                    |                |                      |                 |                    |  |
|                 |            | ш                         |  |                    |                |                      | I               |                    |  |



Boring No. 51 PAGE 1 OF 2

LOGGED BY: R. Wagner PAGE 1 OF 2
DRILL RIG: Mobile B-53
AUGER TYPE: 6" Hollow Stem DATE: 07-19-2018

|                                     | AUGER TYPE: 6" Hollow Stem |        | DATE: 07-19-2018  |                    |                |                      |                 |                    |  |
|-------------------------------------|----------------------------|--------|---|--------------------|----------------|----------------------|-----------------|--------------------|--|
|                                     | ပ္လ                        |        | OXNARD HIGH SCHOOL No. 8  | SAMPLE DATA        |                |                      |                 |                    |  |
| DEPTH<br>(feet)                     | USCS CLASS                 | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California        | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                                     |                            |        | SOIL DESCRIPTION  |                    | S              | DRY                  | MC              | 3 H                |  |
| - 0<br>1 -                          | SM                         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                               |                    |                |                      |                 |                    |  |
| 2 - 3 -                             |                            |        | moist   |                    |                |                      |                 |                    |  |
| 4                                   |                            |        | increasing silt content   |                    |                |                      |                 | 2                  |  |
| 5<br>-<br>6<br>-<br>7               | SP                         |        | POORLY GRADED SAND: light brown, loose, moist                                     | 5.0-6.5            |                | 122.4                | 12.4            | 3<br>6<br>10       |  |
| 8<br>-<br>9                         |                            |        |   |                    |                |                      |                 |                    |  |
| -<br>10<br>-<br>11<br>-             |                            |        | medium dense  | 10.0-11.5          | -              | 94.9                 | 7.9             | 6<br>17<br>24      |  |
| 12<br>-<br>13<br>-<br>14 -<br>15    | sw                         |        | WELL GRADED SAND: light brown, medium dense, moist, trace fine gravel and cobbles | 15.0-16.5          | _              | 109.5                | 5.0             | 7<br>19<br>21      |  |
| 16<br>-<br>17<br>-<br>18<br>-<br>19 |                            |        |   |                    |                |                      |                 | 7                  |  |
| 20 - 21 - 22 -                      |                            |        | cobbles end wet   | 20.0-21.5          | •              |                      |                 | , 11<br>14         |  |
| 23<br>-<br>24<br>-<br>25<br>-       | =                          |        | DOORLY CRAPED SAND and house and firm the   | 25.0-26.5          | •              |                      |                 | 7<br>8<br>4        |  |
| 26<br>-                             | SP                         |        | POORLY GRADED SAND: gray brown, medium dense, wet, thin lense of silty sand       |                    |                |                      |                 |                    |  |



#### **Earth Systems Pacific**

Boring No. 51

LOGGED BY: R. Wagner PAGE 2 OF 2
DRILL RIG: Mobile B-53
AUGER TYPE: 6" Hollow Stem
PAGE 2 OF 2
JOB NO.: 301953-002
DATE: 07/19/2018

|                          |            |        | TYPE: 6" Hollow Stem   |                    |                |                      |                 | 07/19/2018         |  |
|--------------------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
|                          | USCS CLASS |        | OXNARD HIGH SCHOOL No. 8   | SAMPLE DATA        |                |                      |                 |                    |  |
| DEPTH<br>(feet)          |            | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California                               | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                          | )          |        | SOIL DESCRIPTION   | Z                  | S              | DRY                  | MO              | B 8                |  |
| 27<br>                   | SP         |        | POORLY GRADED SAND: as above   |                    |                |                      |                 |                    |  |
| 28                       |            |        |  |                    |                |                      |                 |                    |  |
| 29                       |            |        |  |                    |                |                      |                 |                    |  |
| 30                       |            |        |  | 30.0-31.5          |                |                      |                 | 8<br>16            |  |
| -                        |            |        |  |                    |                |                      |                 | 32                 |  |
| 31<br>-<br>32<br>-<br>33 |            |        | trace fine gravel and cobbles, flow sands, blow count from 31.0' to 31.5' not reliable due to flow sands |                    |                |                      |                 |                    |  |
| -<br>34<br>-<br>35       |            |        |  | 35.0-36.5          |                |                      |                 | 8<br>12            |  |
| 36<br>-<br>37            | SW-<br>SM  |        | WELL GRADED SAND WITH SILT AND GRAVEL: light brown, medium dense, wet                                    | 35.0-30.5          |                |                      |                 | 14                 |  |
| -<br>38<br>-<br>39       |            |        |  |                    |                |                      |                 |                    |  |
| -<br>40<br>-<br>41       |            |        |  | 40.0-41.5          | •              |                      |                 | 6<br>5<br>7        |  |
| 42<br>-<br>43<br>-       | -sw        |        | WELL GRADED SAND: light brown, dense, wet, flow  |                    |                |                      |                 |                    |  |
| 44<br>-<br>45<br>-<br>46 |            |        | sands end  | 45.0-46.5          | •              |                      |                 | 5<br>10<br>21      |  |
| 47<br>-<br>48<br>-<br>49 |            |        |  |                    |                |                      |                 |                    |  |
| 50<br>-<br>51<br>-       |            |        | thin lenses of poorly graded sand  | 50.0-51.5          | •              |                      |                 | 11<br>16<br>24     |  |
| 52<br>-<br>53<br>-       |            |        | End of Boring @ 51.5'<br>Subsurface water encountered @ 21.0'  |                    |                |                      |                 |                    |  |



Boring No.: 52 PAGE 1 OF 1 JOB NO.: 301953-002

|                 | S          |        | OXNARD HIGH SCHOOL No. 8   | SAMPLE DATA        |                |                      |                 |                    |  |
|-----------------|------------|--------|--|--------------------|----------------|----------------------|-----------------|--------------------|--|
| DEPTH<br>(feet) | USCS CLASS | SYMBOL | Northeast of Camino Del Sol<br>and North Rose Avenue<br>Oxnard, California | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |  |
|                 | SN         |        | SOIL DESCRIPTION   | N<br>N             | SA             | DRY I                | MOI             | 18 H               |  |
| - 1             | SM         |        | SILTY SAND: brown, loose, slightly moist (Alluvium)                        |                    |                |                      |                 |                    |  |
| <b>-</b> .      |            |        | moist  |                    |                |                      |                 |                    |  |
| 3               | <br>ML     |        | SANDY SILT: light gray brown, soft, moist                                  |                    |                |                      |                 |                    |  |
| 4               |            |        |  |                    |                |                      |                 | 1                  |  |
| 5<br>-          |            |        |  | 5.0-6.5            |                | 108.9                | 19.4            | 3 3                |  |
| 6               |            |        |  |                    |                |                      |                 |                    |  |
| 7 -<br>8        | SW         |        | WELL GRADED SAND: light brown, loose, moist                                |                    |                |                      |                 |                    |  |
| 9               |            |        |  |                    |                |                      |                 |                    |  |
| 10              |            |        |  | 10.0-11.5          |                | 107.6                | 2.8             | 5 11               |  |
| 11              |            |        | medium dense, slightly moist, trace fine to coarse gravel                  |                    |                |                      |                 | 11                 |  |
| 12              |            |        |  |                    |                |                      |                 |                    |  |
| 13 -            |            |        | moist, trace cobbles   |                    |                |                      |                 |                    |  |
| 14<br>-         |            |        |  |                    |                |                      |                 | 9                  |  |
| 15<br>-<br>16   |            |        |  | 15.0-16.5          |                |                      |                 | 12<br>13           |  |
| 17              |            |        | End of Boring @ 16.5'  |                    |                |                      |                 |                    |  |
| -<br>18         |            |        | No Subsurface Water Encountered  |                    |                |                      |                 |                    |  |
| 19              |            |        |  |                    |                |                      |                 |                    |  |
| 20              |            |        |  |                    |                |                      |                 |                    |  |
| 21              |            |        |  |                    |                |                      |                 |                    |  |
| 22<br>-         |            |        |  |                    |                |                      |                 |                    |  |
| 23<br>-<br>24   |            |        |  |                    |                |                      |                 |                    |  |
| -<br>25         |            |        |  |                    |                |                      |                 |                    |  |
| <b>-</b><br>26  |            |        |  |                    |                |                      |                 |                    |  |
| -               |            |        |  |                    |                |                      |                 |                    |  |



**Earth Systems Pacific** 

AUGER TYPE: 6" Hollow Stem

DRILL RIG: Mobile B-53

Boring No.: 53 PAGE 1 OF 1 JOB NO.: 301953-002

DATE: 07-17-2018

|                 |            | OVNARD HIGH SCHOOL No. 9 | DATE: 07-17-2018   |                    |                |                      |                 |                    |
|-----------------|------------|--------------------------|--|--------------------|----------------|----------------------|-----------------|--------------------|
|                 | SS         |                          | OXNARD HIGH SCHOOL No. 8  Northeast of Camino Del Sol      | SAMPLE DATA        |                |                      |                 |                    |
| DEPTH<br>(feet) | USCS CLASS | SYMBOL                   | and North Rose Avenue Oxnard, California                   | INTERVAL<br>(feet) | SAMPLE<br>TYPE | DRY DENSITY<br>(pcf) | MOISTURE<br>(%) | BLOWS<br>PER 6 IN. |
|                 | ñ          | ő                        | SOIL DESCRIPTION   | LNI<br>)           | /S             | DRY                  | MO              | BI<br>PE           |
| - 1             | SM         |                          | SILTY SAND: light brown, loose, slightly moist (Alluvium)  | 0-3                | 0              |                      |                 |                    |
| 2               |            |                          | moist, trace roots, increasing silt content                | 2.0-3.5            |                | 94.2                 | 25.1            | 1<br>2             |
| 3               | ML         |                          | SANDY SILT: brown, soft, moist, trace roots                |                    |                |                      |                 | 3                  |
| 4               | IVIL       |                          | SAND F SILT. DIOWII, SOIL, MOISE, Trace roots              |                    |                |                      |                 | 2                  |
| 5               |            |                          |  | 5.0-6.5            |                | 88.9                 | 9.7             | 4<br>7             |
| 6 -             | SP         |                          | POORLY GRADED SAND: light brown/gray mottled, loose, moist |                    |                |                      |                 |                    |
| 7 -             |            |                          |  |                    |                |                      |                 | 3                  |
| 8 -             |            |                          | medium dense   | 8.5-10.0           | •              |                      |                 | 5<br>6             |
| 9 -             |            |                          | modulii donec  |                    |                |                      |                 |                    |
| -<br>11         |            |                          | End of Boring @ 10.0<br>No Subsurface Water Encountered    |                    |                |                      |                 |                    |
| 12              |            |                          |  |                    |                |                      |                 |                    |
| 13              |            |                          |  |                    |                |                      |                 |                    |
| 14              |            |                          |  |                    |                |                      |                 |                    |
| 15<br>-         |            |                          |  |                    |                |                      |                 |                    |
| 16<br>-         |            |                          |  |                    |                |                      |                 |                    |
| 17<br>-<br>18   |            |                          |  |                    |                |                      |                 |                    |
| <b>-</b>        |            |                          |  |                    |                |                      |                 |                    |
| <b>-</b> 20     |            |                          |  |                    |                |                      |                 |                    |
| 21              |            |                          |  |                    |                |                      |                 |                    |
| 22              |            |                          |  |                    |                |                      |                 |                    |
| 23              |            |                          |  |                    |                |                      |                 |                    |
| 24              |            |                          |  |                    |                |                      |                 |                    |
| 25<br>-         |            |                          |  |                    |                |                      |                 |                    |
| 26<br>-         |            |                          |  |                    |                |                      |                 |                    |

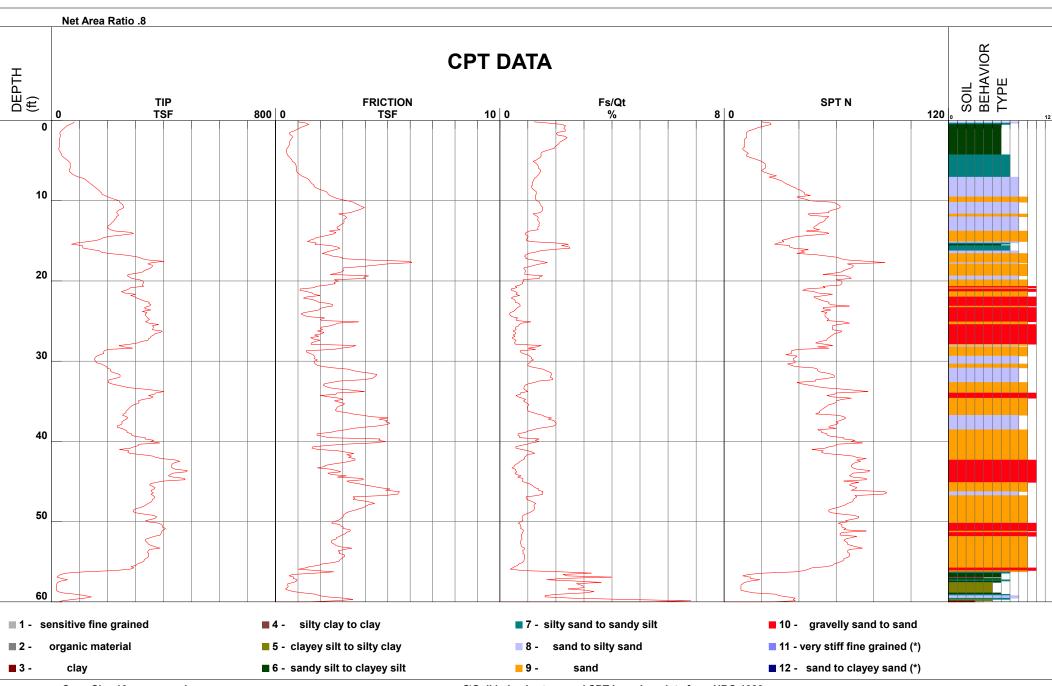
# Middle Earth

### **Earth Systems**

Operator Cone Number Date and Time 24.00 ft RC AS DDG1379 4/20/2018 10:08:51 AM Filename SDF(701).cpt

GPS

Maximum Depth 60.53 ft

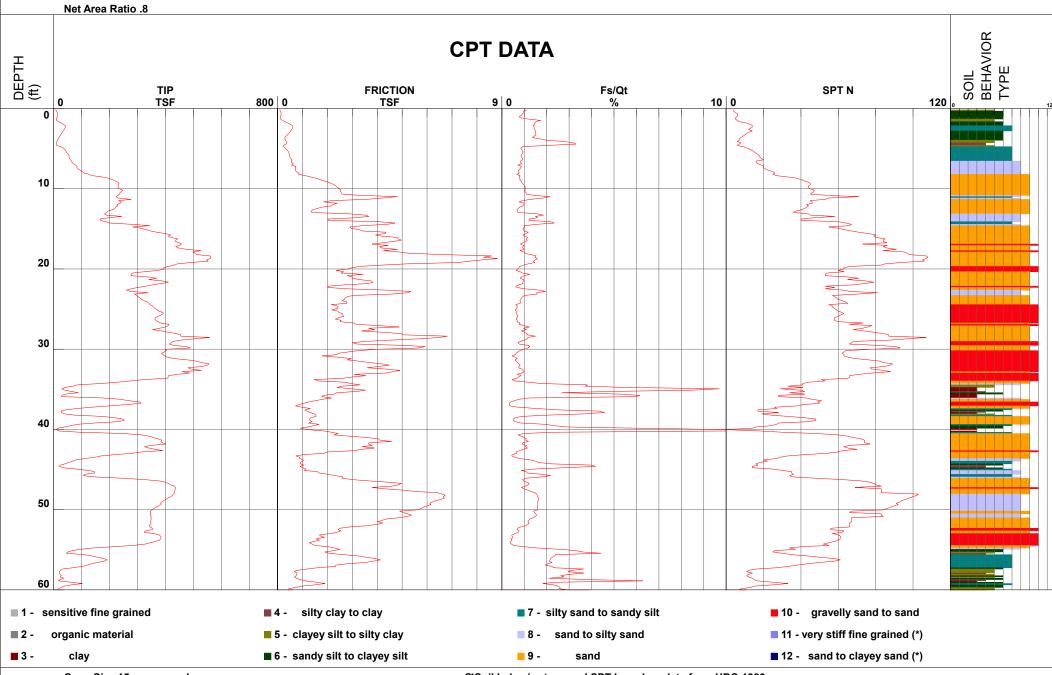




Project Oxnard Un Job Number Hole Number EST GW Depth During Test

Oxnard Union High School No.8 301953-001 CPT-02A Operator Cone Number Date and Time 15.00 ft RC AS DDG1448 7/16/2018 3:49:22 PM Filename
GPS
Maximum Depth

SDF(037).cpt 61.02 ft





 Project
 Oxnard Union HS No.8

 Job Number
 301953-001

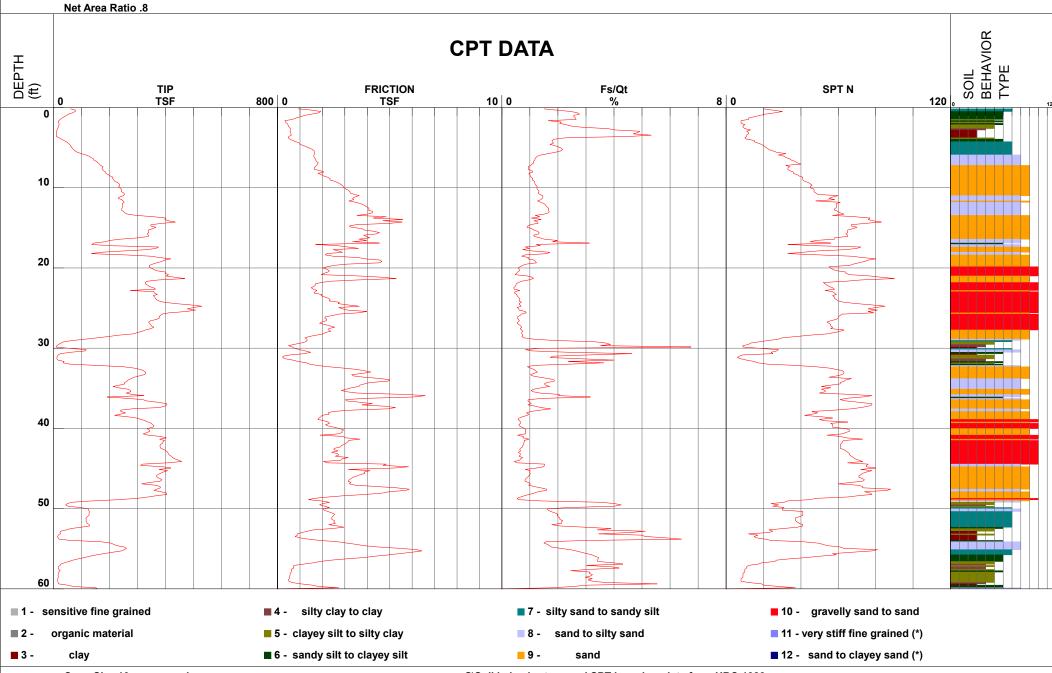
 Hole Number
 CPT-03

 EST GW Depth During Test

Operator Cone Number Date and Time 24.00 ft RC AS DDG1379 4/20/2018 11:12:25 AM Filename SDF(702).cpt

GPS

Maximum Depth 60.20 ft





 Project
 Oxnard Union HS No.8

 Job Number
 301953-001

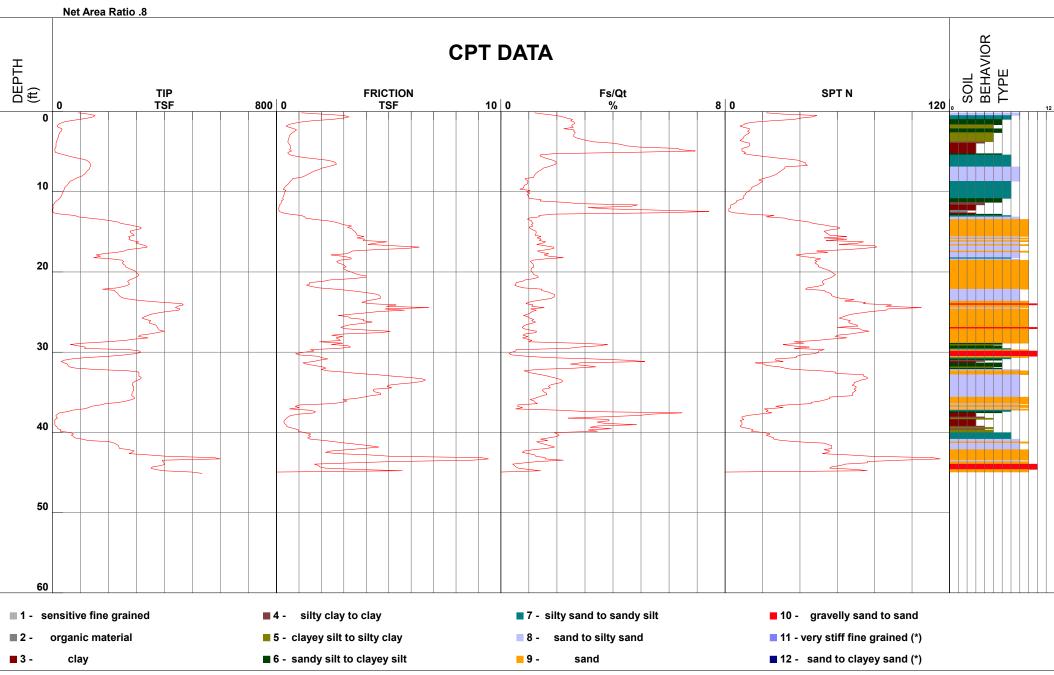
 Hole Number
 CPT-04

 EST GW Depth During Test

Operator Cone Number Date and Time 24.00 ft RC AS DDG1379 4/20/2018 11:57:08 AM Filename SDF(703).cpt

GPS

Maximum Depth 45.11 ft





Project Oxnard Uni
Job Number
Hole Number
EST GW Depth During Test

 Oxnard Union High School No.8
 Operator

 301953-001
 Cone Number

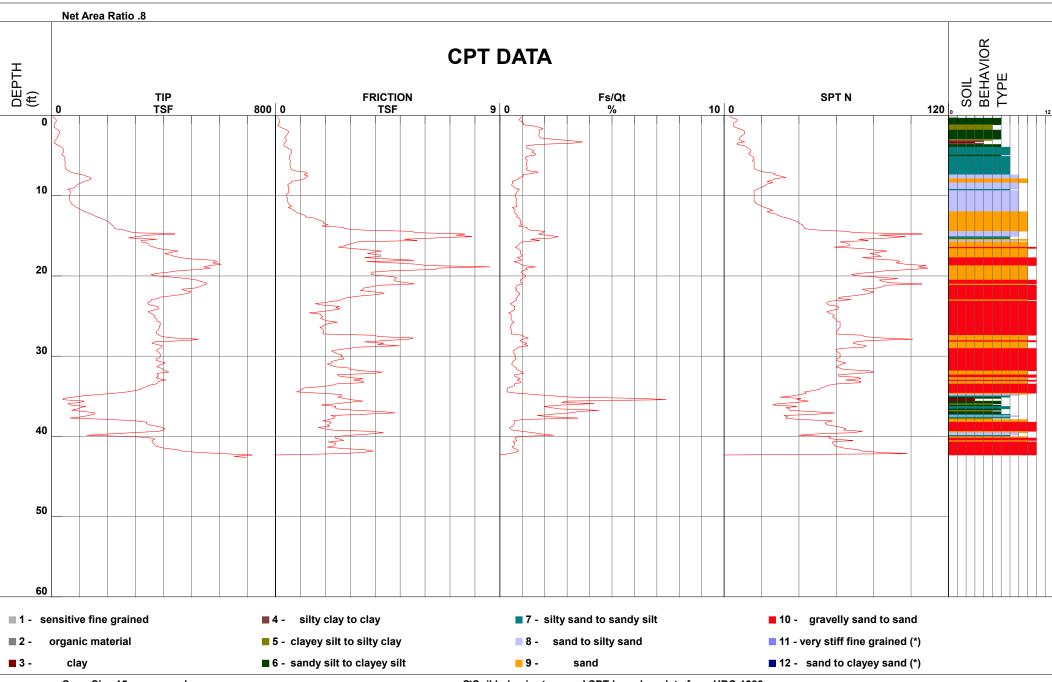
 CPT-05
 Date and Time

 uring Test
 15.00 ft

RC AS DDG1448 7/16/2018 3:07:16 PM Filename SDF(036).cpt

GPS

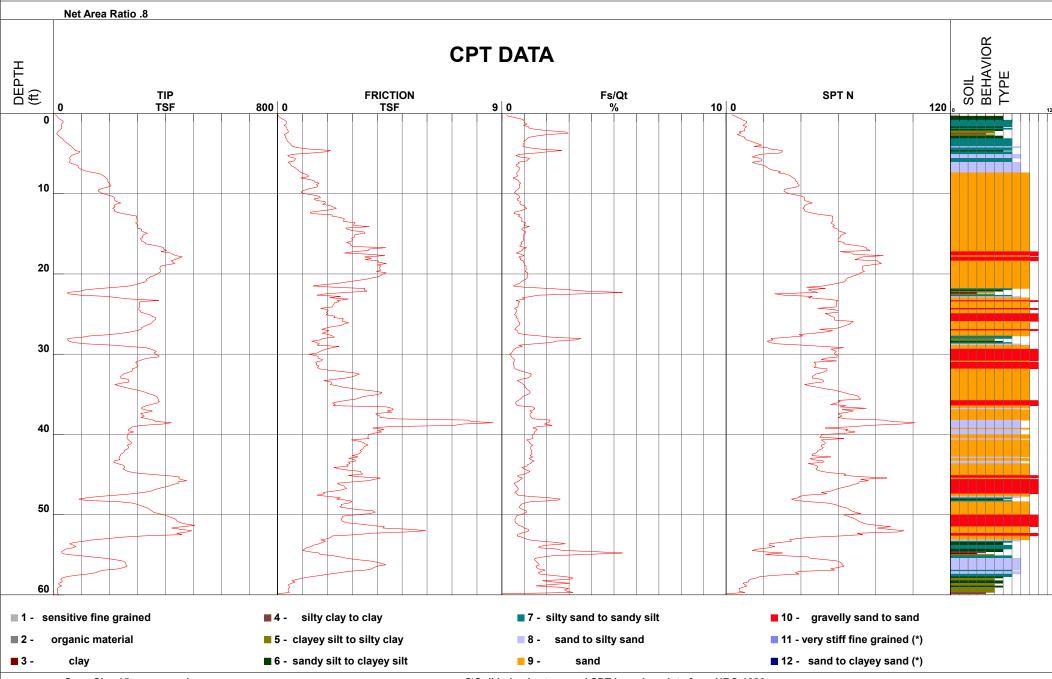
Maximum Depth 42.65 ft





Project Oxnard Un Job Number Hole Number EST GW Depth During Test

Oxnard Union High School No.8 301953-001 CPT-06A Operator Cone Number Date and Time 15.00 ft RC AS DDG1448 7/16/2018 2:15:03 PM Filename SDF(034).cpt
GPS
Maximum Depth 60.20 ft



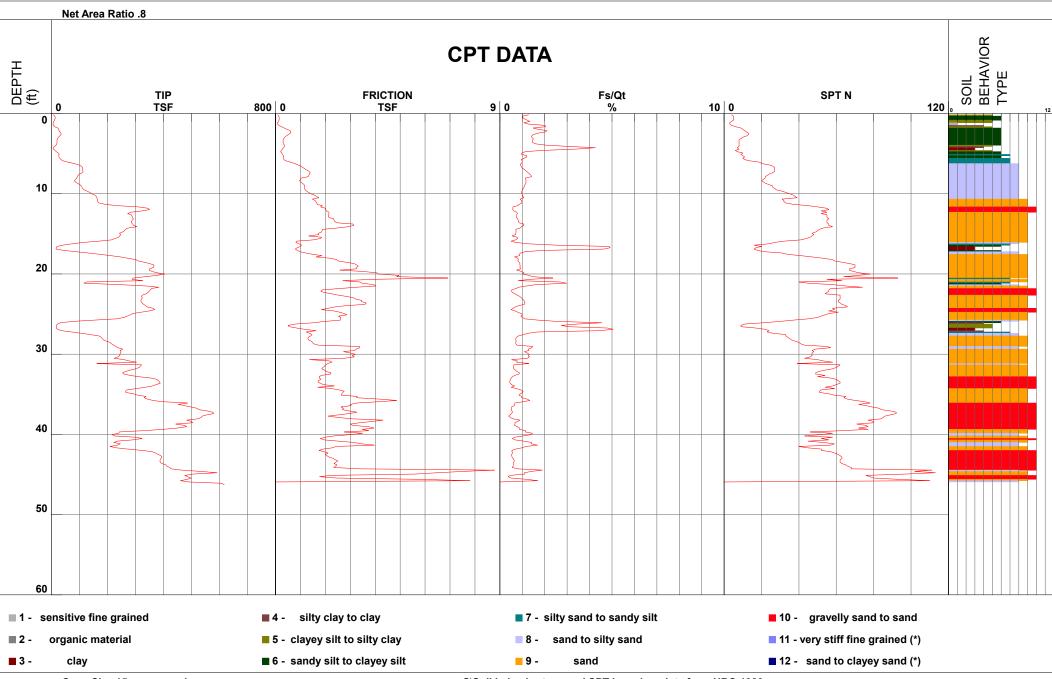


Project Oxnard Un Job Number Hole Number EST GW Depth During Test

Oxnard Union High School No.8 301953-001 CPT-07 Operator Cone Number Date and Time 15.00 ft RC AS DDG1448 7/16/2018 1:22:10 PM Filename SDF(032).cpt

GPS

Maximum Depth 46.26 ft



#### **APPENDIX B**

**Laboratory Test Results** 

# ASTM D 2937-17 (modified for ring liners) August 20, 2018

| BORING<br>NO. | DEPTH<br>feet | MOISTURE CONTENT, % | WET<br>DENSITY, pcf | DRY<br>DENSITY, pcf |
|---------------|---------------|---------------------|---------------------|---------------------|
| 1             | 6.0 - 6.5     | 3.5                 | 101.4               | 98.0                |
| 1             | 11.0 - 11.5   | 3.1                 | 112.0               | 108.6               |
| 1             | 16.0 - 16.5   | 3.5                 | 119.1               | 115.0               |
| 2             | 6.0 - 6.5     | 7.3                 | 106.7               | 99.5                |
| 2             | 11.0 - 11.5   | 4.9                 | 116.0               | 110.6               |
| 2             | 16.0 - 16.5   | 3.9                 | 110.3               | 106.2               |
| 3             | 3.0 - 3.5     | 7.3                 | 108.9               | 101.5               |
| 3             | 6.0 - 6.5     | 7.8                 | 104.6               | 97.0                |
| 4             | 3.0 - 3.5     | 11.9                | 110.5               | 98.8                |
| 4             | 6.0 - 6.5     | 5.8                 | 99.5                | 94.1                |
| 5             | 3.0 - 3.5     | 17.0                | 111.6               | 95.4                |
| 5             | 6.0 - 6.5     | 10.0                | 105.5               | 96.0                |
| 6             | 3.0 - 3.5     | 9.3                 | 107.0               | 97.9                |
| 6             | 6.0 - 6.5     | 30.5                | 116.5               | 89.3                |
| 7             | 6.0 - 6.5     | 5.4                 | 95.8                | 90.9                |
| 7             | 11.0 - 11.5   | 4.2                 | 110.2               | 105.8               |
| 8             | 6.0 - 6.5     | 5.9                 | 101.4               | 95.8                |
| 8             | 11.0 - 11.5   | 7.4                 | 108.7               | 101.2               |
| 9             | 6.0 - 6.5     | 16.3                | 111.9               | 96.2                |
| 9             | 11.0 - 11.5   | 3.6                 | 102.5               | 98.9                |
| 9             | 16.0 - 16.5   | 3.9                 | 120.7               | 116.1               |
| 10            | 6.0 - 6.5     | 31.2                | 114.1               | 87.0                |
| 10            | 11.0 - 11.5   | 3.5                 | 109.4               | 105.7               |
| 11            | 3.0 - 3.5     | 11.9                | 109.2               | 97.6                |
| 11            | 6.0 - 6.5     | 6.6                 | 108.7               | 101.9               |
| 12            | 3.0 - 3.5     | 17.7                | 110.7               | 94.0                |
| 12            | 6.0 - 6.5     | 4.2                 | 102.5               | 98.4                |
| 13            | 6.0 - 6.5     | 3.9                 | 101.1               | 97.3                |
| 13            | 11.0 - 11.5   | 4.5                 | 111.1               | 106.4               |
| 14            | 6.0 - 6.5     | 3.7                 | 103.8               | 100.1               |
| 14            | 11.0 - 11.5   | 15.7                | 103.6               | 89.6                |
| 14            | 16.0 - 16.5   | 9.4                 | 115.0               | 105.1               |
| 15            | 6.0 - 6.5     | 6.3                 | 116.3               | 109.4               |
| 15            | 11.0 - 11.5   | 6.2                 | 104.5               | 98.4                |
| 16            | 6.0 - 6.5     | 5.5                 | 97.6                | 92.5                |
| 16            | 11.0 - 11.5   | 4.4                 | 103.0               | 98.6                |

# ASTM D 2937-17 (modified for ring liners) August 20, 2018

| BORING<br>NO. | DEPTH<br>feet | MOISTURE<br>CONTENT, % | WET                       | DRY                   |
|---------------|---------------|------------------------|---------------------------|-----------------------|
| 16            | 16.0 - 16.5   | 4.7                    | <b>DENSITY, pcf</b> 117.9 | DENSITY, pcf<br>112.6 |
| 17            | 6.0 - 6.5     | 7.6                    | 111.2                     | 103.3                 |
| 17            | 11.0 - 11.5   | 3.4                    | 108.2                     | 104.7                 |
| 18            | 6.0 - 6.5     | 36.1                   | 109.6                     | 80.5                  |
| 18            | 11.0 - 11.5   | 3.2                    | 121.3                     | 117.5                 |
| 19            | 6.0 - 6.5     | 25.6                   | 117.3                     | 93.4                  |
| 19            | 11.0 - 11.5   | 2.8                    | 106.4                     | 103.5                 |
| 20            | 6.0 - 6.5     | 26.2                   | 114.6                     | 90.8                  |
| 20            | 11.0 - 11.5   | 4.3                    | 114.4                     | 109.7                 |
| 20            | 16.0 - 16.5   | 3.9                    | 113.1                     | 108.8                 |
| 21            | 6.0 - 6.5     | 9.2                    | 109.0                     | 99.8                  |
| 21            | 11.0 - 11.5   | 4.8                    | 116.5                     | 111.2                 |
| 22            | 6.0 - 6.5     | 16.5                   | 110.9                     | 95.1                  |
| 22            | 11.0 - 11.5   | 8.6                    | 113.5                     | 104.5                 |
| 22            | 16.0 - 16.5   | 36.5                   | 113.9                     | 83.5                  |
| 23            | 6.0 - 6.5     | 23.4                   | 102.6                     | 83.1                  |
| 23            | 11.0 - 11.5   | 35.2                   | 116.1                     | 85.9                  |
| 24            | 6.0 - 6.5     | 5.5                    | 96.2                      | 91.2                  |
| 24            | 11.0 - 11.5   | 4.4                    | 105.4                     | 101.0                 |
| 24            | 16.0 - 16.5   | 2.4                    | 105.5                     | 103.0                 |
| 25            | 6.0 - 6.5     | 18.9                   | 104.1                     | 87.5                  |
| 25            | 11.0 - 11.5   | 5.8                    | 109.6                     | 103.6                 |
| 26            | 3.0 - 3.5     | 21.8                   | 113.5                     | 93.1                  |
| 26            | 6.0 - 6.5     | 3.7                    | 102.2                     | 98.6                  |
| 27            | 6.0 - 6.5     | 8.2                    | 110.2                     | 101.9                 |
| 27            | 11.0 - 11.5   | 5.8                    | 118.5                     | 112.0                 |
| 27            | 16.0 - 16.5   | 4.0                    | 102.7                     | 98.7                  |
| 28            | 6.0 - 6.5     | 7.9                    | 105.8                     | 98.0                  |
| 28            | 11.0 - 11.5   | 6.6                    | 115.1                     | 108.0                 |
| 29            | 6.0 - 6.5     | 8.1                    | 104.8                     | 96.9                  |
| 29            | 11.0 - 11.5   | 3.9                    | 111.6                     | 107.4                 |
| 30            | 6.0 - 6.5     | 5.2                    | 100.4                     | 95.4                  |
| 30            | 11.0 - 11.5   | 5.8                    | 112.0                     | 105.9                 |
| 31            | 6.0 - 6.5     | 2.5                    | 128.6                     | 125.5                 |
| 31            | 11.0 - 11.5   | 4.1                    | 107.5                     | 103.2                 |
| 32            | 6.0 - 6.5     | 4.0                    | 93.8                      | 90.3                  |

# ASTM D 2937-17 (modified for ring liners) August 20, 2018

| BORING | DEPTH       | MOISTURE   | WET          | DRY          |
|--------|-------------|------------|--------------|--------------|
| NO.    | feet        | CONTENT, % | DENSITY, pcf | DENSITY, pcf |
| 32     | 11.0 - 11.5 | 3.2        | 101.0        | 97.8         |
| 33     | 6.0 - 6.5   | 4.6        | 115.3        | 110.3        |
| 33     | 11.0 - 11.5 | 2.6        | 98.6         | 96.1         |
| 34     | 6.0 - 6.5   | 6.5        | 121.0        | 113.6        |
| 34     | 11.0 - 11.5 | 24.6       | 108.3        | 86.9         |
| 34     | 15.5 - 16.0 | 7.0        | 101.9        | 95.2         |
| 35     | 6.0 - 6.5   | 2.8        | 105.3        | 102.4        |
| 35     | 11.0 - 11.5 | 2.9        | 112.6        | 109.4        |
| 35     | 16.0 - 16.5 | 4.0        | 108.4        | 104.2        |
| 36     | 6.0 - 6.5   | 9.4        | 101.2        | 92.6         |
| 36     | 11.0 - 11.5 | 5.2        | 120.0        | 114.0        |
| 37     | 6.0 - 6.5   | 10.6       | 103.9        | 93.9         |
| 37     | 11.0 - 11.5 | 6.6        | 118.6        | 111.2        |
| 38     | 6.0 - 6.5   | 10.9       | 113.0        | 101.9        |
| 38     | 11.0 - 11.5 | 6.2        | 112.7        | 106.1        |
| 39     | 6.0 - 6.5   | 15.1       | 119.1        | 103.5        |
| 39     | 11.0 - 11.5 | 4.6        | 126.8        | 121.2        |
| 40     | 6.0 - 6.5   | 6.7        | 105.6        | 99.0         |
| 40     | 11.0 - 11.5 | 3.6        | 110.7        | 106.9        |
| 41     | 6.0 - 6.5   | 3.0        | 103.2        | 100.2        |
| 41     | 11.0 - 11.5 | 3.5        | 106.5        | 102.8        |
| 41     | 16.0 - 16.5 | 16.3       | 110.6        | 95.1         |
| 42     | 6.0 - 6.5   | 8.6        | 106.5        | 98.0         |
| 42     | 11.0 - 11.5 | 5.8        | 108.9        | 102.9        |
| 43     | 6.0 - 6.5   | 6.9        | 103.2        | 96.5         |
| 43     | 11.0 - 11.5 | 4.6        | 110.3        | 105.5        |
| 43     | 16.0 - 16.5 | 4.0        | 119.0        | 114.4        |
| 44     | 3.0 - 3.5   | 15.8       | 121.1        | 104.6        |
| 44     | 6.0 - 6.5   | 2.4        | 101.9        | 99.6         |
| 45     | 6.0 - 6.5   | 8.3        | 107.3        | 99.1         |
| 45     | 11.0 - 11.5 | 5.1        | 124.1        | 118.1        |
| 45     | 16.0 - 16.5 | 4.5        | 126.9        | 121.4        |
| 46     | 6.0 - 6.5   | 11.4       | 113.3        | 101.6        |
| 46     | 11.0 - 11.5 | 18.1       | 122.1        | 103.3        |
| 47     | 6.0 - 6.5   | 9.4        | 112.7        | 103.0        |
| 47     | 11.0 - 11.5 | 6.3        | 113.7        | 107.0        |
|        |             |            |              |              |

# ASTM D 2937-17 (modified for ring liners) August 20, 2018

| BORING<br>NO. | DEPTH<br>feet | MOISTURE CONTENT, % | WETDENSITY, pcf | DRY<br>DENSITY, pcf |
|---------------|---------------|---------------------|-----------------|---------------------|
| 48            | 6.0 - 6.5     | 8.6                 | 109.3           | 100.7               |
| 48            | 11.0 - 11.5   | 6.0                 | 116.7           | 110.1               |
| 49            | 6.0 - 6.5     | 15.5                | 113.4           | 98.1                |
| 50            | 6.0 - 6.5     | 8.0                 | 106.8           | 98.9                |
| 50            | 11.0 - 11.5   | 11.7                | 129.7           | 116.1               |
| 50            | 16.0 - 16.5   | 5.5                 | 115.5           | 109.5               |
| 51            | 6.0 - 6.5     | 12.4                | 137.5           | 122.4               |
| 51            | 11.0 - 11.5   | 7.9                 | 102.4           | 94.9                |
| 51            | 16.0 - 16.5   | 5.0                 | 114.9           | 109.5               |
| 52            | 6.0 - 6.5     | 19.4                | 130.1           | 108.9               |
| 52            | 11.0 - 11.5   | 2.8                 | 110.6           | 107.6               |
| 53            | 3.0 - 3.5     | 25.1                | 117.9           | 94.2                |
| 53            | 6.0 - 6.5     | 9.7                 | 97.5            | 88.9                |

# **EXPANSION INDEX TEST RESULTS**

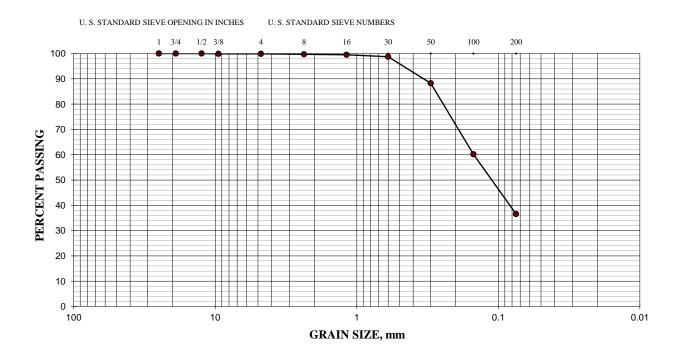
ASTM D 4829-11

| BORING | DEPTH     | EXPANSION |
|--------|-----------|-----------|
| NO.    | feet      | INDEX     |
| 45     | 0.0 - 5.0 | 5         |

ASTM D 422-63/07; D 1140-17

Boring #5 @ 2.0 - 5.0' Silty Sand (SM)

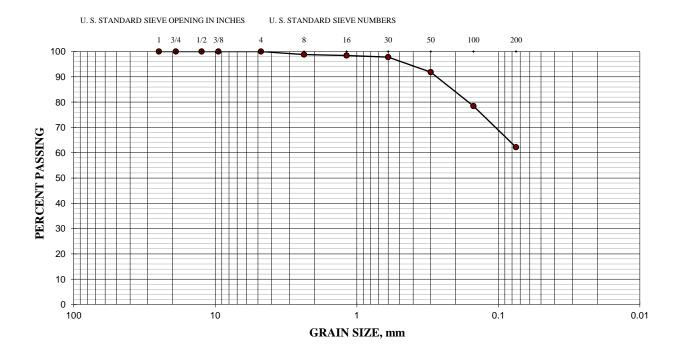
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 0          | 100       |
| #16 (1.18-mm)  | 0          | 100       |
| #30 (600-μm)   | 1          | 99        |
| #50 (300-μm)   | 12         | 88        |
| #100 (150-μm)  | 40         | 60        |
| #200 (75-μm)   | 63         | 37        |



ASTM D 422-63/07; D 1140-17

Boring #6 @ 4.0 - 7.0' Sandy Silt (ML)

| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 1          | 99        |
| #16 (1.18-mm)  | 2          | 98        |
| #30 (600-μm)   | 2          | 98        |
| #50 (300-μm)   | 8          | 92        |
| #100 (150-μm)  | 22         | 78        |
| #200 (75-μm)   | 38         | 62        |



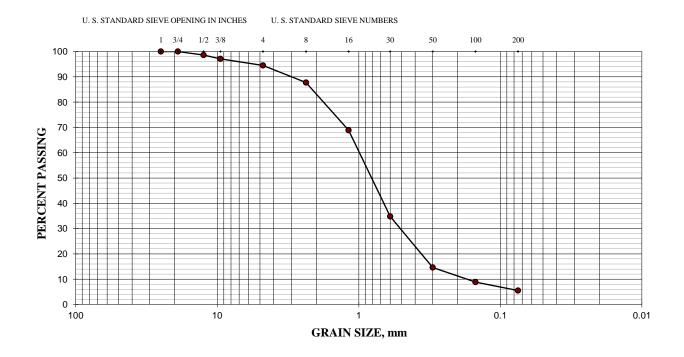
August 20, 2018

# **PARTICLE SIZE ANALYSIS**

ASTM D 422-63/07; D 1140-17

Boring #16 @ 30.0 - 31.5' Well Graded Sand (SW) Cu = 5.7; Cc = 1.5

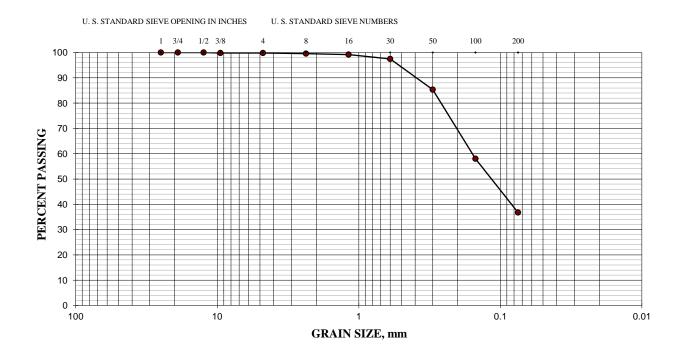
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 1          | 99        |
| 3/8" (9.5-mm)  | 3          | 97        |
| #4 (4.75-mm)   | 5          | 95        |
| #8 (2.36-mm)   | 12         | 88        |
| #16 (1.18-mm)  | 31         | 69        |
| #30 (600-μm)   | 65         | 35        |
| #50 (300-μm)   | 85         | 15        |
| #100 (150-μm)  | 91         | 9         |
| #200 (75-μm)   | 95         | 5         |



ASTM D 422-63/07; D 1140-17

Boring #20 @ 4.0 - 7.0' Silty Sand (SM)

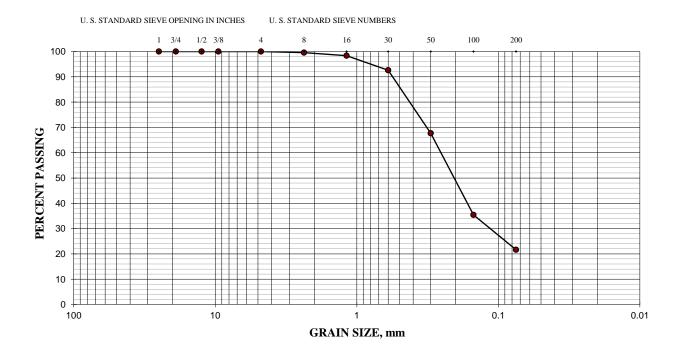
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 0          | 100       |
| #16 (1.18-mm)  | 1          | 99        |
| #30 (600-μm)   | 3          | 97        |
| #50 (300-μm)   | 15         | 85        |
| #100 (150-μm)  | 42         | 58        |
| #200 (75-μm)   | 63         | 37        |



ASTM D 422-63/07; D 1140-17

Boring #34 @ 6.0 - 8.0' Silty Sand (SM)

| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 0          | 100       |
| #16 (1.18-mm)  | 2          | 98        |
| #30 (600-μm)   | 7          | 93        |
| #50 (300-μm)   | 32         | 68        |
| #100 (150-μm)  | 65         | 35        |
| #200 (75-μm)   | 78         | 22        |



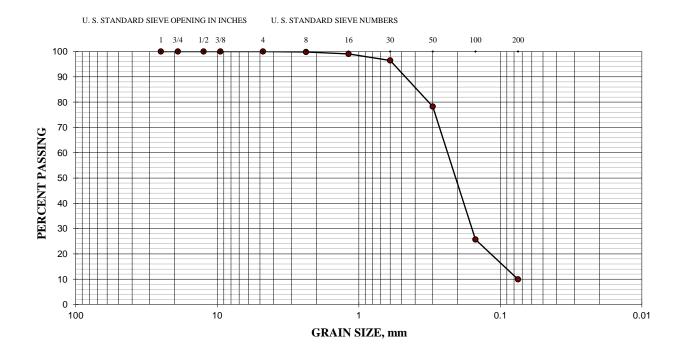
August 20, 2018

# **PARTICLE SIZE ANALYSIS**

ASTM D 422-63/07; D 1140-17

Boring #35 @ 45.0 - 46.5' Poorly Graded Sand with Silt (SP-SM) Cu = 3.1; Cc = 1.4

| Sieve size     | <b>% Retained</b> | % Passing |
|----------------|-------------------|-----------|
| 1" (25-mm)     | 0                 | 100       |
| 3/4" (19-mm)   | 0                 | 100       |
| 1/2" (12.5-mm) | 0                 | 100       |
| 3/8" (9.5-mm)  | 0                 | 100       |
| #4 (4.75-mm)   | 0                 | 100       |
| #8 (2.36-mm)   | 0                 | 100       |
| #16 (1.18-mm)  | 1                 | 99        |
| #30 (600-μm)   | 4                 | 96        |
| #50 (300-μm)   | 22                | 78        |
| #100 (150-μm)  | 74                | 26        |
| #200 (75-μm)   | 90                | 10        |



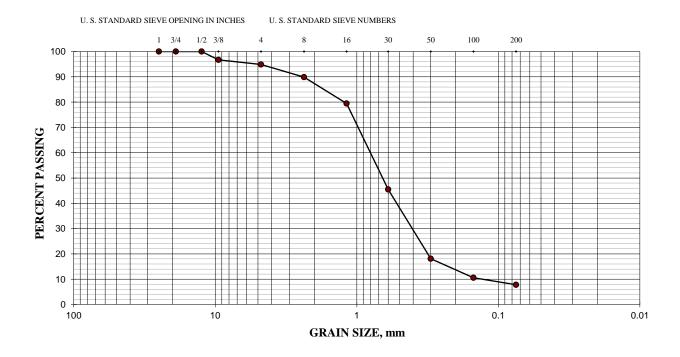
August 20, 2018

# **PARTICLE SIZE ANALYSIS**

ASTM D 422-63/07; D 1140-17

Boring #43 @ 40.0 - 41.5'
Well Graded Sand with Silt (SW-SM)
Cu = 6.2; Cc = 1.6

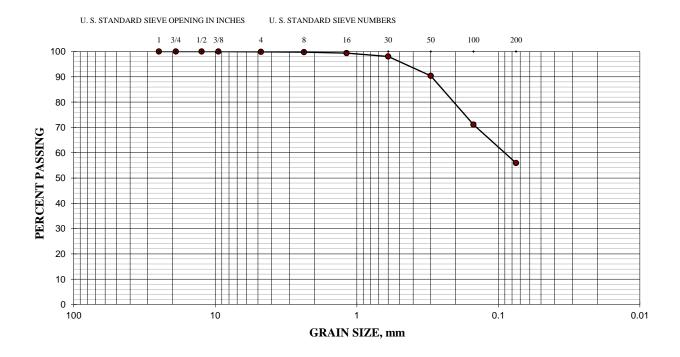
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 3          | 97        |
| #4 (4.75-mm)   | 5          | 95        |
| #8 (2.36-mm)   | 10         | 90        |
| #16 (1.18-mm)  | 21         | 79        |
| #30 (600-μm)   | 55         | 45        |
| #50 (300-μm)   | 82         | 18        |
| #100 (150-μm)  | 89         | 11        |
| #200 (75-μm)   | 92         | 8         |



ASTM D 422-63/07; D 1140-17

Boring #44 @ 0.0 - 4.0' Sandy Silt (ML)

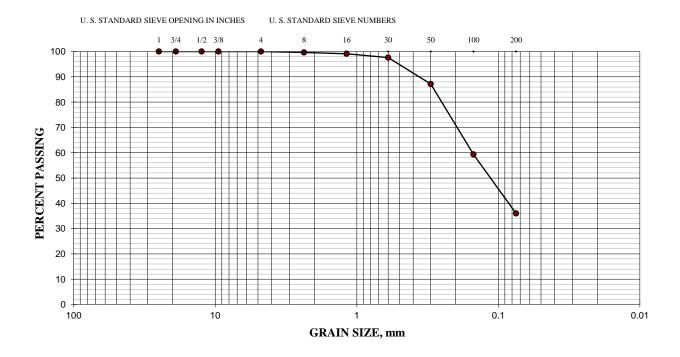
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 0          | 100       |
| #16 (1.18-mm)  | 1          | 99        |
| #30 (600-μm)   | 2          | 98        |
| #50 (300-μm)   | 10         | 90        |
| #100 (150-μm)  | 29         | 71        |
| #200 (75-μm)   | 44         | 56        |



ASTM D 422-63/07; D 1140-17

Boring #45 @ 0.0 - 5.0' Silty Sand (SM)

| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 0          | 100       |
| #16 (1.18-mm)  | 1          | 99        |
| #30 (600-μm)   | 2          | 98        |
| #50 (300-μm)   | 13         | 87        |
| #100 (150-μm)  | 41         | 59        |
| #200 (75-μm)   | 64         | 36        |



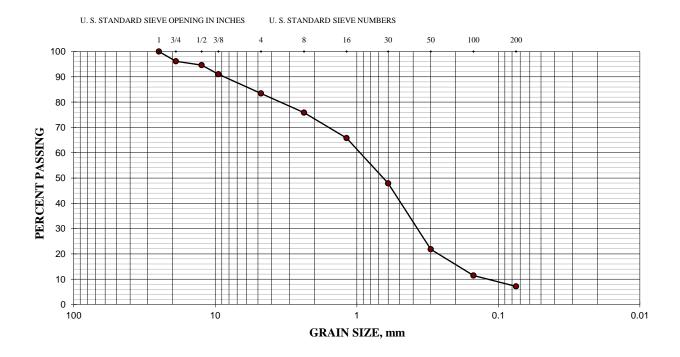
August 20, 2018

# **PARTICLE SIZE ANALYSIS**

ASTM D 422-63/07; D 1140-17

Boring #51 @ 35.0 - 36.5' Well Graded Sand with Silt and Gravel (SW-SM) Cu = 8.0; Cc = 1.2

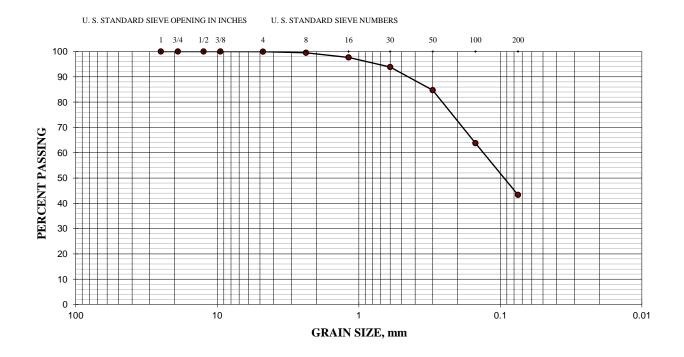
| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 4          | 96        |
| 1/2" (12.5-mm) | 5          | 95        |
| 3/8" (9.5-mm)  | 9          | 91        |
| #4 (4.75-mm)   | 17         | 83        |
| #8 (2.36-mm)   | 24         | 76        |
| #16 (1.18-mm)  | 34         | 66        |
| #30 (600-μm)   | 52         | 48        |
| #50 (300-μm)   | 78         | 22        |
| #100 (150-μm)  | 89         | 11        |
| #200 (75-μm)   | 93         | 7         |



ASTM D 422-63/07; D 1140-17

Boring #53 @ 0.0 - 4.0' Silty Sand (SM)

| Sieve size     | % Retained | % Passing |
|----------------|------------|-----------|
| 1" (25-mm)     | 0          | 100       |
| 3/4" (19-mm)   | 0          | 100       |
| 1/2" (12.5-mm) | 0          | 100       |
| 3/8" (9.5-mm)  | 0          | 100       |
| #4 (4.75-mm)   | 0          | 100       |
| #8 (2.36-mm)   | 1          | 99        |
| #16 (1.18-mm)  | 2          | 98        |
| #30 (600-μm)   | 6          | 94        |
| #50 (300-μm)   | 15         | 85        |
| #100 (150-μm)  | 36         | 64        |
| #200 (75-μm)   | 57         | 43        |



# **MOISTURE-DENSITY COMPACTION TEST**

ASTM D 1557-12 (Modified)

MAXIMUM DRY DENSITY: 119.0 pcf

**OPTIMUM MOISTURE: 9.1%** 

PROCEDURE USED: A August 20, 2018

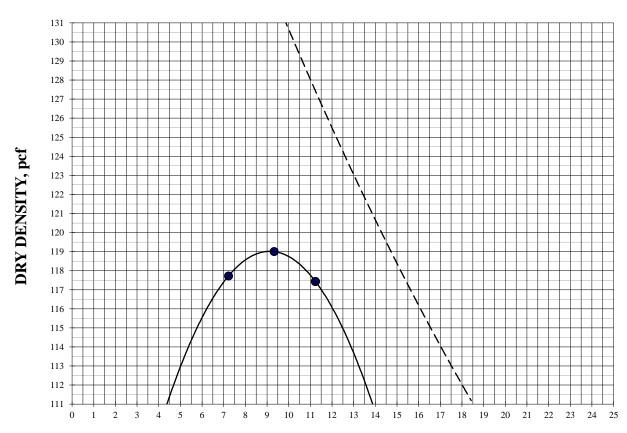
PREPARATION METHOD: Moist Boring #5 @ 2.0 - 5.0'

RAMMER TYPE: Mechanical Light Brown Silty Sand (SM)

SPECIFIC GRAVITY: 2.65 (assumed)

SIEVE DATA:

| Sieve Size | % Retained (Cumulative) |
|------------|-------------------------|
| 3/4"       | 0                       |
| 3/8"       | 0                       |
| #4         | 0                       |



# **MOISTURE CONTENT, percent**

Compaction Curve Zero Air Voids Curve

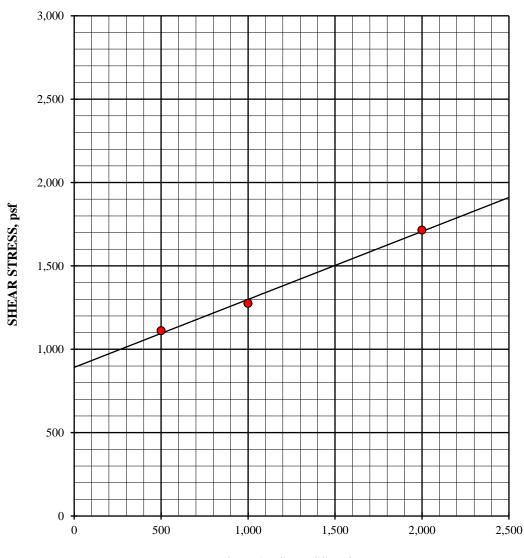
#### **DIRECT SHEAR**

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

August 20, 2018

Boring #5 @ 2.0 - 5.0' Silty Sand (SM) Compacted to 90% RC, saturated INITIAL DRY DENSITY: 107.1 pcf INITIAL MOISTURE CONTENT: 9.1 % PEAK SHEAR ANGLE (Ø): 22° COHESION (C): 892 psf

#### **SHEAR vs. NORMAL STRESS**



NORMAL STRESS, psf

#### **DIRECT SHEAR** continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

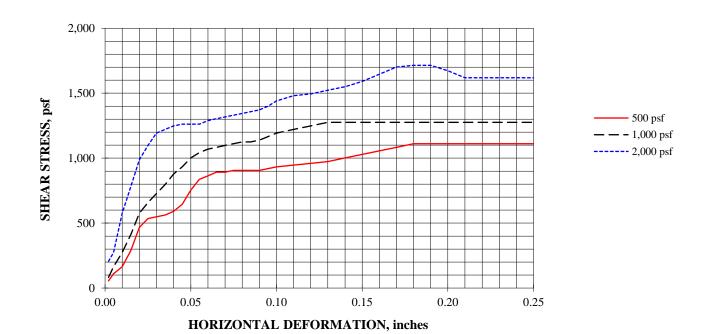
Boring #5 @ 2.0 - 5.0'

Silty Sand (SM)

Compacted to 90% RC, saturated

SPECIFIC GRAVITY: 2.65 (assumed)

| SAMPLE NO.:      | 1     | 2     | 3     | AVERAGE |  |  |  |
|------------------|-------|-------|-------|---------|--|--|--|
| INITIAL          |       |       |       |         |  |  |  |
| WATER CONTENT, % | 9.1   | 9.1   | 9.1   | 9.1     |  |  |  |
| DRY DENSITY, pcf | 107.1 | 107.1 | 107.1 | 107.1   |  |  |  |
| SATURATION, %    | 44.3  | 44.3  | 44.3  | 44.3    |  |  |  |
| VOID RATIO       | 0.544 | 0.544 | 0.544 | 0.544   |  |  |  |
| DIAMETER, inches | 2.375 | 2.375 | 2.375 |         |  |  |  |
| HEIGHT, inches   | 1.00  | 1.00  | 1.00  |         |  |  |  |
| AT TEST          |       |       |       |         |  |  |  |
| WATER CONTENT, % | 19.8  | 19.5  | 17.4  |         |  |  |  |
| DRY DENSITY, pcf | 108.5 | 109.2 | 113.1 |         |  |  |  |
| SATURATION, %    | 100.0 | 100.0 | 100.0 |         |  |  |  |
| VOID RATIO       | 0.524 | 0.514 | 0.462 |         |  |  |  |
| HEIGHT, inches   | 0.99  | 0.98  | 0.95  |         |  |  |  |



# **MOISTURE-DENSITY COMPACTION TEST**

ASTM D 1557-12 (Modified)

**OPTIMUM MOISTURE: 10.1%** 

PROCEDURE USED: A August 20, 2018

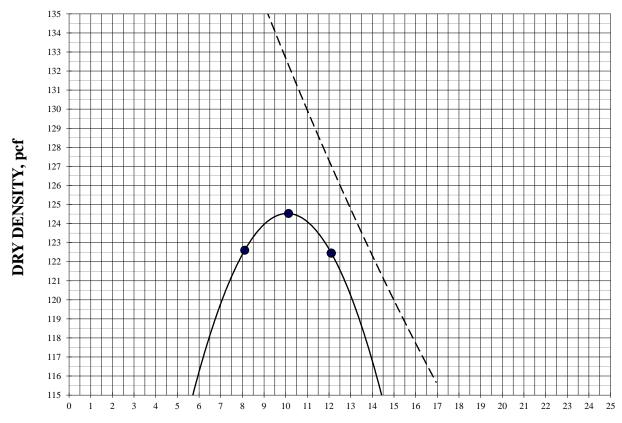
PREPARATION METHOD: Moist Boring #44 @ 4.0 - 5.0'

RAMMER TYPE: Mechanical Light Brown Sandy Silt (ML)

SPECIFIC GRAVITY: 2.70 (assumed)

SIEVE DATA: MAXIMUM DRY DENSITY: 124.5 pcf

| Sieve Size | % Retained (Cumulative) |
|------------|-------------------------|
| 3/4"       | 0                       |
| 3/8"       | 0                       |
| #4         | 0                       |



# **MOISTURE CONTENT, percent**

Compaction Curve Zero Air Voids Curve

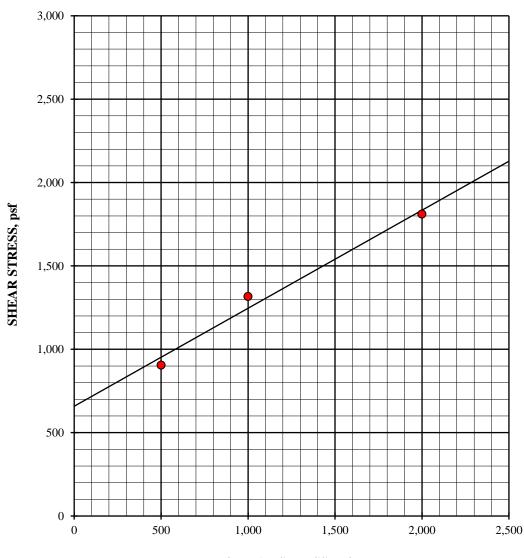
#### **DIRECT SHEAR**

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

August 20, 2018

Boring #44 @ 4.0 - 5.0' Sandy Silt (ML) Compacted to 90% RC, saturated INITIAL DRY DENSITY: 112.1 pcf INITIAL MOISTURE CONTENT: 10.1 % PEAK SHEAR ANGLE (Ø): 30° COHESION (C): 658 psf

#### **SHEAR vs. NORMAL STRESS**



NORMAL STRESS, psf

#### **DIRECT SHEAR** continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #44 @ 4.0 - 5.0'

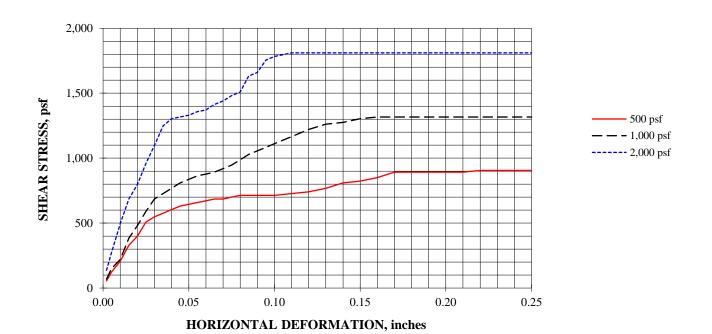
Sandy Silt (ML)

Compacted to 90% RC, saturated

August 20, 2018

SPECIFIC GRAVITY: 2.70 (assumed)

| SAMPLE NO.:      | 1     | 2     | 3     | AVERAGE |  |  |  |
|------------------|-------|-------|-------|---------|--|--|--|
| INITIAL          |       |       |       |         |  |  |  |
| WATER CONTENT, % | 10.1  | 10.1  | 10.1  | 10.1    |  |  |  |
| DRY DENSITY, pcf | 112.1 | 112.1 | 112.1 | 112.1   |  |  |  |
| SATURATION, %    | 54.2  | 54.2  | 54.2  | 54.2    |  |  |  |
| VOID RATIO       | 0.503 | 0.503 | 0.503 | 0.503   |  |  |  |
| DIAMETER, inches | 2.375 | 2.375 | 2.375 |         |  |  |  |
| HEIGHT, inches   | 1.00  | 1.00  | 1.00  |         |  |  |  |
| AT TEST          |       |       |       |         |  |  |  |
| WATER CONTENT, % | 21.4  | 22.0  | 22.4  |         |  |  |  |
| DRY DENSITY, pcf | 113.0 | 115.2 | 115.7 |         |  |  |  |
| SATURATION, %    | 100.0 | 100.0 | 100.0 |         |  |  |  |
| /OID RATIO       | 0.491 | 0.463 | 0.457 |         |  |  |  |
| HEIGHT, inches   | 0.99  | 0.97  | 0.97  |         |  |  |  |



#### RESISTANCE 'R' VALUE AND EXPANSION PRESSURE

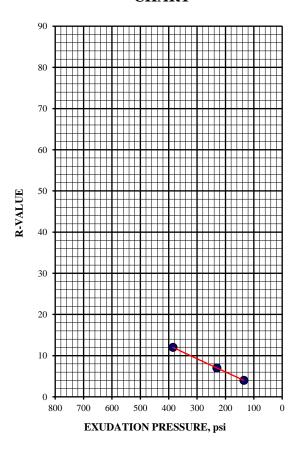
ASTM D 2844/D2844M-13

August 20, 2018

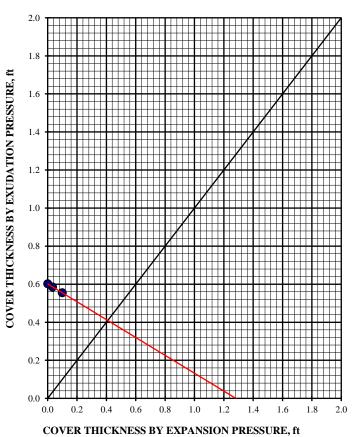
Boring #6 @ 4.0 - 7.0' Brown to Light Brown Sandy Silt (ML) Specified Traffic Index: 5.0 Dry Density @ 300 psi Exudation Pressure: 111.7-pcf %Moisture @ 300 psi Exudation Pressure: 20.7% R-Value - Exudation Pressure: 9 R-Value - Expansion Pressure: 35

R-Value @ Equilibrium: 9

#### EXUDATION PRESSURE CHART



#### **EXPANSION PRESSURE CHART**



#### RESISTANCE 'R' VALUE AND EXPANSION PRESSURE

ASTM D 2844/D2844M-13

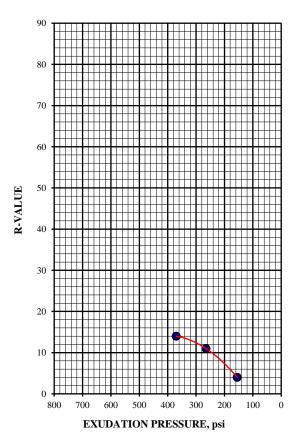
August 20, 2018

Boring #53 @ 0.0 - 3.0' Light Brown Silty Sand (SM) Specified Traffic Index: 5.0 Dry Density @ 300 psi Exudation Pressure: 107.6-pcf %Moisture @ 300 psi Exudation Pressure: 20.2% R-Value - Exudation Pressure: 12

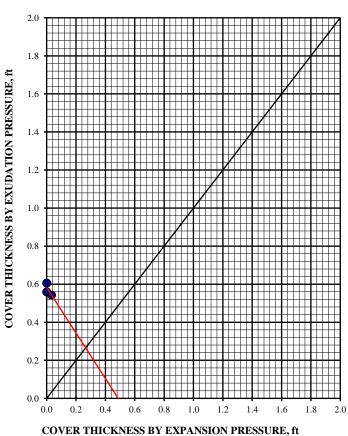
R-Value - Expansion Pressure: 58

R-Value @ Equilibrium: 12

# EXUDATION PRESSURE CHART



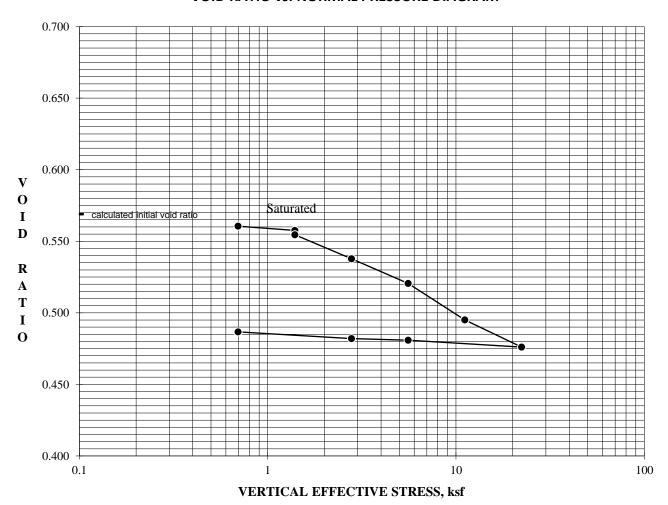
#### **EXPANSION PRESSURE CHART**



ASTM D 2435/D2435M-11

August 20, 2018

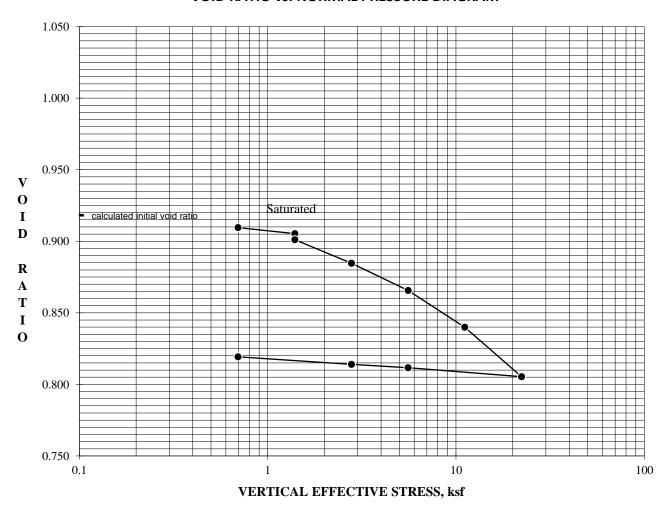
Boring #10 @ 11.0 - 11.5' Well-Graded Sand (SW) Ring Sample DRY DENSITY: 105.5 pcf MOISTURE CONTENT: 3.5% SPECIFIC GRAVITY: 2.65 (assumed) INITIAL VOID RATIO: 0.569



ASTM D 2435/D2435M-11

August 20, 2018

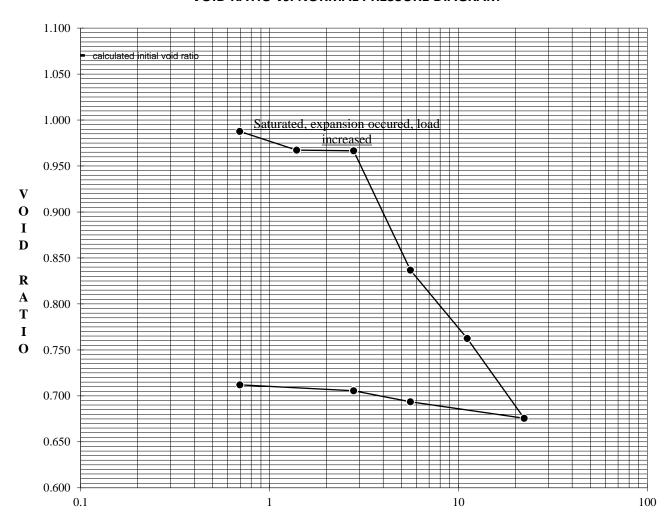
Boring #14 @ 11.0 - 11.5' Well-Graded Sand (SW) Ring Sample DRY DENSITY: 86.3 pcf MOISTURE CONTENT: 15.7% SPECIFIC GRAVITY: 2.65 (assumed) INITIAL VOID RATIO: 0.918



#### ASTM D 2435/D2435M-11

August 20, 2018

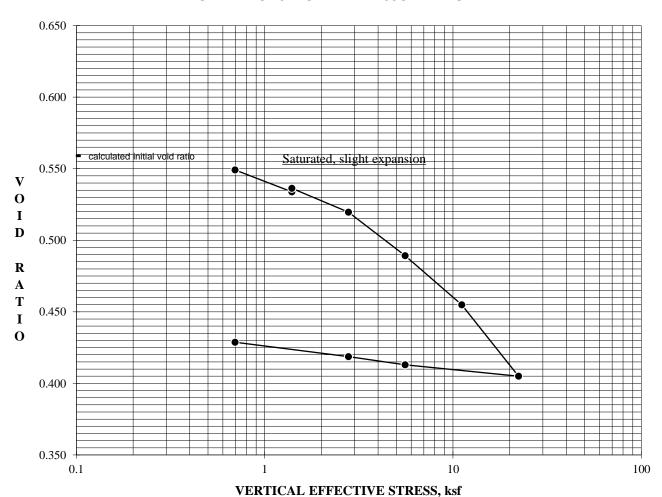
Boring #18 @ 6.0 - 6.5' Sandy Silt (ML) Ring Sample DRY DENSITY: 81.4 pcf MOISTURE CONTENT: 36.1% SPECIFIC GRAVITY: 2.70 (assumed) INITIAL VOID RATIO: 1.070



#### ASTM D 2435/D2435M-11

August 20, 2018

Boring #52 @ 6.0 - 6.5' Sandy Silt (ML) Ring Sample DRY DENSITY: 108.1 pcf MOISTURE CONTENT: 19.4% SPECIFIC GRAVITY: 2.70 (assumed) INITIAL VOID RATIO: 0.559



#### **APPENDIX C**

Corrosion Evaluation Report prepared by CERCO Analytical

23 August, 2018

Job No. 1808074 Cust. No. 12651



1100 Willow Pass Court, Suite A Concord, CA 94520-1006 925 **462 2771** Fax. 925 **462 2775** www.cercoanalytical.com

Mr. Doug Dunham, PE Earth Systems Pacific 2049 Preisker Lane, Suite E Santa Maria, CA 93454

Subject:

Project No.: 301953-002

Project Name: Oxnard High School No.8, Oxnard, CA

Corrosivity Analysis - CalTrans Test Methods

Dear Mr. Dunham:

Pursuant to your request, CERCO Analytical has analyzed the soil samples submitted on August 08, 2018. Based on the analytical results, a brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements, all samples are classified as "corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations ranged 23 to 47 mg/kg, and are determined to be insufficient to attack steel embedded in a concrete mortar coating.

The sulfate ion concentrations ranged from 340 to 1,500 mg/kg and are determined to be sufficient to damage reinforced concrete structures and cement mortar-coated steel at these locations. Therefore, concrete that comes into contact with this soil should use sulfate resistant cement such as Type II, in accordance with the California Building Code requirements with a maximum water-to-cement ratio of 0.50.

The pH of the soils ranged from 7.73 to 7.99, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants*, *Inc.* at (925) 927-6630.

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,

CERCO ANALYTICAL, INC.

J. Qarby Howard, Jr., P.E

President

JDH/jdl Enclosure Client:

Earth Systems Pacific

Client's Project No.:

301953-002

Client's Project Name:

Oxnard High School No.8, Oxnard, CA

Date Sampled:

07/20 - 26/18

Date Received:

8-Aug-18

Matrix:

Soil

Authorization:

Letter dated July 19, 2018



1100 Willow Pass Court, Suite A Concord, CA 94520-1006

925 462 2771 Fax. 925 462 2775

www.cercoanalytical.com

Date of Report:

23-Aug-2018

| Job/Sample No.  | Sample I.D. | Moisture (%)          | pН          | Min.Resistivity (ohms-cm)** | Sulfide (mg/kg)* | Chloride (mg/kg)*     | Sulfate (mg/kg)*      |
|-----------------|-------------|-----------------------|-------------|-----------------------------|------------------|-----------------------|-----------------------|
| 1808074-001     | B-6 @ 4-7'  | -                     | 7.81        | 740                         |                  | 47                    | 450                   |
| 1808074-002     | B-20 @ 4-7' |                       | 7.73        | 800                         |                  | 42                    | 610                   |
| 1808074-003     | B-34 @ 6-8' |                       | 7.99        | 1,500                       |                  | 23                    | 340                   |
| 1808074-004     | B-45 @ 0-5' |                       | 7.83        | 1,000                       |                  | 36                    | 1,500                 |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
|                 |             |                       |             |                             |                  |                       |                       |
| ethod:          |             | CT 226 <sup>(a)</sup> | CT 643 (b)  | CT 643 (b)                  |                  | CT 422 <sup>(c)</sup> | CT 417 <sup>(c)</sup> |
| eporting Limit: |             |                       | -           | -                           | 50               | 15                    | 15                    |
| ate Analyzed:   |             | -                     | 17-Aug-2018 | 22-Aug-2018                 | -                | 17-Aug-2018           | 17-Aug-2018           |

Cheryl McMillen

Laboratory Director

\* Results Reported on an "As Received" Basis

(a) Rev. July 2010

(b) Rev. June 2007

17-Aug-2018
(c) Rev. November 2006

# APPENDIX D Liquefaction and Seismically Induced Settlement of Dry Sand Analyses



# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L., Stringer, GE, Earth Systems Southwest

|                |                  |                     |                   |              |                    |                |              |              |                |                  |              |                   | Total<br>Liquefied |            |              |                      |                |  |              |                        |                        |                |                      |                           |                      |
|----------------|------------------|---------------------|-------------------|--------------|--------------------|----------------|--------------|--------------|----------------|------------------|--------------|-------------------|--------------------|------------|--------------|----------------------|----------------|--|--------------|------------------------|------------------------|----------------|----------------------|---------------------------|----------------------|
|                |                  |                     | 8/14/20           |              | Plot:              |                |              |              |                | Dry San          |              |                   |                    |            |              |                      |                |  |              |                        |                        |                |                      |                           | Thickness            |
| EARTH          | HQUAKE           | INFORM              | ATION:            | 7.5          | Plot:              | 1              |              |              |                | (M=7.5):         |              |                   |                    | o'o)*rd    | /MSF         | 0.5                  | 000            | *** 10                                 |              |                        |                        |                |                      |                           | (feet)<br>1.6        |
|                | IVIE             | gnitude:<br>PGA, g: | 6.77<br>0.97      | 7.5<br>0.75  |                    |                |              | Ci           | ean Sa         | ind Qc1n         | = Cq.        | K <sub>C</sub> "i | √HÓC               |            | Us           |                      |                | <sub>5</sub> *Kσ/C:<br>& Seed          |              | Ishihara               | a &Yosh                | mine (1):      | 0                    | Probab                    | Total<br>Induced     |
| -              | GV               | MSF:<br>VT, feet:   | 1.30              |              | -                  |                | •            |              |                | 110<br>110       | · ·          |                   |                    |            |              |                      |                |  | 1,50<br>0.50 | 2%<br>Max              | Subsidence<br>(inches) |                |                      |                           |                      |
| 1              | Design GV        | VT, feet:           | 8.0               | Total        | Eff.Stress         |                |              | 100          |                | ble soils:       |              | ш                 |                    |            | ting Ic      | for K <sub>H</sub> : | 2.0            | A                                      |              | 17.5                   |                        | Layers:        | 0.02                 | 100%                      | 0.2                  |
| Layer<br>Depth | •                | Fs                  | Friction<br>Ratio |              | at Midpt,          | S              |              |              |                | Corrected        | d            | erid              | Liquef.<br>Suscept | Dens       |              | Н                    |                | Clean<br>Sand                          |              |                        | EQ                     | M=7,5          | Liquefac.<br>Safety  | Probab.                   | Volumetric<br>Strain |
| (feet)<br>0.16 | (tsf)<br>82.43   | (tsf)               | 1.22              | (pcf)<br>110 | p'o (tsf)<br>0.009 | rd<br>1.000    | 1,22         | n<br>0.57    | C <sub>Q</sub> | Qc1n<br>132.43   | 1.88         | 6                 | (0 or 1)           | Dr (%)     | 1.17         | (m)<br>0.05          | К <sub>н</sub> | Qc1n                                   | Kσ           | CRR <sub>7</sub> 0 424 | 0.424                  | CSR<br>0.485   | Factor<br>Non-Lig.   | P <sub>L</sub><br>Non-Liq | 0.00                 |
| 0.33<br>0.49   | 77,94<br>66,43   | 1.37<br>1.48        | 1.76<br>2.23      | 110<br>110   | 0.018              | 1,000          | 1.76<br>2.23 | 0,61<br>0,65 | 1.70<br>1.70   | 125.21<br>106.70 | 2.01         |                   | 1                  | 86<br>80   | 1.31<br>1.51 |                      | 1.00           | 164.0<br>161.4                         | 1.00         | Infin.                 | 0.000                  | 0.485<br>0.485 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                 |
| 0.66<br>0.82   | 56.46<br>50.54   | 1.33                | 2.35              | 110<br>110   | 0.036<br>0.045     | 1.000          | 2.35         | 0,67<br>0,67 | 1.70<br>1.70   | 90.66<br>81.14   | 2.20         |                   | 1                  | 73<br>68   | 1.65<br>1.72 |                      | 1.00           |  | 1,00         | 0.394                  | 0,394                  | 0.485<br>0.485 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00         |
| 0,98<br>1,15   | 45,66<br>40.24   | 1.04<br>0.94        | 2,28<br>2,33      | 110<br>110   | 0,054              | 1,000<br>0,999 | 2,28<br>2,33 | 0,68<br>0,70 | 1.70<br>1.70   | 73.28<br>64.56   | 2.25         |                   | 1                  | 64<br>59   | 1,80<br>1,94 |                      | 1.00           | 132.1                                  | 1,00         | 0.294                  | 0.294<br>0.263         | 0.485<br>0.484 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
| 1,31<br>1,48   | 40,24<br>34,62   | 0.94                | 2,33              | 110<br>110   | 0,072              | 0,999          | 2.33         | 0,70<br>0,71 | 1.70           | 64 54<br>55 50   | 2.30         |                   | 1                  | 59<br>52   | 1 94         |                      | 1.00           | 125.2                                  | 1.00         | 0.263<br>0.229         | 0.263                  | 0 484<br>0 484 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 1.64           | 31.09<br>30.58   | 0.64                | 2,05              | 110<br>110   | 0,090              | 0,998          | 2.06         | 0.71         | 1.70           | 49.81<br>48.98   | 2,34         |                   | 1                  | 48<br>47   | 2.10         |                      | 1.00           |  | 1.00         | 0.186                  | 0.186                  | 0.484<br>0.484 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 1,97           | 32.03<br>31.02   | 0.75                | 2,33              | 110<br>110   | 0,108              | 0,998          | 2 34         | 0,72         | 1,70           | 51 29            | 2,37         |                   | 1                  | 49         | 2.20         |                      | 1,00           | 112.8                                  | 1.00         | 0.213                  | 0,213                  | 0.484          | Non-Liq.             | Non-Liq                   | 0.00                 |
| 2.13           | 29.95            | 0.70                | 2.34              | 110          | 0,117<br>0,126     | 0.997          | 2.41         | 0.73         | 1.70           | 49 65<br>47 92   | 2.39         |                   | 1                  | 48<br>46   | 2 27         |                      | 1.00           | 109.8                                  | 1.00         | 0.214                  | 0,214                  | 0.483<br>0.483 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 2,46           | 29.19<br>29.17   | 0.66                | 2,26              | 110<br>110   | 0.135<br>0.144     | 0,996          | 2.27         | 0.73         | 1.70           | 46 69<br>46 64   | 2.39         |                   | 1                  | 45<br>45   | 2.29         |                      | 1.00           | 106.7<br>104.4                         | 1.00         | 0.193<br>0.186         | 0.193<br>0.186         | 0 483<br>0 483 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 2.79<br>2.95   | 29.42<br>29.77   | 0.62<br>0.62        | 2.12<br>2.08      | 110<br>110   | 0.153<br>0.162     | 0.996<br>0.995 | 2.13<br>2.09 | 0.72<br>0.72 | 1.70<br>1.70   | 47.03<br>47.57   | 2,37<br>2,36 |                   | 1                  | 46<br>46   | 2.20<br>2.17 |                      | 1.00<br>1.00   |  | 1.00<br>1.00 | 0.183<br>0.182         | 0 183<br>0 182         | 0.483<br>0.482 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 3 12<br>3 28   | 29.70<br>28.88   | 0.60<br>0.57        | 2.02<br>1.96      | 110<br>110   | 0 171<br>0 180     | 0 995<br>0 994 | 2.04<br>1.98 | 0.72<br>0.72 | 1.70<br>1.70   | 47.45<br>46.11   | 2.36<br>2.36 |                   | 1                  | 46<br>45   | 2.14<br>2.15 |                      | 1.00<br>1.00   | 101.7<br>99.1                          | 1.00<br>1.00 | 0.178<br>0.170         | 0.178<br>0.170         | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
| 3.44           | 26,80<br>26.96   | 0.52<br>0.49        | 1.95<br>1.80      | 110<br>110   | 0.189<br>0.198     | 0.994<br>0.994 | 1.97<br>1.81 | 0.72<br>0.72 | 1.70<br>1.70   | 42.76<br>43.00   | 2.38<br>2.36 |                   | 1                  | 42<br>42   | 2.24<br>2.15 |                      | 1.00<br>1.00   | 95.7<br>92.3                           | 1.00<br>1.00 | 0 162<br>0 153         | 0 162<br>0 153         | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 3.77           | 29,75<br>32,57   | 0.49<br>0.49        | 1.63<br>1.50      | 110<br>110   | 0.217              | 0.993          | 1.65<br>1.51 | 0.70<br>0.68 | 1.70<br>1.70   | 47.47<br>51.99   | 2.30<br>2.24 |                   | 1                  | 46<br>50   | 1.94<br>1.78 |                      | 1.00<br>1.00   | 92 <sub>.</sub> 2<br>92 <sub>.</sub> 7 | 1.00<br>1.00 | 0.153<br>0.154         | 0.153<br>0.154         | 0.482<br>0.481 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 4.10<br>4.27   | 34,78<br>36,24   | 0.51<br>0.53        | 1.46<br>1.47      | 110<br>110   |                    | 0.993<br>0.992 | 1.47<br>1.48 | 0.67<br>0.67 | 1.70<br>1.70   | 55.52<br>57.85   | 2.21         |                   | 1                  | 52<br>54   | 1.70<br>1.67 |                      | 1.00           | 94.6<br>96.7                           | 1.00         | 0.159<br>0.164         | 0.159<br>0.164         | 0.481<br>0.481 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 4.43<br>4.59   | 38.86<br>44.03   | 0.57<br>0.63        | 1.47<br>1.44      | 110<br>110   |                    | 0.992          | 1.48<br>1.45 | 0.66<br>0.65 | 1.70<br>1.70   | 62.05<br>70.34   | 2.18<br>2.13 |                   | 1                  | 57<br>62   | 1.62<br>1.51 |                      | 1.00           |  | 1,00         | 0 174<br>0 192         | 0.174<br>0.192         | 0.481<br>0.481 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00         |
| 4.76<br>4.92   | 50.25<br>56.32   | 0.69<br>0.74        | 1.36<br>1.31      | 110<br>110   |                    | 0,991          | 1.37<br>1.31 | 0.63<br>0.61 | 1.70<br>1.70   | 80.32<br>90.06   | 2.07         |                   | 1                  | 68<br>72   | 1.41<br>1.33 |                      |                |  | 1.00         | 0.214                  | 0.214                  | 0.480<br>0.480 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00         |
| 5.09<br>5.25   | 62.37<br>67.00   | 0.74<br>0.84        | 1,19<br>1,26      | 110<br>110   |                    | 0,990          | 1.19<br>1.27 | 0.60<br>0.59 | 1.70<br>1.70   | 99.77<br>107.19  | 1,96<br>1,95 |                   | 1                  | 77<br>80   | 1,25<br>1,25 |                      | 1.19           | 148.2                                  | 1.00         | 0.383                  | 0.383                  | 0.480<br>0.480 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
| 5.41<br>5.58   | 67.37<br>67.34   | 0.89                | 1,32<br>1,35      | 110<br>110   |                    | 0.989          | 1.32<br>1.36 | 0.60         | 1.70<br>1.70   | 107.77<br>107.71 | 1.97<br>1.97 |                   | 1                  | 80<br>80   | 1.26<br>1.27 |                      |                |  | 1.00         | Infin.                 | 0,000                  | 0.480<br>0.479 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00         |
| 5.74<br>5.91   | 67.46<br>67.82   | 0.93<br>0.93        | 1.37<br>1.37      | 110<br>110   | 0.316              | 0,989<br>0.988 | 1.38<br>1.38 | 0,60         | 1.70<br>1.70   | 107.89<br>108.45 | 1.98<br>1.98 |                   | 1                  | 80<br>80   | 1,27<br>1,27 | 0.75                 | 1.19           | 162.9                                  | 1.00         | Infin.                 | 0.000                  | 0.479<br>0.479 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
| 6.07<br>6.23   | 65 23<br>63 78   | 0.93                | 1.42              | 110<br>110   | 0.334              | 0.988          | 1.43         | 0.61         | 1.70<br>1.70   | 104.28<br>101.93 | 2.00         |                   | 1                  | 79<br>78   |              | 0.85                 | 1.19           | 160.7                                  | 1.00         | Infin.<br>0.306        | 0.000                  | 0.479<br>0.479 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 6.40<br>6.56   | 65.72<br>71.05   | 0.95                | 1.45              | 110<br>110   | 0.352              | 0.987<br>0.987 | 1.45<br>1.41 | 0.61         | 1.70<br>1.70   | 105.03<br>113.58 | 2.00         |                   | 1                  | 79<br>82   | 1.30         |                      | 1.00           | 136 9                                  | 1.00         | 0.319                  | 0.319                  | 0 479<br>0 478 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
| 6.73<br>6.89   | 77.49<br>86.69   | 1.08                | 1.39              | 110<br>110   | 0.370              | 0.986          | 1.40         | 0.59         | 1.70           | 123,92<br>138,69 | 1.94         |                   | 1                  | 86<br>90   | 1.23         | 1.05                 | 1.00           | 152.7                                  | 1.00         | 0.411                  | 0.411                  | 0.478<br>0.478 | Non-Liq.             | Non-Liq.                  | 0.00                 |
| 7.05<br>7.22   | 98.48            | 1.28                | 1.30              | 110          | 0.388              | 0.986          | 1.31         | 0.56         | 1.70           | 157.61           | 1.85         |                   | 1                  | 96         | 1.14         |                      |                |  | 1.00         | Infin.                 | 0,000                  | 0.478          | Non-Liq.             | Non-Liq                   | 0.00                 |
| 7.38<br>7.55   | 114.53<br>122.82 | 1.49                | 1.23              | 110<br>110   |                    | 0.985          | 1,21         | 0.54         | 1.67           | 193.40           | 1.76         |                   | i                  | 100        |              |                      |                |  | 1.00         | Infin.                 | 0.000                  | 0.478          | Non-Liq.             | Non-Liq.                  | 0.00                 |
| 7.71           | 128.68<br>128.68 | 1.53                | 1.19              | 110<br>110   | 0.424              | 0.985          | 1.19         | 0.53         | 1.65           | 197.34           | 1.75         |                   | 1                  | 100        | 1.07         | 1.35                 | 1.00           | 212.2                                  |              | Infin.                 | 0.000                  | 0.477          | Non-Liq.             | Non-Liq                   | 0.00                 |
| 7.87<br>8.04   | 134.06<br>139.69 | 1.56                | 1.17              | 110<br>110   | 0.442              | 0.984          | 1.17         | 0.53         | 1.60           | 208 28           | 1.74         |                   | 1                  | 100        | 1.06         | 1.45                 | 1.00           | 220,8                                  | 1.00         | Infin.                 | 0.000                  | 0.477          | Non-Liq.             | Non-Liq.                  | 0.00                 |
| 8.20<br>8.37   | 147.04<br>151.94 | 1.72                | 1.17              | 110<br>110   | 0.460              | 0.983          | 1.17<br>1.13 | 0.52         | 1.56<br>1.54   | 220.33           | 1.72<br>1.70 |                   | 1                  | 100        | 1.04         | 1.55                 | 1.00           | 229.4                                  |              | Infin.                 | 0.000                  | 0,481<br>0,486 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                 |
| 8.53<br>8.69   | 158.05<br>163.87 | 1.80                | 1.14              | 110<br>110   | 0.478              | 0.982          | 1.14<br>1.18 | 0.52<br>0.52 | 1.52<br>1.51   | 232,90           | 1.69<br>1.70 |                   | 1                  | 100        | 1.04         | 1.65                 | 1.00           | 242.3                                  | 1.00         | Infin.                 | 0.000                  | 0.491<br>0.496 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00         |
| 8.86<br>9.02   | 169.68<br>174.27 | 2.08<br>2.26        | 1.22              | 110<br>110   | 0.496              | 0.981          | 1,23<br>1,30 | 0.52<br>0.52 | 1,50<br>1,49   | 244.08           | 1.70<br>1.72 |                   | 1                  | 100<br>100 | 1,05         | 1.75                 | 1.00           | 257.2                                  | 1.00<br>1.00 | Infin.<br>Infin.       | 0.000                  | 0.501<br>0.506 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 9.19<br>9.35   | 179.31<br>181.08 | 2.32<br>2.35        | 1.29<br>1.30      | 110<br>110   | 0.514              | 0.981          | 1.30<br>1.30 | 0.52<br>0.52 | 1.47<br>1.46   | 248.69           | 1.71<br>1.71 |                   | 1                  | 100<br>100 |              |                      |                |  | 1.00<br>1.00 | Infin.<br>Infin.       | 0.000                  | 0.510<br>0.515 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 9.51<br>9.68   | 191.53<br>202.38 | 2.42                | 1.26<br>1.27      | 110<br>110   |                    | 0.980<br>0.980 | 1.27<br>1.27 | 0.52<br>0.51 | 1.44<br>1.42   |                  | 1.69<br>1.68 |                   | 1                  | 100<br>100 |              |                      |                |  | 1.00<br>1.00 | Infin.<br>Infin        | 0.000                  | 0.520<br>0.524 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 9.84<br>10.01  | 214.08<br>227.79 | 2.69<br>2.91        | 1.26<br>1.28      | 110<br>110   |                    |                | 1.26<br>1.28 | 0.51<br>0.51 | 1.41<br>1.39   |                  | 1.67<br>1.66 |                   | 1                  | 100<br>100 |              |                      |                |  | 1.00         | Infin.                 | 0.000                  | 0.529<br>0.533 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 10.17<br>10.33 | 242.24<br>244.06 | 3.22<br>3.47        | 1.33<br>1.42      | 110<br>110   |                    | 0.979<br>0.979 | 1.33<br>1.43 | 0.51<br>0.51 |                |                  | 1.66<br>1.68 |                   | 1                  | 100<br>100 |              | 2.10<br>2.15         |                | 319.4<br>325.7                         |              | Infin.                 | 0.000                  | 0.537<br>0.541 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 10,50<br>10,66 | 249.05<br>254.87 | 3.55<br>3.69        | 1.43<br>1.45      | 110<br>110   |                    | 0.978<br>0.978 | 1.43<br>1.45 | 0.51<br>0.51 | 1.36<br>1.35   |                  | 1.68<br>1.68 |                   | 1                  | 100<br>100 |              |                      |                | 329.2<br>334.7                         | 1.00<br>1.00 | Infin.                 | 0.000                  | 0.545<br>0.550 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00         |
| 10.83<br>10.99 | 256.69<br>258.54 | 3.79<br>3.96        | 1.48<br>1.53      | 110<br>110   |                    |                | 1.48<br>1.53 | 0.51<br>0.52 | 1.34<br>1.34   |                  | 1.69<br>1.70 |                   | 1                  | 100<br>100 |              |                      |                |  | 1.00<br>1.00 | Infin.<br>Infin.       | 0.000                  | 0.554<br>0.557 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00         |
| 11.15<br>11.32 | 252.91<br>241.86 | 3.87<br>3.70        | 1.53<br>1.53      | 110<br>110   |                    |                | 1.53<br>1.53 | 0.52<br>0.52 | 1.33           | 316.61           | 1.71<br>1.72 |                   | 1                  |            | 1.04         | 2.40                 | 1.00           | 331.4<br>317.7                         | 1.00         | Infin.                 | 0.000                  | 0.561<br>0.565 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00         |
| 11.48          | 235.08<br>233.08 | 3.50<br>3.34        | 1.49<br>1.43      | 110<br>110   | 0.632              | 0.976          | 1.49<br>1.44 |              | 1.31           | 290.38           | 1.72<br>1.71 |                   | 1                  | 100        | 1.05         | 2.50                 | 1.00           | 306.4<br>299.4                         | 1.00         | Infin.                 | 0.000                  | 0.569<br>0.572 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                 |
| 11,81<br>11,98 | 236.89<br>239.86 | 2.82<br>3.05        | 1.19<br>1.27      | 110<br>110   | 0.650              | 0.975          | 1.19<br>1.27 | 0.50         | 1.28           | 285.24           | 1.65<br>1.67 |                   | 1                  | 100        | 1.00         | 2.60                 | 1.00           |  | 1.00         | Infin.                 | 0.000                  | 0.576<br>0.580 | Non-Liq.             | Non-Liq.                  | 0.00                 |
| 12.14          | 232.44<br>231.56 | 3.13<br>3.17        | 1.35              | 110<br>110   | 0.668              | 0.975          | 1.35         | 0.52         | 1.27           | 277.93           | 1.70<br>1.70 |                   | 1                  | 100        | 1.04         | 2.70                 | 1.00           | 288.9<br>287.5                         | 1.00         | Infin.                 | 0.000                  | 0.583<br>0.587 | Non-Liq.             | Non-Liq                   | 0.00                 |
| 12.47          | 226.67<br>224.32 | 3.06<br>3.05        | 1.35              | 110<br>110   | 0.686              | 0.974          | 1.35         | 0.52         | 1.25           | 267.63           | 1.71<br>1.71 |                   | 1                  |            | 1.04         | 2.70                 | 1.00           | 280.0                                  |              | Infin.                 | 0.000                  | 0.590<br>0.593 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                 |
|                | 219.31           |                     | 1.39              | 110          |                    |                | 1.40         |              |                | 256.14           |              |                   | 1                  |            |              |                      |                | 272.0                                  |              |                        | 0.000                  | 0.597          | Non-Liq.             |                           | 0.00                 |

| Layer           | Tip              | Friction      | Friction     | Total      | Eff_Stres           | s              |              |              |              |                  | _            | e e   | Liquef.  | Rel_       |              |              |              | Clean          | _            |                      |                | Induced        | Liquefac.            |                           | Volumetric   |
|-----------------|------------------|---------------|--------------|------------|---------------------|----------------|--------------|--------------|--------------|------------------|--------------|-------|----------|------------|--------------|--------------|--------------|----------------|--------------|----------------------|----------------|----------------|----------------------|---------------------------|--------------|
| Depth           | Qc               | Fs            | Ratio        | Unit Wt    | * 10000 million (~) | E              | _            | _            |              | Corrected        |              | /erid | Suscept  | Dens       |              | H            | 120          | Sand           |              |                      | EQ             | M=7,5          | Safety               | Probab                    | Strain       |
| (feet)<br>12.96 | (tsf)<br>214.97  | (tsf)<br>3.04 | %<br>1_41    | (pcf)      | p'o (tsf)<br>0.713  | rd<br>0.973    | 1,42         | 0.53         | 1,23         | Qc1n<br>249.70   | lc<br>1_74   | 0     | (0 or 1) | 100        | 1.07         | (m)<br>2,70  | 1_00         | 267.1          | 1.00         | CRR <sub>75</sub>    | 0,000          | 0.600          | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Lia | 0.00         |
| 13.12<br>13.29  | 210.39 202.73    | 2.92          | 1.39<br>1.41 | 110<br>110 | 0.722<br>0.731      | 0.973<br>0.972 | 1.39<br>1.41 | 0.53<br>0.54 | 1.23<br>1.22 | 242.78           | 1.74         |       | 1        | 100        | 1.07         | 2.70         | 1_00         | 260.0          | 1.00         | Infin.               | 0.000          | 0.603          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 13.45           | 202.03           | 2.75          | 1.36         | 110        | 0.740               | 0.972          | 1,36         | 0.53         | 1.21         | 232.77<br>230.22 | 1.76<br>1.75 |       | 1        | 100<br>100 | 1.08<br>1.07 | 2,70<br>2,70 | 1.00         | 251.7<br>247.7 | 1.00         | Infin.               | 0.000          | 0.606<br>0.609 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 13.62           | 202.36           | 2,74<br>2,87  | 1.36<br>1.36 | 110<br>110 | 0.749<br>0.758      | 0,972          | 1,36         | 0.53         | 1.20         | 229.11           | 1.75<br>1.74 |       | 1        | 100        | 1.07         | 2,70         | 1.00         | 246.5          | 1.00         | Infin.               | 0.000          | 0.612          | Non-Liq.             |                           | 0.00         |
| 13.78<br>13.94  | 228.51           | 2,41          | 1.05         | 110        | 0,758               | 0.971<br>0.971 | 1,37<br>1,06 | 0.50         | 1.19<br>1.17 | 237.04<br>252.83 | 1.64         |       | 1        | 100<br>100 | 1,07<br>1,00 | 2,70<br>2,70 | 1.00<br>1.00 | 253.8<br>253.8 | 1.00         | Infin.               | 0.000          | 0.615<br>0.618 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 14.11<br>14.27  | 285.52<br>292.87 | 2,69<br>2,62  | 0.94<br>0.89 | 110<br>110 | 0,776<br>0,785      | 0,971<br>0.970 | 0,94         | 0,50         | 1.17<br>1.16 | 314,27<br>320,51 | 1,54         |       | 1        | 100        | 1.00         | 2.70         | 1.00         | 315.4          | 1.00         | Infin.               | 0.000          | 0.621          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 14 44           | 251.89           | 2,37          | 0.94         | 110        | 0.794               | 0,970          | 0.94         | 0,50         | 1.15         | 273,97           | 1,52<br>1,58 |       | 1        | 100<br>100 | 1.00         | 2,70<br>2,70 | 1,00         | 321.7<br>275.0 | 1.00         | Infin.               | 0.000          | 0.624<br>0.627 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 14.60<br>14.76  | 209.49<br>185.30 | 2,12<br>1,81  | 1.01<br>0.97 | 110<br>110 | 0,803<br>0,812      | 0,970<br>0,969 | 1.02<br>0.98 | 0,51<br>0,51 | 1.15<br>1.15 | 226.74<br>199.73 | 1.66<br>1.68 |       | 1        | 100        | 1.01         | 2,70         | 1.00         | 229.5          | 1,00         | Infin.               | 0,000          | 0,629          | Non-Liq.             | Non-Liq                   | 0.00         |
| 14.93           | 177.04           | 1.72          | 0.97         | 110        | 0.821               | 0,969          | 0.97         | 0.52         | 1.14         | 189 90           | 1,70         |       | 1        | 100<br>100 | 1.03         | 2,70<br>2,70 | 1.00         | 205.8<br>197.4 | 1.00         | Infin<br>Infin       | 0.000          | 0.632<br>0.635 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 15.09<br>15.26  | 163.66<br>131.77 | 1.53<br>1.43  | 0.94<br>1.09 | 110<br>110 | 0.830               | 0.969<br>0.968 | 0.94         | 0.52         | 1.13<br>1.14 | 174.67<br>140.77 | 1,71<br>1,83 |       | 1        | 100        | 1.05         | 2.70         | 1,00         | 183.4          | 1.00         | Infin_               | 0.000          | 0.637          | Non-Liq.             |                           | 0.00         |
| 15.42           | 90.92            | 1.82          | 2,00         | 110        | 0,848               | 0,968          | 2.02         | 0.64         | 1.15         | 98.18            | 2.12         |       | 1        | 91<br>76   | 1.13<br>1.50 | 2,70         | 1.00         | 159.1<br>147.1 | 1,00         | 0 454<br>0 376       | 0,454<br>0,376 | 0.640<br>0.643 | 0.71<br>0.59         | 76%<br>85%                | 0.58<br>0.86 |
| 15.58<br>15.75  | 71.71            | 1.75<br>2.45  | 2,45<br>2,21 | 110<br>110 | 0,857<br>0,866      | 0,967<br>0,967 | 2.48         | 0.69         | 1.16<br>1.14 | 77.37<br>118.01  | 2,26<br>2,10 |       | 1        | 66<br>84   | 1,82<br>1,46 |              | 1.00         |                | 1.00         | 0.342                | 0.342          | 0.645          | 0.53                 | 89%                       | 1.00         |
| 15.73           | 111.12           | 2.74          | 2.46         | 110        | 0.875               | 0.967          | 2.48         | 0.65         | 1.13         | 117.85           | 2.14         |       | 4        | 84         | 1.52         |              | 1,00         |                | 1,00         | Infin<br>Infin       | 0,000          | 0.648<br>0.650 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 16.08<br>16.24  | 114.52<br>142.13 | 2.87          | 2.51<br>1.91 | 110<br>110 | 0.884               | 0.966<br>0.966 | 2.52<br>1.92 | 0.65<br>0.60 | 1 12<br>1 11 | 120.66<br>147.88 | 2.14         |       | 1        | 85<br>93   | 1.52<br>1.28 | 1.00         | 1,00         | 183.7<br>190.7 | 1.00         | Infin.               | 0.000          | 0.653          | Non-Liq.             |                           | 0.00         |
| 16.40           | 171,27           | 2,46          | 1.44         | 110        | 0.902               | 0.966          | 1.45         | 0.56         | 1.09         | 176.09           | 1.84         |       | 1        | 100        | 1.14         | 1.00<br>1.05 | 1.00         |                | 1.00         | Infin.<br>Infin.     | 0.000          | 0.655<br>0.657 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 16.57<br>16.73  | 179,24<br>203.64 | 2.28          | 1.27<br>1.02 | 110<br>110 | 0.911               | 0.965<br>0.965 | 1.28<br>1.03 | 0.55<br>0.51 | 1.08         | 182,87<br>205,87 | 1.79<br>1.69 |       | 1        | 100<br>100 | 1.10         | 1.10<br>1.15 | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.660          | Non-Liq.             |                           | 0.00         |
| 16.90           | 253,20           | 2.34          | 0.92         | 110        | 0.929               | 0.965          | 0.93         | 0.50         | 1.07         | 254,42           | 1.59         |       | 3        | 100        | 1.00         | 1.15         | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.662<br>0.664 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 17.06<br>17.22  | 288,82<br>315,97 | 2.54<br>2.96  | 0.88<br>0.94 | 110<br>110 | 0,938<br>0,947      | 0.964<br>0.964 | 0.88<br>0.94 | 0.50<br>0.50 | 1.06<br>1.06 | 288,93<br>314,66 | 1,54<br>1,54 |       | 1        | 100<br>100 | 1,00         | 1,25         | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.666<br>0.669 | Non-Liq.             | Non-Liq.                  | 0.00         |
| 17.39           | 322,57           | 2,98          | 0.92         | 110        | 0,956               | 0.963          | 0.93         | 0.50         | 1,05         | 319,73           | 1.53         |       | 1        | 100        | 1,00         | 1.35         | 1.00         |                | 1.00         | Infin <sub>i</sub> s | 0.000          | 0.671          | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 17.55<br>17.72  | 346.12<br>402.20 | 4,11<br>6.00  | 1,19<br>1,49 | 110<br>110 | 0.965<br>0.974      | 0.963          | 1.19<br>1.50 | 0.50<br>0.50 | 1.05         | 341,52<br>395,22 | 1,60<br>1,65 |       | 1        | 100<br>100 | 1,00         | 1.40<br>1.45 | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.673<br>0.675 | Non-Liq.             | Non-Liq.                  | 0.00<br>0.00 |
| 17.88           | 358.55           | 6.07          | 1,69         | 110        | 0,983               | 0.962          | 1.70         | 0.52         | 1.04         | 351,16           | 1.72         |       | i        | 100        | 1,05         | 1.50         | 1.00         | 370.5          | 1.00         | Infin                | 0,000          | 0.677          | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00         |
| 18.04<br>18.21  | 345.21<br>360.17 | 4.98<br>4.43  | 1,44<br>1,23 | 110<br>110 | 0,992               | 0,962<br>0,962 | 1.45<br>1.23 | 0.51<br>0.50 | 1.03         | 336,13<br>348,93 | 1.67<br>1.61 |       | 1        | 100<br>100 | 1.02         | 1.55<br>1.60 | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.679<br>0.681 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 18.37           | 359,99           | 3.79          | 1.05         | 110        | 1,010               | 0.961          | 1.06         | 0.50         | 1.02         | 347,18           | 1.55         |       | 1        | 100        | 1.00         |              | 1.00         |                | 1,00         | Infin                | 0.000          | 0.683          | Non-Liq.             |                           | 0.00         |
| 18.54           | 354.62<br>344.24 | 3.03<br>2.99  | 0.86         | 110<br>110 | 1.020<br>1.029      | 0,961<br>0,960 | 0.86<br>0.87 | 0.50<br>0.50 | 1.02<br>1.01 | 340,46<br>329,01 | 1.49         |       | 1        | 100<br>100 | 1.00         | 1.70<br>1.75 | 1.00         |                | 1.00         | Infin.               | 0.000          | 0 685<br>0 687 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 18_86           | 332,45           | 3.04          | 0.91         | 110        | 1,038               | 0.960          | 0.92         | 0.50         | 1.01         | 316,31           | 1.53         |       | 1        | 100        | 1,00         | 1.80         | 1.00         | 317.5          | 1.00         | Infin.               | 0.000          | 0.689          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 19.03           | 327,71<br>307,45 | 2.96<br>2.73  | 0.90         | 110<br>110 | 1.047<br>1.056      | 0.960<br>0.959 | 0.91<br>0.89 | 0.50         | 1.01<br>1.00 | 310,43<br>289,93 | 1.53<br>1.54 |       | 1        | 100<br>100 | 1.00         | 1.85<br>1.90 | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.691<br>0.692 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 19.36           | 274.72           | 2.45          | 0.89         | 110        | 1.065               | 0.959          | 0.89         | 0.50         | 1.00         | 257 85           | 1.58         |       | 1        | 100        | 1.00         | 1_95         | 1.00         | 258.8          | 1.00         | Infin.               | 0.000          | 0.694          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 19.52<br>19.69  | 271.54<br>279.83 | 4.15<br>3.92  | 1.53<br>1.40 | 110<br>110 | 1.074<br>1.083      | 0.958<br>0.958 | 1.53<br>1.41 | 0.54<br>0.53 | 0.99         | 253.63<br>260.29 | 1.76<br>1.73 |       | 1        | 100<br>100 | 1.08         | 2.00         | 1.00         |                | 1,00         | Infin.               | 0.000          | 0.696<br>0.698 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 19,85           | 285,99           | 4.02          | 1.41         | 110        | 1.092               | 0.957          | 1.41         | 0.53         | 0.98         |                  | 1.72         |       | 1        | 100        | 1.05         | 2.10         | 1.00         | 280.2          | 1.00         | Infin.               | 0.000          | 0.699          | Non-Liq.             | Non-Liq                   | 0.00         |
| 20.01           | 315.42<br>326.56 | 2.61<br>2.81  | 0.83<br>0.86 | 110<br>110 | 1.101<br>1.107      | 0.957<br>0.957 | 0.83         | 0.50<br>0.50 | 0.98<br>0.98 |                  | 1.52<br>1.52 |       | 1        | 100<br>100 | 1,00         |              | 1.00         |                | 1.00         | Infin.<br>Infin.     | 0.000          | 0.701<br>0.703 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 20,34           | 329.89<br>327.47 | 2.62<br>2.66  | 0.79<br>0.81 | 110        | 1.111               | 0.956          | 0.80         | 0.50         | 0.98         |                  | 1.49         |       | 1        | 100        | 1.00         |              | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.704          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 20,51           | 324.48           | 2.31          | 0.71         | 110<br>110 | 1.115<br>1.118      | 0.956<br>0.955 | 0.82<br>0.71 | 0.50<br>0.50 | 0.97<br>0.97 | 300,53<br>297,26 | 1.50<br>1.47 |       | 1        | 100<br>100 | 1,00         |              | 1.00         |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.706<br>0.708 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 20.83           | 329.51<br>283.15 | 1.82<br>1.71  | 0.55<br>0.61 | 110<br>110 | 1.122               | 0.955<br>0.954 | 0.55<br>0.61 | 0.50<br>0.50 | 0.97<br>0.97 |                  | 1.38<br>1.46 |       | 1        | 100        | 1.00         |              | 1.00         |                | 1.00         | Infin.               | 0.000          | 0.709          | Non-Liq.             |                           | 0.00         |
| 21.16           | 276.58           | 1.11          | 0.40         | 110        | 1.130               | 0.954          | 0.40         | 0.50         | 0.97         |                  | 1.35         |       | i        | 100<br>100 | 1.00<br>1.00 | 2.45<br>2.50 | 1,00         |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.711<br>0.712 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 21.33           | 265.97<br>250.21 | 1.09          | 0.41<br>0.56 | 110<br>110 | 1.134               | 0.954<br>0.953 | 0.41<br>0.56 | 0.50<br>0.50 | 0.97<br>0.96 | 241.77<br>226.99 | 1.37<br>1.48 |       | 1        | 100<br>100 | 1.00         | 2.55<br>2.60 | 1.00         |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.714<br>0.715 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 21.65           | 261.15           | 1.64          | 0.63         | 110        | 1.142               | 0.953          | 0.63         | 0.50         | 0.96         | 236.55           | 1.50         |       | 1        |            | 1.00         |              |              |                | 1.00         | Infin.               | 0.000          | 0.717          | Non-Liq.             |                           | 0.00<br>0.00 |
|                 | 300.85<br>283.46 | 1.72<br>1.98  | 0,57<br>0,70 | 110<br>110 | 1.146<br>1.150      | 0.952<br>0.952 | 0.57<br>0.70 | 0.50<br>0.50 | 0.96<br>0.96 |                  | 1.42<br>1.50 |       | 1        |            |              |              | 1.00         |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.718<br>0.719 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 22.15           | 299.30           | 1.41          | 0.47         | 110        | 1.154               | 0.951          | 0.47         | 0.50         | 0.96         | 269.87           | 1.37         |       | 1        | 100        | 1,00         | 2.80         | 1.00         | 270,9          | 1.00         | Infin.               | 0.000          | 0.721          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 22.31           | 305.84<br>317.96 | 1.24<br>1.63  | 0.41<br>0.51 | 110<br>110 | 1.158<br>1.161      | 0.951<br>0.950 | 0.41<br>0.51 | 0.50<br>0.50 | 0.96<br>0.95 |                  | 1.32<br>1.38 |       | 1        |            | 1.00<br>1.00 |              |              |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.722<br>0.724 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 22,64           | 329.92           | 1,81          | 0.55         | 110        | 1.165               | 0.950          | 0.55         | 0.50         | 0.95         | 296.08           | 1.39         |       | 1        | 100        | 1.00         | 2.95         | 1.00         | 297.2          | 1.00         | Infin                | 0.000          | 0.725          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 22,80<br>22,97  | 349.36<br>347.80 | 1.91<br>2.37  | 0.55<br>0.68 | 110<br>110 | 1.169<br>1.173      | 0.949<br>0.949 | 0.55<br>0.68 | 0.50<br>0.50 | 0.95<br>0.95 |                  | 1.37<br>1.44 |       | 1        |            | 1.00<br>1.00 |              |              |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.726<br>0.727 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 23,13           | 355.41<br>348.90 | 2.55<br>2.53  | 0.72<br>0.73 | 110        | 1.177               |                | 0.72         | 0.50         | 0.95         |                  | 1.45         |       | 1        |            | 1.00         |              |              |                | 1.00         |                      | 0.000          | 0.729          | Non-Liq.             |                           | 0.00         |
| 23,46           | 332.91           | 2.12          | 0.64         | 110<br>110 | 1.181<br>1.185      | 0.947          | 0.73<br>0.64 | 0.50<br>0.50 | 0.95<br>0.94 | 296,28           | 1.46<br>1.43 |       | 1        | 100        | 1.00<br>1.00 | 3.20         | 1.00         | 297.4          | 1.00<br>1.00 |                      | 0.000          | 0.730<br>0.731 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 23,62<br>23,79  | 334.85<br>354.63 | 1.98<br>1.92  | 0.59<br>0.54 | 110<br>110 | 1.189<br>1.193      |                | 0.59<br>0.54 | 0.50<br>0.50 | 0.94<br>0.94 |                  | 1.41<br>1.36 |       | 1        |            | 1.00         |              |              |                | 1.00<br>1.00 | Infin.<br>Infin.     | 0.000          | 0.732<br>0.733 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 23,95           | 324,76           | 1.60          | 0.49         | 110        | 1,197               | 0.946          | 0.49         | 0.50         | 0.94         | 287,57           | 1.36         |       |          | 100        | 1.00         | 3.35         | 1.00         | 288.6          | 1.00         | Infin                | 0.000          | 0.735          | Non-Liq.             | Non-Liq                   | 0.00         |
| 24.11           | 341.67<br>335.98 | 1.26<br>1.14  | 0.37         | 110<br>110 | 1,200<br>1,204      |                | 0.37         | 0.50<br>0.50 | 0.94<br>0.94 |                  | 1.27<br>1.25 |       |          |            | 1.00         |              |              |                | 1.00<br>1.00 |                      | 0.000          | 0.736<br>0.737 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 24.44           | 335.54           | 1.25          | 0.37         | 110        | 1,208               | 0.944          | 0.38         | 0.50         | 0.94         | 295.70           | 1.28         |       | 1        | 100        | 1.00         | 3.50         | 1.00         | 296.8          | 1.00         | Infin.               | 0.000          | 0.738          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 24.61<br>24.77  | 340,03<br>343.51 | 1.44<br>2.18  | 0.42<br>0.64 | 110<br>110 |                     |                | 0.42<br>0.64 | 0.50<br>0.50 | 0.93<br>0.93 |                  | 1.31<br>1.42 |       |          |            |              |              |              |                | 1.00<br>1.00 |                      | 0.000          | 0.739<br>0.740 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 24,93           | 350.49           | 2.01          | 0.57         | 110        | 1,220               | 0.942          | 0.58         | 0.50         | 0.93         | 307.42           | 1.39         |       | 1        | 100        | 1.00         | 3.65         | 1.00         | 308.6          | 1.00         | Infin.               | 0,000          | 0.741          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 25.10<br>25.26  | 344.14<br>336.49 | 2.05<br>3.71  | 0.60<br>1.10 | 110<br>110 | 1.224<br>1.228      |                | 0.60<br>1.11 | 0.50<br>0.50 | 0.93<br>0.93 |                  | 1.41<br>1.61 |       |          |            |              |              |              |                | 1.00<br>1.00 |                      | 0.000          | 0.742<br>0.743 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 25.43<br>25.59  | 347.63<br>382.52 | 2.78<br>2.64  | 0.80         | 110        | 1,232               | 0.941          | 08.0         | 0.50         | 0.93         | 303.44           | 1_50         |       | 1        | 100        | 1.00         | 3.80         | 1.00         | 304.6          | 1,00         | Infin.               | 0.000          | 0.744          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 25,75           | 360.83           | 2,44          | 0.68         | 110<br>110 | 1.240               | 0.939          | 0.69<br>0.68 | 0.50<br>0.50 | 0.93<br>0.92 |                  | 1.42<br>1.43 |       |          |            |              |              |              | 334.7<br>315.2 | 1.00<br>1.00 |                      | 0.000          | 0.745<br>0.746 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 25.92<br>26.08  | 365.07<br>363.26 | 2.04          | 0.56<br>0.55 | 110<br>110 |                     |                | 0.56<br>0.56 |              |              |                  | 1.37<br>1.37 |       |          |            |              |              | 1.00         | 318.4          | 1.00         | Infin.               | 0 000          | 0.747          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 26.25           | 360.99           | 2,10          | 0.58         | 110        | 1.251               | 0.938          | 0.58         | 0.50         | 0.92         | 312.66           | 1.39         |       | 1        | 100        | 1.00         | 4.05         | 1.00         | 313.8          | 1.00<br>1.00 | Infin.               | 0.000          | 0.747<br>0.748 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 26.41<br>26.57  | 395.59<br>390.21 | 1.87<br>2.16  | 0.47<br>0.55 | 110<br>110 |                     |                | 0.48<br>0.55 | 0.50<br>0.50 |              |                  | 1.30<br>1.35 |       |          |            |              |              |              |                | 1.00<br>1.00 |                      | 0.000          | 0.749<br>0.750 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00 |
| 26.74           | 369.74           | 2.08          | 0.56         | 110        | 1.263               | 0.936          | 0.57         | 0.50         | 0.92         | 318.77           | 1.37         |       | . 1      | 100        | 1.00         | 4.20         | 1.00         | 320.0          | 1_00         | Infin:               | 0.000          | 0.751          | Non-Liq.             |                           | 0.00         |
| 26.90<br>27.07  | 365.49<br>355.65 | 1.74<br>1.92  | 0.48<br>0.54 | 110<br>110 |                     |                | 0.48<br>0.54 |              |              |                  | 1,32<br>1,37 |       |          |            |              |              |              |                | 1.00<br>1.00 |                      | 0.000          | 0.751<br>0.752 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 27.23           | 353.49           | 1.57          | 0.44         | 110        | 1.275               | 0.934          | 0.44         | 0.50         | 0.91         | 303,30           | 1.32         |       | 1        | 100        | 1.00         | 4.35         | 1.00         | 304.4          | 1.00         | Infin.               | 0.000          | 0.753          | Non-Liq.             | Non-Liq.                  | 0.00         |
|                 | 346.49<br>345.45 | 1.68          | 0.48<br>0.58 | 110<br>110 |                     |                | 0.49<br>0.58 |              |              |                  | 1,35<br>1,40 |       |          |            |              | 4.40<br>4.45 |              | 297.9<br>296.6 | 1.00<br>1.00 |                      | 0.000          | 0.754<br>0.754 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 27.72           | 320,92           | 1.75          | 0.55         | 110        | 1,286               | 0.932          | 0.55         | 0.50         | 0.91         | 273.99           | 1.41         |       | 1        | 100        | 1.00         | 4.50         | 1.00         | 275 0          | 1.00         | Infin.               | 0.000          | 0.755          | Non-Liq.             | Non-Liq                   | 0.00         |
| 27.89           | 307.08           | 1.60          | 0.52         | 110        | 1,290               | 0.931          | 0.52         | 0.50         | 0.91         | 261.72           | 1.41         |       | 1        | 100        | 1.00         | 4.55         | 1.00         | 262.7          | 1.00         | Infin.               | 0.000          | 0.756          | Non-Liq.             | Non-Liq.                  | 0.00         |

| Laye           | er Tip           | Friction     | r Friction   | Total      | Eff Stres          | S              | _            |              |              |                  |              | a      | Liquef.  | Rel        |              | ==           |      | Clean              |              | _                |                | Induced        | Liquefac.            |                | Volumetric   |
|----------------|------------------|--------------|--------------|------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|--------|----------|------------|--------------|--------------|------|--------------------|--------------|------------------|----------------|----------------|----------------------|----------------|--------------|
| Dept           |                  | Fs           | Ratio        |            | at Midpt           | s .            | _            |              |              | Corrected        |              | erio ( | Suscept  | Dens.      |              | Н            |      | Sand               |              |                  | EQ             | M=7.5          | Safety               | Probab         | Strain       |
| 28.0           |                  | (tsf)        | 0.56         | (pcf)      | p'o (tsf)<br>1,294 | rd<br>0.930    | 0.57         | 0.50         | 0.90         | 238.08           | 1.46         | 0      | (0 or 1) | Dr (%)     | 1,00         | (m)<br>4,60  | 1.00 | Qc1n<br>239.0      | Κσ<br>1.00   | Infin.           | 0.000          | 0.756          | Factor<br>Non-Liq.   | P <sub>L</sub> | 0.00         |
| 28.2           | 2 242.13         | 3.57         | 1.47         | 110        | 1,298              | 0.929          | 1.48         | 0.55         | 0.89         | 203.34           | 1.81         |        | 1        | 100        | 1.12         | 4.65         | 1.00 | 227.7              | 1.00         | Infin            | 0,000          | 0.757          | Non-Liq.             |                | 0.00         |
| 28.38<br>28.54 |                  | 3.41<br>2.93 | 1.31<br>1.01 | 110<br>110 | 1,302<br>1,306     | 0.929<br>0.928 | 1.32         | 0.53         | 0.90         | 218.73<br>245.61 | 1.75<br>1.63 |        | 1        | 100<br>100 | 1.07         | 4.70<br>4.75 | 1.00 | 235.7<br>246.5     | 1.00         | Infin.           | 0,000          | 0.758<br>0.758 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 28.7           | 202.32           | 2.56         | 1.27         | 110        | 1.310              | 0.927          | 1.28         | 0.55         | 0.89         | 168.83           | 1.82         |        | 1        | 99         | 1.12         | 4.80         | 1.00 | 189.7              | 1,00         | Infin.           | 0,000          | 0.759          | Non-Liq.             |                | 0.00         |
| 28.87          |                  | 1.37         | 0.72<br>0.74 | 110<br>110 | 1.314<br>1.318     | 0.926<br>0.926 | 0.73<br>0.75 | 0.51<br>0.51 | 0.90         | 159.28<br>156.09 | 1.67<br>1.68 |        | 1        | 96<br>95   | 1.01         | 4.85<br>4.90 | 1.00 | 162,2<br>160,7     | 1,00         | Infin.           | 0.000          | 0.759<br>0.760 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 29.20          | 187.42           | 1.54         | 0.82         | 110        | 1.322              | 0,925          | 0.83         | 0.52         | 0.89         | 156.67           | 1.71         |        | 1        | 95         | 1.04         | 4.95         | 1.00 | 164.1              | 1.00         | Infin.           | 0.000          | 0.760          | Non-Liq.             |                | 0.00         |
| 29.36          |                  | 1.68         | 0.96<br>1.07 | 110<br>110 | 1.325<br>1.329     | 0,924          | 0.97<br>1.07 | 0.54<br>0.56 | 0.88<br>0.88 | 144.51<br>134.10 | 1.78<br>1.84 |        | 1        | 92<br>89   | 1.09         | 5.00<br>5.05 | 1.00 | 158.6<br>152.5     | 1.00         | 0 451<br>0 410   | 0 451<br>0 410 | 0.761<br>0.761 | 0.59<br>0.54         | 85%<br>89%     | 0.61<br>0.75 |
| 29,69          | 156,88           | 1.76         | 1,12         | 110        | 1,333              | 0.923          | 1.13         | 0.57         | 0.88         | 128.96           | 1,86         |        | 1        | 87         | 1.16         | 5.10         | 1.00 | 149.6              | 1.00         | 0.391            | 0.391          | 0.762          | 0.51                 | 90%            | 0.83         |
| 29 86<br>30 02 |                  | 1.73         | 1.12<br>1.20 | 110<br>110 | 1,337<br>1,341     | 0.922          | 1.13<br>1.21 | 0.57<br>0.57 | 0.88         | 126.69<br>126.93 | 1.87<br>1.89 |        | 1        | 87<br>87   | 1.16<br>1.18 | 5.15<br>5.20 | 1.00 | 147.5<br>150.1     | 1.00         | 0.378            | 0.378          | 0.762<br>0.763 | 0.50<br>0.52         | 91%<br>90%     | 0.88<br>0.81 |
| 30_16          | 159,05           | 1.71         | 1.08         | 110        | 1.345              | 0.920          | 1.09         | 0.56         | 0.87         | 130.24           | 1,85         |        | 1        | 88         | 1.14         | 5.25         | 1.00 | 149.5              | 1.00         | 0.391            | 0.391          | 0.763          | 0.51                 | 90%            | 0.83         |
| 30.35          |                  | 1.73         | 1.08         | 110<br>110 | 1,349<br>1,353     | 0.919<br>0.918 | 1.09<br>1.01 | 0.56<br>0.55 | 0.87<br>0.87 | 131.25<br>145.44 | 1.85<br>1.79 |        | 1        | 88<br>92   | 1.14         | 5.30<br>5.35 | 1.00 |                    | 1.00         | 0.396<br>Infin   | 0.396          | 0.763<br>0.764 | 0.52<br>Non-Liq.     | 90%<br>Non-Lig | 0.81<br>0.00 |
| 30.68          | 188.18           | 1.86         | 0.99         | 110        | 1,357              | 0,918          | 1.00         | 0.54         | 0.87         | 154.46           | 1.77         |        | 1        | 95         | 1.08         | 5.40         | 1.00 | 168.0              | 1.00         | Infin.           | 0,000          | 0.764          | Non-Liq.             | Non-Lig        | 0.00         |
| 30.84<br>31.00 |                  | 2.12<br>3.25 | 1.08<br>1.55 | 110<br>110 | 1,361<br>1,364     | 0.917<br>0.916 | 1.09<br>1.56 | 0.54<br>0.57 | 0.87<br>0.86 | 161.22<br>170.70 | 1.78<br>1.88 |        | 1        | 97<br>99   | 1.09         | 5.45<br>5.50 |      |                    | 1.00         | Infin.           | 0,000          | 0.764<br>0.765 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 31.17          |                  | 3.44         | 1.63         | 110        | 1,368              | 0.915          | 1.64         | 0.58         | 0.86         | 170.54           | 1.90         |        | 1        | 99         | 1.19         | 5.55         | 1.00 | 202.9              | 1.00         | Infin.           | 0.000          | 0.765          | Non-Liq.             | Non-Liq.       | 0.00         |
| 31.33<br>31.50 |                  | 3.75<br>4.18 | 1.75<br>1.83 | 110<br>110 | 1,372<br>1,376     | 0.914          | 1.76<br>1.84 | 0.58<br>0.58 | 0.86<br>0.86 | 173.38<br>183.75 | 1.91<br>1.91 |        | 1        | 100<br>100 | 1.20         | 5.60<br>5.65 |      |                    | 1.00         | Infin.           | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 31.66          |                  | 4.52         | 1.85         | 110        | 1_380              | 0.912          | 1.86         | 0.58         | 0.86         | 196.76           | 1.90         |        | 1        | 100        | 1.19         | 5.70         | 1.00 | 234.4              | 1.00         | Infin.           | 0.000          | 0.766          | Non-Liq.             | Non-Liq.       | 0.00         |
| 31.82          |                  | 4.47         | 1.82<br>1.80 | 110<br>110 | 1.384<br>1.388     | 0.911          | 1.83<br>1.81 | 0.57<br>0.57 | 0.86<br>0.86 | 198.13<br>196.51 | 1.89<br>1.89 |        | 1        | 100<br>100 | 1.18         | 5.75<br>5.80 |      |                    | 1.00         | Infin.           | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 32.15          | 229,90           | 4.32         | 1.88         | 110        | 1.392              | 0.909          | 1.89         | 0.58         | 0.85         | 184.00           | 1.92         |        | 1        | 100        | 1.21         | 5.85         | 1.00 | 223.5              | 1.00         | Infin,           | 0.000          | 0.766          | Non-Liq.             | Non-Liq.       | 0.00         |
| 32.32<br>32.48 |                  | 3.87<br>2.85 | 1.88         | 110<br>110 | 1,396<br>1,400     | 0.908          | 1.89<br>1.40 | 0.59<br>0.56 | 0.85<br>0.85 | 164.10<br>164.05 | 1.95<br>1.86 |        | 1        | 97<br>97   | 1.24         | 5.90<br>5.95 |      |                    | 1.00         | Infin.           | 0.000          | 0.766<br>0.767 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 32.64          |                  | 2.51         | 1.24         | 110        | 1.403              | 0,906          | 1.25         | 0.55         | 0.86         | 163.10           | 1.82         |        | 1        | 97         | 1.12         | 6.00         | 1.00 | 183.6              | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.       | 0.00         |
| 32 81<br>32 97 |                  | 2.19<br>2.13 | 1.03<br>0.91 | 110<br>110 | 1.407<br>1.411     | 0.905<br>0.904 | 1.04<br>0.92 | 0.53<br>0.51 | 0.86<br>0.86 | 171.59<br>189.28 | 1.75<br>1.68 |        | 1        | 99<br>100  | 1.07         | 6.05<br>6.10 | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 33.14<br>33.30 |                  | 2.22         | 0.87         | 110        | 1,415              | 0,903          | 0.88         | 0.50         | 0.86         | 207.21           | 1.64         |        | 1        |            | 1.00         |              |      |                    | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.       | 0.00         |
| 33.46          |                  | 2.80         | 0.86         | 110<br>110 | 1,419<br>1,423     | 0.902<br>0.901 | 0.87<br>0.86 | 0.50<br>0.50 | 0.86<br>0.86 | 224.56<br>264.54 | 1.61<br>1.56 |        | 1        |            | 1.00         | 6.20<br>6.25 |      |                    | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 33.63<br>33.79 |                  | 3.43<br>3.96 | 0.93         | 110<br>110 | 1.427<br>1.431     | 0.900          | 0.94<br>0.99 | 0.50<br>0.50 | 0.86<br>0.86 |                  | 1.55<br>1.55 |        | 1        | 100        | 1.00         | 6.30         |      |                    | 1.00         | Infin.           | 0,000          | 0.767          | Non-Liq.             | Non-Liq        | 0.00         |
| 33.96          |                  | 2.74         | 0.73         | 110        | 1.435              | 0.898          | 0.74         | 0.50         | 0.86         |                  | 1.47         |        | i        |            | 1.00         | 6.35<br>6.40 |      |                    | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 34.12<br>34.28 |                  | 2.68         | 0.73         | 110<br>110 | 1.439<br>1.443     | 0.897<br>0.896 | 0.73<br>0.58 | 0.50<br>0.50 | 0.86         |                  | 1.47<br>1.42 |        | 1        |            | 1.00         | 6.45<br>6.50 |      |                    | 1.00         | Infin.<br>Infin. | 0.000          | 0.767          | Non-Liq.             |                | 0.00         |
| 34.45          | 363,15           | 2.39         | 0.66         | 110        | 1.446              | 0.895          | 0.66         | 0.50         | 0.86         |                  | 1.45         |        | i        |            | 1.00         |              | 1000 |                    | 0.99         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 34.61<br>34.78 | 354.73<br>326.42 | 2.83         | 0.80         | 110<br>110 | 1.450<br>1.454     | 0.894<br>0.893 | 0.80<br>0.92 | 0.50<br>0.50 | 0.85<br>0.85 |                  | 1.51<br>1.58 |        | 1        |            | 1.00         | 6.60<br>6.65 |      |                    | 0.99         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.             |                | 0.00         |
| 34.94          | 311.03           | 2.62         | 0.84         | 110        | 1.458              | 0.892          | 0.85         | 0.50         | 0.85         | 249.24           | 1.57         |        | i        |            | 1.00         |              |      |                    | 0.99         | Infin.           | 0.000          | 0.766          | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 35.10<br>35.27 | 313.61<br>310.40 | 2.84<br>3.07 | 0.90         | 110<br>110 | 1.462<br>1.466     | 0.890          | 0.91<br>0.99 | 0.50<br>0.50 | 0.85<br>0.85 |                  | 1.59<br>1.62 |        |          |            |              |              |      |                    | 0.99         | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 35,43          | 294.50           | 3.05         | 1.03         | 110        | 1.470              | 0.888          | 1.04         | 0.50         | 0.85         | 234.64           | 1.65         |        |          | 100        | 1.01         | 6.85         | 1.00 | 237.1              | 0.99         | Infin.           | 0.000          | 0.766          | Non-Liq.             |                | 0.00         |
| 35.60<br>35.76 |                  | 2.83         | 0.99         | 110<br>110 |                    | 0.887<br>0.886 | 1.00<br>0.98 | 0.50<br>0.50 | 0.85         |                  | 1.65<br>1.65 |        | 1        |            |              |              |      |                    | 0.98         | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 35.93          |                  | 2.73         | 0.99         | 110        | 1.482              | 0.885          | 0.99         | 0.51         | 0.84         | 219.05           | 1.66         |        | 1        | 100        | 1.01         | 7.00         | 1.00 | 222.3              | 0.98         | Infin.           | 0.000          | 0.765          | Non-Liq.             | Non-Liq        | 0.00         |
| 36.09<br>36.25 |                  | 2.66<br>2.73 | 0.98         | 110<br>110 |                    | 0.883          | 0.99         | 0.51<br>0.51 | 0.84<br>0.84 |                  | 1.66<br>1.68 |        |          |            |              |              |      |                    | 0.98         | Infin.<br>Infin: | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 36.42<br>36.58 |                  | 3.17         | 1.19         | 110        |                    | 0.881          | 1.19         | 0.53         | 0.83         |                  | 1.73         |        |          |            |              |              |      | 222.4              | 0.98         | Infin.           | 0.000          | 0.765          | Non-Liq.             | Non-Liq        | 0.00         |
| 36.75          |                  | 3.44<br>3.88 | 1.33<br>1.53 | 110<br>110 |                    | 0.880<br>0.878 | 1.34<br>1.54 | 0.54<br>0.56 | 0.83         |                  | 1.78<br>1.83 |        |          |            |              | 7.20<br>7.25 |      |                    | 0.98         | Infin:<br>Infin: | 0.000          | 0.764<br>0.764 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 36.91          | 268.14<br>272.86 | 4.26<br>5.01 | 1.59<br>1.84 | 110<br>110 |                    |                | 1.60         |              | 0.82         |                  | 1.83<br>1.88 |        |          |            |              |              |      | 235.1              |              | Infin.           | 0.000          | 0.764          | Non-Liq.             | Non-Liq.       | 0.00         |
| 37.24          | 267.15           | 4.61         | 1.73         | 110        |                    |                | 1.74         | 0.57         | 0.82         |                  | 1.86         |        |          |            |              |              |      | 245.8<br>237.9     | 0.97         | Infin.<br>Infin. | 0.000          | 0.763<br>0.763 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 37.40<br>37.57 |                  | 4.98<br>4.92 | 1.93         | 110<br>110 |                    |                | 1.94<br>1.97 | 0.58<br>0.59 | 0.81<br>0.81 |                  | 1.91<br>1.92 |        |          |            |              |              |      |                    | 0.97<br>0.97 |                  | 0.000          | 0 762<br>0 762 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 37.73          | 253.20           | 5.10         | 2.01         | 110        | 1.525              | 0.871          | 2.02         | 0.59         | 0.81         | 191.89           | 1.93         |        | 1        | 100        | 1.22         | 7.55         | 1.00 | 235.4              |              |                  | 0.000          | 0.762          | Non-Liq.             |                | 0.00<br>0.00 |
| 37.89<br>38.06 |                  | 4.99<br>4.60 | 1.99<br>1.95 | 110<br>110 |                    |                | 2.01<br>1.96 |              | 0.81         |                  | 1.93<br>1.94 |        |          |            |              |              |      | 232.3<br>220.2     | 0.97         |                  | 0.000          | 0.761<br>0.761 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 38.22          | 234.67           | 4.00         | 1.70         | 110        | 1.536              | 0.867          | 1.71         | 0.58         | 0.81         | 177.66           | 1.90         |        | 1        | 100        | 1.19         | 7.70         | 1.00 | 211.7              | 0.96         | Infin.           | 0.000          | 0.760          | Non-Liq.             | Non-Liq.       | 0.00         |
| 38.39<br>38.55 |                  | 3.44         | 1.37<br>1.20 | 110<br>110 |                    |                | 1.38         |              | 0.81<br>0.82 |                  | 1.80<br>1.75 |        |          |            |              |              |      | 214.0<br>215.9     |              |                  | 0.000          | 0,760<br>0.759 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 38.71<br>38.88 |                  | 2.71<br>2.45 | 1.00         | 110        |                    |                | 1.01         | 0.51         | 0.82         | 209.01           | 1.68         |        | 1        | 100        | 1.02         | 7.85         | 1.00 | 2148               | 0.96         | Infin.           | 0.000          | 0.759          | Non-Liq.             | Non-Liq        | 0.00         |
| 39.04          |                  | 1.88         | 0.91<br>0.66 | 110<br>110 |                    |                | 0.91<br>0.66 |              |              |                  | 1.65<br>1.53 |        |          |            |              |              |      | 210.4<br>222.2     | 0.96         |                  | 0.000          | 0.758<br>0.758 | Non-Liq.<br>Noп-Liq. |                | 0.00         |
| 39.21<br>39.37 |                  | 1.84<br>2.11 | 0.64<br>0.71 | 110<br>110 |                    |                | 0.65<br>0.71 | 0.50         | 0.82         | 221.38           | 1.53<br>1.54 |        | 1        | 100        | 1.00         |              | 1.00 | 222.2              | 0.96         | Infin.           | 0.000          | 0.757          | Non-Liq.             | Non-Liq.       | 0.00         |
| 39.53          | 335.11           | 2.36         | 0.71         | 110        |                    |                | 0.71         |              |              | 259.01           |              |        |          |            |              |              |      | 231.9<br>260.0     |              |                  | 0.000          | 0.757<br>0.756 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 39.70<br>39.86 |                  | 4.67<br>4.60 | 1.39<br>1.26 | 110<br>110 |                    |                | 1.40<br>1.26 |              |              |                  | 1.73<br>1.67 |        |          |            |              | 8.15<br>8.20 |      | 271.7<br>286.9     |              |                  | 0.000          | 0.756          | Non-Liq.             |                | 0.00         |
| 40.03          | 354.98           | 4.90         | 1.38         | 110        | 1.579              | 0.852          | 1.39         |              |              |                  | 1.71         |        |          |            |              | 8.25         |      |                    | 0 95<br>0 95 |                  | 0.000          | 0.755<br>0.754 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 40.19<br>40.35 |                  | 4.35<br>3.03 | 1.13<br>0.97 | 110<br>110 |                    |                | 1.13<br>0.98 |              |              |                  | 1.62<br>1.63 |        |          |            |              | 8.30<br>8.35 |      | 298.4<br>240.5     | 0.95         |                  | 0.000          | 0.754<br>0.753 | Non-Liq.<br>Non-Liq. | Non-Liq        | 0.00         |
| 40.52          | 311.39           | 2.28         | 0.73         | 110        | 1.591              | 0.847          | 0.74         | 0.50         | 0.82         | 238.79           | 1.54         |        | 1        | 100        | 1.00         | 8.40         | 1.00 | 239.7              | 0.95         | Infin.           | 0.000          | 0.752          | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 40.68<br>40.85 |                  | 1.66<br>1.62 | 0.56         | 110<br>110 |                    |                | 0.57<br>0.58 |              |              |                  | 1.48<br>1.50 |        |          |            |              | 8.45<br>8.50 |      | 226.3<br>216.4     |              |                  | 0.000          | 0.752<br>0.751 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 41.01          | 243.47           | 1.88         | 0.77         | 110        | 1.603              | 0.843          | 0.78         | 0.50         | 0.81         | 185.75           | 1.64         |        | 1        | 100        | 1.00         | 8.55         | 1.00 | 186.4              | 0.94         | Infin.           | 0.000          | 0.750          | Non-Liq.             | Non-Liq        | 0.00         |
| 41.17<br>41.34 | 276.31<br>272.69 | 2.79<br>3.15 | 1.01<br>1.16 | 110<br>110 |                    |                | 1.01<br>1.16 |              |              |                  | 1.68<br>1.73 |        |          |            |              | 8.60<br>8.65 |      | 215.6<br>218.0     |              |                  | 0.000          | 0.750<br>0.749 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 41.50          | 280.76           | 3.48         | 1.24         | 110        | 1.614              | 0.838          | 1.25         | 0.53         | 0.80         | 210.77           | 1.74         |        | 1        | 100        | 1.07         | 8.70         | 1_00 | 226.0              | 0.94         | Infin.           | 0.000          | 0.748          | Non-Liq.             | Non-Lig        | 0.00         |
| 41.67<br>41.83 | 325.03<br>361.66 | 3.18<br>3.38 | 0.98         | 110<br>110 |                    |                | 0.98<br>0.94 |              |              |                  | 1.62<br>1.58 |        |          |            |              | 8.75<br>8.80 |      | 248.1<br>275.9     |              |                  |                | 0.747<br>0.747 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 41.99          | 372.69           | 3.26         | 0.87         | 110        | 1,626              | 0.834          | 88.0         | 0.50         | 0.81         | 282.91           | 1.55         |        | 1        | 100 ′      | 1.00         | 8.85         | 1.00 | 284.0              | 0.93         | Infin.           | 0.000          | 0.746          | Non-Liq.             | Non-Liq.       | 0.00         |
| 42.16<br>42.32 | 396 43<br>442 33 | 3.53<br>3.55 | 0.89         | 110<br>110 |                    |                | 0.89<br>0.81 |              |              |                  | 1.53<br>1.47 |        |          |            |              | 8.90<br>8.95 |      | 301.8 (<br>336.4 ( |              |                  |                | 0.745<br>0.744 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 42,49          |                  | 3.30         | 0.72         | 110        | 1.638              | 0.829          | 0.72         | 0.50         | 0.80         | 347.12           | 1.42         |        | 1        | 100 1      | 1.00         | 9.00         | 1.00 | 348.4              | 0.93         | Infin:           | 0.000          | 0.743          | Non-Liq.             | Non-Liq.       | 0.00         |
| 42.81          | 431.91           | 2.98         | 0.68<br>0.60 | 110<br>110 |                    |                | 0.68<br>0.60 |              |              |                  | 1.42<br>1.38 |        |          |            |              | 9.05<br>9.10 |      | 334.1 (<br>327.3 ( |              |                  |                | 0.743<br>0.742 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| II 42 Q₽       | 428.57           | 2.24         | 0.52         | 110        | 1.649              | 0.824          | 0.52         | 0.50         | 0.80         | 323.17           | 1.34         |        | 1        | 100 1      |              | 9.15         |      | 324.4              |              | Infin            |                | 0.741          | Non-Liq.             |                | 0.00         |

| Laye           | r Tip            | Friction     | Friction     | Tolal      | Eff.Stres      | s              | _            |              |              | _                |              | ge | Liquef.  | Rel.       |              |               |      | Clean          | _            |                  |       | Induced        | Liquefac.            |                      | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|----|----------|------------|--------------|---------------|------|----------------|--------------|------------------|-------|----------------|----------------------|----------------------|--------------|
| Dept           |                  | Fs           | Ratio        |            | at Midpt,      |                |              |              |              | Corrected        | d            |    | Suscept  |            |              | Н             |      | Sand           |              |                  | EQ    | M=7,5          | •                    | Probab.              | Strain       |
| (feet          | - hmer-          | (tsf)        | 0.51         | (pcf)      | p'o (tsf)      | rd             | F 0.54       | n            | Co           | Qc1n             | lc.          | δ  | (0 or 1) |            |              | (m)           | KH   | Qc1n           |              | CRR75            |       | CSR            | Factor               | PL                   | (%)          |
| 43.14          | 431.32           | 1.87         | 0.43         | 110        | 1.653<br>1.657 | 0.823          | 0.51<br>0.43 | 0.50         | 0.80         | 322.73<br>324.48 | 1.33         |    | 1        | 100<br>100 | 1.00         | 9.20<br>9.25  | 1.00 | 323.9<br>325.7 | 0.93         | Infin<br>Infin   | 0.000 | 0.740          | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00         |
| 43.47          |                  | 2.46         | 0.56         | 110        | 1,661          | 0.820          | 0.56         | 0.50         | 0.80         | 332,50           | 1,35         |    | 1        | 100        | 1.00         | 9,30          | 1.00 | 333.7          | 0.92         | Infin.           | 0.000 | 0.738          | Non-Liq.             | Non-Liq.             | 0.00         |
| 43.64          |                  | 2.74         | 0.56<br>0.61 | 110<br>110 | 1,665<br>1,669 | 0.818<br>0.816 | 0.57<br>0.61 | 0.50<br>0.50 | 0.80         | 364.57<br>360.31 | 1.33         |    | 1        | 100<br>100 | 1.00         | 9.35<br>9.40  | 1.00 | 365.9<br>361.7 | 0.92         | Infin.           | 0.000 | 0.737<br>0.736 |                      | Non-Liq.<br>Non-Liq. | 0.00<br>0.00 |
| 43.96          | 434,40           | 2.34         | 0.54         | 110        | 1,673          | 0.815          | 0.54         | 0.50         | 0.80         | 325.27           | 1,35         |    | 1        | 100        | 1.00         | 9.45          | 1.00 | 326.5          | 0.92         | Infin            | 0.000 | 0.735          | Non-Liq.             |                      | 0.00         |
| 44 13<br>44 29 |                  | 2.47<br>3.15 | 0.58<br>0.75 | 110<br>110 | 1,677<br>1,681 | 0.813          | 0.58<br>0.76 | 0.50<br>0.50 | 0.79<br>0.79 | 317.27<br>312.04 | 1,38<br>1,47 |    | 1        | 100        | 1.00         | 9,50          | 1.00 | 318.5          | 0.92         | Infin            | 0.000 | 0.735          |                      | Non-Liq              | 0.00         |
| 44.46          |                  | 2.76         | 0.64         | 110        | 1,685          | 0.810          | 0.64         | 0.50         | 0.79         | 324.31           | 1.40         |    | 1        | 100<br>100 | 1.00         | 9.55<br>9.60  | 1.00 | 313 2<br>325 5 | 0.92         | Infin            | 0.000 | 0.734<br>0.733 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 44.62          |                  | 3.88         | 0.82         | 110        | 1,689          | 0.808          | 0.82         | 0.50         | 0.79         | 354.06           | 1.46         |    | 1        | 100        | 1.00         |               | 1.00 | 355.4          | 0.92         | Infin.           | 0.000 | 0.732          | Non-Liq.             | Non-Liq.             | 0.00         |
| 44.78<br>44.95 | 477.42<br>400.75 | 3,92         | 0.82<br>0.79 | 110<br>110 | 1,692<br>1,696 | 0.807<br>0.805 | 0.82<br>0.80 | 0.50<br>0.50 | 0.79<br>0.79 | 355.52<br>297.88 | 1.46<br>1.50 |    | 1        | 100<br>100 | 1.00         | 9.70<br>9.75  | 1.00 | 356 8<br>299 0 | 0.92         | Infin            | 0,000 | 0.731<br>0.730 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 45.11          | 375.01           | 3.32         | 0.89         | 110        | 1.700          | 0.803          | 0.89         | 0.50         | 0.79         | 278,34           | 1.56         |    | 1        | 100        | 1.00         | 9.80          | 1.00 | 279.4          | 0.91         | Infin.           | 0,000 | 0.729          | Non-Liq.             |                      | 0.00         |
| 45.28<br>45.44 | 353.62<br>350.76 | 3.70         | 1.05<br>1.14 | 110<br>110 | 1.704<br>1.708 | 0.802          | 1.05<br>1.14 | 0.50<br>0.51 | 0.79<br>0.78 | 262,09<br>258,98 | 1.63<br>1.66 |    | 1        | 100<br>100 | 1.00         |               | 1.00 | 263.1<br>262.3 | 0.91         | Infin<br>Infin   | 0.000 | 0.728<br>0.727 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 45,60          | 361.90           | 4.33         | 1.20         | 110        | 1.712          | 0.798          | 1.20         | 0.51         | 0.78         | 266.57           | 1.67         |    | 1        | 100        | 1.02         |               | 1.00 | 271.8          | 0.91         | Infin.           | 0.000 | 0.726          | Non-Liq.             |                      | 0.00         |
| 45.77<br>45.93 | 370.34<br>366.89 | 4.64<br>5.10 | 1.25<br>1.39 | 110<br>110 | 1.716<br>1.720 | 0.797<br>0.795 | 1.26<br>1.40 | 0.51<br>0.52 | 0.78<br>0.78 | 272.10<br>267.69 | 1.68<br>1.72 |    | 1        | 100<br>100 | 1.02         | ####<br>####  |      | 279.3          | 0.91         | Infin.           | 0,000 | 0.725          | Non-Liq.             |                      | 0.00         |
| 46.10          | 356.56           | 4.91         | 1.38         | 110        | 1,724          | 0.793          | 1.38         | 0.52         | 0.77         | 259.60           | 1.72         |    | 1        | 100        | 1.05         | ####          |      | 282.0<br>274.4 | 0.91         | Infin.<br>Infin. | 0.000 | 0.724<br>0.723 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 46.26<br>46.42 | 358.23           | 5.52         | 1.54         | 110        | 1,728          | 0.792          | 1.55         | 0.54         | 0.77         | 259,00           | 1.76         |    | 1        | 100        | 1.08         | ####          |      | 280.7          | 0.91         | Infin.           | 0.000 | 0.722          | Non-Liq.             | Non-Liq.             | 0.00         |
| 46 59          | 364.21<br>355.49 | 5.48<br>5.43 | 1.51<br>1.53 | 110<br>110 | 1.731<br>1.735 | 0.790<br>0.788 | 1.51<br>1.53 | 0.53<br>0.54 | 0.77<br>0.77 | 263,52<br>256,41 | 1.75<br>1.76 |    | 1        | 100<br>100 | 1.07         | ####<br>##### |      | 283.3<br>277.8 | 0.91         | Infin.           | 0.000 | 0.721<br>0.720 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 46.75          | 363.06           | 4.83         | 1.33         | 110        | 1,739          | 0.787          | 1.34         | 0.52         | 0.77         | 263.74           | 1.71         |    | 1        | 100        | 1.04         | ####          | 1,00 | 275.9          | 0.90         | Infin            | 0.000 | 0.719          | Non-Liq.             |                      | 0.00         |
| 46 92<br>47 08 | 369 03<br>367 25 | 3.46         | 0.94         | 110<br>110 | 1.743<br>1.747 | 0.785          | 0.94<br>0.97 | 0.50         | 0.78<br>0.78 | 270,45<br>268,84 | 1.58         |    | 1        | 100<br>100 | 1.00         | ####<br>####  |      | 271.5<br>269.8 | 0.90         | Infin            | 0.000 | 0.717<br>0.716 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 47.24          | 360.71           | 3.46         | 0.96         | 110        | 1,751          | 0.782          | 0.96         | 0.50         | 0.78         |                  | 1.60         |    | i        | 100        | 1,00         | ####          |      |                | 0.90         | Infin            | 0.000 | 0.715          | Non-Liq.             |                      | 0.00         |
| 47 41<br>47 57 | 359.57<br>355.34 | 3.90<br>4.23 | 1.08<br>1.19 | 110<br>110 | 1.755<br>1.759 | 0.780<br>0.778 | 1.09<br>1.20 | 0.50<br>0.51 | 0.78<br>0.77 | 262.60<br>257.82 | 1.64<br>1.67 |    | 1        | 100<br>100 | 1.00         | ####          |      | 263.6          | 0.90         | Infin.           | 0.000 | 0.714          | Non-Liq.             |                      | 0.00         |
| 47.74          | 345.82           | 4.41         | 1.28         | 110        | 1.763          | 0.777          | 1.28         | 0.52         | 0.77         |                  | 1.71         |    | 1        | 100        | 1.04         | ####          |      | 264.2<br>261.0 | 0.90         | Infin<br>Infin   | 0.000 | 0.713<br>0.712 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 47.90<br>48.06 | 339,06<br>331.05 | 4.15<br>4.03 | 1.22<br>1.22 | 110        | 1.767          | 0.775          | 1.23         | 0.52         | 0.77         |                  | 1.70         |    | 1        | 100        | 1.04         | ####          |      |                | 0.90         | Infin.           | 0.000 | 0.711          | Non-Liq.             | Non-Liq              | 0.00         |
| 48.23          | 319.37           | 3.94         | 1.23         | 110<br>110 | 1.770<br>1.774 | 0.773<br>0.772 | 1.23<br>1.24 | 0.52<br>0.52 | 0.77<br>0.76 |                  | 1.70<br>1.72 |    | 1        | 100<br>100 | 1.04         | ####<br>####  |      | 248,9<br>241.6 | 0.90         | Infin.           | 0.000 | 0.710<br>0.709 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 48 39          | 303,85           | 3.75         | 1.23         | 110        | 1.778          | 0.770          | 1.24         | 0.53         | 0.76         | 216,98           | 1.74         |    | 1        | 100        | 1.06         | ####          | 1.00 | 231.2          | 0.89         | Infin.           | 0.000 | 0.708          | Non-Liq.             |                      | 0.00         |
| 48.56<br>48.72 | 293.74<br>291.29 | 3.57<br>3.33 | 1.21         | 110<br>110 | 1.782<br>1.786 | 0.768<br>0.767 | 1.22<br>1.15 | 0.53<br>0.52 | 0.76<br>0.76 |                  | 1.74<br>1.72 |    | 1        | 100<br>100 | 1.06         | ####<br>####  |      | 223.7<br>219.7 | 0.89         | Infin.           | 0.000 | 0.707<br>0.705 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 48.88          | 298.38           | 3.16         | 1.06         | 110        | 1.790          | 0.765          | 1.06         | 0.51         | 0.76         | 213.83           | 1.69         |    | i        | 100        | 1.03         | ####          | 1.00 | 221.3          | 0.89         | Infin.           | 0.000 | 0.704          | Non-Liq.             |                      | 0.00         |
| 49.05<br>49.21 | 325.89<br>362.41 | 3.09         | 0.95         | 110<br>110 | 1.794<br>1.798 | 0.763<br>0.762 | 0.95<br>0.84 | 0.50<br>0.50 | 0.77<br>0.77 |                  | 1.63<br>1.55 |    | 1        | 100<br>100 | 1.00         | ####<br>####  |      | 236.1<br>262.4 | 0.89         | Infin.<br>Infin. | 0.000 | 0,703          | Non-Liq.             |                      | 0.00         |
| 49.38          | 375,59           | 3.02         | 0.80         | 110        | 1.802          | 0.760          | 0.81         | 0.50         | 0.77         | 270.73           | 1.53         |    | 1        | 100        | 1.00         | ####          |      | 271.7          | 0.89         | Infin.           | 0.000 | 0.702          | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 49.54<br>49.70 | 373.37<br>359.81 | 2.95         | 0.79         | 110<br>110 | 1.806<br>1.810 | 0.758<br>0.757 | 0.79<br>0.80 | 0.50<br>0.50 | 0.77<br>0.76 |                  | 1.53<br>1.54 |    |          |            | 1.00         | ####          |      |                | 0.89         | Infin.           | 0.000 | 0.700          | Non-Liq.             |                      | 0.00         |
| 49.87          | 336.99           | 2.78         | 0.82         | 110        | 1.813          | 0.755          | 0.83         | 0.50         | 0.76         |                  | 1.57         |    |          |            | 1.00         | ####<br>####  |      | 259.7<br>242.9 | 0.89         | Infin.<br>Infin. | 0.000 | 0.699<br>0.698 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 50.03<br>50.20 | 346.15<br>381.96 | 2.56<br>2.51 | 0.74         | 110<br>110 | 1,817<br>1,821 | 0.753<br>0.752 | 0.74         | 0.50<br>0.50 | 0.76<br>0.76 |                  | 1.53<br>1.46 |    |          |            | 1.00         | ####          |      |                | 0.88         | Infin:           | 0.000 | 0.696          | Non-Liq.             |                      | 0.00         |
| 50.36          | 392.72           | 2.85         | 0.73         | 110        |                | 0.750          | 0.73         | 0.50         | 0.76         |                  | 1.49         |    |          |            | 1.00         | ####<br>####  |      |                | 0.88<br>0.88 | Infin.<br>Infin. | 0.000 | 0.695<br>0.694 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 50.52<br>50.69 | 396.83<br>396.75 | 2.89<br>3.02 | 0.73         | 110        | 1.829          | 0.748          | 0.73         | 0.50         | 0.76         |                  | 1.49         |    |          |            | 1.00         | ####          |      |                | 88.0         | Infin.           | 0.000 | 0.693          | Non-Liq.             | Non-Liq.             | 0.00         |
| 50.85          | 407 28           | 3.02         | 0.74         | 110<br>110 |                | 0.747<br>0.745 | 0.76<br>0.74 | 0.50<br>0.50 | 0.76<br>0.76 |                  | 1.50         |    |          |            | 1.00         | ####<br>####  |      |                | 88.0<br>88.0 | Infin.<br>Infin. | 0.000 | 0.692<br>0.691 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 51.02          | 402.29           | 3.32         | 0.83         | 110        |                | 0.743          | 0.83         | 0.50         | 0.76         |                  | 1.52         |    |          |            | 1.00         | ####          |      |                | 0.88         | Infin.           | 0.000 | 0.689          | Non-Liq.             | Non-Liq.             | 0.00         |
| 51.18<br>51.35 | 394.50<br>393.59 | 3.33         | 0.84         | 110<br>110 |                | 0.742<br>0.740 | 0.85<br>0.81 | 0.50<br>0.50 | 0.76<br>0.76 |                  | 1.54<br>1.52 |    |          |            | 1.00         | ####<br>####  |      |                | 0.88         | Infin<br>Infin   | 0.000 | 0.688<br>0.687 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 51.51          | 390.67           | 3.12         | 0.80         | 110        |                | 0.738          | 0.80         | 0.50         | 0.76         |                  | 1.52         |    |          |            | 1.00         | ####          | 1.00 | 278.8          | 0.87         | Infin.           | 0.000 | 0.686          | Non-Liq.             | Non-Liq.             | 0.00         |
| 51.67<br>51.84 | 388.71<br>368.01 | 2.96<br>2.86 | 0.76         | 110<br>110 |                | 0.737<br>0.735 | 0.76<br>0.78 |              | 0.75<br>0.75 |                  | 1.51         |    |          |            | 1.00         | ####<br>####  |      |                | 0.87<br>0.87 | Infin.           | 0.000 | 0.685<br>0.684 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 52.00          | 352.83           | 2.71         | 0.77         | 110        | 1.864          | 0.733          | 0.77         | 0.50         | 0.75         | 249.91           | 1.54         |    | 1        | 100        | 1.00         | ####          | 1.00 | 250.8          | 0.87         |                  | 0,000 | 0.682          | Non-Liq.             |                      | 0.00         |
| 52.17<br>52.33 | 339.28<br>334.38 | 2.70<br>2.52 | 0.80         | 110<br>110 |                |                | 0.80<br>0.76 | 0.00         | 0.75<br>0.75 |                  | 1.57<br>1.55 |    |          |            | 1.00         | ####<br>####  |      | 240.9<br>237.2 | 0.87<br>0.87 | Infin.<br>Infin. | 0.000 | 0.681<br>0.680 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 52.49          | 338.19           | 2.48         | 0.73         | 110        | 1.876          | 0.728          | 0.74         | 0.50         | 0.75         | 238.72           | 1.54         |    | 1        | 100        | 1.00         | ####          | 1.00 | 239.6          | 0.87         | Infin.           | 0.000 | 0.679          | Non-Liq.             |                      | 0.00         |
| 52.66<br>52.82 | 343.61<br>346.70 | 2.50<br>2.63 | 0.73         | 110<br>110 |                |                | 0.73<br>0.76 |              | 0.75<br>0.75 |                  | 1.53<br>1.54 |    |          |            | 1.00         | ####<br>####  |      | 243.2<br>245.2 |              |                  | 0.000 | 0.678<br>0.677 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 52.99          | 356.95           | 2.69         | 0.75         | 110        | 1.888          | 0.724          | 0.76         | 0.50         | 0.75         |                  | 1.53         |    |          |            | 1.00         | ####          |      | 252.2          |              |                  | 0.000 | 0.676          | Non-Liq.             |                      | 0.00         |
| 53.15          | 371.38<br>388.05 | 2.91<br>3.41 | 0.78<br>0.88 | 110<br>110 |                |                | 0.79         |              | 0.75<br>0.75 |                  | 1.53<br>1.56 |    |          |            | 1.00         | ####          |      | 262.2<br>273.7 |              |                  | 0.000 | 0.674          | Non-Liq.             |                      | 0.00         |
| 53.48          | 350.81           | 3.06         | 0.87         | 110        |                |                | 0.88         |              | 0.75         |                  | 1.59         |    |          |            | 1.00         | ####          |      |                | 0.86         |                  | 0.000 | 0.673<br>0.672 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 53.64<br>53.81 | 345.68<br>342.94 | 2.79<br>2.87 | 0.81         | 110<br>110 |                |                | 0.81<br>0.84 |              | 0.75         |                  | 1.57         |    |          |            | 1.00         | ####          |      | 243.2          |              |                  | 0.000 | 0,671          | Non-Liq.             |                      | 0.00         |
| 53.97          | 347.41           | 2.83         | 0.81         | 110        |                |                | 0.82         |              |              |                  | 1.58<br>1.57 |    |          |            | 1.00         | ####<br>####  |      |                | 0.86<br>0.86 |                  | 0.000 | 0.670<br>0.669 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 54.13          | 347.69<br>347.55 | 3.06<br>3.09 | 0.88         | 110        |                |                | 0.88         |              | 0.74         |                  | 1.59         |    |          |            | 1.00         | ####          |      |                | 0.86         | Infin.           | 0.000 | 0.667          | Non-Liq.             | Non-Liq.             | 0.00         |
| 54.30<br>54.46 | 345.11           | 3.01         | 0.89         | 110<br>110 |                |                | 0.89         |              | 0.74<br>0.74 |                  | 1.60<br>1.59 |    |          |            | 1.00         | ####          |      |                | 0.86<br>0.86 |                  | 0.000 | 0.666<br>0.665 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 54.63          | 336.26           | 2.94         | 0.87         | 110        |                |                | 0.88         | 0.50         | 0.74         | 234,17           | 1.60         |    | 1        | 100        | 1.00         | ####          | 1.00 | 235.0          | 0.86         | Infin.           | 0.000 | 0.664          | Non-Liq.             | Non-Liq              | 0.00         |
| 54.79<br>54.95 | 331.85<br>330.23 | 2.87         | 0.86         | 110<br>110 |                |                | 0.87<br>0.86 |              |              |                  | 1.60<br>1.60 |    |          |            | 1.00<br>1.00 | ####<br>####  |      |                | 0.86<br>0.86 |                  | 0.000 | 0.663<br>0.662 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 55.12          | 319,45           | 2.55         | 0.80         | 110        | 1.938          | 0.703          | 08.0         | 0.50         | 0.74         | 221.72           | 1.59         |    | 1        | 100        | 1.00         | #####         | 1.00 | 222,5          | 0.86         | Infin.           | 0.000 | 0.661          | Non-Liq.             |                      | 0.00         |
| 55.28<br>55.45 | 307.70<br>302.76 | 2.09<br>1.94 | 0.68         | 110<br>110 |                |                | 0.68<br>0.64 |              |              |                  | 1.55<br>1.54 |    |          |            | 1.00<br>1.00 | ####<br>####  |      |                | 0.85<br>0.86 |                  | 0.000 | 0,659<br>0.658 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 55.61          | 284,61           | 1.51         | 0.53         | 110        | 1.950          | 0.698          | 0.53         | 0.50         | 0.74         | 196.79           | 1.51         |    |          |            | 1.00         | ####          |      | 197.5          |              |                  | 0.000 | 0.657          | Non-Liq.             |                      | 0.00         |
| 55.77<br>55.94 | 294.51<br>280.07 | 1.35<br>1.03 | 0.46         | 110<br>110 |                |                | 0.46<br>0.37 |              |              |                  | 1.46         |    |          |            | 1.00         | ####          |      | 204.2          |              |                  | 0.000 | 0.656          | Non-Liq.             |                      | 0.00         |
| 56.10          | 225,15           | 1.83         | 0.81         | 110        | 1,962          | 0.694          | 0.82         | 0.52         | 0.74         |                  | 1.42<br>1.71 |    |          |            | 1.00<br>1.05 | ####<br>####  |      | 194.0<br>160.7 | 0.85         |                  | 0.000 | 0.655<br>0.654 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 56.27<br>56.43 | 117.85<br>54.87  | 2.59<br>1.79 | 2.20<br>3.26 | 110<br>110 |                |                | 2.23<br>3.38 |              | 0.65         |                  | 2.25         |    |          | 63         | 1.80         |               |      | 129.2          | 0.88         |                  | 0.248 | 0.653          | 0.38                 | 96%                  | 1.14         |
| 56.59          | 32.82            | 0.74         | 2.25         | 110        | 1.974          |                | 3.38<br>2.40 |              | 0.61<br>0.60 |                  | 2.65<br>2.74 |    | 0        |            |              |               |      |                | 0.92<br>0.92 |                  |       | 0.652<br>0.650 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 56.76<br>56.92 | 25.50<br>20.56   | 0.61<br>0.82 | 2.38<br>3.98 | 110        |                |                | 2.58         |              | 0.58         |                  | 2.87         |    | 0        |            |              |               |      |                | 0.92         |                  |       | 0.649          | Non-Liq.             | Non-Lig              | 0.00         |
| 57.09          | 35.90            | 0.82         | 2.22         | 110<br>110 |                |                | 4.40<br>2.35 |              | 0.55<br>0.60 |                  | 3.10<br>2.71 |    | 0        |            |              |               |      |                | 0.92<br>0.92 |                  |       | 0.648<br>0.647 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 57.25<br>57.41 | 57.52            | 0.96         | 1.67         | 110        | 1.989          | 0.683          | 1.73         | 0.74         | 0.63         | 32.91            | 2.44         |    | 1        | 31 :       | 2.47         | ·             | 1.00 | 81.4           | 0.92         | 0.130            | 0.120 | 0.646          | 0.19                 | 100%                 | 1.81         |
| 57.41<br>57.58 | 35.14<br>22.41   | 0.94<br>0.81 | 2.68<br>3.61 | 110<br>110 |                |                |              |              | 0.59<br>0.56 |                  | 2.77<br>3.04 |    | 0        |            |              |               |      |                | 0.92<br>0.92 |                  |       | 0.645<br>0.644 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 57.74          | 20.05            | 0.55         | 2.73         | 110        | 2.001          | 0.679          | 3.04         | 0.91         | 0.56         | 9.53             | 3.02         |    | 0        |            |              |               |      |                | 0.92         |                  |       | 0.643          | Non-Liq.             | Non-Liq              | 0.00         |
| 57.91<br>58.07 | 18.79<br>18.85   |              | 2.88<br>3.00 | 110<br>110 |                |                |              |              | 0.55<br>0.55 |                  | 3.06<br>3.07 |    | 0        |            |              |               |      |                | 0.92<br>0.92 |                  |       | 0.642<br>0.641 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| ii.            |                  |              |              |            |                |                |              |              |              | 96               |              |    |          |            |              |               |      |                | 20           |                  |       |                |                      |                      |              |

| Layer  | Tip    | Friction | Friction | Total   | Eff.Stress | s     |      |      |      |          |      | e   | Liquef.  | Rei    |      |     |      | Clean |      |       |       | Induced | Liquefac. |                | Volumetric |
|--------|--------|----------|----------|---------|------------|-------|------|------|------|----------|------|-----|----------|--------|------|-----|------|-------|------|-------|-------|---------|-----------|----------------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt | at Midpt   |       |      |      |      | Correcte | d    | e i | Suscept  | Dens,  |      | Н   |      | Sand  |      |       | EQ    | M=7.5   | Safety    | Probab.        | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)   | p'o (tsf)  | rd    | F    | n    | Co   | Qc1n     | lc   | õ   | (0 or 1) | Dr (%) | Kc   | (m) | KH   | Qc1n  | Κσ   | CRR75 | CRR   | CSR     | Factor    | P <sub>L</sub> | (%)        |
| 58.23  | 17.52  | 0.53     | 3.01     | 110     | 2.013      | 0.675 | 3 40 | 0.94 | 0,55 | 8.01     | 3.11 |     | 0        |        |      |     |      |       | 0,92 |       |       | 0.640   | Non-Liq.  | Non-Liq.       | 0.00       |
| 58,40  | 18,20  | 0.44     | 2.44     | 110     | 2.016      | 0.673 | 2.74 | 0.92 | 0.55 | 8.46     | 3,04 |     | 0        |        |      |     |      |       | 0.92 |       |       | 0.638   | Non-Liq.  | Non-Liq.       | 0.00       |
| 58,56  | 18.28  | 0.56     | 3.06     | 110     | 2.020      | 0.672 | 3.44 | 0.94 | 0.55 | 8.39     | 3,09 |     | 0        |        |      |     |      |       | 0 92 |       |       | 0.637   | Non-Liq.  | Non-Liq.       | 0.00       |
| 58.73  | 23.81  | 0.80     | 3.36     | 110     | 2.024      | 0.671 | 3.67 | 0.91 | 0.55 | 11.42    | 3,00 |     | 0        |        |      |     |      |       | 0,91 |       |       | 0,636   | Non-Liq.  | Non-Liq.       | 0.00       |
| 58.89  | 41.12  | 1.24     | 3.02     | 110     | 2,028      | 0.669 | 3.18 | 0.83 | 0.58 | 21.51    | 2,75 |     | 0        |        |      |     |      |       | 0.91 |       |       | 0,635   | Non-Liq.  | Non-Liq.       | 0.00       |
| 59.06  | 86.65  | 1.81     | 2.08     | 110     | 2.032      | 0.668 | 2.13 | 0.71 | 0.63 | 50.20    | 2.35 |     | 1        | 48     | 2,13 |     | 1.00 | 106.7 | 0.91 | 0,193 | 0,176 | 0,634   | 0.28      | 99%            | 1.41       |
| 59 22  | 119.37 | 1.93     | 1.62     | 110     | 2.036      | 0.666 | 1.64 | 0.66 | 0.65 | 72.21    | 2.16 |     | 1        | 63     | 1,57 |     | 1.00 | 113.4 | 0.87 | 0.216 | 0,188 | 0,633   | 0.30      | 98%            | 1.32       |
| 59,38  | 142,80 | 2,30     | 1.61     | 110     | 2 040      | 0 665 | 1.63 | 0.64 | 0.66 | 87.60    | 2.09 |     | 1        | 71     | 1.45 |     | 1.00 | 126,6 | 0.83 | 0.269 | 0.224 | 0,632   | 0.35      | 97%            | 1.16       |
| 59,55  | 118,50 | 3,06     | 2.58     | 110     | 2,044      | 0.664 | 2,62 | 0.70 | 0.63 | 69.37    | 2.31 |     | 1        | 62     | 1.98 |     | 1.00 | 137.6 | 0.87 | 0.322 | 0.281 | 0,631   | 0.45      | 94%            | 1.04       |
| 59.71  | 77.32  | 3.45     | 4.46     | 110     | 2.048      | 0.662 | 4.58 | 0.80 | 0.59 | 41.98    | 2.64 |     | 0        |        |      |     |      |       | 0.91 |       |       | 0.630   | Non-Liq.  | Non-Lig.       | 0.00       |
| 59,88  | 39.16  | 2.67     | 6.81     | 110     | 2.052      | 0.661 | 7.19 | 0.91 | 0.55 | 19.16    | 3.02 |     | 0        |        |      |     |      |       | 0.91 |       |       | 0.629   | Non-Liq.  | Non-Lig        | 0.00       |
| 60.04  | 26.72  | 1.42     | 5.31     | 110     | 2 055      | 0.660 | 5.75 | 0.93 | 0.54 | 12.53    | 3.09 |     | 0        |        |      |     |      |       | 0.91 |       |       | 0,628   | Non-Liq.  | Non-Liq.       | 0.00       |
| 60.20  | 20.01  | 0.81     | 4.05     | 110     | 2.059      | 0.658 | 4.51 | 0.95 | 0.53 | 9.02     | 3.14 |     | 0        |        |      |     |      |       | 0.91 |       |       | 0.627   | Non-Liq.  | Non-Liq        | 0.00       |
| 60,37  | 19.72  | 0.00     | 0.01     | 110     | 2.063      | 0.657 | 0.01 | 0.81 | 0.58 | 9.69     | 2.69 |     | 0        |        | 1.00 |     |      |       | 0.91 |       |       | 0.626   | Non-Liq.  | Non-Liq.       | 0.00       |
| 60,53  | 22.97  | 0.00     | 0.00     | 110     | 2,067      | 0.656 | 0.00 | 0.80 | 0,58 | 11.54    | 2.65 |     | 0        |        | 1.00 |     |      |       | 0.91 |       |       | 0.625   | Non-Lia.  |                | 0.00       |

## CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

|                |                  | Project:<br>Job No: |              | _          | hool No.           | 8              |              | Me           | thods:       | Liquefac                 |              |      |         | -          |              |                    | •                |                    |              |                    | & Wride        | )  |                      |  | Total<br>Liquefied |
|----------------|------------------|---------------------|--------------|------------|--------------------|----------------|--------------|--------------|--------------|--------------------------|--------------|------|---------|------------|--------------|--------------------|------------------|--------------------|--------------|--------------------|----------------|--|----------------------|--|--------------------|
|                |                  |                     | 8/14/20      |            |                    |                |              |              |              | Dry San                  |              |      |         |            |              |                    |                  |                    |              |                    |                |  |                      |  | Thickness          |
| FARTH          |                  | unding:<br>INFORM   |              |            | Plot:              | 2              |              | Induce       | d CSR        | (M=7.5):                 | = 0.69       | 5*P  | GA*(no  | /n'n)*rd   | MSE          |                    |                  |                    |              |                    |                |  |                      |  | (feet)<br>3.8      |
|                |                  | agnitude:           |              | 7.5        |                    |                |              |              |              | ind Qc1n                 |              |      |         | ,p 0, 10   |              | SF =               | CRR <sub>7</sub> | <sub>5</sub> *Κσ/C | SR           |                    |                |  |                      | Probab   |                    |
|                |                  | PGA, g:             |              | 0,75       |                    |                |              |              |              |                          |              |      |         |            | Us           | e Toki             | matsu            | & Seed             | (0) or       | Ishihara           | a &Yosh        | mine (1):  | 0                    | Avg  | Induced            |
| -              | C                | MSF:<br>WT, feet:   | 1.30         |            | -                  |                | _            |              |              | led soils:               |              | pc   |         |            |              |                    |                  |                    | u:- or       |                    |                | uired SF:  | 1.50                 | 5%   | Subsidence         |
|                |                  | WT, feet:           | 8.0          |            |                    |                |              | _            |              | ted soils:<br>ble soils: |              | pc   | 1       | Limi       | ting lc      | for K <sub>H</sub> | 2.0              |                    |              |                    |                | Layers:  |                      | Max<br>100%  | (inches)<br>0.6    |
| Layer          | Tip              | Friction            | Friction     | Total      | Eff Stress         |                |              |              |              | DITE SERVICE             |              | ge   | Lique   |            | 1110%        |                    | -                | Clean              | -            |                    |                | A STATE OF THE PARTY OF THE PAR | Liquefac.            | The same of the sa | Volumetric         |
| Depth          |                  | Fs                  | Ratio        |            | at Midpt.          |                | 21           | _            |              | Correcte                 |              | Veri |         | ot Dens    |              | H                  |                  | Sand               | ***          | 000                | EQ             | M=7.5  | Safety               | Probab.  | Strain             |
| (feet)<br>0.16 | (tsf)<br>8.00    | (tsf)<br>0.09       | 1.13         | (pcf)      | p'o (tsf)<br>0.009 | rd<br>1.000    | 1.13         | n<br>0.81    | 1.70         | Qc1n<br>12.84            | 1c<br>2.68   | 0    | (0 or 1 | ) Dr (%)   | Kc           | (m)                | KH               | Qc1n               | 1,00         | CRR <sub>7.5</sub> | CRR            | 0.485  | Non-Lig              | P <sub>L</sub><br>Non-Lig  | 0.00               |
| 0.33           | 11,37            | 0.11                | 0.97         | 110        | 0,018              | 1.000          | 0.97         | 0.76         | 1.70         | 18,24                    | 2,52         |      | 1       | 6          | 2.86         |                    | 1.00             | 52.1               | 1.00         | 0.093              | 0.093          | 0,485  | Non-Liq.             |  | 0.00               |
| 0.49           | 14.06<br>15.85   |                     | 1.00         | 110<br>110 |                    | 1.000          | 1.00<br>0.90 | 0.74<br>0.72 | 1.70<br>1.70 | 22.55<br>25.41           | 2 44         |      | 1       | 15<br>20   | 2,50         |                    | 1.00             | 56.3<br>56.4       | 1.00         | 0.097              | 0.097          | 0.485  | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 0.82           | 15.82            | 0.14                | 0.88         | 110        | 0.045              | 1.000          | 0.89         | 0.72         | 1.70         | 25.35                    | 2.37         |      | 1       | 20         | 2.21         |                    | 1.00             | 55,9               | 1.00         | 0.096              | 0.096          | 0.485  | Non-Liq.             |  | 0.00               |
| 0.98           | 15.42<br>12.24   |                     | 0.78         | 110<br>110 |                    | 1,000          | 0.79<br>0.81 | 0.72<br>0.74 | 1.70<br>1.70 | 24.69<br>19.57           | 2.36<br>2.45 |      | 1       | 19<br>9    | 2.15         |                    | 1.00             | 53.1<br>49.8       | 1.00         | 0.094              | 0.094          | 0.485<br>0.484   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 1.31           | 12.24            | 0.10                | 0.81         | 110        | 0.072              | 0,999          | 0.81         | 0.74         | 1.70         | 19.55                    | 2,45         |      | 4       | 9          | 2.55         |                    | 1.00             | 49.8               | 1.00         | 0.092              | 0.092          | 0.484  | Non-Liq.             |  | 0.00               |
| 1.48           | 10.64<br>11.63   | 0.13                | 1.17         | 110<br>110 |                    | 0.999          | 1.18<br>1.73 | 0.78<br>0.80 | 1.70<br>1.70 | 16.97<br>18.54           | 2,59<br>2,64 |      | 1       | 3          | 3,25         |                    | 1.00             | 55.1               | 1.00         | 0.096              | 0.096          | 0.484<br>0.484   | Non-Liq.             |  | 0.00<br>0.00       |
| 1.80           | 19.13            | 0.29                | 1.53         | 110        |                    | 0.998          | 1.53         | 0.74         | 1.70         | 30.58                    | 2.43         |      | 1       | 28         | 2.45         |                    | 1.00             | 74.9               | 1.00         | 0_119              | 0.119          | 0.484  | Non-Liq.<br>Non-Liq. |  | 0.00               |
| 1.97<br>2.13   | 35.11<br>43.24   | 0.52                | 1.48<br>1.40 | 110<br>110 |                    | 0.998<br>0.997 | 1.48<br>1.40 | 0.67<br>0.65 | 1.70<br>1.70 | 56.24<br>69.29           | 2.21         |      | 1       | 53<br>62   | 1.70<br>1.50 |                    | 1.00             | 95.4<br>104.3      | 1.00         | 0.161<br>0.185     | 0.161<br>0.185 | 0.484<br>0.483   | Non-Liq.             | Non-Liq.   | 0.00<br>0.00       |
| 2,30           | 43,08            | 0.62                | 1.43         | 110        | 0,126              | 0.997          | 1.44         | 0.65         | 1.70         | 69.02                    | 2,13         |      | 1       | 61         | 1.52         |                    | 1.00             | 105.0              | 1.00         | 0.188              | 0.188          | 0.483  | Non-Liq.<br>Non-Liq. |  | 0.00               |
| 2.46<br>2.62   | 41,08<br>38,58   | 0.60<br>0.56        | 1.46<br>1.46 | 110<br>110 |                    | 0.996<br>0.996 | 1.46<br>1.46 | 0.65<br>0.66 | 1.70<br>1.70 | 65.79<br>61.76           | 2,16<br>2,18 |      | 1       | 59<br>57   | 1.56<br>1.61 |                    | 1.00             | 102.9<br>99.6      | 1.00         | 0.181<br>0.172     | 0.181<br>0.172 | 0.483<br>0.483   | Non-Liq.             |  | 0.00               |
| 2.79           | 35.25            | 0.53                | 1,50         | 110        | 0.153              | 0.996          | 1.50         | 0.67         | 1.70         | 56.39                    | 2,22         |      | 1       | 53         | 1.70         |                    | 1.00             | 96.1               | 1.00         | 0.163              | 0.163          | 0.483  | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 2.95<br>3.12   | 32.60<br>29.61   | 0.49<br>0.45        | 1,50<br>1,52 | 110<br>110 |                    | 0.995<br>0.995 | 1.51<br>1.53 | 0.68<br>0.69 | 1.70<br>1.70 | 52 12<br>47 30           | 2,24         |      | 1       | 50<br>46   | 1.78<br>1.88 |                    | 1.00             | 92.6<br>89.0       | 1.00         | 0.154<br>0.146     | 0.154<br>0.146 | 0.482<br>0.482   | Non-Lig.<br>Non-Lig. |  | 0.00<br>0.00       |
| 3.28           | 26.41            | 0.40                | 1.51         | 110        |                    | 0.994          | 1.52         | 0.70         | 1.70         | 42.15                    | 2.32         |      | i       | 41         | 2.01         |                    | 1.00             | 84.6               | 1.00         | 0.136              | 0.136          | 0.482  | Non-Liq.             |  | 0.00               |
| 3.44           | 23.64<br>21.08   | 0.34                | 1,44         | 110<br>110 |                    | 0.994<br>0.994 | 1.45<br>1.37 | 0.71<br>0.72 | 1.70<br>1.70 | 37.68<br>33.55           | 2.34         |      | 1       | 36<br>32   | 2.10         |                    | 1.00             | 79.2<br>73.8       | 1.00         | 0.126              | 0.126<br>0.117 | 0.482<br>0.482   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 3.77           | 18.23            | 0.30                | 1.67         | 110        |                    | 0.993          | 1.69         | 0.75         | 1.70         | 28.96                    | 2.48         |      | 1       | 25         | 2.65         |                    | 1.00             | 76.6               | 1.00         | 0.122              | 0.122          | 0.482  | Non-Liq.             |  | 0.00               |
| 3.94<br>4.10   | 15.34<br>12.99   | 0.30                | 1.98         | 110<br>110 |                    | 0.993          | 2.00<br>2.77 | 0.78<br>0.83 | 1.70<br>1.70 | 24.30<br>20.51           | 2.58         |      | 0       | 18         | 3 21         |                    | 1.00             | 78,0               | 1,00         | 0.124              | 0.124          | 0.481<br>0.481   | Non-Liq.<br>Non-Liq. |  | 0.00               |
| 4.27           | 11,82            | 0.38                | 3,20         | 110        | 0.235              | 0.992          | 3.26         | 0.85         | 1.70         | 18.62                    | 2.80         |      | 0       |            |              |                    |                  |                    | 1.00         |                    |                | 0.481  | Non-Liq.             |  | 0.00               |
| 4.43           | 10.34            | 0.34<br>0.24        | 3.30         | 110<br>110 |                    | 0.992<br>0.991 | 3.38<br>2.08 | 0.87<br>0.81 | 1.70<br>1.70 | 16.22<br>18.70           | 2.86<br>2.68 |      | 0       |            |              |                    |                  |                    | 1.00         |                    |                | 0.481<br>0.481   | Non-Liq.             |  | 0.00<br>0.00       |
| 4.76           | 26.79            | 0.25                | 0,93         | 110        | 0.262              | 0,991          | 0.94         | 0.67         | 1.70         | 42.63                    | 2.19         |      | 1       | 41         | 1.65         |                    | 1.00             | 70.3               | 1.00         | 0,112              | 0,112          | 0.480  | Non-Liq.<br>Non-Liq. |  | 0.00               |
| 4.92<br>5.09   | 35.67<br>41.25   | 0.30                | 0.84         | 110<br>110 |                    | 0.991<br>0.990 | 0.85<br>0.89 | 0.63<br>0.61 | 1.70<br>1.70 | 56.88<br>65.83           | 2.06         |      | 1       | 53<br>59   | 1.39<br>1.33 |                    | 1.00             | 79.2<br>87.7       | 1.00         | 0.126<br>0.143     | 0,126<br>0,143 | 0.480  | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 5,25           | 44.28            | 0.41                | 0.92         | 110        | 0,289              | 0.990          | 0.93         | 0.61         | 1_70         | 70.69                    | 2.01         |      | 1       | 62         | 1.31         |                    | 1.00             | 92.7               | 1.00         | 0.154              | 0.154          | 0.480  | Non-Liq.             |  | 0.00               |
| 5.41<br>5.58   | 46.60<br>50.22   | 0.44<br>0.47        | 0.94         | 110<br>110 |                    | 0.989<br>0.989 | 0.95<br>0.94 | 0.61<br>0.60 | 1.70<br>1.70 | 74.40<br>80.20           | 2.00<br>1.97 |      | 1       | 65<br>68   | 1.30         |                    | 1.00             | 96.8<br>101.4      | 1.00         | 0.164<br>0.177     | 0.164          | 0.480<br>0.479   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 5.74           | 54.67            | 0.47                | 0.87         | 110        | 0,316              | 0.989          | 0.87         | 0.58         | 1.70         | 87.34                    | 1,92         |      | 1       | 71         | 1,21         | 1,10               | 1.00             | 105.9              | 1.00         | 0.190              | 0,190          | 0.479  | Non-Liq.             |  | 0.00               |
| 5,91<br>6.07   | 56 65<br>56 48   | 0.48                | 0.85         | 110<br>110 |                    | 0.988<br>0.988 | 0.86<br>0.90 | 0.58<br>0.58 | 1.70<br>1.70 | 90.50<br>90.22           | 1.90         |      | 1       | 73<br>73   | 1.19         |                    |                  | 108.2              | 1.00         | 0.198<br>0.201     | 0.198          | 0.479<br>0.479   | Non-Liq.<br>Non-Liq. |  | 0.00               |
| 6.23           | 58,52            | 0.53                | 0.91         | 110        | 0.343              | 0.988          | 0.92         | 0.58         | 1.70         | 93.48                    | 1,91         |      | 1       | 74         | 1,20         | 1.25               | 1.00             | 112,4              | 1.00         | 0.212              | 0.212          | 0.479  | Non-Liq.             |  | 0.00               |
| 6.40           | 61.73<br>65.05   | 0.57<br>0.55        | 0.92         | 110<br>110 |                    | 0.987<br>0.987 | 0.93<br>0.85 | 0.58<br>0.56 | 1.70<br>1.70 | 98.62<br>103.94          | 1.90<br>1.85 |      | 1       | 76<br>78   | 1.18<br>1.15 |                    |                  | 117.2<br>119.6     | 1.00         | 0.230              | 0.230          | 0.479<br>0.478   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 6.73           | 67,42            | 0.56                | 0.83         | 110        | 0.370              | 0.986          | 0.84         | 0.56         | 1.70         | 107,74                   | 1.84         |      | 1       | 80         | 1.13         | 1.40               | 1,00             | 122.6              | 1.00         | 0,251              | 0.251          | 0.478  | Non-Liq.             | Non-Liq  | 0.00               |
| 6.89<br>7.05   | 72.04<br>79.98   | 0.64<br>0.56        | 0.89         | 110<br>110 |                    | 0.986<br>0.986 | 0.89<br>0.71 | 0.56<br>0.53 |              | 115.15<br>127.76         | 1.83<br>1.73 |      | 1       | 83<br>87   |              |                    | 1.00<br>1.00     |                    |              | 0.287<br>0.314     | 0.287<br>0.314 | 0.478<br>0.478   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 7.22           | 84,69            | 0.74                | 0.87         | 110        | 0.397              | 0.985          | 0.88         | 0.54         | 1.70         | 135,25                   | 1.77         |      | 1       | 89         | 1.09         | 1.55               | 1.00             | 147.6              | 1.00         | 0.379              | 0,379          | 0.478  | Non-Liq.             | Non-Liq.   | 0.00               |
| 7.38<br>7.55   | 84.27<br>88.99   | 0.71                | 0.84         | 110<br>110 |                    | 0,985<br>0,985 | 0.84<br>0.81 | 0.54         | 1.67<br>1.64 |                          | 1.77         |      | 1       | 89<br>90   |              |                    |                  |                    | 1.00         | 0.360<br>0.378     | 0.360<br>0.378 | 0.478<br>0.477   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 7.71           | 88.99            | 0.71                | 0.80         | 110        |                    | 0.984          | 0.81         | 0.53         | 1.63         | 136,17                   | 1.75         |      | 1       | 90         | 1.07         |                    | 1.00             | 146.2              | 1,00         | 0.371              | 0.371          | 0.477  | Non-Liq.             | Non-Liq.   | 0.00               |
| 7.87<br>8.04   | 97.16<br>104.13  | 0.72<br>0.76        | 0.74         | 110<br>110 |                    | 0.984<br>0.984 | 0.74<br>0.73 | 0.52<br>0.51 | 1.59<br>1.56 | 145,34<br>153,24         | 1.70<br>1.68 |      | 1       | 92<br>95   | 1.04         |                    |                  |                    | 1.00         | 0.405<br>0.445     | 0.405<br>0.445 | 0.477<br>0.477   | Non-Liq.             |  | 0.00<br>0.00       |
| 8,20           | 109.72           | 0.85                | 0.77         | 110        | 0.451              | 0.983          | 0.78         | 0.51         | 1.55         | 159.96                   | 1.68         |      | 1       | 96         | 1.03         | 1.85               | 1.00             | 164.9              | 1.00         | Infin.             | 0.000          | 0.481  | Non-Liq.             | Non-Liq.   | 0.00               |
| 8.37<br>8.53   | 127.90<br>139.29 | 0.84<br>1.12        | 0.66         | 110<br>110 |                    | 0.983<br>0.982 | 0.66         | 0.50<br>0.50 | 1.52<br>1.50 | 182.65<br>197.04         | 1.59         |      | 1       | 100<br>100 | 1.00         |                    |                  |                    | 1.00         | Infin.<br>Infin.   | 0.000          | 0.486<br>0.491   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 8.69<br>8.86   | 174.32           | 1.33                | 0.76<br>0.78 | 110        |                    | 0.982          | 0.77         | 0.50         |              | 244,41                   | 1.55         |      | 1       | 100        |              |                    |                  |                    | 1.00         | Infin.             | 0.000          | 0.496  | Non-Liq.             | Non-Liq.   | 0.00               |
| 9.02           | 197.20<br>211.19 | 1.54<br>1.71        | 0.78         | 110<br>110 |                    | 0.982<br>0.981 | 0.78<br>0.81 | 0.50<br>0.50 |              |                          | 1.52<br>1.51 |      | 1       | 100<br>100 |              |                    |                  |                    | 1.00         | Infin:<br>Infin:   | 0.000          | 0.501<br>0.506   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 9.19<br>9.35   | 221.47<br>230.78 | 1.88<br>2.04        | 0.85         | 110        |                    | 0.981          | 0.85<br>0.88 | 0.50         |              |                          | 1.52         |      | 1       | 100        |              |                    |                  |                    | 1.00         | Infin:             | 0.000          | 0.510  | Non-Liq.             | Non-Liq.   | 0.00               |
| 9.51           | 234.50           | 2.16                | 0.92         | 110<br>110 |                    | 0.981<br>0.980 | 0.92         | 0.50<br>0.50 |              |                          | 1.52<br>1.53 |      | 1       | 100<br>100 |              |                    |                  | 313.3<br>315.6     | 1.00         | Infin.<br>Infin.   | 0.000          | 0.515<br>0.520   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 9.68<br>9.84   | 232.94<br>231.57 | 2.27<br>2.35        | 0.98         | 110<br>110 |                    | 0.980<br>0.980 | 0.98<br>1.02 | 0.50<br>0.50 | 1.41<br>1.40 |                          | 1.56         |      | 1       | 100        |              |                    | 1.00             | 310.8              | 1,00         | Infin.             | 0,000          | 0.524  | Non-Liq.             | Non-Liq  | 0.00               |
| 10.01          | 230.54           | 2.41                | 1.04         | 110        | 0.550              | 979            | 1.05         | 0.50         | 1.39         | 301.40                   | 1.57<br>1.59 |      | ì       | 100<br>100 |              |                    |                  | 306.4<br>302.5     | 1.00         | Infin.<br>Infin.   | 0.000          | 0.529<br>0.533   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
| 10.17<br>10.33 | 237.18<br>247.31 | 2.50<br>2.55        | 1.05         | 110<br>110 |                    | 0.979<br>0.979 | 1.06<br>1.03 | 0.50<br>0.50 |              |                          | 1.58<br>1.57 |      | 1       |            |              |                    |                  | 308.7              |              | Infin.             | 0.000          | 0.537  | Non-Liq.             | Non-Liq.   | 0.00               |
| 10.50          | 243.77           | 2.52                | 1.03         | 110        | 0.577              | 978            | 1.04         | 0.50         | 1.35         | 311.14                   | 1.58         |      | 1       | 100<br>100 |              |                    |                  | 319.4<br>312.3     |              | Infin.<br>Infin.   | 0.000          | 0 541<br>0 545   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 237.97<br>236.70 | 2.56<br>2.58        | 1.07         | 110<br>110 |                    | 0.978<br>0.978 | 1.08<br>1.09 | 0.50<br>0.50 |              |                          | 1.60<br>1.61 |      | 1       |            |              |                    |                  |                    | 1.00         | Infin.             | 0.000          | 0.550<br>0.554   | Non-Liq.             | Non-Liq.   | 0.00               |
| 10.99          | 231.19           | 3.35                | 1.45         | 110        | 0.604              | 977            | 1.45         | 0.52         | 1_34         | 291.69                   | 1.71         |      | 1       |            |              | 2.70               |                  |                    | 1.00         | Infin.<br>Infin.   | 0.000          | 0.554  | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 223.52<br>231.18 | 4.80<br>4.24        | 2.15<br>1.83 | 110<br>110 |                    | 0.977<br>0.977 | 2.15<br>1.84 | 0.56<br>0.55 |              |                          | 1.85<br>1.79 |      | 1       |            |              |                    |                  | 330.3              |              | Infin.             | 0.000          | 0.561  | Non-Liq.             | Non-Liq.   | 0.00               |
| 11.48          | 277.74           | 3.56                | 1.28         | 110        | 0.632              | 0.976          | 1.29         | 0.50         | 1.29         | 339.00                   | 1.63         |      | i       |            | 1.00         | 2.80<br>2.85       |                  | 321.9<br>340.3     | 1.00         | Infin.<br>Infin.   | 0.000          | 0.565<br>0.569   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 232.79<br>242.50 | 2.16<br>1.85        | 0.93         | 110<br>110 |                    |                | 0.93<br>0.76 | 0.50<br>0.50 |              |                          | 1.57<br>1.49 |      | 1       | 100        |              | 2.90               |                  |                    | 1.00         | Infin.             | 0.000          | 0.572  | Non-Liq.             | Non-Liq  | 0.00               |
| 11,98          | 238,61           | 2.39                | 1.00         | 110        | 0.659              | 975            | 1.00         | 0.50         |              |                          | 1.49         |      | 1       |            |              | 2.95<br>3.00       | 1.00             | 286.1              | 1.00<br>1.00 | Infin:<br>Infin:   | 0.000          | 0.576<br>0.580   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 226,91<br>230,52 | 2,22<br>2,15        | 0.98         | 110<br>110 |                    | 0.975<br>0.974 | 0.98         |              |              | 269.19<br>271.64         | 1.60         |      | 1       |            |              | 3.05<br>3.10       |                  | 270.2<br>272.7     | 1.00         | Infin.             | 0.000          | 0.583<br>0.587   | Non-Liq.             | Non-Liq  | 0.00               |
| 12,47          | 221,89           | 1.76                | 0.79         | 110        | 0.686              | 974            | 0.80         | 0.50         | 1,24         | 259.71                   | 1.54         |      | í       | 100        | 1.00         | 3,15               | 1.00             | 260.7              | 1.00         | Infin.             | 0.000          | 0.590  | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 219.46<br>210.68 |                     | 0.72         | 110<br>110 |                    |                | 0.72<br>0.67 |              |              | 255 17<br>243 34         | 1.51         |      | 1       |            |              |                    |                  | 256.1<br>244.3     |              |                    | 0.000          | 0.593<br>0.597   | Non-Liq.<br>Non-Liq. |  | 0.00<br>0.00       |
|                | 0.00             |                     |              |            |                    |                | 2.01         | 5.00         | . 20         | _ ,5,54                  |              |      | (7)     | .00        |              | 5,20               |                  | _ 17.0             |              | o and              | J., J. U.      | 0.001  | .von-Liq.            | . to: I-LIQ  | v.00               |

| Layer          | Tip              | Friction     | Friction     | Total      | Eff Stress     |                |              |              |              |                      |              | 02 | Liquef.  | Rel        |              | _            |      | Clean          |              |                    |                | Induced        | Liquefac.            |          | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|----------------------|--------------|----|----------|------------|--------------|--------------|------|----------------|--------------|--------------------|----------------|----------------|----------------------|----------|--------------|
| Depth          |                  | Fs           | Ratio        |            | at Midpt       |                |              |              |              | Corrected            | 1            |    | Suscept  |            |              | Н            |      | Sand           |              |                    | EQ             | M=7.5          | Safety               | Probab   | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n                 | lc           | ò  | (0 or 1) | Dr (%)     | Kc           | (m)          | KH   | Qc1n           | Κσ           | CRR <sub>7.5</sub> | CRR            | CSR            | Factor               | PL       | (%)          |
| 12.96          |                  | 1.35         | 0.69         | 110        |                | 0.973          | 0.70         | 0.50         | 1.22         | 224_11               | 1,54         | T  | 1        | 100        | 1,00         | 3 30         | 1.00 | 225.0          | 1,00         | Infin.             | 0.000          | 0.600          | Non-Liq.             | Non-Liq. | 0.00         |
| 13.12          | 189.89           | 1.37         | 0.72         | 110        | 0.722          | 0.973          | 0.72         | 0.50         | 1.21         | 216_47               | 1,57         |    | 1        | 100        | 1.00         | 3.35         | 1.00 |                | 1,00         | Infin.             | 0.000          | 0.603          | Non-Liq.             |          | 0.00         |
| 13.29<br>13.45 | 182,75<br>189,66 | 2.89         | 1.58<br>1.85 | 110<br>110 | 0.731<br>0.740 | 0.972<br>0.972 | 1.59<br>1.86 | 0.56<br>0.57 | 1.23<br>1.23 | 211 28<br>218 84     | 1.82<br>1.87 |    | 1        | 100<br>100 | 1.13<br>1.16 | 3.40<br>3.45 | 1.00 |                | 1,00<br>1,00 | Infin.<br>Infin.   | 0.000          | 0.606          | Non-Liq.             |          | 0.00         |
| 13.62          | 243.92           | 3.67         | 1.50         | 110        | 0.749          | 0.972          | 1.51         | 0.53         | 1.20         | 275.93               | 1.74         |    | 1        | 100        | 1.06         | 3.50         | 1.00 |                | 1.00         | Infin.             | 0.000          | 0,609<br>0,612 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 13.78          | 196.55           | 3.12         | 1.59         | 110        | 0.758          | 0.971          | 1.59         | 0.55         | 1.20         | 222 44               | 1.81         |    | 1        | 100        | 1.12         |              | 1.00 |                | 1.00         | Infin              | 0.000          | 0.615          | Non-Liq.             |          | 0.00         |
| 13,94          | 166.33           | 2.01         | 1.21         | 110        | 0.767          | 0.971          | 1.22         | 0.54         | 1.19         | 186,17               | 1.77         |    | 1        | 100        | 1.09         | 3,60         | 1.00 |                | 1.00         | Infin.             | 0.000          | 0.618          | Non-Liq.             |          | 0.00         |
| 14.11          | 168,09           | 2.05         | 1.22         | 110        | 0.776          | 0.971          | 1.22         | 0.54         | 1.18         | 186,97               | 1.77         |    | 1        | 100        | 1.09         |              | 1.00 | 204.2          | 1.00         | Infin.             | 0.000          | 0.621          | Non-Liq.             |          | 0.00         |
| 14.27<br>14.44 | 186,64<br>201,80 | 4.05<br>4.71 | 2.17         | 110<br>110 | 0.785          | 0.970          | 2.18         | 0.59         | 1.19         | 209.42               | 1,94         |    | 1        | 100        | 1.22         |              | 1.00 |                | 1.00         | Infin.             | 0,000          | 0,624          | Non-Liq.             |          | 0.00         |
| 14.60          | 281.02           | 4.40         | 1.57         | 110        | 0.794<br>0.803 | 0.970<br>0.970 | 2.34<br>1.57 | 0.59<br>0.53 | 1.18<br>1.16 | 225 11<br>306 15     | 1,94<br>1,72 |    | 1        | 100<br>100 | 1.23         | 3,75<br>3,80 | 1.00 | 278.4<br>324.0 | 1.00         | Infin.             | 0,000          | 0,627<br>0,629 | Non-Liq.             |          | 0.00         |
| 14.76          | 344 71           | 3.37         | 0.98         | 110        |                | 0.969          | 0.98         | 0.50         | 1.14         | 371.03               | 1.51         |    | 1        | 100        | 1.00         |              | 1.00 | 372.4          |              | Infin              | 0.000          | 0.632          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 14.93          | 284.50           | 2.91         | 1.02         | 110        |                | 0.969          | 1.03         | 0.50         | 1.14         | 304.37               | 1,58         |    | 1        | 100        | 1.00         |              |      |                | 1,00         | Infin              | 0.000          | 0.635          | Non-Liq.             |          | 0.00         |
| 15.09          | 313,45           | 2.95         | 0.94         | 110        |                | 0 969          | 0.94         | 0.50         | 1.13         | 333,60               | 1,52         |    | 1        | 100        | 1.00         | 3,95         | 1,00 | 334.8          | 1,00         | Infin.             | 0,000          | 0,637          | Non-Liq.             |          | 0.00         |
| 15.26          | 330.55           | 3.27         | 0.99         | 110        |                | 0.968          | 0.99         | 0.50         | 1.12         | 349.94               | 1,53         |    | 1        | 100        | 1.00         |              | 1,00 |                | 1.00         | Infin.             | 0,000          | 0.640          | Non-Liq.             |          | 0.00         |
| 15,42<br>15,58 | 347.21<br>369.08 | 3.40<br>4.35 | 0.98         | 110<br>110 |                | 0.968<br>0.967 | 0.98<br>1.18 | 0.50<br>0.50 | 1.12         |                      | 1,51<br>1,56 |    | 1        | 100<br>100 | 1.00         |              | 1.00 |                | 1.00         | Infin,             | 0,000          | 0.643          | Non-Liq.             |          | 0.00         |
| 15.75          | 398.50           | 4.30         | 1.08         | 110        |                | 0.967          | 1.08         | 0.50         | 1.11         |                      | 1,52         |    | 1        | 100        | 1.00         |              | 1.00 | 388.1<br>416.9 | 1.00         | Infin.<br>Infin.   | 0,000          | 0.645<br>0.648 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 15,91          | 418.82           | 3.93         | 0.94         | 110        |                | 0.967          | 0.94         | 0.50         | 1.10         |                      | 1.46         |    | 1        | 100        | 1.00         |              | 1.00 |                | 1.00         | Infin.             | 0,000          | 0.650          | Non-Liq.             |          | 0.00         |
| 16.08          | 410,39           | 4.19         | 1.02         | 110        | 0.884          | 0.966          | 1.02         | 0.50         | 1.09         | 423,39               | 1,49         |    | 1        | 100        | 1.00         |              | 1.00 |                | 1.00         | Infin.             | 0.000          | 0.653          | Non-Liq.             |          | 0.00         |
| 16.24          | 419.61           | 4.80         | 1.14         | 110        |                | 0.966          | 1.15         | 0.50         | 1.09         |                      | 1.53         |    | 1        | 100        | 1,00         |              | 1.00 |                | 1.00         | Infin.             | 0,000          | 0.655          | Non-Liq.             |          | 0.00         |
| 16.40<br>16.57 | 443,67           | 4.84<br>4.97 | 1.09<br>1.14 | 110        |                | 0.966          | 1.09         | 0.50         | 1.08         |                      | 1.50         |    | 1        | 100        | 1,00         |              | 1.00 | 454.9          |              | Infin.             | 0.000          | 0.657          | Non-Liq.             |          | 0.00         |
| 16.73          | 435.84           | 4.65         | 1.07         | 110<br>110 |                | 0.965<br>0.965 | 1.14<br>1.07 | 0.50<br>0.50 | 1.08<br>1.07 |                      | 1.52         |    | 1        | 100<br>100 | 1.00         |              | 1.00 |                | 1.00         | infin_             | 0.000          | 0,660          | Non-Liq.             |          | 0.00         |
| 16.90          | 448,38           | 4.22         | 0.94         | 110        |                | 0,965          | 0.94         | 0.50         | 1.07         |                      | 1.45         |    | 1        | 100        | 1.00         |              | 1.00 |                | 1.00         | Infin.             | 0.000          | 0.662<br>0.664 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 17,06          | 457,41           | 3.79         | 0.83         | 110        |                | 0.964          | 0.83         | 0.50         | 1.06         |                      | 1.40         |    | 1        | 100        | 1.00         |              | 1.00 |                | 1.00         | Infin.             | 0.000          | 0.666          | Non-Liq.             | •        | 0.00         |
| 17,22          | 450.04           | 4.42         | 0.98         | 110        |                | 0.964          | 0.99         | 0.50         | 1.06         |                      | 1.46         |    | 1        | 100        | 1.00         | 4,60         | 1.00 | 450.3          | 1.00         | Infin.             | 0.000          | 0.669          | Non-Liq.             | Non-Liq. | 0.00         |
| 17.39          | 437 15           | 4.09         | 0.94         | 110        |                | 0,963          | 0.94         | 0.50         | 1.05         |                      | 1.45         |    | 1        | 100        | 1.00         |              | 1,00 |                | 1.00         | Infin.             | 0.000          | 0.671          | Non-Liq.             |          | 0.00         |
| 17.55<br>17.72 | 447 32<br>476 04 | 4.19<br>4.81 | 0.94         | 110<br>110 |                | 0,963<br>0,963 | 0.94<br>1.01 | 0.50<br>0.50 | 1.05<br>1.04 |                      | 1.45         |    | 1        | 100<br>100 | 1.00         |              | 1.00 |                | 1.00         |                    | 0.000          | 0.673          | Non-Liq.             |          | 0.00         |
| 17.88          | 526 73           | 4.25         | 0.81         | 110        |                | 0 962          | 0.81         | 0.50         | 1.04         |                      | 1.36         |    | 1        | 100        | 1.00         |              |      |                | 1.00         |                    | 0,000          | 0.675<br>0.677 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 18.04          | 498,22           | 4.85         | 0.97         | 110        |                | 0.962          | 0.98         | 0.50         | 1.03         |                      | 1.44         |    | i        | 100        | 1.00         |              |      |                | 1.00         |                    | 0,000          | 0.679          | Non-Liq.             |          | 0.00         |
| 18.21          | 506,10           | 5.27         | 1.04         | 110        |                | 0.962          | 1.04         | 0.50         | 1.03         |                      | 1.46         |    | 1        |            | 1.00         | 4.90         | 1,00 | 492,5          | 1,00         | Infin              | 0,000          | 0.681          | Non-Liq.             | Non-Liq  | 0.00         |
| 18.37          | 512.17           | 6.70         | 1.31         | 110        |                | 0.961          | 1.31         | 0.50         | 1.02         |                      | 1,55         |    | 1        |            | 1.00         |              | 1.00 |                | 1.00         |                    | 0,000          | 0.683          | Non-Liq.             |          | 0.00         |
| 18,54<br>18,70 | 559.50<br>562.50 | 8.56<br>8.26 | 1.53<br>1.47 | 110<br>110 |                | 0.961<br>0.960 | 1.53<br>1.47 | 0.50<br>0.50 | 1.02<br>1.01 |                      | 1.59<br>1.57 |    | 1        | 100<br>100 | 1.00         |              | 1.00 | 7.1            | 1.00         |                    | 0.000          | 0.685<br>0.687 | Non-Liq.             |          | 0.00         |
| 18.86          | 559.79           | 8.82         | 1.58         | 110        |                | 0.960          | 1.58         | 0.50         | 1.01         |                      | 1.60         |    | 1        | 100        | 1.00         |              |      |                | 1.00         |                    | 0,000          | 0.689          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 19,03          | 547.34           | 8.23         | 1.50         | 110        |                | 0.960          | 1.51         | 0.50         | 1.01         |                      | 1.59         |    | 1        |            | 1.00         |              | 1.00 |                | 1.00         |                    | 0.000          | 0.691          | Non-Liq.             |          | 0.00         |
| 19.19          | 552,34           | 7.74         | 1.40         | 110        |                | 0.959          | 1.40         | 0.50         | 1.00         | 0,000                | 1.56         |    | 1        | 100        | 1,00         | 5.20         | 1.00 | 523.6          | 1.00         | Infin.             | 0.000          | 0.692          | Non-Liq.             |          | 0.00         |
| 19.36          | 492.99           | 7.25         | 1.47         | 110        |                | 0.959          | 1.47         | 0.50         | 1.00         |                      | 1.60         |    | 3        | 100        | 1,00         |              |      |                | 1.00         |                    | 0.000          | 0.694          | Non-Liq.             |          | 0.00         |
| 19.52          | 443.38<br>430.83 | 5.21<br>4.17 | 1.18         | 110<br>110 |                | 0,958<br>0,958 | 1.18<br>0.97 | 0.50         | 0.99         |                      | 1.55<br>1.49 |    | 1        | 100<br>100 | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.696          | Non-Liq.             | 5.1      | 0.00         |
| 19.85          | 411.08           | 3.30         | 0.80         | 110        |                | 0.957          | 0.80         | 0.50         | 0.98         |                      | 1.43         |    | 1        | 100        | 1.00         |              |      |                | 1.00<br>1.00 | Infin.             | 0.000          | 0.698<br>0.699 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 20.01          | 393,49           | 2.98         | 0.76         | 110        |                | 0.957          | 0.76         | 0.50         | 0.98         |                      | 1.43         |    | 1        |            | 1.00         |              |      |                | 1.00         | Infin.             | 0.000          | 0.701          | Non-Liq.             |          | 0.00         |
| 20.18          | 395,26           | 2.83         | 0.72         | 110        |                | 0.957          | 0.72         | 0.50         | 0.98         | 364,24               | 1.41         |    | 1        | 100        | 1.00         | 5.50         | 1.00 | 365.6          | 1.00         | Infin.             | 0.000          | 0.703          | Non-Liq.             |          | 0.00         |
| 20,34          | 374.51           | 2.35         | 0.63         | 110        |                | 0.956          | 0.63         | 0.50         | 0.98         |                      | 1.38         |    | 1        |            | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.704          | Non-Liq.             |          | 0.00         |
| 20,51<br>20,67 | 326.62<br>282.57 | 2.65<br>2.55 | 0.81         | 110<br>110 |                | 0.956<br>0.955 | 0.81<br>0.91 | 0.50<br>0.50 | 0.97<br>0.97 |                      | 1.51<br>1.58 |    | 1        | 100<br>100 | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.706          | Non-Liq.             |          | 0.00         |
| 20.83          | 276.78           | 3.44         | 1.24         | 110        |                | 0.955          | 1.25         | 0.52         | 0.97         |                      | 1.69         |    | 1        | 100        | 1.03         |              |      |                | 1.00         |                    | 0.000          | 0.708          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 21.00          | 278.21           | 2.80         | 1.01         | 110        |                | 0.954          | 1.01         | 0.50         | 0.97         |                      | 1.62         |    | 1        |            | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.711          | Non-Liq.             |          | 0.00         |
| 21.16          | 340.07           | 3.01         | 0.88         | 110        |                | 0.954          | 0.89         | 0.50         | 0.97         | 309,96               | 1.52         |    | 1        | 100        | 1,00         | 5.80         | 1,00 | 311,1          | 1.00         |                    | 0.000          | 0.712          | Non-Liq.             |          | 0.00         |
| 21.33          | 368.76           | 2.98         | 0.81         | 110        |                | 0.954          | 0.81         | 0.50         | 0.97         |                      | 1.47         |    | 1        |            | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.714          | Non-Liq.             |          | 0.00         |
| 21.49          | 341.22<br>390.12 | 3.31<br>3.77 | 0.97         | 110<br>110 |                | 0.953<br>0.953 | 0.97<br>0.97 | 0.50<br>0.50 | 0.96<br>0.96 |                      | 1,55<br>1.52 |    | 1        |            | 1.00         |              |      |                | 1.00         |                    | 0.000          | 0.715          | Non-Liq.             |          | 0.00         |
| 21.82          | 410.04           | 3.82         | 0.93         | 110        |                |                |              |              | 0.96         |                      | 1.49         |    | 1        |            |              | 6.00         |      | 355.2<br>372.8 | 1.00         |                    | 0.000          | 0.717<br>0.718 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 21.98          | 384.92           | 3.63         | 0.94         | 110        |                |                |              |              | 0.96         | 347.96               |              |    | 1        |            |              | 6.05         |      | 349.3          |              |                    | 0.000          | 0.719          | Non-Liq.             |          | 0.00         |
|                | 353.56           | 2.69         | 0.76         | 110        |                | 0.951          |              | 0.50         | 0.96         |                      | 1.47         |    | 1        |            |              | 6.10         |      |                | 1.00         |                    | 0.000          | 0.721          | Non-Liq.             |          | 0.00         |
|                | 330.47<br>302.85 | 2.03         | 0.62         | 110        |                |                |              | 0.50         | 0.96         |                      | 1.42         |    | 1        |            |              |              |      |                | 1.00         |                    | 0.000          | 0.722          | Non-Liq.             |          | 0.00         |
| 22.47          | 277.81           | 2.78         | 0.67<br>1.00 | 110<br>110 |                | 0.950<br>0.950 |              | 0.50<br>0.50 | 0.95<br>0.95 |                      | 1.47<br>1.63 |    | 1        |            |              |              |      | 273.2<br>250.1 |              |                    | 0.000          | 0.724<br>0.725 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
|                | 261.06           | 4.42         | 1.69         | 110        |                |                |              |              | 0.95         |                      | 1.82         |    | 160      |            |              |              |      |                | 1.00         |                    | 0.000          | 0.726          | Non-Liq.             |          | 0.00         |
|                | 275.05           | 5.35         | 1.94         | 110        |                | 0_949          | 1.95         | 0.57         | 0.94         |                      | 1.86         |    | 1        |            |              |              |      |                | 1.00         |                    | 0.000          | 0.727          | Non-Liq.             |          | 0.00         |
|                | 338.08           | 5.26         | 1.55         | 110        |                |                |              |              | 0.95         |                      | 1.73         |    |          |            |              | 6.40         | 1.00 | 319.0          | 1.00         | Infin.             | 0.000          | 0.729          | Non-Liq.             | Non-Liq. | 0.00         |
|                | 290.23<br>297.08 | 4.56<br>3.04 | 1.57<br>1.02 | 110<br>110 |                |                |              |              | 0.94<br>0.94 |                      | 1.77<br>1.62 |    |          |            |              |              |      | 280.5          |              |                    | 0.000          | 0.730          | Non-Liq.             |          | 0.00         |
|                | 303.30           | 2.81         | 0.92         | 110        |                |                |              |              | 0.94         |                      | 1.58         |    |          |            |              |              |      |                | 1.00<br>1.00 |                    | 0.000<br>0.000 | 0.731<br>0.732 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 23,79          | 309.47           | 2.71         | 0.87         | 110        |                |                |              |              |              |                      | 1.55         |    |          |            |              |              |      | 275.5          |              |                    |                | 0.733          | Non-Liq.             |          | 0.00         |
|                | 314,79           | 2.69         | 0.86         | 110        | 1.197          | 946            | 0.86         | 0.50         | 0.94         | 278,71               | 1.54         |    | 1        | 100        | 1.00         | 6.65         | 1.00 | 279.8          | 1.00         | Infin.             | 0.000          | 0.735          | Non-Liq.             | Non-Liq  | 0.00         |
|                | 323.75           | 2.59         | 0.80         | 110        |                |                |              |              |              |                      | 1.51         |    |          |            |              |              |      | 287.3          |              |                    |                | 0.736          | Non-Liq.             |          | 0.00         |
| 24.28          | 334.53<br>341.22 | 2.78<br>2.78 | 0.83         | 110<br>110 |                |                |              |              |              |                      | 1.52<br>1.51 |    |          |            |              |              |      | 296.4          |              |                    | 0.000          | 0.737          | Non-Liq.             |          | 0.00         |
| 24.61          |                  | 2.16         | 0.62         | 110        |                |                |              |              |              |                      | 1.42         |    |          |            |              |              |      | 301.8<br>305.0 | 1.00         |                    |                | 0.738<br>0.739 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 24.77          | 354.45           | 2.39         | 0.67         | 110        | 1.216          |                |              |              |              |                      | 1.43         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.740          | Non-Liq.             |          | 0.00         |
|                | 357.66           | 2.44         | 0.68         | 110        |                |                |              |              |              |                      | 1,44         |    |          |            | 1.00         | 6.95         | 1.00 | 314.9          | 1.00         | Infin.             | 0.000          | 0.741          | Non-Liq.             | Non-Liq. | 0.00         |
|                | 363.46           | 2.39         | 0.66         | 110        |                |                |              |              |              |                      | 1.42         |    |          |            |              |              |      | 319.5          |              |                    |                | 0.742          | Non-Liq.             |          | 0.00         |
| 25,26<br>25.43 |                  | 2.17         | 0.69         | 110<br>110 |                |                |              |              |              |                      | 1.38<br>1.40 |    |          |            |              | 7.05 7.10    |      | 325.4<br>331.1 | 1.00<br>1.00 |                    |                | 0.743<br>0.744 | Non-Liq.             |          | 0.00         |
| 25.59          |                  | 2.46         | 0.63         | 110        |                |                |              |              |              |                      | 1.38         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.744          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 25.75          | 392.15           | 2.61         | 0.66         | 110        | 1.240          | 939            | 0.67         | 0.50         | 0.92         | 341.36               | 1.40         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.746          | Non-Liq.             |          | 0.00         |
| 25.92          |                  | 2.62         | 0.68         | 110        |                |                |              |              |              |                      | 1.42         |    | 1        | 100        | 1.00         | 7.25         | 1.00 | 333.9          | 1.00         | Infin.             | 0.000          | 0.747          | Non-Liq.             | Non-Liq  | 0.00         |
| 26.08<br>26.25 |                  |              | 0.71         | 110        |                |                |              |              |              |                      | 1.44         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.747          | Non-Liq.             |          | 0.00         |
| 26.25          |                  |              | 0.67         | 110<br>110 |                |                |              |              |              |                      | 1.43<br>1.42 |    |          |            |              |              |      | 316.3<br>314.3 | 1.00         |                    |                | 0.748<br>0.749 | Non-Liq.             |          | 0.00         |
| 26.57          |                  |              | 0.70         | 110        |                |                |              |              |              |                      | 1.44         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.750          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 26.74          | 372.93           | 2.51         | 0.67         | 110        | 1,263          | 936            | 0.68         | 0.50         |              |                      | 1.42         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.751          | Non-Liq.             |          | 0.00         |
|                | 383.15           |              | 0.80         | 110        |                |                |              |              |              |                      | 1.47         |    |          |            |              |              | 1.00 | 331.1          | 1.00         | Infin:             | 0.000          | 0.751          | Non-Liq.             | Non-Liq. | 0.00         |
| 27.07          |                  |              | 0.76         | 110        |                |                |              |              |              |                      | 1.44         |    |          |            |              |              |      | 356.7          |              |                    |                | 0.752          | Non-Liq.             |          | 0.00         |
| 27.23<br>27.40 | 399.12           |              | 1.00         | 110<br>110 |                |                |              |              |              | 351.37 1<br>342.06 1 | 1.53<br>1.61 |    |          |            |              |              |      |                | 1.00<br>1.00 |                    |                | 0.753<br>0.754 | Non-Liq.             |          | 0.00<br>0.00 |
| 27.56          |                  |              | 0.96         | 110        |                |                |              |              |              |                      | 1.54         |    |          |            |              |              |      |                | 1.00         |                    |                | 0.754          | Non-Liq.             |          | 0.00         |
| 27.72          | 353,99           | 3.89         | 1.10         | 110        | 1.286          | 932            | 1.10         | 0.50         | 0.91         | 302.33               | 1.60         |    | 1        | 100 1      | 1,00         | 7.80 ′       | 1.00 |                | 1.00         |                    |                | 0.755          | Non-Liq.             |          | 0.00         |
| 27.89          | 386.19           | 3.37         | 0.87         | 110        | 1.290          | 931            | 0.88         | 0.50         | 0.91         | 329.43               | 1.50         |    | 1        | 100 1      | 1.00         | 7.85         | 1.00 | 330.7          | 1.00         | Infin.             | 000            | 0.756          | Non-Liq.             | Non-Lig  | 0.00         |
|                |                  |              |              |            |                |                |              |              |              |                      |              |    |          |            |              |              |      |                |              |                    |                |                |                      |          |              |

| Lay            | er Tip           | Friction     | Friction     | Total      | Eff Stress     | 5<br>5         |               |              |              |                  |              | de  | Liquef   | Rel.       |              |              |      | Clear          | 1            |                    |                | Induce         | Liquefac             |                      | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|---------------|--------------|--------------|------------------|--------------|-----|----------|------------|--------------|--------------|------|----------------|--------------|--------------------|----------------|----------------|----------------------|----------------------|--------------|
| Dep            |                  | Fs           |              |            | at Midpt       |                | 120           |              | 0.00         | Correcte         | _            | le. | Suscept  |            |              | Н            |      | Sand           |              |                    | EQ             | M=7.5          | Safety               | Probab_              | Strain       |
| (fee           |                  | (tsf)        | 1.02         | (pcf)      | p'o (tsf)      | rd<br>0.000    | F 4.00        | n            | Ca           | Qc1n             | lc<br>4.54   | Ó   | (0 or 1) |            |              | (m)          | KH   | Qc1n           |              | CRR7               | -              | CSR            | Factor               | PL                   | (%)          |
| 28.2           |                  | 4.19         | 1.02         | 110<br>110 | 1,294<br>1,298 | 0.930          | 1.03          | 0.50<br>0.50 | 0.90         | 349,34<br>373,26 | 1.54<br>1.56 |     | 4        | 100<br>100 | 1.00         | 7,90<br>7,95 | 1.00 | 350,6<br>374.7 | 1.00         | Infin.             | 0.000          | 0,756<br>0,757 |                      | Non-Liq.<br>Non-Liq. | 0.00<br>0.00 |
| 28,3           |                  | 5.10         | 1_12         | 110        | 1.302          | 0.929          | 1.13          | 0.50         | 0.90         | 386,27           | 1.55         |     | 1        | 100        | 1.00         | 8.00         | 7.0  | 387.7          |              | Infin              | 0,000          | 0.758          | Non-Liq.             |                      | 0.00         |
| 28.5<br>28.7   |                  | 6.81<br>6.50 | 1.50<br>1.17 | 110<br>110 | 1.306<br>1.310 | 0.928<br>0.927 | 1.50<br>1.17  | 0.50<br>0.50 | 0.90         | 386 04<br>472 46 | 1,65<br>1,51 |     | 1        | 100<br>100 | 1.00         | 8.05<br>8.10 | 1.00 | 389.3          |              | Infin.             | 0,000          | 0.758          |                      | Non-Liq.             | 0.00         |
| 28.8           |                  | 5.71         | 1.13         | 110        | 1.314          | 0.926          | 1.14          | 0.50         | 0.90         | 426.60           | 1.53         |     | 1        | 100        | 1.00         | 8.15         | 1.00 | 474.2<br>428.2 |              | Infin.             | 0.000          | 0.759          | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 29.0           |                  | 4.48         | 0,99         | 110        | 1.318          | 0.926          | 0.99          | 0.50         | 0.90         | 381.89           | 1,51         |     | 1        | 100        | 1.00         | 8.20         | 1.00 | 383.3          |              | Infin.             | 0,000          | 0.760          | Non-Liq.             | Non-Liq.             | 0.00         |
| 29 2<br>29 3   |                  | 3.52         | 0,82<br>0,71 | 110<br>110 | 1,322<br>1,325 | 0.925<br>0.924 | 0.83          | 0.50<br>0.50 | 0.89         | 360,53<br>353,30 | 1,46<br>1,42 |     | 1        | 100<br>100 | 1.00         | 8.25<br>8.30 | 1.00 | 361.9<br>354.6 |              | Infin.             | 0.000          | 0.760<br>0.761 | Non-Liq.             |                      | 0.00         |
| 29.5           | 3 414.05         | 3.21         | 0.78         | 110        | 1,329          | 0.923          | 0.78          | 0.50         | 0.89         | 348.02           | 1.45         |     | 1        | 100        | 1.00         | 8.35         | 1.00 | 349.3          | 1,00         | Infin              | 0.000          | 0.761          | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 29.6<br>29.8   |                  | 5 15<br>5 92 | 1,20<br>1,24 | 110<br>110 | 1,333<br>1,337 | 0.923          | 1.20          | 0.50         | 0.89         | 361,00           | 1,59         |     | 1        | 100        | 1.00         | 8.40         |      | 362.3          | 1.00         | Infin.             | 0.000          | 0.762          | Non-Liq.             |                      | 0.00         |
| 30.0           |                  | 5.66         | 1,16         | 110        | 1,337          | 0.922          | 1.25<br>1.16  | 0.50<br>0.50 | 0.89         | 398.78<br>408.46 | 1,58<br>1,55 |     | 1        | 100<br>100 | 1.00         | 8.45<br>8.50 | 1.00 | 400.3<br>410.0 | 1.00         | Infin              | 0.000          | 0.762<br>0.763 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 30.1           |                  | 3.93         | 0.98         | 110        | 1,345          | 0.920          | 0.98          | 0.50         | 0.89         | 334,51           | 1,54         |     | 1        | 100        | 1.00         | 8.55         | 1.00 | 335.8          |              | Infin.             | 0.000          | 0.763          | Non-Liq.             |                      | 0.00         |
| 30.3<br>30.5   |                  | 3 24<br>2 84 | 0.80<br>0.72 | 110<br>110 | 1,349<br>1,353 | 0.919<br>0.918 | 0.80<br>0.72  | 0.50<br>0.50 | 0.89         | 336,62<br>330,14 | 1.47<br>1.44 |     | 1        | 100<br>100 | 1.00         | 8.60<br>8.65 | 1.00 | 337.9<br>331.4 | 1.00         | Infin              | 0.000          | 0.763          | Non-Liq.             |                      | 0.00         |
| 30.6           |                  | 2.45         | 0.63         | 110        | 1,357          | 0.918          | 0.64          | 0.50         | 0.88         | 321.18           | 1.41         |     | i        | 100        | 1.00         | 8.70         | 1.00 | 322 4          | 1.00         | Infin.             | 0.000          | 0.764<br>0.764 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 30.8           |                  | 2.37         | 0.61         | 110        | 1,361          | 0.917          | 0.61          | 0.50         | 0.88         | 325,78           | 1.39         |     | 1        | 100        | 1.00         | 8.75         | 1.00 | 327.0          | 1.00         | Infin,             | 0,000          | 0.764          | Non-Liq.             | Non-Liq.             | 0.00         |
| 31 0           |                  | 2.42         | 0.60<br>0.69 | 110<br>110 | 1,364<br>1,368 | 0.916<br>0.915 | 0.60<br>0.69  | 0.50<br>0.50 | 0.88         | 336,16<br>357,04 | 1.37<br>1.40 |     | 1        | 100<br>100 | 1.00         | 8.80<br>8.85 | 1.00 | 337.4<br>358.4 | 1.00         | Infin,<br>Infin    | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 31.3           |                  | 2.81         | 0.59         | 110        | 1.372          | 0.914          | 0.59          | 0.50         | 0.88         | 395,41           | 1,32         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 396.9          | 1.00         | Infin.             | 0,000          | 0.765          | Non-Liq.             |                      | 0.00         |
| 31.50          |                  | 3.25<br>3.67 | 0.64         | 110<br>110 | 1,376<br>1,380 | 0.913<br>0.912 | 0.64<br>0.70  | 0.50<br>0.50 | 0.88         | 422,67<br>434,87 | 1.33<br>1.35 |     | 1        | 100        | 1,00         | 8.85         | 1.00 | 424.3          | 1.00         | Infin,             | 0.000          | 0.765          | Non-Liq.             |                      | 0.00         |
| 31.8           |                  | 4.16         | 0.75         | 110        | 1,384          | 0.912          | 0.75          | 0.50         | 0.87         | 458.37           | 1.36         |     | 1        | 100<br>100 | 1.00         | 8.85<br>8.85 | 1.00 | 436.5<br>460.1 | 1.00         | Infin.             | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 31.99          |                  | 4.48         | 0.82         | 110        | 1,388          | 0.910          | 0.82          | 0.50         | 0.87         | 452.46           | 1.39         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 454.1          | 1.00         | Infin.             | 0.000          | 0.766          | Non-Liq.             | Non-Liq              | 0.00         |
| 32 13          |                  | 4.07<br>3.60 | 0.77<br>0.75 | 110<br>110 | 1,392<br>1,396 | 0.909          | 0.77<br>0.75  | 0.50<br>0.50 | 0.87<br>0.87 | 437.34<br>394.63 | 1.38<br>1.40 |     | 1        | 100<br>100 | 1.00         | 8.85<br>8.85 | 1.00 | 439 0<br>396 1 | 1.00         | Infin.             | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 32,48          | 490,89           | 4.33         | 0.88         | 110        | 1,400          | 0.907          | 0.88          | 0.50         | 0.87         | 402 25           | 1.45         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 403.8          | 1.00         | Infin.             | 0.000          | 0.767          | Non-Liq.             |                      | 0.00         |
| 32.64<br>32.8  |                  | 4,91<br>4,63 | 0.93         | 110<br>110 | 1,403          | 0.906          | 0.93          | 0.50         | 0.87         | 432.50           | 1.45         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 434.1          | 1.00         | Infin              | 0.000          | 0.767          | Non-Liq.             | Non-Liq              | 0.00         |
| 32.8           |                  | 4.63         | 0.89         | 110        | 1,407<br>1,411 | 0.905<br>0.904 | 1.01<br>0.89  | 0.50<br>0.50 | 0.87<br>0.87 | 376 10<br>396 69 | 1.52<br>1.46 |     | 1        | 100<br>100 | 1.00         | 8.85<br>8.85 | 1.00 | 377.5<br>398.2 | 1.00         | Infin.             | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 33.14          | 443,98           | 3.08         | 0.69         | 110        | 1,415          | 0.903          | 0.70          | 0.50         | 0.86         | 361,68           | 1.40         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 363.0          | 1.00         | Infin.             | 0,000          | 0.767          | Non-Liq.             |                      | 0.00         |
| 33.30          |                  | 3.53         | 0.86         | 110<br>110 | 1.419<br>1.423 | 0.902<br>0.901 | 0.86<br>0.74  | 0.50<br>0.50 | 0.86         | 334.00<br>333.35 | 1.49<br>1.44 |     | 1        | 100<br>100 | 1.00         | 8.85<br>8.85 | 1,00 | 335.3<br>334.6 | 1.00         | Infin.             | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 33 63          | 405.83           | 2.64         | 0.65         | 110        | 1.427          | 0.900          | 0.65          | 0.50         | 0.86         | 329.13           | 1.41         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 330.4          | 1.00         | Infin,             | 0.000          | 0.767          | Non-Liq.             |                      | 0.00         |
| 33.79          |                  | 1.47         | 0.46         | 110        | 1.431          | 0.899          | 0.46          | 0.50         | 0.86         | 260,60           | 1.37         |     | 1        | 100        | 1.00         | 8.85         | 1.00 | 261,6          | 1.00         | Infin.             | 0.000          | 0,767          | Non-Liq.             | Non-Liq.             | 0.00         |
| 33,96          |                  | 1.64<br>2.72 | 0.60<br>1.19 | 110<br>110 | 1.435<br>1.439 | 0.898<br>0.897 | 0.60<br>1.20  | 0.50<br>0.54 | 0.86<br>0.85 | 222,23<br>181.18 | 1.50<br>1.78 |     | 1        | 100<br>100 | 1.00         | 8.85<br>8.85 | 1.00 | 223.1<br>198.3 | 1.00         | Infin.<br>Infin.   | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 34.28          | 169.10           | 2.93         | 1.74         | 110        | 1.443          | 0.896          | 1.75          | 0.61         | 0.83         | 131.34           | 1.99         |     | 1        | 88         | 1.29         | 8.85         | 1.00 | 170.0          | 1.00         | Infin.             | 0.000          | 0.767          | Non-Liq.             |                      | 0.00         |
| 34.45          |                  | 3.30<br>2.59 | 3.82         | 110<br>110 |                | 0.895<br>0.894 | 3.89          | 0.75<br>0.76 | 0.79         | 63,47<br>50,64   | 2.46<br>2.52 |     | 1        | 58<br>49   | 2.58         |              | 1.00 | 163.6          | 1.00         | Infin.             | 0.000          | 0.767          | Non-Liq.             |                      | 0.00         |
| 34.78          |                  | 2.39         | 5.53         | 110        | 17.            |                | 5.73          | 0.76         | 0.79         | 30.06            | 2.81         |     | o        | 49         | 2.88         |              | 1.00 | 145.8          | 1.00         | 0.368              | 0.367          | 0.767<br>0.767 | 0.48<br>Non-Liq.     | 92%<br>Non-Lia       | 0.92<br>0.00 |
| 34.94          |                  | 2.97         | 9.69         | 110        |                |                | 10.17         | 0.94         | 0.74         | 20.42            | 3 10         |     | 0        |            |              |              |      |                | 1.00         |                    |                | 0.766          | Non-Liq.             | Non-Liq.             | 0.00         |
| 35.10<br>35.27 |                  | 3.52         | 8.49<br>4.90 | 110<br>110 |                | 0.890<br>0.889 | 8.80<br>5.01  | 0.90<br>0.80 | 0.75<br>0.77 | 28.30<br>46.41   | 2.96<br>2.63 |     | 0        |            |              |              |      |                | 0.99         |                    |                | 0,766<br>0,766 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 35,43          | 88.65            | 2,38         | 2,68         | 110        |                |                | 2.73          | 0.71         | 0.79         | 65.24            | 2.34         |     | 1        | 59         | 2.09         |              | 1.00 | 136.3          | 0.99         | 0,315              | 0.312          | 0.766          | 0.41                 | 95%                  | 1.07         |
| 35.60<br>35.76 |                  | 2.29<br>1.82 | 5 24<br>6 14 | 110        |                | 0.887          | 5.42          | 0.84         | 0.76         | 30.22            | 2.79         |     | 0        |            |              |              |      |                | 0.99         |                    |                | 0.766          | Non-Liq.             |                      | 0.00         |
| 35.93          |                  | 1.77         | 5.98         | 110<br>110 |                |                | 6.46<br>6.30  | 0.90         | 0.74<br>0.74 | 19.72<br>19.65   | 2.98<br>2.97 |     | 0        |            |              |              |      |                | 0.99         |                    |                | 0.766<br>0.765 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 36.09          |                  | 2.16         | 1.21         | 110        |                |                | 1.22          | 0.57         | 0.82         | 137.89           | 1.86         |     | 1        |            | 1.16         |              | 1.31 | 208.8          | 0.98         | Infin.             | 0.000          | 0.765          | Non-Liq.             |                      | 0.00         |
| 36.25<br>36.42 |                  | 1.79<br>1.54 | 0.74<br>0.57 | 110<br>110 |                |                | 0.75<br>0.58  | 0.50<br>0.50 | 0.84<br>0.84 |                  | 1.62<br>1.51 |     | 1        |            | 1.00         |              | 1,31 | 249.9<br>276.9 | 0.98         | Infin.<br>Infin.   | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 36,58          | 307.90           | 1.25         | 0.41         | 110        |                |                | 0.41          | 0.50         | 0.84         |                  | 1.36         |     | i        |            | 1.00         |              | 1.31 | 318.6          | 0.98         | Infin              | 0.000          | 0.764          | Non-Liq.             |                      | 0.00         |
| 36.75<br>36.91 |                  | 1,06<br>0,86 | 0.34         | 110<br>110 |                |                | 0.34          | 0.50         | 0.84         | 247.60           | 1.31         |     | 1        |            | 1.00         |              | 1,31 | 324.0          | 0.98         | Infin.             | 0.000          | 0.764          | Non-Liq.             |                      | 0.00         |
| 37.07          |                  | 0.72         | 0.36         | 110        |                |                | 0.36          | 0.50         | 0.84         |                  | 1.38         |     | 1        |            |              | 0.40         |      | 267.7<br>205.4 |              | Infin.<br>Infin.   | 0.000          | 0.764<br>0.763 | Non-Liq.             |                      | 0.00         |
| 37.24          |                  | 0.99         | 0.72         | 110        |                |                | 0.73          |              | 0.82         | 104.86           | 1.81         |     | 1        | 79         | 1.11         | 0.40         |      | 152,8          | 0.97         | 0.412              | 0.400          | 0.763          | 0.52                 | 89%                  | 0.75         |
| 37.40<br>37.57 |                  | 1.31<br>1.10 | 1.58         | 110<br>110 |                |                | 1.61<br>2.56  | 0.67<br>0.78 | 0.79<br>0.75 | 60.64<br>30.55   | 2.21         |     | 1        |            | 1.69<br>3.13 |              | 1.00 | 102.5<br>95.7  | 0.98         | 0.180<br>0.162     | 0.176<br>0.159 | 0.762<br>0.762 | 0.23<br>0.21         | 99%<br>99%           | 1.49<br>1.59 |
| 37.73          | 27.18            | 1.18         | 4.34         | 110        | 1.525          | 0.871          | 4.60          | 0.88         | 0.72         | 17.57            | 2.91         |     | 0        |            |              |              | 3.00 | 001.           | 0.98         | 0.102              | 0.100          | 0.762          | Non-Liq.             |                      | 0.00         |
| 37.89<br>38.06 |                  | 1.31<br>1.47 | 4.57<br>3.71 | 110<br>110 |                |                | 4.83<br>3.86  | 0.88<br>0.83 | 0.72<br>0.74 | 18.57<br>26.46   | 2.91         |     | 0        |            |              |              |      |                | 0.98         |                    |                | 0.761<br>0.761 | Non-Liq,             | •                    | 0.00         |
| 38.22          | 75.21            | 1.54         | 2.05         | 110        |                |                | 2.09          | 0.71         | 0.77         |                  | 2.33         |     | 1        | 51         | 2.03         |              | 1.00 | 108.8          |              | 0.200              | 0.194          | 0.760          | Non-Liq.<br>0.26     | 99%                  | 0.00<br>1.40 |
| 38.39<br>38.55 |                  | 1,55         | 0.88         | 110<br>110 |                |                | 0.89<br>0.61  | 0.54<br>0.50 | 0.82         |                  | 1.78         |     | 1        |            |              | 0.35         |      | 198.1          |              | Infin.             | 0.000          | 0.760          | Non-Liq.             |                      | 0.00         |
| 38.71          |                  | 1.28         | 0.52         | 110        |                |                | 0.52          |              | 0.83         |                  | 1.59         |     | 1        |            |              | 0.40<br>0.45 |      | 232.3<br>261.1 | 0.96         | Infin.             | 0.000          | 0.759<br>0.759 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 38.88          |                  | 1.31         | 0.52         | 110        | 1,552          | 0.861          | 0.52          | 0.50         | 0.83         | 196,21           | 1.50         |     | 1        | 100        | 1.00         | 0.50         | 1.36 | 266.1          | 0.96         | Infin.             | 0.000          | 0.758          | Non-Liq.             |                      | 0.00         |
| 39.04<br>39.21 |                  | 1.38<br>1.25 | 0.60         | 110<br>110 |                |                | 0.60<br>0.87  |              | 0.82         |                  | 1.58<br>1.84 |     | 1        |            |              | 0.55         |      | 242.5<br>169.1 |              | Infin.<br>Infin.   | 0.000          | 0.758<br>0.757 | Non-Liq.             |                      | 0.00         |
| 39.37          |                  | 1.67         | 1.94         | 110        |                |                | 1.98          |              | 0.76         |                  | 2.27         |     | 1        |            | 1.85         | 0.00         |      | 112.5          |              |                    | 0.205          | 0.757          | Non-Liq.<br>0.27     | 99%                  | 0.00<br>1.35 |
| 39.53<br>39.70 |                  | 1.46<br>1.21 | 2.33         | 110        |                |                | 2.39          |              | 0.75         |                  | 2.43         |     | 1        | 42         | 2.46         |              | 1.00 | 106.0          |              | 0:191              | 0.186          | 0.756          | 0.25                 | 99%                  | 1.44         |
| 39.86          |                  | 0.92         | 6.14         | 110<br>110 |                |                | 3.01<br>6.86  |              | 0.73<br>0.67 | 27.65<br>8.58    | 2.65<br>3.27 |     | 0        |            |              |              |      |                | 0.98<br>0.97 |                    |                | 0.756<br>0.755 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 40.03          |                  |              | 10.11        | 110        | 1.579          | 0.852          | 11.69         | 1.00         | 0.67         | 6.40             | 3.51         |     | 0        |            |              |              |      |                | 0.97         |                    |                | 0.754          | Non-Liq.             |                      | 0.00         |
| 40.19<br>40.35 |                  | 1.87<br>2.16 | 9,99         | 110<br>110 |                |                | 10.91<br>2.33 |              | 0.67<br>0.75 |                  | 3.32         |     | 0        | 60         | 1.91         |              | 1.00 | 126.7          | 0.97         | 0.280              | 0.258          | 0.754          | Non-Liq.             |                      | 0.00         |
| 40.52          |                  | 2.43         | 0.96         | 110        |                |                | 0.97          |              | 0.73         |                  | 1.69         |     | 1        |            |              | 1.00         |      | 198.8          |              |                    | 0.258          | 0.753<br>0.752 | 0.34<br>Non-Liq.     | 97%<br>Non-Lig       | 1.18<br>0.00 |
| 40.68<br>40.85 |                  | 2.26         | 0.72         | 110<br>110 |                |                | 0.73<br>0.85  |              |              |                  | 1.54         |     | 1        |            |              | 1.00         |      | 240.7          |              |                    | 0.000          | 0.752          | Non-Liq.             |                      | 0.00         |
| 41.01          | 354.79           | 3.52         | 0.99         | 110        |                |                |               |              |              |                  | 1.56<br>1.60 |     | 1        |            |              | 1.00         |      | 262.5<br>272.3 |              |                    | 0.000          | 0.751<br>0.750 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 41.17          | 373.62           | 4.05         | 1.09         | 110        |                |                |               |              |              |                  | 1.62         |     |          |            | 1.00         | 1.00         | 1.00 | 286.4          | 0.94         | Infin.             | 0.000          | 0.750          | Non-Liq.             | Non-Liq.             | 0.00         |
| 41.34<br>41.50 | 386.97<br>384.45 | 4.10<br>4.56 | 1.06         | 110<br>110 |                |                |               |              |              |                  | 1.60<br>1.64 |     |          |            |              | 1.00         |      | 296.3<br>294.0 |              |                    | 0.000          | 0.749<br>0.748 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 41.67          | 388.83           | 3.67         | 0.94         | 110        | 1,618          | 0.837          | 0.95          | 0.50         | 0.81         | 295.93           | 1.56         |     | 1        |            |              | 1.00         |      | 297.0          |              |                    | 0.000          | 0.748          | Non-Liq.             |                      | 0.00         |
| 41.83<br>41.99 | 401.57<br>345.90 |              | 0.91<br>1.10 | 110<br>110 |                |                |               |              |              |                  | 1.54<br>1.64 |     | 5400     |            |              |              |      | 306.4          |              |                    | 0.000          | 0.747          | Non-Liq,             | Non-Liq.             | 0.00         |
| 42.16          | 326.26           | 3.40         | 1.04         | 110        |                |                |               |              |              |                  | 1.64         |     |          |            |              |              |      | 262.9<br>247.6 |              |                    | 0.000          | 0.746<br>0.745 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 42.32<br>42.49 | 340.48<br>364.19 |              | 1.14         | 110        | 1.634          | 0.831          | 1.14          |              | 0.80         | 257.02           | 1.66         |     | 1        | 100        | 1.01         | 1.00         | 1.00 | 260.8          | 0.93         | Infin              | 0.000          | 0.744          | Non-Liq.             | Non-Liq.             | 0.00         |
| 42.65          | 390.03           |              | 0.93<br>0.79 | 110<br>110 |                |                |               |              |              |                  | 1.57<br>1.50 |     | 040      |            |              | 1.00<br>1.00 |      | 276.5<br>295.8 |              |                    |                | 0.743<br>0.743 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 42.81          | 313.44           | 2.00         | 0.64         | 110        | 1.646          | 0.826          | 0.64          | 0.50         | 0.80         | 236,30           | 1.50         |     | 1        | 100        | 1.00         | 1.00         | 1.00 | 237.2          | 0.93         | Infin.             | 0.000          | 0.742          | Non-Liq.             | Non-Liq              | 0.00         |
| 42.90          | 281,49           | 1.86         | 0.66         | 110        | 1.649 (        | 0.824          | 0.67          | 0.50         | 0.80         | 211.83           | 1.55         |     | 1        | 100        | 1.00         | 1.00         | 1.00 | 212.6          | 0.93         | Infin <sub>e</sub> | 0.000          | U.741          | Non-Liq.             | Non-Liq              | 0.00         |

| Layer          | Tip              | Friction     | Friction     | Total      | Eff Stress     | 3              |              |              |              |                  |              | Φ | Liquef   | Rel        |              |              |              | Clean          | _            |                 |                | Induced        | Liquefac.            |            | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|---|----------|------------|--------------|--------------|--------------|----------------|--------------|-----------------|----------------|----------------|----------------------|------------|--------------|
| Depth          | Qc               | Fs           | Ratio        | Unit Wt    |                |                |              |              |              | Corrected        | i            |   | Suscept  |            |              | Н            |              | Sand           |              |                 | EQ             | M=7.5          | Safety               | Probab     | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n             | lc           | õ | (0 or 1) | Dr (%)     | Kc           | (m)          | KH           | Qc1n           | Κσ           | CRR75           | CRR            | CSR            | Factor               | Pc         | (%)          |
| 43.14          | 220.54           | 1.03         | 0.47         | 110        |                | 0.823          | 0.47         | 0.50         | 0.80         | 165,50           | 1.54         |   | 1        | 98         | 1.00         | 1.00         | 1.00         | 166.1          | 0.93         | Infin.          | 0.000          | 0.740          | Non-Liq.             | Non-Liq    | 0.00         |
| 43.31          | 170.25           | 0.75         | 0.44         | 110        | 1.657          | 0.821          | 0.44         | 0.50         | 0.80         | 127,32           | 1.62         |   | 1        | 87         | 1.00         |              | 1,00         | 127.8          | 0.93         | 0.274           | 0.254          | 0.739          | 0.34                 | 97%        | 1.16         |
| 43.47<br>43.64 | 150.87<br>112.32 | 0.88         | 0.58         | 110<br>110 | 1,661<br>1,665 | 0.820          | 0.59<br>0.81 | 0.53         | 0.79<br>0.77 | 111,11<br>80,14  | 1.73         |   | 1        | 81<br>68   | 1.06<br>1.22 | 1.00         | 1.00         | 118.4<br>98.0  | 0.92         | 0,234           | 0.217<br>0.158 | 0.738<br>0.737 | 0.29<br>0.21         | 98%<br>99% | 1.27<br>1.55 |
| 43.80          | 82.53            | 1.03         | 1.25         | 110        |                | 0.816          | 1.28         | 0.66         | 0.74         | 56.60            | 2.17         |   | 1        | 53         | 1.60         | 1,00         | 1.00         | 90.3           | 0.94         |                 | 0.140          | 0.736          | 0.19                 | 100%       | 1.68         |
| 43.96          | 68.72            | 1.03         | 1_49         | 110        |                | 0.815          | 1.53         | 0.69         | 0.73         | 46.10            | 2.29         |   | 1        | 45         | 1.91         |              | 1.00         | 88.2           | 0.96         | 0.144           | 0.138          | 0.735          | 0.19                 | 100%       | 1.71         |
| 44.13          | 55,11            | 0.91         | 1.64         | 110        |                | 0.813          | 1.69         | 0.73         | 0.72         | 36.12            | 2.40         |   | 1        | 35         | 2.31         |              | 1.00         | 83.4           | 0.96         |                 | 0.128          | 0.735          | 0.17                 | 100%       | 1.79         |
| 44.29<br>44.46 | 41.85<br>26.31   | 0.92<br>1.06 | 2.19         | 110<br>110 |                | 0.811          | 2.28<br>4.29 | 0.78<br>0.89 | 0.70<br>0.66 | 26.42<br>15.39   | 2.59<br>2.94 |   | 1        | 22         | 3.24         |              | 1.00         | 85_6           | 0.96         | 0.138           | 0.133          | 0.734<br>0.733 | 0.18<br>Non-Liq.     | 100%       | 1.75<br>0.00 |
| 44 62          | 21.72            | 0.91         | 4.17         | 110        |                | 0.808          | 4.52         | 0.03         | 0.65         | 12.33            | 3.03         |   | 0        |            |              |              |              |                | 0.96         |                 |                | 0.733          | Non-Liq.             |            | 0.00         |
| 44.78          | 37,10            | 1.02         | 2.74         | 110        |                | 0,807          | 2.87         | 0.82         | 0.68         | 22.80            | 2.70         |   | 0        |            |              |              |              |                | 0.96         |                 |                | 0.731          | Non-Liq.             |            | 0.00         |
| 44.95          | 79.45            | 1.14         | 1.44         | 110        |                | 0,805          | 1.47         | 0.68         | 0.73         | 53,41            | 2.23         |   | 1        | 51         | 1.73         |              | 1.00         | 92.7           | 0.94         | 0.154           |                | 0.730          | 0.20                 | 100%       | 1.64         |
| 45.11<br>45.28 | 124.52<br>146.40 | 1.08         | 0.86         | 110<br>110 |                | 0.803          | 0.88         | 0.58         | 0.76         | 88.02<br>103.42  | 1.92         |   | 1        | 72         | 1.21         |              | 1.10         | 116.3          | 0.91         |                 | 0,207          | 0.729          | 0.28                 | 98%        | 1.30         |
| 45 44          | 147.64           | 1.68         | 1.14         | 110        |                | 0.802          | 1.11<br>1.15 | 0.59<br>0.59 | 0.76<br>0.75 | 103 42           | 1.93<br>1.94 |   | 1        | 78<br>78   | 1.22         | 0.75<br>0.80 | 1.10<br>1.10 | 137.7<br>139.6 | 0.91         | 0.323           | 0.295          | 0.728<br>0.727 | 0.40<br>0.42         | 95%<br>95% | 1.05<br>1.03 |
| 45.60          | 111.81           | 2.01         | 1.80         | 110        |                | 0.798          | 1.83         | 0.66         | 0.73         | 75.74            | 2.17         |   | 1        | 65         | 1.61         | 0.00         | 1.00         |                | 0.93         | 0.247           | 0,230          | 0.726          | 0.32                 | 98%        | 1.23         |
| 45.77          | 107.68           | 2.34         | 2.17         | 110        |                | 0.797          | 2.21         | 0.68         | 0.72         | 72.03            | 2.25         |   | 1        | 63         | 1.79         |              | 1.00         | 128.7          | 0,93         | 0.278           | 0.259          | 0.725          | 0.36                 | 97%        | 1.15         |
| 45.93          | 150.61           | 2.63         | 1.75         | 110        |                | 0.795          | 1.77         | 0.63         | 0.74         | 103.74           | 2.07         |   | 1        | 78         | 1.40         |              | 1.00         | 144.8          | 0.91         | 0.363           | 0.329          | 0.724          | 0.45                 | 93%        | 1.00         |
| 46 10<br>46 26 | 249.00<br>324.42 | 2.59<br>3.00 | 1.04         | 110<br>110 |                | 0.793<br>0.792 | 1.05<br>0.93 | 0.53         | 0.77<br>0.78 | 180.59<br>238.69 | 1.73         |   | 1        | 100        | 1.06         | 1.00         | 1.00         |                | 0.91         | Infin           | 0.000          | 0.723          | Non-Liq.             |            | 0.00         |
| 46.42          | 376.79           | 3.64         | 0.96         | 110        |                | 0.792          | 0.93         | 0.50         | 0.78         | 277.11           | 1.61<br>1.58 |   | 1        | 100<br>100 | 1.00         | 1.10         | 1.00         | 239.6<br>278.1 | 0.91<br>0.91 | Infin.          | 0.000          | 0.722<br>0.721 | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 46.59          | 401.24           | 4.49         | 1.12         | 110        |                | 0.788          | 1.12         | 0.50         | 0.78         | 294.84           | 1.62         |   | 1        | 100        | 1.00         |              |              |                | 0.90         | Infin.          | 0.000          | 0.720          | Non-Liq.             |            | 0.00         |
| 46.75          | 410.01           | 4.98         | 1.21         | 110        |                | 0.787          | 1.22         | 0.50         | 0.78         | 300.97           | 1.64         |   | 1        | 100        | 1.00         | 1.20         | 1.00         | 302.1          | 0.90         | Infin.          | 0.000          | 0.719          | Non-Liq.             | Non-Liq.   | 0.00         |
| 46,92          | 417.89           | 4.83         | 1.16         | 110        |                | 0.785          | 1.16         | 0.50         | 0.78         | 306.43           | 1.62         |   | 1        | 100        | 1.00         |              | 1.00         |                | 0.90         | Infin.          | 0.000          | 0.717          | Non-Liq.             |            | 0.00         |
| 47.08<br>47.24 | 432.83<br>435.16 | 4.59<br>3.80 | 1.06<br>0.87 | 110<br>110 |                | 0.783<br>0.782 | 1.06<br>0.88 | 0.50         | 0.78<br>0.78 | 317.08<br>318.43 | 1.58<br>1.51 |   | 1        | 100<br>100 | 1.00         |              |              |                | 0.90         | Infin.<br>Infin | 0.000          | 0.716<br>0.715 | Non-Liq.             |            | 0.00         |
| 47.24          | 434.87           | 4.29         | 0.99         | 110        |                | 0.780          | 0.99         | 0.50         | 0.78         | 317.86           | 1.55         |   | 1        | 100        | 1.00         |              |              |                | 0.90         | Infin.          | 0.000          | 0.715          | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 47.57          | 434,40           | 5.04         | 1.16         | 110        |                | 0.778          | 1.17         | 0.50         | 0.78         | 317,16           | 1.61         |   | 1        | 100        | 1.00         |              |              |                | 0.90         | Infin           | 0.000          | 0.713          | Non-Liq.             |            | 0.00         |
| 47.74          | 430.64           | 5.51         | 1.28         | 110        |                | 0,777          | 1.28         | 0.50         | 0.77         | 313,70           | 1.65         |   | 1        | 100        | 1.00         |              |              | 315.3          | 0.90         | Infin           | 0.000          | 0.712          | Non-Liq.             | Non-Liq.   | 0.00         |
| 47.90          | 433.15           | 6.42         | 1.48         | 110        |                | 0.775          | 1.49         | 0.52         | 0.77         | 312.64           | 1.70         |   | 1        | 100        | 1.04         |              |              |                | 0.90         | Infin           | 0.000          | 0.711          | Non-Liq.             |            | 0.00         |
| 48.06<br>48.23 | 428.46<br>424.25 | 6.61<br>6.72 | 1.54<br>1.58 | 110<br>110 |                | 0.773<br>0.772 | 1.55<br>1.59 | 0.52         | 0.76<br>0.76 | 308,02<br>304,04 | 1.72<br>1.73 |   | 1        | 100<br>100 | 1.05<br>1.06 | 1.60<br>1.65 |              |                | 0.90         | Infin           | 0.000          | 0.710<br>0.709 | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 48.39          | 419.06           | 6.65         | 1.59         | 110        |                | 0.770          | 1.59         | 0.53         | 0.76         | 299.75           | 1.73         |   | 1        | 100        | 1.06         |              |              |                | 0.89         | Infin           | 0.000          | 0.708          | Non-Liq.             |            | 0.00         |
| 48.56          | 409,58           | 6.70         | 1.64         | 110        |                | 0.768          | 1.64         | 0.53         | 0.76         | 291.80           | 1.75         |   | 1        | 100        | 1.07         |              |              |                | 0.89         | Infin           | 0.000          | 0.707          | Non-Liq.             |            | 0.00         |
| 48,72          | 401.26           | 6.55         | 1.63         | 110        |                | 0.767          | 1.64         | 0.54         | 0.76         | 285.28           | 1.76         |   | 1        |            | 1.08         |              |              |                | 0.89         | Infin.          | 0.000          | 0.705          | Non-Liq.             |            | 0.00         |
| 48.88<br>49.05 | 393.67<br>386.90 | 6.35<br>6.22 | 1.61<br>1.61 | 110<br>110 |                | 0.765<br>0.763 | 1.62         | 0.54         | 0.75         | 279.50           | 1.76         |   | 1        | 100        | 1.08         |              |              |                | 0.89         | Infin           | 0.000          | 0.704          | Non-Liq.             |            | 0.00         |
| 49.03          | 381.95           | 6.11         | 1.60         | 110        |                | 0.762          | 1.62<br>1.61 | 0.54<br>0.54 | 0.75<br>0.75 | 274.18<br>270.24 | 1.76<br>1.76 |   | 1        |            | 1.08<br>1.08 |              |              |                | 0.89         |                 | 0.000          | 0.703<br>0.702 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 49.38          | 382.17           | 6.15         | 1.61         | 110        |                | 0.760          | 1.62         | 0.54         | 0.75         | 269.99           | 1.77         |   | 1        |            | 1.08         |              |              |                | 0.89         |                 | 0.000          | 0.701          | Non-Liq.             |            | 0.00         |
| 49.54          | 376.16           | 6.01         | 1.60         | 110        |                | 0.758          | 1.61         | 0.54         | 0.75         | 265,33           | 1.77         |   | 1        | 100        | 1.08         | 2.05         | 1.00         | 288.7          | 0.89         | Infin.          | 0.000          | 0.700          | Non-Liq.             |            | 0.00         |
| 49.70          | 367.77           | 5.85         | 1.59         | 110        |                | 0.757          | 1.60         | 0.54         | 0.75         | 258.87           | 1.77         |   | 1        |            | 1.09         |              |              |                | 0.89         |                 | 0.000          | 0.699          | Non-Liq.             |            | 0.00         |
| 49.87<br>50.03 | 358.21<br>351.53 | 5.75<br>5.60 | 1.61         | 110<br>110 |                | 0.755<br>0.753 | 1.61<br>1.60 | 0.54<br>0.54 | 0.75<br>0.75 | 251.37<br>246.26 | 1.78<br>1.79 |   | 1        |            | 1.10         |              |              |                | 0.88         |                 | 0.000          | 0.698<br>0.696 | Non-Liq.             |            | 0.00         |
| 50.20          | 347,31           | 4.90         | 1.41         | 110        |                | 0.752          | 1.42         | 0.53         | 0.75         | 244.59           | 1.75         |   | 1        |            | 1.07         |              |              |                | 0.88         | Infin.          | 0.000          | 0.695          | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 50.36          | 345.77           | 5.05         | 1.46         | 110        |                | 0.750          | 1.47         | 0.54         | 0.75         | 242.68           | 1.76         |   | 1        |            | 1.08         |              |              |                | 0.88         |                 | 0.000          | 0 694          | Non-Liq.             |            | 0.00         |
| 50.52          | 347.22           | 5.22         | 1.50         | 110        |                | 0.748          | 1.51         | 0.54         | 0.74         | 243.04           | 1.77         |   | 1        |            | 1.09         |              |              |                | 88.0         |                 | 0.000          | 0.693          | Non-Liq.             | Non-Liq    | 0.00         |
| 50.69          | 346.06           | 5.37         | 1.55         | 110        |                | 0.747          | 1.56         | 0.54         | 0.74         | 241.42           | 1.78         |   | 1        |            | 1.09         |              |              |                | 0.88         |                 | 0.000          | 0.692          | Non-Liq.             |            | 0.00         |
|                | 349.13<br>348.56 | 5.22<br>4.86 | 1.50         | 110<br>110 |                | 0.745<br>0.743 | 1.50<br>1.40 | 0.54<br>0.53 | 0.74<br>0.75 | 243.91<br>244.21 | 1.77<br>1.74 |   | 1        |            | 1.08<br>1.07 |              |              |                | 88.0<br>88.0 |                 | 0.000          | 0.691<br>0.689 | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                | 349.29           | 4.35         | 1.25         | 110        |                | 0.742          | 1.25         | 0.52         | 0.75         | 246.10           | 1.70         |   | 1        |            |              |              |              |                | 0.88         |                 | 0.000          | 0.688          | Non-Liq.             |            | 0.00         |
| 51.35          | 348.08           | 4.19         | 1.20         | 110        | 1.849          | 0.740          | 1.21         | 0.52         | 0.75         | 245.42           | 1.69         |   | 1        |            |              |              |              |                | 0.88         |                 | 0.000          | 0.687          | Non-Liq.             |            | 0.00         |
|                | 347.63           | 4.03         | 1.16         | 110        |                | 0.738          | 1.17         | 0.51         | 0.75         | 245.34           | 1.68         |   | 1        |            |              |              |              |                | 0.87         |                 | 0,000          | 0.686          | Non-Liq.             |            | 0.00         |
|                | 345.96<br>345.46 | 4.21         | 1.22         | 110<br>110 |                | 0.737<br>0.735 | 1.22<br>1.17 | 0.52<br>0.51 | 0.75<br>0.75 | 243.12<br>243.07 | 1.70<br>1.68 |   | 1        |            | 1.04         |              |              |                | 0.87         |                 | 0.000          | 0.685<br>0.684 | Non-Liq.             |            | 0.00         |
|                | 342.27           | 3.60         | 1.05         | 110        |                |                | 1.06         | 0.50         | 0.75         |                  | 1.65         |   | i        |            |              |              |              |                | 0.87         |                 | 0.000          | 0.682          | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 200            | 345.47           | 2.90         | 0.84         | 110        |                | 0.732          | 0.84         | 0.50         | 0.75         |                  | 1.58         |   | 1        |            |              | 2.65         |              | 245.3          |              |                 | 0.000          | 0.681          | Non-Lig.             |            | 0.00         |
|                | 353.60           | 2.51         | 0.71         | 110        |                | 0.730          | 0.71         | 0.50         | 0.75         | 249.93           | 1.52         |   | 1        |            |              |              |              |                | 0.87         |                 | 0.000          | 0.680          | Non-Liq.             |            | 0.00         |
|                | 353.44           | 2.43         | 0.69         | 110        |                |                | 0.69         | 0.50         | 0.75         |                  | 1.51         |   | 1        |            |              |              |              |                | 0.87         |                 | 0.000          | 0.679          | Non-Liq.             |            | 0.00         |
|                | 329.04<br>324.06 | 2.54         | 0.77         | 110<br>110 |                | 0.727<br>0.725 | 0.77<br>0.75 | 0.50<br>0.50 | 0.75<br>0.75 |                  | 1.57<br>1.56 |   | 1        |            |              |              |              |                | 0.87<br>0.87 |                 | 0.000          | 0.678<br>0.677 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
|                | 357.49           | 2.12         | 0.59         | 110        |                |                | 0.60         | 0.50         | 0.75         |                  | 1.46         |   | 1        |            |              | 2.65         |              |                | 0.87         |                 | 0.000          | 0.676          | Non-Liq.             |            | 0.00         |
|                | 377.56           | 1.69         | 0.45         | 110        |                |                | 0.45         | 0.50         | 0.75         |                  | 1.36         |   | 1        | 100        |              |              |              |                | 0.87         |                 | 0.000          | 0.674          | Non-Liq.             |            | 0.00         |
|                | 383.09           | 1.73         | 0.45         | 110        |                |                | 0.45         | 0.50         | 0.75         |                  | 1.36         |   | 1        |            |              |              |              |                | 0.86         |                 | 0.000          | 0.673          | Non-Liq.             |            | 0.00         |
|                | 384.71<br>382.98 | 1.88<br>1.55 | 0.49         | 110<br>110 |                |                | 0.49<br>0.41 | 0.50<br>0.50 | 0.75<br>0.75 |                  | 1.38         |   | 1<br>1   |            |              | 2.65         |              |                | 0.86<br>0.86 |                 | 0.000          | 0.672<br>0.671 | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                | 378.65           | 1.68         | 0.44         | 110        |                |                | 0.45         | 0.50         | 0.74         |                  | 1.36         |   | 1        |            |              |              |              |                | 0.86         |                 | 0.000          | 0.670          | Non-Liq.             |            | 0.00         |
| 53.97          | 364.32           | 1.45         | 0.40         | 110        | 1.911          | 0.714          | 0.40         | 0.50         | 0.74         | 254.87           | 1.34         |   | 1        | 100        | 1.00         | 2.65         | 1.00         | 255,8          | 0.86         | Infin.          | 0.000          | 0.669          | Non-Liq.             | Non-Liq.   | 0.00         |
|                | 345.61           | 1.28         | 0.37         | 110        |                |                | 0.37         | 0.50         | 0.74         |                  | 1.34         |   | 1        |            |              |              |              |                | 0.86         |                 | 0.000          | 0.667          | Non-Liq.             |            | 0.00         |
|                | 328.15<br>286.22 | 1.38         | 0.42         | 110<br>110 |                |                | 0.42<br>0.53 | 0.50<br>0.50 | 0.74<br>0.74 |                  | 1.40<br>1.50 |   | 1<br>1   |            |              |              |              |                | 0.86<br>0.86 |                 | 0.000          | 0.666<br>0.665 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
|                | 215.92           | 2.04         | 0.94         | 110        |                |                | 0.55         | 0.54         | 0.74         |                  | 1.77         |   | 1        |            |              |              |              |                | 0.86         |                 | 0.000          | 0.664          | 0.59                 | 85%        | 0.57         |
| 54.79          | 142.12           | 2.27         | 1.60         | 110        |                |                | 1.62         | 0.63         | 0.68         |                  | 2.08         |   | 1        |            | 1.42         |              |              |                |              |                 | 0 239          | 0.663          | 0.36                 | 97%        | 1.14         |
| 54,95          | 95.61            | 2.50         | 2.61         | 110        | 1.934          | 0.705          | 2.66         | 0.72         | 0.65         | 57.33            | 2.37         |   | 1        | 54         | 2.21         |              | 1.00         | 126.7          | 0.89         | 0.269           | 0.240          | 0.662          | 0.36                 | 97%        | 1.16         |
| 55.12          | 68.05            | 2.25         | 3.30         | 110        |                |                | 3.40         | 0.78         | 0.62         |                  | 2.57         |   | 1        | 38         | 3.14         |              | 1.00         | 122.4          |              | 0.251           | 0.232          | 0.661          | 0.35                 | 97%        | 1.22         |
| 55.28<br>55.45 | 52.93<br>46.61   | 1.90<br>2.00 | 3.59         | 110<br>110 |                |                | 3.73<br>4.61 | 0.81<br>0.85 | 0.61<br>0.60 |                  | 2.69<br>2.80 |   | 0        |            |              |              |              |                | 0.92<br>0.92 |                 |                | 0.659<br>0.658 | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                | 110.59           | 2.63         | 2.38         | 110        |                |                | 2.42         | 0.70         | 0.65         |                  | 2.30         |   | 1        | 60         | 1.94         |              | 1.00         | 129.9          |              | 0.284           | 0.252          | 0.657          | 0.38                 | 96%        | 1.13         |
| 55.77          | 134.82           | 3.19         | 2.37         | 110        | 1.954          | 0 697          | 2.40         | 0.68         | 0.66         | 82.91            | 2.23         |   | 1        | 69         | 1.74         |              | 1.00         | 144.4          | 0.89         | 0.360           | 0.319          | 0.656          | 0.49                 | 92%        | 1.00         |
|                | 157.81           | 3.55         | 2.25         | 110        |                |                | 2.28         | 0.66         | 0.67         |                  | 2.16         |   | 1        |            | 1.58         |              |              |                |              |                 | 0.363          | 0.655          | 0.55                 | 87%        | 0.67         |
|                | 180.29<br>192.22 | 3.92<br>4.13 | 2.18         | 110<br>110 |                |                | 2.20<br>2.17 | 0.64<br>0.63 |              |                  | 2.11<br>2.08 |   | 1        |            | 1.47<br>1.43 |              |              | 166.8<br>173.3 | 0.85<br>0.85 |                 | 0.000          | 0.654<br>0.653 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
|                | 181.99           | 3.86         | 2.12         | 110        |                |                | 2.14         | 0.64         |              |                  | 2.10         |   | 1        |            | 1.45         |              |              |                | 0.85         |                 | 0.000          | 0.652          | Non-Liq.             |            | 0.00         |
| 56.59          | 157.22           | 3.50         | 2.23         | 110        | 1.974          | 0.689          | 2.26         | 0.66         | 0.66         | 97.46            | 2.16         |   | 1        | 76         | 1.58         |              | 1.00         | 153 6          | 0.85         | 0 417           | 0.354          | 0.650          | 0.54                 | 88%        | 0.71         |
|                | 135.91           | 2.78         | 2.04         | 110        |                |                | 2.07         | 0.66         | 0.66         |                  | 2.18         |   | 1        |            | 1.62         |              |              | 135.7          |              |                 | 0.276          | 0.649          | 0.42                 | 94%        | 1.06         |
|                | 120,38<br>104.50 | 2.34         | 1.94<br>2.23 | 110<br>110 |                |                | 1.97<br>2.27 | 0.67<br>0.70 | 0.66<br>0.64 |                  | 2.21         |   | 1        |            | 1.68<br>1.95 |              |              | 123.7<br>121.6 |              |                 | 0.226<br>0.218 | 0.648<br>0.647 | 0.35<br>0.34         | 97%<br>97% | 1.20<br>1.22 |
| 57.09          | 69.37            | 1.60         | 2.23         | 110        |                |                | 2.38         | 0.75         | 0.62         |                  | 2.46         |   | 1        |            | 2.57         |              |              | 102.2          |              | 0.179           |                | 0.646          | 0.34                 | 97%        | 1.48         |
| 57.41          | 32.64            | 1.19         | 3.63         | 110        | 1.993 (        | 0.682          | 3.87         | 0.87         | 0.58         | 16,66            | 2,88         |   | 0        | _          |              |              |              |                | 0.92         | •               |                | 0.645          | Non-Liq.             |            | 0.00         |
| 57.58          | 24.63            | 0.77         | 3.11         | 110        |                |                | 3.38         | 0.90         | 0.57         |                  | 2.96         |   | 0        |            |              |              |              |                | 0.92         |                 |                | 0.644          | Non-Liq.             |            | 0.00         |
| 57.74<br>57.91 | 22.59<br>21.75   | 0.67<br>0.79 | 2.95<br>3.64 | 110<br>110 |                |                | 3.23<br>4.01 | 0.90         | 0.56<br>0.55 |                  | 2.98<br>3.06 |   | 0        |            |              |              |              |                | 0.92<br>0.92 |                 |                | 0 643<br>0 642 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 58.07          | 25.26            |              | 3.05         | 110        |                |                |              |              | 0.56         |                  | 2.95         |   | 0        |            |              |              |              |                | 0.92         |                 |                | 0.641          | Non-Liq.             |            | 0.00         |
|                |                  |              |              |            |                |                |              |              |              |                  |              |   |          |            |              |              |              |                | -            |                 |                |                |                      | 40         |              |

| Layer  | Tip    | Friction | Friction | Total    | Eff,Stres | s     |      |      |      |          |      | ge   | Liquef.  | Rel.  |      |     |      | Clean |      |        |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|----------|-----------|-------|------|------|------|----------|------|------|----------|-------|------|-----|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt. | at Midpt  |       |      |      |      | Correcte | d    | Pa S | Suscept  | Dens  |      | H   |      | Sand  |      |        | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)    | p'o (tsf) | rd    | F    | n    | Cq   | Qc1n     | lc   | õ    | (0 or 1) | Dr (% | Kc   | (m) | KH   | Qc1n  | Κσ   | CRR7.5 | CRR   | CSR     | Factor    | PL       | (%)        |
| 58.23  | 28.61  | 0.75     | 2.63     | 110      | 2.013     | 0.675 | 2.83 | 0.86 | 0.57 | 14.43    | 2.85 |      | 0        |       |      |     |      |       | 0,92 |        |       | 0,640   | Non-Liq.  | Non-Liq. | 0.00       |
| 58,40  | 24,43  | 0.68     | 2.77     | 110      | 2,016     | 0.673 | 3.02 | 0.89 | 0.56 | 11.94    | 2.94 |      | 0        |       |      |     |      |       | 0,92 |        |       | 0,638   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.56  | 36,91  | 0.77     | 2.09     | 110      | 2,020     | 0.672 | 2.21 | 0.81 | 0.59 | 19.49    | 2,68 |      | 0        |       |      |     |      |       | 0.92 |        |       | 0.637   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.73  | 23,45  | 0.91     | 3.86     | 110      | 2.024     | 0.671 | 4.23 | 0.92 | 0.55 | 11,13    | 3,05 |      | 0        |       |      |     |      |       | 0,91 |        |       | 0.636   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.89  | 18,11  | 1.14     | 6.28     | 110      | 2,028     | 0.669 | 7.07 | 1.00 | 0.52 | 7.93     | 3,30 |      | 0        |       |      |     |      |       | 0,91 |        |       | 0,635   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.06  | 65.03  | 1.57     | 2.41     | 110      | 2.032     | 0.668 | 2.48 | 0.76 | 0.61 | 36.29    | 2,50 |      | 1        | 35    | 2.78 |     | 1_00 | 100_8 | 0.91 | 0_175  | 0,160 | 0.634   | 0.25      | 99%      | 1.50       |
| 59.22  | 103.87 | 1.91     | 1.83     | 110      | 2.036     | 0.666 | 1.87 | 0.68 | 0.64 | 61.58    | 2,25 |      | 1        | 57    | 1.79 |     | 1.00 | 110.3 | 0.87 | 0.205  | 0.179 | 0.633   | 0.28      | 98%      | 1.37       |
| 59.38  | 65.03  | 1.50     | 2.30     | 110      | 2.040     | 0.665 | 2.38 | 0.75 | 0.61 | 36.27    | 2.49 |      | 1        | 35    | 2.72 |     | 1.00 | 98.5  | 0.91 | 0.169  | 0.154 | 0.632   | 0.24      | 99%      | 1.53       |
| 59.55  | 38.85  | 0.98     | 2.51     | 110      | 2 044     | 0.664 | 2,65 | 0.82 | 0.58 | 20.23    | 2.72 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.631   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.71  | 27.32  | 0.71     | 2.60     | 110      | 2.048     | 0.662 | 2.81 | 0.87 | 0_56 | 13.44    | 2,88 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.630   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.88  | 17.57  | 0.45     | 2.57     | 110      | 2.052     | 0.661 | 2.91 | 0.93 | 0.54 | 7.92     | 3.07 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.629   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.04  | 14.52  | 0.43     | 2.94     | 110      | 2,055     | 0,660 | 3.43 | 0.97 | 0.53 | 6.19     | 3.20 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.628   | Non-Liq.  | Non-Liq. | 0.00       |
| 60 20  | 13.78  | 0.46     | 3.32     | 110      | 2,059     | 0,658 | 3.91 | 0.99 | 0.52 | 5.74     | 3,26 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.627   | Non-Liq.  | Non-Liq: | 0.00       |
| 60.37  | 14.34  | 0.56     | 3.88     | 110      | 2,063     | 0.657 | 4.54 | 0.99 | 0.52 | 5.98     | 3.28 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.626   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.53  | 16.36  | 0.62     | 3.78     | 110      | 2.067     | 0.656 | 4.32 | 0.97 | 0.52 | 7.05     | 3,21 |      | 0        |       |      |     |      |       | 0.91 |        |       | 0.625   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.70  | 23.29  | 0.00     | 0.00     | 110      | 2,071     | 0,654 | 0.00 | 0.80 | 0.58 | 11,71    | 2.64 |      | 0        |       | 1.00 |     |      |       | 0.91 |        |       | 0.624   | Non-Liq.  | Non-Liq  | 0.00       |
| 60.86  | 28.55  | 0.00     | 0.00     | 110      | 2,075     | 0.653 | 0.00 | 0.79 | 0.59 | 14.72    | 2.60 |      | 1        | 0     | 1.00 |     | 1.00 | 14.7  | 0.91 | 0.062  | 0.057 | 0.623   | 0.09      | 100%     | 5.78       |
| 61.02  | 34.53  | 0.00     | 0.00     | 110      | 2,079     | 0.652 | 0.00 | 0.78 | 0.59 | 18.16    | 2,56 |      | 1        | 6     | 1,00 |     | 1,00 | 18.2  | 0.91 | 0.065  | 0.059 | 0.622   | 0.10      | 100%     | 5.00       |

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-3 Plot: 3 (feet) EARTHQUAKE INFORMATION: Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF 2.3 Magnitude: Clean Sand Qc1n = Cq\*Kc\*KH\*Qc  $SF = CRR_{7.5}*K\sigma/CSR$ 6.77 Probab Total PGA, g: 0.75 0.97 Use Tokimatsu & Seed (0) or Ishihara &Yoshmine (1): Avg Induced MSF 1\_30 Unit Weight of unsaturated soils: 110 pcf Required SF: 1.50 5% Subsidence GWT, feet: Unit Weight of saturated soils: 110 pcf Min SF of Liquefiable Layers: 20.0 0.17 Max (inches) Design GWT, feet: 2.60 8.0 Limiting Ic for liquefiable soils: Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 0.02 100% 0.3 g Liquef Rel Eff\_Stress Laye Tip Friction Friction Total Clear Induced Liquefac. Volumetric Depth Ωc Fs Ratio Unit Wt. at Midpt. Safety Corrected Suscept Dens Sand FO M=7.5Probab. Strain (feet) (tsf) (tsf) % (pcf) p'o (tsf) Qc1n (0 or 1) Dr (%) Oc1n CRR75 CRR n (m) CSR Factor 1961 1.50 0.16 61.63 0.93 110 0.009 1,000 1.50 0.62 1.70 99.01 2.03 1.34 1.00 133,0 76 1.00 0.299 0.299 0.485 Non-Lia, Non-Lia 0.00 0.33 79.05 1:53 1 94 110 0.018 1,000 1 94 0.62 1.70 126.99 2.03 1.35 1.00 171.2 1.00 0.000 0.485 Infin. Non-Lia, Non-Lia 0.00 0.4978 13 1.93 2.46 110 0.027 1.000 2.46 0.64 1.70 125.50 2.12 86 1,48 1,00 186.4 Infin. 0.000 0.485 Non-Liq. Non-Liq. 0.00 0.66 68.31 1.84 2.70 110 0.036 1.000 2.70 0.66 1.70 109.70 2.18 81 1.63 1.00 178.6 1.00 Infin 0,000 0.485 Non-Liq. Non-Liq. 0.00 0.82 1.52 2.77 54.87 0.045 1.000 110 2.77 0.68 1.70 88.09 2.26 72 1.82 1.00 159.9 1.00 0.460 0.460 O 485 Non-Liq. Non-Liq. 0.00 0.98 47.14 1.21 110 0.054 1,000 2.57 0.69 1.70 75.66 2.28 65 1.88 1:00 142.1 1.00 0.347 0.347 0.485 Non-Liq. Non-Liq. 0.00 1.15 39.47 1.02 2.57 0.063 0.999 2.58 0.71 1.70 63.32 2.33 58 2,06 1,00 130.5 1,00 0.287 0.287 0.484 Non-Liq. Non-Liq 0.00 39.47 1.02 2.57 0,072 0.999 1.31 110 2.58 0.71 1.70 63.30 2.33 2.06 1.00 130.5 1,00 0.287 0.484 0.287 Non-Lia, Non-Lia 0.00 1.48 31.24 0.82 2.63 110 0.081 0.999 2.64 0.73 1.70 50.07 2.41 48 2,37 1,00 118.7 1,00 0.236 0,236 0.484 Non-Liq. Non-Liq. 0.00 Non-Liq. Non-Liq. 1.64 24.89 0.66 2.65 110 0.090 0.998 2.66 0.75 1.70 39.85 2 49 39 2.72 1.00 108.3 1.00 0.198 0,198 0.484 0.00 1.80 19.86 0.33 1.65 0.099 110 0.998 1.66 0.741.70 31.75 2.44 29 2.48 1.00 78.7 1.00 0.125 0.125 0.484 Non-Liq. Non-Liq. 0.00 1.97 20.55 0.42 2.06 0.108 110 0.998 2.07 0.75 1.70 32.85 2.49 31 2.70 1.00 88.6 1.00 0.145 0.145 0.484Non-Liq. Non-Liq. 0.00 0.47 32,62 2.13 20.42 2.29 110 0.117 0.997 2.30 0.76 1.70 2.52 30 2.85 1.00 93.0 1.00 0.155 0.155 0.483 Non-Lia, Non-Lia 0.00 2,30 19 65 0.48 2 45 0.997 110 0.126 2.46 0.77 1.70 31.37 2.55 1.00 94.8 1.00 0.159 0.159 0.483 Non-Lia, Non-Lia 0.00 1.70 2.46 18.16 0.52 2.85 110 0.135 0.996 2.87 0.79 28.96 0 2.62 1.00 0.483 Non-Liq. Non-Liq. 0.00 2.62 15.20 0.57 3.77 110 0.144 0.996 3.81 0.83 1.70 24.19 2.76 0 0.483 1.00 Non-Liq. Non-Liq. 0.00 2.79 0.153 0.57 4.06 13.95 110 0.996 4.10 0.85 1.70 22 17 281 0 1 00 0.483 Non-Liq. Non-Liq. 0.00 0.162 2.95 0.56 11.38 4.92 110 0.995 4.99 0.89 1.70 18.02 2.93 0 1.00 0.482 Non-Liq. Non-Liq. 0.00 3,12 12.18 0.59 4.85 0.171 0.995 4.92 0.88 1.70 19.30 2.90 0 1.00 0.482 Non-Liq. Non-Liq 0.00 3,28 0.60 0.180 12,71 4.68 110 0.994 4.75 0.87 1.70 20.13 2.88 0 1.00 0.482 Non-Lia, Non-Lia 0.00 3.44 11.57 0.62 5.32 110 0.189 0.994 5.41 0.89 1.70 18.29 2.95 0 1.00 0 482 Non-Liq. Non-Liq. 0.00 3.61 11.06 0.51 4.57 110 0.1980.994 4 65 0.88 1.70 17.45 2.92 0 0.482 1.00 Non-Liq. Non-Liq. 0.00 3,77 20.97 0.48 2.28 110 0.208 0.993 2.30 0.76 1.70 33.36 2.51 31 2.81 1.00 93 R 1.00 0.157 0.157 0.482 Non-Liq. Non-Liq. 0.00 3.94 0.55 1.88 0.993 29.22 110 0.217 1.90 0.71 46.60 1.70 2.34 45 2.09 1.00 976 1.00 0.166 0.166 0.481 Non-Liq. Non-Liq. 0.00 4.10 37.87 0.68 110 0.226 0.993 1.80 0.68 1.70 60.49 2.24 107.4 56 1.78 1.00 1:00 0.195 0.195 0.481 Non-Liq. Non-Liq. 0.00 0,235 4.27 45.79 0.82 1.80 0.992 1.81 110 0.66 1,70 73,20 2.18 1.62 1.00 1.00 0.236 118.8 0.236 0.481 Non-Lig. Non-Lig. 0.00 4.43 52.76 0.97 1.84 110 0.244 0.992 1.85 0.65 84.38 1.70 2.14 70 1.54 1.00 129.9 1.00 0.284 0.284 0.481 Non-Liq. Non-Liq. 0.00 4.59 58.36 1.00 1.72 110 0.253 0.991 1.73 0.64 1.70 93.37 2.09 74 1.44 1,00 134.3 0.305 0.481 1.00 0.305 Non-Liq. Non-Liq. 0.00 4.76 62.10 1.17 1.89 110 0.262 0.991 1.90 0.64 1.70 99.36 2.10 77 1.46 1.00 144.7 1.00 0.362 0.362 0.480 Non-Liq. Non-Liq. 0.00 2.03 4.92 64.35 1.31 110 0.271 0.991 2.04 0.64 102.96 1.70 2.11 78 1.48 1.00 152.2 1.00 0.408 0.408 0.480 Non-Liq. Non-Liq. 0.00 5.09 68.21 1.45 110 0.280 0.990 2.14 0.64 1.70 109.15 2.11 80 1.47 1.00 160.8 1.00 Infin. 0.000 0.480 Non-Liq. Non-Liq. 0.00 5.25 72,78 1.57 2.16 110 0.289 0.990 2.17 0.64 1.70 116,48 2.10 83 1.45 1.00 168.6 Infin. 0.000 1.00 0.480 Non-Lia, Non-Lia, 0.00 5 41 77 R1 1.63 2 10 110 0.298 n gag 2 11 0.63 1.70 124.55 2.07 86 1.40 1.00 174.2 1.00 Infin. 0.000 0.480 Non-Liq. Non-Liq. 0.00 5.58 Non-Liq. Non-Liq. 85.70 1.64 1.91 110 0.307 0.989 1 92 0.61 1.70 137.21 2.01 90 1.31 179.9 0.479 1.00 1.00 Infin 0.000 0.00 5.74 100.29 0.316 1.65 1.65 110 0.989 1.65 0.58 1.70 160.64 1.91 96 1.20 1.00 1.00 1939 1.00 Infin 0.000 0.479 Non-Liq. Non-Liq. 0.00 5.91 115.78 1.63 1.41 0.988 110 0.325 1.41 0.55 185.51 1.70 1.82 100 1.12 1.05 1.00 209 1 1.00 Infin 0.000 0.479 Non-Liq. Non-Liq. 0.00 127.60 6.07 1.61 1.26 110 0.334 0.988 1.27 0.54 1.70 204.49 1.76 100 1.08 1\_10 1.00 221.2 1.00 Infin. 0.000 0.479 Non-Liq. Non-Liq. 0.00 6.23 135,25 1.64 1,21 110 0.343 0.988 1.22 0.53 1.70 216.77 1.73 100 1.06 1.15 1.00 0.000 230.1 1.00 Infin. 0.479 Non-Lia, Non-Lia, 0.00 6.40 142 84 1.69 1.18 110 0.352 0.987 1 19 0.52 1.70 228.95 1.20 1.71 100 1.04 1.00 239.3 1.00 Infin 0.000 0.479 Non-Liq. Non-Liq. 0.00 6.56 144.87 1.70 1.18 110 0.361 0.987 1.18 0.52 1.70 232 20 1.70 100 1.04 1.25 1.00 Infin 0.000 241.7 1.00 0.478 Non-Liq. Non-Liq. 0.00 6.73 154:10 1.74 0.370 Infin. 1.13 110 0.986 1.13 0.51 1.70 247.01 1.67 100 1.02 1.30 1.00 251.8 1.00 0.0000.478 Non-Liq. Non-Liq. 0.00 6.89 159.66 1.81 0,379 1:14 110 0.986 1.14 0.51 253.36 1.66 257.5 1.68 100 1.01 1.35 1.00 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 165,12 1.78 7.05 1.08 110 0.388 0.986 1.08 0.50 1.65 257.24 1.00 1.64 100 1,40 1.00 257.5 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 169,35 1.74 0.397 7.22 1.02 110 0.985 1.03 0.50 1.63 260.70 1.62 100 1.00 1.45 1.00 261.7 0.478 1.00 Infin: 0.000 Non-Lia, Non-Lia, 0.00 7.38 177.82 1.68 0.94 110 0.406 0.985 0.95 0.50 1.61 270,69 1.00 1.50 1.00 1.58 100 271.7 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 Infin. 7.55 173.84 1.63 0.94 110 0.415 0.985 0.94 0.50 1.60 261.72 1.59 100 1.00 1.55 1.00 262.7 1.00 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.71 173.84 0.94 110 1.63 0.424 0.984 0.94 Infin: 0.50 1.58 258.90 1.59 100 1.00 1.60 1.00 259 9 1.00 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.87 174.47 1.63 0.94 0.433 0.984 110 0.94 0.50 1.56 257.11 1.60 1.00 100 1.65 1.00 258.1 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 179.36 8.04 1,92 1.07 110 0.442 0.984 1.07 0.50 1,55 261.61 1.63 100 1.00 1.70 1.00 262.6 0.000 0.477 1.00 Infin. Non-Liq. Non-Liq. 0.00 8.20 186.51 2.06 0.451 0.983 1.10 110 1.11 0.50 .53 269.32 1.64 100 1.00 1.75 1.00 270.3 0.000 0.481 1.00 Infin. Non-Lig. Non-Lig. 0.00 8.37 187.62 1.80 0.96 110 0.460 0.983 0.96 0.50 268.24 1.00 1.52 1.59 100 1.80 1.00 269.2 1.00 Infin. 0.000 0.486 Non-Liq. Non-Liq. 0.00 8.53 196.66 1.97 1.00 110 0.469 0.982 1.00 0.50 1.50 278.47 1.60 100 1.00 1.85 1.00 279.5 1.00 Infin. 0.000 0.491 Non-Liq. Non-Liq. 0.00 8.69 203.40 0.982 2.06 1.01 0.478 110 1.01 0.50 1.49 285.29 1.59 100 1.00 1.90 1.00 286.4 1.00 Infin. 0.000 0.496 Non-Liq. Non-Liq. 0.00 8.86 213.10 2.23 1.05 0.487 0.982 110 1.05 0.50 1.47 296.14 1.59 100 1.00 1.95 1.00 297.2 1.00 Infin. 0.000 0.501 Non-Liq. Non-Liq. 0.00 9.02 211.76 2.34 1.10 0.496 0.981 0.50 291 57 2.00 1.11 1.46 1.62 100 1.00 1.00 292.7 1.00 0.000 0.506 Infin. Non-Lig. Non-Lig. 0.00 215.66 2.34 1.09 0.505 0.981 9.19 110 1.09 0.50 1.45 294.28 1.61 100 1.00 2.05 1.00 295.4 0.510 1.00 0.000 Infin. Non-Lig. Non-Lig. 0.00 9.35 219.54 2.54 1:16 110 0.514 0.981 1.16 0.50 1.43 296.93 1.00 1.63 100 2.10 1.00 298.0 1.00 Infin. 0.000 0.515 Non-Liq. Non-Liq. 0.00 309.1 2.68 9.51 229.63 1.17 110 0.523 0.980 1 17 0.50 1 42 307.91 1 62 100 1.00 2.15 1.00 1.00 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 235.06 9.68 2.79 110 0.532 0.980 1.18 1.19 0.50 1.41 312.51 1.62 100 1.00 2.20 1.00 3137 1.00 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 9.84 237.58 2.88 0.980 1.21 110 0.541 1.21 0.50 1.40 313.21 1.63 100 1.00 2.25 1.00 314.4 1.00 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 10.01 233.01 2,93 1 26 110 0.550 0.979 1 26 0.50 1.39 305.09 1.65 100 1.00 306.7 2.30 1.00 0.000 1.00 Infin. 0.533 Non-Liq. Non Liq. 0.00 10,17 237.10 2.96 1.25 0.559 0.979 110 1.25 0.50 1.38 307.65 1.64 100 1.00 2.35 1.00 308.3 1.00 0.000 0.537 Infin. Non-Lig. Non-Lig. 0.00 10.33 243.13 3.06 1.26 110 0.568 0.979 1.26 0.50 1.36 312.86 1.64 100 1.00 2.40 1.00 313.1 1.00 Infin. 0.000 0.541 Non-Liq. Non-Liq. 0.00 243.55 10.50 3.17 1.30 110 0.577 0.978 1.30 0.50 1.36 311.64 1.65 100 1.01 2.45 1.00 3147 0.000 1.00 Infin. 0,545 Non-Liq. Non-Liq. 0.00 10.66 243.58 3,23 1.32 0.586 1.00 110 0.978 1.33 0.51 1.35 309.70 1.66 100 1.01 2.50 1.00 3146 Infin. 0.000 0.550 Non-Liq. Non-Liq. 0.00 10.83 251.39 3.25 1.29 110 0.595 0.978 1.30 0.50 1.33 316.43 1.65 100 1.00 2 55 1.00 318.3 1.00 Infin. 0.000 0.554 Non-Liq. Non-Liq. 0.00 10.99 254.32 3,43 1.35 110 0.604 0.977 1.35 0.51 1.33 318,41 1.66 100 1.01 2.60 1.00 323.3 0.000 0.557 1.00 Infin. Non-Lig. Non-Lig. 0.00 250.44 3.64 0.614 11.15 1.45 110 0.977 1.46 0.52 1,32 312,74 1.69 100 1.03 324.1 2.65 1.00 1.00 Infin. 0.000 0.561 Non-Lia, Non-Lia 0.00 1.32 11.32 235.91 3.45 1.46 110 0.623 0.977 1 47 0.52 293.22 1.71 100 1.05 2.70 1.00 307.7 1.00 Infin. 0.000 0.565 0.00 Non-Lig. Non-Lig 300.1 11.48 231,44 3.34 1.44 110 0.632 0.976 1 45 0.52 1.31 285.58 1.71 1.05 2.75 0.000 100 1.00 1.00 Infin. 0.569 Non-Liq. Non-Liq. 0.00 243.81 11.65 3.39 1.39 110 0.641 0.976 1.40 0.51 1.29 297.60 1.69 100 1\_03 2.80 1.00 308.0 1.00 Infin. 0.000 0.572 Non-Liq. Non-Liq. 0.00 11.81 248.76 3 18 1.28 0.650 0.975 110 1.28 1.28 300.06 0.51 1.66 100 1\_01 2.85 1.00 303.9 1.00 Infin. 0.000 0.576 Non-Liq. Non-Liq. 0.00 252.74 11.98 3.49 1.38 110 0.659 0.975 1.39 0.51 1.27 303.78 1.68 100 1.03 312.7 2.90 1.00 0.000 0.580 1.00 Infin. Non-Lig. Non-Lig. 0.00 12:14 246.32 3.71 1.51 110 0.668 0.975 0.52 1.51 1.27 295.51 1.72 100 1.05 2.95 1.00 311.7 1.00 0.000 0.583 0.00 Infin. Non-Lia, Non-Lia 12.30 247.22 3.84 1.55 110 0.677 0.974 1.56 0.53 1.27 294 93 1.73 100 1.06 3.00 1\_00 313.3 1.00 Infin. 0.000 0.587 Non-Liq. Non-Liq. 0.00 246.81 3.92 313.0 12.47 1.59 110 0.686 0.974 1.59 0.53 1.26 292.77 174 100 1.07 3.05 1.00 0.590 1.00 Infin 0.000 Non-Liq. Non-Liq. 0.00 12.63 246,30 4.04 1.64 110 0.695 0.974 1.65 0.53 1.25 290.63 1.75 100 1.07 3.10 1.00 313.4 1.00 Infin. 0.000 0.593 Non-Liq. Non-Liq. 0.00 12.80 4.09 1.67 110 0.704 0.973 1.68 0.54 1.25 286.30 1.76 100 1.08 3.15 1.00 310.9 1.00 Infin. 0.000 0.597 Non-Liq. Non-Liq. 0.00

| L            | ayer         | Tip              | Friction     | Friction     | Total      | Eff Stress            | s              |              |              |              |                  | -            | 9 | Liquef   | Rel        |              |                                | -            | Clean          |              | -                |       | Induced        | Liquefac.                |                           | Volumetric   |
|--------------|--------------|------------------|--------------|--------------|------------|-----------------------|----------------|--------------|--------------|--------------|------------------|--------------|---|----------|------------|--------------|--------------------------------|--------------|----------------|--------------|------------------|-------|----------------|--------------------------|---------------------------|--------------|
| 100          | epth<br>eet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt<br>p'o (tsf) | ed             | F            | n            | Co           | Corrected        |              |   | Suscept  |            |              | H                              | 1200         | Sand           |              | con              | EQ    | M=7,5          | Safety                   | Probab                    | Strain       |
| -            | 2.96         | 243,85           | 4.05         | 1,66         | 110        | 0.713                 | 0.973          | 1.67         | 0.54         | 1.24         | Qc1n<br>284,13   | 1.76         | 0 | (0 or 1) | 100        | 1.08         | (m)<br>3.20                    | 1,00         | Qc1n<br>308.4  | 1.00         | CRR <sub>7</sub> | 0.000 | 0,600          | Factor<br>Non-Liq.       | P <sub>L</sub><br>Non-Lia | 0.00         |
|              | 3.12         | 250.82<br>254.86 | 4 24         | 1.69<br>1.66 | 110<br>110 | 0.722                 | 0.973<br>0.972 | 1.70<br>1.66 | 0.54<br>0.53 | 1.23<br>1.22 | 290,33<br>292,76 | 1.76<br>1.76 |   | 1        | 100<br>100 | 1.08         | 3.25<br>3.30                   | 1.00         | 315.3          | 1.00         | Infin.           | 0.000 | 0.603          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 13           | 3.45         | 265,02           | 4.01         | 1,51         | 110        | 0.740                 | 0.972          | 1.52         | 0.52         | 1.21         | 301.15           | 1.72         |   | i        | 100        | 1.05         | 3.35                           | 1.00         | 316.1<br>316.9 | 1.00         | Infin.           | 0,000 | 0.606<br>0.609 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              | 3.62<br>3.78 | 296.24<br>358.75 | 3.54<br>4.85 | 1.19<br>1.35 | 110<br>110 | 0.749<br>0.758        | 0.972<br>0.971 | 1.20<br>1.35 | 0.50         | 1.19<br>1.18 | 331.97<br>399.79 | 1.61<br>1.61 |   | 1        | 100<br>100 | 1.00         | 3.40<br>3.45                   | 1.00         | 333.2<br>401.3 | 1.00         | Infin.           | 0,000 | 0,612<br>0,615 | Non-Liq.                 |                           | 0.00         |
| 13           | 94           | 401.73           | 4.27         | 1.06         | 110        | 0.767                 | 0.971          | 1.07         | 0.50         | 1.17         | 445.14           | 1,49         |   | 1        | 100        | 1.00         | 3.45                           | 1.00         | 446.8          | 1.00         | Infin            | 0.000 | 0.618          | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              | 1.11<br>1.27 | 397.89<br>408.46 | 5.59<br>4.70 | 1.40<br>1.15 | 110<br>110 | 0.776<br>0.785        | 0.971          | 1.41         | 0.50         | 1.17<br>1.16 | 438,29<br>447,36 | 1.60<br>1.52 |   | 1        | 100<br>100 | 1.00         |                                | 1.00<br>1.00 | 439.9<br>449.0 | 1.00         | Infin.           | 0.000 | 0.621<br>0.624 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 14           | 1.44         | 435,23           | 5,55         | 1.28         | 110        | 0.794                 | 0.970          | 1.28         | 0.50         | 1.15         | 474.00           | 1.55         |   | 1        | 100        | 1.00         | 3.45                           | 1_00         | 475.8          | 1.00         | Infin.           | 0.000 | 0,627          | Non-Liq.                 | Non-Lig                   | 0.00         |
|              | 1.60<br>1.76 | 389 69<br>348 88 | 5,04<br>3,51 | 1.29<br>1.01 | 110<br>110 | 0.803<br>0.812        | 0.970          | 1.30<br>1.01 | 0.50<br>0.50 | 1.15<br>1.14 | 421.92<br>375.53 | 1.58<br>1.52 |   | 1        | 100<br>100 | 1.00         | 3.45<br>3.45                   | 1.00         | 423.5<br>376.9 | 1.00         | Infin.           | 0.000 | 0.629<br>0.632 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              | 1.93<br>5.09 | 347.64<br>366.34 | 3,21         | 0.92<br>0.90 | 110<br>110 | 0.821<br>0.830        | 0.969          | 0.93         | 0.50         | 1.14         | 372,12           | 1.49         |   | 1        | 100        | 1.00         |                                | 1.00         | 373.5          | 1.00         | Infin.           | 0.000 | 0,635          | Non-Liq.                 | Non-Liq.                  | 0.00         |
|              | 26           | 355.46           | 3.76         | 1.06         | 110        | 0.839                 | 0.969<br>0.968 | 1.06         | 0.50<br>0.50 | 1.13<br>1.12 | 390.04<br>376.38 | 1.47         |   | 1        | 100<br>100 | 1.00         |                                | 1.00         |                | 1.00         | Infin.           | 0.000 | 0.637<br>0.640 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              | 42<br>5.58   | 339.34<br>338.34 | 3.85<br>4.27 | 1.14<br>1.26 | 110<br>110 | 0.848<br>0.857        | 0.968          | 1.14<br>1.27 | 0.50<br>0.50 | 1.12<br>1.11 | 357.34<br>354.40 | 1.57<br>1.61 |   | 1        | 100<br>100 | 1.00         |                                | 1.00         | 358.7          | 1.00         | Infin            | 0.000 | 0.643          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 15           | 75           | 341.10           | 4,54         | 1.33         | 110        | 0.866                 | 0,967          | 1.33         | 0.50         | 1.11         |                  | 1.63         |   | i        | 100        | 1.00         |                                | 1.00<br>1.00 | 355.7<br>356.7 | 1.00         | Infin.<br>Infin. | 0.000 | 0.645<br>0.648 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              | 5.91<br>5.08 | 335.06<br>339.73 | 4.41<br>3.85 | 1,32<br>1,13 | 110<br>110 | 0.875<br>0.884        | 0,967          | 1.32         | 0.50<br>0.50 | 1.10<br>1.09 | 347,30<br>350,34 | 1.63<br>1.58 |   | 1        | 100<br>100 | 1.00         |                                | 1.00         |                | 1.00         | Infin.           | 0.000 | 0.650<br>0.653 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 16           | 24           | 339,17           | 3.94         | 1.16         | 110        | 0.893                 | 0.966          | 1.16         | 0.50         | 1.09         | 347.98           | 1,59         |   | 1        | 100        | 1.00         | 3.45                           | 1.00         | 349.3          |              | Infin            | 0.000 | 0.655          | Non-Liq.                 |                           | 0.00         |
|              |              | 304,89<br>240.39 | 4.11<br>3.63 | 1,35<br>1,51 | 110<br>110 | 0.902<br>0.911        | 0.966<br>0.965 | 1.35         | 0.51<br>0.54 | 1.08<br>1.08 | 311,54<br>245,31 | 1,67<br>1,77 |   | 1        | 100<br>100 | 1.02         |                                | 1.00         |                | 1.00         | Infin.           | 0.000 | 0.657<br>0.660 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 200.85           | 3.97         | 1.97         | 110        |                       | 0.965          | 1.98         | 0.58         | 1.08         | 204.91           | 1,91         |   | 1        | 100        | 1.20         | 3.45                           | 1.00         | 246.3          | 1.00         | Infin.           | 0.000 | 0,662          | Non-Liq.                 | Non-Liq.                  | 0.00         |
|              | 90           | 186.05<br>145.35 | 3.36<br>4.55 | 1.80<br>3.13 | 110<br>110 | 0.929<br>0.938        | 0.965<br>0.964 | 1.81<br>3.15 | 0.58<br>0.65 | 1.08<br>1.08 | 188,60<br>147,65 | 1,90<br>2,15 |   | 1        | 100<br>93  | 1.19<br>1.56 | 3.45                           | 1.00         |                | 1.00         | Infin.           | 0,000 | 0,664<br>0,666 | Non-Liq.<br>Non-Liq.     | 4.5                       | 0.00<br>0.00 |
|              | .22          | 137.21<br>195.13 | 1.70<br>2.67 | 1.24<br>1.37 | 110<br>110 |                       | 0.964          | 1.25         | 0.57         | 1.06         | 137,16           | 1,87         |   | 1        | 90         | 1.16         |                                | 1.00         | 160.3          | 1.00         | Infin.           | 0,000 | 0.669          | Non-Liq.                 | Non-Liq.                  | 0.00         |
|              |              | 375.11           | 3.14         | 0.84         | 110        |                       | 0.963<br>0.963 | 1.37<br>0.84 | 0.55<br>0.50 | 1.06<br>1.05 |                  | 1.80<br>1.46 |   | 1        | 100<br>100 | 1.11         |                                |              |                | 1.00         | Infin.           | 0,000 | 0.671<br>0.673 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 366,40<br>334,19 | 3.61<br>2.48 | 0,98<br>0,74 | 110<br>110 |                       | 0.963<br>0.962 | 0.99<br>0.75 | 0.50<br>0.50 | 1.04<br>1.04 |                  | 1.52<br>1.45 |   | 1        | 100<br>100 | 1.00         |                                |              |                | 1.00         | Infin.           | 0,000 | 0.675          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 18           | 04           | 253,24           | 2.71         | 1.07         | 110        | 0.992                 | 0.962          | 1.08         | 0.50         | 1.03         | 246.22           | 1.65         |   | 1        |            | 1.00         |                                |              |                | 1.00         | Infin.<br>Infin. | 0.000 | 0.677<br>0.679 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 169.29<br>135.74 | 2.90         | 1,71<br>1,61 | 110<br>110 |                       | 0.962<br>0.961 | 1.72<br>1.62 | 0.58         | 1.03<br>1.03 |                  | 1.92<br>1.97 |   | 1        | 97<br>88   | 1.21<br>1.26 |                                |              |                | 1.00         | Infin.           | 0.000 | 0.681<br>0.683 | Non-Liq.<br>Non-Liq.     |                           | 0.00         |
| 18           | .54          | 258.73           | 2,13         | 0,82         | 110        | 1,020                 | 0,961          | 0.83         | 0.50         | 1.02         | 248.14           | 1.56         |   | i        | 100        | 1.00         | 1.40                           | 1.00         | 249.1          | 1.00         | Infin.           | 0.000 | 0.685          | Non-Liq.                 | Non-Liq.                  | 0.00         |
|              |              | 348.17<br>379.90 | 2,48<br>3.61 | 0.71<br>0.95 | 110<br>110 |                       | 0.960<br>0.960 | 0.71         | 0.50<br>0.50 | 1.01<br>1.01 |                  | 1,43<br>1,51 |   | 1        |            | 1.00         |                                |              |                | 1.00         | Infin            | 0.000 | 0.687<br>0.689 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 419.21           | 3.90         | 0.93         | 110        | 1,047                 | 0,960          | 0.93         | 0.50         | 1.01         | 397.39           | 1,47         |   | 1        | 100        | 1.00         | 1,55                           | 1.00         | 398.9          | 1.00         | Infin.           | 0,000 | 0.691          | Non-Liq.                 | Non-Liq                   | 0.00         |
|              |              | 396.96<br>387.05 | 4.58<br>4.64 | 1.15<br>1.20 | 110<br>110 |                       | 0.959<br>0.959 | 1.16<br>1.20 | 0.50<br>0.50 | 1.00<br>1.00 |                  | 1.57<br>1.59 |   | 1        |            | 1.00         |                                |              |                | 1.00         | Infin.           | 0,000 | 0.692<br>0.694 | Non-Liq.<br>Non-Liq.     |                           | 0.00         |
|              |              | 368.81<br>354.61 | 4.55<br>3.09 | 1.23<br>0.87 | 110<br>110 |                       | 0.958<br>0.958 | 1.24<br>0.87 | 0.50<br>0.50 | 0.99         |                  | 1,61<br>1,50 |   | 1        |            | 1.00         |                                | 1,00         | 346.3          | 1.00         | Infin.           | 0,000 | 0.696          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 19           | .85          | 342.37           | 2.52         | 0.74         | 110        | 1.092                 | 0.957          | 0.74         | 0.50         | 0.98         |                  | 1.46         |   | 1        |            | 1.00<br>1.00 |                                |              |                | 1.00<br>1.00 | Infin.           | 0.000 | 0.698<br>0.699 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 342.04<br>348.47 | 2.21         | 0.65<br>0.58 | 110<br>110 |                       | 0,957<br>0,957 | 0.65         | 0.50<br>0.50 | 0.98         |                  | 1.42<br>1.38 |   | 1        |            | 1.00         |                                |              |                | 1.00         | Infin.           | 0.000 | 0.701<br>0.703 | Non-Liq.                 |                           | 0.00         |
| 20           | .34          | 358.46           | 2.21         | 0.62         | 110        | 1,111                 | 0,956          | 0.62         | 0.50         | 0.98         | 329,65           | 1.39         |   | 1        | 100        |              | 1.95                           |              |                | 1.00         | Infin.           | 0.000 | 0.703          | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 20           |              | 366.69<br>400.46 | 2.31         | 0.63<br>0.56 | 110<br>110 |                       | 0,956<br>0.955 | 0.63         | 0.50<br>0.50 | 0.97<br>0.97 |                  | 1.39         |   | 1        |            | 1.00         |                                |              |                | 1.00         | Infin.           | 0.000 | 0.706<br>0.708 | Non-Liq.<br>Non-Liq.     |                           | 0.00         |
|              |              | 398.65           | 2.07         | 0.52         | 110        |                       |                | 0.52         | 0.50         | 0.97         |                  | 1.31         |   | 1        |            |              | 2.10                           | 1.00         | 366.2          | 1.00         | Infin.           | 0.000 | 0.709          | Non-Liq.                 | Non-Liq.                  | 0.00         |
|              |              | 411.19<br>402.69 | 1.95<br>3.64 | 0.47<br>0.90 | 110<br>110 |                       |                | 0.48<br>0.91 | 0.50<br>0.50 | 0.97<br>0.97 |                  | 1.27<br>1.48 |   | 1        |            |              |                                |              |                | 1.00         | Infin.           | 0.000 | 0.711<br>0.712 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 432.94<br>469.69 | 4.66<br>5.29 | 1.08         | 110<br>110 |                       |                | 1.08         | 0.50<br>0.50 | 0.97<br>0.96 |                  | 1.53<br>1.52 |   | 1        |            |              |                                |              |                | 1.00         | Infin.           | 0.000 | 0.714          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 21           | 65           | 374.94           | 3.56         | 0.95         | 110        | 1,142                 | 0,953          | 0.95         | 0.50         | 0.96         | 340.08           | 1.52         |   | i        |            |              |                                | 1.00         | 341.3          | 1.00         | Infin.           | 0.000 | 0.715<br>0.717 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
|              |              | 335.23<br>327.25 | 2.37         | 0.71         | 110<br>110 |                       |                | 0.71         | 0.50<br>0.50 | 0.96<br>0.96 |                  | 1.46<br>1.41 |   |          |            |              |                                |              | 304.6<br>296.8 | 1.00         | Infin.           | 0.000 | 0.718<br>0.719 | Non-Liq.<br>Non-Liq.     |                           | 0.00         |
|              |              | 329.21           | 1,70         | 0.51         | 110        | 1,154                 | 0_951          | 0.52         | 0.50         | 0.96         | 296.94           | 1.37         |   | 1        | 100        | 1.00         | 2.50                           | 1.00         | 298.1          | 1.00         | Infin.           | 0.000 | 0.721          | Non-Liq.                 | Non-Liq                   | 0.00         |
| 22           |              | 336.57<br>342.42 | 1.69<br>1.62 | 0.50<br>0.47 | 110<br>110 |                       |                | 0.50<br>0.48 | 0.50<br>0.50 | 0.96<br>0.95 |                  | 1.35<br>1.33 |   |          |            |              |                                |              |                | 1.00<br>1.00 | Infin.           | 0.000 | 0.722<br>0.724 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 22,          |              | 357.21<br>365.13 | 1.50<br>1.60 | 0.42         | 110<br>110 |                       |                | 0.42<br>0.44 | 0.50         | 0.95<br>0.95 |                  | 1.28<br>1.29 |   |          |            |              |                                |              |                | 1.00         | Infin.           | 0.000 | 0.725          | Non-Liq.                 | Non-Liq                   | 0.00         |
| 22.          | 97           | 275.06           | 1.75         | 0.64         | 110        | 1,173                 | 0.949          | 0.64         | 0.50         | 0.95         | 245.84           | 1.49         |   |          |            |              |                                |              |                | 1,00<br>1,00 | Infin.<br>Infin. | 0.000 | 0.726<br>0.727 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 23,          |              | 359.31<br>360.37 | 1.67<br>1.63 | 0.47<br>0.45 | 110<br>110 |                       |                | 0.47<br>0.45 | 0.50<br>0.50 | 0.95<br>0.95 |                  | 1.31<br>1.30 |   |          |            |              |                                |              |                | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.729<br>0.730 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 23.          | 46           | 371.26           | 1.97         | 0.53         | 110        | 1,185                 | 0.947          | 0.53         | 0.50         | 0.94         | 330,53           | 1.34         |   | 1        | 100        | 1.00         | 2.90                           | 1.00         | 331.8          | 1.00         | Infin.           | 0.000 | 0.731          | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 23,<br>23,   |              | 356.90<br>361.74 | 1.94<br>2.11 | 0.54<br>0.58 | 110<br>110 |                       |                | 0.54<br>0.58 |              | 0.94<br>0.94 |                  | 1.36<br>1.38 |   |          |            |              |                                |              | 318.4<br>322.2 |              | Infin.<br>Infin. | 0.000 | 0.732<br>0.733 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 23.<br>24.   |              | 364.42<br>368.01 | 2.28 2.35    | 0.63<br>0.64 | 110<br>110 | 1.197                 | 0.946          | 0.63<br>0.64 | 0.50         | 0.94<br>0.94 | 322.82           | 1.40         |   | 1        | 100        | 1.00         | 3.05                           | 1.00         | 324.0          | 1.00         | Infin.           | 0.000 | 0.735          | Non-Liq.                 | Non-Liq                   | 0.00         |
| 24.          | 28 3         | 376.81           | 2,30         | 0.61         | 110        | 1.204                 | 0.945          | 0.61         | 0.50         | 0.94         | 332.74           | 1.40<br>1.38 |   |          |            |              |                                |              |                | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.736<br>0.737 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 24<br>24     |              | 395,44<br>439.09 | 2.76<br>2.71 | 0.70<br>0.62 | 110<br>110 |                       |                | 0.70<br>0.62 |              |              |                  | 1.41<br>1.34 |   |          |            |              |                                | 1.00         | 350.0          | 1.00<br>1.00 | Infin.           | 0.000 | 0.738<br>0.739 | Non-Liq.                 | Non-Liq.                  | 0.00         |
| 24.          | 77 4         | 490.41           | 3.14         | 0.64         | 110        | 1.216                 | 0.943          | 0.64         | 0.50         | 0.93         | 431.28           | 1.32         |   | 1        | 100        | 1.00         | 3.30                           | 1.00         | 432.9          | 1.00         | Infin.           | 0.000 | 0.740          | Non-Liq.<br>Non-Liq.     | Non-Liq                   | 0.00<br>0.00 |
| 24<br>25     |              | 529.94<br>499.75 | 3.64<br>2.73 | 0.69<br>0.55 | 110<br>110 |                       |                | 0.69<br>0.55 |              |              |                  | 1.33<br>1.27 |   |          |            |              |                                |              | 467.1<br>439.7 |              | Infin:<br>Infin: | 0.000 | 0.741<br>0.742 | Non-Liq.<br>Non-Liq.     |                           | 0.00<br>0.00 |
| 25.          | 26 4         | 478.20<br>506.69 | 2,89<br>3.13 | 0.80         | 110        | 1,228                 | 0.941          | 0.61         | 0.50         | 0.93         | 418,49           | 1.31         |   | 1        | 100        | 1.00         | 3.45                           | 1.00         | 420.1          | 1.00         | Intin.           | 0.000 | 0.743          | Non-Liq.                 | Non-Liq                   | 0.00         |
| 25.<br>25.   | 59 🛂         | 475.10           | 3,98         | 0.62<br>0.84 | 110<br>110 | 1.236                 | 940            | 0.62<br>0.84 | 0.50         |              |                  | 1.30<br>1.43 |   |          |            |              | 3.50<br>3.55                   |              |                | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.744<br>0.745 | Non-Liq.  <br>Non-Liq.   |                           | 0.00<br>0.00 |
| 25,<br>25.   |              | 412.87<br>387.95 | 3,59<br>2.71 | 0.87<br>0.70 | 110<br>110 |                       |                | 0.87<br>0.70 |              | 0.92         | 359.45           | 1.48<br>1.42 |   | 1        | 100        | 1.00         |                                | 1.00         | 360.8          | 1.00         | Infin.           | 0.000 | 0.746          | Non-Liq.                 | Non-Liq                   | 0.00         |
| 26.          | 08 3         | 382.12           | 2.49         | 0.65         | 110        | 1,247                 | 938            | 0.65         | 0.50         | 0.92         | 331.55           | 1.40         |   | 1        | 100        | 1.00         | 3.65                           | 1.00         | 332.8          | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.747<br>0.747 | Non-Liq.  <br>Non-Liq.   |                           | 0.00<br>0.00 |
| 26.          |              | 377.33<br>378.71 | 2 13 2 10    | 0.56<br>0.56 | 110<br>110 |                       |                | 0.57<br>0.56 |              |              |                  | 1.36<br>1.36 |   |          |            |              | 3.65<br>3.65                   |              | 328.1<br>328.8 | 1.00         | Infin.<br>Infin. | 0.000 | 0.748<br>0.749 | Non-Liq.  <br>Non-Liq.   |                           | 0.00         |
| 26.          | 57 3         | 368.97           | 2.20         | 0.60         | 110        | 1.259                 | 936            | 0.60         | 0.50         | 0.92         | 318.60           | 1.39         |   | 1        | 100 1      | 1.00         | 3.65                           | 1.00         | 319.8          | 1.00         | Infin.           | 0.000 | 0.750          | Non-Liq. I               | Non-Liq                   | 0.00         |
| 26.<br>26.   |              | 347.99<br>340.27 | 2.18         | 0.63<br>0.58 | 110<br>110 |                       |                | 0.63<br>0.58 |              |              |                  | 1_42<br>1_41 |   |          |            |              | 3.65 3.65 4                    |              |                | 1.00<br>1.00 | Infin<br>Infin   |       | 0.751<br>0.751 | Non-Liq.  <br>Non-Liq.   |                           | 0.00<br>0.00 |
| 27.5<br>27.5 | 07 3         | 342.93<br>348.32 | 1.87         | 0.55         | 110        | 1,271                 | 934            | 0.55         | 0.50         | 0.91         | 294.66           | 1.39         |   | 1        | 100 1      | 1.00         | 3.65                           | 1.00         | 295.8          | 1.00         | Infin.           | 0.000 | 0.752          | Non-Liq. I               | Non-Liq                   | 0.00         |
| 27.          | 40 3         | 349.36           | 2.35         | 0.62<br>0.67 | 110<br>110 | 1.279                 | 933            | 0.62<br>0.68 | 0.50         |              |                  | 1.42<br>1.45 |   |          |            |              | 3.65 <i>1</i><br>3.65 <i>1</i> |              |                | 1.00<br>1.00 |                  |       | 0.753<br>0.754 | Non-Liq. 1<br>Non-Liq. 1 |                           | 0.00         |
| 27.          |              | 359.08<br>348.61 | 2.55         | 0.71<br>0.65 | 110<br>110 |                       |                | 0.71<br>0.66 |              |              |                  | 1.46<br>1.44 |   |          |            |              | 3.65 1<br>3.65 1               | 1.00         | 308.3          |              | Infin.           | 0.000 | 0.754          | Non-Liq. 1               | Non-Liq.                  | 0.00         |
|              |              | 28.38            |              | 0,69         | 110        |                       |                |              |              |              |                  | 1.47         |   | (5)      |            |              | 3.65 1                         |              | 296.6<br>281.0 |              |                  |       |                | Non-Liq.  <br>Non-Liq.   |                           | 0.00         |
|              |              |                  |              |              |            |                       |                |              |              |              |                  |              |   |          |            |              |                                |              |                |              |                  |       |                |                          |                           |              |

| Layer           | Tip              | Friction     | Friction     | Total      | Eff Stres             | s              | _            |              |              |                  | _            | ø | Liquef.             | Rel        |              |              | _            | Clean          | _            |                    |        | Induced        | l Liquefac.          |                  | Volumetric    |
|-----------------|------------------|--------------|--------------|------------|-----------------------|----------------|--------------|--------------|--------------|------------------|--------------|---|---------------------|------------|--------------|--------------|--------------|----------------|--------------|--------------------|--------|----------------|----------------------|------------------|---------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt<br>p'o (tsf) | rd             | F            | n            | Co           | Correcte<br>Qc1n | d<br>Ic      |   | Suscept<br>(0 or 1) |            | Kc           | H<br>(m)     | K            | Sand<br>Octo   | Κσ           | CRR <sub>7.5</sub> | EQ     | M=7.5<br>CSR   | Safety<br>Factor     | Probab<br>P      | Strain<br>(%) |
| 28.05           | 318.21           | 2.37         | 0.75         | 110        | 1,294                 | 0,930          | 0.75         | 0.50         | 0.90         | 270,83           | 1,51         |   | 1                   | 100        | 1.00         | 3,65         | 1,00         | 271.8          | 1.00         | Infin_             | 0.000  | 0.756          | Non-Liq.             | Non-Liq.         | 0.00          |
| 28.22<br>28.38  | 301.08<br>284.36 | 2.13         | 0.71<br>0.71 | 110<br>110 | 1,298<br>1,302        | 0.929          | 0.71<br>0.72 | 0.50<br>0.50 | 0.90         | 255 81<br>241 17 | 1,51<br>1,53 |   | 1                   | 100<br>100 | 1.00         | 3.65<br>3.65 | 1.00         | 256.8<br>242.1 | 1,00         | Infin              | 0.000  | 0.757<br>0.758 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 28,54<br>28,71  | 233,79<br>198,59 | 1.73         | 0.74<br>0.72 | 110<br>110 | 1,306<br>1,310        | 0.928          | 0.74<br>0.72 | 0.50<br>0.50 | 0.90         | 197.79           | 1,60         |   | 1                   | 100        | 1.00         | 3.65         | 1.00         | 198.5          | 1.00         | Infin.             | 0,000  | 0.758          | Non-Liq.             | Non-Liq.         | 0.00          |
| 28.87           | 159.05           | 1.23         | 0.72         | 110        | 1.314                 | 0.926          | 0.72         | 0.50         | 0.89         | 167,50<br>132,88 | 1,65<br>1,75 |   | 1                   | 98<br>89   | 1.00<br>1.07 | 3.65<br>3.65 | 1.00<br>1.00 | 168.5<br>142.6 | 1.00         | Infin<br>0.349     | 0.000  | 0.759<br>0.759 | Non-Liq.<br>0.46     | Non-Liq<br>93%   | 0.00<br>1.00  |
| 29 04<br>29 20  | 114.83<br>70.90  | 1.31<br>1.32 | 1 14<br>1 86 | 110<br>110 | 1,318<br>1,322        | 0.926<br>0.925 | 1.15<br>1.90 | 0.60<br>0.69 | 0.88<br>0.86 | 94.08<br>56.38   | 1,97<br>2,28 |   | 1                   | 74.<br>53  | 1,26<br>1,89 | 3,65         | 1.00         | 119.2          | 1.00         | 0.238              | 0.238  | 0.760          | 0.31                 | 98%              | 1.27          |
| 29.36           | 37,97            | 1.25         | 3.30         | 110        | 1.325                 | 0.924          | 3.42         | 0.81         | 0.83         | 28.87            | 2,67         |   | 0                   | 55         | 1.09         |              | 1.00         | 106.3          | 1,00         | 0.192              | U, 192 | 0.760<br>0.761 | 0.25<br>Non-Liq.     | 99%<br>Non-Liq   | 1.44<br>0.00  |
| 29.53<br>29.69  | 27,93<br>18,87   | 1.04         | 3.72<br>3.87 | 110<br>110 | 1,329                 | 0.923          | 3.91<br>4.16 | 0.85<br>0.90 | 0.82<br>0.81 | 20.70<br>13.46   | 2.81<br>2.98 |   | 0                   |            |              |              |              |                | 1.00         |                    |        | 0.761<br>0.762 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 29.86           | 13,89            | 0.49         | 3,53         | 110        | 1.337                 | 0.922          | 3.90         | 0.93         | 0.80         | 9.54             | 3,08         |   | 0                   |            |              |              |              |                | 1.00         |                    |        | 0.762          | Non-Liq.             |                  | 0.00          |
| 30.02           | 9.76<br>57.63    | 0.66<br>0.77 | 6,75<br>1,33 | 110<br>110 | 1,341<br>1,345        | 0.921<br>0.920 | 7.83<br>1.36 | 1.00<br>0.69 | 0.79         | 6.28<br>45.11    | 3,41<br>2,26 |   | 0                   | 44         | 1.84         |              | 1.00         | 83.0           | 1.00         | 0,133              | 0.133  | 0.763<br>0.763 | Non-Liq.<br>0.17     | Non-Liq.<br>100% | 0.00<br>1.80  |
| 30.35           | 117.53           | 0.99         | 0.84         | 110        | 1,349                 | 0.919          | 0.85         | 0.57         | 0.87         | 95.56            | 1.88         |   | 1                   | 75         | 1:17         | 0.45         | 1.26         | 141.6          | 1.00         | 0.344              | 0.344  | 0.763          | 0.45                 | 93%              | 1.01          |
| 30.51<br>30.68  | 114.11<br>61.97  | 1.23<br>1.48 | 1.08<br>2.39 | 110<br>110 | 1,353<br>1,357        | 0.918<br>0.918 | 1.09<br>2.44 | 0.60<br>0.73 | 0.86         | 92.04<br>47.78   | 1,96<br>2,41 |   | 1                   | 73<br>46   | 1,25<br>2,34 | 0.50         | 1.26         | 146.0<br>111.8 | 1.00         | 0.369              | 0.369  | 0.764<br>0.764 | 0.48<br>0.27         | 92%<br>99%       | 0.92<br>1.36  |
| 30.84           | 26.16<br>14.26   | 1,22<br>0.26 | 4.64<br>1.81 | 110<br>110 | 1,361<br>1,364        | 0,917<br>0,916 | 4.90<br>2.00 | 0.88<br>0.88 | 0.80         | 18.78<br>9.74    | 2.91<br>2.91 |   | 0                   |            |              |              |              |                | 1.00         |                    |        | 0.764<br>0.765 | Non-Liq.             |                  | 0.00          |
| 31,17           | 13,19            | 0.23         | 1.73         | 110        | 1_368                 | 0.915          | 1.93         | 0.89         | 0.80         | 8.89             | 2.94         |   | 0                   |            |              |              |              |                | 1.00         |                    |        | 0.765          | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 31.33<br>31.50  | 12.49<br>17.25   | 0.36         | 2.88<br>3.98 | 110<br>110 | 1.372<br>1.376        | 0.914<br>0.913 | 3.24<br>4.33 | 0.93<br>0.92 | 0.78         | 8.24<br>11.79    | 3.08         |   | 0                   |            |              |              |              |                | 1.00         |                    |        | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 31.66           | 38.57            | 0.92         | 2.37         | 110        | 1,380                 | 0.912          | 2.46         | 0.78         | 0.81         | 28.56            | 2.58         |   | 1                   | 25         | 3.20         |              | 1.00         | 91.5           | 1.00         | 0.151              | 0.151  | 0.766          | 0.20                 | 100%             | 1.66          |
| 31.82<br>31.99  | 35,69<br>58,47   | 1.30<br>1.43 | 3.63<br>2.44 | 110<br>110 | 1.384<br>1.388        | 0.911          | 3.78<br>2.50 | 0.83<br>0.74 | 0.80         | 25 97<br>44 14   | 2.73         |   | 0                   | 43         | 2,48         |              | 1.00         | 109.5          | 1.00         | 0.202              | 0.202  | 0.766<br>0.766 | Non-Liq.<br>0.26     | Non-Liq<br>99%   | 0.00<br>1.39  |
| 32.15           | 153,79           | 1.76         | 1.14         | 110        | 1.392                 | 0.909          | 1.15         | 0.57         | 0.85         | 123,10           | 1,88         |   | 1                   | 85         | 1,17         |              | 1.00         | 145.0          | 1.00         | 0.363              | 0.363  | 0.766          | 0.47                 | 92%              | 1.00          |
| 32.32<br>32.48  | 250.44<br>286.97 | 2.28<br>2.91 | 0.91<br>1.02 | 110<br>110 | 1,396<br>1,400        | 0.908<br>0.907 | 0.91<br>1.02 | 0.50<br>0.50 | 0.87<br>0.87 | 204.70<br>234.50 | 1.65<br>1.65 |   | 1                   | 100<br>100 | 1,01         |              | 1.00         | 206.8<br>236.0 | 1.00<br>1.00 | Infin.             | 0.000  | 0.766<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 32.64<br>32.81  | 309,86<br>322,36 | 3.53<br>3.86 | 1.14<br>1.20 | 110<br>110 | 1.403<br>1.407        | 0.906<br>0.905 | 1.14<br>1.20 | 0.51<br>0.51 | 0.87<br>0.86 | 252,58<br>262,31 | 1.67<br>1.67 |   | 1                   | 100<br>100 | 1.01         | 1.15         | 1.00         | 257.2          | 1.00         | Infin.             | 0.000  | 0.767          | Non-Liq.             | Non-Liq.         | 0.00          |
| 32,97           | 328,44           | 4.15         | 1.26         | 110        | 1,411                 | 0.904          | 1.27         | 0.51         | 0.86         | 266,57           | 1.69         |   | 3                   | 100        | 1.03         |              | 1.00         |                | 1.00         | Infin.             | 0.000  | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 33.14           | 330.70<br>324.34 | 3.81<br>3.31 | 1.15<br>1.02 | 110<br>110 | 1.415<br>1.419        | 0.903          | 1.16<br>1.02 | 0.50<br>0.50 | 0.86         | 268,83<br>263,54 | 1.65<br>1.62 |   | 1                   | 100<br>100 | 1.00         |              | 1.00         | 271.1<br>264.5 | 1.00         | Infin.<br>Infin.   | 0.000  | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 33,46           | 306.20           | 3.39         | 1.11         | 110        | 1,423                 | 0.901          | 1.11         | 0.51         | 0.86         | 247.92           | 1.66         |   | 1                   | 100        | 1.01         | 1.20         | 1.00         | 251.7          | 1.00         | Infin,             | 0,000  | 0.767          | Non-Liq.             | Non-Liq.         | 0.00          |
| 33.63<br>33.79  | 287.68<br>277.70 | 3,87<br>4.63 | 1.35<br>1.67 | 110<br>110 | 1,427<br>1,431        | 0.900          | 1.35<br>1.68 | 0.53<br>0.56 | 0.85<br>0.85 | 230.75<br>220.68 | 1.75         |   | 1                   | 100<br>100 | 1.07         |              | 1.00         |                | 1.00         | Infin.             | 0.000  | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 33.96           | 267.02<br>262.99 | 5.00         | 1.87         | 110        | 1,435                 | 0.898          | 1.88         | 0.57         | 0.84         | 210.82           | 1.88         |   | 1                   | 100        | 1,17         | 1.20         | 1.00         | 248.3          | 1,00         | Infin.             | 0.000  | 0.767          | Non-Liq.             | Non-Liq          | 0.00          |
| 34.12<br>34.28  | 254.98           | 4.90<br>4.12 | 1.86<br>1.61 | 110<br>110 | 1,439<br>1,443        | 0.897<br>0.896 | 1.87<br>1.62 | 0.57<br>0.56 | 0.84<br>0.84 | 207.23<br>201.34 | 1.89<br>1.85 |   | 1                   | 100<br>100 | 1.18<br>1.14 |              | 1.00         |                | 1.00         | Infin.<br>Infin.   | 0.000  | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 34.45<br>34.61  | 255.22<br>235.40 | 3.88<br>3.66 | 1.52<br>1.56 | 110<br>110 | 1.446<br>1.450        | 0.895<br>0.894 | 1.53<br>1.56 | 0.56<br>0.57 | 0.84<br>0.84 | 201,61<br>185,03 | 1.82         |   | 1                   | 100<br>100 | 1.13<br>1.15 |              | 1.00         |                | 0.99         | Infin.             | 0.000  | 0.767          | Non-Liq.             | Non-Liq          | 0.00          |
| 34.78           | 213.23           | 3.63         | 1.70         | 110        | 1.454                 | 0.893          | 1.72         | 0.58         | 0.83         | 166,27           | 1.92         |   | i                   | 98         | 1.21         |              |              |                | 0.99         | Infin.<br>Infin.   | 0.000  | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 34.94<br>35.10  | 232,64<br>266,61 | 3.28<br>3.08 | 1.41<br>1.15 | 110<br>110 | 1,458<br>1,462        | 0.892<br>0.890 | 1.42<br>1.16 | 0.56<br>0.52 | 0.84         | 182.78<br>211.53 | 1.83<br>1.72 |   | 1                   | 100<br>100 | 1.13         |              | 1.00         |                | 0.99         | Infin.<br>Infin.   | 0.000  | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 35.27           | 275.08           | 2.85         | 1.04         | 110        | 1,466                 | 0.889          | 1.04         | 0.51         | 0.85         | 218,93           | 1.68         |   | 1                   | 100        | 1.02         | 1.20         | 1.00         | 224.4          | 0.99         | Infin.             | 0.000  | 0.766          | Non-Liq.             | Non-Liq.         | 0.00          |
| 35.43<br>35.60  | 276.58<br>260.34 | 3.07<br>3.57 | 1.11<br>1.37 | 110<br>110 | 1.470<br>1.474        | 0.888<br>0.887 | 1.12<br>1.38 | 0.52<br>0.54 | 0.84         | 219.36<br>204.30 | 1.70<br>1.79 |   | 1                   | 100<br>100 | 1.04<br>1.10 |              | 1.00         |                | 0.99         | Infin.<br>Infin.   | 0.000  | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                  | 0.00          |
| 35.76<br>35.93  | 280,13<br>323,56 | 5.74<br>6.58 | 2.05         | 110<br>110 | 1.478<br>1.482        | 0.886<br>0.885 | 2.06<br>2.04 | 0.58<br>0.57 | 0.82         | 216.97<br>251.42 | 1.91<br>1.87 |   | 1                   | 100<br>100 | 1.20<br>1.16 |              | 1.00         |                | 0.98         | Infin.             | 0.000  | 0.766          | Non-Liq.             | Non-Liq.         | 0.00          |
| 36.09           | 191.60           | 6.05         | 3.16         | 110        | 1.485                 | 0.883          | 3.18         | 0.66         | 0.80         |                  | 2.17         |   | i                   | 92         | 1.59         | 1.20         | 1.00         |                | 0.98         | Infin.             | 0.000  | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 36,25<br>36,42  | 264.99<br>319.83 | 3.90         | 1.47<br>0.95 | 110<br>110 | 1.489<br>1.493        | 0.882          | 1.48<br>0.95 | 0.55<br>0.50 | 0.83         | 206,32<br>253,26 | 1.81<br>1.60 |   | 1                   | 100<br>100 | 1.11         |              | 1.00         |                | 0.98         | Infin.<br>Infin.   | 0.000  | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 36,58           | 332.93           | 3.09         | 0.93         | 110        | 1,497                 | 0.880          | 0.93         | 0.50         | 0.84         | 263.34           | 1.59         |   | 1                   | 100        | 1.00         | 1.10         | 1.00         | 264.3          | 0.98         | Infin:             | 0.000  | 0.764          | Non-Liq.             | Non-Liq.         | 0.00          |
| 36.75<br>36.91  | 372.73<br>404.69 | 3.69<br>4.23 | 0.99<br>1.05 | 110<br>110 | 1,501<br>1,505        | 0.878<br>0.877 | 0.99<br>1.05 | 0.50<br>0.50 | 0.84         | 294.57<br>319.52 | 1.58<br>1.57 |   | 1                   | 100<br>100 |              |              | 1.00<br>1.00 | 295.7<br>320.7 | 0.98         | Infin.             | 0.000  | 0.764<br>0.764 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 37.07<br>37.24  | 405,53<br>398.38 | 3.77<br>4.78 | 0.93         | 110<br>110 | 1,509<br>1,513        | 0.876<br>0.875 | 0.93<br>1.20 | 0.50<br>0.50 | 0.84         | 319.76<br>313.70 | 1.53<br>1.62 |   | 1                   | 100        | 1.00         |              | 1.00         |                | 0.97         | Infin.             | 0.000  | 0.763          | Non-Liq.             | Non-Lig.         | 0.00          |
| 37,40           | 378.24           | 5.25         | 1.39         | 110        | 1.517                 | 0.873          | 1.39         | 0.52         | 0.84<br>0.83 |                  | 1.69         |   | i                   | 100<br>100 |              |              |              | 314.9<br>306.3 | 0.97<br>0.97 | Infin.<br>Infin.   | 0.000  | 0.763<br>0.762 | Non-Liq.<br>Non-Liq. |                  | 0.00          |
| 37,57<br>37,73  | 281 40<br>240 64 | 4.91<br>3.31 | 1.75<br>1.37 | 110<br>110 | 1.521<br>1.525        |                | 1.75<br>1.38 | 0.56<br>0.55 | 0.81         | 215,59<br>184,66 | 1,85<br>1,82 |   | 1                   | 100<br>100 |              |              |              | 248.4<br>207.4 | 0.97         | Infin.<br>Infin.   | 0.000  | 0.762<br>0.762 | Non-Liq.<br>Non-Liq. |                  | 0.00          |
| 37.89           | 240.96           | 2,46         | 1.02         | 110        | 1.528                 | 0.869          | 1.03         | 0.52         | 0.82         | 186.65           | 1.72         |   | 1                   | 100        | 1.05         | 1.50         | 1.00         | 196.8          | 0.97         | Infin.             | 0.000  | 0.761          | Non-Liq.             | Non-Liq.         | 0.00          |
| 38.06<br>38.22  | 258.07<br>239.78 | 2,27         | 0.88         | 110<br>110 | 1.532<br>1.536        |                | 0.88<br>0.97 | 0.50<br>0.52 | 0.83         |                  | 1.65<br>1.70 |   | 1                   | 100<br>100 |              |              |              | 202.6<br>193.5 | 0.96<br>0.96 | Infin.             | 0.000  | 0.761<br>0.760 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
|                 | 218.69<br>264.47 | 1.98<br>1.94 | 0.90<br>0.73 | 110<br>110 | 1.540<br>1.544        |                | 0.91<br>0.74 | 0.52         | 0.82<br>0.83 |                  | 1.71<br>1.59 |   | 1                   | 99<br>100  |              |              |              | 177.3<br>206.5 | 0.96<br>0.96 | Infin.             | 0.000  | 0.760<br>0.759 | Non-Liq.             |                  | 0.00<br>0.00  |
| 38.71           | 297.09           | 1.85         | 0.62         | 110        | 1.548                 | 0.863          | 0.63         | 0.50         | 0.83         | 230,94           | 1.50         |   | 1                   | 100        | 1_00         | 1.75         | 1.00         | 231.8          | 0.96         | Infin              | 0.000  | 0.759          | Non-Liq.<br>Non-Liq. |                  | 0.00          |
|                 | 312.92<br>327.85 | 1.80         | 0.57<br>0.63 | 110<br>110 | 1.552<br>1.556        |                | 0.58<br>0.63 |              | 0.83<br>0.82 |                  | 1.46<br>1.47 |   | 1                   | 100<br>100 |              |              |              | 243.9<br>255.3 |              | Infin.<br>Infin.   | 0.000  | 0.758<br>0.758 | Non-Liq.<br>Non-Liq. |                  | 0.00          |
| 39,21           | 337.25           | 2.27         | 0.67         | 110        | 1,560                 | 0.859          | 0.67         | 0.50         | 0.82         | 261.32           | 1.49         |   | 1                   | 100        | 1_00         | 1.90         | 1.00         | 262.3          | 0.96         | Infin.             | 0.000  | 0.757          | Non-Liq.             | Non-Liq.         | 0.00          |
| 39.37<br>39.53  | 350.08<br>354.11 | 2,32         | 0.66         | 110<br>110 | 1.564<br>1.567        |                | 0.67<br>0.61 |              | 0.82<br>0.82 |                  | 1.47<br>1.44 |   | 1                   |            |              | 1.95<br>2.00 |              |                | 0.95<br>0.95 |                    | 0.000  | 0.757<br>0.756 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
|                 | 359.55<br>355.78 | 2,27<br>2,53 | 0.63<br>0.71 | 110<br>110 | 1.571<br>1.575        |                | 0.63<br>0.72 |              | 0.82<br>0.82 |                  | 1.45<br>1.49 |   | 1                   |            |              | 2.05<br>2.10 |              | 278.7<br>275.4 |              |                    | 0.000  | 0.756<br>0.755 | Non-Liq.             |                  | 0.00          |
| 40.03           | 334,77           | 2,75         | 0.82         | 110        | 1.579                 | 0.852          | 0.83         | 0.50         | 0.82         | 257.77           | 1.55         |   | î                   |            |              | 2.15         |              | 258.7          |              |                    | 0.000  | 0.754          | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
|                 | 342,17<br>344.05 | 2.95<br>2.87 | 0.86<br>0.83 | 110<br>110 | 1.583<br>1.587        |                | 0.86<br>0.84 |              | 0.82<br>0.82 |                  | 1.56<br>1.55 |   | 1                   |            |              |              |              | 264.2<br>265.3 | 0.95         |                    | 0.000  | 0.754<br>0.753 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 40.52           | 335,17           | 2,88         | 0.86         | 110        | 1,591                 | 0.847          | 0.86         | 0.50         | 0.82         | 257.12           | 1.57         |   | 1                   | 100        | 1.00         | 2.30         | 1.00         | 258.1          | 0.95         | Infin.             | 0.000  | 0.752          | Non-Liq.             | Non-Liq          | 0.00          |
|                 | 320.89<br>339.05 | 2.72<br>1.89 | 0.85<br>0.56 | 110<br>110 |                       |                | 0.85<br>0.56 |              | 0.81<br>0.81 |                  | 1.58<br>1.43 |   | 1                   |            |              | 2.35<br>2.40 |              | 246.7<br>260.4 | 0.94<br>0.94 |                    | 0.000  | 0.752<br>0.751 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 41.01<br>41.17  | 382,25<br>403,21 | 2.92<br>3.03 | 0.76<br>0.75 | 110<br>110 | 1.603                 | 0.843          | 0.77<br>0.76 | 0.50         | 0.81<br>0.81 | 292.33           | 1.49<br>1.47 |   |                     | 100        | 1.00         | 2.45         | 1.00         | 293.4          | 0.94         | Infin.             | 0.000  | 0.750          | Non-Liq.             | Non-Liq.         | 0.00          |
| 41.34           | 379.57           | 3.67         | 0.97         | 110        | 1,610                 | 0.840          | 0.97         | 0.50         | 0.81         | 289.56           | 1.57         |   | 1                   | 100        | 1.00         | 2.55         | 1.00         | 290.6          | 0.94<br>0.94 | Infin.             | 0.000  | 0.750<br>0.749 | Non-Liq.<br>Non-Liq. | Non-Liq,         | 0.00<br>0.00  |
|                 | 396.71<br>391.23 | 3.17<br>3.14 | 0.80         | 110<br>110 |                       |                | 0.80<br>0.81 |              | 0.81<br>0.81 |                  | 1.50<br>1.50 |   |                     |            |              | 2.60<br>2.65 |              | 303.4<br>298.9 | 0.94         |                    | 0.000  | 0.748<br>0.747 | Non-Liq.<br>Non-Liq. | Non-Liq          | 0.00<br>0.00  |
| 41.83           | 390.72           | 3.06         | 0.78         | 110        | 1.622                 | 0.835          | 0.79         | 0.50         | 0.81         | 297 01           | 1.50         |   | 1                   | 100        | 1.00         | 2.70         | 1.00         | 298.1          | 0.94         | Infin.             | 0.000  | 0.747          | Non-Liq.             | Non-Liq          | 0.00          |
|                 | 382.61<br>380.43 | 2.95<br>2.84 | 0.77<br>0.75 | 110<br>110 |                       |                | 0.78<br>0.75 |              | 0.81<br>0.81 |                  | 1.50<br>1.49 |   |                     |            |              | 2.75<br>2.80 |              | 291.6<br>289.5 |              |                    | 0.000  | 0.746<br>0.745 | Non-Liq.<br>Non-Liq. |                  | 0.00<br>0.00  |
| 42.32           | 381.27<br>383.78 | 2.80<br>2.53 | 0.73<br>0.66 | 110<br>110 | 1.634                 | 0.831          | 0.74<br>0.66 | 0.50         | 0.80         | 288.75           | 1.48<br>1.45 |   | 1                   | 100        | 1.00         | 2.85         | 1.00         | 289.8          | 0.93         | Infin.             | 0.000  | 0.744          | Non-Liq.             | Non-Liq          | 0.00          |
| 42.65           | 395.93           | 2.51         | 0,63         | 110        | 1.642                 | 0,827          | 0.64         | 0.50         | 0.80         | 299.18           | 1.43         |   | 1                   | 100        | 1.00         | 2.90<br>2.95 | 1.00         | 291.4<br>300.3 | 0.93         | Infin.             | 0.000  | 0.743<br>0.743 | Non-Liq.<br>Non-Liq. | Non-Liq.         | 0.00<br>0.00  |
| 42.81<br>42.98  | 401.54<br>408.28 | 2.69<br>2.41 | 0,67<br>0,59 | 110<br>110 |                       |                | 0.67<br>0.59 |              | 0.80<br>0.80 |                  | 1.44<br>1.40 |   |                     |            |              | 3.00<br>3.05 |              | 304.2<br>309.0 |              |                    | 0.000  | 0.742<br>0.741 | Non-Liq.<br>Non-Liq. | Non-Liq          | 0.00<br>0.00  |
| 12,00           | .50,20           | 2,71         | 3,00         |            | 1,040                 | 5,027          | 3.00         | 3.50         | 5.50         | 307,01           | 1 70         |   | K1                  | ,00        | 1,00         | 0.00         | 1.00         | 505.0          | U.33         | and G              | J.,000 | 0.7.41         | Mon-Fid.             | MOLI-LIQ.        | 0.00          |

| Layer           | Tip              | Friction     | Friction     | Total      | Eff.Stres              | s              |              | _            |              | _                 |              | e e | Liquef.             | Rel        |              |              |              | Clear          | 1            |                  |                | Induce         | d Liquefac.          |                      | Volumetric    |
|-----------------|------------------|--------------|--------------|------------|------------------------|----------------|--------------|--------------|--------------|-------------------|--------------|-----|---------------------|------------|--------------|--------------|--------------|----------------|--------------|------------------|----------------|----------------|----------------------|----------------------|---------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt    | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Ca           | Corrected<br>Qc1n | d<br>Ic      |     | Suscept<br>(0 or 1) |            | Kc           | H<br>(m)     | KH           | Sand           |              | CRR,             | EQ<br>CRR      | M=7.5<br>CSR   | Safety<br>Factor     | Probab_              | Strain<br>(%) |
| 43 14<br>43 31  | 410.18           | 2.68         | 0.65         | 110        | 1 653                  | 0,823          | 0.66         | 0.50         | 0,80         | 308.88            | 1,43         |     | 1                   | 100        | 1,00         | 3,10         | 1,00         | 310.0          | 0,93         | Infin            | 0,000          | 0,740          | Non-Liq.             | Non-Liq              | 0.00          |
| 43.47           | 413.71<br>420.65 | 2.73<br>2.58 | 0.66<br>0.61 | 110<br>110 | 1,657<br>1,661         | 0.821<br>0.820 | 0.66<br>0.62 | 0.50<br>0.50 | 080<br>080   | 311,18<br>316,05  | 1.43<br>1.40 |     | 1                   | 100<br>100 | 1,00         | 3.15         |              |                |              | Infin.<br>Infin. | 0,000          | 0.739<br>0.738 | Non-Liq.<br>Non-Liq. | Non-Liq.<br>Non-Liq. | 0.00<br>0.00  |
| 43.64<br>43.80  | 425 34<br>433 25 | 3.15<br>2.87 | 0.74<br>0.66 | 110<br>110 | 1,665<br>1,669         | 0.818<br>0.816 | 0.74<br>0.67 | 0.50<br>0.50 | 0.80         | 319 21<br>324 78  | 1.46<br>1.42 |     | 1                   | 100<br>100 | 1,00         | 3,25         |              |                | 7.7          | Infin_<br>Infin_ | 0,000          | 0.737<br>0.736 | Non-Liq.             |                      | 0.00          |
| 43.96           | 445,49           | 2.84         | 0.64         | 110        | 1,673                  | 0.815          | 0.64         | 0.50         | 0.80         | 333,60            | 1,40         |     | 1                   | 100        | 1,00         | 3 35         |              |                |              | Infin            | 0,000          | 0.735          | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00  |
| 44.13<br>44.29  | 458,14<br>407,19 | 2.05         | 0.45<br>0.55 | 110<br>110 | 1,677<br>1,681         | 0,813<br>0,811 | 0.45<br>0.55 | 0.50<br>0.50 | 0.79<br>0.79 | 342,71<br>304,10  | 1,28         |     | 1                   | 100        | 1.00         | 3.40         |              | 344.0<br>305.2 |              | Infin.           | 0,000          | 0.735<br>0.734 | Non-Liq.             | Non-Liq.<br>Non-Liq. | 0.00          |
| 44.46           | 318.78           | 4.85         | 1.52         | 110        | 1,685                  | 0.810          | 1.53         | 0.54         | 0_78         | 232,72            | 1,79         |     | 1                   | 100        | 1,10         | 3.50         | 1.00         | 256.2          | 0.92         | Infin,           | 0,000          | 0.733          | Non-Liq.             | Non-Liq.             | 0.00          |
| 44.62<br>44.78  | 311.01<br>390.54 | 4.70<br>5.84 | 1.51<br>1.50 | 110<br>110 | 1,689<br>1,692         | 0,808<br>0,807 | 1.52<br>1.50 | 0.55<br>0.53 | 0.77<br>0.78 | 226 57<br>287 14  | 1.79<br>1.72 |     | 1                   | 100<br>100 | 1,10         | 3.55<br>3.60 |              |                |              | Infin.<br>Infin. | 0,000          | 0.732<br>0.731 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00  |
| 44.95<br>45.11  | 419.57<br>377.69 | 5.18<br>3.17 | 1.23<br>0.84 | 110<br>110 | 1.696<br>1.700         | 0.805          | 1.24<br>0.84 | 0.50<br>0.50 | 0.79<br>0.79 | 311.92<br>280.34  | 1.64<br>1.54 |     | 1                   | 100<br>100 | 1,00         | 3.65         |              |                | 0.91         | Infin.           | 0.000          | 0.730          | Non-Liq.             | Non-Liq              | 0.00          |
| 45.28           | 407,75           | 4.13         | 1.01         | 110        | 1,704                  | 0,802          | 1.02         | 0.50         | 0.79         | 302.40            | 1.58         |     | 1                   | 100        | 1.00         | 3.70<br>3.75 |              |                |              | Infin<br>Infin   | 0.000          | 0.729<br>0.728 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 45 44<br>45 60  | 392,74<br>382.50 | 3.86         | 0.98         | 110<br>110 | 1.708<br>1.712         | 0.800<br>0.798 | 0.99<br>1.02 | 0.50<br>0.50 | 0.79<br>0.79 | 290,89<br>282,94  | 1,58<br>1,60 |     | 3                   | 100        | 1.00         | 3.80<br>3.85 | 1.00         | 292.0<br>284.0 |              | Infin.           | 0.000          | 0.727<br>0.726 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 45.77           | 373,19           | 3.69         | 0.99         | 110        | 1,716                  | 0.797          | 0.99         | 0.50         | 0.79         | 275,71            | 1.59         |     | 1                   | 100        | 1.00         | 3.90         | 1.00         | 276.7          | 0,91         | Infin,           | 0,000          | 0.725          | Non-Liq.             | Non-Liq.             | 0.00          |
| 45.93<br>46.10  | 367.93<br>369.72 | 3.54<br>3.36 | 0.96         | 110<br>110 | 1.720<br>1.724         | 0 795<br>0 793 | 0.97<br>0.91 | 0.50<br>0.50 | 0.78<br>0.78 | 271,49<br>272,51  | 1,59<br>1,57 |     | 1                   | 100        | 1,00         | 3.90         |              | 272.5<br>273.5 |              | Infin.           | 0.000          | 0.724          | Non-Liq,<br>Non-Liq. |                      | 0.00          |
| 46.26<br>46.42  | 381,32<br>386,91 | 3.27<br>3.19 | 0.86         | 110<br>110 | 1,728                  | 0.792<br>0.790 | 0.86<br>0.83 | 0.50<br>0.50 | 0.78<br>0.78 | 280,78<br>284,59  | 1.54<br>1.53 |     | 1                   | 100<br>100 | 1,00         | 3,90         | 1.00         | 281.8<br>285.7 | 0,91         | Infin.           | 0,000          | 0.722          | Non-Liq.             | Non-Liq.             | 0.00          |
| 46.59           | 380,97           | 3.15         | 0.83         | 110        | 1,735                  | 0.788          | 0.83         | 0.50         | 0.78         | 279.88            | 1.53         |     | i                   | 100        | 1,00         | 3.90         |              | 280 9          |              | Infin.           | 0.000          | 0.721<br>0.720 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 46.75<br>46.92  | 341.92<br>315.47 | 3.27<br>3.20 | 0.96         | 110<br>110 | 1,739<br>1,743         | 0,787<br>0,785 | 0.96<br>1.02 | 0.50<br>0.50 | 0.78<br>0.78 | 250,78<br>230,52  | 1.61<br>1.65 |     | 1                   | 100<br>100 | 1,00         | 3,90         | 1.00         | 251.7<br>232.8 | 0.90         | Infin.           | 0.000          | 0.719<br>0.717 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 47.08           | 363,49           | 3.46         | 0.95         | 110        | 1,747                  | 0.783          | 0.96         | 0.50         | 0.78         | 266,07            | 1.59         |     | 1                   | 100        | 1,00         | 3,90         | 1.00         | 267.1          | 0.90         | Infin.           | 0,000          | 0.716          | Non-Liq.             | Non-Liq.             | 0.00          |
| 47.24<br>47.41  | 379.91<br>382.41 | 4.34<br>5.30 | 1.14<br>1.38 | 110<br>110 | 1,751<br>1,755         | 0,782<br>0,780 | 1.15<br>1.39 | 0.50<br>0.52 | 0.78<br>0.77 | 277,81<br>276,50  | 1.64<br>1.71 |     | 1                   | 100<br>100 | 1,00         | 3.90         | 1.00         | 277.9<br>289.5 | 0.90         | Infin.<br>Infin. | 0,000          | 0,715<br>0,714 | Non-Liq.<br>Non-Liq. | -                    | 0.00          |
| 47 57<br>47 74  | 369.25<br>359.68 | 5.87<br>5.73 | 1.59<br>1.59 | 110<br>110 | 1.759                  | 0.778          | 1.60         | 0.54         | 0.76         | 264,21            | 1.77         |     | 1                   | 100        | 1.08         | 3.90         | 1.00         | 287.4          | 0.90         | Infin.           | 0.000          | 0.713          | Non-Liq.             | Non-Liq              | 0.00          |
| 47.90           | 383,68           | 4.97         | 1.29         | 110        | 1,763<br>1,767         | 0.777<br>0.775 | 1.60<br>1.30 | 0.54<br>0.51 | 0.76<br>0.77 |                   | 1.78<br>1.68 |     | 1                   | 100<br>100 | 1,09<br>1,03 | 3.90<br>3.90 | 1.00<br>1.00 | 280.7<br>285.9 | 0.90         | Infin.           | 0.000          | 0.712<br>0.711 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 48.06<br>48.23  | 403.15<br>405.14 | 4.67<br>3.95 | 1.16<br>0.97 | 110<br>110 | 1.770<br>1.774         | 0.773<br>0.772 | 1.16<br>0.98 | 0.50<br>0.50 | 0.77<br>0.77 | 293 27<br>294 40  | 1,63<br>1.57 |     | 1                   | 100<br>100 | 1.00         | 3.90         | 1.00         | 294.4<br>295.5 | 0.90         | Infin.           | 0.000          | 0,710<br>0,709 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 48.39           | 369,68           | 3.01         | 0.81         | 110        | 1:778                  | 0.770          | 0.82         | 0.50         | 0.77         | 268,22            | 1.54         |     | i                   | 100        | 1.00         | 3.90         | 1,00         | 269.2          | 0.89         | Infin.           | 0.000          | 0.708          | Non-Liq.             |                      | 0.00          |
| 48.56<br>48.72  | 336,91<br>299,19 | 2.26<br>1.63 | 0.67         | 110<br>110 | 1.782<br>1.786         | 0.768<br>0.767 | 0.67<br>0.55 | 0.50<br>0.50 | 0.77<br>0.77 |                   | 1.51         |     | 1                   | 100<br>100 | 1.00         | 3.90         | 1.00         | 245.0<br>217.2 | 0.89         | Infin.<br>Infin. | 0.000          | 0 707<br>0 705 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 48.88<br>49.05  | 236,26<br>139,68 | 1.38<br>1.94 | 0.58         | 110<br>110 | 1.790<br>1.794         | 0.765<br>0.763 | 0.59<br>1.41 | 0.50<br>0.62 | 0.77         |                   | 1.58         |     | 1                   | 99         | 1.00         | 3,90         | 1,00         | 171.0          | 0.89         | Infin,           | 0,000          | 0.704          | Non-Liq.             | Non-Liq.             | 0.00          |
| 49,21           | 65.30            | 2.32         | 3.55         | 110        | 1.798                  | 0.762          | 3.65         | 0.78         | 0.72<br>0.66 | 94.13<br>39.62    | 2.03         |     | 1                   | 74<br>38   | 1.34<br>3.23 |              | 1,00         | 125.9<br>128.1 | 0.89<br>0.94 | 0.265<br>0.276   | 0.236<br>0.260 | 0.703<br>0.702 | 0.34<br>0.37         | 97%<br>96%           | 1.18<br>1.15  |
| 49.38<br>49.54  | 49.82<br>44.18   | 2.01<br>1.88 | 4.03         | 110<br>110 | 1.802<br>1.806         | 0.760<br>0.758 | 4.18<br>4.44 | 0.82<br>0.84 | 0.64<br>0.64 | 29,26<br>25,53    | 2.72<br>2.78 |     | 0                   |            |              |              |              |                | 0.94<br>0.94 |                  |                | 0.701<br>0.700 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 49.70           | 52.54            | 2.11         | 4.01         | 110        | 1,810                  | 0.757          | 4.15         | 0.82         | 0.64         | 30,90             | 2.70         |     | o                   |            |              |              |              |                | 0.94         |                  |                | 0.699          | Non-Liq.             |                      | 0.00          |
| 49.87<br>50.03  | 96.95<br>125.29  | 2.31         | 2.38<br>1.61 | 110<br>110 | 1.813<br>1.817         | 0.755<br>0.753 | 2.42<br>1.64 | 0.71<br>0.64 | 0.68         | 61.49<br>82.44    | 2.32         |     | 1                   | 57<br>69   | 2.03         |              | 1.00         | 124.7<br>122.2 | 0.91         | 0.260<br>0.250   | 0.237          | 0.698<br>0.696 | 0.34<br>0.33         | 97%<br>98%           | 1.19<br>1.22  |
| 50.20<br>50.36  | 125.58<br>128.65 | 2.07<br>2.24 | 1.65<br>1.74 | 110<br>110 | 1.821<br>1.825         | 0.752<br>0.750 | 1.67<br>1.77 | 0.64<br>0.65 | 0.70<br>0.70 | 82,44             | 2.12         |     | 1                   | 69         | 1.49         |              | 1.00         | 123.1          | 0.91         | 0.253            | 0.231          | 0.695          | 0.33                 | 97%                  | 1.21          |
| 50,52           | 128.05           | 2.41         | 1.88         | 110        | 1,829                  | 0.748          | 1.91         | 0.66         | 0.70         |                   | 2.13<br>2.16 |     | 1                   | 70<br>69   | 1.51<br>1.57 |              | 1.00         | 127.4<br>130.7 |              | 0 272<br>0 288   | 0.248<br>0.261 | 0.694<br>0.693 | 0.36<br>0.38         | 97%<br>96%           | 1.16<br>1.12  |
| 50,69<br>50.85  | 127.87<br>127.22 | 2.55<br>2.50 | 1.99         | 110<br>110 | 1.833<br>1.837         | 0.747<br>0.745 | 2.02         | 0.66<br>0.66 | 0,70         |                   | 2.18         |     | 1                   | 69<br>69   | 1,61<br>1,61 |              | 1.00         | 133.4<br>132.2 | 0.91         | 0.301            | 0.273<br>0.268 | 0.692<br>0.691 | 0.39<br>0.39         | 96%<br>96%           | 1.09<br>1.11  |
| 51.02           | 120.78           | 2.43         | 2.02         | 110        | 1.841                  | 0.743          | 2.05         | 0.67         | 0.69         | 77_65             | 2.20         |     | 1                   | 66         | 1.67         |              | 1.00         | 129,4          | 0.91         | 0.282            | 0.255          | 0.689          | 0.37                 | 96%                  | 1.14          |
| 51.18<br>51.35  | 116 72<br>117 01 | 2.42         | 2.07         | 110<br>110 | 1.845<br>1.849         | 0.742<br>0.740 | 2.11         | 0.67<br>0.67 | 0.69<br>0.69 |                   | 2.22         |     | 1                   | 65<br>65   | 1.72<br>1.72 |              | 1.00         | 128.3<br>128.4 | 0.91         | 0.277<br>0.277   | 0,251<br>0,250 | 0,688<br>0,687 | 0.36<br>0.36         | 97%<br>97%           | 1.15<br>1.15  |
| 51,51<br>51,67  | 117.05<br>118.36 | 2.54<br>2.51 | 2.17         | 110<br>110 | 1.852<br>1.856         | 0.738<br>0.737 | 2.20<br>2.15 | 0.68<br>0.68 | 0.68<br>0.68 |                   | 2.24         |     | 1                   | 65<br>65   | 1.76<br>1.73 |              | 1.00         | 130.9          | 0.90         | 0.289            | 0.261<br>0.258 | 0.686          | 0.38                 | 96%                  | 1.12          |
| 51,84           | 121,19           | 2.58         | 2.13         | 110        | 1.860                  | 0.735          | 2.16         | 0.67         | 0.68         | 77.11             | 2.22         |     | i                   | 66         | 1.71         |              | 1.00         | 130.3<br>132.2 |              | 0.295            | 0.266          | 0.685<br>0.684 | 0.38<br>0.39         | 96%<br>96%           | 1.13<br>1.10  |
|                 | 128,21<br>129,58 | 2.29         | 1.78<br>2.06 | 110<br>110 |                        |                | 1.81<br>2.09 | 0.65<br>0.66 | 0.69         |                   | 2.14         |     | 1                   | 69<br>69   | 1.54<br>1.64 |              | 1.00         | 127.2<br>135.4 | 0.90         | 0,271<br>0,311   | 0.245<br>0.280 | 0.682<br>0.681 | 0.36<br>0.41         | 97%<br>95%           | 1.16<br>1.07  |
| 52 33           | 98.86            | 2.96         | 2.99         | 110        | 1.872                  | 0.730          | 3.05         | 0.73         | 0.66         | 60,52             | 2.40         |     | 1                   |            | 2.31         |              |              | 139,7          |              | 0.333            |                | 0,680          | 0.44                 | 94%                  | 1.02          |
| 52.49<br>52.66  | 61 64<br>47 03   | 2.40<br>1.60 | 3.89<br>3.41 | 110<br>110 |                        |                | 4.02<br>3.55 | 0.80<br>0.82 | 0.63<br>0.62 |                   | 2.65<br>2.70 |     | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.679<br>0.678 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 52.82<br>52.99  | 25.94<br>23.82   | 1.33         | 5.12<br>4.58 | 110<br>110 |                        |                | 5.52<br>4.98 | 0.93         | 0.59<br>0.58 |                   | 3.06<br>3.06 |     | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.677<br>0.676 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 53,15           | 25.73            | 0.89         | 3.46         | 110        | 1.892                  | 0.722          | 3.74         | 0.89         | 0.60         | 13.41             | 2.95         |     | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.674          | Non-Liq.             |                      | 0.00          |
| 53,31<br>53,48  | 17.66<br>15.40   | 0.88         | 4.99<br>5.10 | 110<br>110 |                        |                | 5.59<br>5.81 | 0.97<br>0.99 | 0.57<br>0.56 |                   | 3 22<br>3 28 |     | 0                   |            |              |              |              |                | 0,93         |                  |                | 0.673<br>0.672 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 53,64<br>53,81  | 16.91<br>21.62   | 0.99         | 5.82<br>6.41 | 110        |                        |                | 6.56<br>7.03 | 0.99<br>0.97 | 0.56         | 7.92              | 3.28         |     | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.671          | Non-Liq.             | Non-Liq              | 0.00          |
| 53.97           | 61.80            | 1.89         | 3.06         | 110<br>110 |                        |                | 3.16         |              | 0.56<br>0.63 |                   | 3.20<br>2.58 |     | 0                   | 34         | 3,18         |              | 1_00         | 113.6          | 0.93         | 0.216            | 0,201          | 0.670<br>0.669 | Non-Liq.<br>0.30     | 98%                  | 0.00<br>1.33  |
| 54.13<br>54.30  | 169.40<br>205.29 | 2.67<br>3.08 | 1.58<br>1.50 | 110<br>110 |                        |                | 1.60<br>1.51 | 0.61<br>0.59 | 0.70<br>0.70 |                   | 2.02<br>1.94 |     | 1                   |            | 1.32         | 0.25         | 1.00         | 145.4<br>242.4 |              | 0.366<br>Infin.  | 0.315          | 0.667<br>0.666 | 0.47<br>Non-Liq.     | 92%<br>Non-Lig       | 0.91<br>0.00  |
| 54.46           | 216.51           | 3.54         | 1.63         | 110        | 1.923                  | 0.709          | 1.65         | 0.59         | 0.70         | 142.34            | 1.95         |     | 1                   | 91         | 1.24         | 0.25         | 1.46         | 257.6          | 0.86         | Infin_           | 0.000          | 0.665          | Non-Liq.             |                      | 0.00          |
| 54.63<br>54.79  | 226.53<br>253.78 | 3.84<br>4.49 | 1.70<br>1.77 | 110<br>110 |                        |                | 1.71<br>1.78 |              | 0.70         |                   | 1.95<br>1.93 |     | 1                   |            |              | 0.25         |              | 269.2<br>297.4 |              | Infin<br>Infin   | 0.000          | 0.664<br>0.663 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 54.95<br>55.12  | 261.07<br>254.36 | 5.47<br>6.20 | 2.09         | 110<br>110 |                        |                | 2.11<br>2.46 |              | 0.70<br>0.69 | 170.33            | 1.98         |     | 1                   | 99         | 1.27         | 0.25         |              | 317.1          | 0.86         | Infin.           | 0.000          | 0.662          | Non-Liq.             | Non-Liq.             | 0.00          |
| 55,28           | 242.98           | 6.44         | 2.65         | 110        | 1,942                  | 0.701          | 2.67         | 0.63         | 0.68         |                   | 2.04<br>2.09 |     | 1                   |            | 1.36<br>1.43 |              | 1.00         | 222.6<br>221.5 |              | Infin.<br>Infin. | 0.000          | 0.661<br>0.659 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 55,45<br>55,61  | 210.76<br>179.72 | 5.98<br>5.45 | 2.84<br>3.03 | 110<br>110 |                        |                | 2.86<br>3.06 |              | 0.67<br>0.66 |                   | 2.15<br>2.22 |     | 1                   |            | 1.56<br>1.72 |              | 1.00         | 206.2<br>191.6 |              | Infin.           | 0.000          | 0.658<br>0.657 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 55,77           | 154,42           | 4.96         | 3.21         | 110        | 1.954                  | 0.697          | 3.26         | 0.69         | 0.65         | 94.09             | 2.29         |     | 1                   | 74         | 1.92         |              | 1.00         | 180.2          | 0.85         | Infin.           | 0.000          | 0,656          | Non-Liq.             | Non-Liq              | 0.00          |
| 55.94<br>56.10  | 130.91<br>111.46 | 4.35<br>3.85 | 3.32<br>3.45 | 110<br>110 |                        |                |              |              | 0,64<br>0,64 |                   | 2.35<br>2.42 |     | 1                   |            | 2.13<br>2.39 |              | 1.00         | 167.3<br>157.1 |              | Infin.<br>0.441  | 0.000          | 0.655<br>0.654 | Non-Liq.<br>0.60     | Non-Liq<br>85%       | 0.00<br>0.62  |
| 56.27<br>56.43  | 89.53<br>70.63   | 3.08<br>2.41 | 3.44<br>3.41 | 110<br>110 | 1.966                  | 0.692          | 3.52         | 0.76         | 0,63<br>0,62 | 51,85             | 2 49<br>2 57 |     | 1                   | 50         | 2.72         |              | 1.00         | 140.9          | 0.92         | 0.340            | 0.314          | 0.653          | 0.48                 | 92%                  | 1.01          |
| 56.59           | 55,06            | 1.89         | 3.43         | 110        | 1,974                  | 0.689          | 3.55         | 0.81         | 0.60         | 30,35             | 2.66         |     | 0                   | Ja         | 3.15         |              | 1,00         | 125.9          | 0.92         | 0.266            | U_Z45          | 0.652<br>0.650 | 0.38<br>Non-Liq.     |                      | 1.17<br>0.00  |
| 56.76<br>56.92  | 39.94<br>26.94   | 1.59<br>1.16 | 3.99<br>4.32 | 110<br>110 |                        |                |              |              | 0,59<br>0,56 |                   | 2.83<br>3.01 |     | 0                   |            |              |              |              |                | 0.92<br>0.92 |                  |                | 0.649<br>0.648 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 57.09           | 24.31            | 0.74         | 3.02         | 110        | 1,985                  | 0.685          | 3.29         | 0.89         | 0.57         | 12.02             | 2.95         |     | 0                   |            |              |              |              |                | 0.92         |                  |                | 0.647          | Non-Liq.             | Non-Liq.             | 0.00          |
| 57.25<br>57.41  | 17.67<br>17.34   | 0.69<br>0.73 | 3.89<br>4.18 | 110<br>110 | 1.993                  | 0.682          | 4.72         | 0.97         | 0.55<br>0.54 |                   | 3.17<br>3.20 |     | 0                   |            |              |              |              |                | 0.92<br>0.92 |                  |                | 0.646<br>0.645 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 57.58<br>57.74  | 19.61<br>24.98   | 0.61<br>0.61 | 3.11<br>2.45 | 110<br>110 |                        |                |              |              | 0.56<br>0.57 |                   | 3.06<br>2.89 |     | 0                   |            |              |              |              |                | 0.92         |                  |                | 0.644<br>0.643 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 57.91           | 19,44            | 0.61         | 3.14         | 110        | 2.005                  | 0.678          | 3.50         | 0.93         | 0.55         | 9.10              | 3.07         |     | 0                   |            |              |              |              |                | 0.92         |                  |                | 0.642          | Non-Liq.             | Non-Liq.             | 0.00          |
| 58.07           | 18,43            | 0.58         | 3.12         | 110        | 2,009                  | 0.676          | 3.50         | 0.94         | 0.55         | 8.52              | 3.09         |     | 0                   |            |              |              |              |                | 0.92         |                  |                | 0.641          | Non-Liq.             | Non-Liq.             | 0.00          |

| Layer  | Tip    | Friction |       |         | Eff.Stres |       |      |      |      |           |      | de  | Liquef     | Rel    |      |     |      | Clean |      |       |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|-------|---------|-----------|-------|------|------|------|-----------|------|-----|------------|--------|------|-----|------|-------|------|-------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio | Unit Wt | at Midpt  |       |      |      |      | Corrected | b    | er. | Suscept (  | Dens.  |      | Н   |      | Sand  |      |       | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %     | (pcf)   | p'o (tsf) | rď    | F    | n    | Ca   | Qc1n      | lc   | ò   | (0 or 1) t | Or (%) | Kc   | (m) | KH   | Qc1n  | Κσ   | CRR75 | CRR   | CSR     | Factor    | PL       | (%)        |
| 58.23  | 17.22  | 0.56     | 3,23  | 110     | 2.013     | 0.675 | 3.66 | 0.95 | 0.54 | 7.81      | 3.13 |     | 0          |        |      |     |      |       | 0.92 |       | -     | 0.640   | Non-Liq.  | Non-Lia  | 0.00       |
| 58,40  | 17.30  | 0.55     | 3.17  | 110     | 2,016     | 0.673 | 3.59 | 0.95 | 0.54 | 7.85      | 3.13 |     | 0          |        |      |     |      |       | 0.92 |       |       | 0.638   | Non-Liq.  |          | 0.00       |
| 58,56  | 18.04  | 0.54     | 2,97  | 110     | 2.020     | 0.672 | 3.35 | 0.94 | 0.55 | 8.27      | 3.09 |     | 0          |        |      |     |      |       | 0.92 |       |       | 0.637   | Non-Lig.  | Non-Liq. | 0.00       |
| 58,73  | 16.07  | 0.52     | 3.22  | 110     | 2.024     | 0.671 | 3.69 | 0.96 | 0.54 | 7.13      | 3.17 |     | 0          |        |      |     |      |       | 0.91 |       |       | 0.636   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.89  | 15.75  | 0.49     | 3,08  | 110     | 2.028     | 0.669 | 3.53 | 0.96 | 0.54 | 6.95      | 3.17 |     | 0          |        |      |     |      |       | 0,91 |       |       | 0.635   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.06  | 15.86  | 0.51     | 3.23  | 110     | 2,032     | 0.668 | 3.71 | 0.96 | 0.53 | 6,98      | 3.18 |     | 0          |        |      |     |      |       | 0.91 |       |       | 0.634   | Non-Lig.  | Non-Liq. | 0.00       |
| 59.22  | 17.14  | 0.64     | 3.71  | 110     | 2.036     | 0.666 | 4.21 | 0.96 | 0.53 | 7,61      | 3.18 |     | 0          |        |      |     |      |       | 0,91 |       |       | 0.633   | Non-Liq.  | Non-Lig. | 0.00       |
| 59.38  | 19.02  | 1.05     | 5.54  | 110     | 2,040     | 0,665 | 6.21 | 0.98 | 0.53 | 8,43      | 3.24 |     | 0          |        |      |     |      |       | 0.91 |       |       | 0.632   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.55  | 50.85  | 1.55     | 3.04  | 110     | 2.044     | 0.664 | 3.17 | 0.81 | 0.59 | 27.10     | 2.67 |     | 0          |        |      |     |      |       | 0.91 |       |       | 0.631   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.71  | 71.44  | 1.83     | 2,56  | 110     | 2.048     | 0.662 | 2.64 | 0.75 | 0.61 | 39.86     | 2.49 |     | 1          | 39     | 2.71 |     | 1.00 | 107.9 | 0.91 | 0.197 | 0.180 | 0.630   | 0.28      | 98%      | 1.40       |
| 59,88  | 152.33 | 2.73     | 1.79  | 110     | 2,052     | 0.661 | 1.81 | 0.64 | 0.65 | 92,95     | 2.11 |     | 1          | 74     | 1.47 |     | 1.00 | 136.5 | 0.83 | 0.316 | 0.263 | 0.629   | 0.42      | 95%      | 1.05       |
| 60.04  | 157.44 | 0.00     | 0.00  | 110     | 2,055     | 0,660 | 0.00 | 0.75 | 0.61 | 88.95     | 2.49 |     | 1          | 72     | 1.00 |     | 1.00 | 89.0  | 0.83 | 0.145 | 0.121 | 0.628   | 0.19      | 100%     | 1.68       |
| 60 20  | 137,47 | 0.00     | 0.00  | 110     | 2.059     | 0.658 | 0.00 | 0.75 | 0.61 | 77.55     | 2.48 |     | 1          | 66     | 1.00 |     | 1.00 | 77.6  | 0.87 | 0.123 | 0.107 | 0.627   | 0.17      | 100%     | 1.88       |

### CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

|                | J                | ob No:            | 301953<br>8/14/20 | -001       | Plot:                  | 8              |              | Met          | thods:       | Liquefac<br>Post-liqu<br>Dry San | uefactio     | on S     | ettleme            | nt Ana     | llysis fr    | om To              | kimats       | u & See              | ed (198      | 37)              | & Wride        | )                |                      |                | Total<br>Liquefled<br>Thickness<br>(feet) |
|----------------|------------------|-------------------|-------------------|------------|------------------------|----------------|--------------|--------------|--------------|----------------------------------|--------------|----------|--------------------|------------|--------------|--------------------|--------------|----------------------|--------------|------------------|----------------|------------------|----------------------|----------------|---|
| EARTH          | QUAKE            |                   |                   | 7.5        |                        |                |              |              |              | (M=7.5):<br>and Qc1n             |              |          |                    | p'o)*rd    | /MSF         | SE =               | - CRR        | <sub>7.5</sub> *Kσ/C | SD.          |                  |                |                  |                      | Brobab         | 7,2<br>Total                              |
|                |                  | PGA, g:           | 0.97              | 0.75       |                        |                |              | 01           | oan o        | and dem                          | - 00         | I.C      | INH CAC            |            | Us           |                    |              |                      |              | Ishihara         | a &Yosh        | mine (1):        | 0                    | Probab<br>Avg  | Induced                                   |
|                | GW               | MSF:<br>/T, feet: | 1.30              |            |                        |                | _            |              |              | ted soils:                       |              | pc<br>pc |                    |            | -            |                    |              |                      | Min SI       | F of Lia         |                | uired SF:        |                      | 6%<br>Max      | Subsidence<br>(inches)                    |
|                | esign GV         | /T, feet:         | 8.0               |            |                        |                |              | CHARLEST CO. |              | ble soils:                       |              |          |                    |            | iting Ic     | for K <sub>H</sub> | 2.0          |                      | Avg SI       |                  |                | Layers:          |                      | 100%           | 1.2                                       |
| Layer<br>Depth | Tip<br>Qc        | Friction<br>Fs    | Friction<br>Ratio |            | Eff.Stress<br>at Midpt | 3              |              |              |              | Corrected                        | d            | u        | Liquef,<br>Suscept |            |              | н                  |              | Clean                |              |                  | EQ             | Induced<br>M=7.5 | Liquefac.<br>Safety  | Probab         | Volumetric<br>Strain                      |
| (feet)         | (tsf)            | (tsf)             | %                 | (pcf)      | p'o (tsf)              | rd             | F            | n            | Cq           | Qc1n                             | lc           |          | (0 or 1)           | Dr (%)     |              | (m)                | KH           | Qc1n                 |              | CRR <sub>7</sub> | 5 CRR          | CSR              | Factor               | PL             | (%)                                       |
| 0.16<br>0.33   | 92.62<br>130.04  | 1.11              | 1,20<br>1,55      | 110<br>110 |                        | 1,000<br>1,000 | 1.20<br>1.55 | 0,56<br>0,55 | 1.70<br>1.70 | 148.81<br>208.92                 | 1.84<br>1.82 |          | 1                  | 93<br>100  | 1.13<br>1.12 | 0.25<br>0.25       | 1.00<br>1.00 | 168.8<br>234.3       | 1.00         | Infin.<br>Infin. | 0.000          | 0.485<br>0.485   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
|                | 152,39<br>146,45 | 3.01<br>3.22      | 1,98              | 110<br>110 |                        | 1,000          | 1.98<br>2.20 | 0.57<br>0.58 | 1.70<br>1.70 | 244.82<br>235.26                 | 1,86<br>1,91 |          | 1                  | 100<br>100 | 1.16<br>1.20 | 0.25               | 1.00         | 282.8<br>282.0       | 1.00         | Infin.<br>Infin. | 0.000          | 0.485<br>0.485   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
|                | 125.63<br>97.23  | 2.97<br>2.48      | 2,36<br>2,55      | 110<br>110 | 0.045                  | 1,000          | 2.36<br>2.55 | 0,60<br>0,63 | 1.70<br>1.70 | 201.79<br>156.14                 | 1.97<br>2.07 |          | 1                  | 100<br>95  | 1.27         | 0,25               | 1.00         | 255.7                | 1.00         | Infin.           | 0,000          | 0.485            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 1,15           | 63,94            | 1.59              | 2.49              | 110        | 0.063                  | 0 999          | 2,50         | 0.66         | 1,70         | 102,64                           | 2,18         |          | 1                  | 78         | 1,61         |                    | 1,00<br>1,00 | 218.4<br>165.7       | 1.00         | Infin            | 0,000          | 0.485<br>0.484   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 1,31<br>1,48   | 63.94<br>41.59   | 1.59              | 2 49 2 61         | 110<br>110 |                        | 0.999          | 2,50<br>2,62 | 0.66<br>0.70 | 1.70<br>1.70 | 102,62<br>66,70                  | 2.18<br>2.32 |          | 1                  | 78<br>60   | 1,61         |                    | 1.00         | 165.7<br>134.8       | 1.00         | Infin.<br>0.308  | 0,000          | 0.484<br>0.484   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 1,64<br>1,80   | 28.11<br>20.76   | 0.74<br>0.53      | 2.64              | 110<br>110 |                        | 0.998<br>0.998 | 2,64<br>2,57 | 0.74         | 1.70<br>1.70 | 45,02<br>33,20                   | 2.45<br>2.54 |          | 1                  | 44<br>31   | 2,52<br>2,98 |                    | 1.00         | 113.6<br>98.9        | 1.00         | 0,216            | 0,216<br>0,170 | 0.484<br>0.484   | Non-Liq.<br>Non-Liq. | Non-Liq        | 0.00<br>0.00                              |
| 1,97           | 21.63            | 0.56              | 2.58              | 110        | 0.108                  | 0.998          | 2.60         | 0.77         | 1.70         | 34.58                            | 2,53         |          | 1                  | 33         | 2,92         |                    | 1.00         | 101_1                | 1.00         | 0.176            | 0,176          | 0.484            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 2.13<br>2.30   | 34,59<br>34,08   | 0.78<br>0.89      | 2,25              | 110<br>110 | 0,126                  | 0.997<br>0.997 | 2.26<br>2.62 | 0.71<br>0.72 | 1.70<br>1.70 | 55 39<br>54 56                   | 2.34<br>2.39 |          | 1                  | 52<br>52   | 2.07<br>2.25 |                    | 1.00         | 114.6<br>123.0       | 1.00<br>1.00 | 0.220<br>0.253   | 0,220<br>0,253 | 0 483<br>0 483   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 2.46<br>2.62   | 31.06<br>26.71   | 0.81<br>0.71      | 2,60              | 110<br>110 |                        | 0,996          | 2,61<br>2,67 | 0.73<br>0.75 | 1.70<br>1.70 | 49 69<br>42 69                   | 2.41         |          | 1                  | 48<br>42   | 2,37<br>2,62 |                    | 1.00         | 117.7<br>111.6       | 1.00         | 0.231            | 0.231          | 0.483<br>0.483   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 2.79<br>2.95   | 24.66<br>22.66   | 0.64<br>0.59      | 2.61<br>2.60      | 110<br>110 | 0.153                  | 0,996<br>0,995 | 2.62<br>2.62 | 0.76<br>0.76 | 1.70<br>1.70 | 39.38                            | 2.49         |          | 1                  | 38         | 2,72         |                    | 1.00         | 107.1                | 1.00         | 0.194            | 0.194          | 0.483            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 3.12           | 21.79            | 0.57              | 2.60              | 110        | 0.171                  | 0.995          | 2.62         | 0.77         | 1.70         | 36 15<br>34 74                   | 2,53         |          | 1                  | 35<br>33   | 2.86<br>2.93 |                    | 1.00<br>1.00 | 103.4<br>101.7       | 1.00<br>1.00 | 0.183<br>0.178   | 0.183<br>0.178 | 0.482<br>0.482   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 3,28<br>3,44   | 20,52<br>18.85   | 0.55<br>0.54      | 2.69              | 110<br>110 |                        | 0.994<br>0.994 | 2.72<br>2.89 | 0.78<br>0.79 | 1.70<br>1.70 | 32.68<br>29.98                   | 2.56<br>2.61 |          | 0                  | 30         | 3.10         |                    | 1.00         | 101.3                | 1.00         | 0_177            | 0.177          | 0.482<br>0.482   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 3,61<br>3,77   | 16.96<br>15.22   | 0.52<br>0.50      | 3.05              | 110<br>110 |                        | 0.994<br>0.993 | 3.09<br>3.34 | 0,81<br>0,82 | 1.70<br>1.70 | 26.93<br>24.12                   | 2.66<br>2.72 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.482<br>0.482   | Non-Liq.<br>Non-Liq. | Non-Liq        | 0.00<br>0.00                              |
| 3,94           | 13.60            | 0.54              | 3.97              | 110        | 0.217                  | 0.993          | 4.03         | 0.85         | 1.70         | 21.50                            | 2.81         |          | 0                  |            |              |                    |              |                      | 1.00         |                  |                | 0.481            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 4.10<br>4.27   | 13.10<br>13.76   | 0.56<br>0.61      | 4.31<br>4.45      | 110<br>110 |                        | 0,993<br>0,992 | 4.38<br>4.52 | 0.86<br>0.86 | 1.70<br>1.70 | 20.69<br>21.73                   | 2.85<br>2.84 |          | 0                  |            |              |                    |              |                      | 1.00         |                  |                | 0.481<br>0.481   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 4.43<br>4.59   | 12,78<br>9,82    | 0.63<br>0.62      | 4.94<br>6.32      | 110<br>110 |                        | 0.992          | 5.03<br>6.49 | 0.88         | 1.70<br>1.70 | 20.14<br>15.37                   | 2.90<br>3.06 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.481<br>0.481   | Non-Liq.<br>Non-Liq. | Non-Liq        | 0.00<br>0.00                              |
| 4.76<br>4.92   | 9.11<br>9.64     | 0.58              | 6.39              | 110        | 0 262                  | 0.991          | 6.58         | 0.93         | 1.70         | 14,22                            | 3.09         |          | 0                  |            |              |                    |              |                      | 1.00         |                  |                | 0.480            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 5.09           | 11.05            | 0.67<br>0.51      | 6.94<br>4.60      | 110<br>110 | 0.280                  | 0.991<br>0.990 | 7 14<br>4 72 | 0.94<br>0.89 | 1.70<br>1.70 | 15 05<br>17 31                   | 3.09<br>2.93 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.480<br>0.480   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 5,25<br>5,41   | 26.79<br>43.87   | 0.51<br>0.61      | 1.91<br>1.40      | 110<br>110 |                        | 0.990          | 1.93<br>1.41 | 0.72<br>0.65 | 1.70<br>1.70 | 42.58<br>70.01                   | 2.38         |          | 1                  | 41<br>62   | 2.22<br>1.50 |                    | 1.00<br>1.00 | 94.7<br>105.0        | 1.00         | 0.159<br>0.188   | 0.159<br>0.188 | 0,480<br>0,480   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 5.58<br>5.74   | 61.57<br>81.48   | 0.87<br>1.27      | 1.42<br>1.55      | 110<br>110 |                        | 0.989          | 1.42<br>1.56 | 0.61<br>0.60 | 1.70<br>1.70 | 98.44<br>130.42                  | 2.02         |          | 1                  | 76<br>88   | 1,32<br>1,25 | 1.00               | 1.00<br>1.00 | 130.2<br>163.4       | 1.00         | 0.285<br>Infin   | 0.285<br>0.000 | 0.479<br>0.479   | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 5.91           | 104.49           | 1.77              | 1.69              | 110        | 0.325                  | 0.988          | 1.70         | 0.58         | 1.70         | 167,37                           | 1_91         |          | 1                  | 98         | 1,20         | 1.05               | 1.00         | 201.7                | 1.00         | Infin.           | 0.000          | 0.479            | Non-Liq.<br>Non-Liq. | Non-Liq.       | 0.00<br>0.00                              |
|                | 121.74<br>129.40 | 2.26<br>2.54      | 1.85<br>1.96      | 110<br>110 |                        | 0.988<br>0.988 | 1.86<br>1.97 | 0.58<br>0.58 | 1.70<br>1.70 | 195.08<br>207.37                 | 1.90<br>1.90 |          | 1                  | 100        | 1.19<br>1.19 | 1.10<br>1.15       | 1.00<br>1.00 | 232.8<br>248.1       | 1.00         | Infin.<br>Infin. | 0.000          | 0.479<br>0.479   | Non-Liq.<br>Non-Liq. |                | 0.00                                      |
|                | 133.71<br>136.13 | 2.63<br>2.67      | 1.97<br>1.96      | 110<br>110 |                        | 0.987<br>0.987 | 1.98<br>1.97 | 0.58<br>0.57 | 1.70<br>1.70 | 214.28<br>218.15                 | 1.90<br>1.89 |          | 1                  | 100        | 1.18<br>1.18 | 1.20               | 1.00<br>1.00 | 254.9<br>258.3       | 1.00         | Infin.           | 0.000          | 0.479<br>0.478   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 6.73           | 137,04<br>134,61 | 2.50<br>2.27      | 1.82              | 110<br>110 | 0.370                  | 0.986<br>0.986 | 1.83<br>1.69 | 0.57<br>0.56 | 1.70<br>1.70 | 219,60<br>215,68                 | 1.86         |          | 1                  | 100        | 1.16         | 1.20               | 1.00         | 254.6                | 1.00         | Infin.           | 0.000          | 0.478            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 7.05           | 133,55           | 2.02              | 1.51              | 110        | 0.388                  | 0.986          | 1.52         | 0.55         | 1.70         | 213.97                           | 1.81         |          | i                  | 100        |              |                    |              | 238.6                | 1.00         | Infin.<br>Infin. | 0.000          | 0.478<br>0.478   | Non-Liq.<br>Non-Liq. | Non-Liq.       | 0.00<br>0.00                              |
|                | 130.84<br>125.34 | 1.92<br>1.72      | 1.47<br>1.37      | 110<br>110 |                        | 0.985<br>0.985 | 1.47<br>1.38 | 0.55<br>0.55 | 1.70<br>1.69 | 209.60<br>199.24                 | 1.80<br>1.79 |          | 1                  | 100<br>100 | 1.11<br>1.10 | 1.20               | 1.00<br>1.00 | 233.0<br>220.4       |              | Infin.<br>Infin. | 0.000          | 0.478<br>0.478   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
|                | 121,32<br>121.32 | 1.59<br>1.59      | 1.31              | 110<br>110 |                        | 0.985<br>0.984 | 1.32<br>1.32 | 0.55<br>0.55 | 1.67<br>1.65 |                                  | 1.79<br>1.80 |          | 1                  | 100<br>100 | 1.10         | 1.20<br>1.20       | 1.00<br>1.00 | 210.4<br>208.6       |              | Infin.           | 0.000          | 0.477<br>0.477   | Non-Liq.<br>Non-Liq. | Non-Liq.       | 0.00<br>0.00                              |
| 7.87           | 117.69           | 1.47              | 1.25              | 110        | 0.433                  | 0.984          | 1.25         | 0,55         | 1.63         | 180.43                           | 1.79         |          | i                  | 100        | 1.10         | 1.20               | 1.00         | 199.4                | 1.00         | Infin.           | 0.000          | 0.477            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 8.20           | 112 60<br>105 92 | 1.37<br>1.25      | 1.22              | 110<br>110 | 0.451                  |                | 1.22<br>1.19 |              | 1.61<br>1.60 |                                  | 1.80<br>1.81 |          | 1                  | 99<br>96   | 1.11<br>1.12 | 1.20<br>1.20       | 1.00<br>1.00 | 189.9<br>178.5       |              | Infin.<br>Infin. | 0.000          | 0.477<br>0.481   | Non-Liq.<br>Non-Liq. |                | 0.00                                      |
| 8.37<br>8.53   | 94.02<br>82.35   | 1.10<br>0.71      | 1.17<br>0.86      | 110<br>110 |                        | 0.983<br>0.982 | 1.18<br>0.86 | 0.56<br>0.55 | 1.60<br>1.56 |                                  | 1.85<br>1.81 |          | 1                  | 91<br>85   |              |                    |              | 161.8<br>135.0       |              | Infin<br>0.309   | 0.000          | 0.486<br>0.491   | Non-Liq.<br>0.63     | Non-Liq<br>82% | 0.00<br>1.05                              |
| 8.69<br>8.86   | 75.19<br>63.26   | 0.69<br>0.61      | 0.91              | 110<br>110 | 0.478                  |                | 0.92<br>0.97 | 0.56         | 1.56<br>1.57 | 110,51                           | 1.85<br>1.93 |          | 1                  | 81<br>74   |              |                    | 1.00         | 127.3<br>113.9       | 1.00         | 0.272<br>0.217   | 0.272<br>0.217 | 0.496<br>0.501   | 0.55<br>0.43         | 88%<br>94%     | 1.14                                      |
| 9.02           | 59.99            | 0.57              | 0.95              | 110        | 0 496                  | 0.981          | 0.96         | 0.59         | 1.56         | 87.95                            | 1.94         |          | 1                  | 71         | 1,23         | 1.20               | 1.00         | 108.8                | 1.00         | 0.200            | 0.200          | 0.506            | 0.39                 | 96%            | 1.30<br>1.37                              |
| 9.19<br>9.35   | 56.32<br>53.37   | 0.53<br>0.45      | 0.94              | 110<br>110 |                        | 0.981<br>0.981 | 0.94<br>0.86 | 0.60<br>0.60 | 1.55<br>1.54 | 81.99<br>76.78                   | 1.96<br>1.96 |          | 1                  | 69<br>66   |              | 1.20               |              | 103.2<br>96.4        | 1.00         | 0.182<br>0.163   | 0.182<br>0.163 | 0,510<br>0,515   | 0.36<br>0.32         | 97%<br>98%     | 1.45<br>1.55                              |
| 9.51<br>9.68   | 48.12<br>43.46   | 0.39<br>0.35      | 0.82              | 110<br>110 |                        | 0.980<br>0.980 | 0.83         |              | 1.53<br>1.53 | 68.86<br>61.93                   | 1.99<br>2.03 |          | 1                  | 61<br>57   | 1.29<br>1.34 | 1.20               | 1.00<br>1.00 |                      | 1.00<br>1.00 | 0.145<br>0.133   |                | 0.520<br>0.524   | 0.28<br>0.25         | 99%<br>99%     | 1.66<br>1.77                              |
| 9.84<br>10.01  | 43.28<br>40.37   | 0.29              | 0.68              | 110        | 0.541                  | 0.980          | 0.69         | 0.61         | 1.50         | 60,60                            | 1.99         |          | 1                  | 56         | 1.29         | 0.05               | 1.71         | 133.7                | 1.00         | 0.302            | 0.302          | 0.529            | 0.57                 | 86%            | 1.07                                      |
| 10.17          | 38,85            | 0.35              | 0.91              | 110<br>110 | 0.559                  | 0,979          | 1 05<br>0.92 | 0.64         | 1,52<br>1,50 | 57.28<br>54.36                   | 2.12<br>2.10 |          | 1                  | 54<br>52   | 1.48<br>1.46 |                    | 1.00<br>1.00 | 84.9<br>79.2         | 1.00         | 0.126            | 0.137<br>0.126 | 0.533<br>0.537   | 0.26<br>0.23         | 99%<br>99%     | 1.73<br>1.83                              |
| 10.33<br>10.50 | 35.99<br>35.23   | 0.37              | 1.03              | 110<br>110 |                        | 0.979<br>0.978 | 1.05<br>0.96 |              | 1.50<br>1.48 | 50.33<br>48.64                   | 2.16         |          | 1                  | 48<br>47   | 1.58<br>1.55 |                    | 1.00<br>1.00 |                      |              | 0.126<br>0.120   | 0.126<br>0.120 | 0.541<br>0.545   | 0.23<br>0.22         | 99%<br>99%     | 1.83<br>1.90                              |
| 10.66<br>10.83 | 32,68<br>29,98   | 0.32<br>0.30      | 0.98              | 110<br>110 | 0.586                  | 0.978          | 0.99         | 0.66         | 1.48<br>1.47 | 44.89                            | 2.19<br>2.22 |          | 1                  | 44<br>40   | 1.64<br>1.73 |                    | 1.00         | 73.5                 | 1.00         | 0.117<br>0.113   | 0.117          | 0.550<br>0.554   | 0.21                 | 99%<br>99%     | 2.00                                      |
| 10.99          | 26.35            | 0.27              | 1.02              | 110        | 0.604                  | 0.977          | 1.04         | 0.69         | 1_47         | 35.85                            | 2.28         |          | 1                  | 34         | 1.89         |                    | 1.00         | 67.7                 | 1.00         | 0.109            | 0.109          | 0.557            | 0.20                 | 100%           | 2.07                                      |
| 11.15<br>11.32 | 21.42<br>14.65   | 0.21              | 1.43<br>1.40      | 110<br>110 | 0.623                  | 0.977          | 1.48<br>1.46 | 0.78         | 1.50<br>1.51 | 29.41<br>20.05                   | 2.44<br>2.57 |          | 1                  | 26<br>10   | 2.47<br>3.16 |                    | 1.00<br>1.00 |                      | 1.00         | 0.115            |                | 0.561<br>0.565   | 0.21<br>0.18         | 99%<br>100%    | 2.00<br>2.17                              |
| 11.48<br>11.65 | 9.05<br>7.19     |                   | 2.30              | 110<br>110 |                        |                | 2.47<br>3.04 |              | 1.57<br>1.58 | 12.46<br>9.77                    | 2.87<br>3.01 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.569<br>0.572   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 11.81<br>11.98 | 2.70<br>2.65     | 0.13              | 4.89<br>4.64      | 110<br>110 | 0.650                  | 0.975          | 6.44<br>6.18 | 1,00         | 1.63<br>1.61 | 3.16                             | 3.60<br>3.60 |          | 0                  |            |              |                    |              |                      | 1.00         |                  |                | 0.576            | Non-Liq.             | Non-Liq.       | 0.00                                      |
| 12.14          | 3.48             | 0.11              | 3.10              | 110        | 0.668                  | 975            | 3.84         | 1.00         | 1.58         | 4.21                             | 3.37         |          | 0                  |            |              |                    |              |                      | 1.00         |                  |                | 0.580<br>0.583   | Non-Liq.             | Non-Liq.       | 0.00<br>0.00                              |
| 12.30<br>12.47 | 2.50<br>1.85     | 0.11              | 3.84<br>5.73      | 110<br>110 | 0.686                  | 0.974          | 5.27<br>9.10 |              | 1.56<br>1.54 | 2.69<br>1.70                     | 3.61<br>3.90 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.587<br>0.590   | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00                              |
| 12.63<br>12.80 | 1.79<br>5.10     |                   | 7.43<br>5.59      | 110<br>110 |                        | 0.974<br>0.973 |              |              | 1.52<br>1.50 |                                  | 4.00<br>3.36 |          | 0                  |            |              |                    |              |                      | 1.00<br>1.00 |                  |                | 0.593<br>0.597   | Non-Liq.<br>Non-Liq. | Non-Liq.       | 0.00<br>0.00                              |

| Lay            | er Tip           | Friction      | n Friction   | Total        | Eff,Stres          | s              |              |              |                |                  |              | φl  | Liquef. Re     | L          |        |              |       | Clean                            |              | _                |       | Induced        | Liquefac             |                | Volumetric   |
|----------------|------------------|---------------|--------------|--------------|--------------------|----------------|--------------|--------------|----------------|------------------|--------------|-----|----------------|------------|--------|--------------|-------|----------------------------------|--------------|------------------|-------|----------------|----------------------|----------------|--------------|
| Dej            |                  | Fs            | Ratio        |              | at Midpt           | (122247)       | _            |              | · Arr          | Corrected        |              | D S | uscept De      | is.        |        | Н            | gav   | Sand                             |              |                  | EQ    | M=7,5          | Safety               | Probab         | Strain       |
| (fe            |                  | (tsf)<br>0.58 | 1.88         | (pcf)<br>110 | p'o (tsf)<br>0,713 | rd<br>0,973    | 1.92         | 0.73         | C <sub>0</sub> | Qc1n<br>38,00    | lc<br>2,42   | 0 ( | 0 or 1) Dr (   |            |        | m)           | 1.00  | 90.3                             | 1.00         | 0.148            | 0,148 | 0,600          | Factor<br>0.25       | 99%            | 1.65         |
| 13.            |                  | 1.11<br>1.26  | 1,36<br>1,37 | 110<br>110   | 0.722              | 0.973<br>0.972 | 1.37<br>1.38 | 0.61<br>0.60 | 1,26<br>1,25   | 96,14<br>107,89  | 2,01         |     | 1 75           | 1,3        | 32     |              | 1.00  | 126.7                            | 1.00         | 0.269            | 0,269 | 0,603          | 0.45                 | 93%            | 1.16         |
| 13.4           |                  | 1.30          | 0.99         | 110          | 0.740              | 0.972          | 0.99         | 0.54         | 1.25           | 150 49           | 1,77         |     | 1 80           | 1.0        |        |              | 1.00  | 137.9<br>164.4                   | 1.00         | 0.324<br>Infin   | 0,324 | 0,606<br>0,609 | 0.53<br>Non-Liq.     | 89%<br>Non-Liq | 1.04<br>0.00 |
| 13.6           |                  |               | 0,95<br>1,09 | 110<br>110   | 0.749<br>0.758     | 0,972<br>0,971 | 0.96<br>1.10 | 0.51<br>0.51 | 1.19<br>1.19   | 198.00<br>232.55 | 1,68<br>1,68 |     | 1 10           |            |        | 1            | 1.00  |                                  | 1.00         | Infin.           | 0,000 | 0,612          | Non-Liq.             |                | 0.00         |
| 13,9           | 234.75           | 2.60          | 1,11         | 110          | 0.767              | 0.971          | 1.11         | 0.50         | 1.18           | 259.95           | 1.65         |     | 1 10           |            |        | 3            |       |                                  | 1.00         | Infin.           | 0,000 | 0.615<br>0.618 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 14.            |                  |               | 1,15<br>1,09 | 110<br>110   | 0.776<br>0.785     | 0.971<br>0.970 | 1.16<br>1.10 | 0.50<br>0.50 | 1.17<br>1.16   | 269 60<br>297 68 | 1.65<br>1.61 |     | 1 10           | 170        |        |              |       |                                  | 1,00         | Infin.           | 0,000 | 0.621<br>0.624 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 14.4           | 14 294,29        | 3,35          | 1.14         | 110          | 0.794              | 0.970          | 1.14         | 0.50         | 1.15           | 320.23           | 1.60         |     | 1 10           | 1.0        | 00 1.  | 35           | 1,00  | 321.4                            | 1,00         | Infin,           | 0,000 | 0.627          | Non-Liq.             | Non-Liq.       | 0.00         |
| 14.6           |                  |               | 1,00<br>1,06 | 110<br>110   | 0.803<br>0.812     | 0.970<br>0.969 | 1.00<br>1.06 | 0.50<br>0.50 | 1.15           | 342.22<br>340.73 | 1,54<br>1,56 |     | 1 100          | -          |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0 629<br>0 632 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 14.9<br>15.0   |                  | 3.41<br>3.48  | 1.16<br>1.25 | 110<br>110   | 0.821              | 0.969          | 1.16<br>1.25 | 0.50         | 1.14           | 315,37           | 1.61         |     | 1 100          | - 2        |        | 50           | 1,00  | 316,5                            | 1.00         | Infin.           | 0.000 | 0.635          | Non-Liq.             | Non-Liq.       | 0.00         |
| 15.2           |                  | 3,53          | 1.26         | 110          | 0.839              | 0.969<br>0.968 | 1.25         | 0.50<br>0.51 | 1.13<br>1.12   | 296 09<br>295 90 | 1.65<br>1.66 |     | 1 100          | - 2        |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0.637<br>0.640 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 15.4<br>15.5   |                  | 3.58<br>3.59  | 1,24<br>1,23 | 110<br>110   | 0,848<br>0,857     | 0.968<br>0.967 | 1.25<br>1.23 | 0.50<br>0.50 | 1.12           | 303.25<br>306.22 | 1.65<br>1.64 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0.643          | Non-Liq.             | Non-Liq.       | 0.00         |
| 15.7           | 5 272.56         | 3,89          | 1_43         | 110          | 0.866              | 0,967          | 1.43         | 0.52         | 1.11           | 285,01           | 1,71         |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin            | 0,000 | 0.645<br>0.648 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 15.9           |                  | 3.59          | 1.30<br>1.44 | 110<br>110   | 0,875<br>0,884     | 0,967<br>0,966 | 1.30<br>1.44 | 0.51<br>0.52 | 1.10<br>1.10   | 287,18<br>282,65 | 1.67<br>1.71 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0,000 | 0.650<br>0.653 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 16.2           | 4 281,27         | 3.86          | 1,37         | 110          | 0.893              | 0,966          | 1.38         | 0.52         | 1.09           | 289 18           | 1,69         |     | 1 100          | 1.0        | 03 1   | 55           | 1.00  | 299.7                            | 1,00         | Infin.           | 0,000 | 0.655          | Non-Liq.             |                | 0.00         |
| 16.5           |                  | 4.92<br>4.41  | 1,60<br>1,48 | 110<br>110   | 0,902<br>0,911     | 0,966<br>0,965 | 1.60<br>1.48 | 0.53<br>0.52 | 1.09           | 315,65<br>303,79 | 1,72<br>1,71 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0,000 | 0.657<br>0.660 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 16.7           |                  | 4.08          | 1,28         | 110          | 0.920              | 0.965          | 1.29         | 0.50         | 1.07           | 320,96           | 1.64         |     | 1 100          | 1,0        | 00 1.  | 55           | 1.00  | 321.4                            | 1.00         | Infin.           | 0.000 | 0.662          | Non-Liq.             | Non-Liq.       | 0.00         |
| 16.9           |                  | 5.17<br>6.36  | 1,56<br>1,88 | 110<br>110   | 0 929<br>0 938     | 0.965<br>0.964 | 1.56<br>1.88 | 0.52<br>0.54 | 1,07<br>1,07   | 335,03<br>340,25 | 1.70<br>1.76 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0,000 | 0.664<br>0.666 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 17.2<br>17.3   |                  | 5.82<br>4.43  | 1.89<br>1.64 | 110<br>110   | 0.947<br>0.956     | 0.964<br>0.963 | 1.90<br>1.65 | 0.55         | 1.06           | 308,23           | 1,79         |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin            | 0.000 | 0.669          | Non-Liq.             | Non-Liq        | 0.00         |
| 17.5           | 5 257.64         | 3.38          | 1,31         | 110          | 0,965              | 0.963          | 1.32         | 0.54<br>0.52 | 1.06<br>1.05   | 267.85<br>254.47 | 1.78<br>1.71 |     | 1 100          |            |        |              |       |                                  | 1.00<br>1.00 | Infin,<br>Infin, | 0.000 | 0.671<br>0.673 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 17.7<br>17.8   |                  | 3.27<br>3.15  | 1.42<br>1.70 | 110<br>110   | 0.974              | 0,963<br>0,962 | 1.43<br>1.71 | 0.54<br>0.58 | 1.05<br>1.04   | 225.75<br>181.55 | 1.77<br>1.89 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0.675<br>0.677 | Non-Liq.             | Non-Liq.       | 0.00         |
| 18.0           | 4 157.27         | 2.43          | 1.54         | 110          | 0,992              | 0.962          | 1.55         | 0.58         | 1_04           | 153,30           | 1,91         |     | 1 95           | 1.2        | 20 1   | 55 ′         | 1,00  | 184.1                            | 1.00         | Infin.           | 0.000 | 0.679          | Non-Liq.<br>Non-Liq. | Non-Liq        | 0.00<br>0.00 |
| 18.2           |                  | 2.97          | 1.72<br>2.23 | 110<br>110   | 1.001<br>1.010     | 0,962<br>0.961 | 1.73<br>2.24 | 0.58<br>0.62 | 1.03           | 167.15<br>142.99 | 1.92         |     | 1 98           | 1.2        |        |              |       |                                  | 1.00<br>1.00 | Infin.           | 0.000 | 0.681<br>0.683 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 18.5           |                  | 3.34          | 1,57         | 110          | 1,020              | 0.961          | 1.58         | 0.56         | 1.02           |                  | 1.83         |     | 1 100          | 0.00       |        | 00           | 1.00  | 231.6                            | 1.00         | Infin.           | 0.000 | 0.685          | Non-Liq.             | Non-Liq        | 0.00         |
| 18.7           |                  | 2.81<br>2.69  | 1.13<br>1.06 | 110<br>110   | 1,029<br>1,038     | 0,960<br>0,960 | 1.13<br>1.06 | 0.51<br>0.50 | 1.01<br>1.01   |                  | 1.68<br>1.65 |     | 1 100          |            | -      |              |       | 77                               | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.687<br>0.689 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 19.0<br>19.1   |                  | 2.74<br>2.91  | 1.10<br>1.15 | 110<br>110   | 1.047<br>1.056     | 0.960<br>0.959 | 1.10<br>1.15 | 0.51<br>0.51 | 1.01<br>1.00   |                  | 1.67<br>1.68 |     | 1 100          |            |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0.691          | Non-Liq.             | Non-Liq.       | 0.00         |
| 19.3           | 6 260,64         | 3.02          | 1.16         | 110          | 1,065              | 0,959          | 1.16         | 0.51         | 1.00           |                  | 1.68         |     | 1 100          |            |        |              |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.692<br>0.694 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 19.5           |                  | 3.10<br>2.97  | 1.18<br>1.10 | 110<br>110   | 1.074<br>1.083     | 0.958<br>0.958 | 1.19<br>1.10 | 0.51<br>0.50 | 0.99           |                  | 1.69<br>1.65 |     | 1 100          |            |        |              |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.696<br>0.698 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 19.8           | 5 280.85         | 3.04          | 1.08         | 110          | 1,092              | 0.957          | 1.09         | 0.50         | 0.98           | 260.31           | 1.64         |     | 1 100          | 1,0        | 00 1.4 | 40 1         | 1.00  | 261.3                            | 1.00         | Infin.           | 0.000 | 0.699          | Non-Liq.             |                | 0.00         |
| 20.0           |                  | 3.15<br>3.34  | 1.07<br>1.12 | 110<br>110   | 1.101<br>1.107     | 0 957<br>0 957 | 1.07<br>1.12 | 0.50<br>0.50 | 0.98           |                  | 1.62<br>1.64 |     | 1 100          |            |        |              |       |                                  | 1.00<br>1.00 | Infin.           | 0.000 | 0.701<br>0.703 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 20.3           |                  | 3,48<br>3.65  | 1.15<br>1.18 | 110          | 1.111              | 0.956          | 1.15         | 0.50         | 0.98           | 278,14           | 1.64         |     | 1 100          | 1.0        | 00 1.5 | 55 1         | 1.00  | 278.4                            | 1.00         | Infin.           | 0.000 | 0.704          | Non-Liq.             | Non-Liq        | 0.00         |
| 20.6           |                  | 4.01          | 1.31         | 110<br>110   |                    | 0.956<br>0.955 | 1.19<br>1.32 | 0.50<br>0.51 | 0.97<br>0.97   |                  | 1.65<br>1.69 |     | 1 100          | 1.0        |        |              |       |                                  | 1.00<br>1.00 | infin.<br>Infin. | 0.000 | 0.706<br>0.708 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 20.8           |                  | 3.98          | 1.33         | 110<br>110   | 1.122<br>1.126     | 0.955<br>0.954 | 1.34         | 0.52<br>0.51 | 0.97<br>0.97   |                  | 1.70<br>1.66 |     | 1 100          | 1.0        |        |              |       |                                  | 1.00<br>1.00 | Infin.           | 0.000 | 0.709          | Non-Liq.             | Non-Liq.       | 0.00         |
| 21.1           | 6 276.16         | 2.37          | 0.86         | 110          | 1,130              | 0.954          | 0.86         | 0.50         | 0.97           | 251_51           | 1.57         |     | 1 100          | 1.0        |        |              |       |                                  | 1.00         | Infin.           | 0.000 | 0.711<br>0.712 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 21.3           |                  | 2.09<br>1.47  | 0.78         | 110<br>110   |                    |                | 0.78<br>0.54 | 0.50<br>0.50 | 0.97<br>0.96   |                  | 1.55<br>1.44 |     | 1 100          | 1.0        |        |              |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.714<br>0.715 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 21.6           | 5 275,51         | 1.48          | 0.54         | 110          | 1.142              | 0.953          | 0.54         | 0.50         | 0.96           | 249.62           | 1.43         |     | 1 100          | 1.0        | 00 1.9 | 95 1         | 1.00  | 250.6                            | 1.00         | Infin.           | 0.000 | 0.717          | Non-Liq.             | Non-Liq.       | 0.00         |
| 21.8           |                  | 1.33<br>1.56  | 0.49<br>0.61 | 110<br>110   | 1.146<br>1.150     | 0.952<br>0.952 | 0.50<br>0.61 | 0.50<br>0.50 | 0.96<br>0.96   | 243.52<br>229.58 | 1.42         |     | 1 100          | 1.0        | 00 2.0 | 9            |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.718<br>0.719 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 22.1<br>22.3   |                  | 1.90<br>2.62  | 0.82<br>1.46 | 110<br>110   |                    |                | 0.82<br>1.47 | 0.50<br>0.57 | 0.96           |                  | 1.62         |     | 1 100          | 1.0        | 0 2.1  | 10 1         | 1.00  | 209.0                            | 1.00         | Infin.           | 0.000 | 0.721          | Non-Liq.             | Non-Liq        | 0.00         |
| 22.4           | 7 221.58         | 3,22          | 1.45         | 110          |                    |                | 1.46         | 0.55         | 0.95<br>0.95   |                  | 1.88<br>1.82 |     | 1 96<br>1 100  | 1.1        |        |              |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.722<br>0.724 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 22.6           |                  | 3.74<br>4.18  | 1.66<br>1.79 | 110<br>110   |                    |                | 1.67<br>1.80 | 0.56<br>0.57 | 0.95<br>0.94   |                  | 1.86<br>1.87 |     | 1 100          | 1.1        |        | 25 1<br>30 1 |       | 231.7<br>241.8                   | 1.00         | Infin.           | 0.000 | 0.725<br>0.726 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 22,9           | 7 236.02         | 4.51          | 1.91         | 110          | 1,173              | 0.949          | 1.92         | 0.58         | 0.94           | 209,15           | 1.89         |     | 1 100          | 1,1        | 8 2,3  | 35 1         | .00   | 248.2                            | 1.00         | Infin.           | 0.000 | 0.727          | Non-Liq.             | Non-Liq        | 0.00         |
| 23,1           |                  | 4 59<br>4 64  | 1.92<br>1.90 | 110<br>110   |                    |                | 1.93<br>1.91 | 0.58<br>0.57 |                |                  | 1.89<br>1.88 |     | 1 100<br>1 100 | 1.1        |        | 40 1<br>45 1 |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.729<br>0.730 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 23.4           |                  | 4.62<br>4.32  | 1.79<br>1.51 | 110<br>110   |                    |                | 1.80<br>1.51 |              |                |                  | 1.85<br>1.76 |     | 1 100<br>1 100 | 1.1        | 4 2.5  | 50 1         | 1,00  | 261.4                            | 1.00         | Infin.           | 0.000 | 0.731          | Non-Liq.             | Non-Liq.       | 0.00         |
| 23.7           | 333,44           | 4.00          | 1.20         | 110          | 1,193              | 0.946          | 1.20         | 0.50         | 0.94           | 295.77           | 1.64         |     | 1 100          | 1.0        |        | 55 1<br>30 1 |       |                                  | 1.00<br>1.00 | infin.<br>Infin. | 0.000 | 0.732<br>0.733 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 23.9           |                  | 3.80<br>4.16  | 0.97<br>0.90 | 110<br>110   |                    |                | 0.97<br>0.90 |              |                |                  | 1.52<br>1.45 |     | 1 100<br>1 100 | 1.0<br>1.0 |        | 35 1<br>70 1 |       |                                  | 1.00<br>1.00 | Infin.<br>Infin. | 0.000 | 0.735<br>0.736 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 24.2           | 467.10           | 5.33          | 1.14         | 110          | 1 204              | 0.945          | 1.14         | 0.50         | 0.94           | 412.73           | 1.54         |     | 1 100          | 1.0        | 0 2.7  | 75           | .00 4 | 414.3                            | 1.00         | Infin.           | 0.000 | 0.737          | Non-Liq.             |                | 0.00         |
| 24.4           |                  | 4.90<br>6.79  | 1.09         | 110<br>110   |                    |                | 1.10<br>1.55 |              |                |                  | 1.53<br>1.66 |     | 1 100<br>1 100 | 1.0        |        | 30 1<br>35 1 |       |                                  | 1.00<br>1.00 |                  | 0.000 | 0.738<br>0.739 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 24.7           |                  | 4.85<br>5.70  | 1.07<br>1.26 | 110<br>110   |                    |                | 1.07         |              |                |                  | 1.52         |     | 1 100          | 1.0        | 0 2.9  | 00 1         | .00 4 | 402.1                            | 1_00         | Infin.           | 0.000 | 0.740          | Non-Liq.             | Non-Liq        | 0.00         |
| 25,10          | 407.93           | 4,55          | 1.11         | 110          |                    |                | 1.27<br>1.12 |              |                |                  | 1.58<br>1.57 |     | 1 100          | 1.0        |        | 95 1<br>00 1 |       | 397.6 <i>1</i><br>358.7 <i>1</i> |              |                  | 0.000 | 0.741<br>0.742 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 25.26<br>25.43 |                  | 4,01<br>3,37  | 1.06<br>0.95 | 110<br>110   |                    |                | 1.06<br>0.96 |              |                |                  | 1.57<br>1.55 |     | 1 100<br>1 100 | 1.0        |        | )5 1<br>10 1 | .00 3 | 332.5 °                          | .00          | Infin.           | 0.000 | 0.743<br>0.744 | Non-Liq.             | Non-Liq.       | 0.00         |
| 25.59          | 340.03           | 2,76          | 0.81         | 110          | 1.236              | 0.940          | 0.81         | 0.50         | 0.93           | 296.31           | 1.51         |     | 1 100          | 1.0        | 0 3.1  | 5 1          | .00 2 | 297.4                            | .00          | Infin.           | 0.000 | 0.745          | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 25.75<br>25.92 |                  | 3.20<br>3.29  | 0.97         | 110<br>110   |                    |                | 0.98<br>1.03 |              |                |                  | 1.58<br>1.60 |     | 1 100<br>1 100 | 1.0        |        | 20 1         |       | 286.8 1<br>278.8 1               | I.00<br>I.00 |                  | 0.000 | 0.746<br>0.747 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 26.08          | 333.74           | 3,88          | 1.16         | 110          | 1,247              | 0.938          | 1.17         | 0.50         | 0.92           | 289.43           | 1.64         |     | 1 100          | 1.0        | 0 3.2  | 20 1         | 00 2  | 290.5 1                          | .00          | Infin.           | 0.000 | 0.747          | Non-Liq.             | Non-Liq.       | 0.00         |
| 26.25<br>26.4  | 345.28           | 3.87<br>4.26  | 1.10<br>1.23 | 110<br>110   |                    |                | 1.10<br>1.24 |              |                |                  | 1.60<br>1.65 |     | 1 100<br>1 100 | 1.0        |        | 20 1         |       | 305.6 1<br>300.0 1               |              |                  | 0.000 | 0.748<br>0.749 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 26.57<br>26.74 |                  | 3,84<br>3,31  | 1.10         | 110<br>110   | 1.259              | 936            | 1.11         | 0.50         | 0.92           | 300 21           | 1.61         |     | 1 100          | 1_0        | 0 3.2  | 20 1         | .00 3 | 301.3                            | .00          | Infin.           | 0.000 | 0.750          | Non-Liq.             | Non-Liq        | 0.00         |
| 26.90          | 372.59           | 3.04          | 0.82         | 110          | 1,267              | 0.935          |              | 0.50         | 0.91           | 320.74           | 1.52<br>1.49 |     | 1 100<br>1 100 | 1.00       |        | 20 1         |       | 3176 1<br>3219 1                 |              |                  |       | 0.751<br>0.751 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 27.07<br>27.23 |                  | 2.86<br>3.03  | 0.76         | 110<br>110   |                    |                |              |              |                |                  | 1.47<br>1.48 |     | 1 100<br>1 100 | 1.00       | 0 3.2  | 0 1          | .00 3 | 323 1 1<br>325 3 1               | -00          | Infin.           | 0.000 | 0.752<br>0.753 | Non-Liq.             | Non-Liq.       | 0.00         |
| 27.40          | 381:19           | 3.93          | 1.03         | 110          | 1.279              | 933            | 1.03         | 0.50         | 0.91           | 326.65           | 1.56         |     | 1 100          | 1.00       | 0 3.2  | 0 1          | .00 3 | 327.9 1                          | .00          | Infin.           | 0.000 | 0.754          | Non-Liq.<br>Non-Liq. | Non-Liq.       | 0.00         |
| 27 56<br>27 72 | 399.40<br>375.52 | 5.08<br>4.69  | 1.27<br>1.25 | 110<br>110   |                    |                |              |              |                |                  | 1.62<br>1.63 |     | 1 100<br>1 100 | 1.00       |        | 0 1          |       | 343.1 1<br>322.0 1               |              |                  |       | 0.754<br>0.755 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 27.89          | 347.76           | 3.01          | 0.86         | 110          |                    |                |              |              |                |                  | 1.53         |     | 1 100          |            |        |              |       | 97.6 1                           |              |                  | 0.000 |                | Non-Liq.             |                | 0.00         |

| Layer           | Tip              | Friction      | Friction     | Total             | Eff.Stress         | s              | _            |              | _            | _                |              | 0    | Liquef  | Rel        | -            | _            |              | Clean          | 1            |                  |                | Induced        | Liquefac.            |                            | Volumetric   |
|-----------------|------------------|---------------|--------------|-------------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|------|---------|------------|--------------|--------------|--------------|----------------|--------------|------------------|----------------|----------------|----------------------|----------------------------|--------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs            | Ratio<br>%   | Unit Wt           |                    | e rd           | F            |              | Co           | Corrected        |              | enid | Suscep  |            |              | H            |              | Sand           |              | con              | EQ             | M=7,5          | Safety               | Probab.                    | Strain       |
| 28,05           | 312.31           | (tsf)<br>2.46 | 0.79         | (pcf)<br>110      | p'o (tsf)<br>1.294 | rd<br>0.930    | 0.79         | 0.50         | 0,90         | Qc1n<br>265,79   | 1,53         | 0    | (0 or 1 | 100        | 1.00         | (m)<br>3,20  | 1.00         | Qc1n<br>266.8  |              | CRR <sub>7</sub> | 0.000          | 0,756          | Factor<br>Non-Lig.   | P <sub>L</sub><br>Non-Liq. | 0.00         |
| 28 22<br>28 38  | 307.37<br>341.79 | 2.94<br>2.65  | 0.96<br>0.78 | 110<br>110        | 1,298<br>1,302     | 0.929<br>0.929 | 0.96<br>0.78 | 0.50         | 0.90         | 261.17<br>290.11 | 1.60<br>1.50 |      | 1       | 100<br>100 | 1.00<br>1.00 | 3,20         | 1.00         | 262.2<br>291.2 |              | Infin.           | 0.000          | 0.757          | Non-Liq.             | Non-Liq                    | 0.00         |
| 28,54           | 292.80           | 2.77          | 0.95         | 110               | 1,306              | 0,928          | 0.75         | 0.50         | 0.90         | 247,99           | 1,61         |      | i       | 100        | 1.00         | 3,20         | 1.00         | 248.9          |              | Infin.<br>Infin. | 0.000          | 0.758<br>0.758 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 28.71<br>28.87  | 257.96<br>193.75 | 2.84<br>1.91  | 1.10         | 110<br>110        | 1,310<br>1,314     | 0.927<br>0.926 | 1.11<br>0.99 | 0.52         | 0.90         | 217,21<br>162,04 | 1,70<br>1,75 |      | 1       | 100<br>97  | 1.04<br>1.07 | 3,20         | 1,00         | 226.0<br>174.6 |              | Infin.           | 0.000          | 0.759<br>0.759 | Non-Liq.             |                            | 0.00         |
| 29.04           | 110.13           | 2.95          | 2.68         | 110               | 1,318              | 0,926          | 2.71         | 0.68         | 0.86         | 88,55            | 2,25         |      | 1       | 72         | 1.79         | 5,20         | 1.00         | 158.7          |              | 0 452            | 0.452          | 0.760          | Non-Liq.<br>0.59     | 85%                        | 0.00<br>0.61 |
| 29.20<br>29.36  | 64.38<br>90.04   | 2.45          | 3.80<br>3.54 | 110<br>110        | 1,322<br>1,325     | 0,925<br>0,924 | 3.88         | 0.77<br>0.73 | 0.84         | 50.25<br>71.15   | 2,53         |      | 1       | 48<br>63   | 2,93         |              | 1.00         | 147.0<br>165.2 |              | 0.376<br>Infin   | 0.376          | 0.760<br>0.761 | 0.49<br>Non-Liq.     | 91%<br>Non-Lin             | 0.89<br>0.00 |
| 29.53           | 118.08           | 3.29          | 2.78         | 110               | 1,329              | 0.923          | 2.82         | 0.68         | 0.86         | 94.48            | 2,24         |      | 1       | 74         | 1,77         |              | 1.00         | 167.5          | 1.00         | Infin.           | 0.000          | 0.761          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 29.69<br>29.86  | 115.86<br>274.31 | 2.76<br>1.51  | 2.38<br>0.55 | 110<br>110        | 1,333<br>1,337     | 0,923<br>0,922 | 2.41<br>0.55 | 0.67<br>0.50 | 0.86<br>0.89 | 92.78<br>229.50  | 2.20<br>1.47 |      | 1       | 74<br>100  | 1.66<br>1.00 | 0.30         | 1.00         | 153.8<br>322.9 |              | 0 418<br>Infin   | 0.418          | 0.762<br>0.762 | 0.55<br>Non-Liq.     | 88%<br>Non-Lia             | 0.72<br>0.00 |
| 30.02<br>30.18  | 311.77<br>315.95 | 1.67          | 0.53         | 110<br>110        | 1,341<br>1,345     | 0.921<br>0.920 | 0.54         | 0.50<br>0.50 | 0.89         | 260.62<br>263.74 | 1.42<br>1.32 |      | 1       | 100<br>100 | 1.00         | 0.35         | 1.41<br>1.41 | 366.6<br>371.0 |              | Infin.           | 0,000          | 0.763          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 30.35           | 297.70           | 0.86          | 0.29         | 110               | 1 349              | 0 919          | 0.29         | 0.50         | 0.89         | 248.08           | 1.27         |      | 1       | 100        | 1.00         | 0.45         | 1.41         | 349 0          |              | Infin.           | 0.000          | 0.763<br>0.763 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 30.51<br>30.68  | 257.40<br>200.41 | 1.00          | 0.39         | 110<br>110        | 1.353<br>1.357     | 0.918<br>0.918 | 0.39<br>0.94 | 0.50<br>0.53 | 0.88         | 214.03<br>165.04 | 1.40<br>1.73 |      | 1       | 100<br>98  | 1.00<br>1.06 | 0.50<br>0.55 | 1.41<br>1.41 | 301.1<br>245.6 |              | Infin.<br>Infin. | 0,000          | 0.764          | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 30.84           | 117.72           | 2.01          | 1.71         | 110               | 1,361              | 0.917          | 1.73         | 0.63         | 0.85         | 93.75            | 2.09         |      | 1.      | 74         | 1.44         | I.E.         |              | 134.7          | 1.00         | 0.307            | 0.307          | 0.764          | 0.40                 | 95%                        | 1.09         |
| 31.00<br>31.17  | 42.32<br>31.82   | 1.90<br>1.64  | 4.50<br>5.14 | 110<br>110        | 1,364<br>1,368     | 0.916<br>0.915 | 4.65<br>5.37 | 0.83<br>0.87 | 0.81<br>0.80 | 31.36<br>23.01   | 2.73<br>2.87 |      | 0       |            |              |              |              |                | 1.00         |                  |                | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 31.33<br>31.50  | 41.78<br>54.16   | 1.18          | 2.82<br>2.48 | 110<br>110        | 1,372<br>1,376     | 0.914          | 2.92<br>2.55 | 0.79<br>0.75 | 0.81<br>0.82 | 31.12<br>40.98   | 2.60<br>2.47 |      | 1       | 28<br>40   | 3.31<br>2.62 |              | 1.00         | 103.1<br>107.2 |              | 0.182<br>0.194   | 0.182          | 0.765          | 0.24                 | 99%                        | 1.48         |
| 31,66           | 56.06            | 1.68          | 3.00         | 110               | 1,380              | 0.912          | 3.07         | 0.76         | 0.82         | 42.21            | 2.51         |      | i       | 41         | 2.84         |              | 1.00         | 119.8          | 1.00         | 0.240            | 0.194          | 0.765<br>0.766 | 0.25<br>0.31         | 99%<br>98%                 | 1.43<br>1.26 |
| 31.82<br>31.99  | 60.54<br>82.92   | 2.05          | 3.38<br>2.65 | 110<br>110        | 1,384<br>1,388     | 0.911          | 3.46<br>2.70 | 0.77<br>0.71 | 0.81<br>0.82 | 45,52<br>63,52   | 2.53         |      | 1       | 44<br>58   | 2.90         |              | 1.00         | 132.1<br>133.8 |              | 0.294            | 0.294          | 0.766<br>0.766 | 0.38<br>0.40         | 96%<br>96%                 | 1.12<br>1.10 |
| 32,15           | 148.83           | 1.99          | 1.34         | 110               | 1,392              | 0.909          | 1.35         | 0.59         | 0.85         | 118,52           | 1.94         |      | 1       | 84         | 1.23         | 1.00         | 1,00         | 146.5          | 1.00         | 0.372            | 0,372          | 0.766          | 0.49                 | 92%                        | 0.90         |
| 32 32<br>32 48  | 268.70<br>308.62 | 2.23          | 0.83         | 110<br>110        | 1,396<br>1,400     | 0.908<br>0.907 | 0.83<br>0.97 | 0.50         | 0.87<br>0.87 | 219,97<br>252,47 | 1.60<br>1.61 |      | 1       | 100<br>100 | 1,00         | 1.05         | 1.00         | 220.8<br>253.4 | 1.00         | Infin.           | 0.000          | 0.766<br>0.767 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 32.64<br>32.81  | 309.13<br>309.47 | 3.57<br>4.46  | 1.16<br>1.44 | 110<br>110        | 1.403<br>1.407     | 0.906<br>0.905 | 1.16<br>1.45 | 0.51<br>0.53 | 0.87<br>0.86 | 251.87<br>250.13 | 1.67<br>1.75 |      | 1       | 100        | 1.02         | 1.15         | 1,00         | 257.4<br>268.7 | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 32.97           | 308.84           | 5.13          | 1.66         | 110               | 1.411              | 0.904          | 1.67         | 0.55         | 0.85         | 248.16           | 1.80         |      | 1       | 100        | 1,11         | 1.25         | 1.00         | 275.4          |              | Infin            | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 33.14<br>33.30  | 317.27<br>316.07 | 5.82<br>6.46  | 1.84         | 110<br>110        | 1.415<br>1.419     | 0.903          | 1.84<br>2.05 | 0.56<br>0.57 | 0.85<br>0.85 | 253.92<br>251.67 | 1.83<br>1.87 |      | 1       | 100<br>100 | 1.13<br>1.16 | 1.30<br>1.35 | 1.00         | 287.4<br>293.2 | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 33.46<br>33.63  | 306.67           | 6.63<br>6.52  | 2.16         | 110               | 1.423              | 0.901          | 2.17         | 0.58         | 0.84         | 243,15           | 1.90         |      | 1       | 100        | 1,19         | 1.40         | 1.00         | 289.5          | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 33.79           | 295.70<br>287.84 | 6.15          | 2.20         | 110<br>110        | 1.427<br>1.431     | 0 900<br>0 899 | 2.21<br>2.15 | 0.58<br>0.58 | 0.84<br>0.84 | 233,68<br>227,15 | 1.91<br>1.91 |      | 1       | 100<br>100 | 1.20<br>1.20 | 1.45<br>1.50 | 1.00         | 282.0<br>273.3 | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 33.96<br>34.12  | 286.58<br>285.14 | 5.47<br>4.97  | 1.91<br>1.74 | 110<br>110        | 1.435<br>1.439     | 0.898<br>0.897 | 1.92<br>1.75 | 0.57<br>0.56 | 0.84         | 226.60<br>225.74 | 1.87<br>1.84 |      | 1       | 100<br>100 | 1.16         | 1.55<br>1.55 | 1.00         |                | 1.00         | Infin.           | 0.000          | 0.767<br>0.767 | Non-Liq.             | Non-Liq                    | 0.00         |
| 34.28           | 290.96           | 4.93          | 1.70         | 110               | 1,443              | 0.896          | 1.70         | 0.56         | 0.84         | 230,34           | 1.83         |      | 1       | 100        | 1.13         | 1.55         | 1.00         | 260.3          | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 34.45<br>34.61  | 290.25<br>288.91 | 5.14<br>4.35  | 1.77<br>1.51 | 110<br>110        | 1.446<br>1.450     | 0.895<br>0.894 | 1.78<br>1.51 | 0.56<br>0.54 | 0.84<br>0.84 | 229,07<br>228.85 | 1.84<br>1.79 |      | 1       | 100<br>100 | 1.14         | 1.55<br>1.55 | 1.00         | 261.8<br>252.1 | 0.99         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 34.78<br>34.94  | 290.18<br>286.57 | 4.30<br>4.37  | 1.48<br>1.53 | 110<br>110        | 1,454              | 0.893          | 1.49         | 0.54         | 0.84         | 229.67           | 1.78         |      | 1       | 100        | 1.09         | 1.55         | 1.00         | 251.9          | 0.99         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 35,10           | 285.33           | 4.63          | 1.62         | 110               | 1.458<br>1.462     | 0.892<br>0.890 | 1.53<br>1.63 | 0.55<br>0.55 | 0.84<br>0.84 | 226,16<br>224,33 | 1.79<br>1.82 |      | 1       | 100<br>100 | 1,10<br>1,12 | 1.55<br>1.55 | 1.00<br>1.00 | 250.3<br>252.2 | 0.99         | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 35.27<br>35.43  | 282.90<br>284.23 | 4.65<br>4.21  | 1.64         | 110<br>110        | 1.466<br>1.470     | 0.889<br>0.888 | 1.65<br>1.49 | 0.56<br>0.54 | 0.83         | 221.92<br>223.46 | 1.83<br>1.79 |      | 1       | 100<br>100 | 1,13         | 1.55<br>1.55 | 1.00         |                | 0.99         | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 35,60           | 291.38           | 3.88          | 1.33         | 110               | 1.474              | 0.887          | 1.34         | 0.53         | 0.84         | 229.77           | 1.74         |      | 1       | 100        | 1,07         | 1.55         | 1.00         | 246.2          | 0.98         | Infin.           | 0.000          | 0.766          | Non-Liq.             |                            | 0.00         |
| 35.76<br>35.93  | 294.00<br>283.22 | 3.53<br>2.96  | 1.20         | 110<br>110        |                    | 0.886<br>0.885 | 1.21<br>1.05 | 0.52<br>0.51 | 0.84<br>0.84 | 232,40<br>224,32 | 1.71<br>1.67 |      | 1       | 100<br>100 | 1.04         | 1.55<br>1.55 | 1.00         | 243.1<br>229.3 | 0.98<br>0.98 | Infin.<br>Infin. | 0.000          | 0.766<br>0.765 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 36.09<br>36.25  | 264.79<br>239.70 | 3.14<br>2.92  | 1.18<br>1.22 | 110<br>110        |                    | 0.883<br>0.882 | 1.19<br>1.23 | 0.53<br>0.54 | 0.84<br>0.83 | 208.03<br>187.17 | 1.73<br>1.77 |      | 1       | 100<br>100 | 1.06         | 1.55<br>1.55 | 1.00         |                | 0.98         | Infin<br>Infin   | 0.000          | 0.765          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 36.42           | 190.73           | 2.49          | 1.30         | 110               | 1_493              | 0.881          | 1.31         | 0.57         | 0.82         | 147.05           | 1.87         |      | i       | 93         | 1.16         | 1.55         |              | 204.4<br>171.2 | 0.98<br>0.98 | Infin            | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 36.58<br>36.75  | 172.32<br>139.82 | 1.04<br>0.84  | 0.60         | 110<br>110        |                    | 0.880<br>0.878 | 0.61<br>0.61 | 0.51<br>0.53 | 0.84         | 135.25<br>108.50 | 1.67<br>1.75 |      | 1       | 89<br>80   | 1,02<br>1,07 | 1,55<br>1,55 |              | 138.5<br>116.7 | 0.98         | 0.327<br>0.228   | 0.319          | 0.764<br>0.764 | 0.42<br>0.29         | 95%<br>98%                 | 1.05<br>1.30 |
| 36,91           | 130.14           | 1.01          | 0.77         | 110               | 1.505              | 0.877          | 0.78         | 0.56         | 0.82         | 99.75            | 1.85         |      | 1       | 77         | 1.14         | 1_55         | 1.00         | 114.3          | 0.97         | 0.219            | 0.213          | 0.764          | 0.28                 | 99%                        | 1.33         |
| 37.24           | 111.04<br>70.92  | 0.59<br>1.49  | 0.53<br>2.10 | 110<br>110        |                    | 0.876<br>0.875 | 0.54<br>2.14 | 0.55<br>0.71 | 0.82<br>0.78 | 85.14<br>50.84   | 1.81<br>2.35 |      | 1       | 70<br>49   | 1.11<br>2.12 | 1.55         | 1.00         | 95.2<br>107.6  | 0.97<br>0.99 | 0.160<br>0.196   | 0.156<br>0.193 | 0.763<br>0.763 | 0.20<br>0.25         | 99%<br>99%                 | 1.60<br>1.42 |
| 37,40<br>37,57  | 56.54<br>26.06   | 1.73<br>1.68  | 3.06<br>6.46 | 110<br>110        |                    | 0.873<br>0.872 | 3.15<br>6.86 | 0.77<br>0.92 | 0.76<br>0.72 | 39.40<br>16.60   | 2.54<br>3.05 |      | 0       | 38         | 2.99         |              | 1.00         | 117.9          | 0.98<br>0.98 | 0.232            | 0.229          | 0.762<br>0.762 | 0.30<br>Non-Liq.     | 98%<br>Non-Lig             | 1.28<br>0.00 |
| 37.73           | 18.93            | 1.02          | 5.39         | 110               | 1.525              | 0,871          | 5.87         | 0.94         | 0.71         | 11.65            | 3.12         |      | 0       |            |              |              |              |                | 0.98         |                  |                | 0.762          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 37.89<br>38.06  | 12.92<br>14.23   | 0.63<br>0.52  | 4.91<br>3.65 | 110<br><b>110</b> |                    | 0.869<br>0.868 | 5.57<br>4.09 | 0.98<br>0.95 | 0.70<br>0.70 | 7.50<br>8.45     | 3.26         |      | 0       |            |              |              |              |                | 0.98         |                  |                | 0.761<br>0.761 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 38 22<br>38 39  | 18.57<br>10.40   | 0.45<br>0.40  | 2.40<br>3.83 | 110<br>110        |                    | 0.867<br>0.865 | 2.61<br>4.49 | 0.88         | 0.72<br>0.69 | 11.59<br>5.76    | 2.91<br>3.29 |      | 0       |            |              |              |              |                | 0.98<br>0.98 |                  |                | 0,760          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 38.55           | 8.61             | 0.33          | 3.87         | 110               | 1.544              | 0,864          | 4.71         | 1.00         | 0.69         | 4.58             | 3.39         |      | 0       |            |              |              |              |                | 0.98         |                  |                | 0.760<br>0.759 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 38.71<br>38.88  | 9.61<br>9.33     | 0.33          | 3.43<br>3.71 | 110<br>110        |                    | 0.863<br>0.861 | 4.09<br>4.45 | 1.00         | 0.68<br>0.68 |                  | 3.31         |      | 0       |            |              |              |              |                | 0.98<br>0.98 |                  |                | 0.759<br>0.758 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 39.04           | 8.70             | 0.42          | 4.84         | 110               | 1.556              | 0.860          | 5.89         | 1.00         | 0.68         | 4.59             | 3.44         |      | 0       |            |              |              |              |                | 0.98         |                  |                | 0,758          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 39.21<br>39.37  | 12.90<br>17.45   | 0.44<br>0.56  | 3.42<br>3.19 | 110<br>110        | 1.564              | 0 859<br>0 857 | 3.89<br>3.50 | 0.96<br>0.91 | 0.69<br>0.70 |                  | 3.17<br>3.02 |      | 0       |            |              |              |              |                | 0.98<br>0.98 |                  |                | 0,757<br>0,757 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 39.53<br>39.70  | 20.31<br>31.28   | 0.80          | 3.94<br>3.12 | 110<br>110        |                    | 0.856<br>0.854 |              | 0.91<br>0.84 | 0.70<br>0.72 |                  | 3.01<br>2.78 |      | 0       |            |              |              |              |                | 0.98<br>0.98 |                  |                | 0.756<br>0.756 | Non-Liq.             | Non-Liq.                   | 0.00         |
| 39.86           | 28.06            | 0.97          | 3.45         | 110               | 1.575              | 0.853          | 3.65         | 0.86         | 0.71         | 17.76            | 2.85         |      | 0       |            |              |              |              |                | 0.97         |                  |                | 0.755          | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00         |
| 40.03           | 65,29<br>75.32   | 1.25<br>1.52  | 1.91         | 110<br>110        |                    |                |              | 0.72<br>0.71 | 0.75<br>0.75 |                  | 2.36         |      | 1       |            | 2.16<br>2.04 |              | 1.00<br>1.00 |                | 0.97<br>0.96 | 0.167<br>0.194   | 0.163<br>0.186 | 0.754<br>0.754 | 0.22<br>0.25         | 99%<br>99%                 | 1.56<br>1.43 |
| 40.35<br>40.52  | 68.28<br>76.08   | 1.42<br>1.52  | 2.08         | 110<br>110        | 1.587              | 0.849          | 2.12         | 0.72<br>0.70 | 0.75<br>0.75 | 47.09            | 2.37         |      | 1       | 46         | 2.20         |              | 1.00         | 103.6          | 0.97         | 0.183            | 0.178          | 0.753          | 0.24                 | 99%                        | 1.47         |
| 40,68           | 80.77            | 1.39          | 1.72         | 110               | 1.595              | 0.846          | 1.75         | 0.69         | 0.75         | 56,49            | 2.32<br>2.26 |      | 1       | 53         | 2.02<br>1.82 |              |              | 106.8<br>102.7 |              | 0.193<br>0.181   | 0.185<br>0.173 | 0.752<br>0.752 | 0.25<br>0.23         | 99%<br>99%                 | 1.43<br>1.49 |
|                 | 107.08<br>126.77 | 1.51<br>2.12  | 1.41<br>1.67 | 110<br>110        |                    |                |              | 0.64<br>0.64 | 0.77<br>0.77 |                  | 2.10         |      | 1       |            | 1.45<br>1.44 |              |              | 111.4<br>131.1 | 0.96<br>0.94 | 0.208            | 0.200<br>0.273 | 0.751<br>0.750 | 0.27<br>0.36         | 99%<br>97%                 | 1.37<br>1.12 |
| 41.17           | 204.50           | 2.61          | 1.28         | 110               | 1.607              | 0.841          | 1.29         | 0.56         | 0.79         | 151.55           | 1.85         |      | 1       | 94         | 1:15         |              | 1.00         | 174.4          | 0.94         | Infin.           | 0.000          | 0.750          | Non-Liq.             | Non-Liq                    | 0.00         |
| 41.50           | 221.25<br>230.53 | 3.11<br>3.66  | 1.41         | 110<br>110        |                    |                |              | 0.57<br>0.57 | 0.79<br>0.78 |                  | 1.86<br>1.89 |      | 1       |            | 1.15<br>1.18 |              |              |                | 0.94<br>0.94 | Infin.           | 0.000          | 0.749<br>0.748 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
|                 | 236.49<br>238.11 | 4.16<br>4.55  | 1.76<br>1.91 | 110<br>110        | 1,618              | 0,837          | 1.77         | 0.58<br>0.59 | 0.78         | 173.29           | 1.92<br>1.94 |      | 1       | 100        | 1.20<br>1.23 | 1.15         | 1.00         | 209.5          | 0.94         | Infin            | 0.000          | 0.747          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 41.99           | 239.78           | 3.88          | 1.62         | 110               | 1.626              | 0.834          | 1.63         | 0.57         | 0.78         | 175.95           | 1,88         |      | 1       | 100        | 1.17         | 1.15         | 1.00         | 207.4          |              | Infin.           | 0.000          | 0.747<br>0.746 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 42.16<br>42.32  | 274.29<br>291.71 | 3.22<br>2.41  | 1.17<br>0.83 | 110<br>110        |                    |                |              | 0.53<br>0.50 |              |                  | 1.74<br>1.60 |      | 1       |            | 1.06<br>1.00 | 1.15<br>1.15 |              |                | 0.93         |                  | 0.000          | 0.745<br>0.744 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 42.49           | 285.46           | 2.18          | 0.76         | 110               | 1.638              | 0.829          | 0.77         | 0.50         | 0.80         | 215.62           | 1.59         |      | 1       | 100        | 1.00         | 1.15         | 1.00         | 216.4          | 0.93         | Infin.           | 0.000          | 0.743          | Non-Liq.             | Non-Liq                    | 0.00         |
| 42.81           | 273.88<br>343.04 |               | 1.00         | 110<br>110        | 1.646              | 826            | 1.21         |              | 0.80         | 257_35           | 1.68<br>1.68 |      | 1       |            |              | 1.15<br>1.15 |              |                | 0.93<br>0.93 |                  | 0.000          | 0.743<br>0.742 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 42.98           | 408.63           | 5.08          | 1.24         | 110               | 1.649              | 0.824          | 1.25         | 0.50         | 0.80         | 307.99           | 1 64         |      | 1       | 100        | 1_00         | 1.15         | 1.00         | 308.4          | 0.93         | Infin            | 0.000          | 0.741          | Non-Liq.             |                            | 0.00         |

| Layer  | Tip    | Friction | Friction | Total   | Eff.Stres | s     |      |      |      |           |      | de  | Liquef.  | Rel    |      |      |      | Clean |      |        |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|---------|-----------|-------|------|------|------|-----------|------|-----|----------|--------|------|------|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt | at Midpt. |       |      |      |      | Corrected | ď    | S S | Suscept  | Dens.  |      | Н    |      | Sand  |      |        | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)   | p'o (tsf) | rd    | F    | n    | Ca   | Qc1n      | lc   | ò   | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Κσ   | CRR75  | CRR   | CSR     | Factor    | PL       | (%)        |
| 43.14  | 577.81 | 9,13     | 1,58     | 110     | 1 653     | 0,823 | 1,59 | 0,50 | 0.80 | 435.30    | 1.65 | П   | 1        | 100    | 1,00 | 1.15 | 1.00 | 437.0 | 0,93 | Infin. | 0.000 | 0.740   | Non-Lig.  | Non-Lig. | 0.00       |
| 43,31  | 597.92 | 9.45     | 1.58     | 110     | 1,657     | 0.821 | 1.58 | 0,50 | 0.80 | 450,30    | 1,64 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 452.0 | 0,93 | Infin. | 0.000 | 0,739   | Non-Lig.  | Non-Lig. | 0.00       |
| 43.47  | 392,43 | 8,74     | 2,23     | 110     | 1.661     | 0.820 | 2.24 | 0.57 | 0.77 | 285.78    | 1.87 |     | 1        | 100    | 1.16 | 1.15 | 1.00 | 332.9 | 0.92 | Infin. | 0,000 | 0,738   | Non-Liq.  | Non-Lig  | 0.00       |
|        | 395.33 | 5,19     | 1,31     | 110     | 1,665     | 0.818 | 1,32 | 0.51 | 0.79 | 295,31    | 1.67 |     | 1        | 100    | 1.02 | 1.15 | 1.00 | 302.0 | 0.92 | Infin. | 0,000 | 0.737   | Non-Lig.  | Non-Liq. | 0.00       |
|        | 397.94 | 3,38     | 0.85     | 110     | 1,669     | 0.816 | 0.85 | 0.50 | 0.80 | 298,21    | 1.52 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 299,3 | 0.92 | Infin. | 0,000 | 0.736   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 401,09 | 1.69     | 0.42     | 110     | 1,673     | 0.815 | 0.42 | 0.50 | 0.80 | 300,23    | 1.30 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 301.4 | 0.92 | Infin. | 0,000 | 0.735   | Non-Liq.  | Non-Lig  | 0.00       |
| 44.13  | 389.81 | 1.87     | 0.48     | 110     | 1.677     | 0.813 | 0.48 | 0.50 | 0.79 | 291,41    | 1,35 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 292.5 | 0.92 | Infin. | 0.000 | 0.735   | Non-Lig.  | Non-Lig. | 0.00       |
| 44.29  | 358.36 | 1.92     | 0.53     | 110     | 1.681     | 0.811 | 0.54 | 0.50 | 0.79 | 267,48    | 1.41 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 268.5 | 0.92 | Infin. | 0.000 | 0.734   | Non-Lig.  | Non-Lia  | 0.00       |
| 44.46  | 351.76 | 2.17     | 0.62     | 110     | 1.685     | 0.810 | 0,62 | 0.50 | 0.79 | 262,22    | 1.46 |     | 1        | 100    | 1.00 | 1,15 | 1.00 | 263.2 | 0.92 | Infin. | 0.000 | 0.733   | Non-Lig.  | Non-Lia. | 0.00       |
| 44.62  | 367.06 | 3.54     | 0.96     | 110     | 1.689     | 0.808 | 0.97 | 0.50 | 0.79 | 273.36    | 1.59 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 274.4 | 0.92 | Infin  | 0.000 | 0.732   | Non-Lia.  | Non-Lia  | 0.00       |
| 44.78  | 396.02 | 5,60     | 1,41     | 110     | 1,692     | 0.807 | 1.42 | 0.52 | 0.78 | 292.17    | 1.70 |     | 1        | 100    | 1.04 | 1.15 | 1.00 | 304.5 | 0.92 | Infin. | 0.000 | 0.731   | Non-Lig.  | Non-Lia  | 0.00       |
| 44_95  | 497.62 | 0.00     | 0.00     | 110     | 1,696     | 0.805 | 0.00 | 0.80 | 0.68 | 320.55    | 2.66 |     | 0        |        | 1.00 |      |      |       | 0.96 |        |       | 0.730   | Non-Lig.  |          | 0.00       |
| 45.11  | 534,51 | 0.00     | 0,00     | 110     | 1.700     | 0.803 | 0,00 | 0,81 | 0.68 | 342.84    | 2,68 |     | 0        |        | 1.00 |      |      |       | 0.96 |        |       | 0.729   | Non-Lig.  | 5.00     | 0.00       |

Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride)

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8

Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-5 Plot: 5 (feet) **EARTHQUAKE INFORMATION** Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF Magnitude: 6.77 7.5 Clean Sand Qc1n = Cq\*Kc\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab **Fota** 0.75 PGA, g: 0.97 Use Tokimatsu & Seed (0) or Ishihara & Yoshmine (1): 0 Avg Induced MSF Unit Weight of unsaturated soils: 110 1 30 1.50 4% Required SF Subsidence 110 pcf Min SF of Liquefiable Layers: GWT, feet: 20.0 Unit Weight of saturated soils: 0.32 Max (inches) Design GWT, feet Limiting Ic for liquefiable soils: 2.60 Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 0.06 98% 0.8 Laver Tip Friction Friction Total Fff Stress Liquef. Rel Clean Induced Liquefac. Volumetric Ratio Unit Wt. at Midpt Depth Qc Fs Corrected Suscept Dens. Sand M=7.5 Probab EQ Safety Strain (feet (tsf) (tsf) Ko CRR75 (pcf) p'o (tsf) C Qc1n (0 or 1) Dr (%) Qc1n CRR rd (m) CSR Factor (%) 7.20 1.000 0.16 0.07 0.96 110 0.009 0.96 0.82 1.70 11.55 2.69 1.00 0.485 Non-Lig. Non-Lia 0.00 0.330.92 110 0.018 1.000 11 97 0.11 0.92 0.75 1.70 19.20 2.49 А 2.70 1.00 51.9 1.00 0.093 0.093 0.485 Non-Liq. Non-Liq. 0.00 0.49 16.98 0.15 0.86 110 0.027 1.000 0.86 0.71 27.24 2.08 1.70 2.34 23 1.00 56.7 1.00 0.097 0.097 0.485 Non-Liq. Non-Liq. 0.00 0.66 18.41 0.90 110 0.036 1 000 0.90 0.70 1.70 29.52 2,32 26 2.01 1.00 59.5 1.00 0.100 0.100 0.485 Non-Liq. Non-Liq. 0.00 0.82 16.13 0.16 1.01 110 0.045 1\_000 1.01 0.73 1.70 25.85 2.40 21 2.29 1.00 59.2 1.00 0.099 0.099 0.485 0.00 Non-Lig. Non-Lig. 0.98 12.95 0 14 1 06 110 0.054 1.000 1.06 0.75 1.70 2.71 20.72 2.49 12 1.00 56.1 1.00 0.096 0.096 0.485 Non-Lia, Non-Lia 0.00 1.15 10.49 0.11 1.05 110 0.063 0.999 1.05 0.78 1.70 16.75 2.57 3.13 1.00 52.5 0.093 1.00 0.093 0.484 Non-Liq. Non-Liq. 0.00 1.31 10.49 110 0.072 0.11 1.05 0.999 1.06 0.78 1.70 16.74 2.57 3 3.13 1.00 52.5 1.00 0.093 0.093 0.484 Non-Liq. Non-Liq. 0.00 1.48 9.50 0.14 1.52 110 0.081 0.999 1.53 0.81 1.70 15.13 2.69 0 1.00 0.484 Non-Liq. Non-Liq. 0.00 1.64 11.89 0.21 1.77 110 0.090 0.998 1.79 0.80 1.70 18.96 2.64 0 1.00 0.484 Non-Liq. Non-Liq. 0.00 1,80 17.29 0.33 1.93 110 0.099 0.998 1.94 0.77 1.70 27.62 2.53 23 2.91 1.00 80.4 0.128 1.00 0.128 0.484 Non-Lig. Non-Lig. 0.00 110 1.97 29.55 0.52 1 75 0,108 0.998 1.76 0.70 1.70 47.31 2.32 46 2.00 1.00 94.8 1.00 0.159 0.159 0.484 Non-Lia, Non-Lia 0.00 2.13 29.26 0.52 1 76 110 0.117 0.997 1.77 0.70 1.70 46.83 2.32 45 2.02 1.00 94.6 1.00 0.159 0:159 0.483 Non-Liq. Non-Liq. 0.00 2.30 27.77 0.48 1.74 110 0.126 0.997 1.75 0.71 1.70 44.42 2.34 43 2.07 1.00 92.1 1.00 0.153 0.483 Non-Liq. Non-Liq. 0.153 0.00 2.46 25.48 0.44 1.74 110 0.135 0.996 1.75 0.72 2.37 1.70 40.72 40 2 18 1.00 88.A 1.00 0.145 0.145 0.483 Non-Liq. Non-Liq. 0.00 2.62 22.54 0.40 1.76 0.144 0.996 1.77 0.73 1.70 35.99 2.41 34 2.36 1.00 85.1 1.00 0.137 0.137 0.483 Non-Liq. Non-Liq. 0.00 2.79 20,15 0.37 1.83 110 0.153 0.996 1.85 0.75 1.70 32.13 2.46 30 2.58 83.0 1.00 1.00 0.133 0,133 0.483 Non-Lig. Non-Lig. 0.00 2.95 17.63 0.42 2.37 110 0.162 0.995 2.39 0.78 1.70 28.07 2.58 3.19 1.00 89.5 1.00 0.147 0.147 0.482 Non-Lig. Non-Lig. 0.00 3.12 13 94 0.433.06 110 0.1710.995 3.10 0.83 1.70 22.12 2.73 0 1.00 0.482 Non-Liq. Non-Liq. 0.00 3.28 11.33 0.42 3.69 110 0.180 0.994 3.75 0.86 1.70 17.92 2.85 0 1.00 0.482 Non-Lig. Non-Lig. 0.00 3 44 10.79 0.35 3.27 110 0.189 0.994 3.33 0.86 0.00 1.70 17.03 2.84 0 1.00 0.482 Non-Liq. Non-Liq. 3.61 19.14 0.32 1.69 110 0.198 0.994 1.71 0.75 1.70 30.44 2.46 27 2.58 1.00 78.4 0.125 0.125 1.00 0.482 Non-Liq. Non-Liq. 0.00 3.77 28.87 0.35 1.20 110 0.208 0.993 1.21 0.68 1.70 46.06 2.23 45 1.74 1.00 79.9 1.00 0.127 0.127 0.482 Non-Lia, Non-Lia, 0.00 3.94 37:13 0 44 1 18 110 0.217 0.993 1.19 0.65 1.70 59.31 2.13 55 1.52 1.00 90.2 1.00 0.148 0.148 0.481 Non-Lig. Non-Lig. 0.00 4.10 42.19 0.52 1 24 110 0.226 0.993 1.25 0.64 1.70 67.43 2.10 60 0.169 0.481 1.46 1.00 98.5 1.00 0.169 Non-Liq. Non-Liq. 0.00 4.27 42.88 0.62 1.43 110 0.235 0.992 1.44 0.65 1.70 68.52 2.14 61 1.53 1.00 104 7 1.00 0.187 0.187 0.481 Non-Liq. Non-Liq. 0.00 4.43 42.87 0.65 1.51 110 0.244 0.992 1.52 0.65 1.70 68.49 2.15 61 1.56 1.00 106.9 1.00 0.194 0 194 0.481 Non-Liq. Non-Liq. 0.00 4.59 43.05 0.62 1.44 110 0.253 0.991 1.44 0.65 1.70 68.77 1.53 2.14 61 1.00 105.0 1.00 0.188 0.188 0.481 Non-Liq. Non-Liq. 0.00 4.76 40.55 0.64 1.58 110 0.262 0.991 1.59 0.66 1.70 64.74 2.18 59 1.63 1.00 105.4 1.00 0.189 0.189 0.480 Non-Lia. Non-Lia 0.00 1.60 4.92 37.17 0.59 1 58 110 0.271 0.991 0.67 1.70 59.29 2.21 55 1.70 1.00 101.0 1.00 0.176 0.176 0.480 Non-Liq. Non-Liq. 0.00 5.09 45.41 0.55 1.21 110 0.280 0.990 1.22 0.63 1.70 72.52 2.07 1.41 63 1.00 102.1 1.00 0.179 0.179 0.480 Non-Liq. Non-Liq. 0.00 5.25 49.21 0.55 1.12 110 0.289 0.990 1.13 0.62 1.70 78.61 2.02 67 1.33 1.00 104 9 1:00 0.187 0.187 0.480 Non-Liq. Non-Liq. 0.00 5.41 0.56 48.56 1.16 110 0.298 0.989 1.16 0.62 1.70 77.55 2.04 66 1.35 1.00 1049 1.00 0.187 0.187 0.480 Non-Liq. Non-Liq. 0.00 5.58 48.19 0.59 1.22 110 0.307 0.989 1.23 0.62 1.70 76.94 2.06 66 1.38 1.00 106.1 1.00 0.191 0.191 0.479 Non-Liq. Non-Liq. 0.00 0.59 0.316 5.74 48.82 1.20 110 0.989 1.21 0.62 1.70 77.94 2.05 66 1.37 1.00 106.5 1.00 0.192 0.479 0.192 Non-Lia, Non-Lia, 0.00 1.18 5.91 49 59 0.58 1 17 110 0.325 0.988 0.62 1,70 79,16 2.03 67 1.35 1.00 106.6 1.00 0.193 0.193 0.479 Non-Liq. Non-Liq. 0.00 6.07 49.01 0.58 1.19 110 0.3340.988 1.19 0.62 1.70 78.21 2.04 67 1.36 1.00 106.2 1.00 0.191 0.191 0.479 Non-Liq. Non-Liq. 0.00 6.23 48.87 0.58 1.19 110 0.343 0.988 1.20 0.62 1.70 77.97 2.04 67 1.36 1.00 106.2 1.00 0.191 0.191 0.479 Non-Liq. Non-Liq. 0.00 6.40 0.59 1\_20 0.352 48.92 110 0.987 1.21 0.62 2.05 1.37 1.70 78.04 67 1.00 106.5 1.00 0.192 0.192 0.479 Non-Liq. Non-Liq. 0.00 6.56 50.19 0.62 1.23 110 0.361 0.987 1.24 0.62 1.70 80.07 2.04 68 1.36 1.00 109.1 1\_00 0.201 0.201 0.478 Non-Lia, Non-Lia, 0.00 54.54 6.73 0.64 1.17 110 0.370 0.986 1.17 0.61 1.70 87.04 2.00 71 1.30 1.00 113.3 1.00 0.215 0.478 Non-Lia, Non-Lia 0.215 0.00 6.89 60.79 0.78 1 29 110 0.379 0.986 1.29 0.61 1.70 97.07 1.99 76 1.29 0.90 1.02 127.9 1.00 0.275 0.275 0.478 0.00 Non-Liq. Non-Liq. 1.35 7.05 70.21 1.20 1.71 110 0.388 0.986 1.72 0.62 1.70 112 19 2 03 82 1.00 151.2 1.00 0.401 0.401 0.478 Non-Liq. Non-Liq. 0.00 7.22 86,10 1.28 1.49 110 0.397 0.985 1.49 0.59 1.70 137.71 1.93 90 1 22 1.00 1.00 168 1 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq 0.00 7.38 1.15 1.02 0.406 0.985 1.02 112.25 110 0.53 1.06 1.66 175.45 1.74 100 1.05 1.00 187.1 1.00 Infin 0.000 0.478 Non-Liq. Non-Liq. 0.00 7:55 123.77 1.31 1.06 110 0.415 0.985 1.06 0.52 190.49 1,63 1.72 100 1.05 1.10 1.00 201.3 0.000 1.00 Infin. 0.477 Non-Lia, Non-Lia 0.00 123.77 1.31 0.424 0.984 7.71 1.06 110 1.06 0.53 1,62 188,51 1.73 100 1.05 1.15 1.00 199.6 1.00 0.000 0.477 Infin. 0.00 Non-Lia. Non-Lia 7.87 137.24 1.24 0.90 110 0.433 0.984 0.90 0.50 1:57 202.88 1.65 100 1.01 1.20 1.00 204.9 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 209.6 8.04 143.26 1 17 0.82 110 0.442 0.984 0.82 0.50 1.55 208.83 1.61 100 1:00 1 25 1.00 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 Infin. 8.20 133.59 0.95 0.71 110 0.451 0.983 0.72 0.50 1:53 192.72 1.60 100 1.00 1.30 1.00 193.4 1.00 0.000 0.481 Non-Liq. Non-Liq. 0.00 0.65 0.54 0.460 Non-Liq. 8.37 119.63 110 0.983 0.54 0.50 1,52 170.80 1.56 99 1.00 1.35 1.00 171.4 1.00 Infin. 0.000 0.486 0.00 Non-Lia 8.53 108.61 0.64 0.59 110 0.469 0.982 0.59 0.50 153.49 1.50 1.62 95 1.00 1.40 1.00 154.1 1.00 0.420 0.420 0.491 0.86 63% 0.66 8.69 0.53 0.54 0.478 0.982 97.77 110 0.54 0.50 1.49 136.81 1.64 90 1.00 1.45 1.00 136.9 1.00 0,318 0.318 0.496 0.64 81% 1.04 1.48 8.86 91.00 0.480.52 110 0.487 0.982 0.53 0.51 126.66 1.66 87 1.01 1.50 1.00 128.5 1.00 0.277 0.277 0.501 0.55 88% 1.13 1.71 1.55 128.8 9.02 88.06 0.54 0.61 110 0.4960.981 0.62 0.52 1.48 122,80 85 1.05 1.00 1.00 0.279 0.279 0.506 0.55 1.12 0.505 9.19 80.39 0.53 0.66 110 0.981 0.66 0.54 1.49 112.21 1.76 82 1.08 1.60 1.00 121.5 1.00 0.247 0.510 92% 0.247 0.48 1.21 9.35 57.91 0.50 0.87 0.514 0.981 0.88 0.59 110 1.53 83.01 1.94 69 1.23 165 1.00 102.3 1.00 0.1800.180 0.515 0.3597% 1.46 1.87 67.62 0.54 0.79 110 0.523 0.980 0.80 0.57 1.49 94.64 75 1.16 1.70 110.3 0.205 1.00 1.00 0.205 0.520 0.39 96% 1.35 9.68 0.52 0.532 67.40 0.77 110 0.980 0.78 0.57 1.48 93.34 1.87 74 1-16 1.75 1.00 108.5 1.00 0.199 0.199 0.524 96% 0.38 1.37 9.84 67.98 0.51 0.75 110 0.541 0.980 0.76 0.57 1.46 93.14 1.86 74 1.15 1.80 1.00 107.8 1.00 0.197 0.197 0.529 0.37 96% 1.38 10.01 65.93 0.45 0.68 110 0.550 0.979 0.69 0.56 1 44 89.29 1.85 72 1.15 1.85 1,00 102.7 1.00 0.101 0.181 0.533 1.48 10.17 65.84 0.44 0.67 110 0.559 0.979 0.68 0.56 1.43 88 34 1.85 72 1.15 1.90 1.00 101.6 1.00 0.178 0.178 0.537 0.33 97% 1.47 10.33 0.46 0.979 64.79 0.70 110 0.568 0.71 0.57 1.42 86.44 1.87 71 1.16 1 95 1.00 100.8 1.00 0.175 0.175 0.541 0.32 98% 1.48 10.50 0.49 0.74 110 0.577 0.978 0.75 1.42 0.57 86.37 1.88 71 1.17 2.00 1.00 101.9 1.00 0.178 0.178 0.545 0.33 98% 1.47 10.66 65.57 0.48 0.74 110 0.586 0.978 0.74 0.57 1.40 86.12 1.88 1.17 2.05 1.00 101.4 1.00 0.177 0 177 0.550 0.32 98% 1.48 10.83 66.76 0.49 0.73 110 0.595 0.978 0.74 0.57 1.39 86.85 1.88 2.10 1.00 101.9 1.00 0.178 0.178 0.554 0.32 98% 1.47 1:37 2.15 10.99 69.51 0.50 0.72 110 0.604 0.977 0.730.5789.46 1.86 72 1.16 1.00 103.8 1.00 0.184 0.184 0.557 0.33 97% 1.44 72.61 0.54 0.74 0.614 11.15 110 0.9770.74 0.571.36 92.59 1.86 74 1.15 2.20 1.00 107 O 1.00 0.194 0.194 0.561 0.35 97% 1.40 0.57 11.32 77.76 0.73 0.623 0.977 110 0.73 0.56 1.34 98.03 1.83 76 1.13 2.25 1.00 111.4 1.00 0.209 0.209 0.565 0.37 96% 1.34 11.48 84.82 0.65 0.76 110 0.632 0.976 0.77 0.55 1.33 105.90 1,82 79 1.12 2.30 1.00 119.2 1.00 0.238 0.238 0.569 0.42 95% 1.24 11.65 92,40 0.51 0.641 0.55 110 0.976 0.56 0.52 1.30 112.72 1.72 82 1.05 2.35 1.00 118.6 1.00 0.235 0.235 0.572 0.41 95% 1.25 0.53 11.81 100.55 0.65 0.64 110 0.650 0.975 0.65 122.02 1.29 1.73 85 1.06 2.40 1.00 129.2 1.00 0.281 0.281 0.576 0.49 91% 1.13 11.98 108.89 0.74 0.67 110 0.659 0.975 0.68 0.52 1.28 131.02 1.71 RA 1.05 2.45 1.00 137.7 1.00 0.323 0.323 0.580 0.56 87% 1.03 120.07 0.79 0.66 110 0.668 12.14 0.975 0.66 0.51 1.27 142.80 1.68 92 1.02 2.50 1.00 146.6 1.00 0.373 0.373 0.583 0.64 81% 0.86 12.30 132.01 0.89 0.68 110 0.974 0.677 1.25 155.55 0.68 0.50 1.66 95 1.01 2.55 1.00 157.3 1.00 0.442 0.442 0.587 0.75 72% 0.61 12.47 144.08 1.04 0.72 110 0.686 0.974 0.72 0.50 168.48 1.00 1.24 1.65 98 2.60 1.00 169.2 1.00 Infin. 0.000 0.590 Non-Lia, Non-Lia, 0.00 12.63 152 23 1 19 0.78 110 0.695 0.974 0.79 0.50 177.08 1.01 2.65 1.00 178.9 1.00 Infin. 0.000 0,593 Non-Lia, Non-Lia 0.00 12.80 162.83 1.20 0.74 110 0.704 0.973 0.74 0.50 1,23 187,89 1.62 100 1.00 2.70 1.00 188.6 1.00 Infin 0.000 0.597 Non-Liq. Non-Liq. 0.00

Total

| Lay            | er Tip           | Friction     | Friction     | Total        | Eff Stress     | S              | _            |              |              |  |              | Ф | Liquef.  | Rel.       |              | _                | _            | Clean                       |              | _                |       | Induced        | Liquefac.                |          | Volumetric   |
|----------------|------------------|--------------|--------------|--------------|----------------|----------------|--------------|--------------|--------------|--|--------------|---|----------|------------|--------------|------------------|--------------|-----------------------------|--------------|------------------|-------|----------------|--------------------------|----------|--------------|
| Dep            |                  | Fs           | Ratio        |              | at Midpt       |                |              |              |              | Corrected                                  | t            | D | Suscept  |            |              | Н                |              | Sand                        |              |                  | EQ    | M=7.5          | Safety                   | Probab   | Strain       |
| (fee           | 17474            | (tsf)        | %            | (pcf)        | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n                                       | lc           | ò | (0 or 1) | Dr (%)     | Kc           | (m)              | KH           | Qc1n                        | Κσ           | CRR75            | CRR   | CSR            | Factor                   | PL       | (%)          |
| 12.9           |                  | 1.56<br>1.70 | 0.88         | 110<br>110   | 0,713<br>0,722 | 0.973<br>0.973 | 0.88         | 0.50         | 1.22         | 203.18                                     | 1,65         |   | 1        | 100        | 1.00         | 2.75             | 1.00         | 204.1                       | 1.00         | Infin.           | 0.000 | 0_600          | Non-Liq.                 |          | 0.00         |
| 13.2           |                  | 1.82         | 0.90         | 110          | 0.722          | 0.973          | 0.90<br>0.92 | 0.50         | 1.21         | 214 55<br>226 07                           | 1,64<br>1,63 |   | 1        | 100<br>100 | 1.00         | 2.80<br>2.85     | 1.00         | 215.4 <sub>1</sub><br>226.9 | 1.00         | Infin.           | 0.000 | 0,603<br>0,606 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 13,4           |                  | 1.96         | 0.95         | 110          | 0.740          | 0.972          | 0.95         | 0.50         | 1.20         | 232,38                                     | 1,63         |   | 1        | 100        | 1.00         | 2.90             | 1.00         | 233.2                       | 1,00         | Infin_           | 0.000 | 0.609          | Non-Liq.                 |          | 0.00         |
| 13,6           |                  | 1.92         | 0.92         | 110<br>110   | 0.749<br>0.758 | 0.972<br>0.971 | 0.92<br>0.98 | 0.50         | 1.19<br>1.18 | 234 21<br>241 40                           | 1,62<br>1,63 |   | 1        | 100        | 1.00         |                  | 1,00         | 235.1                       | 1,00         | Infin.           | 0.000 | 0.612          | Non-Liq.                 |          | 0.00         |
| 13,9           |                  | 1.88         | 0.85         | 110          |                | 0.971          | 0.85         | 0.50         | 1.17         | 244 14                                     | 1.58         |   | 1        | 100<br>100 | 1.00         |                  | 1.00         | 242.3<br>245.1              | 1.00         | Infin,           | 0.000 | 0,615<br>0,618 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 14.1           |                  | 2.72         | 1.21         | 110          | 0.776          | 0.971          | 1.21         | 0.51         | 1.17         | 249.15                                     | 1.69         |   | 1        | 100        | 1.03         | 3.10             | 1.00         | 257.6                       | 1.00         | Infin.           | 0,000 | 0.621          | Non-Liq.                 |          | 0.00         |
| 14.2           |                  | 2.77<br>3.44 | 1.22<br>1.32 | 110<br>110   | 0.785<br>0.794 | 0,970<br>0,970 | 1.22<br>1.32 | 0.52<br>0.51 | 1.17<br>1.16 | 249.35<br>284.70                           | 1.69<br>1.68 |   | 1        | 100<br>100 | 1.03         |                  | 1.00         | 258.3<br>293.3              | 1.00         | Infin.           | 0.000 | 0,624<br>0,627 | Non-Liq.                 |          | 0.00         |
| 14.6           | 273.34           | 5.44         | 1.99         | 110          | 0.803          | 0.970          | 2.00         | 0.55         | 1.16         | 300.02                                     | 1.82         |   | 1        | 100        | 1.12         |                  | 1.00         | 336.8                       | 1.00         | Infin            | 0.000 | 0,629          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 14.7           |                  | 5.65<br>7.59 | 1,92<br>1,72 | 110<br>110   | 0.812          | 0.969          | 1.93         | 0.54         | 1.15         | 319.57                                     | 1.79         |   | 1        | 100        | 1.10         | 3.30             | 1.00         | 352.3                       | 1.00         | Infin.           | 0.000 | 0,632          | Non-Liq.                 | Non-Liq  | 0.00         |
| 15.0           |                  | 7.25         | 2.09         | 110          | 0.821<br>0.830 | 0.969          | 1.72<br>2.09 | 0.51<br>0.54 | 1.14<br>1.14 | 473.40<br>374.13                           | 1,66<br>1,78 |   | 1        | 100<br>100 | 1.01         |                  | 1_00<br>1_00 | 479.8<br>410.8              | 1.00<br>1.00 | Infin.           | 0.000 | 0.635<br>0.637 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 15.20          |                  | 7.87         | 2.60         | 110          | 0,839          | 0.968          | 2.61         | 0.58         | 1.14         | 326_31                                     | 1.90         |   | 1        | 100        | 1.18         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0.640          | Non-Liq.                 |          | 0.00         |
| 15 4:<br>15 5  |                  | 6.43<br>5.16 | 2.33<br>1.37 | 110<br>110   |                | 0.968<br>0.967 | 2.34<br>1.37 | 0.57<br>0.50 | 1.13         | 295 <sub>.</sub> 07<br>394 <sub>.</sub> 73 | 1.88<br>1.61 |   | 1        | 100<br>100 | 1.17         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0.643          | Non-Liq.                 |          | 0.00         |
| 15.7           |                  | 5.68         | 1.76         | 110          |                | 0.967          | 1.77         | 0.53         | 1.11         |  | 1.74         |   | 1        | 100        | 1.07         |                  | 1.00         |                             | 1.00         | Infin<br>Infin   | 0,000 | 0.645<br>0.648 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 15,9           |                  | 3.28         | 1.02         | 110          |                | 0.967          | 1.02         | 0.50         | 1.10         | 333,46                                     | 1,55         |   | 1        | 100        | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0.650          | Non-Liq.                 |          | 0.00         |
| 16.08<br>16.24 |                  | 3.11<br>2.94 | 0.90         | 110<br>110   |                | 0.966<br>0.966 | 0.90<br>0.84 | 0.50<br>0.50 | 1.09<br>1.09 | 355.08<br>358.01                           | 1,49<br>1,47 |   | 1        | 100<br>100 | 1.00         |                  | 1.00         | 356.4<br>359.3              | 1.00         | Infin.           | 0.000 | 0.653<br>0.655 | Non-Liq.                 |          | 0.00         |
| 16.40          | 351,59           | 2.77         | 0.79         | 110          |                | 0.966          | 0.79         | 0.50         | 1.08         |  | 1.44         |   | 1        |            | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0,000 | 0,657          | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 16.5           |                  | 2.53         | 0.69         | 110<br>110   |                | 0.965          | 0.69         | 0.50         | 1.08         | 372,35                                     | 1.39         |   | 1        | 100        | 1.00         |                  | 1.00         |                             | 1,00         | Infin            | 0,000 | 0,660          | Non-Liq.                 | Non-Liq. | 0.00         |
| 16.90          |                  | 3.60         | 0.87         | 110          |                | 0.965<br>0.965 | 0.80<br>0.87 | 0.50<br>0.50 | 1.07<br>1.07 | 385,27<br>416,40                           | 1.43         |   | 1        | 100<br>100 | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0,662<br>0,664 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 17.06          | 452,15           | 4.24         | 0.94         | 110          | 0.938          | 0.964          | 0.94         | 0.50         | 1.06         | 452,86                                     | 1.44         |   | 1        | 100        | 1.00         | 4.00             | 1,00         | 454.6                       | 1.00         | Infin.           | 0.000 | 0,666          | Non-Liq.                 |          | 0.00         |
| 17.22<br>17.39 |                  | 3.95         | 0.92<br>0.91 | 110<br>110   |                | 0.964<br>0.963 | 0.93         | 0.50         | 1.06<br>1.05 |  | 1,45<br>1,46 |   | 1        | 100<br>100 | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0,669          | Non-Liq.                 | Non-Liq  | 0.00         |
| 17.55          |                  | 4.21         | 0.99         | 110          |                | 0.963          | 0.99         | 0.50         | 1.05         |  | 1.48         |   | 1        |            | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0,671<br>0,673 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 17.72          |                  | 4.22         | 0.96         | 110          |                | 0.963          | 0.96         | 0.50         | 1.04         | 431.05                                     | 1.47         |   | 1        | 100        | 1.00         | 4.20             | 1.00         | 432.7                       | 1.00         | Infin.           | 0.000 | 0.675          | Non-Liq.                 | Non-Liq. | 0.00         |
| 17.88          |                  | 3.57<br>4.53 | 0.77         | 110<br>110   |                | 0.962<br>0.962 | 0.78<br>0.91 | 0.50<br>0.50 | 1.04<br>1.03 |  | 1,38         |   | 1        | 100<br>100 | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0,677<br>0,679 | Non-Liq.                 |          | 0.00         |
| 18.21          | 579,29           | 5.58         | 0.96         | 110          | 1.001          | 0.962          | 0.96         | 0.50         | 1.03         |  | 1.40         |   | 1        |            | 1.00         |                  |              |                             | 1.00         | Infin            | 0,000 | 0.679          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 18.37<br>18.54 |                  | 3.67<br>4.80 | 0.62<br>0.83 | 110<br>110   |                | 0.961<br>0.961 | 0.62<br>0.83 | 0.50<br>0.50 | 1.02         |  | 1.24         |   | 1        |            | 1.00         |                  |              |                             | 1.00         | Infin            | 0,000 | 0.683          | Non-Liq.                 | Non-Liq. | 0.00         |
| 18.70          |                  | 5.65         | 0.93         | 110          |                | 0.960          | 0.93         | 0.50         | 1.02         |  | 1.35<br>1.38 |   | 1        | 100<br>100 | 1.00         |                  | 1.00         |                             | 1.00         | Infin.<br>Infin. | 0.000 | 0,685<br>0,687 | Non-Liq,<br>Non-Liq,     |          | 0.00         |
| 18,86          |                  | 6.10         | 1.08         | 110          |                | 0.960          | 1.08         | 0.50         | 1.01         | 538,37                                     | 1.46         |   | 1        |            | 1.00         |                  | 1.00         |                             | 1.00         | Infin            | 0.000 | 0.689          | Non-Liq.                 |          | 0.00         |
| 19.03          |                  | 8.59<br>6.47 | 1.58         | 110<br>110   |                | 0.960<br>0.959 | 1.58<br>1.14 | 0.50<br>0.50 | 1.01         |  | 1.61<br>1.48 |   | 1        |            | 1.00         |                  |              |                             | 1.00         | Infin.           | 0.000 | 0.691          | Non-Liq.                 |          | 0.00         |
| 19.36          |                  | 6.42         | 1.22         | 110          |                | 0.959          | 1.22         | 0.50         | 1.00         |  | 1.52         |   | 1        |            | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0.000 | 0.692<br>0.694 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 19.52          |                  | 4.60         | 1.02         | 110          |                | 0.958          | 1.02         | 0.50         | 0.99         |  | 1.49         |   | 1        |            | 1.00         |                  | 1,00         |                             | 1.00         | Infin.           | 0,000 | 0.696          | Non-Liq.                 | Non-Liq. | 0.00         |
| 19 69          |                  | 3.90<br>3.82 | 0.93         | 110<br>110   |                | 0.958<br>0.957 | 0.94<br>1.02 | 0.50<br>0.50 | 0.99<br>0.98 |  | 1.48<br>1.54 |   | 1        |            | 1.00         |                  | 1.00         |                             | 1.00         | Infin.           | 0,000 | 0.698<br>0.699 | Non-Liq.                 |          | 0.00         |
| 20.01          | 355,23           | 3.87         | 1.09         | 110          | 1,101          | 0.957          | 1.09         | 0.50         | 0.98         |  | 1.58         |   | i        |            | 1.00         |                  | 1000         |                             | 1.00         | Infin.           | 0,000 | 0.701          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 20.18          | 380.08<br>440.83 | 4.45<br>4.85 | 1.17         | 110<br>- 110 |                | 0.957<br>0.956 | 1.17         | 0.50         | 0.98         |  | 1,59         |   | 1        |            | 1.00         |                  |              |                             | 1.00         | Infin.c          | 0,000 | 0.703          | Non-Liq.                 | Non-Liq  | 0.00         |
| 20.51          | 486.23           | 4.83         | 0.99         | 110          |                | 0.956          | 1.10<br>1.00 | 0.50<br>0.50 | 0.98<br>0.97 |  | 1.53<br>1.47 |   | 1        |            | 1.00<br>1.00 |                  | 1.00         |                             | 1.00         | Infin.<br>Infin. | 0,000 | 0.704<br>0.706 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 20.67          | 520.20           | 4.75         | 0.91         | 110          |                | 0.955          | 0.92         | 0.50         | 0.97         | 477.17                                     | 1.42         |   | 1        | 100        | 1.00         | 5.10             |              |                             | 1.00         | Infin            | 0,000 | 0.708          | Non-Liq.                 |          | 0.00         |
| 20.83          |                  | 4.83<br>5.24 | 0.91         | 110<br>110   |                | 0.955<br>0.954 | 0.91<br>0.95 | 0.50<br>0.50 | 0.97<br>0.97 |  | 1.41<br>1.42 |   | 3        |            |              |                  |              |                             | 1.00         | Infin            | 0.000 | 0.709          | Non-Liq.                 |          | 0.00         |
| 21.16          |                  | 5.57         | 1.00         | 110          |                | 0.954          | 1.00         | 0.50         | 0.97         |  | 1.44         |   | ä        |            |              |                  |              |                             | 1.00         | Infin.           | 0.000 | 0.711<br>0.712 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 21.33          | 541.40           | 4.23         | 0.78         | 110          |                | 0.954          | 0.78         | 0.50         | 0.97         |  | 1.36         |   | 3        |            |              |                  |              | 495.1                       | 1,00         | Infin.           | 0.000 | 0.714          | Non-Liq.                 |          | 0.00         |
| 21 49<br>21 65 | 529.93<br>514.51 | 3.90<br>3.55 | 0.74         | 110<br>110   |                | 0.953<br>0.953 | 0.74<br>0.69 | 0.50<br>0.50 | 0.96<br>0.96 |  | 1.34<br>1.33 |   | 1        |            |              |                  |              |                             | 1.00<br>1.00 | Infin.           | 0.000 | 0.715<br>0.717 | Non-Liq.                 |          | 0.00<br>0.00 |
| 21.82          | 465.36           | 3.51         | 0.75         | 110          |                |                | 0.76         | 0.50         |              |  | 1.39         |   | 1        |            |              |                  |              | 423.2                       |              | Infin.           | 0.000 | 0.718          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 21.98          |                  | 3.41<br>3.95 | 0.71         | 110<br>110   | 8-27           | 0,000          | 0.72         | 0.00         |              |  | 1.36         |   |          |            |              |                  |              |                             | 1.00         | Infin            | 0.000 | 0.719          | Non-Liq.                 | Non-Liq. | 0.00         |
| 22.31          | 488.77           | 4.36         | 0.89         | 110          |                |                | 0.79<br>0.89 | 0.50<br>0.50 |              |  | 1.39         |   |          |            |              |                  |              |                             | 1.00         | Infin.           | 0.000 | 0.721<br>0.722 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 22.47          |                  | 4.12         | 0.88         | 110          |                |                | 0.88         | 0.50         |              | 420 97                                     | 1.44         |   | 1        | 100        | 1.00         | 5.65             | 1.00         | 422.5                       | 1.00         | Infin            | 0.000 | 0.724          | Non-Liq.                 |          | 0.00         |
| 22.64<br>22.80 | 430.22<br>388.20 | 3.45         | 0.80         | 110<br>110   |                |                |              | 0.50<br>0.50 |              |  | 1.43<br>1.45 |   |          |            |              |                  |              |                             | 1.00<br>1.00 | Infin.<br>Infin: | 0.000 | 0.725<br>0.726 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 22,97          | 382.78           | 2.72         | 0.71         | 110          | 1.173          | 0 949          | 0.71         |              |              |  | 1.42         |   |          |            |              |                  |              | 343.8                       |              | Infin.           | 0.000 | 0.727          | Non-Liq.                 |          | 0.00         |
| 23.13          |                  | 2.68         | 0.75         | 110<br>110   |                |                |              |              |              |  | 1.46         |   |          |            |              |                  |              | 319.3                       |              |                  | 0.000 | 0,729          | Non-Liq.                 |          | 0.00         |
| 23,46          | 343,88           | 1.99         | 0.58         | 110          |                |                |              |              |              |  | 1.42<br>1.39 |   |          |            |              |                  |              | 319.0<br>307.2              | 1.00         | Infin.           | 0.000 | 0.730<br>0.731 | Non-Liq.                 |          | 0.00         |
| 23,62          |                  | 1.60         | 0.46         | 110          | 1.189          | 0.947          | 0.47         | 0.50         | 0.94         | 306.46                                     | 1.33         |   | 1        | 100        | 1.00         | 6.00             | 1.00         | 307.6                       | 1,00         | Infin.           | 0.000 | 0.732          | Non-Liq.                 | Non-Liq  | 0.00         |
| 23.79<br>23.95 | 352.04<br>379.12 | 1.86<br>2.56 | 0.53         | 110<br>110   |                |                |              |              |              |  | 1.36<br>1.41 |   |          |            |              |                  |              | 313.5<br>337.1              | 1.00         | Infin.<br>Infin. |       | 0.733<br>0.735 | Non-Liq.                 |          | 0.00<br>0.00 |
| 24.11          | 381.50           | 2.41         | 0.63         | 110          | 1.200          | 945            | 0.63         | 0.50         | 0.94         | 337,45                                     | 1.39         |   |          |            |              |                  | 1.00         | 338.7                       | 1.00         | Infin.           |       | 0.736          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 24.28<br>24.44 |                  | 2.59         | 0.68         | 110<br>110   |                |                |              |              |              |  | 1.41         |   |          |            |              |                  |              | 339.0                       | 1.00         | Infin.           | 0.000 | 0.737          | Non-Liq.                 | Non-Liq  | 0.00         |
| 24.44          | 345.67           | 1.84         | 0.53         | 110          |                |                |              |              |              |  | 1.40<br>1.37 |   |          |            |              |                  |              | 321.0<br>305.3              | 1,00<br>1,00 | Infin.<br>Infin. |       | 0.738<br>0.739 | Non-Liq.  <br>Non-Liq.   |          | 0.00         |
| 24,77          | 352,36           | 1.35         | 0.38         | 110          | 1.216          | 943            | 0.39         | 0.50         | 0.93         | 309.57                                     | 1.27         |   | 1        | 100        | 1.00         | 6.35             | 1.00         | 310.7                       |              |                  |       | 0.740          | Non-Liq.                 | Non-Liq. | 0.00         |
| 24,93<br>25,10 | 361.66<br>368.75 | 1.81<br>1.84 | 0.50         | 110<br>110   |                |                |              |              |              |  | 1.34<br>1.33 |   |          |            |              | 6.40<br>6.45     |              | 318.4<br>324.2              |              |                  |       | 0.741          | Non-Liq. I               |          | 0.00         |
| 25.26          | 366,01           | 1.90         | 0.52         | 110          | 1,228          | 941            | 0.52         | 0.50         |              |  | 1.35         |   |          |            |              | 6.50 °           |              | 321.3                       |              |                  |       | 0.742<br>0.743 | Non-Liq.  <br>Non-Liq.   |          | 0.00         |
| 25.43          | 371,63           | 1.81         | 0.49         | 110          |                |                |              |              |              |  | 1.32         |   |          |            |              |                  | 1.00         | 325.7                       | 1.00         | Infin.           | 0.000 | 0.744          | Non-Liq. I               | Non-Liq. | 0.00         |
| 25.59<br>25.75 | 377,11<br>376,28 | 1.91<br>2.06 | 0.51<br>0.55 |              |                |                |              |              |              |  | 1.33<br>1.35 |   |          |            |              |                  |              | 330.0<br>328.7              |              |                  |       |                | Non-Liq. I               |          | 0.00         |
| 25.92          | 388.18           | 2.48         | 0.64         | 110          | 1.243          | 0.939          | 0.64         | 0.50         | 0.92         | 337.36                                     | 1.39         |   | 1        | 100 1      | 1.00         | 6.70 1           | 1.00         | 338.6                       | 1.00         |                  |       |                | Non-Liq. 1               |          | 0.00         |
| 26.08<br>26.25 | 387.53<br>390.12 | 2.18<br>1.95 | 0.56         |              |                |                |              |              |              |  | 1.35<br>1.32 |   |          |            |              |                  |              | 337.5                       |              |                  |       | 0.747          | Non-Liq. 1               | Non-Liq  | 0.00         |
| 26.41          | 385.52           | 1.93         | 0.50         |              |                |                |              |              |              |  | 1.32         |   |          |            |              | 6.80 1<br>6.85 1 |              | 339.2<br>334.7              |              |                  |       |                | Non-Liq. !               |          | 0.00         |
| 26.57          | 386.49           | 1.78         | 0.46         |              | 1 259 0        | 936            | 0.46         | 0.50         | 0.92         | 333.78                                     | 1.30         |   | 1        | 100 1      | 1.00         | 6.90 1           | 1.00         | 335.0                       | 1.00         | Infin.           | 0.000 | 0.750          | Non-Liq. 1               | Non-Liq  | 0.00         |
| 26.74<br>26.90 | 384.18<br>381.61 | 1.88         | 0.49         |              |                |                |              |              |              |  | 1.32         |   |          |            |              | 6.95 1<br>7.00 1 |              | 332.5<br>329.8              | 1.00         |                  |       |                | Non-Liq. I               |          | 0.00         |
| 27.07          | 376.27           | 1.93         | 0.51         | 110          | 1 271 0        | .934           | 0.51         | 0.50         | 0.91         | 323,41                                     | 1.34         |   |          |            |              |                  |              | 324.6                       |              |                  |       |                | Non-Liq. I<br>Non-Liq. I |          | 0.00         |
| 27.23<br>27.40 | 373,66<br>376,94 |              | 0.51<br>0.51 |              |                |                |              |              |              |  | 1.34         |   |          |            |              |                  | 1.00         | 321.9                       | 1.00         | Infin.           | 0.000 | 0.753          | Non-Liq.                 | Non-Lig  | 0.00         |
| 27.56          | 386.83           |              | 1.01         |              |                |                |              |              |              |  | 1.33         |   |          |            |              |                  |              |                             | 1.00<br>1.00 |                  |       |                | Non-Liq. Non-Liq. N      |          | 0.00         |
|                | 393.44           | 4.16         | 1.06         | 110          | 1,286 0        | 932            | 1.06         | 0.50         | 0.91         | 336.15                                     | 1.56         |   | 1        | 100 1      | .00          | 7.25 1           | 1.00         | 337.4                       | 1_00         | Infin.           | 0.000 | 0.755          | Non-Liq. 1               | lon-Liq  | 0.00         |
| <b>■</b> 21.89 | 437.24           | 5.53         | 1.26         | 110          | 1.290 0        | 931            | 1.27         | 0.50         | 0.91         | 373.12 1                                   | 1.60         |   | 1        | 100 1      | .00          | 7.30 1           | 1.00 3       | 374.5                       | 1.00         | Infin.           | 0.000 | 0.756          | Non-Liq.                 | lon-Liq  | 0.00         |

| Laye           | r Tip  | Friction     | Friction     | Total      | Eff.Stres      | s              |              | _            |              |                  |              | Ф | Liquef,  | Rel        |                |                  | _     | Clean          |              | _                | _     | Induced        | Liquefac.                |                | Volumetric   |
|----------------|--|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|---|----------|------------|----------------|------------------|-------|----------------|--------------|------------------|-------|----------------|--------------------------|----------------|--------------|
| Dept           |  | Fs           | Ratio        | Unit Wt    |                |                |              |              |              | Corrected        | i            | 0 | Suscept  |            |                | н                |       | Sand           |              |                  | EQ    | M=7.5          | Safety                   | Probab.        | Strain       |
| (feet          | A STATE OF THE PARTY OF THE PAR | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Cg           | Qc1n             | lc           | - | (0 or 1) |            | Kc             | (m)              | KH    | Qc1n           | Κσ           | CRR7             |       | CSR            | Factor                   | PL             | (%)          |
| 28,05          |  | 5.33         | 1.01         | 110        | 1,294          | 0.930          | 1.02         | 0.50         | 0,90         | 448 27           | 1.48         |   | 1        | 100        | 1.00           | 7,35             | 1.00  | 449.9          | 1.00         | Infin.           | 0.000 | 0.756          | Non-Liq.                 |                | 0.00         |
| 28.22          |  | 4.40<br>3.58 | 0.91<br>0.98 | 110<br>110 | 1,298<br>1,302 | 0.929          | 0.91<br>0.98 | 0,50         | 0.90         | 412.76<br>311.51 | 1.46<br>1.56 |   | 1        | 100<br>100 | 1.00           | 7.40<br>7.45     | 1.00  | 414.3<br>312.7 | 1.00         | Infin.           | 0.000 | 0.757<br>0.758 | Non-Liq.                 |                | 0.00         |
| 28.54          |  | 4.34         | 1.21         | 110        | 1.306          | 0.928          | 1.21         | 0.50         | 0,90         | 304,90           | 1.63         |   | 1        | 100        | 1.00           | 7.50             | 1.00  | 306.0          | 1.00         | Infin            | 0.000 | 0.758          | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 28.71          |  | 4.11<br>4.96 | 1.09<br>1.25 | 110        | 1.310          | 0.927          | 1.09         | 0.50         | 0.90         | 318.68           | 1.59         |   | 1        | 100        | 1.00           | 7.55             | 1.00  | 319.9          | 1,00         | Infin.           | 0.000 | 0.759          | Non-Liq.                 | Non-Liq.       | 0.00         |
| 29 04          |  | 3.29         | 0.83         | 110<br>110 | 1.314<br>1.318 | 0.926<br>0.926 | 1.25<br>0.84 | 0.50         | 0.90         | 335,32<br>332,26 | 1,62<br>1,49 |   | 1        | 100<br>100 | 1.00           | 7.60<br>7.65     | 1.00  | 336.6<br>333.5 | 1.00         | Infin.           | 0.000 | 0,759<br>0,760 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 29.20          |  | 2.93         | 0.76         | 110        | 1.322          | 0.925          | 0.76         | 0.50         | 0.89         | 326.84           | 1.46         |   | 1        | 100        | 1.00           | 7.70             | 1.00  | 328.1          | 1.00         | Infin            | 0.000 | 0.760          | Non-Liq.                 |                | 0.00         |
| 29.36<br>29.53 |  | 2.51         | 0.67<br>0.60 | 110<br>110 | 1,325          | 0.924          | 0.67<br>0.60 | 0.50         | 0.89         | 316.65           | 1,43         |   | 1        | 100        | 1.00           | 7.75             | 1.00  | 317.8          | 1.00         | Infin.           | 0.000 | 0,761          | Non-Liq.                 |                | 0.00         |
| 29,69          |  | 2.36         | 0.61         | 110        | 1.333          | 0.923          | 0.62         | 0.50         | 0.89         | 316.99<br>323.02 | 1.39<br>1.39 |   | 1        | 100        | 1.00<br>1.00   | 7.80<br>7.85     | 1.00  | 318.2<br>324.2 | 1.00         | Infin.           | 0.000 | 0.761<br>0.762 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 29,86          |  | 2.46         | 0.64         | 110        | 1,337          | 0.922          | 0.64         | 0.50         | 0.89         | 324.84           | 1.40         |   | 1        | 100        | 1.00           | 7.90             | 1.00  | 326.1          | 1.00         | Infin            | 0.000 | 0.762          | Non-Liq.                 |                | 0.00         |
| 30,02          |  | 2.68         | 0.69<br>0.67 | 110<br>110 | 1,341<br>1,345 | 0.921          | 0.69         | 0.50         | 0.89         | 325.97           | 1.43         |   | 1        |            | 1.00           | 7.95             | 1.00  | 327.2          | 1,00         | Infin.           | 0.000 | 0,763          | Non-Liq.                 |                | 0.00         |
| 30.35          |  | 2.70         | 0.70         | 110        | 1.349          | 0.920          | 0,67<br>0,70 | 0.50         | 0.89         |                  | 1.42         |   | 1        | 100<br>100 | 1.00           |                  | 1.00  | 326.6<br>323.1 | 1.00         | Infin.           | 0.000 | 0.763<br>0.763 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 30,51          | 373,85   | 2.74         | 0.73         | 110        | 1.353          | 0.918          | 0.74         | 0.50         | 0.88         | 311.37           | 1.46         |   | 1        |            | 1.00           |                  |       | 312.5          | 1.00         | Infin.           | 0.000 | 0.764          | Non-Liq.                 |                | 0.00         |
| 30,68          |  | 2.42         | 0.65<br>0.58 | 110<br>110 | 1,357<br>1,361 | 0.918          | 0,65<br>0,58 | 0,50         | 0.88         | 310.88           | 1.42         |   | 1        |            | 1.00           |                  |       | 312.0          | 1.00         | Infin.           | 0.000 | 0.764          | Non-Liq.                 |                | 0.00         |
| 31.00          |  | 2.07         | 0.52         | 110        | 1.364          | 0.916          | 0.53         | 0.50         | 0.88         |                  | 1.37<br>1.34 |   | 1        | 100<br>100 | 1.00           |                  | 1.00  | 325.2<br>329.7 | 1.00         | Infin.           | 0.000 | 0.764<br>0.765 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 31.17          |  | 2.25         | 0.59         | 110        | 1,368          | 0.915          | 0.59         | 0.50         | 0.88         | 316.45           | 1,39         |   | 1        |            | 1.00           |                  |       | 317.6          | 1.00         | Infin            | 0.000 | 0.765          | Non-Liq.                 |                | 0.00         |
| 31.33          |  | 2.42         | 0.64<br>0.77 | 110<br>110 | 1.372<br>1.376 | 0.914          | 0,65<br>0.77 | 0.50<br>0.50 | 0.88         | 310.76<br>322.92 | 1.42         |   | 1        |            | 1.00           |                  |       | 311.9          | 1.00         | Infin.           | 0,000 | 0,765          | Non-Liq.                 |                | 0.00         |
| 31.66          |  | 2.99         | 0.74         | 110        | 1.380          | 0.912          | 0.75         | 0.50         | 0.88         |                  | 1.46<br>1.45 |   | 1        |            | 1.00           |                  |       | 324.1<br>331.9 | 1.00         | Infin.           | 0.000 | 0.765<br>0.766 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 31.82          |  | 3.52         | 0.87         | 110        | 1,384          | 0.911          | 0.87         | 0.50         | 0.87         |                  | 1,50         |   | 1        |            | 1.00           |                  |       | 336.3          | 1.00         | Infin            | 0.000 | 0.766          | Non-Liq.                 |                | 0.00         |
| 31.99          |  | 4.27<br>3.97 | 1.02<br>1.05 | 110<br>110 | 1.388<br>1.392 | 0.910          | 1.02         | 0.50         | 0.87<br>0.87 |                  | 1,54         |   | 1        |            | 1,00           |                  |       | 345.8          | 1.00         | Infin            | 0,000 | 0.766          | Non-Liq.                 |                | 0.00         |
| 32.32          |  | 2.48         | 0.65         | 110        | 1.396          | 0.908          | 0.66         | 0.50         | 0.87         |                  | 1.58<br>1.43 |   | 1        |            | 1.00           |                  |       | 311.2<br>312.0 | 1.00         | Infin.           | 0.000 | 0.766<br>0.766 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 32.48          | 383.08   | 2.56         | 0.67         | 110        | 1,400          | 0.907          | 0.67         | 0.50         | 0,87         | 313,66           | 1.43         |   | 1        | 100        | 1.00           | 8.45             | 1.00  | 314.8          | 1.00         | Infin.           | 0.000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 32.64<br>32.81 | 374.12<br>381,30   | 2.93         | 0.78         | 110<br>110 | 1.403<br>1.407 | 0.906          | 0.79         | 0.50         | 0.87<br>0.87 |                  | 1.49         |   | 1        |            | 1.00           |                  |       | 307.0          | 1.00         | Infin.           | 0.000 | 0.767          | Non-Liq.                 | Non-Liq        | 0.00         |
| 32.97          | 408.55   | 3.13         | 0.92         | 110        | 1.411          | 0.905          | 0.77         | 0.50         | 0.87         |                  | 1,53<br>1,46 |   | 1        |            |                |                  |       | 312.5<br>334.4 | 1.00         | Infin<br>Infin   | 0.000 | 0.767<br>0.767 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 33.14          | 382,63   | 3.51         | 0.92         | 110        | 1.415          | 0.903          | 0.92         | 0.50         | 0.86         | 311.54           | 1,53         |   | 1        | 100        | 1.00           | 8.45             | 1,00  | 312.7          | 1.00         | Infin            | 0.000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 33.30<br>33.46 | 380 84<br>373 57   | 3.52<br>2.42 | 0.93         | 110<br>110 | 1.419<br>1.423 | 0.902          | 0.93<br>0.65 | 0.50<br>0.50 | 0.86<br>0.86 |                  | 1.54         |   | 1        |            |                |                  |       | 310.8          | 1.00         | Infin,           | 0,000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 33.63          | 348.56   | 2.29         | 0.66         | 110        |                | 0.900          | 0.66         | 0.50         | 0.86         |                  | 1.46         |   | 1        |            |                |                  |       | 304.4<br>283.6 | 1.00         | Infin.<br>Infin. | 0.000 | 0.767<br>0.767 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 33.79          | 339.90   | 1.86         | 0.55         | 110        | 1,431          | 0.899          | 0.55         | 0.50         | 0.86         | 275.10           | 1,41         |   | 1        |            |                |                  |       | 276.1          | 1.00         | Infin            | 0,000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 33.96<br>34.12 | 325 76<br>318 65   | 1.16         | 0.36         | 110<br>110 |                | 0.898<br>0.897 | 0.36         | 0.50<br>0.50 | 0.86         |                  | 1.30         |   | 1        |            |                |                  |       | _              | 1.00         | Infin.           | 0.000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 34 28          | 302.21   | 0.98         | 0.32         | 110        |                | 0.896          | 0.33         | 0.50         | 0.86         |                  | 1.31         |   | 1        |            |                |                  |       |                | 1.00         | Infin.           | 0.000 | 0.767<br>0.767 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 34.45          | 271,69   | 0.85         | 0.31         | 110        |                | 0.895          | 0.31         | 0.50         | 0.86         |                  | 1.34         |   | 1        |            |                |                  | 1.00  | 219.3          | 0,99         | Infin            | 0.000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 34.61<br>34.78 | 230 31<br>172 13   | 1.74<br>2.62 | 0.76<br>1.52 | 110<br>110 |                | 0.894<br>0.893 | 0.76<br>1.53 | 0.50         | 0.85         |                  | 1.63<br>1.94 |   | 1        |            |                |                  |       |                | 0.99         | Infin            | 0.000 | 0.767          | Non-Liq.                 |                | 0.00         |
| 34.94          | 115.70   | 2.67         | 2.31         | 110        |                | 0.892          | 2.34         | 0.67         | 0.81         |                  | 2.21         |   | 1        |            | 1.68           |                  |       |                | 0.99         | Infin<br>0.372   | 0.000 | 0.767<br>0.766 | Non-Liq.<br>0.48         | 92%            | 0.00<br>0.91 |
| 35.10          | 77.37  | 2.49         | 3.21         | 110        |                | 0.890          | 3.28         | 0.74         | 0.79         |                  | 2.44         |   | 1        | 53         | 2,49           |                  |       |                | 0.99         | 0.339            | 0.336 | 0.766          | 0.44                     | 94%            | 1.02         |
| 35 27<br>35 43 | 43.09<br>41.07   | 2.75<br>3.05 | 6.39<br>7.42 | 110<br>110 |                | 0.889<br>0.888 | 6,62<br>7,70 | 0.86<br>0.88 | 0.75<br>0.75 |                  | 2.86<br>2.92 |   | 0        |            |                |                  |       |                | 0.99         |                  |       | 0.766<br>0.766 | Non-Liq.                 |                | 0.00         |
| 35.60          | 117.22   | 3.50         | 2.98         | 110        |                | 0.887          | 3.02         | 0.69         | 0.79         |                  | 2.29         |   | 1        | 71         | 1.91           |                  | 1,00  | 166.1          | 0.98         | Infin            | 0,000 | 0.766          | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 35.76          | 102,95   | 2.85         | 2.77         | 110        |                | 0.886          | 2.81         | 0.70         | 0.79         |                  | 2.30         |   | 1        | 65         | 1.96           |                  | 1.00  | 149.1          | 0.99         | 0.389            | 0,384 | 0.766          | 0.50                     | 91%            | 0.84         |
| 35.93<br>36.09 | 60,37<br>66.61   | 2.54<br>1.85 | 4.20<br>2.78 | 110<br>110 |                | 0.885<br>0.883 | 4.31<br>2.84 | 0.79<br>0.74 | 0.77<br>0.78 |                  | 2.61<br>2.45 |   | 0<br>1   | 46 :       | 2,53           |                  | 1.00  | 121.1          | 0.99         | 0.245            | 0.243 | 0.765<br>0.765 | Non-Liq.<br>0.32         | Non-Liq<br>98% | 0.00         |
| 36_25          | 123.04   | 2.42         | 1.97         | 110        |                |                | 1.99         | 0.65         | 0.80         |                  | 2 14         |   | 1        |            | 1.53           |                  |       |                |              | 0.339            | 0.332 | 0.765          | 0.32                     | 94%            | 1.24<br>1.02 |
| 36.42<br>36.58 | 104,40<br>92,52  | 2.38         | 2.28         | 110        |                | 0.881          | 2.31         | 0.68         | 0.79         |                  | 2.24         |   | 1        |            | 1,77           |                  |       |                |              | 0,315            | 0,310 | 0.765          | 0.41                     | 95%            | 1.07         |
| 36.75          | 72.66  | 2.48<br>3.21 | 2.68<br>4.42 | 110<br>110 |                | 0.880<br>0.878 | 2.72<br>4.52 | 0.71<br>0.78 | 0.78<br>0.76 |                  | 2.33<br>2.57 |   | 1        |            | 2.05<br>3.16   |                  |       |                | 0.98         | 0.325<br>Infin   | 0.319 | 0.764<br>0.764 | 0.42<br>Non-Liq.         | 95%<br>Non Lia | 1.05<br>0.00 |
| 36.91          | 123.36   | 4.33         | 3.51         | 110        | 1,505          |                | 3.55         |              | 0.78         |                  | 2.33         |   | 1        |            | 2.05           |                  |       | 184.4          |              | Infin            |       | 0.764          | Non-Liq.                 |                | 0.00         |
| 37.07<br>37.24 | 154.86<br>152.31   | 4.78<br>3.58 | 3.09<br>2.35 | 110<br>110 |                |                | 3.12         |              |              |                  | 2.22         |   | 1        |            | 1.72           |                  |       | 196.3          |              | Infin.           |       | 0.763          | Non-Liq.                 |                | 0.00         |
| 37.40          | 132.82   | 2.22         | 1.67         | 110        |                |                | 2.38<br>1.69 |              | 0.79         |                  | 2.13<br>2.07 |   | 1        |            | 1.52<br>1.40   |                  |       |                | 0.97<br>0.97 | Infin.<br>0.326  |       | 0.763<br>0.762 | Non-Liq.<br>0.42         | Non-Liq<br>95% | 0.00<br>1.05 |
| 37.57          | 105.83   | 2.40         | 2.26         | 110        | 1,521          | 0.872          | 2.30         | 0.68         | 0.78         | 77_06            | 2.24         |   | 1        | 66         | 1.76           |                  |       |                |              |                  | 0.306 | 0.762          | 0.40                     | 95%            | 1.07         |
| 37.73<br>37.89 | 67,92<br>210.25  | 2.37         | 3.48<br>1.02 | 110<br>110 |                |                | 3,56<br>1,03 |              | 0.76<br>0.82 |                  | 2.52<br>1.76 |   | 1        |            | 2.88           |                  |       |                |              |                  | 0.312 | 0.762          | 0.41                     | 95%            | 1.07         |
| 38.06          | 301.78   | 1.89         | 0.62         | 110        |                |                | 0.63         |              |              |                  | 1.50         |   | 1        |            |                |                  |       |                | 0.97<br>0.96 | Infin.<br>Infin. |       | 0.761<br>0.761 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 38.22          |  | 2.23         | 0.65         | 110        |                |                | 0.66         | 0.50         | 0.83         | 266.71           | 1.47         |   | 1        | 100        | 1.00           | 0.60             | 1.15  | 307.4          | 0.96         | Infin,           | 0.000 | 0.760          | Non-Liq.                 | Non-Liq.       | 0.00         |
|                | 339.90<br>347.24   | 2.19         | 0.64         | 110<br>110 |                |                | 0.65<br>0.60 |              |              |                  | 1.47<br>1.44 |   |          |            |                |                  |       | 305.5<br>311.8 | 0.96<br>0.96 |                  |       | 0.760          | Non-Liq.                 |                | 0.00         |
| 38.71          | 371.45   | 2.18         | 0.59         | 110        | 1.548          | 0.863          | 0.59         | 0.50         |              |                  | 1.41         |   |          |            |                |                  |       |                | 0.96         | Infin.<br>Infin. |       | 0.759<br>0.759 | Non-Liq.  <br>Non-Liq.   |                | 0.00<br>0.00 |
| 38,88          | 396.18<br>405.84   | 1.74         | 0.44         | 110        |                |                |              |              |              |                  | 1.31         |   | 1        | 100 1      | 1.00           | 0.65             | 1.15  | 355 0          | 0.96         | Infin.           | 0.000 | 0.758          | Non-Liq.                 | Non-Liq        | 0.00         |
| 39.04          | 405.84   | 1.92<br>2.26 | 0.47         | 110<br>110 |                |                |              |              |              |                  | 1.32<br>1.38 |   |          |            |                |                  |       | 363.2<br>357.9 | 0.96<br>0.96 |                  |       | 0.758<br>0.757 | Non-Liq.  <br>Non-Liq.   |                | 0.00<br>0.00 |
| 39,37          | 383.75   | 3.81         | 0.99         | 110        | 1.564          | 0.857          | 1.00         | 0.50         | 0.82         | 297.15           | 1.57         |   |          |            |                |                  |       |                | 0.95         | Infin.           |       | 0.757          | Non-Liq.                 |                | 0.00         |
| 39.53          | 290.03<br>204.10   | 4.33<br>3.79 | 1.49         | 110        |                |                |              |              |              |                  | 1.79         |   |          |            |                | 0.70             | 1.15  | 279.6          | 0.95         | Infin,           | 0.000 | 0.756          | Non-Liq. I               | Non-Liq.       | 0.00         |
|                | 126.34   | 3.79         | 1.85         | 110<br>110 |                |                |              |              | 0.79<br>0.77 |                  | 1.97<br>2.21 |   | 1        |            | 1.27<br>1.68   | 0.70             |       | 220.3<br>151.9 |              | Infin.<br>0.406  |       | 0.756<br>0.755 | Non-Liq.  <br>0.51       | Non-Liq<br>90% | 0.00<br>0.77 |
| 40,03          | 296.00   | 2.40         | 0.81         | 110        | 1,579          | 0.852          | 0.82         | 0,50         | 0.82         | 227.78           | 1.59         |   | 1        | 100 1      | 1.00           | 0.70             | 1.10  | 249.4          | 0.95         |                  |       | 0.754          | Non-Liq. 1               |                | 0.00         |
| 40 19          | 353.59<br>369.58   | 2.39         | 0.68         | 110<br>110 |                |                |              |              |              |                  | 1.48         |   |          |            |                | 0.70             |       | 297.8          |              | Infin.           | 0.000 | 0.754          | Non-Liq. 1               | Non-Liq.       | 0.00         |
|                | 358.58   | 2.73         | 0.76         | 110        |                |                |              |              |              |                  | 1.48<br>1.51 |   |          |            |                | 0.70<br>0.70     |       | 311.0<br>301.3 |              |                  |       | 0.753<br>0.752 | Non-Liq.  <br>Non-Liq.   |                | 0.00<br>0.00 |
| 40.68          | 360.65   | 2.12         | 0.59         | 110        | 1,595          | 846            | 0.59         | 0.50         | 0,81         | 276,42           | 1.43         |   | 1        | 100 1      | 1.00           | 0.70             | .10   | 302.7          | 0.94         | Infin:           | 0.000 | 0.752          | Non-Liq.                 |                | 0.00         |
| 40.85          | 364.14<br>369.03   | 2.43         | 0.67<br>0.65 | 110<br>110 |                |                |              |              |              |                  | 1.46<br>1.45 |   |          |            |                | 0.70             |       | 305.3          |              |                  |       |                | Non-Liq. 1               | Non-Liq        | 0.00         |
| 41.17          | 370.72   | 2.34         | 0.63         | 110        |                |                |              |              |              |                  | 1.45         |   |          |            |                |                  |       | 309.0<br>310.0 | 0.94<br>0.94 |                  |       |                | Non-Liq. 1<br>Non-Liq. 1 |                | 0.00         |
| 41.34          | 386.57   | 2.08         | 0.54         | 110        | 1,610          | 840            | 0.54         | 0.50         | 0.81         | 294.92           | 1.38         |   | 1        | 100 1      | .00            | 0.70             | 1.10  | 323.0          | 0.94         | Infin.           | 0.000 | 0.749          | Non-Liq. I               | Non-Liq        | 0.00         |
| 41.50          | 407.71<br>452.33   | 2.69<br>3.54 |              | 110<br>110 |                |                |              |              |              |                  | 1.43<br>1.45 |   |          |            |                | 0.70 1<br>0.70 1 |       | 340.3<br>377.2 |              |                  |       |                | Non-Liq.                 |                | 0.00         |
| 41.83          | 466.57   | 3.92         | 0.84         | 110        | 1.622          |                |              |              |              |                  | 1.45         |   |          |            |                |                  |       | 388.6          |              |                  |       |                | Non-Liq. 1<br>Non-Liq. 1 |                | 0.00         |
| 41.99          | 524.35   | 3.52         |              | 110        |                | 834            | 0.67         | 0.50         | 0.81         | 398,53           | 1,36         |   | 1 '      | 100 1      | .00 (          | 0.70 1           | .10 4 | 436.4          | 0.93         | Infin.           | 0.000 | 0.746          | Non-Liq. 1               | Non-Liq        | 0.00         |
|                | 610.77<br>716.25   | 2.62<br>0.00 |              |            |                |                |              |              |              |                  | 1.17<br>2.75 |   | 1 '      |            | 1.00 (<br>1.00 | J. 70 1          | .10 6 | 0.80           | 0.93<br>0.97 | Infin.           |       |                | Non-Liq. 1<br>Non-Liq. 1 |                | 0.00<br>0.00 |
| 42.49          | 652.94   | 0.00         | 0.00         | 110        | 1,638          | 829            | 0.00         | 0.83         | 0.70         | 429 16 2         | 2.73         |   | 0        | 1          | .00            |                  |       |                | 0.97         |                  |       |                | Non-Liq. 1               |                | 0.00         |
| <b>∥</b> 42.65 | 696,03   | 0.00         | 0.00         | 110        | 1,642          | 827            | 0,00         | 0,83         | 0,69         | 455.52 2         | 2.74         |   | 0        | 1          | .00            |                  |       |                | 0.96         |                  |       |                | Non-Liq. 1               |                | 0.00         |
|                |  |              |              |            |                |                |              |              |              |                  |              |   |          |            |                |                  |       |                |              |                  |       |                |                          |                |              |

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-6A Plot: 6 (feet) EARTHQUAKE INFORMATION: Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF 2.1 Magnitude: Clean Sand Qc1n = CQ\*KC\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab Total PGA, g: 0.75 0.97 Use Tokimatsu & Seed (0) or Ishihara &Yoshmine (1): Avg Induced MSF Unit Weight of unsaturated soils: 110 pcf Required SF 1.50 3% Subsidence GWT, feet: Unit Weight of saturated soils: 110 pcf 20.0 Min SF of Liquefiable Layers: 0.27 Мах (inches) Design GWT, feet: 8.0 Limiting Ic for liquefiable soils: 2.60 Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 0.02 99% 0.3 Friction Friction Eff.Stress Layer Tip Total Liquef Clean Induced Liquefac. Volumetric Qc at Midot Depth Fs Ratio Unit Wt. Suscept Dens Corrected Н Sand FO M = 7.5Safety Probab. Strain (feet) (tsf) (tsf) % (pcf) p'o (tsf) Oc1n (0 or 1) Dr (%) Qc1n CRR<sub>7.5</sub> CRR (m) CSR Factor 0.21 0.16 6.69 0.01 110 0.009 1,000 0.21 0.76 1.70 10.74 2.50 1.00 1.00 10.7 0.059 1.00 0.059 0.485 Non-Liq. Non-Liq 0.00 0.33 14.12 0.04 0.28 110 0.018 1.000 0.28 0.67 1.70 22.66 2.22 15 1.00 1.00 22.7 1.00 0.069 0.069 0.485 Non-Lia, Non-Lia 0.00 0.4916.59 0.09 0.55 110 0.027 1.000 0.56 0.69 1:70 26.61 2.26 22 1,83 1,00 48.7 1.00 0.091 0.091 Non-Liq. Non-Liq. 0.00 0.66 21.13 0.18 0.84 110 0.036 1.000 0.84 0.68 1:70 33.89 2 25 32 1.81 1:00 61.3 1,00 0.101 0.101 0.485 Non-Liq. Non-Liq. 0.00 0.82 0.98 0.045 1.000 0.98 29.41 0.29 110 0.66 1:70 47.18 2.17 46 1.59 1:00 75.1 1.00 0.119 0.119 0.485 Non-Liq. Non-Liq. 0.00 0.98 35.60 0.35 0.99 110 0.054 1,000 0.99 0.64 1.70 57.12 2:10 54 1.46 1.00 83.2 1.00 0.134 0.134 0.485 Non-Liq. Non-Liq. 0.00 1\_15 34.08 0.35 1.03 0.063 0.999 1.03 0.65 1.70 54.66 52 2.13 1.51 1,00 82,3 1.00 0.132 0.132 0.484 Non-Liq. Non-Liq 0.00 1.03 1\_31 34.08 0.35 0.072 0.999 54.64 110 1.04 0.65 1.70 2.13 1.51 1.00 82.3 1,00 0.132 0.132 0.484 Non-Lia, Non-Lia 0.00 1.48 30.11 0.331.11 110 0.081 0.999 1.11 0.66 1.70 48.25 2.19 47 1.64 1,00 79,2 1,00 0.126 0.126 0.484 Non-Liq. Non-Liq. 0.00 72.8 1.64 28.15 0.27 0.96 110 0.090 0.998 0.96 0.66 1.70 45.09 2.18 44 1.62 1.00 1.00 0.116 0.116 0.484 Non-Liq. Non-Liq. 0.00 1.80 29.07 0.35 1.20 0.099 110 0.998 1.20 0.67 1.70 46.55 2.22 45 1.72 1.00 80.2 1.00 0.128 0.128 0.484 Non-Liq. Non-Liq. 0.00 1.97 0.39 1.47 0.108 0.998 110 1.48 0.70 1.70 41\_91 2.31 41 1.99 1.00 83.4 1.00 0.134 0.134 0.484 Non-Liq. Non-Liq. 0.00 2.13 20.41 0.42 2.07 0.117 0.997 2.08 0.75 1.70 32.61 2 49 30 2.72 1.00 88.5 1.00 0.145 0.145 0.483 Non-Liq. Non-Liq 0.00 2.30 15 45 0.44 2.83 110 0.997 0.126 2.85 0.81 1.70 24.62 2.67 0 1.00 0.483 Non-Lia, Non-Lia 0.00 2.46 12.62 0.37 2.95 110 0.135 0.996 2.98 0.83 1.70 20.06 2.75 0.483 Non-Liq. Non-Liq. 0.00 2.62 13.50 0.27 2.01 110 0.144 0.996 2.04 0.80 1.70 21.46 2.63 0 1.00 0.483 Non-Liq. Non-Liq. 0.00 2,79 0.483 20.18 0.31 1.56 110 0.153 0.996 1.57 Non-Liq. Non-Liq. 0.73 1 70 32 18 2 42 30 2.39 1.00 77 N 1.00 0.123 0.123 0.00 2,95 25,28 1.23 0.162 0.995 110 1.23 0.69 1.70 40.36 2.28 39 1.88 1.00 76.0 1.00 0.121 0.121 0.482 Non-Liq. Non-Liq. 0.00 3.12 31.76 0.36 1.12 0.171 0.995 1.13 0.66 1.70 50.76 2.18 49 1.61 1.00 81.6 1\_00 0.131 0.131 0.482 Non-Liq. Non-Liq. 0.00 3.28 35.56 0.38 0,180 0.994 1.08 110 1.09 0.65 1.70 56.85 2.13 53 1.50 1.00 85.5 1.00 0.138 0.138 0.482 Non-Lig. Non-Lig. 0.00 58 3.44 40.16 0.39 0.98 110 0.1890.994 0.98 0.63 1.70 64,22 2.06 1.38 1.00 88.8 1.00 0.145 0 145 0.482 Non-Liq. Non-Liq. 0.00 3.61 45.45 0.46 1.00 110 0.1980.994 1.01 0.61 1.70 72.71 2.02 64 1.33 1.00 96.5 1.00 0.482 0.164 0.164 Non-Liq. Non-Liq. 0.00 3.77 52.79 0.51 0.208 0.993 0.97 0.96 110 0.60 1.70 84.49 1.96 70 1.25 0.65 1.12 118.5 1:00 0.235 0.235 0.482 Non-Liq. Non-Liq. 0.00 3.94 58.72 0.56 0.95 0.993 110 0.217 0.95 0.58 1.70 94.00 1.92 74 1.20 0.70 1.12 127.1 1.00 0.271 0.271 0.481 Non-Liq. Non-Liq. 0.00 4.10 64,33 0.60 0.94 110 0.226 0.993 0.94 0.57 1.70 103.00 78 1.88 1:17 0.75 1.12 135.7 1.00 0.312 0.312 0.481 Non-Liq. Non-Liq. 0.00 0,235 4.27 69 66 0.83 1.19 110 0.992 1.19 0.59 1:70 111,55 1.93 81 1.21 0.80 1.12 1.00 0.406 151.9 0.406 0.481 Non-Lig. Non-Lig. 0.00 4.43 74.65 1.28 1.71 110 0.244 0.992 1.72 0.61 1.70 119.56 2.01 84 1.32 1.00 157.6 1.00 0.444 0.444 0.481 Non-Liq. Non-Liq. 0.00 4.59 78.74 1.54 2.11 2.68 110 0.253 0.991 2 69 0.65 1.70 126 11 2 14 86 1.00 0.481 194.3 1.00 Infin. 0.000 Non-Liq. Non-Liq. 0.00 4.76 95.41 2.01 Infin. 2.11 0.991 110 0.262 2.12 0.61 1.70 152.88 2.01 94 1.31 1.00 200.9 1:00 0.0000.480 Non-Liq. Non-Liq. 0.00 4.92 90.35 1.38 1.53 110 0.271 0.991 1.54 0.58 144.74 1.70 92 1.00 1.92 1.21 1.00 175.8 1.00 Infin. 0.000 0.480 Non-Liq. Non-Liq. 0.00 5.09 0.57 73.79 0.78 110 0.280 0.990 0.78 0.54 1.70 118.12 1.79 84 1,10 1.05 1.00 130.0 1.00 0.285 0.285 0.480 Non-Liq. Non-Liq. 0.00 0.54 5 25 64.99 0.41 0.63 0.990 0.63 110 0.289 1,70 103.96 1.78 78 1.09 1.10 1.00 0.216 0.216 1.00 113.6 0.480 Non-Lia, Non-Lia 0.00 5 41 60.11 0.48 0.80 110 0.298 0.989 0.81 0.57 1.70 96.11 1 87 75 1.16 1.15 1.00 1.00 0.210 0.480 Non-Liq. Non-Liq. 0.00 5.58 57.62 0.71 1.23 110 0.307 0.989 1 24 0.61 1.70 92.09 2.00 73 1.30 1.20 1.00 120.0 0.241 1.00 0.241 0.479 Non-Liq. Non-Liq. 0.00 60.32 0.70 5.74 1.16 110 0.316 0.989 1.16 0.60 1.70 96.42 1.97 75 1.26 1.25 1.00 121.7 1.00 0.247 0.247 0.479 Non-Lig. Non-Lig. 0.00 5.91 59.79 0.67 0.988 110 0.325 1.12 0.60 95.55 1.70 1.96 75 1.25 1.30 1.00 119.7 1.00 0.239 0.239 0.479Non-Liq. Non-Liq. 0.00 56,99 6.07 0.42 0.74 110 0.334 0.988 0.75 0.57 1.70 91.04 73 1.86 1.35 1.16 1.00 105.8 1.00 0.190 0.190 0.479 Non-Liq. Non-Liq. 0.00 6.23 64.88 0.50 0.77 110 0.343 0.988 0.77 0.56 1.70 103.70 1.83 78 1.13 1 40 1.00 117.4 0.479 1.00 0.230 0.230 Non-Lia, Non-Lia, 0.00 6.40 81.28 0.52 0.64 110 0.352 0.987 0.64 0.52 130.04 88 1.70 1.70 1.04 1.45 1.00 135.6 1.00 0.312 0.312 0.479 Non-Liq. Non-Liq. 0.00 6.56 110 88.72 0.58 0.65 0.361 0.987 0.66 0.51 1.70 141.98 1.68 91 1.02 1.50 1.00 145.7 0.368 0.368 0.478 1.00 Non-Liq. Non-Liq. 0.00 6.73 90.02 0.70 0.78 0.370 0.986 110 0.78 0.52 1.70 144.05 1.72 92 1.05 1.55 1.00 151 9 1.00 0.406 0.406 0.478 Non-Liq. Non-Liq. 0.00 95.98 0.75 0.78 110 0.379 0.986 0.79 0.52 1.70 153.61 1.70 1.04 95 1.60 1.00 160.1 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 106.17 0.82 7.05 0.77 110 0.388 0.986 0.77 0.51 1.67 166.59 1.02 1.67 98 1.65 1.00 170.1 1.00 Infin. 0.000 0.478 Non-Lia, Non-Lia 0.00 120.42 0.87 0.72 0.397 7.22 110 0.985 0.72 0.50 1.63 185.20 1.62 100 1.00 1.70 1.00 185,9 0.478 1.00 0.000 Non-Lia. Non-Lia. Infin. 0.00 7.38 147.55 0.97 0.66 110 0.406 0.985 0.66 0.50 1.61 224.51 1.00 1,75 1.53 100 1.00 225.3 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 7.55 167.64 1.10 0.66 110 0.415 0.985 0.66 0.50 1.60 252.36 1.49 100 1.00 1.80 1.00 253.3 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 167.64 7.71 0.66 1.10 110 0.424 0.984 0.66 0.50 1.58 249.65 1.49 100 1:00 1.85 1.00 250.6 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.87 0.70 110 0.433 0,984 0.70 0.50 1,56 259.28 1.50 1.00 100 1.90 1.00 260.3 1.00 Infin. 0.000 0.477Non-Liq. Non-Liq. 0.00 183.17 1,23 8.04 0.67 110 0.442 0.984 0.67 0.50 1.55 267.18 1.48 100 1.00 1.95 268.2 1.00 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 8.20 189 37 0.94 0.50 110 0.451 0.983 274.5 0.50 0.50 .53 273.46 1.38 100 1.00 2.00 1.00 1.00 0.000 0.481 Infin. Non-Lia, Non-Lia, 0.00 8 37 193 49 1.24 0.64 110 0.460 0.983 0.64 0.50 1.52 276.65 2.05 1.45 100 1.00 1.00 277.7 1,00 Infin. 0.000 0.486 Non-Liq. Non-Liq. 0.00 1.00 8.53 194.51 1.46 0.75 110 0.469 0.982 0.75 0.50 1.50 275.42 1.51 100 1.00 2.10 276.4 Infin 1.00 0.000 0.491 Non-Liq. Non-Liq. 0.00 1.50 8.69 195.90 0.77 Infin 0.478 0.982 110 0.77 0.50 1.49 274.75 1.51 100 1.00 2 15 1.00 275.8 1.00 0.000 0.496 Non-Liq. Non-Liq. 0.00 8.86 199.53 1.67 0.84 110 0.487 0.982 277.23 0.84 1.47 0.50 1.54 100 1.00 2.20 1.00 278.3 1.00 Infin. 0.000 0.501 Non-Liq. Non-Liq. 0.00 9.02 202.65 1.56 0.77 110 0.496 0.981 0.77 0.50 1.46 279.00 1.51 100 1.00 1.00 2.25 280.0 Non-Lig. Non-Lig. 1.00 Infin. 0.000 0.506 0.00 204 68 1.62 0.79 0.505 0.981 0.80 280.3 9.19 110 0.50 1.45 279 26 1.52 100 1.00 2.30 1.00 1.00 0.000 0.510 Infin. Non-Lia, Non-Lia 0.00 9.35 192.88 1.56 0.81 110 0.514 0.981 0.81 0.50 1.43 260.79 1.54 100 1.00 2.35 1.00 261.8 1.00 Infin. 0.000 0.515 Non-Lia, Non-Lia 0.00 1.00 9.51 173.28 1.31 0.75 110 0.523 0.980 0.76 0.50 1.42 232.18 1 56 1.00 2.40 233.0 100 1\_00 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 160,53 9,68 1.12 0.70 110 0.532 0.980 0.70 0.50 1.41 213.20 1.56 100 1.00 2.45 1.00 214.0 1.00 Infin 0.000 0.524 Non-Liq. Non-Liq. 0.00 9.84 160,48 0.98 0.61 0.541 0.980 110 0.61 0.50 1,40 211.34 1.53 100 1.00 2.50 1.00 212.1 1.00 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 167.93 10.01 0.95 0.57 110 0.550 0.979 0.57 0.50 1 39 219.35 1.49 1.00 2.55 100 1.00 220.2 1.00 Infin. 0.000 0.533 Non-Liq. Non Liq. 0.00 179 44 1 12 0.62 0.559 10.17 110 0.979 0.62 0.50 1,38 232.52 1.50 100 1.00 2.60 1:00 233.4 0.000 1.00 Infin. 0.537 Non-Lig. Non-Lig. 0.00 10.33 196.39 1.47 0.75 110 0.568 0.979 0.75 0.50 1:36 252.52 1.53 1.00 2.65 1.00 253.5 1.00 0.000 0.541 Infin. Non-Lig, Non-Lig 0.00 212.87 1.68 10.50 0.79 110 0.577 0.978 0.79 0.50 1.35 271.61 1.52 1.00 2.70 1.00 272.6 100 1.00 Infin 0.000 0.545 Non-Liq. Non-Liq. 0.00 1.72 10.66 218.59 0.586 1.00 0.79 110 0.978 0.79 0.50 1.34 276.76 1.52 100 1\_00 2.75 277.8 1.00 0.000 0.550 Non-Liq. Non-Liq. Infin. 0.00 10.83 219.09 0.67 110 0.595 0.978 0.67 0.50 1.33 275.28 1.47 100 1.00 2.80 1.00 276.3 1.00 Infin: 0.000 0.554 Non-Liq. Non-Liq. 0.00 218.78 1.57 10.99 110 0.604 0.977 0.72 0.50 1.32 272.81 1.49 100 1.00 2.85 1.00 273.8 1.00 Infin. 0.000 0.557 Non-Liq. Non-Liq. 0.00 227 29 1.90 11,15 0.84 110 0.614 0.977 0.84 0.50 1.31 281.35 1.53 100 1.00 282.4 2.90 1.00 1.00 Infin. 0.000 0.561 Non-Lia, Non-Lia 0.00 1.30 11.32 240.17 1.92 0.80 110 0.623 0.977 0.80 0.50 295.17 .50 100 1.00 1.00 296.3 1.00 Infin. 0.000 0.565 Non-Lig. Non-Lig. 0.00 222 62 11.48 1.81 0.81 110 0.632 0.976 0.82 0.50 1.29 271.57 1.53 1.00 3.00 1.00 272.6 100 1.00 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.00 216.62 11.65 2.13 Infin 0.98 110 0.641 0.976 0.98 0.50 1.29 262.35 1.61 100 1.00 3.05 1.00 263.3 1.00 0.000 0.572 Non-Lig. Non-Lig. 0.00 11.81 220.47 2.23 1.01 0.650 110 0.975 1.01 0.50 1.28 265-16 1.61 100 1.00 3.10 1.00 266.1 1.00 Infin. 0.000 0.576 Non-Liq. Non-Liq. 0.00 11.98 211.90 2.36 110 0 659 0.975 1.12 0.50 1.27 253.63 1.66 100 1.01 3,15 1.00 256.5 1.00 Infin. 0.000 0.580 Non-Lig. Non-Lig. 0.00 12.14 218.21 2.15 0.99 0.668 0.975 110 0.99 0.50 1.26 258 84 1.61 100 1.00 3.20 1.00 259.8 1.00 Infin. 0.000 0.583 Non-Lia, Non-Lia, 0.00 12.30 217.25 1.71 0.79 110 0.677 0.974 0.79 0.50 1.25 255.96 1.54 100 1.00 3.25 1.00 256.9 1.00 Infin 0.000 0.587 Non-Liq. Non-Liq. 0.00 227,19 12.47 1.31 0.58 110 0.686 0.974 0.58 0.50 1.24 265.93 1.43 100 1.00 3.30 1.00 266.9 1.00 Infin. 0.000 0.590 Non-Liq. Non-Liq. 0.00 12.63 246.00 1:35 0.55 0.695 0.974 110 0.55 0.50 1.23 286.13 1.40 100 1.00 3.35 1.00 287.2 1.00 Infin. 0.0000.503 Non-Liq. Non-Liq 0.00 271.55 0.81 110 0.704 0.973 0.81 0.50 1.23 313.89 1.49 1 100 1.00 3.40 1.00 315.1 1.00 Infin. 0.000 0.597 Non-Liq. Non-Liq. 0.00

| Laye           | r Tip            | Friction     | n Friction   | Total      | Eff.Stres:     | n              |              |              |              |                  |              | G 15 | auof D              |              |              | _     | Cla                |                  |                    | _              | In discourse   |  |                      |                     |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|------|---------------------|--------------|--------------|-------|--------------------|------------------|--------------------|----------------|----------------|--|----------------------|---------------------|
| Dept           |                  | Fs           | Ratio        |            |                | 5              |              |              |              | Corrected        |              | U    | quef. R<br>scept De |              |              | 4     | Cle<br>Sa          |                  |                    | EQ             | M=7.5          | Liquefac<br>Safety   |                      | Volumetri<br>Strain |
| (feet          |                  | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Ca           | Qc1n             | Ic           | 5    | or 1) Dr            |              |              |       | K <sub>H</sub> Qc  |                  | CRR <sub>7</sub>   |                | CSR            | Factor   | P                    | (%)                 |
| 12.96          |                  | 2.19         | 0.73         | 110        | 0.713          | 0.973          | 0.74         | 0.50         | 1.22         | 343.15           | 1,43         |      | 1 10                |              | 0 3,4        | 45 1  | 00 344             |                  | Infin.             | 0,000          | 0.600          | The state of the s | Non-Lig              | 0.00                |
| 13 12          |                  | 2.53<br>2.68 | 0.85         | 110<br>110 | 0.722<br>0.731 | 0.973<br>0.972 | 0.85<br>0.90 | 0.50<br>0.50 | 1.21         | 339.26<br>337.23 | 1.49<br>1.51 |      | 1 10                | 120          |              |       | 00 340             |                  |                    | 0,000          | 0,603          |  | Non-Liq              | 0.00                |
| 13.45          |                  | 2.66         | 0.89         | 110        | 0.740          | 0.972          | 0.89         | 0.50         | 1.20         | 337.23           | 1.50         |      | 1 10                |              |              |       | 00 338             |                  |                    | 0.000          | 0,606<br>0,609 |  | Non-Liq<br>Non-Liq   | 0.00<br>0.00        |
| 13.62          |                  | 2.65         | 0.88         | 110        | 0.749          | 0.972          | 0.89         | 0.50         | 1.19         | 335,60           | 1,50         |      | 1 10                | 100          | 0 3.6        |       | 00 336             |                  |                    | 0.000          | 0.612          | -  | Non-Liq              | 0.00                |
| 13.78          |                  | 3.11         | 1.06<br>1.03 | 110<br>110 | 0.758<br>0.767 | 0.971<br>0.971 | 1.06<br>1.03 | 0.50<br>0.50 | 1.18         | 327 01<br>330 12 | 1.57<br>1.56 |      | 1 10<br>1 10        |              | . 1791       |       | 00 328             |                  |                    | 0.000          | 0,615          |  | Non-Liq              | 0.00                |
| 14 11          |                  | 3.04         | 1.01         | 110        | 0.776          | 0.971          | 1.03         | 0.50         | 1.17         | 332 29           | 1.55         |      | 1 10<br>1 10        |              |              |       | 00 331             |                  |                    | 0.000          | 0.618<br>0.621 |  | Non-Liq<br>Non-Liq   | 0.00<br>0.00        |
| 14.27          |                  | 3.68         | 1.23         | 110        | 0.785          | 0,970          | 1.24         | 0.50         | 1.16         | 326,64           | 1.62         |      | 1 10                |              |              |       | 00 327             |                  |                    | 0.000          | 0.624          |  | Non-Liq              | 0.00                |
| 14.44          |                  | 2.74         | 0.91<br>0.89 | 110<br>110 | 0.794<br>0.803 | 0.970<br>0.970 | 0.91<br>0.89 | 0.50<br>0.50 | 1.15         | 327.53<br>341.43 | 1.52<br>1.50 |      | 1 10                |              |              |       | 00 328             |                  |                    | 0,000          | 0.627          |  | Non-Liq.             | 0.00                |
| 14.76          |                  | 3.04         | 0.97         | 110        | 0.812          | 0.969          | 0.97         | 0.50         | 1.14         | 337.45           | 1,53         |      | 1 10                |              |              |       |                    | 7 1.00           |                    | 0.000          | 0 629<br>0 632 |  | Non-Liq.<br>Non-Liq. | 0.00<br>0.00        |
| 14.93          |                  | 3.47         | 1.08         | 110        | 0.821          | 0,969          | 1.08         | 0.50         | 1.14         | 345.00           | 1,56         |      | 1 10                |              |              |       | 00 346             | 3 1.00           | Infin.             | 0,000          | 0.635          | Non-Liq.   | Non-Liq.             | 0.00                |
| 15.09<br>15.26 |                  | 3.51         | 1.04<br>0.96 | 110<br>110 | 0,830<br>0,839 | 0,969          | 1.05<br>0.96 | 0.50<br>0.50 | 1.13         | 357.81<br>342.62 | 1,54<br>1,52 |      | 1 10<br>1 10        |              |              |       | 00 359<br>00 343   |                  |                    | 0,000          | 0.637          |  | Non-Liq.             | 0.00                |
| 15.42          |                  | 3.08         | 0.97         | 110        | 0.848          | 0,968          | 0.97         | 0.50         | 1.12         | 334.75           | 1,53         |      | 1 10                |              |              |       | 00 336             |                  |                    | 0.000          | 0,640<br>0,643 |  | Non-Liq.<br>Non-Liq. | 0.00<br>0.00        |
| 15.58          |                  | 3.08         | 0.96         | 110        | 0.857          | 0.967          | 0.96         | 0.50         | 1.11         |                  | 1,53         |      | 1 10                |              |              |       |                    |                  |                    | 0,000          | 0.645          |  | Non-Liq              | 0.00                |
| 15.75<br>15.91 |                  | 2.97<br>3.02 | 0.96<br>0.96 | 110<br>110 | 0.866<br>0.875 | 0.967<br>0.967 | 0.96<br>0.96 | 0.50<br>0.50 | 1.11         | 323 47<br>325 51 | 1,54<br>1,54 |      | 1 10<br>1 10        | 7.0          |              |       | 00 324<br>00 326   |                  |                    | 0,000          | 0.648<br>0.650 | Non-Liq.   |                      | 0.00                |
| 16.08          | 315.60           | 2.97         | 0.94         | 110        | 0.884          | 0.966          | 0.94         | 0.50         | 1.09         |                  | 1.53         |      | 1 10                |              | 1.0          |       | 00 326             |                  |                    | 0.000          | 0.653          |  | Non-Liq<br>Non-Liq   | 0.00<br>0.00        |
| 16 24          |                  | 2.77         | 0.85         | 110        |                | 0.966          | 0.85         |              | 1.09         | 335.73           | 1,49         |      | 1 10                |              |              |       |                    |                  |                    | 0,000          | 0.655          | Non-Liq.   | Non-Liq              | 0.00                |
| 16.40<br>16.57 |                  | 2.94         | 0.89         | 110<br>110 |                | 0.966<br>0.965 | 0.90<br>0.82 | 0.50<br>0.50 | 1.08         | 334,91<br>362,96 | 1.51<br>1.45 |      | 1 10<br>1 10        |              |              |       | 00 336<br>00 364   |                  |                    | 0.000          | 0.657<br>0.660 | Non-Liq.   |                      | 0.00<br>0.00        |
| 16.73          | 379,84           | 3.02         | 0.80         | 110        |                | 0.965          | 0.80         |              | 1.07         |                  | 1.43         |      | 1 10                |              |              |       | 00 385             |                  |                    | 0.000          | 0.662          | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 16.90<br>17.06 |                  | 4.35<br>3.67 | 1.11<br>0.93 | 110<br>110 |                | 0.965          | 1.11         |              | 1.07         |                  | 1.54         |      | 1 10                |              |              |       |                    |                  |                    | 0,000          | 0.664          | Non-Liq.   | Non-Liq              | 0.00                |
| 17.00          |                  | 3.66         | 0.93         | 110        |                | 0.964          | 0.93<br>0.91 |              | 1.06<br>1.06 |                  | 1,48         |      | 1 10<br>1 10        |              |              |       |                    |                  |                    | 0,000          | 0.666<br>0.669 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 17,39          |                  | 3.06         | 0.80         | 110        | 0.956          | 0,963          | 0.80         | 0.50         | 1.05         |                  | 1.43         |      | 1 10                |              |              |       |                    |                  |                    | 0,000          | 0.671          | Non-Liq.   |                      | 0.00                |
| 17.55<br>17.72 |                  | 2.70<br>3.76 | 0.64<br>0.88 | 110<br>110 |                | 0.963          | 0.65         |              | 1.05         |                  | 1,34         |      | 1 10                |              |              |       |                    |                  |                    | 0,000          | 0.673          | Non-Liq.   |                      | 0.00                |
| 17.72          | 438.49           | 4.30         | 0.98         | 110        |                | 0.962          | 0.88<br>0.98 |              | 1.04<br>1.04 |                  | 1.44<br>1.47 |      | 9)                  |              |              |       |                    |                  |                    | 0.000          | 0.675<br>0.677 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 18.04          | 459.63           | 3.50         | 0.76         | 110        | 0.992          | 0.962          | 0.76         | 0.50         | 1.03         |                  | 1.37         |      |                     |              |              |       |                    |                  |                    | 0.000          | 0.679          | Non-Liq.   |                      | 0.00                |
| 18.21<br>18.37 | 446,70<br>433.53 | 3.76<br>3.52 | 0.84<br>0.81 | 110<br>110 |                | 0.962          | 0.84         |              | 1.03         |                  | 1.42         |      |                     |              |              |       |                    |                  |                    | 0.000          | 0.681          | Non-Liq.   | Non-Liq.             | 0.00                |
| 18.54          | 420.70           | 4.05         | 0.96         | 110        |                | 0.961<br>0.961 | 0.81<br>0.96 |              | 1.02<br>1.02 |                  | 1.41<br>1.48 |      | 1 10                |              |              |       |                    |                  | Infin,:<br>Infin,: | 0,000          | 0.683<br>0.685 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 18 70          | 427.38           | 4.04         | 0.95         | 110        | 1.029          | 0,960          | 0.95         | 0.50         | 1.01         | 408.71           | 1.47         |      | 10                  |              |              |       |                    |                  | Infin              | 0.000          | 0.687          | Non-Liq.   |                      | 0.00                |
| 18.86<br>19.03 | 433,11           | 4.37         | 1.01<br>0.99 | 110<br>110 |                | 0,960          | 1.01<br>0.99 |              | 1.01<br>1.01 |                  | 1.49         |      |                     |              |              |       |                    |                  | Infin              | 0.000          | 0,689          | Non-Liq.   |                      | 0.00                |
| 19.19          | 382.11           | 4.15         | 1.09         | 110        |                | 0.959          | 1.09         |              | 1.00         |                  | 1.51<br>1.55 |      |                     | 10,70,0      | 1,0          |       |                    |                  | Infin<br>Infin     | 0.000          | 0.691<br>0.692 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 19 36          | 381.05           | 4.09         | 1.07         | 110        |                | 0.959          | 1.08         | 0.50         | 1.00         | 358.03           | 1.55         | - 3  |                     |              |              |       |                    |                  | Infin              | 0.000          | 0.694          | Non-Liq.   |                      | 0.00                |
| 19.52<br>19.69 | 379.85<br>382.89 | 4.12<br>4.14 | 1.08         | 110<br>110 |                | 0.958<br>0.958 | 1.09<br>1.08 |              | 0.99<br>0.99 |                  | 1.56<br>1.55 |      |                     |              |              |       |                    |                  | Infin.             | 0.000          | 0.696          | Non-Liq.   |                      | 0.00                |
| 19.85          | 384.60           | 3.97         | 1.03         | 110        |                | 0.957          |              |              | 0.98         |                  | 1.54         |      |                     |              |              |       |                    |                  | Infin.             | 0.000          | 0.698<br>0.699 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 20.01          | 377.72           | 4.35         | 1.15         | 110        |                | 0.957          |              |              | 0.98         |                  | 1.58         |      |                     |              | 5.2          | 0 1.0 | 00 350             | 3 1.00           | Infin.             | 0.000          | 0.701          | Non-Liq.   |                      | 0.00                |
| 20.18          | 371.25<br>361.72 | 4.23         | 1.14<br>1.14 | 110<br>110 |                | 0.957<br>0.956 |              |              | 0.98<br>0.98 |                  | 1.58<br>1.59 |      |                     |              |              |       |                    |                  | Infin.<br>Infin.   | 0.000          | 0.703<br>0.704 | Non-Liq.   |                      | 0.00                |
| 20.51          | 347.60           | 4.05         | 1.16         | 110        |                | 0.956          |              |              | 0.97         |                  | 1.61         | 9    |                     |              |              |       |                    |                  | Infin.             | 0.000          | 0.704          | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 20.67          | 339.34           | 3.76         | 1.11         | 110        |                | 0.955          |              |              | 0.97         |                  | 1.60         | 1    |                     |              |              |       |                    |                  | Infin.             | 0.000          | 0.708          | Non-Liq.   | Non-Liq.             | 0.00                |
| 20.83          | 332.14<br>334.58 | 3.55         | 1.07<br>0.94 | 110<br>110 |                | 0.955<br>0.954 |              |              | 0.97<br>0.97 |                  | 1.59<br>1.55 |      |                     |              |              |       |                    |                  | Infin.<br>Infin.   | 0.000          | 0.709<br>0.711 | Non-Liq.   | 50                   | 0.00                |
| 21.16          | 327.20           | 2.80         | 0.86         | 110        |                | 0.954          |              |              | 0.97         |                  | 1.52         | 9    |                     |              |              |       |                    |                  | Infin.             | 0.000          | 0.712          | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 21.33          | 310,59<br>293,79 | 2.46         | 0.79         | 110<br>110 |                | 0.954<br>0.953 |              |              | 0.97         |                  | 1.51         |      |                     |              | -            |       |                    |                  | Infin:             | 0.000          | 0.714          | Non-Liq.   | •                    | 0.00                |
| 21.45          | 272.37           | 1.43         | 0.52         | 110        |                |                |              |              | 0.96<br>0.96 |                  | 1.46<br>1.43 | 1    | 100                 |              |              |       |                    |                  | Infin.<br>Infin.   | 0.000          | 0.715<br>0.717 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 21.82          | 224.93           | 2.27         | 1.01         | 110        |                |                | 1.01         | 0.51         | 0.96         |                  | 1.69         | 1    |                     |              |              |       |                    | 1 1.00           | Infin              | 0.000          | 0.718          | Non-Liq.   |                      | 0.00                |
| 21.98<br>22.15 | 164.58<br>113.74 | 3.51<br>3.46 | 2.13<br>3.04 | 110<br>110 |                | 0.952<br>0.951 | 2.15<br>3.07 |              | 0.95         |                  | 2.03         | 1    | 93                  | 1.34         |              | 1.0   |                    |                  | Infin.             | 0.000          | 0.719          | Non-Liq.   |                      | 0.00                |
| 22.31          | 96,23            | 3.59         | 3.73         | 110        |                |                |              |              | 0.94<br>0.94 |                  | 2.25<br>2.37 | 1    |                     | 1,81<br>2,19 |              | 1.0   |                    | 7 1.00           | Infin.             | 0.000          | 0.721<br>0.722 | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 22.47          | 51.22            | 2.75         | 5.37         | 110        |                |                |              |              | 0.93         | 43.86            | 2.68         | C    | )                   |              |              |       |                    | 1.00             |                    |                | 0.724          | Non-Liq.   |                      | 0.00                |
| 22.64<br>22.80 | 53.23<br>95.82   | 1.95<br>1.58 | 3.66<br>1.65 | 110<br>110 |                |                |              |              | 0.93<br>0.94 |                  | 2.55<br>2.11 | 1    |                     | 3.02<br>1.48 |              | 1.0   |                    | 0 1.00<br>3 1.00 | 0.324<br>0.258     | 0.324<br>0.258 | 0,725<br>0,726 | 0.45   | 93%                  | 1.05                |
| 22.97          | 193,72           | 2.53         | 1.30         | 110        |                |                |              |              |              |                  | 1.82         | 3    |                     | 1.12         | 1.00         |       |                    | 5 1.00           | Infin              | 0.000          | 0.726          | 0.36<br>Non-Liq.   | 97%<br>Non-Lig       | 1.20<br>0.00        |
| 23.13<br>23.29 | 228.65<br>278.92 | 2.09         | 0.91<br>1.02 | 110        |                |                |              |              |              |                  | 1.66         | 1    |                     | 1.01         |              |       |                    | 2 1.00           | Infin.             | 0.000          | 0.729          | Non-Liq.   | Non-Liq.             | 0.00                |
| 23.46          | 376.36           | 2.41         | 0.64         | 110<br>110 |                |                |              |              | 0.95<br>0.94 |                  | 1.63<br>1.40 | 1    |                     | 1.00         |              |       |                    | 4 1.00<br>3 1.00 | Infin.<br>Infin.   | 0.000          | 0.730<br>0.731 | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 23,62          | 310.45           | 2.46         | 0.79         | 110        | 1.189          | 0.947          | 0.80         | 0.50         | 0.94         | 275.76           | 1.52         | 1    |                     | 1.00         |              |       |                    | 3 1.00           | Infin.             | 0.000          | 0.732          | Non-Liq.   |                      | 0.00                |
| 23,79<br>23,95 | 306.26<br>308.85 | 2.29         | 0.75         | 110<br>110 |                |                |              |              |              |                  | 1.51<br>1.50 | 1    |                     | 1.00         |              |       |                    |                  | Infin.             | 0.000          | 0.733          | Non-Liq.   |                      | 0.00                |
| 24.11          | 306.71           | 2.22         | 0.73         | 110        |                |                |              |              |              |                  | 1.50         | 1    |                     | 1.00         |              |       |                    | 1 1.00           | Infin<br>Infin     | 0.000          | 0.735<br>0.736 | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 24.28          | 307.77           | 2.19         | 0.71         | 110        |                |                |              |              | 0.94         | 271.58           | 1.49         | 1    | 100                 | 1.00         | 1.40         | 0.1   | 0 272.             | 3 1.00           | Infin.             | 0.000          | 0.737          | Non-Liq.   |                      | 0.00                |
| 24.44          | 305.26<br>305.26 | 1.72<br>1.99 | 0.56         | 110<br>110 |                |                |              |              |              |                  | 1.42<br>1.47 | 1    |                     | 1.00         |              |       |                    |                  | Infin              | 0.000          | 0.738          | Non-Liq.   |                      | 0.00                |
| 24.77          | 310.72           | 2.04         | 0.66         | 110        |                |                |              |              |              |                  | 1.47         | 1    |                     | 1.00         |              |       |                    | 1.00             | Infina<br>Infina   | 0.000          | 0.739<br>0.740 | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 24.93          | 312.81           | 1.96         | 0.63         | 110        |                |                |              |              | 0.93         | 274.26           | 1.45         | 1    | 100                 | 1.00         | 1.50         | 0.1   | 0 275.             | 1.00             | Infin.             | 0.000          | 0.741          | Non-Liq.   |                      | 0.00                |
| 25.10<br>25.26 | 329.09<br>344.97 | 2.01<br>1.95 | 0.61<br>0.57 | 110<br>110 |                |                |              |              |              |                  | 1.43         | 1    |                     | 1.00         |              |       |                    | 1.00             | Infin.             | 0.000          | 0.742          | Non-Liq.   |                      | 0.00                |
| 25.43          | 351.08           | 2.30         | 0.65         | 110        | 1.232          |                |              |              |              |                  | 1.39<br>1.43 | 1    | 100                 | 1,00         |              |       |                    | 1.00             | Infin.             | 0.000          | 0.743<br>0.744 | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 25.59          | 363.90           | 2.26         | 0.62         | 110        | 1,236          | 940            | 0.62         | 0.50         | 0.93         | 317.19           | 1.40         | 1    | 100                 | 1.00         | 1.50         | 1.0   | 0 318.             | 1.00             | Infin.             | 0.000          | 0.745          | Non-Liq.   |                      | 0.00                |
| 25.75<br>25.92 | 366.29<br>360.95 | 2.65<br>2.59 | 0.72<br>0.72 | 110<br>110 |                |                |              |              |              |                  | 1.45<br>1.45 | 1    | 100<br>100          | 1.00         |              |       |                    | 1.00             |                    | 0.000          | 0.746          | Non-Liq.   |                      | 0.00                |
| 26.08          | 355,58           | 2.62         | 0.74         | 110        |                |                |              |              |              |                  | 1.45         | 1    | 100                 | 1.00         |              |       |                    | 1 00             |                    | 0.000          | 0.747<br>0.747 | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 26.25          | 351.54           | 2.85         | 0.81         | 110        |                |                |              |              | 0.92         | 304.45           | 1.50         | 1    | 100                 | 1.00         | 1.50         | 1.0   | 0 305.0            | 1.00             | Infin.             | 0.000          | 0.748          | Non-Liq.   | Non-Liq              | 0.00                |
| 26.41<br>26.57 | 345.76<br>331.98 | 2.67<br>2.56 | 0.77<br>0.77 | 110<br>110 |                |                |              |              |              |                  | 1.49<br>1.50 | 1    | 100                 | 1.00         | 1.50         |       |                    | 1.00             |                    | 0.000          | 0,749<br>0,750 | Non-Liq.   |                      | 0.00                |
| 26.74          | 322.29           | 2.19         | 0.68         | 110        | 1.263          | 936            | 0.68         | 0.50         |              |                  | 1.47         | 1    | 100                 | 1.00         | 1.50         |       |                    |                  |                    | 0.000          | 0.750          | Non-Liq.<br>Non-Liq.   |                      | 0.00<br>0.00        |
| 26.90          | 314.01           | 1.96         | 0.62         |            |                |                |              |              |              |                  | 45           | 1    | 100                 | 1.00         | 1.50         | 1.0   | 0 271.             | 1.00             | Infin              | 0.000          | 0.751          | Non-Liq.   | Non-Liq              | 0.00                |
| 27.07          | 312,94<br>297,68 | 1.77<br>2.06 | 0.57         |            |                |                |              |              |              |                  | .43<br>.50   | 1    | 100<br>100          | 1.00         | 1.50<br>1.50 |       |                    | 1.00             |                    | 0.000          |                | Non-Liq.<br>Non-Liq.   |                      | 0.00                |
| 27.40          | 274.32           | 1.97         | 0.72         | 110        | 1,279          | 933            | 0.72         | 0.50         | ).91         | 234.76 1         | .54          | 1    | 100                 | 1.00         | 1.50         |       |                    |                  |                    | 0.000          | 0.754          | Non-Liq.   |                      | 0.00                |
| 27.56<br>27.72 | 243.92<br>203.86 | 1.79         | 0.73         |            |                |                |              |              |              |                  | .58          | 1    | 100                 | 1.00         | 1.50         |       |                    |                  |                    | 0.000          |                | Non-Liq.   | Non-Liq.             | 0.00                |
|                | 128,56           |              | 1.71         |            |                |                |              |              |              |                  | .74<br>2.05  | 4    | 99<br>79            | 1.06<br>1.37 | 1.50         |       | 0 184.4<br>0 146.0 | 1.00             |                    | 0.000<br>0.370 | 0.755<br>0.756 | Non-Liq.<br>0.49   | Non-Liq<br>91%       | 0.00<br>0.91        |
|                |                  |              |              |            |                |                |              |              |              | _                |              | - 11 |                     |              |              |       |                    |                  |                    |                |                |  |                      |                     |

| Layer           | Tìp              | Friction      | Friction     | Total        | Eff.Stres          | s              | _            |              |              |                  |              | οl  | Liquef  | Rel        | _            |              | _    | Clean          | _            |                  |                | Induced        | Liquefac.            |            | Volumetric   |
|-----------------|------------------|---------------|--------------|--------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|-----|---------|------------|--------------|--------------|------|----------------|--------------|------------------|----------------|----------------|----------------------|------------|--------------|
| Depth           | Qc               | Fs            | Ratio        | Unit Wt      | at Midpt           | 0              |              |              | 1000         | Correcte         |              | D S | uscept  | Dens,      |              | H            |      | Sand           |              |                  | EQ             | M=7,5          | Safety               | Probab     | Strain       |
| (feet)<br>28.05 | (tsf)<br>101.99  | (tsf)<br>2.28 | 2 23         | (pcf)<br>110 | p'o (tsf)<br>1,294 | rd<br>0.930    | F<br>2.26    | n<br>0.67    | 0.87         | 93.14            | 2.21         | Ó ( | 0 or 1) |            | 1,69         | (m)          | 1,00 | Qc1n           | Κσ           | CRR75            |                | CSR            | Factor               | Pt         | (%)          |
| 28.22           | 51.11            | 1.80          | 3.51         | 110          | 1.298              | 0.929          | 3.60         | 0.78         | 0.85         | 40 13            | 2.58         |     | 1       | 69<br>39   | 3.19         |              | 1.00 | 140.6<br>128.0 | 1.00         | 0.338            | 0,338<br>0,275 | 0.756<br>0.757 | 0.45<br>0.36         | 93%<br>97% | 1.02<br>1.16 |
| 28.38           | 52.32<br>56.72   | 1.72          | 3.29         | 110<br>110   | 1,302              | 0.929          | 3.37         | 0.77         | 0.85         | 41.07            | 2.55         |     | 1       | 40         | 3.03         |              | 1.00 |                | 1.00         | 0.260            | 0.260          | 0.758          | 0.34                 | 97%        | 1.20         |
| 28.54<br>28.71  | 70.59            | 1.37<br>1.56  | 2.42<br>2.21 | 110          | 1,306<br>1,310     | 0.928<br>0.927 | 2.47<br>2.25 | 0.74<br>0.71 | 0.86<br>0.86 | 44.85<br>56.31   | 2.43         |     | 1       | 44<br>53   | 2.44         |              | 1.00 |                | 1.00         | 0.202            | 0.202          | 0.758<br>0.759 | 0.27<br>0.29         | 99%<br>98% | 1.39<br>1.32 |
| 28.87           | 114.33           | 1.68          | 1.47         | 110          | 1.314              | 0.926          | 1.49         | 0.62         | 0.87         | 93.36            | 2,05         |     | 1       | 74         | 1,37         |              | 1.00 |                | 1.00         | 0.273            | 0,273          | 0.759          | 0.36                 | 97%        | 1.17         |
| 29 04<br>29 20  | 212.27<br>270.62 | 1.59<br>2.46  | 0,75<br>0,91 | 110<br>110   | 1,318<br>1,322     | 0,926<br>0,925 | 0.76<br>0.91 | 0.50<br>0.50 | 0.90         | 178,67<br>227,75 | 1.64<br>1.62 |     | 1       | 100<br>100 | 1,00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.760<br>0.760 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 29.36           | 330,54           | 2.18          | 0,66         | 110          | 1,325              | 0.924          | 0.66         | 0.50         | 0.89         | 278,01           | 1,46         |     | 1       | 100        | 1,00         | 1.10         | 1.00 | 279.0          | 1,00         | Infin,           | 0,000          | 0_761          | Non-Liq.             | Non-Liq.   | 0.00         |
| 29,53<br>29,69  | 349 39<br>360 66 | 1,96          | 0,56<br>0,50 | 110<br>110   | 1,329              | 0.923          | 0.56         | 0.50         | 0.89         | 293,49<br>302,55 | 1,39<br>1,35 |     | 1       | 100<br>100 | 1,00         |              | 1.00 |                | 1.00         | Infin,           | 0,000          | 0.761<br>0.762 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 29.86           | 367.26           | 1,69          | 0,46         | 110          | 1,337              | 0.922          | 0.46         | 0.50         | 0.89         | 307,65           | 1.32         |     | 1       | 100        | 1,00         | 1.25         | 1.00 | 308.8          | 1.00         | Infin,           | 0,000          | 0.762          | Non-Liq.             | Non-Liq.   | 0.00         |
| 30,02<br>30,18  | 360,19<br>364,67 | 1.58<br>1.25  | 0,44<br>0,34 | 110<br>110   | 1,341<br>1,345     | 0.921<br>0.920 | 0.44         | 0.50         | 0.89         | 301,27<br>304,58 | 1,32<br>1,24 |     | 1       | 100<br>100 | 1,00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.763<br>0.763 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 30.35           | 376,58           | 1.54          | 0.41         | 110          | 1,349              | 0.919          | 0.41         | 0.50         | 0.89         | 314.11           | 1,28         |     | 1       | 100        | 1,00         | 1.40         | 1.00 | 315.3          | 1.00         | Infin.           | 0,000          | 0.763          | Non-Liq.             | Non-Liq    | 0.00         |
| 30,51<br>30.68  | 377,16<br>333,76 | 1,63          | 0,43<br>0,49 | 110<br>110   | 1,353<br>1,357     | 0.918<br>0.918 | 0.43         | 0.50         | 0.88         | 314.13<br>277.45 | 1.30         |     | 3       | 100<br>100 | 1.00         | 1.45<br>1.50 | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.764<br>0.764 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 30,84           | 317,96           | 1.81          | 0.57         | 110          | 1.361              | 0.917          | 0.57         | 0.50         | 0.88         | 263,88           | 1,43         |     | 1       | 100        | 1,00         | 1.55         | 1,00 | 264.9          | 1.00         | Infin,           | 0.000          | 0.764          | Non-Liq.             | Non-Liq.   | 0.00         |
| 31.00           | 293,92<br>298,19 | 1.53          | 0,52<br>0,53 | 110<br>110   | 1.364<br>1.368     | 0.916<br>0.915 | 0.52         | 0.50         | 0.88         | 243,49<br>246,69 | 1.43         |     | 1       | 100<br>100 | 1.00         | 1_60<br>1_65 | 1.00 |                | 1.00         | Infin.<br>Infin. | 0.000          | 0,765<br>0,765 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 31.33           | 299.06           | 1.55          | 0.52         | 110          | 1.372              | 0.914          | 0.52         | 0.50         | 0.88         | 247,06           | 1.43         |     | 1       | 100        | 1 00         | 1.70         | 1.00 | 248.0          | 1.00         | Infin.           | 0_000          | 0.765          | Non-Liq.             | Non-Liq.   | 0.00         |
| 31.50<br>31.66  | 301,92<br>296,78 | 1.67<br>1.60  | 0,55<br>0,54 | 110<br>110   | 1.376<br>1.380     | 0.913<br>0.912 | 0.55<br>0.54 | 0.50<br>0.50 | 0.88         | 249.07<br>244.47 | 1.44<br>1.44 |     | 1       | 100<br>100 | 1.00         |              | 1,00 |                | 1.00         | Infin.           | 0.000          | 0.765<br>0.766 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 31,82           | 282,25           | 1.66          | 0.59         | 110          | 1 384              | 0,911          | 0.59         | 0.50         | 0.87         | 232,11           | 1.48         |     | i       | 100        | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.766          | Non-Liq.             |            | 0.00         |
| 31.99<br>32.15  | 283.26<br>279.05 | 2.04          | 0.72<br>0.90 | 110<br>110   | 1,388<br>1,392     | 0.910          | 0.73         | 0.50<br>0.50 | 0.87<br>0.87 | 232,61<br>228,81 | 1.54<br>1.62 |     | 1       | 100<br>100 | 1.00         |              | 1,00 |                | 1.00         | Infin            | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 32,32           | 264,05           | 3.05          | 1.15         | 110          | 1,396              | 0,908          | 1.16         | 0.52         | 0.87         | 214,79           | 1.72         |     | i       | 100        | 1.05         |              | 1.00 |                | 1.00         | Infin:           | 0.000          | 0.766          | Non-Liq.             |            | 0.00         |
| 32 48<br>32 64  | 250.59<br>244.23 | 3,28<br>3,15  | 1,31<br>1,29 | 110<br>110   | 1,400<br>1,403     | 0,907          | 1.32         | 0.54<br>0.54 | 0.86<br>0.86 | 202,48<br>196,97 | 1.77<br>1.78 |     | 1       | 100<br>100 | 1.09         |              | 1,00 |                | 1.00         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 32,81           | 239.79           | 3.02          | 1.26         | 110          | 1.407              | 0.905          | 1.27         | 0.54         | 0.86         | 193,10           | 1.78         |     | i       | 100        | 1.09         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             |            | 0.00         |
| 32.97<br>33.14  | 240.83<br>267.29 | 2.74          | 1,14<br>0.85 | 110<br>110   | 1,411<br>1,415     | 0.904          | 1.14<br>0.85 | 0.53         | 0.86<br>0.86 | 194.23<br>217.28 | 1.74<br>1.61 |     | 1       | 100<br>100 | 1,07         | 2.20         | 1.00 |                | 1.00         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.             |            | 0.00         |
| 33.30           | 269.49           | 1.86          | 0.69         | 110          | 1,419              | 0.902          | 0.69         | 0.50         | 0.86         | 218.78           | 1.55         |     | i       | 100        | 1,00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 33,46<br>33,63  | 270.31<br>241.91 | 2.15<br>2.18  | 0.80         | 110<br>110   | 1.423<br>1.427     | 0.901          | 0.80         | 0.50<br>0.51 | 0.86         | 219.14<br>195.27 | 1.59<br>1.67 |     | 1       | 100<br>100 | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0,000          | 0.767          | Non-Liq.             |            | 0.00         |
| 33.79           | 219.65           | 2.12          | 0.96         | 110          | 1,431              | 0.899          | 0.97         | 0.51         | 0.85         | 176.09           | 1.72         |     | 1       | 100        | 1,01<br>1,05 |              | 1.00 |                | 1.00         | Infin.<br>Infin. | 0.000          | 0 767<br>0 767 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 33.96<br>34.12  | 236.69<br>253.42 | 2.44<br>2.64  | 1.03<br>1.04 | 110<br>110   | 1,435<br>1,439     | 0.898          | 1.04<br>1.05 | 0.52         | 0.85         | 189.61           | 1,72         |     | 1       | 100        | 1.05         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.767          | Non-Liq.             |            | 0.00         |
| 34.12           | 273.96           | 3.02          | 1.10         | 110          | 1.443              | 0.897<br>0.896 | 1.11         | 0.52<br>0.52 | 0.85<br>0.85 | 203.12<br>219.46 | 1.70<br>1.70 |     | 1       | 100<br>100 | 1.04         |              | 1.00 |                | 1.00         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 34.45<br>34.61  | 296.13<br>315.65 | 3.44          | 1.16<br>1.24 | 110<br>110   | 1.446              | 0.895          | 1.17         | 0.51         | 0.85         | 237,10           | 1,69         |     | 1       | 100        | 1.03         |              | 1.00 |                | 0.99         | Infin.           | 0.000          | 0.767          | Non-Liq.             | Non-Liq.   | 0.00         |
| 34.78           | 329.54           | 4.18          | 1.24         | 110          | 1.450<br>1.454     | 0.894<br>0.893 | 1.24<br>1.28 | 0.52<br>0.52 | 0.85<br>0.85 | 252.37<br>263.22 | 1.69<br>1.69 |     | 1       | 100<br>100 |              |              | 1.00 |                | 0.99         | Infin.<br>Infin. | 0.000          | 0.767<br>0.767 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 34.94<br>35.10  | 341.71<br>357.73 | 4.12<br>3.87  | 1.21<br>1.08 | 110<br>110   | 1.458<br>1.462     | 0.892          | 1.21<br>1.08 | 0.51         | 0.85         | 273,33           | 1.66         |     | 1       | 100        | 1.01         |              | 1.00 |                | 0.99         | Infin.           | 0.000          | 0.766          | Non-Liq.             |            | 0.00         |
| 35.10           | 368.55           | 3,45          | 0.94         | 110          | 1.466              | 0.889          | 0.94         | 0.50<br>0.50 | 0.85<br>0.85 | 286,45<br>294,76 | 1.61<br>1.56 |     | 1       | 100<br>100 |              |              | 1.00 |                | 0.99<br>0.99 | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 35,43<br>35,60  | 371.34<br>374.83 | 3.32<br>3.14  | 0.89<br>0.84 | 110<br>110   | 1.470<br>1.474     | 0.888<br>0.887 | 0.90<br>0.84 | 0.50<br>0.50 | 0.85<br>0.85 | 296,60<br>299.00 | 1.54<br>1.52 |     | 1       |            |              |              | 1.00 |                | 0.99         | Infin.           | 0.000          | 0.766          | Non-Liq.             |            | 0.00         |
| 35.76           | 374.45           | 2.75          | 0.73         | 110          | 1.478              | 0.886          | 0.74         | 0.50         | 0.85         | 298.29           | 1.47         |     | i       | 100<br>100 | 1.00         |              | 1,00 |                | 0.98<br>0.98 | Infin.<br>Infin. | 0.000          | 0.766<br>0.766 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 35,93<br>36,09  | 379.11<br>370.12 | 2.45<br>2.21  | 0.65<br>0.60 | 110<br>110   | 1.482<br>1.485     | 0.885<br>0.883 | 0.65<br>0.60 | 0.50<br>0.50 | 0.85<br>0.84 | 301.62           | 1.43         |     | 1       |            | 1.00         |              | 1.00 |                | 0.98         | Infin.           | 0.000          | 0.765          | Non-Liq.             |            | 0.00         |
| 36 25           | 350.96           | 2.32          | 0.66         | 110          | 1.489              | 0.882          | 0.66         | 0.50         | 0.84         | 294,05<br>278,40 | 1.41<br>1.46 |     | 1       | 100<br>100 | 1.00<br>1.00 |              | 1.00 |                | 0.98<br>0.98 | Infin.<br>Infin. | 0.000          | 0.765<br>0.765 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 36.42<br>36.58  | 332.11<br>320.02 | 2.24<br>4.38  | 0.67<br>1.37 | 110<br>110   | 1.493<br>1.497     | 0.881<br>0.880 | 0.68<br>1.38 | 0.50<br>0.53 | 0.84<br>0.83 | 263,03<br>250,73 | 1.49<br>1.73 |     | 1       |            |              |              | 1.00 |                | 0.98         | Infin.           | 0.000          | 0.765          | Non-Liq.             |            | 0.00         |
| 36.75           | 314.68           | 4.59          | 1.46         | 110          | 1.501              | 0.878          | 1.47         | 0.53         | 0.83         |                  | 1.76         |     | 1       | 100<br>100 |              |              | 1.00 | 266,2<br>265,3 | 0.98<br>0.98 | Infin<br>Infin   | 0.000          | 0.764<br>0.764 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 36.91           | 323.64<br>352.97 | 4.64<br>4.40  | 1,43<br>1,25 | 110<br>110   | 1,505<br>1,509     | 0.877<br>0.876 | 1.44<br>1.25 | 0.53<br>0.51 | 0.83         |                  | 1.74<br>1.67 |     | 1       |            |              |              |      | 270.5<br>283.2 | 0.97<br>0.97 | Infin.           | 0.000          | 0.764          | Non-Liq.             | 100        | 0.00         |
| 37.24           | 339.32           | 4.58          | 1.35         | 110          | 1.513              | 0.875          | 1.36         | 0.52         | 0.83         |                  | 1.71         |     | ì       |            |              |              |      |                | 0.97         | Infin.<br>Infin. | 0.000          | 0.763<br>0.763 | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                 | 311.75<br>316.65 | 3.95<br>3.97  | 1.27<br>1.25 | 110<br>110   | 1.517<br>1.521     | 0.873<br>0.872 | 1.27<br>1.26 | 0.52<br>0.52 | 0.83         | 243.01<br>246.71 | 1.71<br>1.70 |     | 1       |            |              |              |      |                | 0.97         | Infin.           | 0.000          | 0.762          | Non-Liq.             |            | 0.00         |
| 37.73           | 324.98           | 4.11          | 1.27         | 110          | 1.525              | 0.871          | 1.27         | 0.52         | 0.83         | 253.00           | 1.70         |     | 1       |            |              |              |      |                | 0.97<br>0.97 |                  | 0.000          | 0.762<br>0.762 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 37.89<br>38.06  | 313.50<br>336.26 | 4.12<br>4.69  | 1.31<br>1.39 | 110<br>110   | 1.528<br>1.532     | 0.869<br>0.868 | 1.32<br>1.40 | 0.53<br>0.53 | 0.82         |                  | 1.72<br>1.73 |     | 1       |            |              |              |      | 257.1<br>275.8 | 0.97         |                  | 0.000          | 0.761          | Non-Liq.             |            | 0.00         |
|                 | 355.50           | 7.68          | 2.16         | 110          | 1.536              | 0.867          | 2.17         | 0.57         | 0.82         | 270.57           | 1.87         |     | i       |            |              |              |      | 315.7          |              |                  | 0.000          | 0.761<br>0.760 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
|                 | 365.48<br>420.69 | 7.76<br>8.65  | 2.12         | 110<br>110   | 1.540<br>1.544     | 0.865<br>0.864 | 2.13<br>2.06 | 0.57<br>0.55 | 0.81<br>0.81 | 278,20<br>321,61 | 1.86<br>1.81 |     | 1       |            |              |              |      | 321.5<br>360.0 |              |                  | 0.000          | 0.760<br>0.759 | Non-Liq.             |            | 0.00<br>0.00 |
| 38,71           | 390,62           | 7.43          | 1.90         | 110          | 1.548              | 0.863          | 1.91         | 0.55         | 0.81         | 298.48           | 1.80         |     | i       | 100        | 1.11         | 3.95         | 1.00 | 331.8          | 0.96         | Infin.           | 0.000          | 0,759          | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                 | 316.05<br>282.97 | 7.07<br>4.44  | 2.24<br>1.57 | 110<br>110   | 1.552<br>1.556     | 0.861<br>0.860 | 2.25<br>1.58 | 0.58<br>0.55 | 0.80<br>0.81 |                  | 1.91<br>1.82 |     | 1       |            |              |              |      | 287.2<br>241.6 |              |                  | 0.000          | 0.758<br>0.758 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 39,21           | 275.95           | 3,83          | 1.39         | 110          | 1.560              | 0.859          | 1.39         | 0.54         | 0.81         | 210,08           | 1.78         |     | 1       | 100        | 1.09         | 4.10         | 1.00 | 230.8          | 0.96         | Infin.           | 0.000          | 0.757          | Non-Liq.             | Non-Liq    | 0.00         |
|                 | 269.76<br>267.47 | 4,26<br>4,03  | 1.58<br>1.51 | 110<br>110   | 1.564<br>1.567     |                | 1.59<br>1.51 | 0.56<br>0.55 | 08.0<br>08.0 |                  | 1.83<br>1.82 |     | 1       |            |              |              |      | 231.8<br>227.7 |              | Infin.           | 0.000          | 0.757<br>0.756 | Non-Liq.             |            | 0.00<br>0.00 |
| 39,70           | 286.57           | 4,17          | 1.45         | 110          | 1.571              | 0.854          | 1.46         | 0.54         | 0.81         | 217.15           | 1.79         |     | 1       | 100        | 1.10         | 4.25         | 1.00 | 239.5          | 0.95         | Infin.           | 0.000          | 0.756          | Non-Liq.             | Non-Liq    | 0.00         |
|                 | 266.83<br>266.44 | 3.87<br>3.65  | 1.45<br>1.37 | 110<br>110   | 1,575<br>1,579     |                | 1.46<br>1.38 | 0.55<br>0.55 | 08.0         |                  | 1.81<br>1.79 |     | 1       |            |              |              |      | 225.1<br>222.2 |              | Infin.           | 0.000          | 0.755<br>0.754 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 40.19           | 264.65           | 3.64          | 1_38         | 110          | 1.583              | 0.850          | 1.38         | 0.55         | 0.80         | 199.50           | 1.79         |     | 1       | 100        | 1_10         | 4.40         | 1.00 | 220.9          | 0.95         | Infin.           | 0.000          | 0.754          | Non-Liq.             | Non-Liq.   | 0.00         |
|                 | 262.76<br>263.40 | 3.62<br>3.68  | 1.38         | 110<br>110   | 1.587<br>1.591     | 0.849<br>0.847 | 1.38<br>1.40 | 0.55<br>0.55 | 0.80         |                  | 1.80<br>1.80 |     | 1       |            |              |              |      | 219.3<br>220.0 |              | Infin.<br>Infin. | 0.000          | 0.753<br>0.752 | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 40.68           | 268.30           | 2.97          | 1.11         | 110          | 1.595              | 0.846          | 1.11         | 0.52         | 0.81         | 203 34           |              |     | 1       |            |              |              |      | 214.4          |              |                  | 0.000          | 0.752          | Non-Liq.             |            | 0.00         |
|                 | 273.61<br>279.17 | 3.26<br>3.44  | 1.19         | 110<br>110   |                    |                | 1.20<br>1.24 | 0.53<br>0.53 | 0.80         | 206.64<br>210.44 |              |     | 1       |            |              |              |      | 220.5<br>225.4 |              |                  | 0.000          | 0.751<br>0.750 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 41.17           | 277.56           | 3,52          | 1.27         | 110          | 1.607              | 0.841          | 1.27         | 0.53         | 0.80         | 208.63           | 1.76         |     | 1       | 100        | 1.08         | 4.70         | 1.00 | 225.1          | 0.94         | Infin.           | 0.000          | 0.750          | Non-Liq.             | Non-Liq.   | 0.00         |
|                 | 264.17<br>267.65 | 3,63<br>3,48  | 1.38<br>1.30 | 110<br>110   |                    |                | 1.38<br>1.31 | 0.55<br>0.54 | 0.79<br>0.80 |                  | 1.80<br>1.78 |     | 1       |            |              |              |      | 218.8<br>218.7 | 0.94         |                  | 0.000          | 0.749<br>0.748 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 41,67           | 269,53           | 3,45          | 1,28         | 110          | 1.618              | 0.837          | 1.29         | 0.54         | 0.80         | 201.42           | 1.77         |     | 1       | 100        | 1.08         | 4.85         | 1.00 | 219.2          | 0.94         | Infin.           | 0.000          | 0.747          | Non-Liq.             | Non-Liq    | 0.00         |
|                 | 264.07<br>253.52 | 3.42          | 1.30         | 110<br>110   |                    |                | 1.30<br>1.32 | 0.54<br>0.55 |              |                  | 1.78<br>1.80 |     | 1       |            |              |              |      | 215.7<br>208.4 | 0.94         |                  | 0.000          | 0.747<br>0.746 | Non-Liq.<br>Non-Liq. |            | 0.00         |
| 42,16           | 253,46           | 3.37          | 1,33         | 110          | 1.630              | 0.832          | 1.34         | 0.55         | 0.79         | 187.81           | 1.80         |     | i       | 100        | 1.11         | 5.00         | 1.00 | 208.7          | 0.93         | Infin.           | 0.000          | 0.745          | Non-Liq.             | Non-Liq.   | 0.00         |
|                 | 248.94<br>240.19 | 3.31          | 1.33         | 110<br>110   |                    |                | 1.34<br>1.34 | 0.55<br>0.55 |              |                  | 1.81<br>1.82 |     | 1       |            |              | 5.05<br>5.10 |      | 205.4<br>199.2 |              | Infin.<br>Infin. | 0.000          | 0.744<br>0.743 | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00 |
| 42.65           | 239.26           | 3.01          | 1.26         | 110          | 1.642              | 0.827          | 1.27         | 0.55         | 0.79         | 176.50           | 1.80         |     | 1       | 100        | 1.11         | 5,15         | 1.00 | 196.2          | 0.93         | Infin.           | 0.000          | 0.743          | Non-Liq.             | Non-Liq    | 0.00         |
| 42.81<br>42.98  | 235.68<br>234.20 | 3.23<br>2.85  | 1.37         | 110<br>110   |                    |                | 1.38<br>1.23 |              |              |                  | 1.84         |     | 1       |            |              | 5.20<br>5.25 |      | 196.6<br>191.3 |              | Infin.           |                | 0.742          | Non-Liq.<br>Non-Liq. |            | 0.00         |
|                 |                  |               | 100          |              | 1 0 10             | 5,027          | 1.20         | 3.00         | 3.70         |                  |              |     | 5).     | 00         | 9.11         | 3,20         | 00   | .01.0          |              | oud le           | 3.000          | 3.7-11         |                      | NOIT-LIY   | 0.00         |

| ſ     | Layer            | Tip              | Friction     | Friction       | Total      | Eff.Stress     | 3              |                               |              | _            |                  | -            | g Liquef   | Rel        | -            |              | _            | Clean          |              |                    |                | Induced        | Liquefac.            |                | Volumetric   |
|-------|------------------|------------------|--------------|----------------|------------|----------------|----------------|-------------------------------|--------------|--------------|------------------|--------------|------------|------------|--------------|--------------|--------------|----------------|--------------|--------------------|----------------|----------------|----------------------|----------------|--------------|
| П     | Depth            | Qc               | Fs           |                | Unit Wt    |                |                | 545                           |              | 8            | Corrected        |              | Suscept    | Dens       |              | Н            |              | Sand           |              |                    | EQ             | M=7.5          | Safety               | Probab.        | Strain       |
| ŀ     | (feet)           | (tsf)            | (tsf)        | %              | (pcf)      | p'o (tsf)      | rd ooo         | F 4 04                        | n            | Co           | Qc1n             | lc<br>4 04   | 6 (0 or 1) | 25 25 4 4  |              | (m)          | KH           | Qc1n           | Κσ           | CRR <sub>7.5</sub> | CRR            | CSR            | Factor               | PL             | (%)          |
|       | 43.14<br>43.31   | 238.08<br>216.71 | 3.09         | 1.30<br>1.45   | 110<br>110 | 1.653<br>1.657 | 0.823<br>0.821 | 1.31<br>1.46                  | 0.55<br>0.57 | 0.78<br>0.77 | 174,63<br>157,24 | 1.81<br>1.88 | 1          | 100<br>96  | 1.12<br>1.17 | 5,30<br>5,35 | 1.00         | 195.8<br>184.8 | 0.93         | Infin.<br>Infin.   | 0.000          | 0.740          | Non-Liq.<br>Non-Liq. |                | 0.00         |
| - 11  | 43.47            | 215.92           | 2,85         | 1.32           | 110        | 1.661          | 0.820          | 1.33                          | 0.56         | 0.78         | 157.06           | 1.85         | 1          | 96         | 1.15         | 5.40         | 1.00         | 180.7          | 0.92         | Infin.             | 0.000          | 0.738          | Non-Liq.             |                | 0.00         |
| - 11  | 43.64<br>43.80   | 228.43<br>245.66 | 2.91<br>2.77 | 1.27<br>1.13   | 110<br>110 | 1.665<br>1.669 | 0.818          | 1.28<br>1.14                  | 0.55<br>0.54 | 0.78<br>0.78 | 166,65<br>180,61 | 1.82<br>1.76 | 1 1        | 98<br>100  | 1.12         | 5.45<br>5.50 | 1.00         | 188.0<br>195.6 | 0.92         | Infin.             | 0.000          | 0.737<br>0.736 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 43 96            | 253,66           | 2.83         | 1.12           | 110        | 1.673          | 0.815          | 1.12                          | 0.53         | 0.78         | 186.64           | 1.75         | 1          | 100        | 1.07         | 5.55         | 1.00         | 200.4          | 0.92         | Infin              | 0.000          | 0.735          | Non-Liq.             |                | 0.00         |
|       | 44.13<br>44.29   | 255.03<br>249.25 | 2.26         | 0.89           | 110<br>110 | 1.677<br>1.681 | 0.813          | 0.89                          | 0.51         | 0.79         | 189.39           | 1.67         | 1          | 100        | 1.02         | 5.60         | 1,00         |                | 0.92         | Infin.             | 0.000          | 0.735          | Non-Liq.             |                | 0.00         |
|       | 44.46            | 256,60           | 2.83         | 1.10           | 110        | 1.685          | 0.810          | 1.00                          | 0.52<br>0.53 | 0.79<br>0.78 | 183.72<br>188.29 | 1.72<br>1.74 | 1          | 100<br>100 | 1.05         | 5.65<br>5.70 | 1.00         | 193,3<br>201,3 | 0.92         | Infin.             | 0.000          | 0,734<br>0,733 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 44,62            | 265.56           | 3.34         | 1.26           | 110        | 1.689          | 0.808          | 1.26                          | 0.54         | 0.78         | 193.76           | 1.77         | 1          | 100        | 1.09         | 5.75         | 1.00         | 211,6          | 0.92         | Infin.             | 0.000          | 0.732          | Non-Liq.             | Non-Liq.       | 0.00         |
| 0.00  | 44.78<br>44.95   | 290,32<br>335,88 | 3.34<br>3.42 | 1.15<br>1.02   | 110<br>110 | 1.692<br>1.696 | 0.807          | 1.16<br>1.02                  | 0.52         | 0.78<br>0.79 | 213.36<br>249.45 | 1.72<br>1.63 | 1          | 100        | 1.05         | 5.75<br>5.75 | 1.00         |                | 0.92         | Infin.             | 0.000          | 0.731<br>0.730 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 45,11            | 394,83           | 2.84         | 0.72           | 110        | 1.700          | 0.803          | 0.72                          | 0.50         | 0.79         | 293,12           | 1.47         | 1          | 100        | 1.00         | 5.75         | 1.00         |                | 0.91         | Infin.             | 0.000          | 0.729          | Non-Liq.             |                | 0.00         |
| - 100 | 45,28<br>45,44   | 449 80<br>447 17 | 3.22<br>4.13 | 0.72<br>0.92   | 110<br>110 | 1.704<br>1.708 | 0,802          | 0.72<br>0.93                  | 0.50         | 0.79<br>0.79 | 333.72<br>331.38 | 1.43<br>1.52 | 1          | 100<br>100 | 1.00         | 5.75<br>5.75 | 1.00         |                | 0.91<br>0.91 | Infin.             | 0.000          | 0.728          | Non-Liq.             |                | 0.00         |
|       | 45.60            | 452.93           | 3.89         | 0.86           | 110        | 1.712          | 0.798          | 0.86                          | 0.50         | 0.79         | 335.27           | 1.49         | î          | 100        | 1.00         | 5.75         | 1.00         |                | 0.91         |                    | 0.000          | 0,727<br>0,726 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| - 11  | 45.77            | 475.52<br>444.46 | 3.64         | 0.77           | 110        | 1.716          | 0.797          | 0.77                          | 0.50         | 0.79         | 351.66           | 1.44         | 1          | 100        | 1.00         | 5,75         | 1.00         |                | 0,91         |                    | 0.000          | 0.725          | Non-Liq.             |                | 0.00         |
| - 11  | 45.93<br>46.10   | 446.58           | 2.97<br>2.40 | 0.67<br>0.54   | 110<br>110 | 1.720<br>1.724 | 0.795<br>0.793 | 0.67<br>0.54                  | 0.50         | 0.78<br>0.78 | 328 23<br>329 42 | 1.42         | 1          | 100<br>100 | 1.00         | 5,75<br>5.75 | 1.00         |                | 0.91         | Infin<br>Infin     | 0.000          | 0.724<br>0.723 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 46.26            | 425.00           | 2.48         | 0.58           | 110        | 1.728          | 0.792          | 0.59                          | 0.50         | 0.78         | 313.09           | 1.39         | 1          | 100        | 1.00         | 5.75         | 1.00         | 314.3          | 0.91         | Infin              | 0.000          | 0.722          | Non-Liq.             | Non-Liq.       | 0.00         |
|       | 46,42<br>46,59   | 414.92<br>394.40 | 2.66<br>2.71 | 0.64<br>0.69   | 110<br>110 | 1.731<br>1.735 | 0,790<br>0,788 | 0.64<br>0.69                  | 0.50         | 0.78<br>0.78 | 305.28<br>289.79 | 1.42         | 1 1        | 100<br>100 | 1.00         | 5.75<br>5.75 | 1.00         |                | 0.91         |                    | 0.000          | 0.721<br>0.720 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| - 1   | 46.75            | 375,24           | 2.77         | 0.74           | 110        | 1.739          | 0.787          | 0.74                          | 0.50         | 0.78         | 275.34           | 1.50         | 1          | 100        | 1.00         | 5.75         | 1.00         |                | 0.90         |                    | 0.000          | 0.719          | Non-Liq.             |                | 0.00         |
|       | 46.92<br>47.08   | 360,27<br>348,31 | 2.57<br>2.26 | 0.71<br>0.65   | 110<br>110 | 1,743<br>1,747 | 0.785<br>0.783 | 0.72<br>0.65                  | 0.50         | 0.78<br>0.78 | 264.00<br>254.91 | 1.50<br>1.48 | 1 1        | 100        | 1.00         | 5.75         | 1.00         |                | 0.90         |                    | 0.000          | 0.717          | Non-Liq.             |                | 0.00         |
|       | 47 24            | 321.44           | 1.84         | 0.57           | 110        | 1.751          | 0.782          | 0.58                          | 0.50         | 0.78         | 234.88           | 1.47         | 1          | 100<br>100 | 1.00         | 5.75<br>5.75 | 1.00         |                | 0.90         |                    | 0.000          | 0.716<br>0.715 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 47.41            | 279.99           | 1.88         | 0.67           | 110        | 1,755          | 0.780          | 0.68                          | 0.50         | 0.78         | 204.20           | 1.56         | 1          | 100        | 1_00         | 5,75         | 1,00         | 205.0          | 0.90         | Infin.             | 0,000          | 0.714          | Non-Liq.             | Non-Liq.       | 0.00         |
|       | 47.57<br>47.74   | 223.67<br>164.82 | 1.59<br>2.03 | 0.71<br>1.23   | 110<br>110 | 1.759<br>1.763 | 0.778<br>0.777 | 0.71<br>1.25                  | 0.50<br>0.59 | 0.77<br>0.74 | 162 29<br>114 21 | 1.66<br>1.93 | 1          | 97<br>82   | 1.01<br>1.22 | 5.75<br>5.75 | 1.00         | 164.1<br>139.7 | 0.90         |                    | 0,000          | 0.713<br>0.712 | Non-Liq.<br>0.42     | Non-Liq<br>95% | 0.00<br>1.03 |
| - 1   | 47.90            | 121.59           | 2.53         | 2.08           | 110        | 1.767          | 0.775          | 2.11                          | 0.67         | 0.71         | 80.43            | 2.20         | 1          | 68         | 1.66         | 2,70         | 1.00         | 133.7          | 0.92         | 0.302              | 0.279          | 0.711          | 0.39                 | 96%            | 1.03         |
|       | 48.06<br>48.23   | 91.32<br>116.79  | 2.37<br>2.86 | 2.60<br>2.45   | 110<br>110 | 1.770<br>1.774 | 0 773<br>0 772 | 2.65<br>2.48                  | 0.72<br>0.69 | 0.69<br>0.70 | 58.48<br>76.18   | 2.37         | 1          | 55<br>66   | 2.18         |              | 1.00         |                | 0.92         |                    | 0.251          | 0.710<br>0.709 | 0.35<br>0.44         | 97%<br>94%     | 1.16<br>1.02 |
|       | 48.39            | 231.35           | 2.98         | 1.29           | 110        |                | 0.770          | 1.30                          | 0.56         | 0.75         | 162.37           | 1.83         | 4          | 97         | 1.13         | 1.00         | 1.00         |                | 0.89         |                    | 0.000          | 0.708          | Non-Liq.             |                | 0.00         |
|       | 48.56<br>48.72   | 280.33<br>300.38 | 2.88<br>2.56 | 1.03<br>0.85   | 110<br>110 |                | 0.768<br>0.767 | 1.03<br>0.86                  | 0.52<br>0.50 | 0.76<br>0.77 | 201.01<br>217.21 | 1.70<br>1.62 | 1          | 100<br>100 | 1.04         | 1.05         | 1.00         | 209.2          |              |                    | 0.000          | 0.707          | Non-Liq.             |                | 0.00         |
|       | 48.88            | 311.53           | 2.58         | 0.83           | 110        |                | 0.765          | 0.83                          | 0.50         | 0.77         | 225.07           | 1.60         | 1          | 100        | 1.00         | 1.10<br>1.15 | 1.00         |                | 0.89         |                    | 0.000          | 0.705<br>0.704 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
|       | 49.05<br>49.21   | 325,26<br>339,47 | 2.50<br>2.81 | 0.77 =<br>0.83 | 110        |                | 0.763          | 0.77                          | 0.50         | 0.77         | 234.79           | 1.56         | 1          | 100        | 1,00         | 1,20         | 1.00         |                | 0.89         |                    | 0.000          | 0.703          | Non-Liq.             | Non-Liq.       | 0.00         |
|       | 49.21            | 344.98           | 3.24         | 0.83           | 110<br>110 |                | 0.762<br>0.760 | 0.83<br>0.94                  | 0.50<br>0.50 | 0.77<br>0.77 | 244.84<br>248.56 | 1.57<br>1.61 | 1          | 100<br>100 | 1.00         | 1.25         | 1.00         |                | 0.89         |                    | 0.000          | 0.702<br>0.701 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
|       |                  | 351.47           | 3.83         | 1.09           | 110        | 1.806          | 0.758          | 1.09                          | 0.50         | 0.76         | 252.53           | 1.65         | 1          | 100        | 1.00         | 1,35         | 1.00         | 254.5          | 0.89         | Infin.             | 0.000          | 0.700          | Non-Liq.             | Non-Liq.       | 0.00         |
|       |                  | 357.74<br>374.88 | 3.92<br>3.72 | 1.10<br>0.99   | 110<br>110 |                | 0.757<br>0.755 | 1.10                          | 0.50<br>0.50 | 0.76<br>0.76 | 256.89<br>269.33 | 1.65<br>1.60 | 1          | 100<br>100 | 1.00         | 1.40         | 1.00         |                | 0.89         |                    | 0.000          | 0.699<br>0.698 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| - [ : | 50.03            | 395.53           | 3.14         | 0.79           | 110        | 1,817          | 0,753          | 0.80                          | 0.50         | 0.76         | 283.93           | 1.51         | 1          | 100        | 1.00         | 1.50         | 1.00         |                | 0.88         |                    | 0.000          | 0.696          | Non-Liq.             |                | 0.00         |
| - 11  |                  | 406.66<br>421.58 | 2.61<br>2.63 | 0.64<br>0.62   | 110<br>110 |                | 0.752<br>0.750 | 0.64<br>0.63                  | 0.50<br>0.50 | 0.76<br>0.76 | 291.65<br>302.07 | 1.44<br>1.42 | 1          | 100<br>100 | 1.00         | 1.50         | 1.00         |                | 0.88         |                    | 0.000          | 0.695<br>0.694 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| (     | 50.52            | 433.35           | 2.55         | 0.59           | 110        | 1.829          | 0 748          | 0.59                          | 0.50         | 0.76         | 310.20           | 1.39         | 1          | 100        | 1.00         | 1.50         | 1.00         |                | 0.88         |                    | 0.000          | 0.693          | Non-Liq.             |                | 0.00         |
|       | 50.69<br>50.85   | 439.99<br>441.89 | 2.57<br>2.61 | 0.58<br>0.59   | 110<br>110 |                | 0.747<br>0.745 | 0.59<br>0.59                  | 0.50         | 0.76<br>0.76 | 314.64<br>315.66 | 1.39<br>1.39 | 1          | 100<br>100 | 1.00         | 1.50<br>1.50 | 1.00         |                | 0.88         |                    | 0.000          | 0.692          | Non-Liq.             |                | 0.00         |
|       |                  | 455.49           | 2.77         | 0.61           | 110        |                | 0.743          | 0.61                          | 0.50         | 0.76         | 325.07           | 1.39         | 4          | 100        | 1.00         | 1.50         | 1.00         |                | 0.88         |                    | 0.000          | 0.691<br>0.689 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       |                  | 472.21           | 3.30         | 0.70           | 110        |                | 0.742          | 0.70                          | 0.50         | 0.76         | 336.69           | 1.42         | 1          | 100        | 1.00         | 1.50         | 1.00         |                | 0.88         | Infin.             | 0.000          | 0.688          | Non-Liq.             | Non-Liq.       | 0.00         |
|       |                  | 504.84<br>459.09 | 3.77<br>4.28 | 0.75<br>0.93   | 110<br>110 |                | 0.740<br>0.738 | 0.75<br>0.94                  | 0.50<br>0.50 | 0.76<br>0.76 | 359.67<br>326.60 | 1.43         | 1          | 100<br>100 | 1.00         | 1.50<br>1.50 | 1.00         |                | 0.88         |                    | 0.000          | 0.687<br>0.686 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       | 51.67            | 422,99           | 4.23         | 1.00           | 110        | 1.856          | 0.737          | 1.00                          | 0.50         | 0.75         | 300.50           | 1.57         | 1          | 100        | 1.00         | 1.50         | 1.00         |                | 0.87         |                    | 0.000          | 0.685          | Non-Liq.             |                | 0.00         |
| - 11  |                  | 454.99<br>493.38 | 5.33<br>5.94 | 1.17<br>1.20   | 110<br>110 |                | 0.735<br>0.733 | 1.18<br>1.21                  | 0.50         | 0.75<br>0.75 | 322,99<br>349,99 | 1,61         | 1          | 100<br>100 | 1.00         | 1.50<br>1.50 | 1.00         | 324.2<br>351.3 | 0.87         | Infin.             | 0.000          | 0,684<br>0,682 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| (     | 52,17            | 477.89           | 5.21         | 1.09           | 110        |                |                | 1.09                          | 0.50         | 0.75         |                  | 1.57         | 1          |            |              | 1.50         |              | 339.9          |              |                    | 0.000          | 0.681          | Non-Liq.             |                | 0.00         |
|       |                  | 440.86<br>459.07 | 3.78<br>3.21 | 0.86<br>0.70   | 110<br>110 |                | 0,730<br>0,728 | 0.86<br>0.70                  | 0.50<br>0.50 | 0.75<br>0.75 |                  | 1.51<br>1.43 | 1          | 100<br>100 | 1.00<br>1.00 | 1.50<br>1.50 |              |                | 0.87         |                    | 0.000          | 0.680          | Non-Liq.             |                | 0.00         |
|       |                  | 325 12           | 2.21         | 0.68           | 110        |                | 0.727          | 0.70                          | 0.50         | 0.75         |                  | 1.53         | i          | 100        |              | 1.50         | 1.00         | 325.7<br>230.1 | 0.87<br>0.87 |                    | 0.000          | 0.679<br>0.678 | Non-Liq.<br>Non-Liq. |                | 0.00         |
|       |                  | 240.31           | 2.13         | 0.89           | 110        |                |                | 0.89                          | 0.52         | 0.74         |                  | 1.71         | 1          | 98         | 1.05         | 1.50         |              | 175.1          |              | Infin.             | 0.000          | 0.677          | Non-Liq.             | Non-Liq.       | 0.00         |
|       |                  | 196.52<br>141.14 | 2.05<br>1.74 | 1.05<br>1.23   | 110<br>110 |                |                | 1.06<br>1.25                  | 0.56<br>0.61 | 0.72<br>0.70 |                  | 1.83         | 1          | 89<br>74   |              | 1.50<br>1.50 |              | 151.2<br>120.5 |              |                    | 0.348<br>0.210 | 0 676<br>0 674 | 0.51<br>0.31         | 90%<br>98%     | 0.77<br>1.24 |
| 5     | 3.31             | 110.78           | 1.92         | 1.73           | 110        | 1.895          | 0.720          | 1.76                          | 0.66         | 0.68         | 69.84            | 2.19         | 1          | 62         | 1.64         |              | 1.00         | 114.7          | 0.90         | 0.220              | 0.197          | 0.673          | 0.29                 | 98%            | 1.31         |
|       | 3.48<br>3.64     | 75.09<br>58.78   | 1.81<br>1.67 | 2.41<br>2.83   | 110<br>110 |                |                | 2. <b>4</b> 7<br>2. <b>93</b> | 0.74<br>0.78 | 0.65<br>0.63 |                  | 2.43<br>2.57 | 1          |            | 2,44<br>3.14 |              | 1.00         | 109.6<br>107.0 |              |                    | 0.188<br>0.180 | 0.672<br>0.671 | 0.28<br>0.27         | 99%<br>99%     | 1.38<br>1.42 |
| 5     | 3.81             | 71.04            | 1.45         | 2.05           | 110        | 1.907          | 0.716          | 2.10                          | 0.73         | 0.65         | 42.53            | 2.40         | 1          | 41         | 2.32         |              | 1.00         | 98.7           | 0.93         | 0.170              | 0.157          | 0.670          | 0.24                 | 99%            | 1.53         |
|       | 3.97<br>4.13     | 81.60<br>70.69   | 1.36<br>1.16 | 1.67<br>1.64   | 110<br>110 |                |                |                               | 0.70<br>0.71 | 0.66<br>0.66 |                  | 2.29         | 1          |            | 1.92         |              | 1.00<br>1.00 |                |              | 0.162<br>0.146     |                | 0.669<br>0.667 | 0.22<br>0.20         | 99%<br>99%     | 1.58         |
|       | 4.30             | 44.26            | 1.08         | 2.45           | 110        |                |                |                               | 0.80         | 0.62         |                  | 2.64         | ò          | 41         | 2.05         |              | 1.00         | 09.0           | 0.93         | 0 140              | 0,133          | 0.666          | Non-Liq.             |                | 1.69<br>0.00 |
|       | 4.46             | 37.41            | 1.01         | 2.69           | 110        |                |                |                               | 0.83         | 0.61         |                  | 2.73         | 0          |            |              |              |              |                | 0.93         |                    |                | 0.665          | Non-Liq.             |                | 0.00         |
|       | 4 63<br>4 79     | 29.79<br>31.13   | 1.23<br>1.67 | 4.12<br>5.36   | 110<br>110 |                |                |                               | 0.89<br>0.91 | 0.59<br>0.58 |                  | 2.95<br>3.01 | 0          |            |              |              |              |                | 0.93<br>0.93 |                    |                | 0.664<br>0.663 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 5     | 4.95             | 44.13            | 1.70         | 3.85           | 110        | 1.934          | 0.705          | 4.02                          | 0.84         | 0.60         | 24,02            | 2:77         | 0          |            |              |              |              |                | 0.93         |                    |                | 0.662          | Non-Liq.             | Non-Liq        | 0.00         |
|       | 5.12<br>5.28     | 95,31<br>136,83  | 2.21         | 2.32<br>1.84   | 110<br>110 |                |                |                               | 0.71<br>0.65 | 0.65<br>0.67 |                  | 2 34<br>2 14 | 1          |            | 2.08<br>1.53 |              |              | 119.4<br>131.8 |              | 0.238              | 0.212<br>0.250 | 0.661<br>0.659 | 0.32<br>0.38         | 98%<br>96%     | 1.25<br>1.11 |
| 9     | 5 45             | 185.97           | 2.78         | 1.49           | 110        | 1.946          | 0.700          | 1.51                          | 0.60         | 0.69         | 120.71           | 1.97         | 1          | 85         | 1.26         | 0.45         | 1.26         | 192.9          | 0.85         | Infin              | 0,000          | 0.658          | Non-Liq.             |                | 0.00         |
|       |                  | 219.92<br>244.90 | 3.19<br>3.67 | 1.45<br>1.50   | 110<br>110 |                |                |                               | 0.58<br>0.57 | 0.70<br>0.70 |                  | 1.91<br>1.88 | 1          |            |              | 0.45<br>0.45 |              | 218.4<br>239.9 |              |                    | 0.000          | 0.657<br>0.656 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 5     | 5.94             | 256.05           | 3.99         | 1.56           | 110        |                |                |                               | 0.57         | 0.70         |                  | 1.88         | 1          |            |              |              |              | 250.5          |              |                    | 0.000          | 0.655          | Non-Liq.             |                | 0.00         |
|       | 6.10 :<br>6.27 : |                  | 4.20<br>4.35 | 1.63<br>1.67   | 110<br>110 |                |                |                               | 0.58         | 0.70         |                  | 1.90         | 1          |            |              |              |              |                | 0.85         |                    | 0.000          | 0.654          | Non-Liq.             |                | 0.00         |
| 5     | 6 43             | 262.97           | 4.01         | 1.52           | 110        |                |                |                               | 0.58<br>0.57 | 0.70<br>0.70 |                  | 1.90<br>1.87 | 1          |            |              |              |              | 257.2<br>254.4 |              |                    | 0.000          | 0 653<br>0 652 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
|       | 6.59<br>6.76     |                  | 3.88         | 1.54           | 110        | 1.974          | 0.689          | 1.55                          | 0.57         | 0.70         | 165.32           | 1.89         | 1          | 98         | 1.18         | 0.45         | 1,26         | 245.7          | 0.85         | Infin.             | 0.000          | 0.650          | Non-Liq.             | Non-Liq        | 0.00         |
|       |                  | 183.02           | 3.79<br>3.54 | 1.63<br>1.93   | 110<br>110 |                |                |                               | 0.59<br>0.63 | 0.69<br>0.67 |                  | 1.93<br>2.06 | 1          |            | 1.22<br>1.39 | 0.45         |              | 232.8<br>161.0 |              |                    | 0.000          | 0.649<br>0.648 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 5     | 7.09             | 160.88           | 2.83         | 1.76           | 110        | 1.985          | 0.685          | 1.78                          | 0.63         | 0.67         | 100.96           | 2.08         | 1          | 77         | 1.41         |              | 1.00         | 142.7          | 0.85         | 0.350              | 0.296          | 0.647          | 0.46                 | 93%            | 1.00         |
|       |                  | 152.41<br>121.85 | 2.48         | 1.63<br>1.70   | 110<br>110 |                |                |                               | 0.63<br>0.66 | 0.67<br>0.66 |                  | 2.07<br>2.16 | 1          |            | 1.40<br>1.58 |              |              | 134.1<br>118.0 |              | 0.304              | 0.257<br>0.205 | 0.646<br>0.645 | 0.40<br>0.32         | 95%<br>98%     | 1.08<br>1.27 |
| 5     | 7.58             | 78.30            | 1.74         | 2.23           | 110        | 1.997          | 0.680          | 2.28                          | 0.73         | 0.63         | 45.38            | 2.40         | - 1        |            | 2.33         |              |              | 105.7          | 0.92         | 0.190              |                | 0.644          | 0.27                 | 99%            | 1.43         |
|       | 7.74<br>7.91     | 46.88<br>32.55   | 1.34<br>1.03 | 2.86<br>3.17   | 110<br>110 |                |                |                               | 0.81<br>0.86 | 0.60<br>0.58 |                  | 2.67<br>2.85 | 0          |            |              |              |              |                | 0.92<br>0.92 |                    |                | 0.643<br>0.642 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
|       | 8.07             | 26.44            |              | 3.01           | 110        |                |                |                               |              | 0.57         |                  | 2.92         | o          |            |              |              |              |                | 0.92         |                    |                |                | Non-Liq.             |                | 0.00         |
|       |                  |                  |              |                |            |                |                |                               |              |              |                  |              |            |            |              |              |              |                |              |                    |                |                |                      |                |              |

| Layer  | Tip   | Friction | Friction | Total    | Eff.Stress | S     |      |      |      | *        |      | ge   | Liquef Rel      |      |     |    | Clean |      |       |     | Induced | Liquefac. |          | Volumetric |
|--------|-------|----------|----------|----------|------------|-------|------|------|------|----------|------|------|-----------------|------|-----|----|-------|------|-------|-----|---------|-----------|----------|------------|
| Depth  | Qc    | Fs       | Ratio    | Unit Wt. | at Midpt.  |       |      |      |      | Correcte | d    | Ta S | Suscept Dens    |      | Н   |    | Sand  |      |       | EQ  | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf) | (tsf)    | %        | (pcf)    | p'o (tsf)  | rd    | F    | n    | Co   | Qc1n     | lc   | ò    | (0 or 1) Dr (%) | Kc   | (m) | KH | Qctn  | Κσ   | CRR75 | CRR | CSR     | Factor    | PL       | (%)        |
| 58.23  | 32,25 | 0.58     | 1.80     | 110      | 2,013      | 0,675 | 1,92 | 0.82 | 0.59 | 16.89    | 2.70 |      | 0               |      |     |    |       | 0.92 |       |     | 0,640   | Non-Lig.  | Non-Lia  | 0.00       |
| 58.40  | 30,59 | 0.70     | 2.28     | 110      | 2.016      | 0.673 | 2.44 | 0.84 | 0.58 | 15.67    | 2.79 |      | 0               |      |     |    |       | 0.92 |       |     | 0,638   | Non-Liq.  | Non-Lig  | 0.00       |
| 58 56  | 19.12 | 0,58     | 3.04     | 110      | 2,020      | 0.672 | 3.40 | 0.93 | 0.55 | 8.86     | 3.07 |      | 0               |      |     |    |       | 0.92 |       |     | 0.637   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.73  | 20,40 | 0.44     | 2,17     | 110      | 2,024      | 0.671 | 2,41 | 0.89 | 0.56 | 9.72     | 2.95 |      | 0               |      |     |    |       | 0,91 |       |     | 0,636   | Non-Lig.  | Non-Lig  | 0.00       |
| 58.89  | 29.72 | 0.45     | 1,52     | 110      | 2,028      | 0.669 | 1,63 | 0.82 | 0.59 | 15.38    | 2.70 |      | 0               |      |     |    |       | 0.91 |       |     | 0,635   | Non-Lig.  | Non-Lig  | 0.00       |
| 59_06  | 18.72 | 0.48     | 2.57     | 110      | 2.032      | 0.668 | 2.89 | 0.92 | 0.55 | 8.65     | 3.04 |      | 0               |      |     |    |       | 0.91 |       |     | 0,634   | Non-Lig.  | Non-Lig  | 0.00       |
| 59.22  | 15.04 | 0.45     | 2.97     | 110      | 2.036      | 0.666 | 3,44 | 0.96 | 0.53 | 6.54     | 3.18 |      | 0               |      |     |    |       | 0.91 |       |     | 0,633   | Non-Lig.  | Non-Lig  | 0.00       |
| 59.38  | 14.96 | 0.42     | 2.81     | 110      | 2 040      | 0.665 | 3,25 | 0.96 | 0.53 | 6.50     | 3.17 |      | 0               |      |     |    |       | 0.91 |       |     | 0.632   | Non-Lig.  | Non-Lig. | 0.00       |
| 59.55  | 14.95 | 0.43     | 2.89     | 110      | 2.044      | 0.664 | 3,35 | 0.96 | 0.53 | 6.47     | 3.18 |      | 0               |      |     |    |       | 0.91 |       |     | 0,631   | Non-Lig.  | Non-Lig. | 0.00       |
| 59.71  | 15,06 | 0.48     | 3.17     | 110      | 2.048      | 0.662 | 3.67 | 0.97 | 0.53 | 6.49     | 3.20 |      | 0               |      |     |    |       | 0.91 |       |     | 0.630   | Non-Lig.  | Non-Lig. | 0.00       |
| 59.88  | 16,51 | 0,00     | 0.01     | 110      | 2.052      | 0.661 | 0.01 | 0.83 | 0.58 | 7.89     | 2.74 |      | 0               | 1.00 |     |    |       | 0.91 |       |     | 0.629   | Non-Lig.  | Non-Lig. | 0.00       |
| 60.04  | 19.45 | 0.00     | 0.01     | 110      | 2.055      | 0,660 | 0,01 | 0.82 | 0.58 | 9.57     | 2.69 |      | 0               | 1.00 |     |    |       | 0.91 |       |     | 0.628   | Non-Lig.  |          | 0.00       |
| 30.20  | 26,53 | 0.00     | 0.00     | 110      | 2.059      | 0.658 | 0.00 | 0.79 | 0.59 | 13.65    | 2.61 |      | 0               | 1.00 |     |    |       | 0.91 |       |     | 0.627   | Non-Lig.  |          | 0.00       |

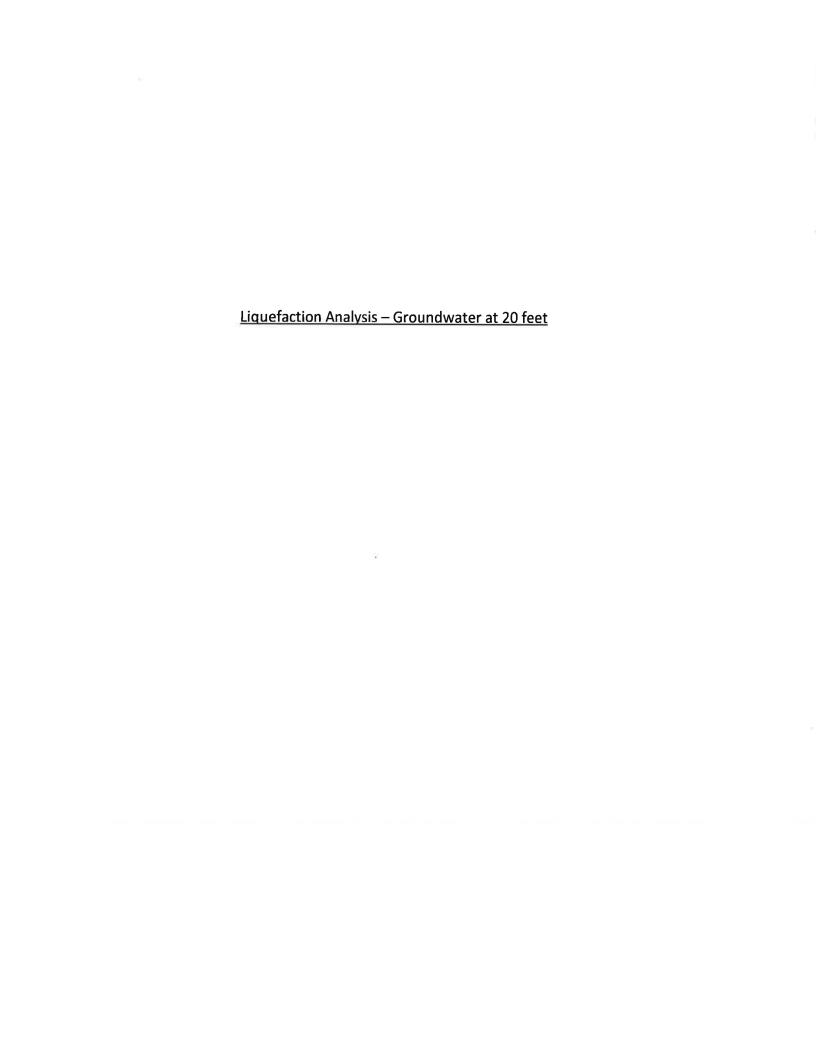
Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefled Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-7 Plot: 7 (feet) EARTHQUAKE INFORMATION: Induced CSR (M=7:5): = 0.65\*PGA\*(po/p'o)\*rd/MSF 3.1 7.5 Magnitude: 6.77 Clean Sand Qc1n = Ca\*Kc\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab Total PGA, g: 0.75 0.97 Use Tokimatsu & Seed (0) or Ishihara & Yoshmine (1): Ava Induced MSF 1.30 Unit Weight of unsaturated soils: 110 pcf Required SF: 1.50 2% Subsidence GWT, feet: 20.0 Unit Weight of saturated soils: Min SF of Liquefiable Layers: 0.25 Max (Inches) Design GWT, feet 8.0 Limiting Ic for liquefiable soils: 2.60 Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 0.04 99% 0.4 Eff.Stress Layer Friction Friction Total Tip Liquef Rel Clean Induced Liquefac Volumetric Depth Qc Ralio Unit Wt. at Midot Suscept Dens Fs Corrected EΩ M=7.5 Safety Probab Strain (feet) (tsf) (tsf Qc1n (0 or 1) Dr (%) (m) Qc1n Κσ CRR76 CRR CSR Factor P KH (%) 1.28 1.000 1.29 0.83 0.16 7.32 110 0.009 1.70 11.75 2.74 1.00 0.485 Non-Liq. Non-Liq 0.00 0 0.12 110 1,000 0.33 1.00 0,018 1.00 0.76 1,70 19,67 2.50 1.00 54.0 0.095 2.75 1.00 0.095 0.485 Non-Liq. Non-Liq 0.00 0.49 14.26 0.15 1.02 110 0.027 1.000 1.03 0.74 1.70 22,87 2.44 2.50 1.00 57.1 0.097 0.097 16 1.00 0.485 Non-Lia, Non-Lia, 0.00 13.52 0.15 1,09 110 0.036 1,000 0.75 1.70 0.66 1.10 21.67 2.48 13 2.66 1.00 57.7 1.00 0.098 0.098 0.485 Non-Liq. Non-Liq 0.00 0.82 11 35 0.14 1 22 110 0.045 1.000 1.22 0.78 1.70 18,16 2,57 6 3,14 1.00 57.0 1.00 0.097 0.097 0.485 Non-Liq. Non-Liq. 0.00 1.70 0.485 0.98 9 04 0.12 1 33 110 0.054 1 000 1.34 0.81 14.44 2 67 0 1.00 Non-Liq. Non-Liq. 0.00 Non-Liq. 1.15 7.13 0.08 1\_07 0.063 110 0.999 1.08 0.82 1.70 11\_36 2.72 0 1.00 0.484 0.00 Non-Liq 1.31 0.08 1 07 110 0.072 0 999 1.08 2.72 0.82 1.70 11\_34 0 1.00 0.484 Non-Lig. Non-Lig. 0.00 1.48 6.14 0.08 1.27 110 0.081 0.999 1.29 0.85 1 70 974 2.82 0 0.484 1.00 Non-Lia. Non-Lia 0.00 0.090 1.64 6.75 0.14 2.01 110 0.998 2.04 0.87 1.70 10.70 2.88 1.00 0.484 Non-Lig. Non-Lig 0.00 1.80 12.03 0.25 2.04 110 0.099 0.998 2.05 0.81 1.70 19.17 2.67 0 0.484 Non-Liq. Non-Liq. 0.00 0.484 1.97 26.83 0.46 1 71 110 0.108 0.998 1.72 0.71 1.70 42 94 2.34 42 2.10 1.00 90.0 1.00 0.148 0.148 Non-Liq. Non-Liq. 0.00 0.58 2.13 27,70 2.10 110 0.117 0.997 2.11 0.72 1.70 44.32 2.39 43 2.27 1.00 100.6 1.00 0.175 0.175 0.483 Non-Liq. Non-Liq. 0.00 2,30 30.71 0.62 2.02 110 0.997 2.02 0.126 0.71 1.70 49.14 2.34 47 2.10 1.00 103.0 1.00 0.182 0.182 0.483 Non-Liq. Non-Liq 0.00 35,14 1.69 110 0.135 0.996 1.70 0.68 1.70 56.25 2.25 53 1.80 1:00 101.0 1.00 0.483 0.176 0.176 Non-Lig. Non-Lig. 0.00 2,62 34.66 0.52 1,49 110 0.144 0,996 1.49 0.67 1.70 55,46 2.22 52 1.71 1.00 0.160 0.483 Non-Lig. Non-Lig. 95.1 1.00 0.160 0.00 2.79 30.29 0.43 1.42 110 0.153 0.996 1,43 0.68 1.70 48.42 2.25 47 1.81 1.00 87.5 1.00 0.142 0.142 0.483 Non-Liq. Non-Liq. 0.00 Non-Liq. Non-Liq. 2.95 25.72 0.37 1 42 110 0.162 0.995 1.43 0.70 1.70 41.07 2.31 40 1.98 1.00 0.130 0.482 81.4 1.00 0.130 0.00 3.12 22.47 0.33 1.49 110 0.1710.995 1.50 0.72 1.70 35.83 2.37 34 2.19 1.00 78.6 1.00 0.125 0.125 0.482 Non-Liq. Non-Liq. 0.00 3.28 20.80 1.47 0.180 0.994 1.48 0.31 110 0.73 1.70 33.13 2.40 31 2.29 1.00 76.0 1.00 0.121 0.1210.482 Non-Liq. Non-Liq. 0.00 3.44 20.45 0.30 1.47 110 0.189 0.994 1.48 0.73 1.70 32.55 2.40 30 2,32 1.00 75.4 1.00 0.120 0.482 0.120 Non-Liq. Non-Liq 0.00 3,61 20.73 0.30 1.45 110 0.198 0.994 1.47 0.73 1.70 32.99 2.39 2.29 1.00 75.5 1.00 0.120 0.120 0.482 0.00 Non-Lia, Non-Lia, 3.77 19.90 0.31 1 58 110 0.208 0.993 1.59 1.70 0.74 31.64 2.43 29 2,44 1,00 77.1 1.00 0.123 0.123 0.482 Non-Liq. Non-Liq. 0.00 0.481 3.94 17.21 0.35 2.05 110 0.217 0.993 2.08 0.77 1.70 27.31 2.55 23 3,03 1.00 82,8 0.133 1.00 0.133 Non-Liq. Non-Liq. 0.00 4.10 3.08 11.84 0.37 110 0.226 0.993 3.14 0.85 1.70 18.66 2.79 0 1.00 0.481 Non-Liq. Non-Liq. 0.00 4 27 7.47 0.32 0.235 0.992 4.38 4.24 110 0.92 3.04 1.70 11.63 0 1.00 0.481 Non-Liq. Non-Liq. 0.00 4,43 7.87 0.27 3 41 110 0.244 0.992 3.51 0 0.90 1.70 12.25 2.96 1.00 0.481 Non-Liq. Non-Liq 0.00 4.59 13.03 0.25 1.89 110 0.253 0.991 1.93 0.80 1.70 20.53 2.63 0 0.481 1.00 0.00 Non-Lia, Non-Lia 4 76 17.56 0.20 1.13 110 0.262 0.991 1.15 0.73 1.70 27.80 2,30 1.00 2.40 24 63.9 1.00 0.104 0.104 0.480 Non-Liq. Non-Liq. 0.00 1.75 0.111 Non-Liq. Non-Liq. 4.92 25.00 0.25 0.99 110 0.271 0.991 1.00 0.68 1.70 39 74 2.23 1 39 1.00 69.6 1.00 0.480 0.111 0.00 5.09 0.27 0.97 28.21 110 0.280 0.990 0.98 0.66 1.70 44 88 2.18 44 163 1.00 73.1 1.00 0.116 0.116 0.480 Non-Liq. Non-Liq. 0.00 5.25 26.74 0.32 1.19 0.289 0.990 0.68 110 1.20 1.70 42.50 41 2.25 1.81 1.00 76.9 1.00 0.122 0.122 0.480 Non-Liq. Non-Liq 0.00 5,41 27,54 0.33 1.20 110 0.298 0.989 1.21 0.68 1.70 2.25 43.77 43 1.79 1.00 78.2 1.00 0.480 0.1240.124 Non-Lig. Non-Lig 0.00 5,58 30.42 0.33 1.08 110 0.307 0.989 1.10 0.66 1.70 48.39 2.18 47 1.63 1.00 78.9 1.00 0.126 0.479 0.126 Non-Lig. Non-Lig. 0.00 5.74 35.07 0.33 0.95 110 0.316 0.989 0.96 0.64 1.70 55.84 2.10 53 1.46 1.00 81.3 1.00 0.130 0:130 0.479 Non-Liq. Non-Liq. 0.00 5.91 42.76 0.43 0.99 110 0.325 0.988 1.00 0.62 1.70 68.19 2.04 61 1.36 1.00 92.6 1.00 0.154 0.479 0.154 Non-Liq. Non-Liq. 0.00 6.07 0.60 1.00 59.96 110 0.334 0.988 1.01 0.59 1.70 95.81 1.93 75 1.22 1:00 1.00 116.9 1.00 0.228 0.228 0.479 Non-Liq. Non-Liq. 0.00 6.23 82.48 0.78 0.94 110 0,343 0.988 0.94 0.55 1.70 131,98 88 1\_80 1.11 1.05 1.00 146.8 1.00 0.374 0.374 0.479 Non-Liq. Non-Liq. 0.00 6.40 98.15 0.89 0.91 0.352 0.987 0.91 0.53 1.70 157.14 1.74 96 1.06 1.10 1.00 167.6 1.00 0.000 0.479 Infin. Non-Lig. Non-Lig 0.00 6.56 106.99 1.01 0.94 110 0.361 0.987 0.95 0.52 1.70 171.33 1.72 1.05 1.15 1.00 180.9 1.00 0.000 0.478 Infin. 0.00 Non-Lig. Non-Lig. 6.73 112.07 1.09 0.97 110 0.370 0.986 0.98 0.52 179.48 1.05 1.70 1.72 100 1,20 1.00 188.9 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 6.89 112 25 1 18 1.05 110 0.379 0.986 1.05 0.53 1.70 179.76 1 74 100 1.06 1,25 1.00 191.9 Infin 0.000 0.478 1.00 Non-Liq. Non-Liq. 0.00 7.05 111.68 1.25 0.388 1-12 110 0.986 1.13 0.54 1.70 178.82 1.76 100 1.08 1.30 1.00 1936 1.00 Infin 0.000 0.478 Non-Liq. 0.00 Non-Lig 7.22 113.57 1.36 1.19 110 0.397 0.985 0.54 1.20 1\_70 181.71 1.78 100 1.09 1.35 1.00 198.6 1.00 Infin. 0.000 0.478 Non-Lig. Non-Lig. 0.00 7.38 110.25 1.39 1.26 110 0.406 0.985 1.27 0.55 1.69 175.63 1.80 100 1.40 195.5 0.000 0.478 1.11 1.00 1.00 Infin. Non-Liq. Non-Liq. 0.00 7.55 100.97 1.35 1.34 110 0.415 0.985 1\_34 0.56 1.69 160.87 1.85 1.45 1.00 184.6 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 110 7.71 100.97 1,35 1.34 0.424 0.984 1.34 0.56 1.67 159.07 1.85 96 1.15 1.50 1.00 183.0 1.00 Infin 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.87 95.77 1.34 1.40 110 0.433 0.984 1 40 0.57 1 67 150.26 1 88 94 1.17 1 55 1.00 176.7 Infin. 0.000 0.477 1.00 Non-Lig. Non-Lig. 0.00 8.04 1.31 1.41 0.442 0.984 Non-Liq. 92.93 110 1.42 0.58 1.65 144.62 1.90 92 1.19 1.60 1.00 172 1 1.00 Infin 0.000 0.477 0.00 Non-Lig. 8.20 90.79 1.03 1.14 110 0.451 0.983 1.14 0.56 137,80 1.61 1.85 90 1 14 1.65 1.00 157.8 1.00 0.446 0.446 0.481 0.93 56% 0.57 8.37 87,38 1.00 1.14 110 0.460 0.983 1:15 0.57 1.60 131.65 1.86 88 1.70 0.486 1.15 1.00 152.6 1.00 0.410 0.410 0.84 64% 0.69 8.53 82.47 0.96 1.17 110 0.469 0.982 1.18 0.57 1.60 123,63 1.89 1.18 1.75 1.00 146.1 1.00 0.370 0.370 0.491 0.75 72% 0.85 8.69 86.06 1.00 1.17 110 0.478 0.982 1.17 0.57 1:57 127.32 1.88 87 1.17 1.80 1.00 149.3 1.00 0.390 0.390 0.496 0.79 0.78 8.86 93.45 1.08 1.15 110 0.487 0.982 1.16 0.56 1.55 136.07 1.85 qn 1.15 1.85 156.8 0.439 0.439 0.501 0.88 1.00 1.00 61% 0.60 102.02 0.496 0.981 9.02 1.14 1.12 110 1.13 0.55 1.52 146.04 1.82 93 1.12 1.90 1.00 164 7 1.00 Infin 0.000 0.506 Non-Lia, Non-Lia, 0.00 107.28 0.981 9.19 1.09 110 0.505 1.10 0.55 1.50 151.44 1.80 94 1.11 1.95 1.00 168.7 1.00 Infin. 0.000 0.510 Non-Liq. Non-Liq. 0.00 9.35 109.34 1.18 1.07 110 0.514 0.981 1.08 0.55 1.48 152,59 1.80 94 1.10 0.515 2.00 1.00 169.1 0.000 1.00 Infin. Non-Liq. Non-Liq. 0.00 9.51 111.98 1.16 1.04 110 0.523 0.980 1.04 0.54 1.47 154,35 1.78 95 1.09 2.05 1.00 169.5 1.00 Infin. 0.000 0,520 0.00 Non-Lia, Non-Lia 9 68 118 26 1.20 1.01 110 0.532 0.980 1.02 0.54 1.45 160.83 1.76 97 1.08 2.10 1.00 174.2 1.00 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 9.84 127.36 1.25 0.98 110 0.541 0.980 0.99 0.53 1.42 170.74 1.73 99 1.06 2.15 1.00 181.7 Infin. 0.000 1.00 0,529 Non-Liq. Non-Liq. 0.00 10.01 137.13 1.33 0.97 110 0.550 0.979 0.97 0.52 1.41 181.45 1.71 100 1.04 2.20 1.00 190.2 1.00 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 144.79 10.17 1.41 0.98 110 0.559 0.979 0.98 0.52 1.39 189.61 1.70 100 1.04 2.25 1.00 197.4 1.00 Infin. 0.000 0.537 Non-Liq. Non-Liq. 0.00 10.33 155.29 1.57 1.01 110 0.568 0.979 1.02 0.52 1.38 201.47 1.69 100 1.03 208.8 2.30 1.00 0.000 0.541 1.00 Infin. Non-Liq. Non-Liq. 0.00 10.50 160.35 1.65 1.03 110 0.577 0.978 1.03 0.51 1.37 206.27 1.69 100 1.03 2.35 1.00 213.4 1.00 Infin. 0.000 0.545 Non-Lia, Non-Lia 0.00 10.66 162.80 1.74 1.07 110 0.586 0.978 1.07 0.52 1.36 208.10 1.70 100 1.04 2.40 1.00 216.7 1.00 Infin. 0.000 0.550 Non-Liq. Non-Liq. 0.00 10.83 163.62 1.48 0.90 110 0.595 0.978 0.91 0.50 1 34 205 78 1 65 100 1.00 2.45 1.00 207.4 0.554 1.00 Infin 0.000 Non-Liq. Non-Liq. 0.00 10.99 165.03 1.59 0.96 110 0.604 0.977 0.96 0.51 1.33 206.59 1.67 100 1 02 2.50 1.00 210.8 1.00 Infin 0.0000.557 Non-Liq. Non-Liq 0.00 165.44 1.62 0.98 11.15 110 0.614 0.977 0.98 0.51 1.32 205.76 1.68 100 1.02 2.55 1.00 210.9 1.00 Infin 0.000 0.561 Non-Liq. Non-Liq. 0.00 170.54 11.32 1.67 0.98 110 0.623 0.977 0.98 0.51 1.31 210.31 1.67 100 1.02 2.60 1.00 214.5 0.000 0.565 1.00 Infin. Non-Lia, Non-Lia 0.00 11.48 193.35 1 66 0.632 0.86 110 0.976 0.86 0.50 1.29 235.76 100 1.00 2.65 1.00 236.6 1.00 Infin. 0.000 0.569 Non-Lig. Non-Lig 0.00 110 0.81 11.65 234.30 1.88 0.80 0.641 0.976 0.50 1.29 283,83 1.52 100 1.00 2.70 1.00 284.9 1.00 Infin. 0.000 0.572 Non-Liq. Non-Liq. 0.00 11.81 311,45 1.81 0.58 110 0.650 0.975 0.58 0.50 1.28 374.90 1.33 100 1.00 2.75 1.00 376.3 1.00 Infin. 0.000 0.576 Non-Lig. Non-Lig. 0.00 11.98 345.03 2.01 0.58 110 0.659 0.975 0.58 0.50 1.27 412.54 1.30 100 1.00 2.80 1.00 4141 1.00 Infin. 0.000 0.580 Non-Liq. Non-Liq. 0.00 110 12.14 350.57 2.01 0.57 0.975 0.668 0.58 0.50 416.32 1,26 1.30 100 1.00 2.85 1.00 417.9 1.00 Infin: 0.000 0.583 Non-Liq. Non-Liq. 0.00 2.04 12.30 323.89 0.63 110 0.677 0.974 0.63 0.50 1.25 381.99 1.35 100 1.00 2.90 1.00 383.4 1.00 0.000 0.587 Non-Lia, Non-Lia 0.00 Infin. 12.47 284.79 2.15 0.75 0.974 110 0.686 0.76 0.50 1.24 333.56 1.45 100 1.00 2.95 1,00 334.8 1.00 Infin. 0.000 0.590 Non-Liq. Non-Liq. 0.00 12.63 272.50 2.15 0.79 110 0.695 0.974 0.79 0.50 1,23 317.04 1.48 100 1.00 3.00 1.00 318.2 1.00 Infin. 0.000 0.593 Non-Liq. Non-Liq. 0.00 2.13 12.80 284.55 0.75 110 0.704 0.973 0.75 0.50 1.23 328.95 1.45 100 1.00 3.05 1.00 330.2 1\_00 Infin. 0.000 0.597 Non-Liq. Non-Liq 0.00

| Laye           | г Тір            | Friction      | Friction     | Total        | Eff Stres          | s              |              |              | _            |                  | _            | ο Li | iquef. | Rel.                     | _            | -            |      | Clean          |              |                  | _              | Induce         | Liquefac             |                           | Volumetric   |
|----------------|------------------|---------------|--------------|--------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|------|--------|--------------------------|--------------|--------------|------|----------------|--------------|------------------|----------------|----------------|----------------------|---------------------------|--------------|
| Dept           |                  | Fs            | Ratio        |              | at Midpt           |                | -            | 1.74471      |              | Corrected        |              |      | scept  |                          |              | Н            | 1.62 | Sand           |              |                  | EQ             | M=7.5          | Safety               | Probab                    | Strain       |
| 12.96          |                  | (tsf)<br>2,12 | 0.73         | (pcf)<br>110 | p'o (tsf)<br>0.713 | 0.973          | 0.74         | 0.50         | 1,22         | Qc1n<br>331_14   | lc<br>1.44   | 0 (0 | or 1)  | Dr (%)                   | 1,00         | (m)<br>3,10  | 1,00 | 332.4          | 1.00         | CRR <sub>7</sub> | 0.000          | 0,600          | Factor<br>Non-Lin    | P <sub>L</sub><br>Non-Liq | 0.00         |
| 13.12<br>13.29 |                  | 2.14          | 0.74<br>0.80 | 110<br>110   | 0.722<br>0.731     | 0.973          | 0.74         | 0.50         | 1.21         | 329.91           | 1.45         |      | 1      | 100                      | 1.00         | 3,15         | 1.00 | 331.1          | 1.00         | Infin            | 0.000          | 0,603          | Non-Liq.             | Non-Liq                   | 0.00         |
| 13,45          |                  | 2.34          | 0.81         | 110          | 0.740              | 0.972<br>0.972 | 0.80<br>0.81 | 0.50<br>0.50 | 1.20<br>1.20 | 332,44<br>325,94 | 1.47<br>1.48 |      | 1      | 100<br>100               | 1.00         | 3.15<br>3.15 | 1.00 | 333.7<br>327.2 | 1.00         | Infin.           | 0.000          | 0,606<br>0,609 | Non-Liq.<br>Non-Liq. | Non-Liq<br>Non-Liq        | 0.00<br>0.00 |
| 13,62<br>13.78 |                  | 2.38          | 0.83<br>0.86 | 110<br>110   | 0.749<br>0.758     | 0.972<br>0.971 | 0.83         | 0.50<br>0.50 | 1.19<br>1.18 | 320 65<br>318 31 | 1.49<br>1.51 |      | 1      | 100                      | 1.00         |              | 1.00 | 321.8          |              | Infin.           | 0.000          | 0,612          | Non-Liq.             | Non-Liq                   | 0.00         |
| 13.94          | 290.46           | 3.11          | 1.07         | 110          | 0.767              | 0.971          | 1.07         | 0.50         | 1.17         | 321.61           | 1,58         |      | 1      | 100<br>100               | 1.00         | 3.15<br>3.15 | 1.00 | 319 5<br>322 8 |              | Infin<br>Infin   | 0.000          | 0.615<br>0.618 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 14,11<br>14,27 |                  | 3.14<br>2.93  | 1.07<br>0.96 | 110<br>110   | 0.776<br>0.785     | 0.971<br>0.970 | 1.07<br>0.96 | 0.50         | 1.17<br>1.16 | 323.22<br>334.02 | 1.58<br>1.53 |      | 1      | 100<br>100               | 1,00         | 3.15<br>3.15 | 1.00 | 324.4<br>335.3 |              | Infin.           | 0.000          | 0.621          | Non-Liq.             | Non-Lig                   | 0.00         |
| 14,44          | 274.68           | 2.47          | 0.90         | 110          | 0.794              | 0.970          | 0.90         | 0.50         | 1.15         | 298.83           | 1.54         |      | 1      | 100                      | 1.00         | 3.15         | 1_00 | 299.9          | 1.00         | Infin.           | 0.000          | 0.624<br>0.627 | Non-Liq,<br>Non-Liq, |                           | 0.00<br>0.00 |
| 14.60          |                  | 1.89<br>1.87  | 0.71<br>0.72 | 110<br>110   | 0.803<br>0.812     | 0.970<br>0.969 | 0.72<br>0.72 | 0.50         | 1.15         | 286.29<br>280.48 | 1.48<br>1.48 |      | 1      | 100<br>100               | 1.00         | 3.15         | 1.00 | 287.4<br>281.5 |              | Infin.           | 0.000          | 0.629<br>0.632 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 14.93          |                  | 1,85          | 0.73         | 110          | 0.821              | 0.969          | 0.73         | 0,50         | 1.14         | 272,43           | 1.50         |      | 1      | 100                      | 1.00         | 3.15         | 1.00 | 273.4          | 1.00         | Infin.           | 0.000          | 0.635          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 15.09<br>15.26 |                  | 1.72<br>1.73  | 0.71<br>0.70 | 110<br>110   | 0.830<br>0.839     | 0.969<br>0.968 | 0.71<br>0.70 | 0.50<br>0.50 | 1.13         | 259.08<br>262.22 | 1.50<br>1.50 |      | 1      | 100<br>100               | 1.00         | 3.15<br>3.15 | 1.00 | 260.0<br>263.2 | 1.00         | Infin.           | 0.000          | 0,637<br>0,640 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 15.42<br>15.58 |                  | 1.34<br>1.85  | 0.55<br>0.77 | 110<br>110   | 0.848<br>0.857     | 0.968<br>0.967 | 0.55         | 0.50         | 1.12         | 256,34           | 1.43         |      | 1      | 100                      | 1.00         | 3.15         | 1.00 | 257.3          | 1.00         | infin.           | 0.000          | 0.643          | Non-Liq.             | Non-Liq                   | 0.00         |
| 15.75          | 227.67           | 1,80          | 0.79         | 110          | 0.866              | 0.967          | 0.79         | 0.50         | 1.11         |                  | 1,54<br>1,57 |      | 1      | 100<br>100               | 1.00<br>1.00 |              | 1.00 | 253.0<br>237.8 | 1.00         | Infin.           | 0.000          | 0,645<br>0,648 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 15.91<br>16.08 |                  | 1.51<br>0.84  | 0.70<br>0.50 | 110<br>110   | 0,875<br>0,884     | 0.967<br>0.966 | 0.71<br>0.50 | 0.50         | 1.10         | 222.56<br>174.33 | 1.55<br>1.53 |      | 1      | 100<br>100               | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.650<br>0.653 | Non-Liq.             |                           | 0.00         |
| 16.24          | 113,63           | 0,81          | 0.71         | 110          | 0.893              | 0.966          | 0.72         | 0.54         | 1.10         | 116.73           | 1.77         |      | 1      | 83                       | 1.08         | 3.15         |      |                | 1.00         | 0.271            | 0.000          | 0.655          | Non-Liq.<br>0.41     | 95%                       | 0.00<br>1.16 |
| 16.40<br>16.57 | 74.42<br>41.55   | 0,94<br>1.04  | 1,26<br>2,51 | 110<br>110   | 0.902<br>0.911     | 0.966<br>0.965 | 1.28<br>2.57 | 0.63<br>0.74 | 1.11         | 76.80<br>42.93   | 2.07         |      | 1      | 66<br>42                 | 1.40<br>2.56 |              | 1.00 |                | 1.00<br>1.00 | 0.195            | 0.195          | 0.657<br>0.660 | 0.30<br>0.31         | 98%<br>98%                | 1.41<br>1.38 |
| 16.73          | 20,49            | 1.00          | 4.87         | 110          | 0.920              | 0,965          | 5.10         | 0,87         | 1.13         | 20,90            | 2.89         |      | 0      |                          | 2.00         |              | 1.00 | 100,7          | 1.00         | 0,200            | 0.200          | 0,662          | Non-Liq.             |                           | 0.00         |
| 16,90<br>17.06 | 17.66<br>17.13   | 0.87          | 4.92<br>4.64 | 110<br>110   | 0.929<br>0.938     | 0.965<br>0.964 | 5.19<br>4.91 | 0.89<br>0.89 | 1.12         | 17,75<br>17,03   | 2.95<br>2.94 |      | 0      |                          |              |              |      |                | 1.00         |                  |                | 0.664<br>0.666 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 17.22<br>17.39 | 45.69<br>85.88   | 0.87          | 1.91<br>1.14 | 110<br>110   | 0.947              | 0.964<br>0.963 | 1.95         | 0.71         | 1.08         | 45,77            | 2,36         |      | 1      |                          | 2.14         |              | 1.00 | 98.1           | 1.00         | 0.168            | 0.168          | 0.669          | 0.25                 | 99%                       | 1.54         |
| 17.55          | 131,32           | 1,21          | 0.92         | 110          | 0.965              | 0.963          | 1,15<br>0.93 | 0.61<br>0.55 | 1.06<br>1.05 | 85.36<br>129.57  | 2.00<br>1.80 |      | 1      | 70<br>88                 | 1,30<br>1,11 | 1.00         | 1.00 |                | 1.00         | 0.208            | 0.208          | 0.671<br>0.673 | 0.31<br>0.53         | 98%<br>89%                | 1.36<br>1.00 |
| 17.72<br>17.88 | 175.08<br>212.23 | 1.51<br>1.86  | 0.86<br>0.88 | 110<br>110   | 0.974<br>0.983     | 0.963          | 0.87<br>0.88 | 0.52         | 1.04<br>1.04 |                  | 1.69<br>1.64 |      | 1      | 99<br>100                | 1.03         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.675          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 18.04          | 246,62           | 1.63          | 0.66         | 110          | 0,992              | 0.962          | 0.66         | 0.50         | 1.03         | 239.71           | 1.51         |      |        | 100                      | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.677<br>0.679 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 18.21<br>18.37 | 274.39<br>300.69 | 2.22          | 0.81<br>0.82 | 110<br>110   | 1,001<br>1,010     | 0.962<br>0.961 | 0.81<br>0.82 | 0,50         | 1.03<br>1.02 |                  | 1.54         |      |        | 100<br>100               | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.681<br>0.683 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 18,54          | 310,01           | 2.49          | 0.80         | 110          | 1,020              | 0.961          | 0.81         | 0,50         | 1.02         | 297.51           | 1,50         |      | 1      | 100                      | 1.00         | 1.10         | 1.00 | 298.6          | 1.00         | Infin.           | 0.000          | 0.685          | Non-Liq.             |                           | 0.00         |
| 18.70<br>18.86 | 331.14<br>350.78 | 2.83<br>3.15  | 0.85<br>0.90 | 110<br>110   |                    | 0.960<br>0.960 | 0.86<br>0.90 | 0,50<br>0,50 | 1.01<br>1.01 |                  | 1,51<br>1,51 |      |        |                          | 1.00         |              | 1.00 | 317.6<br>335.1 | 1.00         | Infin.<br>Infin. | 0.000          | 0.687<br>0.689 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 19.03<br>19.19 | 364.85<br>366.79 | 3.25<br>3.32  | 0.89<br>0.91 | 110<br>110   |                    | 0.960<br>0.959 | 0.89         | 0.50         | 1.01         |                  | 1.50         |      |        | 100                      | 1,00         | 1.10         | 1.00 | 347.0          | 1.00         | Infin.           | 0,000          | 0.691          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 19.36          | 364,13           | 3.25          | 0.89         | 110          |                    | 0.959          | 0.89         | 0.50         | 1.00         |                  | 1.50<br>1.50 |      |        |                          | 1.00         |              | 1.00 | 347.4<br>343.4 | 1.00         | Infin.           | 0,000          | 0.692<br>0.694 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 19.52<br>19.69 | 351.02<br>348.92 | 3,25<br>2,58  | 0.92<br>0.74 | 110<br>110   |                    | 0.958<br>0.958 | 0.93         | 0.50         | 0.99         |                  | 1.52<br>1.45 |      |        |                          | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0,000          | 0.696<br>0.698 | Non-Liq.             | Non-Liq.                  | 0.00         |
| 19.85          | 359.19           | 3.47          | 0.97         | 110          | 1,092              | 0,957          | 0.97         | 0.50         | 0.98         | 333,20           | 1.53         |      | 1      | 100                      | 1,00         | 1.10         | 1.00 | 334.4          | 1.00         | Infin.           | 0,000          | 0.699          | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 20.01<br>20.18 | 376.67<br>404.77 | 4.05<br>4.12  | 1.08<br>1.02 | 110<br>110   |                    | 0,957<br>0,957 | 1.08<br>1.02 | 0.50<br>0.50 | 0.98         |                  | 1.56<br>1.52 | 3    | 6      | 100 <sup>(1</sup><br>100 | 1.00         |              | 1.00 | 349.3<br>374.4 | 1.00         | Infin.           | 0,000          | 0.701<br>0.703 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 20.34<br>20.51 | 377.36<br>335.46 | 4.95<br>4.86  | 1.31<br>1.45 | 110<br>110   | 1,111              | 0.956          | 1.32         | 0.50         | 0.98         | 347.09           | 1.63         |      | 1      | 100                      | 1.00         | 1.10         | 1.00 | 348.4          | 1.00         | Infin.           | 0,000          | 0.704          | Non-Liq.             | Non-Liq                   | 0.00         |
| 20.67          | 292.50           | 6.92          | 2,37         | 110          |                    | 0.956<br>0.955 | 1.45<br>2.37 | 0.52<br>0.58 | 0.97<br>0.97 |                  | 1.70<br>1.91 | 3    |        | 100<br>100               |              |              | 1.00 | 319.6<br>320.0 | 1.00         | Infin.           | 0.000          | 0.706<br>0.708 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 20.83          | 287.91<br>326.82 | 3.88<br>2.70  | 1.35<br>0.82 | 110<br>110   |                    | 0.955<br>0.954 | 1.35<br>0.83 |              | 0.97<br>0.97 |                  | 1.71<br>1.51 |      |        |                          |              | 1.10         |      | 275.8<br>299.5 | 1.00         | Infin.<br>Infin. | 0.000          | 0.709<br>0.711 | Non-Liq.             |                           | 0.00         |
| 21,16          | 125,71           | 3.38          | 2,69         | 110          | 1.130              | 0.954          | 2.71         | 0,66         | 0.96         | 112,72           | 2.18         |      | 1      | 82                       | 1.62         |              |      | 182 1          |              | Infin.           | 0.000          | 0.711          | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 21.33<br>21.49 | 116.66<br>242.49 | 3.47<br>3.92  | 2,97<br>1,62 | 110<br>110   |                    | 0.954<br>0.953 | 3.00<br>1.63 |              | 0.95<br>0.96 |                  | 2.23<br>1.82 |      |        |                          | 1.75<br>1.12 |              |      |                | 1.00         | Infin<br>Infin   | 0.000          | 0.714<br>0.715 | Non-Liq,<br>Non-Liq. |                           | 0.00         |
| 21,65          | 336.70<br>383.91 | 4.03<br>3.24  | 1.20<br>0.84 | 110<br>110   |                    |                |              | 0.50         | 0.96         | 305.29           | 1.63         |      | 1      | 100                      | 1.00         | 1.05         | 1.00 | 306.4          | 1.00         | Infin.           | 0.000          | 0.717          | Non-Liq.             | Non-Liq                   | 0.00         |
| 21.98          | 357.67           | 2.57          | 0.72         | 110          | 1.150              | 0.952          | 0.72         |              | 0.96<br>0.96 |                  | 1.48<br>1.44 |      |        |                          |              | 1.10<br>1.15 |      | 348.9<br>324.5 | 1.00         | Infin.           | 0.000          | 0.718<br>0.719 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 22.15<br>22.31 | 353.56<br>349.51 | 1.87<br>1.82  | 0.53<br>0.52 | 110<br>110   |                    | 0.951<br>0.951 |              |              | 0.96<br>0.96 |                  | 1.35<br>1.35 |      |        |                          |              |              |      | 320 2<br>316 0 |              | Infin.           | 0.000          | 0.721<br>0.722 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00         |
| 22,47          | 344.99           | 1.95          | 0.56         | 110          | 1.161              | 0.950          | 0.57         | 0.50         | 0.95         | 310,17           | 1.38         |      | 1      | 100                      | 1,00         | 1.30         | 1.00 | 311.3          | 1,00         | Infin.           | 0.000          | 0.724          | Non-Liq.             |                           | 0.00<br>0.00 |
| 22.64<br>22.80 | 338.66<br>324.89 | 2.25          | 0.67<br>0.78 | 110<br>110   |                    |                |              |              | 0.95<br>0.95 |                  | 1.44<br>1.50 |      |        |                          |              |              |      | 305.1<br>292.1 |              |                  | 0.000          | 0.725<br>0.726 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 22.97<br>23.13 | 321.85<br>325.14 | 2.86<br>3.11  | 0.89         | 110<br>110   |                    |                |              | 0.50         | 0.95<br>0.95 | 287.84           | 1.55         |      | 1      | 100                      | 1.00         | 1.40         | 1,00 | 288.9          | 1.00         | Infin.           | 0.000          | 0.727          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 23.29          | 321.77           | 3.23          | 1.00         | 110          |                    |                |              |              | 0.95         |                  | 1.57<br>1.59 | į    | Ti .   |                          |              |              |      | 291.4<br>287.9 |              |                  | 0.000          | 0.729<br>0.730 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 23,46          | 319.42<br>320.77 | 3.46<br>3.46  | 1.08         | 110<br>110   |                    |                |              |              | 0.94<br>0.94 |                  | 1.62<br>1.61 |      |        |                          |              |              |      | 285.3<br>286.0 |              |                  | 0.000          | 0.731<br>0.732 | Non-Liq.             |                           | 0.00         |
| 23,79          | 324.18           | 3.64          | 1_12         | 110          | 1.193              | 0.946          | 1.13         | 0.50         | 0.94         | 287,53           | 1.62         | 1    |        | 100                      | 1.00         | 1.40         | 1.00 | 288.6          | 1.00         | Infin            | 0.000          | 0.733          | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00 |
| 23,95<br>24,11 | 329.34<br>336.72 | 3.59<br>2.85  | 1.09<br>0.85 | 110<br>110   |                    |                |              |              |              |                  | 1.61<br>1.52 | 1    |        |                          |              |              |      | 292.7<br>298.8 |              |                  | 0.000          | 0.735<br>0.736 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 24,28<br>24,44 | 342,31<br>363,48 | 2.38          | 0.69<br>0.58 | 110          | 1.204              | 0.945          | 0.70         | 0.50         | 0.94         | 302.18           | 1.45         |      |        | 100                      | 1.00         | 1.40         | 1.00 | 303,3          | 1.00         | Infin.           | 0.000          | 0.737          | Non-Liq.             | Non-Liq                   | 0.00         |
| 24,61          | 368.92           | 1.84          | 0.50         | 110<br>110   | 1.212              | 0.943          | 0.50         |              |              |                  | 1.38<br>1.33 | 1    |        |                          |              |              |      | 321.6<br>325.9 |              |                  | 0.000          | 0.738<br>0.739 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 24.77<br>24.93 | 350.00<br>320.76 | 2.34<br>2.58  | 0.67<br>0.80 | 110<br>110   |                    |                |              |              |              |                  | 1.43<br>1.52 | 1    |        |                          | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000          | 0.740<br>0.741 | Non-Liq.             | Non-Liq                   | 0.00         |
| 25.10          | 290.38           | 2.75          | 0,95         | 110          | 1.224              | 0.942          | 0.95         | 0.50         | 0.93         | 254.11           | 1.60         | j    | 1      | 100                      | 1_00         | 1.40         | 1.00 | 255.1          | 1.00         | Infin:           | 0.000          | 0.742          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00 |
| 25.26<br>25.43 | 201.78<br>270.13 | 2.86          | 1.02<br>0.93 | 110<br>110   |                    |                |              |              |              |                  | 1.63<br>1.62 | 1    |        |                          |              |              |      | 247.1<br>236.4 | 1.00         |                  | 0.000          | 0.743<br>0.744 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 25,59          | 259.39           | 2.62          | 1.01         | 110          | 1,236              | 940            | 1.01         | 0.51         | 0.92         | 225.59           | 1.66         | 1    | 1 1    | 100                      | 1.01         | 1.40         | 1.00 | 228,5          | 1.00         | Infin.           | 0,000          | 0.745          | Non-Liq.             | Non-Lig                   | 0.00         |
| 25.75<br>25.92 | 232.66<br>153.15 | 2.59          | 1.11<br>1.70 | 110<br>110   |                    |                |              |              |              |                  | 1.72<br>1.99 | 1    |        |                          |              |              |      |                | 1.00<br>1.00 |                  | 0.000          | 0.746<br>0.747 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 26.08<br>26.25 | 77.71<br>33.55   | 1.98<br>1.53  | 2.55<br>4.55 | 110<br>110   |                    |                |              |              | 0.89<br>0.87 |                  | 2.33         | 1    |        |                          | 2.05         |              |      | 131.9          | 1_00         | 0.293            |                | 0.747          | 0.39                 | 96%                       | 1.12         |
| 26.41          | 22.88            | 0.79          | 3.47         | 110          | 1.255              | 0.937          | 3.67         | 0.86         | 0.86         | 17,64 2          | 2.85         | 0    | )      |                          |              |              |      |                | 1.00<br>1.00 |                  |                | 0.748<br>0.749 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00 |
| 26.57<br>26.74 | 18.15<br>18.25   | 0,50<br>0,55  | 2.75<br>3.03 | 110<br>110   |                    |                |              |              | 0.86<br>0.86 |                  | 2.88<br>2.91 | 0    |        |                          |              |              |      |                | 1.00<br>1.00 |                  |                | 0.750<br>0.751 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 26.90<br>27.07 | 17:74            | 0.85          | 4.80         | 110          | 1.267              | 0.935          | 5.17         | 0.92         | 0.85         | 13.19            | 3.04         | 0    | )      |                          |              |              |      |                | 1.00         |                  |                | 0.751          | Non-Liq.             | Non-Liq.                  | 0.00         |
| 27 23          | 23.20<br>36.59   | 1.17<br>1.63  | 5.05<br>4.44 | 110<br>110   |                    |                |              |              | 0.85<br>0.86 |                  | 2.96<br>2.76 | 0    |        |                          |              |              |      |                | 1.00<br>1.00 |                  |                | 0.752<br>0.753 | Non-Liq.<br>Non-Liq. |                           | 0.00         |
| 27.40<br>27.56 | 72.79<br>107.63  | 1.23<br>1.36  | 1.69<br>1.26 | 110<br>110   |                    |                |              |              | 0.88<br>0.89 | 59,44 2          | 2.24         | 1    |        |                          | 1.76<br>1.32 |              |      | 104.4          | 1.00         |                  | 0.186          | 0.754          | 0.25                 | 99%                       | 1.46         |
| 27.72          | 139.45           | 1.46          | 1.05         | 110          | 1,286              | 932            | 1,06         | 0.57         | 0.89         | 116,81 1         | .88          | 1    |        | 93 1                     | 1.17         | 1:00 1       | .00  | 136.8          | 1.00         | 0.318            | 0.233<br>0.318 | 0.754<br>0.755 | 0.31<br>0.42         | 98%<br>95%                | 1.28<br>1.06 |
| 27.89          | 170.39           | 1,41          | 0.83         | 110          | 1,290 (            | 931            | 0.83         | 0,53         | 0.90         | 143.88 1         | .74          | 1    | i. S   | 92 1                     | 1_06         | 1.05         | .00  | 153.6          | 1,00         | 0.417            | 0.417          | 0.756          | 0.55                 | 88%                       | 0.73         |

|  | ſ    | Layer | Tip    | Friction | Friction | Total | Eff Stress | S     |      |      |      | _         |       | 9 | Liquef   | Rel    |      |      | _    | Clean   |      |        |       | Induced | Liquefac. |          | Volumetric |
|--|------|-------|--------|----------|----------|-------|------------|-------|------|------|------|-----------|-------|---|----------|--------|------|------|------|---------|------|--------|-------|---------|-----------|----------|------------|
| 1965   1966   1967   1968   1969      |      |       |        |          |          |       |            |       |      |      |      | Corrected | 1     | 0 |          |        |      | Н    |      |         |      |        | EQ    |         |           |          |            |
| 200   190    | Ļ    |       |        |          |          | (pcf) | p'o (tsf)  |       | F    | n    | Co   | Qc1n      | lc    | õ | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n    | Κσ   | CRR75  | CRR   | CSR     | Factor    | Pt       | (%)        |
| 2.30   2.50      |      |       |        |          |          |       |            |       |      |      |      |           |       |   | - 200    |        |      |      |      |         |      |        |       |         |           |          |            |
| 2404   2507   2507   2507   2507   2507   2507   2508   2509      |      |       |        |          |          |       |            |       |      |      |      |           | 7.0   |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 24.00   14.00   15.00   14.0   |      |       |        |          |          |       |            |       | 0.73 | 0.50 |      |           | 1,65  |   | 4        |        |      |      |      |         |      |        |       |         |           |          |            |
| 25.00   27.00   17.0   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 50       |        |      |      |      |         |      |        |       |         |           |          |            |
| 250    |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 285 2840 240 240 240 240 240 240 240 240 240 2   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 7.7      |        | 1.13 | 1.45 |      | 216.3   |      | Infin. |       |         |           |          |            |
| 2.65   2.65   3.65   3.65   3.65   3.65   3.05      | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 2   2   2   2   2   2   2   2   2   2  |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 2019   24470   2020   138   148      | - 10 |       |        |          |          |       |            |       |      |      |      |           |       |   | 2.20     |        |      |      |      |         |      |        |       |         | Non-Liq.  | Non-Liq. |            |
| 10.00   10.0   | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1,000    |        | 2.4  |      |      |         |      |        |       |         |           |          |            |
| 1969   2474   276   27   | ı    | 30 35 | 244.48 | 3.08     | 1.26     | 110   | 1,349      |       | 1.27 |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 1905   26522   130   | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 140   244.20   240   2   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | - 500    |        |      |      |      |         |      |        |       |         |           |          |            |
| 13.15   21.1   | - 11 |       |        |          |          |       | 1.364      | 0.916 | 0.75 | 0.50 | 0.88 | 252 07    | 1,53  |   | 4        | 100    |      | 2.00 |      |         |      |        |       |         |           |          |            |
| 1519      | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 186    | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 319 924-46 180 190 190 190 190 190 190 190 190 070 070 070 070 070 070 190 190 190 190 190 190 190 190 190 19  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 4        |        |      | 2,20 | 1.00 | 259.4   |      | Infin. | 0.000 | 0.766   |           |          |            |
| 22.0   26.77   20.0   27.0     |      |       |        |          |          |       |            |       |      |      |      |           | 1.771 |   | 4        | -      |      |      |      |         |      |        |       |         |           |          |            |
| 2.22   2.64   7   2.20   6.67   10   1.39   6.98   6.96   6.95   6.97   2.98   6.19   6.95   6.97   2.98   6.19   6.95   6.97   2.98   6.19   6.95   6.97   2.98   6.19   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95   6.97   2.98   6.95    |      |       |        |          |          |       |            |       |      |      |      |           |       |   | =        |        | 100  |      |      |         |      |        |       |         |           |          |            |
| 224   231   251    |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        | 100  | 2,40 | 1.00 | 209.2   | 100  | Infin. | 0.000 | 0.766   | Non-Liq.  | Non-Liq  | 0.00       |
| 3247 352.0 17.7 0.9 11.5 17.7 0.9 11.0 14.7 0.90 16.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18  | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 2227     |        |      |      |      |         |      |        |       |         |           |          |            |
| 3247 56.20 1.7   0.9   110   141   0.94   0.5   0.5   0.87   289.53   1.3   1.00   1.00   2.65   1.00   2.05   1.00   1.07   1.07   1.00   0.00   1.07   1.00   1.0 |      | 32,81 | 311.55 | 1.75     | 0.56     | 110   | 1.407      | 0.905 | 0.56 | 0.50 | 0.87 | 254,16    | 1.44  |   | 100      |        |      |      |      |         |      |        |       |         |           |          |            |
| 33.63 882.54 1.72 0.45 191 0.479 0.902 0.45 0.50 0.89 31.03 1.31 1 100 10.00 2.76 100 3124 1.00 1mln 0.000 0.767 Montula, Montula 0.00 31.03 31.03 1.00 1.00 1.00 1.00 1.  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      | 1.00 | 290.6   | 1.00 |        | 0.000 | 0.767   | Non-Liq.  | Non-Liq. | 0.00       |
| 38-78 88-79 170 044 110 1423 0801 04 05 08 3132 130 1 100 100 2.75 100 3144 100 177 080 0.757 080-Liq Non-Liq 0.00 0.757 080-Liq 0.00 0 |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 373 973.85   192 051 110   | ŀ    | 33,46 | 385,73 | 1.70     | 0.44     | 110   | 1,423      | 0.901 | 0.44 | 0.50 | 0.86 | 313,21    | 1,30  |   | 1        | 100    | 1.00 | 2.75 | 1.00 | 314.4   | 1.00 | Infin. | 0,000 | 0,767   |           |          |            |
| 3342 380.4 2.3 68 19 0.5 110 1.45 0.89 0.5 0.5 0.8 291.7 1.44 1 100 100 2.99 100 222 100 101 101 0.0 0.75 Men-Lia, Non-Lia, 0.00 142 380.4 27 10.3 110 1.44 0.89 0.74 0.8 0.85 241.9 1.39 1.0 100 100 2.0 100 27.0 100 101 101 0.0 0.75 Men-Lia, Non-Lia, 0.00 144 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 3412 335.62 158 050 110 1.439 0.987 050 050 050 050 074 050 050 074 050 0750 07  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 3447 2074 254 094 110 1450 085 094 075 085 2176 185 01 100 100 3.05 100 2185 098 1185 0.00 0767 Non-Lig. Non-Li |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      | 2.95 | 1.00 | 272.7   | 1.00 | Infin. | 0,000 | 0.767   |           |          |            |
| 245   255   275   109  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 3478 265.64 271 102 110 1464 083 103 0.51 0.85 2147 110 1.02 110 1.02 3.01 10.0 214.0 0.99 infin. 0.00 0.767 Non-Liq. No | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 35.77 37.72 329 397 10 1.462 0.89 0.89 0.89 0.89 0.89 0.89 0.89 0.89   | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         | Non-Liq.  | Non-Liq  | 0.00       |
| 337.12 329 0.97 110 1466 0.89 0.98 0.50 0.85 2694 159 1 10 0 100 330 1.00 276 0.99 1nin 0.000 0.768 Non-Liq Non-Liq 0.00 3569 3350 32.49 4.15 1.21 110 1.474 0.987 122 0.51 0.85 274.01 167 1 100 1.01 3.35 1.00 285 0.09 1nin 0.000 0.768 Non-Liq Non-Liq 0.00 356 389.30 4.20 107 110 1.476 0.887 170 0.04 275.09 1 10 1.04 27.09 1 10 1.04 2.088 1.07 0.00 1.08 3.85 1.00 1.03 3.45 1.00 277.0 98 1nin 0.000 0.768 Non-Liq Non-Liq 0.00 3.55 0.00 1.00 1.00 3.55 1.00 1.00 3.55 1.00 1.00 3.00 1.00 0.00 0.768 Non-Liq Non-Liq 0.00 1.00 3.55 1.00 1.00 3.00 1.00 1.00 3.55 1.00 1.00 1.00 3.55 1.00 1.00 1.00 3.55 1.00 1.00 1.00 3.55 1.00 1.00 1.00 0.00 0.768 Non-Liq Non-Liq 0.00 1.00 3.55 1.00 1.00 1.00 3.55 1.00 1.00 1.00 0.00 0.768 Non-Liq Non-Liq 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0   | - 11 |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 15.66   34.64   34.5   1.21   110   14.74   0.887   1.22   0.51   0.55   0.72   0.16   1.75   1.05   |      |       |        |          |          |       | 1.466      | 0.889 | 0.98 | 0.50 | 0.85 | 269.52    |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 1876   1886   1.34   110   1.478   0.886   1.34   0.876   0.84   287.98   1.89   1.90   1.00   1.00   3.48   1.00   2.078   1.00   1.00   3.48   1.00   3.48   1.00   3.48   1.00   3.48   1.00   3.48   1.00   3.48   1.00   3.48   1.00   3.48   3.   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 393.85   42.01   107   110   1482   6885   107   050   058   313.11   1589   1590   100   100   35.01   100   31.03   31.08   1611   100   100   35.01   100   31.03   38.00   38.01   100   100   07.05   50.01   100   100   35.01   100   31.03   38.00   38.01   100   100   07.05   50.01   100   100   35.01   100   1   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 98.52   45.28   3.01   0.86   110   1.489   0.882   0.87   0.59   0.98   35.93   1.39   1   100   1.00   3.60   1.00   38.00   0.98   1.01   0.00   0.785   Non-Liq. Non-Liq.   0.00   3.65   47.46   2.63   0.53   1.10   1.497   0.880   0.53   0.50   0.84   376.77   1.38   1   1.00   1.00   3.70   1.00   3.05   0.98   1.01   0.00   0.785   Non-Liq. Non-Liq.   0.00   3.05   0.98   41.70   0.00   0.785   Non-Liq. Non-Liq.   0.00   0.785   0.7   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      | 1.00 | 314.3   |      | Infin. | 0.000 | 0.765   | Non-Liq.  | Non-Liq. | 0.00       |
| 98.42   475.07   30.9   0.94   110   1.499   0.891   0.84   0.85   0.84   376.77   1.38   1   100   1.00   3.05   1.00   3.05   0.98   1.01   0.00   0.764   0.00   0.764   0.00   0.764   0.00   0.765   0.00   0.764   |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 98.56   497.46   2.66   0.53   110   1.497   0.890   0.53   0.50   0.84   394.06   1.29   1   100   1.00   3.75   1.00   412.0   98   1.01   1.00   0.00   0.75   0.00     | ш    |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 5859  2860   0.51   110   1.505   0.877   0.51   0.50   0.84   415.80   1.26    | 11   |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         | Non-Liq.  | Non-Liq. | 0.00       |
| 3776   558.01   2.96   0.53   110   1.590   0.87   0.53   0.50   0.84   48.87   0.126   1   100   1.00   3.98   1.00   44.03   0.97   11fm   0.000   0.763   Non-Liq, Non-Liq   0.00   37.40   576.13   3.26   0.57   101   1.513   0.875   0.75   0.50   0.84   458.20   1.23   1   1.00   1.00   3.98   1.00   467.5   0.97   11fm   0.000   0.763   Non-Liq, Non-Liq   0.00   3.74   0.75   0.755   0.755   0.755   0.75     |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 374   375   376   376   376   377   378   378   377   378   378   377   378   378   377   378    |      |       |        |          |          |       |            | 0.070 | 0.00 | 0.00 | 0.84 | 438.70    |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 37.77   555.02   2.54   0.46   1.01   0.521   0.872   0.46   0.50   0.83   498.03   1.01   1.525   0.871   0.39   0.50   0.83   432.98   1.17   1   1.00   1.00   4.05   1.00   4.20   0.97   Infin.   0.000   0.762   Non-Liq.   Non-Liq.   0.00   37.73   33.86   0.873      |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 37.78   538.68   2.11   0.39   110   1.525   0.871   0.39   0.50   0.83   422.95   1.17   1   100   1.00   4.05   1.00   42.45   0.97   Infin   0.000   0.761   Non-Liq   Non-Liq   0.00   38.475   2.52   0.47   1.10   1.528   0.888   0.59   0.77   0.50   0.83   419.32   1.31   1   100   1.00   4.15   1.00   411.3   0.96   Infin   0.000   0.761   Non-Liq   Non-Liq   0.00   38.48   38.24   48.26   4.31   0.89   110   1.536   0.865   0.78   0.50   0.83   38.91   4.14   1   1.00   1.00   4.15   1.00   411.3   0.96   Infin   0.000   0.761   Non-Liq   Non-Liq   0.00   38.89   499.56   3.91   0.78   1.10   1.540   0.865   0.78   0.50   0.83   38.91   4.14   1   1.00   1.00   4.25   1.00   391.6   0.96   Infin   0.000   0.763   Non-Liq   Non-Liq   0.00   38.55   0.41   0.38   0.67   1.10   1.540   0.865   0.78   0.50   0.83   38.91   0.86   0.78   0.80   0.78   0.80   3.89   0.80   0.78   0.80   0.8   |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 88   6523   23   30   0   50   110   1.532   0.888   0.59   0.50   0.83   307.54   1.47   1   100   1.00   4.15   1.00   37.90   0.96   Infin.   0.000   0.761   Non-Liq.   Non-Liq.   0.00   38.855   3.91   0.78   110   1.540   0.885   0.78   0.50   0.83   397.54   1.47   1   100   1.00   4.25   1.00   391.6   0.96   Infin.   0.000   0.760   Non-Liq.   Non-Liq.   0.00   38.855   0.41   0.39   0.78   110   1.540   0.885   0.78   0.50   0.83   399.20   1.36   1   100   1.00   4.25   1.00   391.6   0.96   Infin.   0.000   0.750   Non-Liq.   Non-Liq.   0.00   38.858   3.91   0.78   110   1.540   0.885   0.78   0.50   0.83   389.20   1.36   1   100   1.00   4.25   1.00   391.6   0.96   Infin.   0.000   0.759   Non-Liq.   Non-Liq.   0.00   3.81   3.71   3.81   3.81   3.71   3.81     |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      | 424.5   | 0.97 | Infin. | 0.000 | 0.762   | Non-Liq.  | Non-Liq  | 0.00       |
| 1882   482   482   88   431   0.89   110   1.536   0.867   0.90   0.50   0.83   397.54   1.47   1   100   1.00   4.20   1.00   397.0   0.96   Infin.   0.000   0.760   Non-Liq.   Non-Liq.   0.00   38.57   504.10   3.38   0.67   110   1.540   0.865   0.78   0.50   0.83   390.14   1.42   1   100   1.00   4.20   1.00   394.7   0.96   Infin.   0.000   0.750   Non-Liq.   Non-Liq.   0.00   38.57   3.91   443.92   3.01   0.66   110   1.540   0.864   0.67   0.50   0.83   393.20   1.36   1   100   1.00   4.35   1.00   347.0   0.96   Infin.   0.000   0.759   Non-Liq.   Non-L   | ш    |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 38.55   504.10   3.38   0.67   110   1.544   0.864   0.67   0.50   0.83   393.20   1.38   1   100   1.00   4.35   1.00   347.0   0.96   Infin.   0.00   0.759   Non-Liq.   Non-Liq.   0.00   38.71   443.92   3.01   0.86   3.10   0.85   110   1.552   0.861   0.65   0.50   0.83   389.38   1.37   1   100   1.00   4.45   1.00   376.8   0.96   Infin.   0.00   0.759   Non-Liq.   Non-Liq.   0.00   39.74   443.92   3.01   0.85   110   1.552   0.861   0.65   0.50   0.83   389.38   1.37   1   100   1.00   4.45   1.00   376.8   0.96   Infin.   0.00   0.758   Non-Liq.   Non-Liq.   0.00   39.74   489.80   3.73   0.77   110   1.552   0.860   0.77   0.50   0.82   375.10   1.43   1   100   1.00   4.45   1.00   376.8   0.96   Infin.   0.00   0.758   Non-Liq.   Non-Liq.   0.00   39.77   409.90   3.48   0.87   1.10   1.567   0.856   0.82   348.87   1.49   1   100   1.00   4.50   1.00   350.2   0.96   Infin.   0.00   0.757   Non-Liq.   Non-Liq.   0.00   39.37   409.90   3.48   0.87   1.14   110   1.571   0.854   1.15   0.854   1.1   | 3    | 88.22 | 482.86 | 4.31     | 0.89     | 110   | 1.536      | 0.867 | 0.90 | 0.50 | 0.83 | 377.54    | 1.47  |   | 1        | 100    | 1.00 | 4.20 | 1.00 | 379.0   | 0.96 | Infin. | 0.000 | 0.760   | Non-Liq.  | Non-Liq  |            |
| 38.71   443.92   3.01   0.68   110   1.584   0.863   0.68   0.50   0.83   345.67   1.41   1   100   1.00   4.35   1.00   347.0   0.96   Infin.   0.000   0.759   Non-Liq.   No   |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 38.88   474.86   3.10   0.65   110   1.552   0.881   0.65   0.50   0.83   3.93   3.93   3.93   3.93   49.28   482.80   3.73   0.77   110   1.555   0.860   0.87   0.50   0.82   375.10   1.43   1   100   1.00   4.45   1.00   376.5   0.96   Infin.   0.00   0.758   Non-Liq.   Non-Liq.   0.00   39.37   409.90   3.48   0.87   110   1.560   0.859   0.88   0.50   0.82   310.48   1.52   1   100   1.00   4.55   1.00   311.6   0.95   Infin.   0.000   0.756   Non-Liq.   Non-Liq.   0.00   39.35   328.20   3.74   1.14   110   1.567   0.856   1.15   0.54   0.87   0.80   2.28   7.76   1   100   1.00   4.55   1.00   311.6   0.95   Infin.   0.000   0.756   Non-Liq.   Non-Liq.   0.00   39.86   241.13   3.50   1.45   110   1.571   0.854   1.15   0.54   0.87   0.80   181.99   1.84   1   100   1.04   4.05   1.00   3.00   3.00   3.00   0.756   Non-Liq.   Non-Liq.   0.00   3.98   241.13   3.50   1.45   110   1.575   0.853   1.46   0.55   0.80   181.19   1.84   1   1.00   1.04   4.05   1.00   3.00   3.00   3.00   0.756   Non-Liq.    | 3    | 88.71 | 443.92 | 3.01     | 0.68     |       | 1.548      |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 39.24   449.71   3.94   0.88   110   1.560   0.859   0.88   0.50   0.82   348.87   1.49   1   100   1.00   4.55   1.00   350.2   0.96   Infin.   0.00   0.757   Non-Liq.   Non-Liq.   0.00   0.937   Non-Liq.   Non-Liq.   0.00   0.937   Non-Liq.   Non-Liq.   0.00   0.937   Non-Liq.   Non-Liq.   Non-Liq.   Non-Liq.   0.00   0.937   Non-Liq.    |      |       |        |          |          |       | 1.552      | 0.861 | 0.65 | 0.50 | 0.83 | 369,38    | 1.37  |   | 1        | 100    | 1.00 | 4.40 | 1.00 | 370.8   | 0.96 | Infin. | 0.000 | 0.758   | Non-Liq.  | Non-Liq. | 0.00       |
| 39.37   400.90   3.48   0.87   110   1.564   0.857   0.87   0.50   0.82   310.48   1.52   1   100   1.00   4.55   1.00   311.6   0.95   Infin.   0.000   0.757   Non-Liq.   Non-Liq.   0.00   39.53   328.20   3.74   1.14   110   1.567   0.856   1.15   0.54   0.81   183.97   1.76   1   100   1.00   4.65   1.00   1.88   0.95   Infin.   0.000   0.756   Non-Liq.   Non-Liq.   0.00   39.86   241.13   3.50   1.45   110   1.575   0.853   1.46   0.56   0.80   181.19   1.84   1   100   1.14   4.70   1.00   206.7   0.95   Infin.   0.000   0.756   Non-Liq.   Non-Liq.   0.00   40.13   216.7   3.02   1.39   110   1.579   0.852   1.40   0.57   0.80   161.99   1.86   1   1.57   1.00   1.14   4.70   1.00   206.7   0.95   Infin.   0.000   0.754   Non-Liq.   Non-Liq.   0.00   40.13    |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 39.53   328.20   3.74   1.14   110   1.567   0.856   1.15   0.81   0.82   252.87   1.67   1.00   1.01   4.60   1.00   257.5   0.95   Infin.   0.000   0.756   Non-Liq.   Non-Liq.   0.00   0.95   Non-Liq.   No   | 3    | 9.37  | 400.90 | 3.48     | 0.87     | 110   | 1.564      | 0.857 | 0.87 | 0.50 | 0.82 | 310,48    | 1.52  |   | 1        | 100    | 1.00 | 4.55 | 1.00 | 311,6   | 0.95 |        |       |         |           |          |            |
| 39.86  |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         | Non-Liq.  | Non-Liq. |            |
| 40.03  |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 40.35  | 4    | 0.03  | 216.57 | 3.02     | 1.39     | 110   | 1.579      | 0.852 | 1.40 | 0.57 | 0.80 | 161.99    | 1.86  |   | 1        | 97     | 1.15 | 4.75 | 1.00 | 187,5   | 0,95 | Infin  | 0.000 | 0.754   | Non-Liq.  | Non-Liq. | 0.00       |
| 40.52 323.21 1.80 0.56 110 1.591 0.847 0.56 0.50 0.82 247.90 1.45 1 100 1.00 4.90 1.00 248.8 0.95 Infin. 0.000 0.752 Non-Liq. Non-Liq. 0.00 40.68 290.82 1.95 0.67 110 1.595 0.846 0.67 0.50 0.81 222.66 1.54 1 100 1.00 4.95 1.00 223.5 0.94 Infin. 0.000 0.755 Non-Liq. Non-Liq. 0.00 40.85 234.61 2.52 1.08 110 1.599 0.844 1.08 0.53 0.80 176.69 1.75 1 100 1.07 5.00 100 19.3 0.94 Infin. 0.000 0.755 Non-Liq. Non-Liq. 0.00 41.01 233.18 3.14 1.41 110 1.603 0.843 1.42 0.56 0.79 185.64 1.86 1 98 1.15 5.05 1.00 191.2 0.94 Infin. 0.000 0.750 Non-Liq. Non-Liq. 0.00 41.34 236.31 3.97 1.68 110 1.610 0.840 1.69 0.58 0.78 174.01 1.90 1 100 1.12 5.10 1.00 207.2 0.94 Infin. 0.000 0.750 Non-Liq. Non-Liq. 0.00 41.50 209.85 2.42 1.15 110 1.614 0.838 1.16 0.55 0.79 185.59 1.81 1 95 1.12 5.20 1.00 174.5 0.94 Infin. 0.000 0.748 Non-Liq. Non-Liq. 0.00 41.667 228.87 2.31 1.01 110 1.618 0.837 1.01 0.53 0.80 171.46 1.74 1 99 1.07 5.25 1.00 183.4 0.94 Infin. 0.000 0.748 Non-Liq. Non-Liq. 0.00 41.99 224.45 1.75 0.54 110 1.622 0.835 0.71 0.50 0.81 205.78 1.57 1 100 1.00 5.30 1.00 207.6 0.94 Infin. 0.000 0.747 Non-Liq. Non-Liq. 0.00 41.99 224.45 1.75 0.54 110 1.622 0.835 0.71 0.50 0.81 205.78 1.57 1 100 1.00 5.30 1.00 207.6 0.94 Infin. 0.000 0.747 Non-Liq. Non-Liq. 0.00 41.99 224.45 1.75 0.54 110 1.622 0.835 0.71 0.50 0.81 205.78 1.57 1 100 1.00 5.30 1.00 207.6 0.94 Infin. 0.000 0.747 Non-Liq. Non-Liq. 0.00 41.99 224.45 1.75 0.54 110 1.634 0.832 0.54 0.50 0.81 246.13 1.44 1 100 1.00 5.30 1.00 207.6 0.94 Infin. 0.000 0.747 Non-Liq. Non-Liq. 0.00 41.99 224.45 1.75 0.54 110 1.634 0.832 0.54 0.50 0.81 222.02 1.41 1 100 1.00 5.35 1.00 283.0 0.93 Infin. 0.000 0.744 Non-Liq. Non-Liq. 0.00 42.89 390.58 2.06 0.55 110 1.632 0.827 0.53 0.50 0.80 285.20 1.38 1 100 1.00 5.55 1.00 288.3 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.89 390.58 2.06 0.55 110 1.646 0.826 0.54 0.50 0.80 285.10 1.38 1 100 1.00 5.55 1.00 288.3 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.88 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 287.72 1.38 1 100 1.00 5.55 1.00 288 |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        |        |      |      |      |         |      |        |       |         |           |          |            |
| 40.88  | 4    | 0.52  | 323.21 | 1.80     | 0.56     | 110   | 1.591      | 0.847 | 0.56 | 0.50 |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 41.01 223.18 3.14 1.41 110 1.603 0.843 1.42 0.56 0.79 165.64 1.86 1 98 1.15 5.05 1.00 191.2 0.94 Infin. 0.000 0.750 Non-Liq. Non-Liq. 0.00 41.17 246.49 3.45 1.40 110 1.607 0.841 1.41 0.56 0.79 183.54 1.82 1 100 1.12 5.10 1.00 207.2 0.94 Infin. 0.000 0.750 Non-Liq. Non-Liq. 0.00 41.34 236.31 3.97 1.68 110 1.610 0.840 1.69 0.58 0.78 174.01 1.90 1 100 1.19 5.15 1.00 207.6 0.94 Infin. 0.000 0.748 Non-Liq. Non-Liq. 0.00 41.50 298.85 2.42 1.15 110 1.614 0.838 1.16 0.837 1.01 0.55 0.79 155.90 1.81 1 95 1.12 5.20 1.00 174.5 0.94 Infin. 0.000 0.748 Non-Liq. Non-Liq. 0.00 41.67 228.87 2.31 1.01 110 1.618 0.837 1.01 0.53 0.80 171.46 1.74 1 99 1.07 5.25 1.00 183.4 0.94 Infin. 0.000 0.747 Non-Liq. Non-Liq. 0.00 41.89 324.45 1.75 0.54 110 1.626 0.834 0.54 0.50 0.81 246.13 1.44 1 100 1.00 5.35 1.00 207.6 0.94 Infin. 0.000 0.748 Non-Liq. Non-Liq. 0.00 42.39 372.30 2.11 0.57 110 1.634 0.832 0.54 0.50 0.81 272.02 1.41 1 100 1.00 5.35 1.00 207.6 0.94 Infin. 0.000 0.746 Non-Liq. Non-Liq. 0.00 42.39 372.30 2.11 0.57 110 1.634 0.831 0.57 0.50 0.80 281.93 1.41 1 100 1.00 5.45 1.00 283.0 0.93 Infin. 0.000 0.744 Non-Liq. Non-Liq. 0.00 42.89 390.56 2.06 0.53 110 1.642 0.827 0.53 0.50 0.80 281.93 1.41 1 100 1.00 5.55 1.00 283.0 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 288.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 288.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 288.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 288.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 288.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. Non-Liq. 0.00   |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        | 100 ′  | 1.00 | 4.95 | 1.00 | 223.5   | 94   | Infin. | 0.000 | 0.752   | Non-Liq.  | Non-Liq  | 0.00       |
| 41.17  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | (D)      |        |      |      |      |         |      |        |       |         |           |          |            |
| 41.50  | 4    | 1.17  | 246.49 | 3.45     | 1.40     | 110   | 1.607      | 0.841 | 1.41 | 0.56 | 0.79 | 183.54    | 1_82  |   | 1        | 100 ′  | 1.12 | 5.10 | 1.00 | 207:2   | 0.94 | Infin. | 0.000 | 0.750   |           |          | 0.00       |
| 41.67  |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         | -         |          |            |
| 41.83  |      | 1.67  | 228.87 | 2.31     |          |       |            |       |      |      |      |           |       |   | - 2      |        |      |      |      |         |      |        |       |         | -         |          |            |
| 42.16 358.84 1.94 0.54 110 1.630 0.832 0.54 0.50 0.81 272.02 1.41 1 100 1.00 5.40 1.00 273.0 0.93 Infin. 0.000 0.745 Non-Liq. Non-Liq. 0.00 42.32 372.30 2.11 0.57 110 1.634 0.831 0.57 0.50 0.80 281.93 1.41 1 100 1.00 5.45 1.00 283.0 0.93 Infin. 0.000 0.744 Non-Liq. Non-Liq. 0.00 42.49 381.00 2.00 0.52 110 1.638 0.829 0.53 0.50 0.80 288.20 1.38 1 100 1.00 5.55 1.00 283.0 0.93 Infin. 0.000 0.743 Non-Liq. Non-Liq. 0.00 42.65 390.56 2.06 0.53 110 1.642 0.827 0.53 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 296.8 0.93 Infin. 0.000 0.743 Non-Liq. Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 297.72 1.38 1 100 1.00 5.55 1.00 298.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. Non-Liq. 0.00  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | 1        | 100 1  | 1-00 | 5.30 | 1.00 | 207.6   | 94   | Infin. | 0.000 | 0.747   | Non-Liq.  | Non-Liq. | 0.00       |
| 42.32 372.30 2.11 0.57 110 1.634 0.831 0.57 0.50 0.80 281.93 1.41 1 100 1.00 5.45 1.00 283.0 0.93 Infin. 0.000 0.744 Non-Liq. Non-Liq. 0.00 42.49 381.00 2.00 0.52 110 1.638 0.829 0.53 0.50 0.80 288.20 1.38 1 100 1.00 5.50 1.00 289.3 0.93 Infin. 0.000 0.743 Non-Liq. Non-Liq. 0.00 42.65 390.56 2.06 0.53 110 1.642 0.827 0.53 0.50 0.80 295.10 1.37 1 100 1.00 5.55 1.00 296.2 0.93 Infin. 0.000 0.743 Non-Liq. Non-Liq. 0.00 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 297.72 1.38 1 100 1.00 5.55 1.00 298.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00  |      |       |        |          |          |       |            |       |      |      |      |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
| 42.49       381.00       2.00       0.52       110       1.638       0.829       0.53       0.50       0.80       288.20       1.38       1       100       1.00       5.50       1.00       289.3       0.93       Infin.       0.000       0.743       Non-Liq.       Non-Liq.       0.00         42.65       394.48       2.14       0.54       110       1.646       0.826       0.54       0.50       0.80       297.72       1.38       1       100       1.00       5.55       1.00       298.8       0.93       Infin.       0.000       0.742       Non-Liq.       Non-Liq.       0.00  | 4    | 2.32  | 372.30 | 2.11     | 0.57     | 110   | 1.634      | 0.831 | 0.57 | 0.50 | 0.80 | 281.93    | 1:41  |   | 1        | 100 1  | 1.00 | 5.45 | 1.00 | 283,0 ( | 93   |        |       |         |           |          |            |
| 42.81 394.48 2.14 0.54 110 1.646 0.826 0.54 0.50 0.80 297.72 1.38 1 100 1.00 5.55 1.00 298.8 0.93 Infin. 0.000 0.742 Non-Liq. Non-Liq. 0.00  |      |       |        |          |          |       |            |       |      |      |      |           |       |   | - 31     |        |      |      |      |         |      |        |       |         |           |          |            |
| 10.00 004.04 0.00 0.00 440 4.00 0.00   | 4    | 2.81  | 394.48 | 2.14     | 0.54     | 110   | 1.646      | 0.826 | 0.54 | 0.50 | 0.80 |           |       |   |          |        |      |      |      |         |      |        |       |         |           |          |            |
|  | 4    | 2.98  | 391.94 | 2.30     | 0.59     | 110   | 1.649      | 0.824 | 0.59 | 0.50 | 0.80 | 295 44    | 1.41  |   | 1        | 100 1  |      |      |      |         |      |        |       |         |           |          |            |

| Layer  | Tip    |       | Friction |         | Eff.Stress |       |      |      |      |           |      | g L  | iquef. | Rel    |      |      |      | Clean |      |        |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|-------|----------|---------|------------|-------|------|------|------|-----------|------|------|--------|--------|------|------|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs    | Ratio    | Unit Wt | at Midpt   |       |      |      |      | Corrected | d    | S SL | scept  | Dens   |      | Н    |      | Sand  |      |        | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf) | %        | (pcf)   | p'o (tsf)  | rd    | F    | n    | Ca   | Qc1n      | lc   | Ó (0 | or 1)  | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Κσ   | CRR75  | CRR   | CSR     | Factor    | P        | (%)        |
| 43,14  | 388.72 | 2.40  | 0.62     | 110     | 1.653      | 0.823 | 0.62 | 0.50 | 0.80 | 292,66    | 1,43 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 293.8 | 0.93 | Infin. | 0.000 | 0.740   | Non-Lig.  | Non-Lig  |            |
| 43.31  | 387,56 | 2.49  | 0.64     | 110     | 1.657      | 0.821 | 0.65 | 0.50 | 0,80 | 291.43    | 1.44 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 292.5 | 0.93 | Infin. | 0.000 | 0.739   | Non-Lig.  | Non-Lia  | 0.00       |
| 43.47  | 388.39 | 2.43  | 0.62     | 110     | 1.661      | 0.820 | 0.63 | 0.50 | 0.80 | 291.71    | 1.43 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 292.8 | 0.92 | Infin. | 0.000 | 0.738   | Non-Lig.  | Non-Lia  | 0.00       |
| 43 64  | 394.80 | 2.34  | 0.59     | 110     | 1.665      | 0.818 | 0,60 | 0.50 | 0.80 | 296.20    | 1.41 |      | 1      | 100    | 1,00 | 5.55 | 1_00 | 297.3 | 0.92 | Infin. | 0.000 | 0.737   | Non-Liq.  | Non-Liq. | 0.00       |
| 43.80  | 409.10 | 2.46  | 0.60     | 110     | 1.669      | 0,816 | 0,60 | 0.50 | 0.80 | 306.61    | 1.40 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 307,8 | 0.92 | Infin. | 0.000 | 0.736   | Non-Liq.  | Non-Lig. | 0.00       |
| 43.96  | 411.66 | 2.41  | 0.59     | 110     | 1.673      | 0.815 | 0,59 | 0.50 | 0.80 | 308,17    | 1.39 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 309.3 | 0.92 | Infin. | 0.000 | 0.735   | Non-Lig.  | Non-Liq. | 0.00       |
| 44.13  | 423.11 | 2.33  | 0.55     | 110     | 1,677      | 0.813 | 0,55 | 0.50 | 0.79 | 316.41    | 1.37 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 317.6 | 0.92 | Infin. | 0.000 | 0.735   | Non-Lig.  | Non-Liq. | 0.00       |
| 44.29  | 427.48 | 3.38  | 0.79     | 110     | 1.681      | 0.811 | 0.79 | 0.50 | 0.79 | 319.31    | 1.48 |      | 1      | 100    | 1.00 | 5,55 | 1.00 | 320.5 | 0.92 | Infin. | 0.000 | 0.734   | Non-Liq.  | Non-Lig. | 0.00       |
| 44.46  | 465.12 | 8.79  | 1.89     | 110     | 1,685      | 0.810 | 1.90 | 0.54 | 0.78 | 341.03    | 1.77 |      | 1      | 100    | 1.08 | 5.55 | 1.00 | 370,8 | 0.92 | Infin. | 0.000 | 0.733   | Non-Liq.  | Non-Lig. | 0.00       |
| 44.62  | 532,93 | 7.53  | 1.41     | 110     |            | 0.808 | 1.42 | 0.50 | 0.79 | 397,46    | 1,62 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 399.0 | 0.92 | Infin. | 0.000 | 0.732   | Non-Liq.  | Non-Lig. | 0.00       |
| 44.78  | 591,21 | 6.48  | 1.10     | 110     |            | 0,807 | 1.10 | 0.50 | 0.79 | 440.56    | 1.51 |      | 1      | 100    | 1.00 | 5,55 | 1.00 | 442.2 | 0.92 | Infin. | 0.000 | 0.731   | Non-Lig.  | Non-Lig. | 0.00       |
| 44.95  | 507.18 | 5.63  | 1.11     | 110     |            | 0.805 | 1,11 | 0.50 | 0.79 | 377.32    | 1.55 |      | 1      | 100    | 1,00 | 5,55 | 1.00 | 378.7 | 0.91 | Infin  | 0.000 | 0.730   | Non-Lig.  | Non-Liq. | 0.00       |
| 45.11  | 476.27 | 2.22  | 0.47     | 110     |            | 0.803 | 0.47 | 0.50 | 0.79 | 353.84    | 1,28 |      | 1      | 100    | 1.00 | 5,55 | 1,00 | 355.2 | 0.91 | Infin. | 0.000 | 0.729   | Non-Lig.  | Non-Lig  | 0.00       |
| 45.28  | 485.36 | 1.77  | 0.36     | 110     |            | 0.802 | 0.37 | 0.50 | 0,79 | 360.20    | 1,20 |      | 1      | 100    | 1.00 | 5,55 | 1.00 | 361.5 | 0.91 | Infin. | 0.000 | 0.728   | Non-Lig.  | Non-Lig  | 0.00       |
| 45_44  | 498.42 | 2.45  | 0.49     | 110     |            | 0.800 | 0.49 | 0.50 | 0.79 | 369,50    | 1,28 |      | 1      | 100    | 1.00 | 5.55 | 1.00 | 370.9 | 0.91 | Infin. | 0,000 | 0,727   | Non-Liq.  | Non-Lig  | 0.00       |
| 45 60  | 485.91 | 5.77  | 1.19     | 110     |            | 0.798 | 1,19 | 0.50 | 0.79 | 359.78    | 1.59 |      | 1      | 100    | 1.00 | 5,55 | 1.00 | 361_1 | 0.91 | infin. | 0.000 | 0,726   | Non-Liq.  | Non-Lig  | 0.00       |
| 45.77  | 460.62 | 7.80  | 1.69     | 110     |            | 0.797 | 1,70 | 0.53 | 0.78 | 336.16    | 1,73 |      | 1      | 100    | 1.06 | 5.55 | 1.00 | 357.1 | 0,91 | Infin. | 0,000 | 0.725   | Non-Liq.  |          | 0.00       |
| 45_93  | 491.30 | 0.00  | 0.00     | 110     |            | 0.795 | 0.00 | 0.80 | 0.68 | 313.04    | 2,66 |      | 0      |        | 1,00 |      |      |       | 0,95 |        |       | 0.724   | Non-Liq.  |          | 0.00       |
|        | 606.17 | 0.00  | 0.00     | 110     |            | 0.793 | 0.00 | 0.82 | 0.67 | 382,66    | 2.71 |      | 0      |        | 1.00 |      |      |       | 0.95 |        |       | 0.723   | Non-Lig.  |          | 0.00       |
| 46.26  | 616.78 | 0.00  | 0.00     | 110     | 1.728      | 0.792 | 0.00 | 0.82 | 0.67 | 388.36    | 2.72 |      | 0      |        | 1.00 |      |      |       | 0.95 |        |       | 0.722   | Non-Lig.  |          | 0.00       |



Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefled Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-1 Plot: 1 (feet) **EARTHQUAKE INFORMATION** Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF Magnitude: 6.77 Clean Sand Qc1n = Cq\*Kc\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab Total PGA, g: 0.97 0.75 Use Tokimatsu & Seed (0) or Ishihara &Yoshmine (1): Ava Induced MSF 1.30 Unit Weight of unsaturated soils: 110 1.50 1% Subsidence Required SF: GWT feet: 20.0 Unit Weight of saturated soils: 110 pcf Min SF of Liquefiable Layers: 0.63 May (inches) Limiting Ic for liquefiable soils: 2.60 Design GWT, feet: 20.0 Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 99% 0.1 0.03 Laye Tip Friction Friction Total Eff.Stress Liquef. Rel Induced Liquefac Volumetric Ratio Unit Wt. at Midpt. Depth Qc Fs Corrected Suscept Dens Sand EQ M=7.5 Safety Probab Strain  $C_{\alpha}$ CRR75 (feet) (tsf) (tsf p'o (tsf) Qc1n (0 or 1) Dr (%) Qc1n CRR CSR (pcf) (m) Κσ Factor (%) 0.16 82.43 1.01 1.22 110 0.009 1.000 1.22 0,57 1.70 132.43 1.88 88 1.17 0.05 1.00 154.7 1.00 0.424 0,424 0.485 Non-Liq. Non-Liq. 0.00 1.37 1.000 1.76 0.61 0.33 77.94 1.76 110 0.018 1.70 125.21 2.01 1.31 1.00 164.0 1.00 Infin. 0.000 0.485 Non-Liq. Non-Liq. 0.00 0.49 66.43 1.48 2.23 110 0.027 1.000 2.23 0.65 1.70 106.70 2.13 RΩ 1.00 161.4 0.000 0.485 Non-Lia. Non-Lia 1.51 1.00 Infin. 0.00 1.00 0.66 56.46 1.33 2.35 110 0.036 1.000 2.35 0.67 1.70 90.66 2.20 73 1.65 1.00 150.0 0.394 0.394 0.485 Non-Liq. Non-Liq 0.00 0.82 50.54 1.16 2.30 110 0.045 1.000 2.30 0.67 1.70 81.14 2.22 68 1.72 1.00 139.9 1.00 0.334 0.334 0.485 Non-Liq. Non-Liq 0.00 0.98 1.04 2.28 0.054 1,000 2.28 45.66 110 0.68 1.70 73.28 2.25 64 1.80 1.00 132.1 1.00 0.294 0.485 0.294 Non-Lia, Non-Lia 0.00 1.15 40.24 0.94 2.33 110 0.063 0.999 2.33 0.70 1.70 64.56 2.30 1.94 1.00 125.2 0.484 1.00 0.263 0.263 Non-Lig. Non-Lig 0.00 40.24 0.94 0.072 0.999 2.33 0.70 1.94 1,31 2.33 110 1.70 64.54 2.30 59 1.00 125.2 1.00 0.263 0.263 0.484 Non-Liq. Non-Liq. 0.00 1 48 34.62 0.81 2 34 110 0.081 0.999 2 35 0.71 1.70 55.50 2.35 52 117.0 0.484 2.11 1.00 1.00 0.229 0.229 Non-Liq. Non-Liq. 1.64 31.09 0.64 2.05 110 0.090 0.998 2.06 0.71 1 70 49 R1 2.34 48 2.10 1.00 104.5 1.00 0.186 0.186 0.484 Non-Liq. Non-Liq 0.00 1.80 30.58 0.62 2.01 0.099 2.02 2.34 110 0.998 0.71 1.70 48.98 47 2.10 1.00 102.7 1.00 0.181 0.181 0.484 Non-Liq. Non-Liq. 0.00 1.97 32.03 0.75 2.33 110 0.108 0.998 2 34 0.72 1.70 51.29 2.37 49 2.20 1.00 112.8 0.213 0.484 1.00 0.213 Non-Lia, Non-Lia 0.00 2,13 0.74 110 0.997 2.41 0.73 1.70 49.65 2.39 48 2.27 1.00 0.483 112.8 1.00 0.214 0.214 Non-Lig. Non-Lig. 0.00 2 30 29,95 0.70 2 34 0.126 2.35 1.70 110 0.997 0.73 47.92 2.39 46 2.29 1.00 109.8 1.00 0.203 0.203 0.483 Non-Liq. Non-Liq. 0.00 1,70 1.00 2.46 29 19 0.66 2 26 110 0.135 0.996 2.27 0.73 46.69 2.39 45 2,29 106.7 0.483 1.00 0.193 0.193 Non-Liq. Non-Liq. 1.00 2.62 29.17 0.63 2.17 110 0.144 0.996 2 18 0.72 1.70 46.64 2.38 45 2.24 104 4 1.00 0.186 0.186 0.483 Non-Liq. Non-Liq. 0.00 2.79 29.42 0.62 2.12 110 0.153 0.996 2.13 0.72 1.70 47.03 2.37 46 2.20 1.00 103.6 1.00 0:183 0.183 0.483 Non-Lig. Non-Lig 0.00 2,95 0.62 29.77 2,08 0.162 0.995 2.09 1.70 47.57 2.36 46 0.482 110 0.72 2.17 1.00 103.3 1.00 0:182 0.182 Non-Lig. Non-Lig. 0.00 3.12 29.70 0.60 2,02 110 0,171 0.995 2.04 0.72 1.70 47.45 2.36 46 2.14 1.00 101.7 1.00 0.178 0.178 0.482 Non-Lig. Non-Lig 0.00 3,28 28,88 0.57 1,96 110 0,180 0.994 1.98 0.72 1.70 46.11 2.36 45 2.15 1.00 1.00 0.170 0.170 0.482 Non-Liq. Non-Liq. 0.00 110 1.70 1.00 3 44 26.80 0.52 1 95 0.189 0.994 1.97 0.72 42.76 2.38 42 2.24 0.482 Non-Liq. Non-Liq. 95.7 1.00 0.162 0,162 3.61 26.96 0.49 1.80 110 0.1980.994 1.81 0.72 1.70 43.00 2.36 42 2.15 1.00 92.3 1.00 0.153 0.153 0.482 Non-Liq. Non-Liq. 0.00 3.77 29.75 0.49 1.63 0.208 0.993 110 1.65 0.70 1.70 47.47 2.30 46 1.94 1.00 92.2 1.00 0.1530.153 0.482 Non-Liq. Non-Liq. 0.00 3.94 32.57 0.49 1.50 110 0.217 0.993 1.51 0.68 1.70 51.99 50 1.78 0.481 2.24 1.00 92.7 1.00 0.154 0.154 Non-Liq. Non-Liq 0.00 4.10 34.78 0.51 1,46 110 0.226 0.993 0.67 1.70 55.52 2.21 52 1.70 1.00 94.6 1.00 0.159 0.159 0.481 Non-Lig. Non-Lig. 0.00 4.27 36.24 0.53 1 47 0.235 0.992 1.70 110 1.48 0.67 57.85 2.20 1.67 1.00 96.7 1.00 0.164 0.164 0.481 Non-Liq. Non-Liq. 0.00 4 43 38.86 0.571 47 110 0.244 0.992 1 48 0.66 1.70 62.05 2.18 57 1.62 1.00 100.3 1.00 0.174 0.174 0.481 Non-Liq. Non-Liq. 0.00 4.59 44.03 0.63 1.44 110 0.253 0.991 1.45 0.65 1.70 70.34 2.13 62 1.51 1.00 106.4 1.00 0.192 0.192 0.481 Non-Liq. Non-Liq. 0.00 0.69 4.76 50.25 1.36 110 0.262 0.991 1.37 0.63 1.70 80.32 2.07 68 1.41 1.00 1129 1.00 0.214 0.214 0.480 Non-Liq. Non-Liq. 0.00 4.92 56.32 1.31 0.991 110 0.271 1.31 0.61 1.70 2.02 1.33 90.06 72 1.00 0.239 0.480 119.7 1.00 0.239 Non-Liq. Non-Liq 0.00 0.74 148.2 5.09 62.37 1.19 110 0.280 0.990 1.19 0.60 1.70 99.77 1.96 77 1,25 0.55 1.19 1.00 0.383 0.383 0.480 Non-Lia. Non-Lia 0.00 5.25 0.84 110 0.289 0.990 1.27 67.00 1.26 0.59 1.70 107.19 1.95 80 1.25 0.60 1.19 158.4 1.00 0.449 0.449 0.480 Non-Liq. Non-Liq. 0.00 5.41 67.37 0.89 1 32 110 0.298 0.989 1.32 0.60 1.70 107.77 1.97 80 1.26 0.65 1.19 Infin. 0.000 0.480 160.8 1.00 Non-Liq. Non-Liq. 0.00 5.58 67.34 0.91 1.35 110 0.307 0.989 1.36 0.60 1.70 107.71 1.97 80 1.27 0.70 1.19 162.0 1.00 Infin. 0.000 0.479 Non-Liq. Non-Liq. 0.00 0.316 0.989 1.38 5.74 67.46 0.93 1.37 110 0.60 107.89 1.70 1.98 80 1.27 0.75 1.19 162.9 1.00 Infin. 0.000 0.479 Non-Liq. Non-Liq. 0.00 5.91 67.82 0.93 1.37 0.325 0,988 1.38 0.60 108.45 110 1.70 1.98 80 1,27 0.80 1.19 163.5 0.000 0.479 1.00 Infin. Non-Liq. Non-Liq. 0.00 6.07 65.23 0.93 1.42 110 0.334 0.988 1.43 0.61 1.70 104.28 2.00 1.30 0.85 1.19 160.7 0.000 0.479 1.00 Infin: Non-Lia, Non-Lia 0.00 63.78 0.93 1.46 0.343 0.988 1.47 0.61 101.93 78 6.23 110 1,70 2,01 1,32 1.00 134.5 1.00 0.306 0.306 0.479 Non-Liq. Non-Liq. 0.00 6.40 65.72 0.95 1.45 110 0.352 0.987 1 45 0.61 1.70 105.03 2.00 79 1,30 1.00 136.9 0.319 0.479 1.00 0.319 Non-Liq. Non-Liq. 0.00 6.56 71.05 1.00 1.40 110 0.361 0.987 1 41 0.60 1.70 113.58 1.97 82 1.26 1.00 1.00 143.8 1.00 0.357 0.357 0.478 Non-Liq. Non-Liq. 0.00 6.73 77.49 0.370 0.59 1.08 1.39 110 0.986 1.40 1.70 123.92 1.94 86 1.23 1.05 1.00 152.7 1.00 0.411 0.411 0.478Non-Liq. Non-Liq. 0.00 6.89 86.69 1.16 1.34 0.379 0.986 1.34 0.58 138,69 110 1.70 1.89 90 1.18 1.10 1.00 164.5 1.00 0.000 0.478 Infin. Non-Lig. Non-Lig. 0.00 7.05 98.48 1.28 1.30 110 0.388 0.986 1.31 0.56 1.70 157.61 1.85 1.14 1.15 1.00 180.6 1.00 0,000 0.478 Infin. 0.00 Non-Lig. Non-Lig. 183,39 7.22 114.53 1.41 1.23 110 0.397 0.985 1.23 0.54 1.70 1.09 1.78 100 1.20 1.00 201.2 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 1.67 Non-Liq. Non-Liq. 7.38 122.82 1.49 1.21 110 0.406 0.985 1 21 0.54 193.40 1.76 100 1.08 1.25 1.00 209.5 1.00 Infin 0.000 0.478 0.00 1.53 0.415 7.55 128.68 1.19 110 0.985 1 19 0.53 1.65 199.45 1.75 100 1.07 1.30 1.00 214 1 1.00 Infin 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.71 1.53 128.68 1.19 0.424 0.984 1.19 0.53 1.63 197.34 1.35 110 1.75 100 1.07 1.00 212.2 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 7.87 134.06 1.17 110 0.433 0.984 1.17 0.53 1.60 202.54 1.74 1.40 215.9 0.000 100 1.06 1.00 1.00 0.477 Infin. Non-Lig. Non-Lig. 0.00 8.04 139.69 1.63 1.16 110 0.442 0.984 1.17 0.53 1.58 208.28 1.73 100 1\_06 1.45 1.00 220.8 0.000 0.477 1.00 Infin. Non-Lig. Non-Lig. 0.00 8.20 147.04 1.72 1.17 110 0.451 0.983 1.17 0.52 1.56 216,44 1.50 1.72 100 1.05 1.00 228.1 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 8.37 151.94 1.71 1.12 110 0.460 0.983 1.13 0.52 1.54 220.33 1.70 100 1.04 1.55 1.00 229.4 0.000 0.476 1.00 Infin Non-Liq. Non-Liq. 0.00 158.05 1.80 8.53 1.14 110 0.469 0.982 1.14 0.52 1.52 226.66 1.69 100 1.03 1.60 1.00 235.3 1.00 Infin 0.000 0.476 Non-Liq. Non-Liq. 0.00 8.69 163.87 1.17 0.478 1.18 1.92 110 0.982 0.52 1.51 232.90 1.70 100 1.04 1.65 1.00 242.3 1.00 Infin. 0.000 0.476 Non-Liq. Non-Liq. 0.00 8.86 169.68 1.22 110 0.487 0.982 1.23 0.52 1.50 239.19 1.04 1.70 1.00 249.8 1.70 100 1.00 0.000 0.476 Infin. Non-Lig. Non-Lig. 0.00 9.02 174.27 2.26 1.30 110 0.496 0.981 1.30 0.52 1.49 244.08 1.72 100 1.05 1.75 1.00 257.2 1.00 Infin. 0.000 0.476 Non-Lig. Non-Lig. 0.00 9.19 179.31 2.32 1,29 110 0.505 0.981 1.30 0.52 1.47 248.52 1.80 100 1.05 1.00 261.0 Infin. 0.000 0.476 Non-Liq. Non-Liq. 0.00 9.35 181 08 2.35 1.30 110 0.514 0.981 1.30 0.52 1,46 248.69 1.71 100 1.05 1.85 1.00 261.3 1.00 0.000 0.475 Infin. Non-Lig. Non-Lig. 0.00 191.53 9.51 2.42 1.26 110 0.523 0.980 1.27 0.52 1.44 259.55 1.69 100 1.03 1.90 1.00 269 1 1.00 Infin 0.0000.475 Non-Liq. Non-Liq. 0.00 9.68 202.38 2.57 1.27 0.532 0.980 1.27 0.51 110 1.42 271.29 1.68 100 1.03 1.95 1.00 279.3 1.00 Infin. 0.000 0.475Non-Liq. Non-Liq. 0.00 0.51 9.84 214.08 2.69 1.26 110 0.541 0,980 1,26 1.41 283.70 1.02 2.00 1.67 100 1.00 289.1 Infin. 0.000 0.475 1.00 Non-Liq. Non-Liq. 0.00 10,01 227.79 2.91 1,28 110 0.550 0.979 1,28 0.51 1.39 298.89 1.88 100 1.01 2.05 1.00 302.9 1.00 0.000 0.475 Infin. Non-Lig. Non-Lig. 0.00 1.33 10.17 242.24 3.22 110 0.559 0.979 1.33 0.51 1.38 315.27 1.66 100 1.01 2.10 1.00 319.4 1.00 Infin. 0.000 0.475 Non-Liq. Non-Liq. 0.00 10.33 244.06 3 47 1 42 110 0.568 0.979 1.43 0.51 1.37 316.43 1.68 100 1.03 2.15 1.00 325.7 Infin. 0.000 0.474 1.00 Non-Liq. Non-Liq. 0.00 10.50 249.05 3.55 1.43 110 0.577 0.978 1.43 0.51 1.36 320.21 1.68 100 1.02 2.20 1.00 329 2 1.00 Infin. 0.0000.474 Non-Liq. Non-Liq. 0.00 10.66 254.87 3.69 1.45 110 0.586 0.978 1.45 0.51 2.25 1.35 325.19 1.68 100 1.03 1.00 334 7 1.00 Infin 0.000 0.474 Non-Liq. Non-Liq. 0.00 10.83 256.89 3.79 1.48 110 0.595 0.978 1.48 0.51 1.34 325.57 1.03 0.474 1.69 100 2.30 1.00 336.5 0.000 1.00 Infin. Non-Liq. Non-Liq. 0.00 10.99 258.54 3.96 1.53 110 0.604 0.977 1.53 0.52 1.34 325.83 1.70 100 1.04 2.35 339.6 0.000 0.474 1.00 1.00 Infin. Non-Lia, Non-Lia 0.00 11.15 252.91 3.87 1 53 110 0.614 0.977 1.53 0.52 1.33 316.61 1.71 100 1\_04 2.40 1.00 1.00 Infin. 0.000 0.474 Non-Liq. Non-Liq. 0.00 11.32 241.86 3.70 1.53 110 0.623 0.977 1.53 0.52 1.32 301.06 1.72 100 1.05 2.45 1.00 317.7 0.000 0.473 1.00 Infin Non-Liq. Non-Liq. 0.00 11.48 235.08 3.50 1.49 110 0.632 0.976 1.49 0.52 1.31 290.38 1.72 100 1.05 2.50 1.00 306.4 1.00 Infin. 0.000 0.473 Non-Liq. Non-Liq. 0.00 11.65 233.08 3.34 1.43 110 0.641 0.976 1.44 0.52 1.30 285.38 1.71 100 1.05 2.55 1.00 299.4 1.00 Infin. 0.000 0.473 Non-Liq. Non-Liq. 0.00 11,81 236,89 2.82 1.19 110 0.650 0.975 1.19 0.50 1,28 285.24 1,65 100 1.00 2,60 286.6 0.473 1.00 0.000 1.00 Infin. Non-Lia, Non-Lia, 0.00 11,98 239.86 3.05 1.27 110 0.659 0.975 1.27 0.51 1.27 287.65 1.67 100 1.02 2.65 1.00 293.1 1.00 Infin. 0.000 0.473 Non-Lia, Non-Lia, 0.00 110 12.14 232.44 3.13 1.35 0.668 0.975 1.35 0.52 1.27 277.93 1.70 100 1.04 2.70 1.00 288.9 1.00 Infin. 0.000 0.473 Non-Liq. Non-Liq. 0.00 Infin 12.30 231.56 3.17 1.37 110 0.677 0.974 1 37 0.52 1.26 275.23 1.70 100 1.04 2.70 1.00 287.5 0.000 0.472 1.00 Non-Liq. Non-Liq. 0.00 12.47 226.67 3.06 1.35 110 0.686 0.974 1.35 0.52 1.25 267.63 1.71 100 1.04 2.70 1.00 280.0 1.00 Infin. 0.000 0.472 Non-Liq. Non-Liq. 0.00 12.63 224.32 3.05 1.36 110 0.695 0.974 1.36 0.52 1.25 263.26 100 1.05 2.70 276.6 1.71 1.00 1.00 Infin. 0.000 0.472 Non-Lig. Non-Lig. 0.00 12,80 219.31 3.06 1.39 110 0.704 0.973 1.40 0.53 1.24 256.14 100 2.70 1.00 272.0 0.000 Non-Lig. Non-Lig. 1.73 1.00 Infin. 0.472 0.00

| Layer           | Tip              | Friction     | Friction     | Total      | Eff Stress             | s              |              |              |                   |                   |              | g L | iquef.         | Rel.       |              |              |      | Clean          |              |                  |           | Induced        | Liquefac             |          | Volumetric   |
|-----------------|------------------|--------------|--------------|------------|------------------------|----------------|--------------|--------------|-------------------|-------------------|--------------|-----|----------------|------------|--------------|--------------|------|----------------|--------------|------------------|-----------|----------------|----------------------|----------|--------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Co                | Corrected<br>Qc1n | d<br>Ic      |     | scept<br>or 1) |            | Kc           | H<br>(m)     | Кн   | Sand<br>Qc1n   | Κσ           | CDD              | EQ<br>CRR | M=7.5<br>CSR   | Safety<br>Factor     | Probab.  | Strain       |
| 12.96           | 214.97           | 3.04         | 1.41         | 110        | 0.713                  | 0.973          | 1.42         | 0.53         | 1.23              | 249.70            | 1.74         | 0 ( | 1              | 100        | 1.07         | 2.70         | 1.00 | 267.1          | 1.00         | Infin            | 0.000     | 0.472          | Non-Liq.             |          | 0.00         |
| 13.12<br>13.29  | 210.39<br>202.73 | 2.92<br>2.85 | 1.39<br>1.41 | 110<br>110 | 0,722<br>0,731         | 0.973<br>0.972 | 1.39<br>1.41 | 0.53<br>0.54 | 1.23<br>1.22      | 242.78<br>232.77  | 1.74<br>1.76 |     | 1              | 100<br>100 | 1.07         | 2.70         | 1.00 | 260.0<br>251.7 | 1.00         | Infin.           | 0.000     | 0.472<br>0.471 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 13.45<br>13.62  | 202.03           | 2.75<br>2.74 | 1.36<br>1.36 | 110        | 0.740                  | 0.972          | 1.36         | 0.53         | 1.21              | 230_22            | 1.75         |     | 1              | 100        | 1.07         | 2,70         | 1.00 | 247.7          | 1.00         | Infin.           | 0.000     | 0.471          | Non-Liq.             | Non-Liq. | 0.00         |
| 13.78           | 210.84           | 2.87         | 1.36         | 110<br>110 | 0.749<br>0.758         | 0 972<br>0 971 | 1.36<br>1.37 | 0.53<br>0.53 | 1.20<br>1.19      | 229 11<br>237 04  | 1,75<br>1,74 |     | 1              | 100<br>100 | 1.07<br>1.07 | 2.70         | 1.00 | 246.5<br>253.8 | 1.00         | Infin.<br>Infin. | 0.000     | 0.471<br>0.471 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 13.94<br>14.11  | 228.51<br>285.52 | 2.41         | 1.05<br>0.94 | 110<br>110 | 0.767<br>0.776         | 0.971<br>0.971 | 1.06<br>0.94 | 0.50         | 1.17              | 252 83<br>314 27  | 1.64<br>1.54 |     | !              | 100<br>100 | 1,00         | 2,70<br>2,70 | 1.00 | 253.8<br>315.4 | 1.00         | Infin,           | 0,000     | 0,471          | Non-Liq.             | Non-Liq  | 0.00         |
| 14.27           | 292.87           | 2,62         | 0.89         | 110        | 0.785                  | 0.970          | 0.90         | 0.50         | 1.16              | 320,51            | 1.52         |     | 1              | 100        | 1.00         |              | 1.00 |                | 1.00<br>1.00 | Infin.           | 0,000     | 0.471<br>0.470 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 14.44<br>14.60  | 251.89<br>209.49 | 2.37         | 0.94         | 110<br>110 | 0.794                  | 0.970<br>0.970 | 0.94<br>1.02 | 0.50<br>0.51 | 1.15<br>1.15      | 273 97<br>226 74  | 1.58<br>1.66 |     | 1              | 100<br>100 | 1.00         |              | 1.00 | 275.0<br>229.5 | 1.00         | Infin.           | 0.000     | 0.470<br>0.470 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 14,76           | 185,30           | 1.81         | 0.97         | 110        | 0.812                  | 0,969          | 0.98         | 0.51         | 1.15              | 199.73            | 1.68         |     | 1              | 100        | 1.03         | 2,70         | 1.00 | 205.8          | 1.00         | Infin.           | 0.000     | 0.470          | Non-Liq.             | Non-Liq. | 0.00         |
| 14.93<br>15.09  | 177.04<br>163.66 | 1.72<br>1.53 | 0.97<br>0.94 | 110<br>110 | 0,821<br>0,830         | 0.969<br>0.969 | 0.97<br>0.94 | 0.52<br>0.52 | 1.14<br>1.13      | 189.90<br>174.67  | 1.70<br>1.71 |     | 1              | 100<br>100 | 1.04<br>1.05 |              | 1.00 | 197.4<br>183.4 | 1.00<br>1.00 | Infin.           | 0.000     | 0 470<br>0 470 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 15.26<br>15.42  | 131.77<br>90.92  | 1.43<br>1.82 | 1.09<br>2.00 | 110<br>110 | 0.839                  | 0.968          | 1.10<br>2.02 | 0.56<br>0.64 | 1.14<br>1.15      | 140.77<br>98.18   | 1,83<br>2,12 |     | 1              | 91<br>76   | 1.13<br>1.50 | 2.70         | 1.00 | 159.1          | 1.00         | 0.454            | 0.454     | 0.469          | Non-Liq.             | Non-Liq. | 0.00         |
| 15.58           | 71.71            | 1.75         | 2.45         | 110        | 0.857                  | 0.967          | 2.48         | 0.69         | 1.16              | 77.37             | 2.26         |     | i              | 66         | 1.82         |              | 1.00 | 147.1<br>141.2 | 1.00<br>1.00 | 0.376<br>0.342   | 0.342     | 0.469<br>0.469 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 15.75<br>15.91  | 110.76<br>111.12 | 2.45         | 2.21<br>2.46 | 110<br>110 | 0.866<br>0.875         | 0.967<br>0.967 | 2.22         | 0.64         | 1.14<br>1.13      | 118.01<br>117.85  | 2,10<br>2.14 |     | 1              | 84<br>84   | 1.46<br>1.52 |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.469<br>0.469 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 16.08           | 114.52           | 2.87         | 2.51         | 110        | 0.884                  | 0,966          | 2.52         | 0.65         | 1.12              | 120.66            | 2,14         |     | 1              | 85         | 1.52         |              | 1.00 | 183.7          | 1.00         | Infin            | 0,000     | 0.468          | Non-Liq.             | Non-Liq. | 0.00         |
| 16.24<br>16.40  | 142.13<br>171.27 | 2.72<br>2.46 | 1.91<br>1.44 | 110<br>110 | 0.893<br>0.902         | 0.966<br>0.966 | 1.92<br>1.45 | 0.60<br>0.56 | 1.11<br>1.09      | 147.88<br>176.09  | 1,99<br>1,84 |     | 1              | 93<br>100  | 1.28<br>1.14 |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.468<br>0.468 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 16.57<br>16.73  | 179.24<br>203.64 | 2.28         | 1.27<br>1.02 | 110<br>110 | 0.911<br>0.920         | 0.965<br>0.965 | 1.28         | 0.55<br>0.51 | 1.08<br>1.07      | 182.87<br>205.87  | 1.79<br>1.69 |     | 62             |            | 1.10         |              | 1.00 |                | 1.00         | Infin.           | 0,000     | 0.468<br>0.468 | Non-Liq.             | Non-Liq. | 0.00         |
| 16,90           | 253.20           | 2.34         | 0.92         | 110        | 0,929                  | 0.965          | 0.93         | 0.50         | 1.07              | 254.42            | 1,59         |     |                | 100        | 1,00         |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.468          | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 17.06<br>17.22  | 288 82<br>315.97 | 2.54<br>2.96 | 0.88         | 110<br>110 | 0.938<br>0.947         | 0.964<br>0.964 | 0.88         | 0.50<br>0.50 | 1.06<br>1.06      | 288.93<br>314.66  | 1.54<br>1.54 |     |                |            | 1,00         |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.467<br>0.467 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 17.39           | 322.57           | 2.98         | 0.92         | 110        | 0.956                  | 0.963          | 0.93         | 0.50         | 1.05              | 319,73            | 1.53         |     | 1              | 100        | 1,00         | 1.35         | 1.00 | 320.9          | 1.00         | Infin.           | 0,000     | 0.467          | Non-Liq.             | Non-Liq. | 0.00         |
| 17.55<br>17.72  | 346 12<br>402 20 | 4.11<br>6.00 | 1.19<br>1.49 | 110<br>110 | 0,965<br>0,974         | 0.963<br>0.963 | 1.19<br>1.50 | 0.50<br>0.50 | 1.05<br>1.04      | 341,52<br>395,22  | 1,60<br>1,65 |     |                |            | 1.00         |              | 1.00 | 342.8<br>396.7 | 1.00         | Infin.           | 0.000     | 0.467<br>0.467 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 17.88<br>18.04  | 358,55<br>345,21 | 6.07<br>4.98 | 1.69<br>1.44 | 110<br>110 | 0.983                  | 0.962<br>0.962 | 1.70<br>1.45 | 0.52<br>0.51 | 1.04<br>1.03      | 351.16<br>336.13  | 1.72<br>1.67 |     | 1              | 100        | 1.05<br>1.02 | 1.50         | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.467<br>0.466 | Non-Liq.<br>Non-Liq. | Non-Liq. | 0.00         |
| 18.21           | 360.17           | 4.43         | 1.23         | 110        | 1,001                  | 0,962          | 1.23         | 0.50         | 1.03              | 348,93            | 1.61         |     |                |            | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.466          | Non-Liq.             | 100      | 0.00<br>0.00 |
| 18.37<br>18.54  | 359.99<br>354.62 | 3.79         | 1.05<br>0.86 | 110<br>110 | 1.010<br>1.020         | 0.961<br>0.961 | 1.06<br>0.86 | 0.50         | 1.02<br>1.02      | 347.18<br>340.46  | 1,55<br>1,49 |     |                |            | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0.466<br>0.466 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 18.70           | 344.24           | 2.99         | 0.87         | 110        | 1.029                  | 0,960          | 0.87         | 0.50         | 1.01              | 329.01            | 1.50         |     | 1              | 100        | 1,00         | 1.75         | 1.00 | 330.2          | 1.00         | Infin.           | 0.000     | 0.466          | Non-Liq.             | Non-Liq. | 0.00         |
| 18.86<br>19.03  | 332.45<br>327.71 | 3.04<br>2.96 | 0.91         | 110<br>110 | 1.038<br>1.047         | 0.960<br>0.960 | 0.92<br>0.91 | 0.50<br>0.50 | 1.01<br>1.01      | 316.31<br>310.43  | 1.53<br>1.53 |     |                |            | 1.00         |              | 1.00 |                | 1.00         | Infin.           | 0.000     | 0,465<br>0,465 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 19.19<br>19.36  | 307.45<br>274.72 | 2.73<br>2.45 | 0.89         | 110<br>110 | 1.056<br>1.065         | 0.959<br>0.959 | 0.89         | 0.50         | 1.00              |                   | 1.54<br>1.58 |     |                |            | 1.00         |              | 1.00 | 291.0          | 1.00         | Infin            | 0.000     | 0.465          | Non-Liq.             | Non-Liq. | 0.00         |
| 19,52           | 271.54           | 4.15         | 1.53         | 110        | 1.074                  | 0.958          | 1.53         | 0.50<br>0.54 | 1.00<br>0.99      | 253,63            | 1.76         |     |                |            | 1.00<br>1.08 |              |      |                | 1.00<br>0.99 | Infin.           | 0.000     | 0.465<br>0.465 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 19.69<br>19.85  | 279.83<br>285.99 | 3.92<br>4.02 | 1.40         | 110<br>110 | 1 083<br>1 092         | 0.958<br>0.957 | 1.41         | 0.53<br>0.53 | 0.99              |                   | 1.73<br>1.72 |     |                |            | 1.06<br>1.05 |              |      |                | 0.99         | Infin.<br>Infin. | 0.000     | 0.464<br>0.464 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 20,01           | 315.42           | 2.61         | 0.83         | 110        | 1.101                  | 0.957          | 0.83         | 0.50         | 0.98              | 291,27            | 1.52         |     | 1              | 100        | 1.00         | 2.15         | 1.00 | 292.4          | 0.98         | Infin            | 0,000     | 0.464          | Non-Liq.             | Non-Liq  | 0.00         |
| 20.18<br>20.34  | 326.56<br>329.89 | 2.81<br>2.62 | 0.86         | 110<br>110 | 1.107<br>1.111         | 0.957<br>0.956 | 0.86<br>0.80 | 0.50<br>0.50 | 0.98<br>0.98      | 300,76<br>303,30  | 1.52<br>1.49 |     |                |            | 1.00         |              |      |                | 0.98<br>0.98 | Infin.<br>Infin. | 0.000     | 0.465<br>0.467 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 20.51           | 327.47<br>324.48 | 2.66         | 0.81         | 110<br>110 | 1.115<br>1.118         | 0.956<br>0.955 | 0.82<br>0.71 | 0.50<br>0.50 | 0.97<br>0.97      | 300.53<br>297.26  | 1.50<br>1.47 |     |                |            | 1.00         |              |      |                | 0.98<br>0.98 | Infin.<br>Infin. | 0.000     | 0.469<br>0.471 | Non-Liq.             |          | 0.00<br>0.00 |
| 20.83           | 329.51           | 1.82         | 0.55         | 110        | 1.122                  | 0.955          | 0.55         | 0.50         | 0.97              | 301,35            | 1.38         |     | 1              | 100        | 1.00         | 2,40         | 1.00 | 302.5          | 0.98         | Infin.           | 0,000     | 0.471          | Non-Liq,<br>Non-Liq, |          | 0.00         |
| 21.00           | 283.15<br>276.58 | 1.71         | 0.61         | 110<br>110 | 1.126<br>1.130         | 0.954          | 0.61<br>0.40 | 0.50<br>0.50 | 0.97<br>0.97      |                   | 1.46<br>1.35 |     |                |            | 1.00         |              |      |                | 0.98<br>0.97 | Infin.<br>Infin. | 0.000     | 0 474<br>0 476 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 21.33<br>21.49  | 265,97<br>250,21 | 1.09<br>1.40 | 0.41         | 110<br>110 |                        | 0.954          | 0.41         | 0.50         | 0.97              | 241.77            | 1.37         |     | 1              | 100        | 1.00         | 2.55         | 1.00 | 242.7          | 0.97         | Infin.           | 0.000     | 0.478          | Non-Liq.             | Non-Liq  | 0.00         |
| 21.65           | 261.15           | 1.64         | 0.63         | 110        |                        | 0.953<br>0.953 | 0.56<br>0.63 | 0.50<br>0.50 | 0.96<br>0.96      |                   | 1.48<br>1.50 |     |                |            | 1.00<br>1.00 |              |      | 227.8<br>237.4 | 0.97<br>0.97 | Infin.<br>Infin. | 0.000     | 0.480<br>0.482 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 21.82<br>21.98  | 300.85<br>283.46 | 1.72<br>1.98 | 0.57         | 110<br>110 |                        |                | 0.57         | 0.50<br>0.50 | 0.96<br>0.96      | 272.20<br>255.97  | 1.42<br>1.50 |     |                |            | 1.00<br>1.00 |              |      | 273.2<br>256.9 | 0.97<br>0.97 | Infin.           | 0.000     | 0.483<br>0.485 | Non-Liq.             | Non-Liq. | 0.00         |
| 22.15           | 299,30           | 1.41         | 0.47         | 110        | 1.154                  | 0.951          | 0.47         | 0.50         | 0.96              | 269.87            | 1.37         |     | 1              | 100        | 1.00         | 2.80         | 1.00 | 270.9          | 0.97         |                  | 0.000     | 0.487          | Non-Liq.<br>Non-Liq. | Non-Liq. | 0.00         |
|                 | 305.84<br>317.96 | 1.24<br>1.63 | 0.41         | 110<br>110 |                        |                | 0.41<br>0.51 | 0.50<br>0.50 |                   |                   | 1.32         |     |                |            |              |              |      |                | 0.96<br>0.96 |                  | 0.000     | 0 489<br>0 490 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 22.64<br>22.80  | 329.92<br>349.36 | 1.81<br>1.91 | 0.55<br>0.55 | 110<br>110 |                        |                | 0.55<br>0.55 | 0.50<br>0.50 |                   |                   | 1.39<br>1.37 |     |                |            |              |              |      | 297.2          | 0.96         | Infin.           | 0.000     | 0.492          | Non-Liq.             | Non-Liq. | 0.00         |
| 22,97           | 347.80           | 2.37         | 0.68         | 110        | 1.173                  | 0.949          | 0.68         | 0.50         | 0.95              | 311,13            | 1.44         |     |                |            |              |              |      | 312.3          | 0.96<br>0.96 |                  | 0.000     | 0.494<br>0.495 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 23.13           | 355.41<br>348.90 | 2.55<br>2.53 | 0.72         | 110<br>110 |                        |                | 0.72<br>0.73 | 0.50<br>0.50 |                   |                   | 1.45<br>1.46 |     |                |            |              |              |      | 318.6<br>312.2 | 0.96<br>0.96 |                  | 0.000     | 0.497<br>0.498 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 23,46           | 332.91           | 2.12         | 0.64         | 110        | 1,185                  | 0.947          | 0.64         | 0.50         | 0.94              | 296,28            | 1.43         |     | 1 .            | 100        | 1,00         | 3.20         | 1.00 | 297.4          | 0.96         | Infin            | 0.000     | 0.500          | Non-Liq.             | Non-Liq  | 0.00         |
| 23.62<br>23.79  | 334.85<br>354.63 | 1.98<br>1.92 | 0.59         | 110<br>110 |                        |                | 0.59<br>0.54 | 0.50<br>0.50 |                   |                   | 1.41<br>1.36 |     |                |            |              |              |      | 298.6<br>315.8 |              |                  | 0.000     | 0.502<br>0.503 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 23,95<br>24,11  | 324.76<br>341.67 | 1.60<br>1.26 | 0.49         | 110<br>110 |                        |                | 0.49<br>0.37 | 0.50<br>0.50 |                   |                   | 1.36<br>1.27 |     |                |            |              |              |      | 288.6<br>303.2 | 0.95<br>0.95 |                  | 0.000     | 0.505<br>0.506 | Non-Liq.<br>Non-Liq. | Non-Liq  | 0.00<br>0.00 |
| 24.28           | 335.98           | 1.14         | 0.34         | 110        | 1,204                  | 0.945          | 0.34         | 0.50         | 0.94              | 296.57            | 1.25         |     | 1 .            | 100        | 1.00         | 3.45         | 1.00 | 297.7          | 0.95         | Infin.           | 0.000     | 0.508          | Non-Liq.             | Non-Liq. | 0.00         |
| 24.44           | 335.54<br>340.03 | 1.25<br>1.44 | 0.37         | 110<br>110 |                        |                | 0.38<br>0.42 | 0.50<br>0.50 |                   |                   | 1.28         |     |                |            |              |              |      | 296.8<br>300.3 |              |                  | 0.000     | 0.509<br>0.511 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 24.77<br>24.93  | 343.51<br>350.49 | 2.18<br>2.01 | 0.64         | 110<br>110 |                        |                | 0.64<br>0.58 | 0.50<br>0.50 |                   |                   | 1.42         |     |                |            | 1.00         | 3,60         | 1.00 | 302.9          | 0.95         | Infin.           | 0.000     | 0.512          | Non-Liq.             | Non-Liq. | 0.00         |
| 25.10           | 344.14           | 2.05         | 0.60         | 110        | 1.224                  | 0.942          | 0.60         | 0.50         |                   |                   | 1.39<br>1.41 |     | 9.             |            |              | 3.65<br>3.70 |      | 308.6<br>302.5 |              |                  | 0.000     | 0.514<br>0.515 | Non-Liq.<br>Non-Liq. |          | 0.00         |
|                 | 336.49<br>347.63 | 3,71<br>2.78 | 1.10         | 110<br>110 |                        |                | 1.11<br>0.80 | 0.50<br>0.50 |                   |                   | 1.61<br>1.50 |     |                |            |              |              |      | 295.3<br>304.6 | 0.94<br>0.94 |                  | 0.000     | 0.516<br>0.518 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 25,59           | 382.52           | 2.64         | 0.69         | 110        | 1.236                  | 0.940          | 0.69         | 0.50         | 0.93              | 333.48            | 1.42         |     | 1 1            | 100        | 1_00         | 3.85         | 1.00 | 334.7          | 0.94         | Infin-           | 0.000     | 0.519          | Non-Liq,             | Non-Liq. | 0.00         |
| 25.92           | 360.83<br>365.07 | 2.44 2.04    | 0.68         | 110<br>110 |                        |                | 0.68<br>0.56 | 0.50<br>0.50 | 0.92              | 317.21            | 1.43<br>1.37 |     |                |            |              |              |      |                | 0.94<br>0.94 |                  | 0.000     | 0.520<br>0.522 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 26.08<br>26.25  | 363.26<br>360.99 | 2.01         | 0.55         | 110<br>110 |                        | 0.938          | 0.56<br>0.58 |              | 0.92              | 315.13            | 1.37<br>1.39 |     | 1 1            | 100        | 1.00         | 4.00         | 1.00 | 316.3          | 0.94         | Infin.           | 0.000     | 0.523          | Non-Liq.             | Non-Liq. | 0.00         |
| 26.41           | 395.59           | 1.87         | 0.47         | 110        | 1.255                  | 0.937          | 0.48         | 0.50         | 0.92              | 342 20            | 1,30         |     | 1 1            | 100        | 1.00         | 4.10         | 1.00 | 313.8<br>343.5 | 0.93         | Infin:           | 0.000     | 0.524<br>0.526 | Non-Liq.<br>Non-Liq. | Non-Liq  | 0.00         |
| 26.57<br>26.74  | 390.21<br>369.74 | 2.16         | 0.55         | 110<br>110 |                        |                | 0.55<br>0.57 | 0.50<br>0.50 |                   |                   | 1.35<br>1.37 |     |                |            |              |              |      | 338.3<br>320.0 | 0.93<br>0.93 |                  | 0.000     | 0.527<br>0.528 | Non-Liq.<br>Non-Liq. |          | 0.00         |
| 26.90           | 365.49           | 1.74         | 0.48         | 110        | 1,267                  | 0.935          | 0.48         | 0.50         | 0.91              | 314,60            | 1,32         |     | 1 1            | 100        | 1.00         | 4.25         | 1.00 | 315.8          | 0.93         | Infin            | 0.000     | 0.529          | Non-Liq.             | Non-Liq  | 0.00         |
| 27.07<br>27.23  | 355.65<br>353.49 | 1.92<br>1.57 | 0.54<br>0.44 | 110<br>110 | 1.275                  | 0.934          | 0.54<br>0.44 | 0.50         |                   |                   | 1.37<br>1.32 |     |                |            |              |              |      | 306.8<br>304.4 |              |                  | 0.000     | 0.531<br>0.532 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
| 27.40<br>27.56  | 346.49<br>345.45 | 1.68         | 0.48         | 110<br>110 |                        |                | 0.49<br>0.58 |              |                   |                   | 1.35<br>1.40 |     |                |            |              | 4.40<br>4.45 |      | 297.9<br>296.6 |              | Infin.           | 0.000     | 0.533<br>0.534 | Non-Liq.<br>Non-Liq. | Non-Liq  | 0.00<br>0.00 |
| 27.72           | 320.92           | 1.75         | 0.55         | 110        | 1.286                  | 0.932          | 0.55         | 0.50         | 0.91              | 273.99            | 1.41         |     | 1 1            | 100 1      | 1.00         | 4.50         | 1.00 | 275.0          | 0.92         | Infin.           | 0.000     | 0.535          | Non-Liq.             | Non-Liq  | 0.00         |
| 1 21 09         | 307.08           | 1.60         | 0.52         | 110        | 1.290                  | 0.931          | 0.52         | 0.50         | U. <del>9</del> 1 | 261.72            | 1.41         |     | 1 1            | 100 '      | 1.00         | 4.55         | 1.00 | 262.7          | U.92         | Infin.           | 0.000     | 0.536          | Non-Liq.             | Non-Liq  | 0.00         |

| The black   The  | Layer    | Tip    | Friction | Friction | Total | Eff Stress     | g              |      | _    |              | _         | _    | (m) | Liquef.  | Rel    | _    |      |      | Clean |      |        |       | Induced | Liquofac     |                | Volumetric |
|--|----------|--------|----------|----------|-------|----------------|----------------|------|------|--------------|-----------|------|-----|----------|--------|------|------|------|-------|------|--------|-------|---------|--------------|----------------|------------|
| 1.       1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.       1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.     1.       1.       1.       1.       1.       1.  | 1 1      |        |          |          |       |                |                |      |      |              | Corrected | I    | 0   |          |        |      | Н    |      |       |      |        | EQ    |         |              |                |            |
| 1  | - hemone |        |          |          |       |                |                |      |      |              |           | Ic   | 8   | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Kσ   | CRR7   | CRR   | CSR     | 11.000-0.000 | P <sub>L</sub> |            |
| 1.50    |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 271   272   273   275  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 2867   1876   1976  |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 200   1640   109   100   101   101   101   102   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 20.50   17.00   1.00  |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      | 4,90 |      | 160.7 | 0.92 | Infin. | 0.000 | 0.544   | Non-Liq.     | Non-Liq.       | 0.00       |
| 253   262   17   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 2 565   2565   2576   2   | 29,53    | 162,50 | 1.73     | 1.07     | 110   | 1,329          | 0,923          | 1.07 | 0.56 | 0.88         | 134.10    | 1.84 |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| Section   1982   186   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1000     |        | 100  |      |      |       |      |        |       |         |              |                |            |
| SASS   MAGNA   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      | 27.  |       |      |        |       |         |              |                |            |
| S.S.   17.72   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        | 0.0  |      |      |       |      |        |       |         |              |                |            |
| 2009   1961   1960  |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 1.00    |          |        |          |          |       |                |                |      |      |              |           |      |     | (0.1     |        |      |      |      | 168.0 |      | Infin  | 0,000 | 0.553   | Non-Liq.     | Non-Liq.       | 0.00       |
| 11.1   17.1  |          |        |          |          |       |                |                |      |      |              |           |      |     | (5)      |        |      |      |      |       |      |        |       |         |              |                |            |
| 15.00   24.00      | 31,17    | 210.66 | 3.44     | 1.63     | 110   | 1.368          | 0.915          | 1.64 | 0.58 | 0.86         | 170,54    |      |     | 125      |        |      |      |      |       |      |        |       |         |              |                |            |
| 156   2460   447   458   161   1390   1391   188   0.89   0.89   1897   1990   1997   109   2794   0.89   |          |        |          |          |       |                |                |      |      |              |           |      |     | 100      |        |      |      |      |       |      |        |       |         |              |                |            |
| 3145 2 660 4.7 128 119 1394 911 1394 911 1394 915 08 18943 1499 1 100 148 578 102 2246 09 1475 000 0.558 near-Ligh Nort-Ligh 2 000 1395 5245 149 149 149 149 149 149 149 149 149 149   |          |        |          |          |       |                |                |      |      |              |           |      |     | 150      |        |      |      |      |       |      |        |       |         |              |                |            |
| 24.0   25.0   26.0  | II.      |        |          |          |       |                |                |      |      |              |           |      |     | 1.0      |        |      |      |      |       |      | Infin  | 0.000 | 0.559   | Non-Liq.     | Non-Liq        | 0.00       |
| 2.32   2.62.66   2.67   1.68   1.96   1.09   1.09   1.09   1.09   1.09   1.05   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 224 2029 251 124 190 1407 0809 125 085 086 183-0 182 1 97 112 0.01 100 163 088 1876 1000 0552 Northigh Northigh Color 124 140 080 080 180 180 180 180 180 180 180 18   | 32.32    | 206.06 | 3.87     | 1.88     | 110   | 1,396          | 0,908          | 1.89 | 0.59 | 0.85         | 164,10    | 1,95 |     | 1        | 97     |      | 5,90 |      | 204.8 | 0,90 | Infin. |       | 0.561   |              |                |            |
| 2.27   2.27   2.28   1.09   10   1.47   0.00   1.04   0.05   1.04   0.05   0.   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      | 2.7  |      |       |      |        |       |         |              |                |            |
| 12.97   23.46   23.9   21   31   11   1.41   3.03   32   25   38   182,0   186   182,0   186   182,0   186   182,0   186   182,0   1   |          |        |          |          |       |                |                |      |      |              |           |      |     | +        |        |      |      |      |       |      |        |       |         |              |                |            |
| 3.36   3.36   2.36   2.36   0.88   110   1.479   0.002   0.87   0.98   2.48   1.58   1   100   1.00   0.00   1.00   2.54   0.88   min.   0.000   0.555   0.555   0.000   0.005   0.000   0.555   0.000   0.005   0.005   0.0   |          |        |          |          |       |                |                |      | 0.51 |              | 189,28    | 1.68 |     | 95       | 100    | 1.02 | 6.10 | 1.00 | 194.5 | 0.89 | Infin. | 0,000 | 0.563   | Non-Liq.     | Non-Liq.       | 0.00       |
| 33.63   36.65  |          |        |          |          |       |                |                |      |      |              |           |      |     | 925      |        |      |      |      |       |      |        |       |         |              |                |            |
| 9379 672-25 396 999 110 1.436 0899 039 039 036 046 02527 1555 1 100 100 635 100 327 089 1876, 000 0356 086-14, 000-140 320 035 035 035 035 035 035 035 035 035 03  |          | 326.02 |          | 0.86     |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 3   3   3   3   3   3   2   3   3   3  |          |        |          |          |       |                |                |      |      |              |           |      |     | 115      |        |      |      |      |       |      |        |       |         |              |                |            |
| 3412 367.69 2.68 0.73 110 1.43 0.99 0.73 0.50 0.8 296.8 74.7 1 100 1.00 0.84 1.00 281.0 281 0.00 1.00 0.00   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 3441 3547.3 28 0.86 110 1446 0.89 0.89 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87   |          |        |          |          |       |                |                |      |      |              |           |      |     | 107      |        |      | 6.45 | 1.00 | 298.0 |      | Infin. | 0.000 | 0.567   | Non-Liq.     | Non-Liq        | 0.00       |
| 3447   364.73   289   080   10   1.450   089   080   050   082   2819   1.510   1   100   1.00   6.00   1.00   2813   0.88   1.010   0.00  |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 341-03   262   0.84   110   1.485   0.885   0.59   0.85   2.494   1.57   1   100   1.00   6.75   1.00   2.50   2.088   1.67   0.00   0.57   0.   | 34.61    | 354.73 | 2.83     | 0.80     | 110   |                |                | 0.80 |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 33.51   28.64   0.90   110   1.462   0.890   0.91   0.50   0.55   0.55   2.59.81   1.90   1.90   1.00   1.00   0.05   0   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 35.43   24.50   30.5   10.3   10.1   14.70   0.889   0.99   0.50   0.85   24.80   18.2   1   10.0   10.0   6.80   10.0   24.70   0.80   Infin.   0.00   0.57   Non-Liq.   Non-Liq.   0.00   35.43   24.50   0.85   24.   |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        |       |         | -            |                |            |
| \$5.60   \$7.6 |          |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        |      |      |      |       |      |        | 0.000 |         | Non-Liq.     | Non-Liq        | 0.00       |
| 1876   280.39   27.4   0.98   170   1.478   0.886   0.99   0.15   0.84   219.50   1.68   1   100   101   7.05   1.00   22.3   0.87   1.075   0.00   0.572   Non-Liq, Non-Liq   | 100      |        |          |          |       |                |                |      |      |              |           |      |     | 1        |        | 100  |      |      |       |      |        |       |         |              |                |            |
| 94.09   271.84   268   0.98   110   1.485   0.881   0.98   0.87   0.87   0.98   0.51   0.84   215.14   1.88   1   100   1.07   7.05   1.00   216.8   0.07   1.07   1.07   1.07   1.07   0.07  | 35.76    | 280.39 | 2.74     | 0.98     | 110   | 1.478          | 0.886          | 0.98 |      |              | 222.80    |      |     | i        |        |      |      |      |       |      |        |       |         |              |                |            |
| 98.52   266.67   273   10.2   110   1.489   0.882   1.03   0.51   0.84   210.29   1.88   1   100   1.03   7.10   1.00   216.8   0.87   Infin   0.000   0.573   Non-Liq, Non-Liq, 0.00   38.58   258.25   3.44   1.33   110   1.497   0.880   1.34   0.54   0.83   201.01   1.78   1.78   1.00   1.00   1.00   7.20   1.00   22.0   0.07   Infin   0.000   0.573   Non-Liq, Non-Liq, 0.00   3.85   | 100      |        |          |          |       |                |                |      |      |              |           |      |     | 100      |        |      |      |      |       |      |        |       |         |              |                |            |
| 38.42   268.74   3.17   1.19   110   1.493   0.891   1.19   0.55   0.83   209.00   1.73   1   100   1.06   7.15   1.00   22.4   0.87   Infin, 0.00   0.573   Non-Liq, Non-Liq, 0.00   3.675   3.675   253.97   3.88   1.53   1.10   1.497   0.890   1.34   0.55   0.82   1.99   0.11   1.75   0.00   0.75   0.75   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0.00   0.75   0.00   0   |          |        |          |          |       |                |                |      |      |              |           |      |     | 100      |        |      |      |      |       |      |        |       |         |              |                |            |
| 38.75   258.67   3.88   1.53   110   1.501   0.878   1.56   0.86   0.82   198.21   1.83   1   100   1.13   7.25   1.00   223.1   0.87   1.011   0.00   0.573   Non-Liq. Non-   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         | Non-Liq.     | Non-Liq        |            |
| 3891   3894   426   5.99   190   1.595   0.877   1.80   0.59   0.87   1.80   0.82   207.04   1.83   1   100   1.13   7.30   1.00   235.1   0.87   Infin.   0.000   0.574   Non-Liq.   Non-Liq.   Non-Liq.   37.24   267.15   4.61   1.73   1.01   1.513   0.875   1.74   0.57   0.82   205.00   1.86   1   1.00   1.16   7.40   1.00   237.9   0.87   Infin.   0.000   0.574   Non-Liq.   Non-Liq.   Non-Liq.   Non-Liq.   37.37   251.61   4.92   1.96   1.01   1.521   0.872   1.97   0.59   0.81   1.915   1.92   1.90   1.90   1.90   1.521   0.872   1.97   0.59   0.81   1.915   1.92   1.90  |          |        |          |          |       |                |                |      |      |              |           |      |     | - 0      |        |      |      |      |       |      |        |       |         |              |                |            |
| 37.49   287.15   4.59   1.79   |          |        |          | 1.59     |       | 1.505          | 0.877          | 1.60 | 0.56 |              |           | 1.83 |     | 1        |        |      |      |      |       |      |        |       |         |              |                |            |
| 37.40   258.14   4.98   1.93   110   1.517   0.873   1.94   0.58   0.81   198.71   1.91   1   1.00   1.20   7.45   1.00   2328   0.88   1.01   0.00   0.574   Non-Liq. Non-Liq. O.00   37.73   253.20   5.10   2.01   1.01   1.525   0.872   2.02   0.59   0.81   191.61   1.92   1.00   1.02   1.75   0.00   2328   0.88   1.01   0.00   0.574   Non-Liq. Non-Liq. O.00   37.78   253.20   5.00   4.99   1.99   1.10   1.525   0.867   2.01   0.59   0.81   1.9   |          |        |          |          |       | 1.509<br>1.513 | 0.876<br>0.875 | 1.85 | 0.57 | 0.82<br>0.82 |           |      |     | 1        |        | 1.17 |      |      |       |      |        |       |         |              |                |            |
| 37.73   253.20   5.10   2.01   110   1.525   0.871   2.02   0.59   0.81   191.28   1.93   1   100   1.22   7.55   1.00   225.4   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.08   236.10   4.60   1.95   1.10   1.525   0.869   1.76   0.80   1.77   0.80   1.77   1.76   1.90   1.90   1.77   0.10   1.17   7.70   1.00   2.11   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.08   236.10   4.60   1.95   1.10   1.532   0.868   1.96   0.59   0.80   178.13   1.94   1   1.00   1.22   7.85   1.00   2.20   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.08   3.91  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 37.89   250.10   4.99   1.99   1.10   1.528   0.869   2.01   0.59   0.81   189.23   1.93   1   100   1.22   7.60   1.00   2.02.2   0.86   Infin   0.000   0.575   Non-Liq   Non-Liq   0.00   38.22   234.67   4.00   1.70   1.10   1.532   0.868   1.71   0.58   0.81   177.66   1.90   1   1.00   1.12   7.65   1.00   2.12   0.86   Infin   0.000   0.575   Non-Liq   Non-Liq   0.00   38.23   234.67   4.00   1.70   1.10   1.534   0.867   1.71   0.58   0.81   192.25   1.80   1   1.00   1.11   7.70   1.00   211.7   0.86   Infin   0.000   0.575   Non-Liq   Non-Liq   0.00   38.23   3.21   3.20   3.20  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 38.06   236.10   4.60   1.95   1.10   1.532   0.886   1.96   0.59   0.80   178.13   1.94   1   1.00   1.23   7.65   1.00   20.2   2.0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   38.39   251.51   3.44   1.37   1.10   1.540   0.865   1.38   0.55   0.81   177.66   1.90   1.91   1.577   0.02   1.17   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   38.71   270.23   2.71   1.00   1.10   1.544   0.865   1.38   0.55   0.81   177.66   1.90   1.75   1.00   1.00   1.07   7.80   1.00   215.9   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   38.71   270.23   2.71   1.00   1.00   1.552   0.860   0.51   0.82   2.90.91   1.68   1.00   1.02   7.85   1.00   214.8   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   3.82   3.855   3.80   0.86   1.10   1.550   0.860   0.66   0.50   0.82   2.91.88   1.53   1.50   1.00   1.00   1.00   1.00   1.00   1.00   2.785   1.00   214.8   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   3.92   2.855.8   1.88   0.86   1.10   1.550   0.860   0.66   0.50   0.82   2.21.38   1.53   1.50   1.00   1.00   0.575   Non-Liq.   Non-Liq.   0.00   3.92   3.93   3   |          |        |          |          |       |                |                |      |      |              |           |      |     | 525      |        |      |      |      |       |      |        |       |         |              |                |            |
| 38.59   251.51   3.44   1.37   110   1.540   0.865   1.38   0.55   0.81   192.25   1.80   1.90   1.00   1.11   7.75   1.00   214.0   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.71   270.23   2.71   1.00   110   1.544   0.864   1.20   0.53   0.82   201.02   1.75   1.00   1.00   1.07   7.80   1.00   214.8   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.71   270.23   2.71   1.00   110   1.545   0.860   0.91   0.50   0.82   209.01   1.68   1.65   1.00   1.00   7.90   1.00   214.8   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.88   270.03   2.45   0.91   1.10   1.555   0.860   0.91   0.50   0.82   221.38   1.53   1.00   1.00   1.00   7.90   1.00   202.2   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.21   285.94   1.84   0.84   1.10   1.554   0.857   0.71   0.50   0.82   221.38   1.53   1.50   1.00   1.00   8.00   1.00   222.2   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.53   335.11   2.36   0.71   110   1.554   0.857   0.71   0.50   0.82   221.38   1.53   1.00   1.00   8.00   1.00   20.22   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.53   335.11   2.36   0.71   110   1.571   0.854   1.40   0.85   0.82   2.91   0.82   2.91   0.85   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      | Infin. | 0.000 |         | Non-Liq.     | Non-Liq        | 0.00       |
| 38.55   281.62   31.31   31.01   11.01   1.544   0.864   1.20   0.55   0.82   201.02   1.75   1.75   1.00   1.07   7.80   1.00   21.59   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.70   2.45   0.91   1.00   1.556   0.860   0.66   0.50   0.82   209.36   1.65   1.00   1.00   7.90   1.00   21.59   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.21   285.59   1.84   0.64   1.01   1.556   0.860   0.66   0.50   0.82   221.38   1.53   1.00   1.00   7.90   1.00   2.22   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.21   285.59   4.84   0.64   1.01   1.560   0.859   0.65   0.62   221.38   1.53   1.00   1.00   1.00   1.00   1.00   2.00   2.22   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.21   285.59   4.84   0.64   1.01   1.560   0.856   0.62   221.38   1.53   1.00   1.00   1.00   2.00   2.00   2.22   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.37   298.71   2.11   0.71   1.01   1.564   0.855   0.71   0.50   0.82   2.59.01   1.50   0.82   2.01   0.00   2.22   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.35   335.31   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 38.88   270.03   2.45   0.91   110   1.552   0.861   0.91   0.50   0.83   209.36   1.65   1   100   1.00   7.90   1.00   210.4   0.86   nfin   0.000   0.575   Non-Liq   Non-Liq   0.00   0.933   0.94   1.84   0.84   1.84   0.86   0.85   0.   | 38.55    | 261.62 | 3.13     | 1.20     | 110   | 1,544          | 0.864          | 1.20 | 0.53 | 0.82         | 201.02    | 1.75 |     | 1        | 100    | 1.07 | 7.80 | 1.00 | 215.9 | 0.86 | Infin. | 0.000 | 0.575   | Non-Liq.     | Non-Liq.       | 0.00       |
| 39.21   285.94   1.84   0.66   110   1.556   0.860   0.66   0.50   0.82   221.38   1.53   1   1.00   1.00   8.05   1.00   222.2   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.53   39.51   2.36   0.71   110   1.567   0.865   0.71   0.50   0.82   221.38   1.53   1   1.00   1.00   8.05   1.00   221.2   0.86   Infin.   0.000   0.576   Non-Liq.   Non-Liq.   0.00   39.53   335.11   2.36   0.71   110   1.567   0.856   0.71   0.50   0.82   231.03   1.54   1   1.567   0.854   1.40   0.55   0.81   25.80   0.71   1.50   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   25.80   0.71   0.55   0.854   1.40   0.55   0.81   0.854   1.40   0.55   0.81   0.854   1.40   0.55   0.85  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 39.27   285.94   1.84   0.84   110   1.560   0.855   0.65   0.50   0.82   221.38   1.53   1   100   1.00   8.00   1.00   222.2   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   39.70   334.95   4.67   1.39   110   1.561   0.854   1.40   0.53   0.85   0.51   0.82   259.01   1.50  | 39.04    | 285.58 | 1.88     | 0.66     | 110   | 1,556          | 0.860          | 0.66 | 0.50 | 0.82         | 221.38    |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 39.53 355.11 2.36 0.71 110 1.567 0.856 0.71 0.50 0.82 259.01 1.50 1 100 1.00 8.10 1.00 260.0 0.65 Infin. 0.000 0.576 Non-Liq. Non-Liq. O.00 490.0 354.98 4.50 1.26 110 1.575 0.853 1.26 0.51 0.82 280.75 1.67 1 100 1.02 8.20 1.00 286.9 0.85 Infin. 0.000 0.576 Non-Liq. Non-Liq. O.00 40.03 354.98 4.90 1.38 110 1.573 0.853 1.39 0.52 0.81 271.07 1.71 1 100 1.05 8.25 1.00 284.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 40.03 354.98 4.90 1.38 110 1.579 0.852 1.39 0.52 0.81 271.07 1.71 1 100 1.05 8.25 1.00 284.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 40.03 312.02 3.03 0.97 110 1.583 0.850 1.33 0.50 0.82 297.27 1.62 1 100 1.00 8.30 1.00 298.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 40.53 312.02 3.03 0.97 110 1.591 0.847 0.74 0.50 0.82 238.79 1.54 1 100 1.00 8.40 1.00 239.7 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 40.68 294.45 1.66 0.56 110 1.595 0.846 0.57 0.81 215.59 1.50 1 100 1.00 8.45 1.00 228.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 440.85 281.98 1.62 0.58 110 1.595 0.844 0.58 0.50 0.81 215.59 1.50 1 100 1.00 8.45 1.00 228.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.17 276.31 2.79 1.01 1.603 0.843 0.78 0.50 0.81 185.75 1.68 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.34 272.69 3.45 1.16 110 1.607 0.841 1.01 0.840 1.16 0.83 0.80 25.44 1.73 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.67 23.03 3.89 0.94 110 1.614 0.836 1.25 0.53 0.80 210.77 1.74 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.67 325.03 3.89 0.94 110 1.622 0.835 0.94 0.50 0.81 274.81 1.58 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.67 325.03 3.89 0.94 110 1.622 0.835 0.94 0.50 0.81 274.81 1.58 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.67 325.03 3.89 0.94 110 1.622 0.835 0.94 0.50 0.81 274.81 1.58 1 100 1.00 8.05 1.00 384.0 8.8 Infin. 0.000 0.575 Non-Liq. Non-Liq. O.00 441.67 325.03 3.89 0.94 110 1.622 0.835 0.94 0.50 0.81 274.81 1.58 1 100 1.00 8.   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         | Non-Liq.     | Non-Liq        | 0.00       |
| 39.70 334.95 4.67 1.39 110 1.571 0.854 1.40 0.53 0.81 255.80 1.73 1 100 1.06 8.15 1.00 271.7 0.85 Infin. 0.000 0.576 Non-Liq. Non-Liq. 0.00 40.03 384.89 4.90 1.38 110 1.579 0.852 1.26 0.51 0.52 280.75 1.67 1 100 1.05 8.25 1.00 284.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.19 386.31 4.35 1.13 110 1.583 0.850 1.13 0.50 0.82 297.27 1.62 1 100 1.00 8.35 1.00 298.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.19 31.39 0.25 0.30 0.97 110 1.587 0.849 0.98 0.50 0.82 238.79 1.54 1 100 1.00 8.35 1.00 240.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 11.39 0.25 0.73 110 1.581 0.847 0.74 0.50 0.82 238.79 1.54 1 100 1.00 8.35 1.00 229.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 1.66 0.56 110 1.595 0.846 0.57 0.50 0.81 225.45 1.48 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 281.98 1.62 0.58 110 1.595 0.844 0.58 0.50 0.81 225.45 1.88 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 281.98 1.62 0.58 110 1.595 0.844 0.58 0.50 0.81 255.45 1.84 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 281.98 1.62 0.58 110 1.595 0.844 0.58 0.50 0.81 255.45 1.68 1 100 1.00 8.55 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.17 276.31 2.79 1.01 110 1.607 0.841 1.01 0.51 0.81 255.45 1.68 1 100 1.00 8.55 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 280.76 3.48 1.24 110 1.614 0.838 1.25 0.53 0.80 210.77 1.74 1 100 1.00 8.55 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.83 381.66 3.38 0.94 110 1.626 0.834 0.85 0.81 274.71 1.62 1 100 1.00 8.85 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.83 381.66 3.38 0.94 110 1.626 0.834 0.85 0.94 0.50 0.81 227.17 1.62 1 100 1.00 8.55 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.83 381.66 3.38 0.94 110 1.626 0.834 0.85 0.94 0.50 0.81 227.17 1.62 1 100 1.00 8.55 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.63 381.65 3.38 0.94 110 1.626 0.834 0.85 0.94 0.50 0.81 227.47 1.62 1 100 1.00 8.5   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 40.03 354.98 4.90 1.38 110 1.579 0.852 1.39 0.52 0.81 271.07 1.71 1 1 100 1.05 8.25 1.00 284.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.19 308.31 4.35 1.13 110 1.583 0.850 1.13 0.50 0.82 297.27 1.62 1 100 1.00 8.30 1.00 298.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.52 311.39 2.28 0.73 110 1.597 0.849 0.98 0.50 0.82 239.57 1.63 1 100 1.00 8.35 1.00 240.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.65 291.98 1.66 0.56 110 1.595 0.846 0.57 0.50 0.81 225.45 1.48 1 100 1.00 8.40 1.00 239.7 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 291.98 1.62 0.58 110 1.599 0.844 0.58 0.50 0.81 255.45 1.48 1 100 1.00 8.45 1.00 239.7 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 291.98 1.62 0.58 110 1.599 0.844 0.58 0.50 0.81 185.75 1.64 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.17 276.31 2.79 1.01 110 1.607 0.841 1.01 0.51 0.81 209.65 1.68 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 243.47 1.82 0.79 1.01 110 1.610 0.843 0.78 0.50 0.81 185.75 1.64 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0  |          | 334.95 | 4.67     | 1.39     | 110   | 1.571          | 0.854          | 1.40 | 0.53 | 0.81         | 255.80    | 1.73 |     | 1        | 100    | 1.06 | 8.15 | 1.00 | 271.7 | 0.85 | Infin. | 0.000 | 0.576   | Non-Liq.     | Non-Liq.       | 0.00       |
| 40.19 386.31 4.35 1.13 110 1.583 0.850 1.13 0.50 0.82 297.27 1.62 1 100 1.00 8.30 1.00 298.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.55 312.02 30.30 0.97 110 1.597 0.849 0.98 0.50 0.82 239.57 1.63 1 100 1.00 8.35 1.00 240.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.52 311.39 2.28 0.73 110 1.591 0.847 0.74 0.50 0.82 239.57 1.63 1 100 1.00 8.40 1.00 239.7 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 294.45 1.66 0.56 110 1.595 0.846 0.57 0.50 0.81 225.45 1.48 1 100 1.00 8.40 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 440.85 281.98 1.62 0.58 110 1.599 0.844 0.58 0.50 0.81 215.59 1.50 1 100 1.00 8.50 1.00 216.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 441.17 276.31 2.79 1.01 110 1.607 0.841 1.01 0.51 0.81 205.65 1.68 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 441.34 272.69 3.15 1.16 110 1.610 0.840 1.16 0.53 0.80 205.34 1.73 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 441.83 361.66 3.38 0.98 110 1.618 0.837 0.98 0.50 0.81 247.17 1.62 1 100 1.00 8.75 1.00 248.1 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 441.83 361.66 3.38 0.98 110 1.622 0.835 0.94 0.50 0.81 247.17 1.62 1 100 1.00 8.75 1.00 248.1 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 442.81 396.43 3.53 0.99 110 1.634 0.831 0.81 0.50 0.81 247.17 1.62 1 100 1.00 8.75 1.00 248.1 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 442.81 396.43 3.53 0.99 110 1.634 0.831 0.81 0.50 0.81 282.91 1.55 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 442.81 396.43 3.53 0.99 110 1.634 0.831 0.81 0.50 0.80 335.19 1.47 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 442.81 433.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 334.1 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 442.81 433.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 327.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. No   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 40.52 311.39 2.28 0.73 110 1.591 0.847 0.74 0.50 0.82 238.79 1.54 1 100 1.00 8.40 1.00 239.7 0.85 Infin. 0.000 0.575 Non-Liq. 0.00 40.68 294.45 1.68 0.56 110 1.595 0.846 0.57 0.50 0.81 225.45 1.48 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 40.85 281.98 1.62 0.58 110 1.599 0.844 0.58 0.50 0.81 125.59 1.50 1 100 1.00 8.45 1.00 226.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.01 243.47 1.88 0.77 110 1.603 0.843 0.78 0.50 0.81 185.75 1.64 1 100 1.00 8.55 1.00 186.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.34 272.69 3.15 1.16 110 1.607 0.841 1.01 0.51 0.81 209.65 1.68 1 100 1.02 8.60 1.00 215.6 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 280.76 3.48 1.24 110 1.614 0.838 1.25 0.53 0.80 210.77 1.74 1 100 1.07 8.70 1.00 226.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.87 325.03 3.18 0.98 110 1.622 0.835 0.94 0.50 0.81 247.47 1.62 1 100 1.07 8.70 1.00 226.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 372.69 3.26 0.87 110 1.622 0.835 0.94 0.50 0.81 247.43 1.55 1 100 1.00 8.80 1.00 275.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 372.69 3.26 0.87 110 1.622 0.835 0.94 0.50 0.81 247.43 1.55 1 100 1.00 8.80 1.00 275.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 372.69 3.26 0.87 110 1.626 0.834 0.88 0.50 0.81 247.43 1.55 1 100 1.00 8.85 1.00 284.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.32 442.33 3.55 0.80 110 1.634 0.831 0.81 0.50 0.80 335.19 1.47 1 100 1.00 8.85 1.00 336.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.34 442.33 3.55 0.80 110 1.638 0.829 0.72 0.50 0.80 335.19 1.47 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.80 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.80 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.80 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.   | 40,19    | 386.31 | 4.35     | 1.13     | 110   | 1.583          | 0.850          | 1.13 | 0.50 | 0.82         | 297.27    | 1.62 |     | 1        | 100    | 1.00 | 8.30 | 1.00 | 298.4 | 0.85 | Infin. | 0.000 | 0.575   |              | .00            | 0.00       |
| 40.68  |          |        |          |          |       |                |                |      |      |              |           |      |     | (5)      |        |      |      |      |       |      |        |       |         |              |                |            |
| 40.85  | 40.68    |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 41.17  |          | 281.98 |          |          |       |                |                |      |      |              |           |      |     |          |        | 1_00 | 8,50 | 1.00 | 216.4 | 0.85 | Infin. | 0.000 | 0.575   | Non-Liq.     | Non-Liq        | 0.00       |
| 41.34  | 7.00     |        |          |          |       |                |                |      |      |              |           |      |     | J        |        |      |      |      |       |      |        |       |         |              |                |            |
| 41.87 325.03 3.18 0.98 110 1.618 0.837 0.98 0.50 0.81 247.17 1.62 1 100 1.00 8.75 1.00 248.1 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.93 361.66 3.38 0.94 110 1.622 0.835 0.94 0.50 0.81 274.83 1.58 1 100 1.00 8.85 1.00 275.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 372.69 3.26 0.87 110 1.626 0.834 0.88 0.50 0.81 282.91 1.55 1 100 1.00 8.85 1.00 284.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 396.43 3.53 0.89 110 1.630 0.832 0.89 0.50 0.81 300.64 1.53 1 100 1.00 8.85 1.00 284.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.32 442.33 3.55 0.80 110 1.634 0.831 0.81 0.50 0.80 335.19 1.47 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.81 42.83 3.55 0.80 110 1.638 0.829 0.72 0.50 0.80 335.19 1.47 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.00 1.00 327.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.00 1.00 327.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. Non-Liq. 0.00 0.574 Non-Liq. 0.00 0.574 Non-Liq. Non-Liq   | 41.34    | 272.69 | 3.15     | 1.16     | 110   | 1.610          | 0.840          | 1.16 | 0.53 | 0.80         | 205.34    | 1.73 |     | 1        | 100    | 1.06 | 8.65 | 1.00 | 218.0 | 0.85 | Infin. | 0.000 | 0,575   | Non-Liq.     | Non-Liq.       | 0.00       |
| 41.83 361.66 3.38 0.94 110 1.622 0.835 0.94 0.50 0.81 274.83 1.58 1 100 1.00 8.80 1.00 275.9 0.84 Infin. 0.000 0.574 Non-Liq. 0.00 42.16 396.43 3.55 0.89 110 1.630 0.832 0.89 0.50 0.81 282.91 1.55 1 100 1.00 8.85 1.00 284.0 0.84 Infin. 0.000 0.574 Non-Liq. 0.00 42.18 142.33 3.55 0.80 110 1.634 0.831 0.81 0.50 0.80 335.19 1.47 1 100 1.00 8.90 1.00 301.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.49 458.56 3.30 0.72 110 1.638 0.829 0.72 0.50 0.80 347.12 1.42 1 100 1.00 8.95 1.00 336.4 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 334.1 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 332.83 1.42 1 100 1.00 9.05 1.00 337.3 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  | .55      |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 42.16  | 41.83    | 361.66 | 3.38     | 0.94     | 110   | 1.622          | 0.835          | 0.94 | 0.50 | 0.81         | 274.83    | 1.58 |     | 1        | 100    | 1.00 | 8,80 | 1.00 | 275.9 | 0.84 | Infin. | 0.000 | 0.574   |              |                | 0.00       |
| 42.32       442.33       3.55       0.80       110       1.634       0.81       0.80       0.80       0.80       0.80       0.84  | 4.5      |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
| 42.49       458.56       3.30       0.72       110       1.638       0.829       0.72       0.50       0.80       347.12       1.42       1       100       1.00       9.00       1.00       348.4       0.84       Infin.       0.00       0.573       Non-Liq.       Non-Liq.       0.00         42.81       431.91       2.59       0.60       110       1.646       0.826       0.60       0.50       0.80       326.09       1.38       1       100       1.00       9.00       1.00       327.3       0.84       Infin.       0.000       0.573       Non-Liq.       Non-Liq.       0.00   | 42.32    | 442.33 | 3.55     | 0.80     |       |                |                |      |      |              |           |      |     | 7.0      |        |      |      |      |       |      |        |       |         |              |                |            |
| 42.81 431.91 2.59 0.60 110 1.646 0.826 0.60 0.50 0.80 326.09 1.38 1 100 1.00 9.10 1.00 327.3 0.84 Infin. 0.000 0.573 Non-Liq. 0.00   |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      | 9.00 | 1.00 |       |      | Infin. | 0.000 | 0.573   | Non-Liq.     | Non-Liq.       | 0.00       |
|  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |
|  |          |        |          |          |       |                |                |      |      |              |           |      |     |          |        |      |      |      |       |      |        |       |         |              |                |            |

| Layer          | Tip              | Friction     | Friction     | Total      | Eff Stres              | s              |              |              |              |                  |              | g   | Liquef  | Rel        |              |                    |      | Clean          |              | _                | _     | Induced        | Liquefac.              | _               | Volumetric   |
|----------------|------------------|--------------|--------------|------------|------------------------|----------------|--------------|--------------|--------------|------------------|--------------|-----|---------|------------|--------------|--------------------|------|----------------|--------------|------------------|-------|----------------|------------------------|-----------------|--------------|
| Depth          |                  | Fs           | Ratio        |            | at Midpt               |                |              |              |              | Correcte         | d            | - 0 | uscept  |            |              | Н                  |      | Sand           |              |                  | EQ    | M=7,5          | Safety                 | Probab          | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)              | rd             | F            | n            | Co           | Qc1n             | Ic           | 6   | 0 or 1) | Dr (%)     |              | (m)                | KH   | Qc1n           | Κσ           | CRR75            |       | CSR            | Factor                 | Pt              | (%)          |
| 43.14<br>43.31 | 428.50<br>431.32 | 2.17<br>1.87 | 0.51         | 110<br>110 | 1.653<br>1.657         | 0.823<br>0.821 | 0.51         | 0.50<br>0.50 | 0.80         | 322.73<br>324.48 | 1.33         |     | 1       | 100<br>100 | 1.00         | 9.20<br>9.25       | 1,00 | 323 9<br>325 7 | 0.84         | Infin.           | 0.000 | 0.572<br>0.572 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 43_47          | 442.46           | 2.46         | 0.56         | 110        | 1,661                  | 0,820          | 0,56         | 0.50         | 0.80         | 332,50           | 1,35         |     | 1       | 100        | 1.00         | 9.30               | 1.00 | 333.7          | 0.83         | Infin            | 0.000 | 0.572          | Non-Liq.               |                 | 0.00         |
| 43 64<br>43 80 | 485.55<br>480.46 | 2.74         | 0.56<br>0.61 | 110<br>110 | 1.665<br>1.669         | 0.818<br>0.816 | 0,57<br>0,61 | 0.50         | 0.80         | 364,57<br>360.31 | 1,33<br>1,36 |     | 1       | 100<br>100 | 1.00         | 9.35<br>9.40       | 1.00 | 365.9<br>361.7 | 0.83         | Infin.           | 0.000 | 0.572          | Non-Liq.               |                 | 0.00         |
| 43.96          | 434.40           | 2.34         | 0.54         | 110        | 1.673                  | 0.815          | 0.54         | 0.50         | 0.80         | 325.27           | 1.35         |     | 1       | 100        | 1.00         |                    | 1.00 | 326.5          | 0.83         | Infin            | 0,000 | 0.571<br>0.571 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 44.13          | 424.26           | 2.47         | 0.58         | 110        | 1.677                  | 0.813          | 0.58         | 0.50         | 0.79         | 317.27           | 1,38         |     | 1       | 100        | 1.00         |                    | 1.00 | 318.5          | 0.83         | Infin.           | 0,000 | 0.571          | Non-Liq.               | Non-Liq.        | 0.00         |
| 44.29<br>44.46 | 417.78<br>434.65 | 3.15<br>2.76 | 0.75<br>0.64 | 110<br>110 | 1,681<br>1,685         | 0.811<br>0.810 | 0.76         | 0.50<br>0.50 | 0.79<br>0.79 | 312.04<br>324.31 | 1.47<br>1.40 |     | 1       | 100        | 1.00         |                    | 1.00 | 313.2<br>325.5 | 0.83         | Infin.           | 0.000 | 0.570<br>0.570 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 44.62          | 474,92           | 3.88         | 0.82         | 110        | 1,689                  | 0.808          | 0.82         | 0.50         | 0.79         | 354.06           | 1.46         |     | 1       | 100        | 1.00         | 9.65               | 1.00 | 355.4          | 0.83         | Infin.           | 0.000 | 0.569          | Non-Liq.               | Non-Liq.        | 0.00         |
| 44.78<br>44.95 | 477.42<br>400.75 | 3.92         | 0.82         | 110<br>110 | 1,692<br>1,696         | 0.807<br>0.805 | 0.82         | 0.50<br>0.50 | 0.79         | 355.52<br>297.88 | 1.46<br>1.50 |     | 1       | 100<br>100 | 1.00         |                    | 1.00 | 356.8<br>299.0 | 0.83         | Infin.           | 0.000 | 0.569<br>0.569 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 45.11          | 375.01           | 3.32         | 0.89         | 110        | 1,700                  | 0.803          | 0.89         | 0.50         | 0.79         | 278.34           | 1.56         |     | 1       | 100        | 1.00         | 9.80               | 1.00 | 279.4          | 0.83         | Infin.           | 0,000 | 0.568          | Non-Liq.               |                 | 0.00         |
| 45.28<br>45.44 | 353 62<br>350 76 | 3.70<br>3.99 | 1.05<br>1.14 | 110<br>110 | 1.704<br>1.708         | 0.802          | 1.05<br>1.14 | 0.50<br>0.51 | 0.79<br>0.78 | 262,09<br>258,98 | 1.63<br>1.66 |     | 1       | 100<br>100 | 1.00         |                    | 1.00 | 263.1          | 0.83         | Infin.           | 0.000 | 0.568          | Non-Liq.               |                 | 0.00         |
| 45 60          | 361.90           | 4.33         | 1.20         | 110        | 1.712                  | 0.798          | 1.20         | 0.51         | 0.78         | 266.57           | 1.67         |     | 1       |            | 1.02         |                    | 1.00 | 262.3<br>271.8 | 0.83         | Infin.           | 0.000 | 0.567<br>0.567 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 45.77<br>45.93 | 370.34<br>366.89 | 4.64<br>5.10 | 1.25<br>1.39 | 110        | 1,716                  | 0.797          | 1,26         | 0.51         | 0.78         | 272.10           | 1.68         |     | 1       | 100        | 1.02         | ####               |      | 279,3          | 0.82         | Infin            | 0,000 | 0.567          | Non-Liq.               | Non-Liq         | 0.00         |
| 46.10          | 356.56           | 4.91         | 1.38         | 110<br>110 | 1:720<br>1,724         | 0,795<br>0,793 | 1,40<br>1,38 | 0.52<br>0.52 | 0.78<br>0.77 | 267.69<br>259.60 | 1,72<br>1,72 |     | 1       |            | 1.05         | ####<br>####       |      | 282.0<br>274.4 | 0.82<br>0.82 | Infin.           | 0.000 | 0.566<br>0.566 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 46,26          | 358,23           | 5.52         | 1.54         | 110        | 1,728                  | 0.792          | 1.55         | 0.54         | 0.77         | 259,00           | 1.76         |     | 1       |            | 1.08         | ####               | 1.00 | 280,7          | 0.82         | Infin.           | 0.000 | 0.565          | Non-Liq.               |                 | 0.00         |
| 46.42<br>46.59 | 364,21<br>355,49 | 5.48<br>5.43 | 1.51<br>1.53 | 110<br>110 | 1.731<br>1.735         | 0,790<br>0,788 | 1.51<br>1.53 | 0.53<br>0.54 | 0.77<br>0.77 | 263.52<br>256.41 | 1.75<br>1.76 |     | 1       |            | 1.07         | ####<br>####       |      | 283,3<br>277.8 | 0.82         | Infin<br>Infin   | 0.000 | 0.565<br>0.564 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 46.75          | 363,06           | 4.83         | 1.33         | 110        | 1,739                  | 0.787          | 1,34         | 0.52         | 0.77         | 263,74           | 1.71         |     | 1       |            | 1.04         | ####               |      | 275.9          | 0.82         | Infin_           | 0.000 | 0.564          | Non-Liq.               |                 | 0.00         |
| 46.92<br>47.08 | 369.03<br>367.25 | 3.46         | 0.94         | 110<br>110 | 1.743<br>1.747         | 0.785<br>0.783 | 0.94         | 0.50         | 0.78<br>0.78 | 270,45<br>268,84 | 1,58<br>1,59 |     | 1       |            | 1.00         | ####<br>####       |      | 271.5<br>269.8 | 0.82         | Infin.<br>Infin. | 0.000 | 0.563          | Non-Liq.               |                 | 0.00         |
| 47.24          | 360.71           | 3.46         | 0.96         | 110        | 1.751                  | 0.782          | 0.96         | 0.50         | 0.78         | 263.73           | 1.60         |     | i       |            | 1.00         | ####               | 100  |                | 0.82         | Infin.           | 0.000 | 0.563<br>0.562 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 47.41<br>47.57 | 359.57<br>355.34 | 3.90<br>4.23 | 1.08<br>1.19 | 110<br>110 | 1.755<br>1.759         | 0.780          | 1.09         | 0.50         | 0.78         | 262.60           | 1.64         |     | 1       |            | 1.00         | ####               |      |                | 0.82         | Infin.           | 0.000 | 0.562          | Non-Liq.               | Non-Liq         | 0.00         |
| 47.74          | 345.82           | 4.41         | 1.28         | 110        | 1.763                  | 0.778<br>0.777 | 1.20<br>1.28 | 0.51<br>0.52 | 0.77<br>0.77 | 257.82<br>249.35 | 1.67<br>1.71 |     | 1       |            | 1.02         | ####<br>####       | 0.00 | 264.2<br>261.0 | 0.82         | Infin.           | 0.000 | 0.561<br>0.561 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 47.90          | 339.06           | 4.15         | 1.22         | 110        | 1.767                  | 0.775          | 1.23         | 0.52         | 0.77         | 244,49           | 1.70         |     | 1       | 100        | 1.04         | ####               | 1.00 | 254.5          | 0.81         | Infin.           | 0.000 | 0.560          | Non-Liq.               | Non-Liq         | 0.00         |
| 48.06<br>48.23 | 331.05<br>319.37 | 4.03<br>3.94 | 1.22<br>1.23 | 110<br>110 | 1.770<br>1.77 <b>4</b> | 0.773<br>0.772 | 1.23<br>1.24 | 0.52<br>0.52 | 0.77<br>0.76 | 238.19           | 1.70<br>1.72 |     | 1       |            | 1.04         | ####               |      | 248.9<br>241.6 | 0.81<br>0.81 | Infin.<br>Infin. | 0.000 | 0.560<br>0.559 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 48,39          | 303.85           | 3.75         | 1.23         | 110        | 1,778                  | 0.770          | 1.24         | 0.53         | 0.76         | 216,98           | 1.74         |     | 1       | 100        | 1.06         | ####               |      | 231.2          | 0.81         | Infin:           | 0.000 | 0.559          | Non-Liq.               |                 | 0.00         |
| 48.56<br>48.72 | 293.74<br>291.29 | 3.57<br>3.33 | 1.21<br>1.14 | 110<br>110 | 1.782<br>1.786         | 0.768<br>0.767 | 1.22<br>1.15 | 0.53<br>0.52 | 0.76<br>0.76 | 209.31<br>207.88 | 1.74<br>1.72 |     | 1       |            | 1.06         | ####               |      |                | 0.81         | Infin.<br>Infin. | 0.000 | 0.558<br>0.558 | Non-Liq.               |                 | 0.00         |
| 48.88          | 298.38           | 3.16         | 1.06         | 110        | 1,790                  | 0.765          | 1.06         | 0.51         | 0.76         | 213.83           | 1.69         |     | i       |            | 1.03         | ####               |      |                | 0.81         | Infin            | 0.000 | 0.557          | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 49.05<br>49.21 | 325.89<br>362.41 | 3.09         | 0.95         | 110<br>110 | 1.794<br>1.798         | 0.763<br>0.762 | 0.95<br>0.84 | 0.50<br>0.50 | 0.77<br>0.77 | 235.25<br>261.47 | 1.63         |     |         |            | 1.00         | ####               |      |                | 0.81         | Infin.           | 0.000 | 0.556          | Non-Liq.               |                 | 0.00         |
| 49.38          | 375.59           | 3.02         | 0.80         | 110        | 1.802                  | 0.760          | 0.81         | 0.50         | 0.77         | 270.73           | 1.55<br>1.53 |     |         |            | 1.00         | ####               |      |                | 0.81         | Infin.           | 0.000 | 0.556<br>0.555 | Non-Liq.<br>Noπ-Liq.   |                 | 0.00         |
| 49.54          | 373.37           | 2.95         | 0.79         | 110        | 1.806                  | 0.758          | 0.79         | 0.50         | 0.77         | 268.83           | 1.53         |     |         |            | 1.00         | ####               |      |                | 0.81         | Infin.           | 0.000 | 0.555          | Non-Liq.               | Non-Liq         | 0.00         |
| 49.70<br>49.87 | 359.81<br>336.99 | 2.88         | 0.80         | 110<br>110 | 1.810<br>1.813         | 0.757<br>0.755 | 0.80         | 0.50<br>0.50 | 0.76<br>0.76 | 258.74<br>241.98 | 1.54<br>1.57 |     |         |            | 1.00         | ####<br>#####      |      |                | 0.81         | Infin<br>Infin   | 0.000 | 0.554<br>0.553 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 50.03          | 346.15           | 2.56         | 0.74         | 110        | 1_817                  | 0.753          | 0.74         | 0.50         | 0.76         | 248.32           | 1,53         |     | 1       | 100        | 1.00         | ####               | 1.00 | 249.3          | 0.81         | Infin.           | 0.000 | 0.553          | Non-Liq.               | Non-Liq.        | 0.00         |
| 50.20<br>50.36 | 381.96<br>392.72 | 2.51<br>2.85 | 0.66         | 110<br>110 | 1.821<br>1.825         | 0.752<br>0.750 | 0.66         | 0.50<br>0.50 | 0.76<br>0.76 | 273.85<br>281.30 | 1.46<br>1.49 |     |         |            | 1.00<br>1.00 | ####<br>####       |      |                | 0.80         | Infin.<br>Infin. | 0.000 | 0.552<br>0.552 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 50,52          | 396.83           | 2.89         | 0.73         | 110        | 1.829                  | 0.748          | 0.73         | 0.50         | 0.76         | 283.95           | 1.49         |     |         |            | 1.00         | ####               |      |                | 0.80         | Infin.           | 0.000 | 0.551          | Non-Liq.               |                 | 0.00         |
| 50.69<br>50.85 | 396.75<br>407.28 | 3.02         | 0.76         | 110<br>110 |                        | 0.747<br>0.745 | 0.76<br>0.74 | 0.50<br>0.50 | 0.76<br>0.76 | 283.59<br>290.84 | 1.50<br>1.48 |     |         |            | 1.00         | ####<br>####       |      |                | 0.80         | Infin.<br>Infin. | 0.000 | 0.550<br>0.550 | Non-Liq.               |                 | 0.00         |
| 51,02          | 402 29           | 3.32         | 0.83         | 110        |                        | 0.743          | 0.83         | 0.50         | 0.76         | 286.95           | 1.52         |     |         |            | 1.00         | ####               |      |                | 0.80         | Infin.           | 0.000 | 0.549          | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 51.18<br>51.35 | 394.50<br>393.59 | 3.33         | 0.84         | 110<br>110 |                        | 0.742<br>0.740 | 0.85         | 0.50<br>0.50 | 0.76<br>0.76 | 281.07<br>280.12 | 1.54<br>1.52 |     |         |            | 1.00         | ####<br>####       |      |                | 0.80         | Infin:           | 0.000 | 0.549          | Non-Liq.               |                 | 0.00         |
| 51,51          | 390.67           | 3.12         | 0.80         | 110        |                        | 0.738          | 0.80         | 0.50         | 0.76         | 277.73           | 1.52         |     |         |            | 1.00         | ####               |      |                | 0.80         | Infin.<br>Infin. | 0.000 | 0.548<br>0.547 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 51.67<br>51.84 | 388.71<br>368.01 | 2.96<br>2.86 | 0.76         | 110<br>110 |                        | 0.737<br>0.735 | 0.76<br>0.78 | 0.50         | 0.75         | 276.04           | 1.51         |     |         |            | 1.00         | ####               |      |                | 0.80         | Infin.           | 0.000 | 0.547          | Non-Liq.               |                 | 0.00         |
| 52.00          | 352.83           | 2.71         | 0.77         | 110        |                        |                | 0.78         | 0.50<br>0.50 | 0.75<br>0.75 | 260.99<br>249.91 | 1.53<br>1.54 |     |         |            | 1.00         | ####<br>####       |      | 262.0<br>250.8 | 080          | Infin.<br>Infin. | 0.000 | 0.546<br>0.545 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
|                | 339.28           | 2.70         | 0.80         | 110        |                        |                | 0.80         |              | 0.75         |                  | 1.57         |     |         |            | 1.00         | ####               |      |                | 0.80         | Infin.           | 0.000 | 0,545          | Non-Liq.               | Non-Liq.        | 0.00         |
| 52.33<br>52.49 | 334.38<br>338.19 | 2.52         | 0.75         | 110<br>110 |                        |                | 0.76<br>0.74 | 0.50<br>0.50 | 0.75<br>0.75 |                  | 1.55<br>1.54 |     |         |            | 1.00<br>1.00 | ####<br>####       |      |                | 0.80<br>0.80 | Infin.           | 0.000 | 0.544<br>0.543 | Non-Liq.<br>Noπ-Liq.   |                 | 0.00         |
| 52.66          | 343.61           | 2.50         | 0.73         | 110        |                        |                | 0.73         |              |              |                  | 1.53         |     |         | 100        | 1.00         | ####               | 1.00 | 243.2          | 0.79         | Infin.           | 0.000 | 0,543          | Non-Liq.               | Non-Liq.        | 0.00         |
| 52.82<br>52.99 | 346.70<br>356.95 | 2.63<br>2.69 | 0.76<br>0.75 | 110<br>110 |                        |                | 0.76<br>0.76 |              | 0.75<br>0.75 |                  | 1.54<br>1.53 |     |         |            | 1.00<br>1.00 | ####<br>####       |      |                | 0.79<br>0.79 | Infin.           | 0.000 | 0.542<br>0.542 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 53.15          | 371.38           | 2.91         | 0.78         | 110        | 1.892                  | 0.722          | 0.79         | 0.50         | 0.75         | 261_19           | 1,53         |     | 1       | 100        | 1.00         | ####               | 1.00 | 262.2          | 0.79         | Infin.           | 0.000 | 0.541          | Non-Liq.               | Non-Liq         | 0.00         |
| 53.31<br>53.48 | 388.05<br>350.81 | 3.41         | 0.88         | 110<br>110 |                        |                | 0.88<br>0.88 |              |              |                  | 1.56<br>1.59 |     |         |            | 1.00<br>1.00 | ####<br>####       |      | 273.7<br>247.1 | 0.79<br>0.79 | Infin.           | 0.000 | 0.540<br>0.540 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 53.64          | 345.68           | 2.79         | 0.81         | 110        | 1.903                  | 0.717          | 0.81         | 0.50         | 0.75         | 242.26           | 1.57         |     | 1       | 100        | 1.00         | ####               | 1.00 | 243.2          | 0.79         | Infin.           | 0.000 | 0.539          | Non-Liq.               |                 | 0.00         |
| 53.81<br>53.97 | 342.94<br>347.41 | 2.87         | 0.84         | 110<br>110 |                        |                | 0.84<br>0.82 |              | 0.74<br>0.74 |                  | 1.58<br>1.57 |     |         |            |              | ####               |      | 241.0<br>243.9 |              |                  | 0.000 | 0.538<br>0.538 | Non-Liq.               |                 | 0.00         |
| 54.13          | 347.69           | 3.06         | 0.88         | 110        | 1.915                  | 0.712          | 0.88         | 0.50         | 0.74         | 242,93           | 1.59         |     | 1       | 100        | 1.00         | ####               | 1_00 | 243.9          |              | Infin<br>Infin   | 0.000 | 0.538          | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 54.30<br>54.46 | 347.55<br>345.11 | 3.09         | 0.89         | 110<br>110 |                        |                | 0.89<br>0.88 |              |              |                  | 1.60<br>1.59 |     |         |            |              | ####<br>####       |      | 243.5<br>241.5 | 0.79<br>0.79 |                  | 0.000 | 0.536<br>0.536 | Non-Liq.               | Non-Liq         | 0.00         |
| 54.63          | 336.26           | 2.94         | 0.87         | 110        |                        |                | 0.88         |              |              |                  | 1.60         |     |         |            |              | ####               |      | 235.0          |              |                  | 0.000 | 0.535          | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 54.79<br>54.95 | 331.85<br>330.23 | 2.87<br>2.82 | 0.86         | 110<br>110 |                        |                | 0.87<br>0.86 |              |              |                  | 1.60<br>1.60 |     |         |            |              | ####<br>####       | 1:00 | 231.7          | 0.79         | Infin.           | 0.000 | 0.534          | Non-Liq.               | Non-Liq.        | 0.00         |
| 55.12          | 319.45           | 2.55         | 0.80         | 110        |                        |                | 0.80         |              |              |                  | 1.59         |     |         |            |              | #####              |      | 230.3<br>222.5 | 0.79<br>0.78 |                  | 0.000 | 0.534<br>0.533 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 55.28          | 307.70           | 2.09         | 0.68         | 110        |                        |                | 0.68         |              |              |                  | 1.55         |     |         |            |              | ####               | 1.00 | 214.1          | 0.78         | Infin.           | 0,000 | 0.532          | Non-Liq.               | Non-Liq.        | 0.00         |
| 55.45<br>55.61 | 302.76<br>284.61 | 1.94<br>1.51 | 0.64         | 110<br>110 |                        |                | 0.84<br>0.53 |              |              |                  | 1.54         |     |         |            |              | ####<br>####       |      | 210.4<br>197.5 | 0.78<br>0.78 |                  | 0.000 | 0.532          | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 55.77          | 294.51           | 1.35         | 0.46         | 110        | 1.954                  | 0.697          | 0.46         | 0.50         | 0.74         | 203.47           | 1.46         |     | 1       | 100        | 1.00         | ####               | 1.00 | 204.2          | 0.78         | Infin.           | 0.000 | 0.530          | Non-Liq.               |                 | 0.00         |
| 55.94<br>56.10 | 280.07<br>225.15 | 1.03         | 0.37<br>0.81 | 110<br>110 |                        |                | 0.37<br>0.82 |              |              |                  | 1.42<br>1.71 |     |         |            |              | ##### *<br>##### * |      |                | 0.78<br>0.78 |                  | 0.000 | 0.530<br>0.529 | Non-Liq.<br>Non-Liq.   |                 | 0.00         |
| 56.27          | 117.85           | 2.59         | 2.20         | 110        | 1.966                  | 0.692          | 2.23         | 0.68         | 0.65         | 71.73            | 2.25         |     | 1       |            | 1.80         |                    |      | 129.2          | 0.83         |                  | 0.233 | 0.528          | 0.44                   | 94%             | 1.12         |
| 56.43<br>56.59 | 54.87<br>32.82   | 1.79<br>0.74 | 3.26<br>2.25 | 110<br>110 |                        |                | 3.38<br>2.40 |              | 0.61<br>0.60 |                  | 2.65<br>2.74 |     | 0       |            |              |                    |      |                | 0.88<br>0.88 |                  |       | 0.528<br>0.527 | Non-Liq.<br>Non-Liq.   |                 | 0.00<br>0.00 |
| 56.76          | 25.50            | 0.61         | 2.38         | 110        | 1.977                  | 0.688          | 2.58         | 0.87         | 0.58         | 12.91            | 2 87         |     | 0       |            |              |                    |      |                | 0.88         |                  |       | 0.526          | Non-Liq.               |                 | 0.00         |
| 56.92<br>57.09 | 20.56<br>35.90   | 0.82         | 3.98         | 110<br>110 |                        |                |              |              | 0.55<br>0.60 |                  | 3.10<br>2.71 |     | 0       |            |              |                    |      |                | 88.0         |                  |       | 0.526          | Non-Liq.               |                 | 0.00         |
| 57.25          | 57.52            | 0.96         | 1.67         | 110        | 1.989                  | 0.683          | 1.73         | 0.74         | 0.63         | 32,91            | 2.44         |     | 1       | 31 2       | 2.47         |                    | 1.00 |                | 0.88<br>0.88 | 0.130            | 0.115 | 0.525<br>0.524 | Non-Liq.<br>0.22       | Non-Liq.<br>99% | 0.00<br>1.79 |
| 57.41<br>57.58 | 35.14<br>22.41   | 0.94<br>0.81 | 2.68<br>3.61 | 110<br>110 |                        |                | 2.84<br>3.97 |              | 0.59<br>0.56 |                  | 2,77<br>3,04 |     | 0       |            |              |                    |      |                | 88.0         |                  |       | 0.524          | Non-Liq.               | Non-Lig         | 0.00         |
| 57.74          | 20.05            | 0.55         | 2.73         | 110        | 2.001                  | 0.679          | 3.04         | 0.91         | 0.56         | 9.53             | 3.02         |     | 0       |            |              |                    |      |                | 88.0<br>88.0 |                  |       | 0.523<br>0.523 | Non-Liq.  <br>Non-Liq. |                 | 0.00         |
| 57.91<br>58.07 | 18.79<br>18.85   |              | 2.88<br>3.00 |            |                        |                |              |              | 0.55<br>0.55 |                  | 3.06<br>3.07 |     | 0       |            |              |                    |      |                | 0.88         |                  |       | 0.522          | Non-Liq.               | Non-Liq         | 0.00         |
| 33.07          | ,5,00            | 5.01         | 3.30         | 110        | -1000                  |                | 0.00         | J.JJ         | J.JJ         | 0,11             | 5.01         |     |         |            |              |                    |      |                | 88.0         |                  |       | 0.521          | Non-Liq.               | NOIT-LIQ:       | 0.00         |

| Layer  | Tip    | Friction | Friction | Total   | Eff Stres | s     |      |      |      |          |      | ap  | Liquef.  | Rel    |      |     |      | Clean |      |       |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|---------|-----------|-------|------|------|------|----------|------|-----|----------|--------|------|-----|------|-------|------|-------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt | at Midpt  |       |      |      |      | Correcte | d    | eri | Suscept  | Dens   |      | Н   |      | Sand  |      |       | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)   | p'o (tsf) | rd    | F    | n    | Co   | Qc1n     | lc   | ó   | (0 or 1) | Dr (%) | Kc   | (m) | KH   | Qc1n  | Kσ   | CRR75 | CRR   | CSR     | Factor    | PL       | (%)        |
| 58.23  | 17.52  | 0.53     | 3.01     | 110     | 2,013     | 0,675 | 3.40 | 0.94 | 0.55 | 8.01     | 3.11 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.521   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.40  | 18,20  | 0.44     | 2.44     | 110     | 2,016     | 0,673 | 2.74 | 0.92 | 0.55 | 8.46     | 3.04 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.520   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.56  | 18.28  | 0.56     | 3.06     | 110     | 2,020     | 0.672 | 3.44 | 0.94 | 0.55 | 8.39     | 3.09 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0,519   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.73  | 23.81  | 0.80     | 3.36     | 110     | 2,024     | 0.671 | 3.67 | 0.91 | 0.55 | 11.42    | 3.00 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0,519   | Non-Liq.  | Non-Liq. | 0.00       |
| 58 89  | 41.12  | 1.24     | 3.02     | 110     | 2,028     | 0,669 | 3.18 | 0.83 | 0.58 | 21.51    | 2.75 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.518   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.06  | 86.65  | 1.81     | 2.08     | 110     | 2.032     | 0.668 | 2.13 | 0.71 | 0.63 | 50.20    | 2.35 |     | 1        | 48     | 2.13 |     | 1.00 | 106.7 | 0.88 | 0.193 | 0,169 | 0.517   | 0.33      | 98%      | 1.40       |
|        | 119.37 | 1.93     | 1.62     | 110     | 2,036     | 0.666 | 1.64 | 0.66 | 0.65 | 72.21    | 2.16 |     | 1        | 63     | 1,57 |     | 1,00 | 113.4 | 0.82 | 0.216 | 0,177 | 0.517   | 0.34      | 97%      | 1.31       |
| 59_38  | 142.80 | 2.30     | 1.61     | 110     | 2.040     | 0.665 | 1.63 | 0.64 | 0.66 | 87.60    | 2.09 |     | 1        | 71     | 1.45 |     | 1,00 | 126.6 | 0.77 | 0.269 | 0,207 | 0.516   | 0.40      | 95%      | 1.15       |
| 59.55  | 118,50 | 3.06     | 2.58     | 110     | 2.044     | 0.664 | 2.62 | 0.70 | 0.63 | 69.37    | 2.31 |     | 1        | 62     | 1.98 |     | 1.00 | 137.6 | 0.82 | 0.322 | 0,265 | 0,516   | 0.51      | 90%      | 1.03       |
| 59_71  | 77.32  | 3.45     | 4.46     | 110     | 2.048     | 0.662 | 4.58 | 0.80 | 0.59 | 41.98    | 2.64 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.515   | Non-Liq.  | Non-Liq. | 0.00       |
| 59_88  | 39.16  | 2.67     | 6.81     | 110     | 2.052     | 0.661 | 7.19 | 0.91 | 0.55 | 19.16    | 3.02 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.514   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.04  | 26,72  | 1.42     | 5.31     | 110     | 2,055     | 0.660 | 5.75 | 0.93 | 0.54 | 12.53    | 3.09 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.514   | Non-Lig.  | Non-Lig. | 0.00       |
| 60.20  | 20.01  | 0.81     | 4.05     | 110     | 2,059     | 0,658 | 4.51 | 0.95 | 0.53 | 9.02     | 3.14 |     | 0        |        |      |     |      |       | 0.88 |       |       | 0.513   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.37  | 19.72  | 0,00     | 0.01     | 110     | 2 063     | 0.657 | 0.01 | 0.81 | 0.58 | 9.69     | 2.69 |     | 0        |        | 1.00 |     |      |       | 0.87 |       |       | 0.512   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.53  | 22,97  | 0.00     | 0.00     | 110     | 2,067     | 0,656 | 0.00 | 0.80 | 0.58 | 11.54    | 2.65 |     | 0        |        | 1,00 |     |      |       | 0.87 |       |       | 0.512   | Non-Liq.  | Non-Lig. | 0.00       |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

|                |                  | Project:<br>Job No: |                   | -          | hool No.               | 8              |              | Me           | thods:       | Liquefac                 |              |       |          |                |              |                    |              |                                |              |                  | & Wride        | )              |                      |             | Total<br>Liquefled  |
|----------------|------------------|---------------------|-------------------|------------|------------------------|----------------|--------------|--------------|--------------|--------------------------|--------------|-------|----------|----------------|--------------|--------------------|--------------|--------------------------------|--------------|------------------|----------------|----------------|----------------------|-------------|---------------------|
|                | So               | Date:<br>unding:    | 8/14/20<br>CPT-2/ |            | Plot:                  | 2              |              |              |              | Dry San                  | d Settle     | eme   | ent by P | Pradel, A      | ASCE .       | Journa             | al of G8     | GE, Vo                         | l 124,       | No. 4            |                |                |                      |             | Thickness<br>(feet) |
| EARTH          |                  | INFORM              | ATION:<br>6.77    | 7.5        |                        |                |              |              |              | (M=7.5):<br>and Qc1n     |              |       |          | /p'o)*rd       | /MSF         | er.                | COD          | *1/-10                         | en.          |                  |                |                |                      | 0           | 3.8                 |
|                | IVIC             | PGA, g:             |                   | 0.75       |                        |                |              |              | ican o       | and QCIII                | - OQ         | r.c   | NH QC    |                | Us           |                    |              | <sub>7.5</sub> *Kσ/C<br>& Seed |              | Ishihara         | a &Yosh        | mine (1):      | 0                    | Probab      | Total               |
| -              | GI               | MSF:<br>WT, feet    | 1.30              |            |                        |                | _            |              |              | ted soils:               | 110          | po    |          |                |              |                    |              |                                |              |                  |                | uired SF:      |                      | 5%          | Subsidence          |
|                |                  | NT feet             | 20.0              |            |                        |                |              | -1. F        |              | ted soils:<br>ble soils: | 110<br>2.60  | рс    |          | Limi           | ting lc      | for K <sub>H</sub> | 2.0          |                                |              |                  |                | Layers:        |                      | Max<br>100% | (inches)<br>0.6     |
| Layer<br>Depth | •                | Friction<br>Fs      | Friction<br>Ralio |            | Eff Stress<br>at Midpt | •              |              |              |              | Corrected                | 4            | eride | Liquef   | Rel<br>ot Dens |              | Н                  |              | Clean<br>Sand                  |              |                  |                |                | Liquefac.            |             | Volumetric          |
| (feet)         | (tsf)            | (tsf)               | %                 | (pcf)      | p'o (tsf)              | rd             | F            | n            | Co           | Qc1n                     | lc           |       |          | ) Dr (%)       | Kc           | (m)                | KH           |                                | Κσ           | CRR <sub>7</sub> | EQ<br>5 CRR    | M=7.5<br>CSR   | Safety<br>Factor     | Probab.     | Strain<br>(%)       |
| 0.16           | 8.00<br>11.37    |                     | 1.13<br>0.97      | 110<br>110 | 0.009<br>0.018         | 1,000          | 1.13<br>0.97 | 0.81<br>0.76 | 1.70<br>1.70 | 12.84<br>18.24           | 2.68<br>2.52 | Ī     | 0        | 6              | 2.86         | 1                  | 1.00         | 52.1                           | 1.00<br>1.00 | 0.093            | 0.093          | 0.485<br>0.485 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 0.49<br>0.66   | 14.06<br>15.85   |                     | 1.00              | 110<br>110 | 0.027                  | 1,000<br>1,000 | 1.00<br>0.90 | 0.74<br>0.72 | 1.70<br>1.70 | 22.55<br>25.41           | 2.44         |       | 1        | 15             | 2.50         |                    | 1.00         | 56.3                           | 1.00         | 0,097            | 0.097          | 0.485          | Non-Liq.             | Non-Liq.    | 0.00                |
| 0.82           | 15.82            | 0.14                | 0.88              | 110        | 0.045                  | 1.000          | 0.89         | 0.72         | 1,70         | 25.35                    | 2.37         |       | 1        | 20<br>20       | 2.22         |                    | 1.00<br>1.00 | 56.4<br>55.9                   | 1.00<br>1.00 | 0,097<br>0,096   | 0.097<br>0.096 | 0.485<br>0.485 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 0.98           | 15.42<br>12.24   |                     | 0.78              | 110<br>110 |                        | 1.000<br>0.999 | 0.79<br>0.81 | 0.72<br>0.74 | 1.70<br>1.70 | 24 69<br>19 57           | 2.36         |       | 1<br>1   | 19<br>9        | 2,15         |                    | 1.00         | 53.1<br>49.8                   | 1.00         | 0.094            | 0.094          | 0 485<br>0 484 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 1.31<br>1.48   | 12.24<br>10.64   |                     | 0.81              | 110<br>110 |                        | 0.999          | 0.81<br>1.18 | 0.74<br>0.78 | 1.70<br>1.70 | 19.55<br>16.97           | 2.45         |       | 1        | 9              | 2,55<br>3,25 |                    | 1.00         | 49.8<br>55.1                   | 1.00         | 0.092            | 0.092          | 0.484<br>0.484 | Non-Liq.             | Non-Liq.    | 0.00                |
| 1,64           | 11,63            | 0.20                | 1.72              | 110        | 0,090                  | 0.998          | 1.73         | 0.80         | 1.70         | 18.54                    | 2.64         |       | 0        |                |              |                    |              |                                | 1.00         |                  |                | 0.484          | Non-Liq.<br>Non-Liq. | Non-Liq     | 0.00<br>0.00        |
| 1.80<br>1.97   | 19 13<br>35 11   | 0.52                | 1.53<br>1.48      | 110<br>110 |                        | 0.998<br>0.998 | 1.53<br>1.48 | 0.74<br>0.67 | 1.70<br>1.70 | 30 58<br>56 24           | 2.43         |       | 1        | 28<br>53       | 2,45<br>1,70 |                    | 1.00         | 74.9<br>95.4                   | 1.00         | 0.119<br>0.161   | 0.119<br>0.161 | 0.484<br>0.484 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 2.13<br>2.30   | 43.24<br>43.08   |                     | 1.40              | 110<br>110 |                        | 0 997<br>0 997 | 1.40<br>1.44 | 0.65<br>0.65 | 1.70<br>1.70 | 69 29<br>69 02           | 2.13         |       | 1        | 62<br>61       | 1,50<br>1,52 |                    | 1.00         | 104.3<br>105.0                 | 1.00         | 0.185<br>0.188   | 0.185<br>0.188 | 0.483<br>0.483 | Non-Liq.<br>Non-Liq. | Non-Liq.    | 0.00<br>0.00        |
| 2,46<br>2.62   | 41.08<br>38.58   | 0.60<br>0.56        | 1.46<br>1.46      | 110<br>110 | 0.135                  | 0.996<br>0.996 | 1.46<br>1.46 | 0.65<br>0.66 | 1.70<br>1.70 | 65 79<br>61 76           | 2.16<br>2.18 |       | 1        | 59<br>57       | 1.56         |                    | 1.00         | 102,9                          | 1,00         | 0.181            | 0.181          | 0.483          | Non-Liq.             | Non-Liq.    | 0.00                |
| 2.79           | 35.25            | 0.53                | 1.50              | 110        | 0.153                  | 0,996          | 1.50         | 0.67         | 1.70         | 56.39                    | 2.22         |       | 1        | 53             | 1,61<br>1,70 |                    | 1,00         | 99.6<br>96.1                   | 1,00<br>1,00 | 0.172<br>0.163   | 0 172<br>0 163 | 0 483<br>0 483 | Non-Liq.<br>Non-Liq. | Non-Liq.    | 0.00<br>0.00        |
| 2.95<br>3.12   | 32.60<br>29.61   | 0.49<br>0.45        | 1.50<br>1.52      | 110<br>110 |                        | 0.995<br>0.995 | 1.51<br>1.53 | 0.68<br>0.69 | 1.70<br>1.70 | 52.12<br>47.30           | 2 24 2 28    |       | 1        | 50<br>46       | 1.78<br>1.88 |                    | 1.00         | 92.6<br>89.0                   | 1.00         | 0.154<br>0.146   | 0.154<br>0.146 | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 3.28           | 26.41<br>23.64   | 0.40                | 1.51              | 110<br>110 |                        | 0.994          | 1.52<br>1.45 | 0.70<br>0.71 | 1.70<br>1.70 | 42.15<br>37.68           | 2.32         |       | 1<br>1   | 41<br>36       | 2.01         |                    | 1.00         | 84.6<br>79.2                   | 1.00<br>1.00 | 0.136<br>0.126   | 0.136<br>0.126 | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 3.61<br>3.77   | 21.08<br>18.23   | 0.29<br>0.30        | 1.36<br>1.67      | 110<br>110 | 0.198                  | 0.994<br>0.993 | 1.37         | 0.72         | 1.70         | 33.55                    | 2.37         |       | 1        | 32             | 2.20         |                    | 1.00         | 73.8                           | 1.00         | 0,117            | 0.117          | 0.482          | Non-Liq.             | Non-Liq.    | 0.00                |
| 3.94           | 15,34            | 0.30                | 1.98              | 110        | 0.217                  | 0.993          | 2.00         | 0.78         | 1.70<br>1.70 | 28.96<br>24.30           | 2.48<br>2.58 |       | 1        | 25<br>18       | 2,65<br>3,21 |                    | 1.00<br>1.00 | 76.6<br>78.0                   | 1.00         | 0.122<br>0.124   | 0.122<br>0.124 | 0.482<br>0.481 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 4.10<br>4.27   | 12.99<br>11.82   | 0.35<br>0.38        | 2.73              | 110<br>110 |                        | 0.993<br>0.992 | 2.77<br>3.26 | 0.83<br>0.85 | 1.70<br>1.70 | 20.51<br>18.62           | 2.72         |       | 0        |                |              |                    |              |                                | 1.00         |                  |                | 0.481<br>0.481 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 4.43<br>4.59   | 10.34<br>11.89   | 0.34<br>0.24        | 3.30              | 110<br>110 |                        | 0.992<br>0.991 | 3.38<br>2.08 | 0.87<br>0.81 | 1.70<br>1.70 | 16.22<br>18.70           | 2.86<br>2.68 |       | 0        |                |              |                    |              |                                | 1.00         |                  |                | 0.481<br>0.481 | Non-Liq.             | Non-Liq     | 0.00                |
| 4.76           | 26.79            | 0.25                | 0.93              | 110        | 0.262                  | 0.991          | 0.94         | 0.67         | 1,70         | 42,63                    | 2,19         |       | 1        | 41             | 1,65         |                    | 1.00         | 70_3                           | 1.00         | 0.112            | 0.112          | 0.480          | Non-Liq.<br>Non-Liq. | Non-Liq.    | 0.00<br>0.00        |
| 4.92<br>5.09   | 35.67<br>41.25   | 0.30                | 0.84              | 110<br>110 |                        | 0.991<br>0.990 | 0.85<br>0.89 |              | 1.70<br>1.70 | 56,88<br>65,83           | 2.06         |       | 1        | 53<br>59       | 1.39<br>1.33 |                    | 1.00<br>1.00 | 79.2<br>87.7                   | 1.00         | 0.126<br>0.143   | 0.126<br>0.143 | 0.480<br>0.480 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 5.25<br>5.41   | 44.28<br>46.60   | 0.41                | 0.92              | 110<br>110 |                        | 0.990<br>0.989 | 0.93<br>0.95 |              | 1.70<br>1.70 | 70,69<br>74,40           | 2.01         |       | 1        | 62<br>65       | 1.31         | 1,00               | 1.00<br>1.00 | 92.7<br>96.8                   | 1.00         | 0.154            | 0.154<br>0.164 | 0,480<br>0,480 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 5.58<br>5.74   | 50.22<br>54.67   | 0.47<br>0.47        | 0.93              | 110<br>110 | 0.307                  | 0.989          | 0.94<br>0.87 | 0.60         | 1.70<br>1.70 | 80,20<br>87,34           | 1.97<br>1.92 |       | 1        | 68<br>71       | 1.26         | 1.05               | 1.00         | 101.4                          | 1,00         | 0.177            | 0.177          | 0.479          | Non-Liq.             | Non-Liq     | 0.00                |
| 5.91           | 56.65            | 0.48                | 0.85              | 110        | 0.325                  | 0.988          | 0.86         | 0.58         | 1,70         | 90,50                    | 1.90         |       | 1        | 73             | 1.21<br>1.19 | 1.10<br>1.15       | 1.00<br>1.00 | 108.2                          | 1.00         | 0.190<br>0.198   | 0.190<br>0.198 | 0 479<br>0 479 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 6.07<br>6.23   | 56.48<br>58.52   | 0.50<br>0.53        | 0.89              | 110<br>110 |                        | 0.988<br>0.988 | 0.90<br>0.92 | 0.58<br>0.58 | 1.70<br>1.70 |                          | 1.92<br>1.91 |       | 1        | 73<br>74       | 1.20<br>1.20 | 1,20<br>1,25       | 1.00<br>1.00 | 109.0<br>112.4                 | 1.00         | 0.201<br>0.212   | 0.201<br>0.212 | 0.479<br>0.479 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 6.40<br>6.56   | 61.73<br>65.05   | 0.57<br>0.55        | 0.92              | 110<br>110 |                        | 0.987<br>0.987 | 0.93<br>0.85 |              | 1.70<br>1.70 |                          | 1.90<br>1.85 |       | 1<br>1   | 76<br>78       | 1,18<br>1,15 | 1,30<br>1.35       |              | 117.2<br>119.6                 |              | 0.230            | 0.230          | 0.479<br>0.478 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 6.73<br>6.89   | 67.42<br>72.04   | 0.56<br>0.64        | 0.83              | 110<br>110 |                        | 0.986<br>0.986 | 0.84<br>0.89 |              | 1.70<br>1.70 | 107_74                   | 1.84<br>1.83 |       | 1        | 80<br>83       | 1.13         | 1.40               | 1.00         |                                | 1.00         | 0.251<br>0.287   | 0.251<br>0.287 | 0.478          | Non-Liq.             | Non-Liq.    | 0.00                |
| 7,05           | 79.98            | 0.56                | 0.70              | 110        | 0,388                  | 0.986          | 0.71         | 0.53         | 1.70         | 127.76                   | 1.73         |       | 1        | 87             | 1.06         | 1.50               | 1.00         | 135,9                          | 1.00         | 0.314            | 0.314          | 0.478<br>0.478 | Non-Liq.             | Non-Liq.    | 0.00                |
| 7.22<br>7.38   | 84.69<br>84.27   | 0.74<br>0.71        | 0.87<br>0.84      | 110<br>110 | 0.406                  | 0.985          | 0.84         | 0.54         | 1.70<br>1.67 |                          | 1,77<br>1,77 |       | 1        | 89<br>89       |              | 1.55<br>1.60       |              | 147.6<br>144.4                 |              | 0.379<br>0.360   | 0.379<br>0.360 | 0.478<br>0.478 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 7.55<br>7.71   | 88.99<br>88.99   | 0.71<br>0.71        | 0.80              | 110<br>110 |                        | 0.985<br>0.984 | 0.81<br>0.81 |              |              |                          | 1.74<br>1.75 |       | 1        | 90<br>90       |              |                    |              |                                | 1.00         | 0.378            | 0.378<br>0.371 | 0.477<br>0.477 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 7.87<br>8.04   | 97.16<br>104.13  | 0.72<br>0.76        | 0.74<br>0.73      | 110<br>110 |                        |                | 0.74<br>0.73 | 0.52         | 1,59         | 145_34                   | 1.70<br>1.68 |       | 1<br>1   | 92<br>95       | 1.04         | 1.75               | 1.00         | 151.8                          | 1.00         | 0,405            | 0.405          | 0.477          | Non-Liq.             | Non-Liq     | 0.00                |
| 8.20           | 109.72           | 0.85                | 0.77              | 110        | 0.451                  | 0.983          | 0.78         | 0.51         | 1.55         | 159.96                   | 1.68         |       | 1        | 96             | 1.03         | 1,85               | 1.00         | 164.9                          | 237          | 0.445<br>Infin   | 0.445<br>0.000 | 0.477<br>0.477 | Non-Liq.<br>Non-Liq. | Non-Liq     | 0.00<br>0.00        |
| 8.37<br>8.53   | 127.90<br>139.29 | 0.84<br>1.12        | 0.66              | 110<br>110 | 0.469                  |                | 0.66<br>0.80 |              |              |                          | 1.59<br>1.63 |       | 1        | 100<br>100     |              | 1,90<br>1,95       |              |                                | 1.00         | Infin.<br>Infin. | 0.000          | 0.476<br>0.476 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 8.69<br>8.86   | 174.32<br>197.20 | 1.33<br>1.54        | 0.76<br>0.78      | 110<br>110 |                        |                | 0.77<br>0.78 |              |              |                          | 1.55<br>1.52 |       | 1<br>1   | 100<br>100     |              | 2,00               |              | 245.3<br>275.0                 |              | Infin.           | 0.000          | 0.476<br>0.476 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 9.02           | 211.19<br>221.47 | 1.71<br>1.88        | 0.81<br>0.85      | 110<br>110 | 0,496                  | 981            | 0.81         | 0.50         | 1.46         | 290,78                   | 1,51         |       | 1        | 100            | 1_00         | 2.10               | 1.00         | 291,9                          | 1,00         | Infin.           | 0,000          | 0.476          | Non-Liq.             | Non-Liq.    | 0.00                |
| 9.35           | 230.78           | 2.04                | 0.88              | 110        | 0.514                  | 0.981          | 0.85<br>0.88 | 0.50         | 1.43         | 312,17                   | 1,52<br>1,52 |       | 1        | 100<br>100     | 1.00         | 2.15<br>2.20       | 1.00         | 303.4<br>313.3                 | 1,00         | Infin.<br>Infin. | 0.000          | 0.476<br>0.475 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
| 9.51<br>9.68   | 234.50<br>232.94 | 2.16                | 0.92              | 110<br>110 |                        |                |              |              |              |                          | 1.53<br>1.56 |       | 1        | 100<br>100     |              | 2.25               |              | 315.6<br>310.8                 |              | Infin.           | 0.000          | 0.475<br>0.475 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
|                | 231.57<br>230.54 | 2.35                | 1.01<br>1.04      | 110<br>110 |                        |                |              |              |              |                          | 1.57<br>1.59 |       | 1        | 100            | 1.00         | 2.35<br>2.40       | 1.00         | 306.4<br>302.5                 | 1.00         | Infin.           | 0.000          | 0.475<br>0.475 | Non-Liq.<br>Non-Liq. | Non-Liq.    | 0.00<br>0.00        |
| 10.17          | 237.18<br>247.31 | 2.50                | 1.05              | 110        | 0,559                  | 979            | 1.06         | 0.50         | 1.38         | 307.58                   | 1.58         |       | 1        | 100            | 1.00         | 2.45               | 1.00         | 308.7                          | 1.00         | Infin.           | 0.000          | 0.475          | Non-Liq.             | Non-Liq.    | 0.00                |
| 10.50          | 243,77           | 2.55<br>2.52        | 1.03              | 110<br>110 | 0.577                  | 978            | 1.04         | 0.50         |              |                          | 1.57<br>1.58 |       | 1        |                |              | 2.50<br>2.55       |              | 319.4<br>312.3                 |              |                  | 0.000          | 0.474<br>0.474 | Non-Liq.<br>Non-Liq. |             | 0.00                |
|                | 237.97<br>236.70 | 2.56<br>2.58        | 1.07<br>1.09      | 110<br>110 |                        |                |              |              |              |                          | 1.60<br>1.61 |       | 1        |                |              | 2.60<br>2.65       |              | 302.5<br>298.6                 |              |                  | 0.000          | 0.474<br>0.474 | Non-Liq.<br>Non-Liq. |             | 0.00                |
| 10.99          | 231.19<br>223.52 | 3.35                | 1.45<br>2.15      | 110<br>110 | 0.604                  | 977            | 1.45         | 0.52         | 1.34         | 291,69                   | 1.71<br>1.85 |       | 1        | 100            | 1.04         | 2.70               | 1.00         | 305.6                          | 1.00         | Infin.           | 0,000          | 0.474          | Non-Liq.             | Non-Liq.    | 0.00                |
| 11.32          | 231.18           | 4.24                | 1.83              | 110        | 0,623                  | 977            | 1.84         | 0.55         | 1.34         | 291.09                   | 1.79         |       | 1        | 100            | 1.10         |                    | 1.00         |                                | 1.00         | Infin.           |                | 0.474<br>0.473 | Non-Liq.<br>Non-Liq. | Non-Liq     | 0.00<br>0.00        |
| 11.65          | 277.74<br>232.79 | 2.16                | 1.28<br>0.93      | 110<br>110 | 0.641                  | 976            | 0.93         | 0.50         |              |                          | 1.63<br>1.57 |       | 1<br>1   |                |              | 2.85<br>2.90       |              | 340.3<br>283.0                 |              | Infin<br>Infin   | 0.000          | 0 473<br>0 473 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |
|                | 242.50<br>238.61 |                     | 0.76<br>1.00      | 110<br>110 |                        |                |              | 0.50         | 1.28         | 291.73                   | 1.49<br>1.59 |       | 1<br>1   | 100            | 1.00         | 2.95<br>3.00       | 1.00         | 292.8<br>286.1                 | 1.00         | Infin.           | 0.000          | 0.473<br>0.473 | Non-Liq.<br>Non-Liq. | Non-Liq     | 0.00                |
| 12.14          | 226.91<br>230.52 | 2.22                | 0.98<br>0.93      | 110<br>110 | 0.668 0                | 975            | 0.98         | 0.50         | 1,26         | 269 19                   | 1.60         |       | 1        | 100            | 1.00         | 3.05               | 1.00         | 270.2                          | 1.00         | Infin.           | 0.000          | 0,473          | Non-Liq.             | Non-Liq.    | 0.00                |
| 12.47          | 221.89           | 1.76                | 0.79              | 110        | 0.686 0                | 974            | 0.80         | 0.50         | 1.24         | 259.71                   | 1.58<br>1.54 |       | 1        | 100            | 1.00         |                    | 1.00         | 272.7<br>260.7                 | 1.00         | Infin.           | 0.000          |                | Non-Liq.<br>Non-Liq. | Non-Liq     | 0.00                |
| 12.63<br>12.80 | 219.46<br>210.68 |                     | 0.72<br>0.67      | 110<br>110 |                        |                |              |              |              |                          | 1.51<br>1.51 |       | 1<br>1   |                |              |                    |              | 256.1<br>244.3                 |              |                  |                | 0.472<br>0.472 | Non-Liq.<br>Non-Liq. |             | 0.00<br>0.00        |

| Layer           | Tip              | Friction      | Friction     | Total        | Eff.Stres          | s              |              |              |              | _  |              | g.    | Liquef   | Rel        | _            |              |      | Clean          | _            |                    |       | Induced        | Liquefac.            |                      | Volumetric   |
|-----------------|------------------|---------------|--------------|--------------|--------------------|----------------|--------------|--------------|--------------|--|--------------|-------|----------|------------|--------------|--------------|------|----------------|--------------|--------------------|-------|----------------|----------------------|----------------------|--------------|
| Depth           | Qc               | Fs            | Ratio        |              | at Midpt,          | 8              | _            |              |              | Corrected                                  |              | veric | Suscept  |            |              | Н            |      | Sand           |              |                    | EQ    | M=7.5          | Safety               | Probab               | Strain       |
| (feet)<br>12.96 | (tsf)<br>195.33  | (tsf)<br>1.35 | 0.69         | (pcf)<br>110 | p'o (tsf)<br>0,713 | rd<br>0.973    | 0.70         | 0.50         | 1.22         | Qc1n<br>224.11                             | 1,54         | Ó     | (0 or 1) | Dr (%)     | 1.00         | (m)<br>3,30  | 1,00 | Qc1n<br>225.0  | 1,00         | CRR <sub>7.5</sub> | -     | CSR            | Factor               | PL                   | (%)          |
| 13.12           | 189.89           | 1.37          | 0.72         | 110          | 0.713              | 0.973          | 0.72         | 0.50         | 1.21         | 216 47                                     | 1,57         |       | 200      | 100        | 1.00         | 3,35         | 1.00 | 217.3          | 1,00         | Infin.             | 0.000 | 0.472<br>0.472 |                      | Non-Liq.<br>Non-Liq. | 0.00<br>0.00 |
| 13 29<br>13 45  | 182.75<br>189.66 | 2.89<br>3.51  | 1.58<br>1.85 | 110<br>110   | 0.731<br>0.740     | 0.972<br>0.972 | 1.59<br>1.86 | 0.56<br>0.57 | 1.23<br>1.23 | 211,28<br>218,84                           | 1,82<br>1,87 |       | 1        | 100<br>100 | 1.13         | 3,40         | 1,00 | 238.6          | 1,00         | Infin.             | 0.000 | 0.471          | Non-Liq.             |                      | 0.00         |
| 13.62           | 243.92           | 3.67          | 1.50         | 110          | 0.749              | 0.972          | 1.51         | 0.53         | 1.20         | 275.93                                     | 1.74         |       | 1        | 100        | 1.16<br>1.06 | 3,45         | 1,00 | 255.0<br>294.2 | 1.00         | Infin.             | 0,000 | 0.471<br>0.471 | -                    | Non-Liq.<br>Non-Liq. | 0.00<br>0.00 |
| 13.78           | 196,55           | 3.12          | 1.59         | 110          | 0.758              | 0.971          | 1.59         | 0.55         | 1.20         | 222,44                                     | 1.81         |       | 1        | 100        | 1,12         | 3.55         | 1.00 | 249.0          | 1.00         | Infin.             | 0.000 | 0.471          | Non-Liq.             | Non-Liq              | 0.00         |
| 13.94<br>14.11  | 166 33<br>168 09 | 2.01          | 1.21<br>1.22 | 110<br>110   | 0,767<br>0,776     | 0.971<br>0.971 | 1.22<br>1.22 | 0.54         | 1.19         | 186 17<br>186 97                           | 1.77         |       | 1        | 100<br>100 | 1.09         | 3.60<br>3.65 | 1.00 | 203.2          | 1.00         | Infin.             | 0.000 | 0,471<br>0,471 | Non-Liq.<br>Non-Liq. | Non-Liq<br>Non-Liq   | 0.00<br>0.00 |
| 14.27           | 186.64           | 4.05          | 2.17         | 110          | 0.785              | 0.970          | 2.18         | 0.59         | 1.19         | 209.42                                     | 1,94         |       |          | 100        | 1.22         | 3,70         | 1.00 | 257.4          | 1.00         | Infin.             | 0.000 | 0.470          | Non-Liq.             | Non-Liq.             | 0.00         |
| 14.44<br>14.60  | 201.80           | 4.71          | 2.33<br>1.57 | 110<br>110   | 0,794<br>0,803     | 0,970<br>0,970 | 2.34<br>1.57 | 0.59         | 1.18<br>1.16 | 225.11<br>306.15                           | 1.94<br>1.72 |       |          | 100<br>100 | 1.23         | 3.75         | 1.00 | 278.4<br>324.0 | 1.00         | Infin.             | 0.000 | 0.470<br>0.470 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 14.76           | 344.71           | 3.37          | 0.98         | 110          | 0.812              | 0,969          | 0.98         | 0.50         | 1.14         | 371.03                                     | 1.51         |       |          | 100        | 1,00         | 3.85         | 1.00 | 372.4          | 1.00         | Infin.             | 0.000 | 0.470          | Non-Liq.             | Non-Liq.             | 0.00         |
| 14.93<br>15.09  | 284.50<br>313,45 | 2.91<br>2.95  | 1.02<br>0.94 | 110<br>110   | 0.821<br>0.830     | 0 969<br>0 969 | 1.03<br>0.94 | 0.50<br>0.50 | 1.14         | 304 <sub>.</sub> 37<br>333 <sub>.</sub> 60 | 1,58<br>1,52 |       |          | 100<br>100 | 1.00         | 3,90         | 1.00 | 305.5<br>334.8 | 1,00         | Infin.             | 0.000 | 0.470<br>0.470 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 15.26           | 330,55           | 3.27          | 0.99         | 110          | 0.839              | 0.968          | 0.99         | 0.50         | 1.12         | 349.94                                     | 1.53         |       | <b>1</b> | 100        | 1.00         | 4.00         | 1.00 | 351_2          | 1.00         | Infin.             | 0.000 | 0.469          | Non-Liq.             | Non-Liq.             | 0.00         |
| 15.42<br>15.58  | 347,21<br>369,08 | 3.40<br>4.35  | 0.98         | 110<br>110   | 0.848<br>0.857     | 0.968<br>0.967 | 0.98<br>1.18 | 0.50<br>0.50 | 1.12         | 365,65<br>386,68                           | 1.51<br>1.56 |       |          | 100<br>100 | 1.00         | 4.05<br>4.10 | 1.00 | 367.0<br>388.1 | 1,00         | Infin.             | 0.000 | 0.469<br>0.469 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 15.75           | 398,50           | 4.30          | 1.08         | 110          | 0.866              | 0.967          | 1.08         | 0.50         | 1.11         | 415,38                                     | 1,52         |       | 1        | 100        | 1.00         | 4.15         | 1.00 | 416.9          | 1.00         | Infin.             | 0.000 | 0.469          | Non-Liq.             | Non-Liq.             | 0.00         |
| 15.91<br>16.08  | 418.82<br>410.39 | 3.93<br>4.19  | 0.94<br>1.02 | 110<br>110   | 0,875<br>0,884     | 0.967<br>0.966 | 0.94<br>1.02 | 0.50<br>0.50 | 1.10         | 434,34<br>423,39                           | 1.46<br>1.49 |       |          | 100<br>100 | 1.00         | 4.20         | 1.00 | 436.0<br>425.0 | 1.00         | Infin.             | 0,000 | 0.469<br>0.468 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 16,24           | 419.61           | 4.80          | 1.14         | 110          | 0,893              | 0,966          | 1.15         | 0.50         | 1.09         | 430,73                                     | 1,53         |       | 1        | 100        | 1.00         | 4,30         | 1.00 | 432.3          | 1.00         | Infin.             | 0,000 | 0.468          | Non-Liq.             | Non-Liq              | 0.00         |
| 16,40<br>16,57  | 443.67<br>437.41 | 4.84<br>4.97  | 1.09         | 110<br>110   | 0.902<br>0.911     | 0,966          | 1.09<br>1.14 | 0.50<br>0.50 | 1.08<br>1.08 | 453,18<br>444,55                           | 1,50<br>1,52 |       |          | 100<br>100 | 1.00         | 4.35<br>4.40 | 1.00 |                | 1.00         | Infin.             | 0.000 | 0.468<br>0.468 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 16.73           | 435,84           | 4.65          | 1.07         | 110          | 0,920              | 0,965          | 1.07         | 0.50         | 1.07         | 440.77                                     | 1.50         |       |          | 100        | 1.00         |              | 1,00 | 442.4          | 1.00         | Infin              | 0,000 | 0.468          | Non-Liq.             |                      | 0.00         |
| 16 90<br>17 06  | 448.38<br>457.41 | 4.22<br>3.79  | 0.94         | 110<br>110   | 0,929              | 0,965<br>0,964 | 0.94<br>0.83 | 0.50<br>0.50 | 1.07<br>1.06 | 451,26<br>458,14                           | 1.45         |       |          | 100<br>100 | 1.00         | 4.50<br>4.55 | 1,00 | 452.9<br>459.8 | 1.00         | Infin              | 0.000 | 0.468<br>0.467 | Non-Liq.             |                      | 0.00         |
| 17.22           | 450.04           | 4.42          | 0.98         | 110          | 0.947              | 0,964          | 0.99         | 0.50         | 1.06         | 448,58                                     | 1,46         |       | 1        | 100        | 1.00         | 4.60         | 1,00 | 450.3          | 1.00         | Infin.             | 0.000 | 0.467          | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 17.39<br>17.55  | 437,15<br>447,32 | 4.09          | 0.94         | 110<br>110   | 0.956<br>0.965     | 0.963          | 0.94<br>0.94 | 0.50         | 1.05<br>1.05 | 433,64<br>441,66                           | 1.45<br>1.45 |       | 5.7      | 100<br>100 | 1,00         | 4.65<br>4.70 | 1,00 | 435,3<br>443.3 | 1.00         | Infin.             | 0.000 | 0.467<br>0.467 | Non-Liq.             |                      | 0.00         |
| 17.72           | 476.04           | 4.81          | 1.01         | 110          | 0.974              | 0.963          | 1.01         | 0.50         | 1.04         | 467.89                                     | 1.46         |       |          | 100        | 1.00         |              | 1,00 | 469.6          | 1.00         | Infin.             | 0.000 | 0.467          | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 17.88<br>18.04  | 526.73<br>498.22 | 4.25<br>4.85  | 0.81         | 110<br>110   | 0.983              | 0.962<br>0.962 | 0.81<br>0.98 | 0.50<br>0.50 | 1.04<br>1.03 | 515,42<br>485,24                           | 1,36<br>1,44 |       |          | 100<br>100 | 1,00         | 4.80<br>4.85 | 1,00 | 517.3<br>487.1 | 1.00         | Infin.             | 0.000 | 0.467<br>0.466 | Non-Liq.             | Non-Liq.             | 0.00         |
| 18.21           | 506.10           | 5.27          | 1.04         | 110          | 1.001              | 0 962          | 1.04         | 0.50         | 1.03         | 490.70                                     | 1.46         |       |          | 100        | 1.00         | 4.90         | 1.00 | 492.5          | 1.00         | Infin,             | 0.000 | 0 466          | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 18.37           | 512.17<br>559.50 | 6.70<br>8.56  | 1.31<br>1.53 | 110<br>110   | 1.010<br>1.020     | 0.961<br>0.961 | 1.31<br>1.53 | 0.50         | 1.02         |  | 1,55<br>1,59 |       |          | 100<br>100 | 1.00         |              | 1.00 | 496.2          | 1.00         | Infin.             | 0.000 | 0.466          | Non-Liq.             |                      | 0.00         |
| 18.70           | 562.50           | 8.26          | 1.47         | 110          | 1,029              | 0.960          | 1.47         | 0.50         | 1.01         |  | 1.57         |       |          |            | 1.00         | 5 00<br>5 05 | 1.00 | 539.7<br>540.2 | 1.00         | Infin.<br>Infin.   | 0,000 | 0.466<br>0.466 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 18.86<br>19.03  | 559.79<br>547.34 | 8.82<br>8.23  | 1.58<br>1.50 | 110<br>110   | 1.038<br>1.047     | 0,960          | 1.58<br>1.51 | 0.50         | 1.01         |  | 1.60         |       |          |            | 1.00         | 5.10         | 1.00 | 535.3          | 1.00         | Infin.             | 0.000 | 0.465          | Non-Liq.             | Non-Liq.             | 0.00         |
| 19.19           | 552 34           | 7.74          | 1.40         | 110          | 1.056              | 0,959          | 1.40         | 0.50<br>0.50 | 1.01         |  | 1.59<br>1.56 |       |          |            | 1.00         | 5.15<br>5.20 | 1.00 |                | 1.00         | Infin.             | 0.000 | 0.465<br>0.465 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 19.36<br>19.52  | 492 99<br>443 38 | 7.25<br>5.21  | 1.47<br>1.18 | 110          | 1,065              | 0.959          | 1.47         | 0.50         | 1.00         |  | 1.60         |       |          |            | 1,00         | 5.25         | 1.00 | 465.2          | 1.00         | Infin              | 0,000 | 0.465          | Non-Liq.             | Non-Liq.             | 0.00         |
| 19.52           | 430.83           | 4.17          | 0.97         | 110<br>110   | 1,074<br>1,083     | 0.958<br>0.958 | 1.18<br>0.97 | 0.50<br>0.50 | 0.99         |  | 1.55<br>1.49 |       |          |            | 1,00         | 5.30<br>5.35 | 1.00 | 416.6<br>403.0 | 0.99         | Infin.             | 0.000 | 0.465<br>0.464 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 19 85<br>20 01  | 411.08<br>393.49 | 3.30<br>2.98  | 0.80         | 110          | 1.092              | 0.957          | 0.80         | 0.50         | 0.98         |  | 1.43         |       |          |            | 1.00         |              |      |                | 0.99         | Infin.             | 0,000 | 0.464          | Non-Liq.             | Non-Liq.:            | 0.00         |
| 20.18           | 395.26           | 2.83          | 0.72         | 110<br>110   | 1.101<br>1.107     | 0.957<br>0.957 | 0.76<br>0.72 | 0.50<br>0.50 | 0.98<br>0.98 |  | 1.43         |       |          |            |              | 5.45<br>5.50 | 1,00 | 365.0<br>365.6 | 0.98<br>0.98 | Infin.             | 0.000 | 0.464<br>0.465 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 20.34 20.51     | 374.51           | 2.35<br>2.65  | 0.63         | 110          | 1.111              | 0.956          | 0.63         | 0.50         | 0.98         |  | 1.38         |       |          |            |              |              |      |                | 0.98         | Infin.             | 0.000 | 0.467          | Non-Liq.             | Non-Liq.             | 0.00         |
| 20,51           | 326,62<br>282.57 | 2.55          | 0.90         | 110<br>110   | 1.115<br>1.118     | 0.956<br>0.955 | 0.81<br>0.91 | 0.50<br>0.50 | 0.97<br>0.97 |  | 1.51<br>1.58 |       |          |            |              | 5.60<br>5.65 |      |                | 0.98         | Infin<br>Infin     | 0.000 | 0.469<br>0.471 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 20.83           | 276.78           | 3.44          | 1.24         | 110          | 1.122              | 0.955          | 1.25         | 0.52         | 0.97         |  | 1.69         |       |          |            |              |              | 1.00 | 262,3          | 0.98         | Infin.             | 0.000 | 0.473          | Non-Liq.             | Non-Liq              | 0.00         |
| 21.00<br>21.16  | 278.21<br>340.07 | 2.80<br>3.01  | 1.01<br>0.88 | 110<br>110   | 1.126<br>1.130     | 0.954<br>0.954 | 1.01<br>0.89 | 0.50<br>0.50 | 0.97<br>0.97 |  | 1.62<br>1.52 |       |          |            |              |              |      |                | 0.98<br>0.97 | Infin.             | 0.000 | 0.474<br>0.476 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 21.33           | 368.76           | 2.98          | 0.81         | 110          | 1.134              | 0.954          | 0.81         | 0.50         | 0.97         |  | 1.47         |       | 1        | 100        | 1.00         | 5.85         | 1.00 | 336,9          | 0.97         | Infin.             | 0,000 | 0.478          | Non-Liq.             | Non-Liq.             | 0.00         |
| 21,49           | 341.22<br>390.12 | 3.31          | 0.97         | 110<br>110   | 1.138              | 0.953          | 0.97<br>0.97 | 0.50<br>0.50 | 0.96<br>0.96 |  | 1.55<br>1.52 |       |          |            |              |              |      |                | 0.97<br>0.97 | Infin.<br>Infin.   | 0.000 | 0.480<br>0.482 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
|                 | 410.04<br>384.92 | 3.82          | 0.93         | 110          |                    |                | 0.93         |              | 0.96         | 371.37                                     | 1.49         |       | 1        | 100        | 1.00         | 6.00         | 1.00 | 372.8          | 0.97         | Infin.             | 0.000 | 0.483          | Non-Liq.             | Non-Liq_             | 0.00         |
| - 1000          | 353.56           | 3.63<br>2.69  | 0.94         | 110<br>110   |                    |                | 0.95<br>0.76 | 0.50<br>0.50 | 0.96<br>0.96 |  | 1.51<br>1.47 |       |          |            |              | 6.05<br>6.10 |      | 349.3<br>320.2 | 0.97         | Infin.<br>Infin.   | 0.000 | 0.485<br>0.487 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 22.31           | 330.47           | 2.03          | 0.62         | 110          | 1.158              | 0.951          | 0.62         | 0.50         | 0.96         | 297.58                                     | 1.42         |       | 1        | 100        | 1.00         | 6.15         | 1.00 | 298.7          | 0.96         | Infin;             | 0.000 | 0.489          | Non-Liq.             | Non-Liq.             | 0.00         |
| 22 47<br>22 64  | 302,85<br>277.81 | 2.02          | 0.67         | 110<br>110   |                    |                | 0.67<br>1.01 | 0.50<br>0.50 | 0.95<br>0.95 |  | 1.47<br>1.63 |       |          |            |              |              |      | 273.2<br>250.1 |              | Infin.<br>Infin.   | 0.000 | 0.490<br>0.492 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 22.80           | 261.06           | 4.42          | 1.69         | 110          |                    | 0.949          | 1.70         | 0.55         | 0.95         | 232.39                                     | 1.82         |       | 1        | 100        | 1,12         | 6.30         | 1.00 | 262.1          | 0.96         | Infin.             | 0.000 | 0_494          | Non-Liq.             | Non-Liq              | 0.00         |
| 22.97           | 275.05<br>338.08 | 5.35<br>5.26  | 1.94<br>1.55 | 110<br>110   |                    |                | 1.95<br>1.56 | 0.57<br>0.53 | 0.94<br>0.95 |  | 1.86<br>1.73 |       |          |            |              | 6.35<br>6.40 |      | 282.3<br>319.0 |              | Infin.<br>Infin.   | 0.000 | 0.495<br>0.497 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
|                 | 290.23           | 4.56          | 1.57         | 110          |                    |                | 1.58         |              | 0.94         | 257.48                                     | 1.77         |       | 1        | 100        | 1.09         | 6.45         | 1.00 | 280.5          | 0.96         | Infin.             | 0.000 | 0.498          | Non-Liq.             | Non-Liq              | 0.00         |
|                 | 297.08<br>303.30 | 3.04<br>2.81  | 1.02<br>0.92 | 110<br>110   |                    |                | 1.03<br>0.93 |              | 0.94         |  | 1.62<br>1.58 |       |          |            |              | 6.50<br>6.55 |      | 265.3<br>270.4 |              | infin.<br>Infin.   | 0.000 | 0.500<br>0.502 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
|                 | 309.47           | 2.71          | 0.87         | 110          | 1.193              | 0.946          | 0.88         | 0.50         | 0.94         | 274.43                                     | 1.55         |       | 1        | 100        | 1.00         | 6.60         | 1.00 | 275.5          | 0.95         | Infin              | 0.000 | 0.503          | Non-Liq.             | Non-Liq.             | 0.00         |
|                 | 314.79<br>323.75 | 2.69          | 0.86         | 110<br>110   |                    |                | 0.86<br>0.80 | 0.50<br>0.50 | 0.94<br>0.94 |  | 1.54<br>1.51 |       |          |            |              |              |      | 279.8<br>287.3 | 0.95         | Infin<br>Infin     | 0.000 | 0.505<br>0.506 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
|                 | 334.53           | 2.78          | 0.83         | 110          | 1.204              | 0.945          | 0.83         | 0.50         | 0.94         | 295.29                                     | 1.52         |       | 1 .      | 100        | 1.00         | 6.75         | 1.00 | 296.4          | 0.95         | Infin.             | 0.000 | 0.508          | Non-Liq.             | Non-Liq.             | 0.00         |
|                 | 341.22<br>345.28 | 2.78<br>2.16  | 0.82         | 110<br>110   |                    |                | 0.82<br>0.63 | 0.50<br>0.50 |              |  | 1.51<br>1.42 |       |          |            |              |              |      | 301.8<br>305.0 | 0.95         | Infin.<br>Infin.   | 0.000 | 0.509<br>0.511 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 24.77           | 354.45           | 2.39          | 0.67         | 110          | 1.216              | 0.943          | 0.68         | 0.50         | 0.93         | 311.41                                     | 1.43         |       | 1 1      | 100        | 1.00         | 6.90         | 1.00 | 312.6          | 0.95         | Infin.             | 0.000 | 0.512          | Non-Liq.             | Non-Liq.             | 0.00         |
|                 | 357.66<br>363.46 | 2.44          | 0.68         | 110<br>110   |                    |                | 0.68<br>0.66 |              |              |  | 1.44<br>1.42 |       |          |            |              | 6.95<br>7.00 |      | 314.9<br>319.5 |              | Infin.<br>Infin.   | 0.000 | 0.514<br>0.515 | Non-Liq.<br>Non-Liq. |                      | 0.00         |
| 25.26           | 370.76           | 2.17          | 0.59         | 110          | 1.228              | 0.941          | 0.59         | 0.50         | 0.93         | 324.22                                     | 1.38         |       | 1 1      | 100        | 1.00         | 7.05         | 1.00 | 325.4          | 0.94         | Infin.             | 0.000 | 0.516          | Non-Liq.             |                      | 0.00         |
| 25.43<br>25.59  | 377.75<br>391.33 | 2.41          | 0.64         | 110<br>110   |                    |                | 0.64<br>0.63 |              |              |  | 1.40<br>1.38 |       |          |            |              | 7.10<br>7.15 |      | 331.1<br>342.5 | 0.94         | Infin.<br>Infin.   | 0.000 | 0.518<br>0.519 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 25.75           | 392.15           | 2.61          | 0.66         | 110          | 1,240              | 0.939          | 0.67         | 0.50         | 0.92         | 341.36                                     | 1.40         |       | 1 1      | 100        | 1.00         | 7.20         | 1.00 | 342.6          | 0.94         | Infin.             | 0.000 | 0.520          | Non-Liq.             | Non-Liq              | 0.00         |
| 25.92<br>26.08  | 382.77<br>373.25 | 2.62<br>2.66  | 0.68         | 110<br>110   |                    |                | 0.69<br>0.71 |              |              |  | 1.42<br>1.44 |       |          |            |              |              |      | 333.9<br>325.0 |              | Infin.             | 0.000 | 0.522<br>0.523 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 26.25           | 363.79           | 2.44          | 0.67         | 110          | 1.251              | 0.938          | 0.67         | 0.50         | 0.92         | 315.10                                     | 1.43         |       | 1 1      | 100        | 1.00         | 7.35         | 1.00 | 316.3          | 0.94         | Infin.             | 0.000 | 0.524          | Non-Liq.             |                      | 0.00         |
|                 | 362.15<br>366.11 | 2.32          | 0.64         | 110<br>110   |                    |                |              |              |              |  | 1.42<br>1.44 |       |          |            |              |              |      | 314.3<br>317.3 |              | Infin.             | 0.000 | 0.526<br>0.527 | Non-Liq.             |                      | 0.00         |
| 26.74           | 372.93           | 2.51          | 0.67         | 110          | 1.263              | 0.936          | 0.68         | 0.50         | 0.92         | 321.53                                     | 1.42         |       | 1 1      | 100        | 1.00         | 7,50         | 1.00 | 322.7          | 0,93         | Infin.             | 0.000 | 0.528          | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 26.90<br>27.07  |                  | 3.06<br>3.14  | 0.80         | 110<br>110   |                    |                |              |              |              |  | 1.47<br>1.44 |       |          |            |              | 7.55<br>7.60 |      | 331.1<br>356.7 |              | Infin.             | 0.000 | 0.529<br>0.531 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 27.23           | 409.32           | 4.09          | 1.00         | 110          | 1.275              | 0.934          | 1.00         | 0.50         | 0.91         | 351.37                                     | 1.53         |       | 1 1      | 100        | 1.00         | 7.65         | 1.00 | 352.7          | 0.93         | Infin.             | 0.000 | 0.532          | Non-Liq.             | Non-Liq.             | 0.00         |
|                 | 399.12<br>379.94 | 4.88<br>3.65  | 1.22<br>0.96 |              |                    |                |              |              |              |  | 1.61<br>1.54 |       |          |            |              |              |      | 343.3<br>326.3 |              | Infin.             | 0.000 | 0.533          | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00 |
| 27.72           | 353.99           | 3.89          | 1.10         | 110          | 1.286              | 0.932          | 1.10         | 0.50         | 0.91         | 302.33                                     | 1.60         |       | 1 1      | 100        | 1.00         | 7.80         | 1.00 | 303.5          | 0.92         | Infin.             | 0.000 | 0.535          | Non-Liq.             | Non-Liq.             | 0.00         |
| 27.89           | 386.19           | 3.37          | 0.87         | 110          | 1.290              | 0.931          | 0.88         | 0.50         | 0.91         | 329.43                                     | 1.50         |       | 1 1      | 00 -       | 1.00         | 7.85         | 1.00 | 330.7          | 0.92         | Infin              | 0.000 | 0.536          | Non-Liq.             | Non-Liq.             | 0.00         |

| Part   Mart      | T        | ayer    | Tip    | Friction    | n Friction | Total      | Eff.Stres        | s     |       | _    |      |        |      | 0    | Liquef | Rel. | -     |       | _    | Clean |      | _      |       | Induced | Liquefac. |          | Volumetric |
|--|----------|---------|--------|-------------|------------|------------|------------------|-------|-------|------|------|--------|------|------|--------|------|-------|-------|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Section   Part   |          | -100000 |        |             |            |            |                  |       |       |      |      |        | d    | - 32 |        |      |       | Н     |      |       |      |        | EQ    |         |           | Probab.  |            |
| 120    | - Inches | -       |        | - House him |            | 111 201000 | - three-leaveste |       | -     |      |      |        |      | Ó    |        |      | _     |       |      |       |      |        |       |         |           |          |            |
| 1.00      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| Section   Personal Property   Personal Prope   | 28       | 3,38    | 454,65 | 5.10        | 1.12       | 110        | 1.302            | 0.929 | 1.13  | 0.50 | 0.90 | 386.27 | 1.55 |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| Section   Sect   | 1.00     |         |        |             |            |            |                  |       |       |      |      |        |      |      | !      |      |       |       |      |       |      |        |       |         |           |          |            |
| 250   160    |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | i      |      |       |       |      |       |      |        |       |         |           |          |            |
| Section   1960   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       | 8.20  | 1,00 | 383,3 | 0.92 | Infin. | 0.000 | 0,544   | Non-Liq.  | Non-Liq  | 0.00       |
| Section   Property     |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 2006   1975   1976      |          |         | 414.05 |             |            |            |                  |       |       |      |      |        |      |      | i      |      |       |       |      |       |      |        |       |         |           |          |            |
| 2006   2007   2008   100   1   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 2019      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 1905   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      | 1,00  | 8.55  | 1.00 | 335.8 | 0.91 | Infin. | 0.000 | 0.551   | Non-Liq.  | Non-Liq. |            |
| 2009   2019      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 1.00   0.00      |          |         | 386,15 | 2.45        |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 11.10   12.1   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | - 20   |      |       |       |      |       |      |        |       |         |           |          |            |
| 1.15   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | - 3    |      |       |       |      |       |      |        |       |         |           |          |            |
| 14.0   26.0      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 150    | 100  | 1.00  | 8.85  | 1.00 | 396.9 | 0.90 | Infin. | 0.000 | 0.556   | Non-Liq.  | Non-Liq. | 0.00       |
| 1.5    | 1110000  |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         | -         |          |            |
| 23.22   26.00   200   7.00     |          |         | 556,04 |             | 0.75       |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 18.22   46.09   45.00   47.0   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 22-24   26-2   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      | 1,000 |       |      |       |      |        |       |         | -         |          |            |
| 22.57   480-35   4.53   1.00   110   1.477   0.60   1.01   1.077   0.60   1.01   1.077   0.60   1.01   1.077   0.60   1.01   1.077   0.00   0.67   3.076   1.01   1.00   0.00   0.75   0.67   0.00     |          |         |        |             |            |            |                  |       |       |      |      | 402.25 | 1.45 |      |        | 100  | 1.00  | 8.85  | 1.00 | 403.8 | 0.89 | Infin. |       |         |           |          |            |
| Section   Sect   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 13314   463-98   308   0.09   110   1.415   0.090   0.70   0.50   0.85   301-98   1.00   0.10   0.50   0.85   0.00   0.00   0.05   0.   | 32       | 97      | 486.15 | 4.33        | 0.89       | 110        | 1,411            | 0.904 | 0.89  | 0.50 | 0.87 | 396 69 | 1.46 |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 33.49   40.56   3.02   247   310   1.42   3.02   3.01   3.07   3.05   3.05   3.03   3.03   3.05   3. |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 0.0    |      |       |       |      |       |      | Infin  | 0.000 | 0.564   | Non-Liq.  | Non-Liq. | 0.00       |
| 33.79 32.06 147 0.46 1 |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 7.0    |      |       |       |      |       |      |        |       |         |           |          |            |
| 275.23 1 64 080 170 1439 089 070 070 070 070 070 070 070 070 070 07  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 70     |      |       | 8.85  | 1,00 | 330.4 | 0.89 | Infin  | 0.000 | 0.566   | Non-Liq.  | Non-Liq. | 0.00       |
| 24.22   27.61   2.72   1.79   110  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 1846   68.05   30.0   30.0   30.0   10   1.46   0.985   3.89   0.75   0.79   50.4   2.55   1.49   2.89   1.00   145.0   50.91   10   0.00   0.589   0.00   1.48   0.00   34.78   34.78   34.78   34.14   2.39   5.33   110   1.450   0.985   3.70   0.75   0.79   50.45   2.55   1.49   2.89   1.00   145.0   0.94   0.98   0.36   0.89   0.81   34.84   0.88   34.70   0.00   34.78   34.84   0.88   34.70   0.80   34.78   34.84   0.88   34.70   0.88   34.70   0.80   0.81   34.78   34.84   0.88   34.70   0.8   |          |         | 227.81 | 2.72        | 1.19       |            |                  |       |       |      |      |        |      |      | 20     |      |       |       |      |       |      |        |       |         |           |          |            |
| 3448   34.76   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       | 8.85  |      |       |      |        |       |         |           |          |            |
| 34.74   3.95   2.79   8.99   101   1.480   8.89   5.73   0.85   0.78   30.06   2.81   0.9   0.   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| SATION   14.47   3.52   8.49   110   1.462   0.890   8.80   0.90   0.77   6.24   2.54   2.55   0.90   0.94   0.970   0.94   0.970   0.970   0.971   0.00   0.94   0.970   0.970   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.973   0.971   0.00   0.972   0.97   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       | 0.94 |        |       | 0.569   | Non-Liq.  | Non-Liq. | 0.00       |
| 18547   1865   238   268   239   268   273   270   276   284   275   2   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 1.4   1.5    | 35       | 27      | 65,17  | 3.19        | 4.90       | 110        | 1.466            | 0.889 | 5.01  | 0.80 | 0.77 | 46,41  | 2 63 |      | 0      |      |       |       |      |       | 0,94 |        |       |         |           |          |            |
| 1876      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        | 59   | 2.09  |       | 1.00 | 136.3 |      | 0.315  | 0,286 |         |           |          |            |
| 1869   1876      | 35       | 76      | 29.66  | 1.82        | 6.14       |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 36.52   241.23   179   0.74   110   1.489   0.882   0.75   0.50   0.84   190.88   1.62   1   100   1.00   0.40   1.31   278.9   0.87   Infin   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        | 00   | 4.40  | 0.40  | 4.04 | 000.0 |      | 1.5    | 0.000 |         |           |          |            |
| 38.42   267.52   1.54   0.57   1.16   0.87   1.16   0.88   0.58   0.50   0.84   211.65   1.51   1   100   1.00   0.00   0.13   318.6   0.07   0.00   0.573   Non-Liq, Non-Liq, 0.00   0.573   0.00   0.573   Non-Liq, Non-Liq, 0.00   0.573   0.00   0.573   0.00   0.574   0.00   0.573   0.00   0.574   0.00   0.573   0.00   0.573   0.00   0   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 83F5   2768   0.86   0.86   0.87      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      | 276.9 | 0.87 | Infin. | 0.000 | 0.573   | Non-Liq.  | Non-Liq. | 0.00       |
| 289.68   0.86   0.33   10   1.595   0.87   0.33   0.50   0.84   204.60   1.38   1   1.00   1.00   0.40   1.31   26.77   0.87   1.01   0.00   0.574   Non-Liq. Non-L   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 137.40   138.61   0.99   0.72   110   1.513   0.875   0.73   0.55   0.82   10.486   1.81   1   79   1.11   0.41   13   152.8   0.87   0.412   0.357   0.574   0.82   83%   0.71  | 36       | 91      | 259.68 | 0.86        | 0.33       |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 37.67   43.21   1.31   1.58   110   1.517   0.873   1.61   0.67   0.79   60.64   2.21   1   56   1.69   1.00   10.25   0.80   0.180   0.152   0.574   0.28   99%   1.46   0.86   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.25   0.78   0.757   0.757   0.75   0.757    |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 1      |      |       | 70.1- |      |       |      |        |       |         |           |          |            |
| 37.73   27.8   1.18   3.4   3.4   110   1.521   0.872   2.56   0.78   0.75   30.55   2.57   1   2.8   3.13   1.00   95.7   0.93   0.162   0.150   0.575   0.00-Liq.   Non-Liq.   0.00   37.89   28.70   1.31   4.57   1.10   1.525   0.871   4.60   0.88   0.72   1.575   2.91   0   0.93   0.93   0.93   0.93   0.93   0.95   0.575   Non-Liq.   Non-Liq.   0.00   0.93   0.957   0.93   0.957   0.93   0.957   0.93   0.957   0.95   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 0.00   |      |       |       |      |       |      |        |       |         |           |          |            |
| 37.89   28.70   1.31   4.57   1.10   1.522   0.889   4.83   0.88   0.72   18.57   2.91   0.93   0.575   0.31   1.91   0.522   0.889   3.86   0.83   0.74   26.46   2.73   0.93   0.575   0.31   9.95   0.83   0.857   0.74   0.74   0.546   0.74   0.865   0.89   0.74   0.74   0.546   0.74   0.865   0.89   0.74   0.74   0.865   0.89   0.74   0.74   0.865   0.89   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.88   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        | 28   | 3.13  |       | 1.00 | 95.7  |      | 0.162  | 0.150 |         | 0.26      | 99%      | 1.56       |
| 38.06   39.57   1.47   371   110   1.532   0.868   3.66   0.83   0.74   26.46   2.73   0.00   38.22   75.21   1.54   2.05   1.10   1.520   0.865   0.89   0.54   0.82   133.49   1.78   1.89   1.09   0.35   1.38   198.1   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   38.55   220.50   1.33   0.60   110   1.544   0.864   0.61   0.50   0.83   171.31   1.59   1.99   1.00   1.00   1.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   1.38   1.28   1.20   1.00   0.05   0.575   Non-Liq.   Non-Liq.   0.00   0.575   Non-L   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 38.55   25.50   1.33   0.60   110   1.540   0.865   0.89   0.54   0.82   133.49   1.78   1   88   1.09   0.35   1.36   1.981   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.71   247.95   1.28   0.52   110   1.548   0.863   0.52   0.50   0.83   171.31   1.59   1   99   1.00   0.45   1.38   281.1   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   38.89   252.98   1.31   0.52   110   1.555   0.860   0.50   0.82   178.81   1.58   1.00   1.00   0.55   1.36   0.86   Infin.   0.000   0.575   Non-Liq.   Non-Liq.   0.00   0.932   1.4579   1.25   0.86   1.10   1.556   0.865   0.87   0.85   0.85   0.87   0.85     |          |         | 39,57  | 1.47        | 3.71       | 110        | 1.532            | 0.868 | 3.86  | 0.83 | 0.74 | 26.46  | 2.73 |      | 0      |      |       |       |      |       | 0,93 |        |       | 0.575   | Non-Liq.  | Non-Liq. | 0.00       |
| 38.55   22.50   1.33   0.60   110   1.544   0.864   0.85   0.87   0.83   17.31   1.59   1   99   1.00   0.45   1.38   232.3   0.86   Infin.   0.00   0.575   Non-Liq.   Non-Liq.   0.00   3.87   Non-Liq.   0.00   3.87   Non-Liq.   Non-Liq.   0.00   3.87   Non-Liq.   Non-Liq.   0.00   3.87   Non-Liq.   0.00   0.87      |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 38.8 25.96 1.31 0.52 110 1.552 0.861 0.52 0.50 0.83 196.21 1.50 1 100 1.00 0.50 1.36 266.1 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 39.21 145.79 1.25 0.86 110 1.556 0.860 0.60 0.50 0.82 178.81 1.58 1 1.50 1 181 1.14 0.60 1.36 169.1 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 39.37 85.88 1.67 1.94 110 1.564 0.857 1.98 0.69 0.76 60.91 2.27 1 56 1.85 1.00 112.5 0.89 0.212 0.189 0.576 0.33 99% 1.33 39.53 62.58 1.46 2.33 110 1.564 0.857 1.98 0.69 0.74 0.75 8.43 1.4 2.43 1 42.246 1.00 10.60 0.92 0.191 0.176 0.576 0.31 99% 1.32 39.86 1.50 0.90 0.74 0.75 8.58 3.27 0.94 1.74 1.21 2.90 110 1.557 0.853 6.86 0.99 0.67 8.58 3.27 0.04 1.89 1.89 1.89 1.89 1.89 1.89 0.89 0.77 0.853 0.86 0.99 0.67 8.58 3.27 0.04 1.89 1.89 1.89 1.89 1.89 1.89 1.89 1.89  | 38       | 55      | 220.50 | 1.33        | 0.60       | 110        | 1,544            | 0.864 | 0.61  | 0.50 | 0.83 | 171,31 | 1.59 |      | 1      |      |       |       |      |       |      |        |       |         |           |          |            |
| 39.04 230.96 1.38 0.60 110 1.556 0.860 0.60 0.50 0.82 178.81 1.58 1 100 1.00 0.55 1.36 242.5 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 39.37 85.88 1.67 1.94 110 1.567 0.865 0.87 1.98 0.89 0.76 60.91 2.27 1 56 1.85 1.00 112.5 0.89 0.21 0.189 0.576 0.33 98% 1.33 39.53 62.58 1.46 2.33 110 1.567 0.856 2.39 0.74 0.75 43.14 2.43 1.29 0.10 1.567 0.856 2.39 0.74 0.75 43.14 2.43 1.29 0.10 1.567 0.856 2.39 0.74 0.75 43.14 2.43 1.29 0.10 1.567 0.856 2.39 0.74 0.75 43.14 2.43 1.29 0.10 1.575 0.853 6.86 0.99 0.67 8.58 3.27 0.40 0.92 0.92 0.575 Non-Liq. Non-Liq. Non-Liq. Non-Liq. 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 39.21 145.79 1.25 0.86 1.67 1.94 110 1.564 0.857 1.98 0.69 0.76 0.857 1.98 0.69 0.76 0.857 1.98 0.69 0.76 0.857 1.98 0.69 0.76 0.857 1.98 0.857 1.98 0.85 1.98 0.857 1.98 0.857 1.98 0.85 0.74 0.75 43.14 2.43 1 42 2.46 1.00 106.0 0.92 0.92 0.91 0.76 0.576 0.33 98% 1.33 98% 1.42 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0  | 39.      | 04      | 230.96 | 1.38        | 0.60       |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 39.53 62.58 1.46 2.33 110 1.567 0.856 2.39 0.74 0.75 43.14 2.43 1 42 2.46 1.00 108.0 0.92 0.91 0.176 0.576 0.31 98% 1.42 39.70 41.74 1.21 2.90 110 1.571 0.854 3.01 0.80 0.73 27.65 2.65 0 0.92 0.92 0.575 Non-Liq. Non-Liq |          |         |        |             |            |            |                  |       |       |      | 0.80 | 109.70 |      |      |        | 81   | 1.14  | 0.60  | 1.36 | 169,1 | 0.86 | Infin. | 0.000 | 0,575   | Non-Liq.  | Non-Liq. | 0.00       |
| 39.70  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 40.03  | 39.      | 70      | 41.74  | 1.21        | 2.90       | 110        | 1.571            | 0.854 | 3.01  | 0.80 | 0.73 | 27.65  | 2,65 |      | 0      |      | S 15  |       | 1531 |       | 0.92 |        |       | 0.576   | Non-Liq.  | Non-Liq  | 0.00       |
| 40.19  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           | •        |            |
| 40.55  | 40.      | 19      | 18.75  | 1.87        | 9.99       | 110        | 1.583            | 0.850 | 10.91 | 1.00 | 0.67 | 10.84  | 3.32 |      | 0      |      |       |       |      |       |      |        |       |         |           |          |            |
| 40.68 313.15 2.26 0.72 110 1.595 0.846 0.73 0.50 0.81 239.85 1.54 1 100 1.00 1.00 1.00 240.7 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.01 354.79 3.52 0.99 110 1.603 0.843 1.00 0.50 0.81 285.35 1.62 1 100 1.00 1.00 1.00 1.00 262.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.03 384.45 4.56 1.19 110 1.610 0.840 1.06 0.50 0.81 295.23 1.60 1 100 1.00 1.00 1.00 296.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.67 388.83 3.67 0.94 110 1.618 0.837 0.95 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 1.00 296.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.67 388.83 3.67 0.94 110 1.622 0.835 0.95 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 296.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. Non-Liq. 41.83 401.57 3.65 0.91 110 1.622 0.835 0.91 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 294.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.99 345.90 3.80 1.10 110 1.622 0.835 0.91 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.18 326.26 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.18 326.26 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.18 338 0.93 110 1.638 0.829 0.93 0.50 0.80 257.43 1.57 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 40.85 341.76 2.88 0.84 110 1.599 0.844 0.85 0.50 0.81 281.55 1.56 1 100 1.00 1.00 1.00 262.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.01 354.79 3.52 0.99 110 1.603 0.843 1.00 0.50 0.81 281.55 1.62 1 100 1.00 1.00 1.00 282.5 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.17 373.62 4.05 1.09 110 1.607 0.841 1.09 0.50 0.81 285.35 1.62 1 100 1.00 1.00 1.00 286.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.34 386.97 4.10 1.06 110 1.610 0.840 1.06 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 286.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 384.45 4.56 1.19 110 1.614 0.838 1.19 0.50 0.81 292.94 1.64 1 100 1.00 1.00 1.00 294.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.67 388.83 3.67 0.94 110 1.618 0.837 0.95 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.83 401.57 3.65 0.91 110 1.622 0.835 0.91 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.28 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 287.02 1.64 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.28 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.00 1.00 1.00 247.6 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.33 340.48 3.88 1.14 110 1.638 0.829 0.93 0.50 0.80 257.02 1.66 1 100 1.00 1.00 1.00 205.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.83 340.48 3.88 1.14 110 1.638 0.829 0.93 0.50 0.80 257.02 1.66 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  |          | 68      | 313.15 | 2.26        |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 41.17 373.62 4.05 1.09 110 1.607 0.841 1.09 0.50 0.81 285.35 1.62 1 100 1.00 1.00 286.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.34 386.97 4.10 1.06 1.10 1.614 0.834 1.9 0.50 0.81 295.23 1.60 1 100 1.00 1.00 1.00 1.00 296.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.50 384.45 4.56 1.19 110 1.614 0.838 1.19 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 294.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.83 401.57 3.65 0.91 110 1.622 0.835 0.91 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 345.90 3.80 1.10 110 1.626 0.834 1.10 0.50 0.81 262.37 1.64 1 100 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 247.11 1.64 1 100 1.00 1.00 1.00 247.6 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.18 364.49 3.38 0.93 1.10 1.634 0.831 1.05 0.50 0.80 275.43 1.57 1 100 1.00 1.00 1.00 206.8 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.85 390.03 3.10 0.79 110 1.642 0.827 0.80 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00   |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        | 100  | 1.00  | 1.00  | 1.00 | 262.5 | 0.85 | Infin  | 0.000 | 0.575   | Non-Liq.  | Non-Liq  | 0.00       |
| 41.34 386.97 4.10 1.06 110 1.610 0.840 1.06 0.50 0.81 295.23 1.60 1 100 1.00 1.00 1.00 1.00 296.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.67 388.83 3.67 0.94 110 1.618 0.837 0.95 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 1.00 294.0 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0.00 41.69 345.90 3.80 1.10 110 1.622 0.835 0.91 0.50 0.81 295.93 1.56 1 100 1.00 1.00 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 345.90 3.80 1.10 110 1.626 0.834 1.10 0.50 0.81 262.37 1.64 1 100 1.00 1.00 1.00 1.00 262.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 247.11 1.64 1 100 1.00 1.00 1.00 247.6 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.18 340.48 3.88 1.14 110 1.634 0.831 1.14 0.51 0.80 275.43 1.57 1 100 1.00 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. Non-Liq. 42.65 390.03 3.00 0.93 110 1.638 0.829 0.93 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 33     |      |       |       |      |       |      |        |       |         |           |          |            |
| 41.67 388.83 3.67 0.94 110 1.618 0.837 0.95 0.50 0.81 295.93 1.56 1 100 1.00 1.00 297.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.93 401.57 3.55 0.91 110 1.622 0.835 0.91 0.50 0.81 305.29 1.54 1 100 1.00 1.00 1.00 306.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 41.99 345.90 3.80 1.10 110 1.626 0.834 1.10 0.50 0.81 262.37 1.64 1 100 1.00 1.00 1.00 262.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 247.11 1.64 1 100 1.00 1.00 1.00 1.00 262.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.42 364.19 3.38 1.14 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.01 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 42.49 364.19 3.38 0.93 110 1.638 0.829 0.93 0.50 0.80 257.02 1.66 1 100 1.01 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 42.65 390.03 3.10 0.79 110 1.642 0.827 0.80 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 237.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 237.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  | 41,      | 34      | 386,97 | 4.10        | 1.06       | 110        | 1.610            | 0.840 | 1.06  | 0.50 | 0.81 | 295.23 | 1.60 |      | 1      | 100  | 1.00  | 1.00  | 1.00 | 296.3 | 0.85 | Infin. | 0.000 | 0.575   | Non-Liq.  | Non-Liq  | 0.00       |
| 41.83 401.57 3.65 0.91 110 1.622 0.835 0.91 0.50 0.81 305.29 1.54 1 100 1.00 1.00 1.00 306.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 262.37 1.64 1 100 1.00 1.00 1.00 1.00 262.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.01 1.00 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.38 38.8 1.14 110 1.634 0.831 1.14 0.51 0.80 275.43 1.57 1 100 1.01 1.00 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.65 390.03 3.10 0.79 110 1.642 0.827 0.80 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 236.30 1.50 1 100 1.00 1.00 1.00 27.0 287.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00   | 1111     |         |        |             |            |            |                  |       |       |      |      |        |      |      | 83     |      |       |       |      |       |      |        |       |         |           |          |            |
| 41.99 345.90 3.80 1.10 110 1.626 0.834 1.10 0.50 0.81 262.37 1.64 1 100 1.00 1.00 1.00 1.00 262.9 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.16 326.26 3.40 1.04 110 1.630 0.832 1.05 0.50 0.81 247.11 1.64 1 100 1.00 1.00 1.00 1.00 247.6 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.42 340.48 3.89 1.14 110 1.634 0.831 1.14 0.51 0.80 275.02 1.66 1 100 1.01 1.00 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.45 364.19 3.38 0.93 110 1.638 0.829 0.93 0.50 0.80 275.43 1.57 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.65 390.03 3.10 0.79 110 1.642 0.827 0.80 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 236.30 1.50 1 100 1.00 1.00 1.00 27.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  | 41.      | 83      | 401.57 | 3.65        | 0.91       | 110        | 1.622            | 0.835 | 0.91  | 0.50 | 0.81 | 305.29 | 1.54 |      | 1      | 100  | 1.00  | 1.00  | 1.00 | 306.4 | 0.84 | Infin  | 0.000 |         |           |          |            |
| 42.32 340.48 3.88 1.14 110 1.634 0.831 1.14 0.51 0.80 257.02 1.66 1 100 1.01 1.00 1.00 260.8 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.00 42.49 364.19 3.38 0.93 110 1.638 0.829 0.93 0.50 0.80 275.43 1.57 1 100 1.00 1.00 1.00 1.00 276.5 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.65 390.03 3.10 0.79 110 1.642 0.827 0.80 0.50 0.80 294.70 1.50 1 100 1.00 1.00 1.00 295.8 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00 42.81 313.44 2.00 0.84 110 1.646 0.826 0.64 0.50 0.80 236.30 1.50 1 100 1.00 1.00 1.00 1.00 237.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      | 352    |      |       |       |      |       |      |        |       |         | Non-Liq.  | Non-Liq  |            |
| 42.49       364.19       3.38       0.93       110       1.638       0.829       0.93       0.50       0.80       275.43       1.57       1       100       1.00       1.00       1.00       276.5       0.84       Infin.       0.000       0.573       Non-Liq.       Non-Liq.       0.00         42.65       390.03       3.10       0.79       110       1.642       0.827       0.80       0.50       0.80       294.70       1.50       1       100       1.00       1.00       1.00       295.8       0.84       Infin.       0.000       0.573       Non-Liq.       Non-Liq.       0.00         42.81       313.44       2.00       0.64       110       1.646       0.826       0.64       0.50       0.80       236.30       1.50       1       100       1.00       1.00       1.00       297.2       0.84       Infin.       0.000       0.573       Non-Liq.       Non-Liq.       0.00  | 42.      | 32      | 340.48 | 3.88        | 1.14       |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
| 42.81 313.44 2.00 0.64 110 1.646 0.826 0.64 0.50 0.80 236.30 1.50 1 100 1.00 1.00 1.00 237.2 0.84 Infin. 0.000 0.573 Non-Liq. Non-Liq. 0.00  |          |         |        |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      | 276.5 | 0.84 | Infin. | 0.000 | 0.573   | Non-Liq.  | Non-Liq  | 0.00       |
| 10.00 004.40 4.00 0.00 0.00 0.00 0.00 0.   | 42.5     | 81      | 313.44 |             |            |            |                  |       |       |      |      |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |
|  | 42.      | 98      | 281.49 | 1.86        | 0.66       | 110        | 1.649            | 0.824 | 0.67  | 0.50 | 0.80 |        |      |      |        |      |       |       |      |       |      |        |       |         |           |          |            |

| Layer           | Tip              | Friction     | Friction     | Total      | Eff.Stres:             | S              | _            | _            | _            |                  |              | je je | Liquef   | Rel        |              |              |              | Clean          |              |                    | _              | induced        | Liquefac.            |                            | Volumetric   |
|-----------------|------------------|--------------|--------------|------------|------------------------|----------------|--------------|--------------|--------------|------------------|--------------|-------|----------|------------|--------------|--------------|--------------|----------------|--------------|--------------------|----------------|----------------|----------------------|----------------------------|--------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Co           | Correcte<br>Qc1n | d<br>Ic      | Bric  | Suscept  |            | v            | H            | v            | Sand           | V -          | CDD                | EQ             | M=7,5          | Safety               | Probab                     | Strain       |
| 43.14           | 220.54           | 1.03         | 0,47         | 110        | 1.653                  | 0.823          | 0.47         | 0.50         | 0.80         | 165.50           | 1.54         | 0     | (0 or 1) | 98         | 1.00         | (m)<br>1.00  | 1.00         | 166.1          | <u>Kσ</u>    | CRR <sub>7,5</sub> | 0.000          | 0.572          | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Liq. | 0.00         |
| 43.31<br>43.47  | 170,25<br>150,87 | 0.75         | 0,44<br>0.58 | 110<br>110 | 1,657<br>1,661         | 0.821<br>0.820 | 0.44<br>0.59 | 0.50<br>0.53 | 0.80<br>0.79 | 127.32<br>111.11 | 1,62<br>1,73 |       | 1        | 87<br>81   | 1.00         | 1.00         | 1.00         | 127.8<br>118.4 | 0.84<br>0.83 | 0.274              | 0.229<br>0.196 | 0.572<br>0.572 | 0.40<br>0.34         | 95%<br>97%                 | 1.14<br>1.25 |
| 43,64           | 112,32           | 0.90         | 0.80         | 110        | 1.665                  | 0.818          | 0.81         | 0.59         | 0.77         | 80 14            | 1_93         |       | 1        | 68         | 1.22         | 1.00         | 1,00         | 98.0           | 0.87         | 0.168              | 0,146          | 0,572          | 0.26                 | 99%                        | 1.53         |
| 43.80<br>43.96  | 82 53<br>68.72   | 1.03         | 1,25<br>1,49 | 110<br>110 | 1,669<br>1,673         | 0.816          | 1.28<br>1.53 | 0.66<br>0.69 | 0.74         | 56.60<br>46.10   | 2.17<br>2.29 |       | 1        | 53<br>45   | 1.60<br>1.91 |              | 1.00         | 90.3<br>88.2   | 0,87<br>0,91 | 0.148              | 0.129          | 0.571<br>0.571 | 0.23<br>0.23         | 99%<br>99%                 | 1.65<br>1.68 |
| 44 13           | 55 11            | 0.91         | 1.64         | 110        | 1.677                  | 0.813          | 1.69         | 0.73         | 0.72         | 36,12            | 2,40         |       | 1        | 35         | 2.31         |              | 1.00         | 83.4           | 0.91         | 0,134              | 0,122          | 0.571          | 0.21                 | 99%                        | 1.76         |
| 44.29<br>44.46  | 41.85<br>26.31   | 0.92<br>1.06 | 2.19<br>4.02 | 110<br>110 | 1,681<br>1,685         | 0.811<br>0.810 | 2.28<br>4.29 | 0.78<br>0.89 | 0.70<br>0.66 | 26,42<br>15,39   | 2.59<br>2.94 |       | 0        | 22         | 3,24         |              | 1.00         | 85.6           | 0.91<br>0.91 | 0.138              | 0.126          | 0,570<br>0,570 | 0.22<br>Non-Lig.     | 99%<br>Non-Lia             | 1.73<br>0.00 |
| 44.62<br>44.78  | 21.72<br>37.10   | 0.91         | 4.17<br>2.74 | 110<br>110 | 1.689<br>1.692         | 0.808<br>0.807 | 4.52<br>2.87 | 0.92<br>0.82 | 0.65<br>0.68 | 12.33<br>22.80   | 3.03         |       | 0        |            |              |              |              |                | 0.91         |                    |                | 0.569          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 44.95           | 79,45            | 1.14         | 1.44         | 110        | 1.696                  | 0.805          | 1.47         | 0.68         | 0.73         | 53 41            | 2.23         |       | 1        | 51         | 1.73         |              | 1.00         | 92.7           | 0.91<br>0.87 | 0.154              | 0.134          | 0.569<br>0.569 | Non-Liq.<br>0.24     | Non-Liq<br>99%             | 0.00<br>1.61 |
| 45 11<br>45 28  | 124.52<br>146.40 | 1.08         | 0.86<br>1.09 | 110<br>110 | 1.700<br>1.704         | 0.803          | 0.88<br>1.11 | 0.58<br>0.59 | 0.76<br>0.76 | 88,02<br>103,42  | 1,92<br>1.93 |       | 1        | 72<br>78   | 1.21<br>1.22 | 0.70<br>0.75 | 1.10<br>1.10 | 116.3<br>137.7 | 0.83         | 0.226              | 0.187<br>0.267 | 0.568<br>0.568 | 0.33<br>0.47         | 98%<br>92%                 | 1.28<br>1.03 |
| 45.44           | 147.64           | 1.68         | 1.14         | 110        | 1.708                  | 0.800          | 1.15         | 0.59         | 0.75         | 104.02           | 1.94         |       | 1        | 78         | 1.23         |              | 1.10         | 139.6          | 0.83         | 0.333              | 0.275          | 0.567          | 0.48                 | 92%                        | 1.01         |
| 45 60<br>45 77  | 111.81<br>107.68 | 2.01<br>2.34 | 1.80<br>2.17 | 110<br>110 | 1.712<br>1.716         | 0.798<br>0.797 | 1.83<br>2.21 | 0.66<br>0.68 | 0.73<br>0.72 | 75.74<br>72.03   | 2.17<br>2.25 |       | 1        | 65<br>63   | 1.61<br>1.79 |              | 1.00         | 121.6<br>128.7 | 0.87         | 0.247<br>0.278     | 0.214          | 0.567<br>0.567 | 0.38<br>0.42         | 96%<br>94%                 | 1.21<br>1.13 |
| 45.93<br>46.10  | 150.61<br>249.00 | 2.63         | 1.75<br>1.04 | 110<br>110 | 1.720<br>1.724         | 0.795<br>0.793 | 1.77<br>1.05 | 0.63         | 0.74<br>0.77 | 103.74<br>180.59 | 2.07<br>1.73 |       | 1        | 78<br>100  | 1.40<br>1.06 | 4 00         | 1,00         | 144.8          | 0.82         | 0.363              | 0.298          | 0.566          | 0.53                 | 89%                        | 1.00         |
| 46,26           | 324,42           | 3,00         | 0.93         | 110        | 1.728                  | 0.792          | 0.93         | 0.50         | 0.78         | 238,69           | 1,61         |       | 1        | 100        | 1.00         | 1.00<br>1.05 | 1.00         | 192.4<br>239.6 | 0.82<br>0.82 | Infin.             | 0.000          | 0.566<br>0.565 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 46.42<br>46.59  | 376.79<br>401.24 | 3.64<br>4.49 | 0.96<br>1.12 | 110<br>110 | 1,731<br>1,735         | 0.790<br>0.788 | 0.97<br>1.12 | 0.50<br>0.50 | 0.78<br>0.78 | 277.11<br>294.84 | 1.58<br>1.62 |       | 1        | 100<br>100 | 1.00         | 1.10<br>1.15 | 1.00         | 278.1<br>295.9 | 0.82         | Infin.             | 0.000          | 0.565<br>0.564 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 46.75           | 410,01           | 4.98         | 1.21         | 110        | 1,739                  | 0.787          | 1.22         | 0.50         | 0.78         | 300,97           | 1.64         |       | 1        | 100        | 1.00         | 1.20         | 1,00         | 302,1          | 0.82         | Infin.             | 0,000          | 0.564          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 46,92<br>47,08  | 417.89<br>432.83 | 4.83<br>4.59 | 1.16<br>1.06 | 110<br>110 | 1.743<br>1.747         | 0.785<br>0.783 | 1.16<br>1.06 | 0.50         | 0.78<br>0.78 | 306,43<br>317,08 | 1,62<br>1,58 |       |          | 100<br>100 | 1.00         | 1.25         | 1.00         | 307.6<br>318.3 | 0.82         | Infin              | 0.000          | 0.563<br>0.563 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 47 24<br>47 41  | 435.16<br>434.87 | 3.80<br>4.29 | 0.87<br>0.99 | 110<br>110 | 1.751                  | 0.782          | 0.88         | 0.50         | 0.78         | 318,43           | 1.51         |       | 1        | 100        | 1.00         | 1.35         | 1.00         | 319,6          | 0.82         | Infin.             | 0,000          | 0.562          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 47 41           | 434.40           | 5.04         | 1.16         | 110        | 1.755<br>1.759         | 0.780<br>0.778 | 0.99<br>1.17 | 0.50<br>0.50 | 0.78<br>0.78 | 317.86<br>317.16 | 1,55<br>1,61 |       |          | 100<br>100 | 1.00<br>1.00 | 1.40<br>1.45 | 1.00         | 319.0<br>318.3 | 0.82<br>0.82 | Infin.             | 0.000          | 0.562<br>0.561 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 47.74<br>47.90  | 430,64<br>433,15 | 5.51<br>6.42 | 1.28<br>1.48 | 110<br>110 |                        | 0.777<br>0.775 | 1.28<br>1.49 | 0.50<br>0.52 | 0.77<br>0.77 | 313.70<br>312.64 | 1.65<br>1.70 |       |          | 100<br>100 | 1.00<br>1.04 | 1.50<br>1.55 | 1.00         | 315.3<br>325.7 | 0.82         | Infin.             | 0.000          | 0.561<br>0.560 | Non-Liq.<br>Non-Liq. | Non-Liq                    | 0.00<br>0.00 |
| 48.06           | 428,46           | 6.61         | 1,54         | 110        | 1.770                  | 0.773          | 1.55         | 0.52         | 0.76         | 308.02           | 1.72         |       | 1        | 100        | 1.05         | 1.60         | 1,00         | 324,6          | 0.81         | Infin.             | 0,000          | 0.560          | Non-Liq.             |                            | 0.00         |
| 48 23<br>48 39  | 424.25<br>419.06 | 6.72<br>6.65 | 1.58<br>1.59 | 110<br>110 |                        | 0.772<br>0.770 | 1.59<br>1.59 | 0.53<br>0.53 | 0.76<br>0.76 | 304.04<br>299.75 | 1.73<br>1.73 |       | - 5      | 100<br>100 | 1.06<br>1.06 | 1.65<br>1.70 | 1.00         | 323.0<br>319.3 | 0.81         | Infin.             | 0.000          | 0.559<br>0.559 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 48.56<br>48.72  | 409.58<br>401.26 | 6.70<br>6.55 | 1.64<br>1.63 | 110<br>110 |                        | 0.768          | 1.64         | 0.53         | 0.76         | 291.80           | 1.75         |       |          | 100        | 1.07         | 1.75         | 1.00         | 314.3          | 0.81         | Infin.             | 0.000          | 0.558          | Non-Liq.             | Non-Liq                    | 0.00         |
| 48.88           | 393.67           | 6,35         | 1.61         | 110        |                        | 0.767<br>0.765 | 1.64<br>1.62 | 0.54<br>0.54 | 0.76<br>0.75 | 285,28<br>279,50 | 1.76<br>1.76 |       |          | 100<br>100 | 1.08         |              | 1.00         | 308.3<br>302.2 | 0.81<br>0.81 | Infin.<br>Infin.   | 0.000          | 0.558<br>0.557 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 49.05<br>49.21  | 386.90<br>381.95 | 6.22<br>6.11 | 1.61<br>1.60 | 110<br>110 |                        | 0.763<br>0.762 | 1.62<br>1.61 | 0.54<br>0.54 | 0.75<br>0.75 | 274.18<br>270.24 | 1.76<br>1.76 |       |          | 100<br>100 | 1.08         |              | 1.00         | 297.2<br>293.3 | 0.81         | Infin.             | 0.000          | 0.556<br>0.556 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 49.38           | 382,17           | 6.15         | 1.61         | 110        | 1.802                  | 0.760          | 1.62         | 0.54         | 0.75         | 269,99           | 1.77         |       | 1        | 100        | 1.08         | 2.00         | 1.00         | 293.4          | 0.81         | Infin.             | 0.000          | 0.555          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 49.54<br>49.70  | 376.16<br>367.77 | 6.01<br>5.85 | 1.60<br>1.59 | 110<br>110 |                        | 0.758<br>0.757 | 1.61<br>1.60 | 0.54<br>0.54 | 0.75<br>0.75 | 265.33<br>258.87 | 1.77<br>1.77 |       |          | 100<br>100 |              |              | 1.00         |                | 0.81<br>0.81 | Infin.             | 0.000          | 0.555<br>0.554 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 49,87<br>50,03  | 358.21<br>351.53 | 5.75<br>5.60 | 1.61<br>1.59 | 110        | 1,813                  | 0.755          | 1.61         | 0.54         | 0.75         | 251.37           | 1.78         |       | 1        | 100        | 1.10         | 2.15         | 1.00         | 276.4          | 0.81         | Infin              | 0.000          | 0.553          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 50,03           | 347.31           | 4.90         | 1.41         | 110<br>110 |                        | 0.753<br>0.752 | 1.60<br>1.42 | 0.54<br>0.53 | 0.75<br>0.75 | 246,26<br>244,59 | 1.79<br>1.75 |       |          | 100<br>100 |              | 2.20         | 1.00         |                | 0.81<br>0.80 | Infin.             | 0.000          | 0.553<br>0.552 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 50,36<br>50,52  | 345.77<br>347.22 | 5.05<br>5.22 | 1.46<br>1.50 | 110<br>110 |                        | 0.750<br>0.748 | 1.47<br>1.51 | 0.54<br>0.54 | 0.75<br>0.74 | 242.68<br>243.04 | 1.76<br>1.77 |       |          | 100        |              | 2.30         | 1.00         |                | 0.80         | Infin.             | 0.000          | 0.552<br>0.551 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 50,69           | 346.06           | 5.37         | 1.55         | 110        | 1,833                  | 0.747          | 1.56         | 0.54         | 0.74         | 241,42           | 1.78         |       | 1        | 100        | 1.09         | 2.40         | 1.00         | 265,2          | 0.80         | Infin              | 0.000          | 0.550          | Non-Liq.             |                            | 0.00         |
| 50.85<br>51.02  | 349.13<br>348.56 | 5.22<br>4.86 | 1.50<br>1.39 | 110<br>110 |                        | 0.745<br>0.743 | 1.50<br>1.40 | 0.54<br>0.53 | 0.74<br>0.75 | 243.91<br>244.21 | 1.77<br>1.74 |       |          |            |              |              | 1.00         |                | 0.80         | Infin.             | 0.000          | 0.550<br>0.549 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 51.18<br>51.35  | 349.29<br>348.08 | 4.35<br>4.19 | 1.25         | 110<br>110 |                        | 0.742          | 1.25<br>1.21 | 0.52<br>0.52 | 0.75<br>0.75 | 246 10<br>245 42 | 1.70<br>1.69 |       |          | 100<br>100 |              |              | 1.00         | 256.9          | 0.80         |                    | 0.000          | 0.549          | Non-Liq.             | Non-Liq                    | 0.00         |
| 51.51           | 347.63           | 4.03         | 1.16         | 110        | 1.852                  | 0.738          | 1.17         | 0.51         | 0.75         | 245.34           | 1.68         |       |          |            |              |              | 1.00<br>1.00 |                | 0.80         | Infin.<br>Infin.   | 0.000          | 0.548<br>0.547 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 51.67<br>51.84  | 345.96<br>345.46 | 4.21         | 1.22         | 110<br>110 |                        |                | 1.22<br>1.17 | 0.52<br>0.51 | 0.75<br>0.75 | 243.12<br>243.07 | 1.70<br>1.68 |       |          |            |              | 2.65<br>2.65 | 1.00         | 253.0<br>250.7 | 0.80         | Infin.<br>Infin.   | 0.000          | 0.547<br>0.546 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 52,00           | 342,27           | 3.60         | 1.05         | 110        | 1.864                  | 0.733          | 1.06         | 0.50         | 0.75         | 241.88           | 1.65         |       | 1        | 100        | 1.00         | 2.65         | 1.00         | 243.9          | 0.80         | Infin.             | 0.000          | 0.545          | Non-Liq.             | Non-Liq.                   | 0.00         |
|                 | 345,47<br>353,60 | 2.90<br>2.51 | 0.84<br>0.71 | 110<br>110 |                        |                | 0.84<br>0.71 |              |              | 244.41<br>249.93 | 1.58<br>1.52 |       |          |            |              | 2.65<br>2.65 |              | 245 3<br>250 9 | 0.80         | Infin<br>Infin     | 0.000          | 0.545<br>0.544 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 52,49<br>52,66  | 353.44<br>329.04 | 2.43<br>2.54 | 0.69<br>0.77 | 110<br>110 |                        |                | 0.69<br>0.77 |              |              |                  | 1.51<br>1.57 |       |          |            |              |              | 1.00         | 250.5          |              | Infin.             | 0.000          | 0.543<br>0.543 | Non-Liq.             | Non-Liq                    | 0.00         |
| 52.82           | 324.06           | 2.40         | 0.74         | 110        | 1.884                  | 0.725          | 0.75         | 0.50         | 0.75         | 228.21           | 1.56         |       | 1        | 100        | 1.00         | 2.65         | 1.00         | 229.1          | 0.79         | Infin;             | 0.000          | 0.542          | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 52.99<br>53.15  | 357.49<br>377.56 | 2.12<br>1.69 | 0.59<br>0.45 | 110<br>110 |                        |                | 0.60<br>0.45 |              |              |                  | 1.46<br>1.36 |       |          |            |              | 2,65<br>2,65 |              | 252.6<br>266.5 |              |                    | 0.000          | 0.542<br>0.541 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 53.31<br>53.48  | 383.09           | 1.73         | 0.45         | 110        | 1.895                  | 0.720          | 0.45         | 0.50         | 0.75         | 269.18           | 1.36         |       | 1        | 100        | 1.00         | 2.65         | 1.00         | 270.2          | 0.79         | Infin.             | 0.000          | 0,540          | Non-Liq.             | Non-Liq                    | 0.00         |
| 53.64           | 384.71<br>382.98 | 1.88<br>1.55 | 0.49<br>0.41 | 110<br>110 |                        |                | 0.49<br>0.41 |              |              |                  | 1.38<br>1.33 |       |          |            |              | 2.65<br>2.65 |              | 271.1<br>269.6 |              |                    | 0.000          | 0.540<br>0.539 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 53.81<br>53.97  | 378.65<br>364.32 | 1.68<br>1.45 | 0.44         | 110<br>110 |                        |                | 0.45<br>0.40 |              | 0.74<br>0.74 |                  | 1.36<br>1.34 |       |          |            |              | 2.65<br>2.65 |              | 266.2<br>255.8 |              |                    | 0.000          | 0.538<br>0.538 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 54.13           | 345,61           | 1.28         | 0.37         | 110        | 1.915                  | 0.712          | 0.37         | 0.50         | 0.74         | 241.46           | 1.34         |       | 1 .      | 100        | 1.00         | 2 65         | 1.00         | 242,4          | 0,79         | Infin.             | 0,000          | 0,537          | Non-Liq.             | Non-Liq.                   | 0.00         |
|                 | 328.15<br>286.22 | 1.38<br>1.49 | 0.42         | 110<br>110 |                        |                | 0.42<br>0.53 |              |              |                  | 1.40<br>1.50 |       |          |            |              | 2 65<br>2 65 |              | 229.8<br>200.1 |              |                    | 0.000          | 0.536<br>0.536 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
|                 | 215.92<br>142.12 | 2.04         | 0.94         | 110<br>110 |                        |                | 0.95<br>1.62 |              | 0.72<br>0.68 |                  | 1.77<br>2.08 |       |          |            |              | 2.65         | 1.00         | 159.6          | 0.79         | 0.458              | 0.361          | 0.535          | 0.67                 | 79%                        | 0.55         |
| 54.95           | 95.61            | 2.50         | 2.61         | 110        | 1.934                  | 0.705          | 2.66         | 0.72         | 0.65         | 57.33            | 2.37         |       | 1        |            | 1.42<br>2.21 |              | 1.00         | 128.9<br>126.7 | 0.83         | 0.269              | 0.219          | 0.534<br>0.534 | 0.41<br>0.42         | 95%<br>95%                 | 1.13<br>1.15 |
| 55.12<br>55.28  | 68.05<br>52.93   | 2.25<br>1.90 | 3.30         | 110<br>110 |                        |                | 3.40<br>3.73 |              | 0.62<br>0.61 | 39.00<br>29.39   | 2.57<br>2.69 |       | 1        | 38         | 3.14         |              | 1.00         | 122.4          | 0.89         | 0.251              | 0.222          | 0.533<br>0.532 | 0.42<br>Non-Liq,     | 95%<br>Non-Lia             | 1.20<br>0.00 |
| 55.45           | 46.61            | 2.06         | 4.41         | 110        | 1.946                  | 0.700          | 4.61         | 0.85         | 0.60         | 25.19            | 2.80         |       | 0        | 00         | 4.07         |              | 4.00         |                | 0.89         | 0.00:              | 0.00-          | 0.532          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 55.77           | 110.59<br>134.82 | 2.63<br>3.19 | 2.38         | 110<br>110 |                        |                | 2.42<br>2.40 |              | 0.65<br>0.66 |                  | 2.30         |       |          |            | 1.94<br>1.74 |              |              | 129.9<br>144.4 |              |                    | 0.236<br>0.299 | 0.531<br>0.530 | 0.44<br>0.56         | 94%<br>87%                 | 1.11<br>1.00 |
|                 | 157.81<br>180.29 | 3.55<br>3.92 | 2.25<br>2.18 | 110<br>110 | 1,958                  | 0.695          | 2.28<br>2.20 | 0.66         | 0.67         | 98.35            | 2.16<br>2.11 |       | 1        | 76         | 1.58<br>1.47 |              | 1:00         | 155:1          | 0.78         | 0.427              | 0.334          | 0.530          | 0.63                 | 82%                        | 0.65         |
| 56.27           | 192.22           | 4.13         | 2.15         | 110        | 1.966                  | 0.692          | 2.17         | 0.63         | 0.68         | 121.48           | 2.08         |       | 1        | 85         | 1.43         |              | 1.00         | 166.8<br>173.3 | 0.78         | Infin:             | 0.000          | 0.529<br>0.528 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
|                 | 181.99<br>157.22 | 3.86<br>3.50 | 2.12         | 110<br>110 |                        |                | 2.14<br>2.26 |              | 0.67<br>0.66 |                  | 2.10         |       |          |            | 1.45<br>1.58 |              |              | 166.0<br>153.6 |              |                    | 0.000<br>0.325 | 0.528<br>0.527 | Non-Liq.<br>0.62     | Non-Liq<br>83%             | 0.00<br>0.68 |
| 56.76           | 135.91           | 2.78         | 2.04         | 110        | 1.977                  | 0.688          | 2.07         | 0.66         | 0.66         | 83,65            | 2.18         |       | 1        | 69         | 1.62         |              | 1.00         | 135.7          | 0.83         | 0.312              | 0.259          | 0.526          | 0.49                 | 91%                        | 1.05         |
| 56.92<br>57.09  | 120,38<br>104,50 | 2.34         | 1.94<br>2.23 | 110<br>110 |                        |                | 1.97<br>2.27 |              | 0.66<br>0.64 |                  | 2.21         |       |          |            | 1.68<br>1.95 |              |              | 123.7<br>121.6 |              | 0.256<br>0.247     | 0.212<br>0.205 | 0.526<br>0.525 | 0.40<br>0.39         | 95%<br>96%                 | 1.18<br>1.21 |
| 57.25<br>57.41  | 69.37<br>32.64   | 1.60<br>1.19 | 2.31<br>3.63 | 110        | 1,989                  | 0.683          | 2.38<br>3.87 | 0.75         | 0.62<br>0.58 | 39.77            | 2 46<br>2 88 |       |          |            | 2.57         |              |              | 102.2          | 0.88         | 0.179              |                | 0.524          | 0.30                 | 98%                        | 1.46         |
| 57.58           | 24.63            | 0.77         | 3.11         | 110        | 1.997                  | 0.680          | 3.38         | 0.90         | 0.57         | 12.11            | 2,96         |       | 0        |            |              |              |              |                | 0.88<br>0.88 |                    |                | 0.524<br>0.523 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 57.74<br>57.91  | 22.59<br>21.75   | 0.67<br>0.79 | 2.95<br>3.64 | 110<br>110 |                        |                | 3.23<br>4.01 |              | 0.56<br>0.55 |                  | 2.98<br>3.06 |       | 0        |            |              |              |              |                | 0.88<br>0.88 |                    |                | 0.523          | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 58.07           | 25,26            |              | 3.05         |            |                        |                |              |              | 0.56         |                  | 2.95         |       | 0        |            |              |              |              |                | 0.88         |                    |                | 0.521          | Non-Liq.             |                            | 0.00         |
|                 |                  |              |              |            |                        |                |              |              |              |                  |              |       |          |            |              |              |              |                |              |                    |                |                |                      |                            |              |

| Layer  | Tip    | Friction | Friction | Total   | Eff_Stres | s     |      |      |      |          |      | e e | Liquef   | Rel    |      |     |      | Clean |      |        |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|---------|-----------|-------|------|------|------|----------|------|-----|----------|--------|------|-----|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt | at Midpt  |       |      |      |      | Correcte | d    | eri | uscept   | Dens   |      | Н   |      | Sand  |      |        | EQ    | M=7,5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)   | p'o (tsf) | rd    | F    | n    | Co   | Qc1n     | Ic   | ò   | (0 or 1) | Dr (%) | Kc   | (m) | KH   | Qc1n  | Κσ   | CRR7.5 | CRR   | CSR     | Factor    | PL       | (%)        |
| 58.23  | 28,61  | 0.75     | 2,63     | 110     | 2.013     | 0.675 | 2.83 | 0.86 | 0.57 | 14.43    | 2.85 | T   | 0        |        |      |     |      |       | 0.88 |        |       | 0.521   | Non-Liq.  | Non-Liq. | 0.00       |
| 58,40  | 24.43  | 0,68     | 2.77     | 110     | 2.016     | 0.673 | 3.02 | 0.89 | 0.56 | 11,94    | 2,94 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0.520   | Non-Liq.  | Non-Lig. | 0.00       |
| 58 56  | 36.91  | 0,77     | 2 09     | 110     | 2.020     | 0.672 | 2.21 | 0.81 | 0.59 | 19.49    | 2.68 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0.519   | Non-Liq.  | Non-Lig. | 0.00       |
| 58.73  | 23.45  | 0.91     | 3_86     | 110     | 2.024     | 0.671 | 4.23 | 0.92 | 0.55 | 11.13    | 3.05 |     | 0        |        |      |     |      |       | 0,88 |        |       | 0,519   | Non-Liq.  | Non-Lig. | 0.00       |
| 58 89  | 18.11  | 1.14     | 6,28     | 110     | 2,028     | 0.669 | 7.07 | 1.00 | 0.52 | 7,93     | 3,30 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0.518   | Non-Liq.  | Non-Lig. | 0.00       |
| 59.06  | 65,03  | 1,57     | 2.41     | 110     | 2.032     | 0.668 | 2.48 | 0.76 | 0.61 | 36,29    | 2.50 |     | 1        | 35     | 2.78 |     | 1.00 | 100.8 | 0.88 | 0:175  | 0.154 | 0.517   | 0.30      | 98%      | 1.48       |
| 59.22  | 103,87 | 1.91     | 1,83     | 110     | 2.036     | 0.666 | 1.87 | 0.68 | 0.64 | 61,58    | 2.25 |     | 1        | 57     | 1.79 |     | 1_00 | 110.3 | 0.82 | 0.205  | 0.168 | 0,517   | 0.33      | 98%      | 1.35       |
| 59.38  | 65.03  | 1.50     | 2,30     | 110     | 2.040     | 0.665 | 2.38 | 0.75 | 0.61 | 36,27    | 2.49 |     | 1        | 35     | 2.72 |     | 1_00 | 98.5  | 0.88 | 0.169  | 0.148 | 0,516   | 0.29      | 98%      | 1.51       |
| 59.55  | 38,85  | 0.98     | 2.51     | 110     | 2.044     | 0.664 | 2.65 | 0.82 | 0.58 | 20,23    | 2.72 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0.516   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.71  | 27.32  | 0.71     | 2.60     | 110     | 2.048     | 0.662 | 2.81 | 0.87 | 0.56 | 13,44    | 2.88 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0,515   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.88  | 17.57  | 0.45     | 2,57     | 110     | 2,052     | 0.661 | 2.91 | 0.93 | 0.54 | 7.92     | 3.07 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0,514   | Non-Liq.  | Non-Liq. | 0.00       |
| 60_04  | 14.52  | 0.43     | 2,94     | 110     | 2,055     | 0,660 | 3.43 | 0.97 | 0.53 | 6.19     | 3,20 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0,514   | Non-Liq.  | Non-Liq. | 0.00       |
| 60 20  | 13.78  | 0.46     | 3,32     | 110     | 2.059     | 0.658 | 3.91 | 0.99 | 0.52 | 5.74     | 3,26 |     | 0        |        |      |     |      |       | 0.88 |        |       | 0,513   | Non-Liq.  | Non-Liq  | 0.00       |
| 60.37  | 14.34  | 0.56     | 3,88     | 110     | 2.063     | 0.657 | 4.54 | 0.99 | 0.52 | 5.98     | 3,28 |     | 0        |        |      |     |      |       | 0.87 |        |       | 0,512   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.53  | 16.36  | 0.62     | 3.78     | 110     | 2,067     | 0.656 | 4.32 | 0.97 | 0.52 | 7.05     | 3.21 |     | 0        |        |      |     |      |       | 0.87 |        |       | 0.512   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.70  | 23,29  | 0.00     | 0.00     | 110     | 2.071     | 0.654 | 0.00 | 0.80 | 0.58 | 11,71    | 2.64 |     | 0        |        | 1.00 |     |      |       | 0.87 |        |       | 0,511   | Non-Liq.  | Non-Liq. | 0.00       |
| 60.86  | 28.55  | 0.00     | 0.00     | 110     | 2.075     | 0.653 | 0.00 | 0.79 | 0.59 | 14.72    | 2.60 |     | 1        | 0      | 1.00 |     | 1.00 | 14.7  | 0.87 | 0.062  | 0.054 | 0,511   | 0.11      | 100%     | 5.46       |
| 61.02  | 34.53  | 0.00     | 0.00     | 110     | 2.079     | 0_652 | 0.00 | 0.78 | 0.59 | 18.16    | 2.56 |     | 1        | 6      | 1.00 |     | 1.00 | 18.2  | 0.87 | 0.065  | 0.057 | 0.510   | 0.11      | 100%     | 5.00       |

|                 |                  | Project:<br>Job No:   |                  | -          | chool No.              | 8              |              | Me           | thods:       | Liquefac<br>Post-liq       |              |     |        | _                   |              |                    |              |                      |              |                   | & Wride        | )                       |                                  |           | Total<br>Liquefied     |
|-----------------|------------------|-----------------------|------------------|------------|------------------------|----------------|--------------|--------------|--------------|----------------------------|--------------|-----|--------|---------------------|--------------|--------------------|--------------|----------------------|--------------|-------------------|----------------|-------------------------|----------------------------------|-----------|------------------------|
|                 | So               | Date:<br>unding:      | 8/14/20<br>CPT-3 | )18        | Plot:                  | 3              |              |              |              | Dry San                    | d Settle     | eme | ent by | Pradel,             | ASCE         | Journa             | I of G8      | GE, Vo               | 124,         | No. 4             |                |                         |                                  |           | Thickness<br>(feet)    |
| EARTI           | HQUAKE<br>Ma     | INFORM<br>agnitude:   |                  | 7,5        |                        |                |              |              |              | (M≃7,5):<br>and Qc1n       |              |     |        |                     | /MSF         | SF =               | : CRR        | <sub>7.5</sub> *Κσ/C | SR           |                   |                |                         |                                  | Probab    | 2.3<br>Total           |
|                 |                  | PGA, g:               | 0.97             | 0.75       |                        |                | nit Maja     | ahl of       |              | stant and a                | 440          |     |        |                     | Us           |                    |              |                      |              | Ishihara          |                | mine (1):               | 0                                | Avg       | Induced                |
|                 |                  | MSF:<br>VT, feet:     |                  |            |                        |                | Unit W       | eight of     | satura       | ated soils:<br>ated soils: | 110          | pc  |        |                     |              |                    |              | - 1                  | Min Sf       | of Liq            |                | uired SF:<br>Layers:    | 1.50<br><b>0.23</b>              | 4%<br>Max | Subsidence<br>(inches) |
| Layer           | Design G\<br>Tip | VT, feet:<br>Friction | 20.0<br>Friction | n Total    | Eff Stress             |                | Limiting     | g Ic for     | liquefia     | ible soils:                | 2.60         | de  | Lique  |                     | iting Ic     | for K <sub>H</sub> | 2.0          | Clean                | Avg SF       | of Liq            | uefiable       | Layers:<br>Induced      | 0.03<br>Liquefac                 | 100%      | 0.3<br>Volumetric      |
| Depth<br>(feet) |                  | Fs<br>(tsf)           | Ratio<br>%       | Unit Wt.   | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Co           | Correcte                   | d<br>Ic      | ē   |        | pt Dens<br>1) Dr (% |              | H<br>(m)           | KH           | Sand                 | V-           | CRR <sub>72</sub> | EQ             | M=7,5<br>CSR            | Safety                           | Probab_   | Strain                 |
| 0.16            | 61.63            | 0.93                  | 1.50             | 110        | 0.009                  | 1,000          | 1.50         | 0.62         | 1.70         | 99 01                      | 2.03         |     | 1      | 76                  | 1,34         | (m)                | 1,00         | 133.0                | 1.00         | 0,299             | 0,299          | 0,485                   |                                  | Non-Liq   | 0.00                   |
| 0.33            | 79.05<br>78.13   | 1.53                  | 1.94<br>2.46     | 110<br>110 | 0.018<br>0.027         | 1,000          | 1,94<br>2,46 | 0.62         | 1,70         | 126 99<br>125 50           | 2.03         |     | 1      | 87<br>86            | 1,35<br>1,48 |                    | 1.00<br>1.00 | 171.2<br>186.4       | 1,00         | Infin.            | 0,000          | 0.485<br>0.485          |                                  | Non-Liq   | 0.00<br>0.00           |
| 0,66            | 68.31<br>54.87   | 1,84                  | 2.70             | 110<br>110 | 0.036<br>0.045         | 1,000          | 2,70         | 0.66         | 1.70<br>1.70 | 109 70<br>88 09            | 2,18<br>2,26 |     | 1      | 81<br>72            | 1,63<br>1,82 |                    | 1.00<br>1.00 | 178.6<br>159.9       | 1.00<br>1.00 | Infin<br>0,460    | 0,000<br>0,460 | 0.485<br>0.485          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 0.98            | 47.14<br>39.47   | 1.21<br>1.02          | 2.56<br>2.57     | 110<br>110 | 0.054<br>0.063         | 1,000<br>0,999 | 2,57<br>2,58 | 0.69<br>0.71 | 1.70<br>1.70 | 75,66<br>63,32             | 2,28<br>2,33 |     | 1      | 65<br>58            | 1.88<br>2.06 |                    | 1.00<br>1.00 | 142.1<br>130.5       | 1.00<br>1.00 | 0.347<br>0.287    | 0,347<br>0,287 | 0.485<br>0.484          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 1.31<br>1.48    | 39.47<br>31.24   | 1.02<br>0.82          | 2.57<br>2.63     | 110<br>110 | 0 072<br>0 081         | 0.999<br>0.999 | 2.58<br>2.64 | 0.71<br>0.73 | 1.70<br>1.70 | 63,30<br>50,07             | 2,33<br>2,41 |     | 1      | 58<br>48            | 2.06<br>2.37 |                    | 1.00         | 130.5<br>118.7       | 1.00         | 0.287<br>0.236    | 0.287          | 0.484<br>0.484          | Non-Liq.<br>Non-Liq.             | 100       | 0.00<br>0.00           |
| 1.64<br>1.80    | 24.89<br>19.86   | 0.66<br>0.33          | 2.65<br>1.65     | 110<br>110 | 0.090                  | 0.998<br>0.998 | 2.66<br>1.66 | 0.75<br>0.74 | 1.70<br>1.70 | 39,85<br>31.75             | 2.49<br>2.44 |     | 1      | 39<br>29            | 2.72<br>2.48 |                    | 1.00<br>1.00 | 108.3<br>78.7        | 1.00         | 0.198<br>0.125    | 0,198          | 0.484<br>0.484          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 1.97<br>2.13    | 20.55<br>20.42   | 0.42                  | 2.06<br>2.29     | 110<br>110 |                        | 0.998<br>0.997 | 2.07         | 0.75<br>0.76 | 1.70<br>1.70 | 32.85<br>32.62             | 2.49<br>2.52 |     | 1      | 31<br>30            | 2.70<br>2.85 |                    | 1.00         | 88.6<br>93.0         | 1.00         | 0.145<br>0.155    | 0.145<br>0.155 | 0.484<br>0.483          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 2,30<br>2,46    | 19.65<br>18.16   | 0.48<br>0.52          | 2.45<br>2.85     | 110<br>110 |                        | 0.997<br>0.996 | 2.46<br>2.87 | 0.77<br>0.79 | 1.70<br>1.70 | 31,37<br>28.96             | 2.55<br>2.62 |     | 1      | 29                  | 3.02         |                    | 1.00         | 94.8                 | 1.00         |                   | 0.159          | 0.483<br>0.483          | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 2.62<br>2.79    | 15.20<br>13.95   | 0.57<br>0.57          | 3.77<br>4.06     | 110<br>110 | 0,144                  | 0,996<br>0,996 | 3.81<br>4.10 | 0.83         | 1.70<br>1.70 | 24.19<br>22.17             | 2.76<br>2.81 |     | 0      |                     |              |                    |              |                      | 1.00         |                   |                | 0.483<br>0.483          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 2.95<br>3.12    | 11.38<br>12.18   | 0.56<br>0.59          | 4.92<br>4.85     | 110<br>110 | 0.162                  | 0.995<br>0.995 | 4.99<br>4.92 | 0.89         | 1.70<br>1.70 | 18.02<br>19.30             | 2,93         |     | 0      |                     |              |                    |              |                      | 1.00         |                   |                | 0.482<br>0.482          | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 3.28<br>3.44    | 12.71<br>11.57   | 0.60                  | 4.68<br>5.32     | 110<br>110 | 0.180                  | 0.994          | 4.75<br>5.41 | 0.87         | 1.70         | 20.13<br>18.29             | 2.88         |     | 0      |                     |              |                    |              |                      | 1.00         |                   |                | 0.482                   | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00                   |
| 3.61<br>3.77    | 11.06<br>20.97   | 0.51<br>0.48          | 4.57<br>2.28     | 110<br>110 | 0,198                  | 0.994          | 4.65         | 0.88         | 1.70         | 17 45                      | 2,92         |     | 0      | 04                  | 0.04         |                    | 4.00         | 00.0                 | 1.00         | 0.457             | 0.457          | 0 482<br>0 482          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 3,94            | 29,22            | 0.55                  | 1.88             | 110        | 0,217                  | 0.993          | 1.90         | 0.76         | 1.70         | 33 36<br>46 60             | 2.51         |     | 1      | 31<br>45            | 2.81         |                    | 1.00         | 93.8<br>97.6         | 1.00         | 0.157<br>0.166    | 0,157<br>0,166 | 0.482<br>0.481          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00           |
| 4.10            | 37.87<br>45.79   | 0.68                  | 1.79             | 110<br>110 | 0.235                  | 0.993          | 1.80         | 0.68         | 1.70<br>1.70 | 60 49<br>73 20             | 2,24<br>2,18 |     | 1      | 56<br>64            | 1.78<br>1.62 |                    | 1.00<br>1.00 | 118.8                | 1.00         | 0,195<br>0,236    | 0,195<br>0,236 | 0.481<br>0.481          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 4.43<br>4.59    | 52.76<br>58.36   | 0.97                  | 1.84<br>1.72     | 110<br>110 | 0.253                  | 0.992<br>0.991 | 1.85<br>1.73 | 0.65<br>0.64 | 1.70<br>1.70 | 84.38<br>93.37             | 2.14<br>2.09 |     | 1      | 70<br>74            | 1,54<br>1,44 |                    | 1.00<br>1.00 | 134.3                | 1.00         | 0.284<br>0.305    | 0,284<br>0,305 | 0 481<br>0 481          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 4.76<br>4.92    | 62,10<br>64,35   | 1.17<br>1.31          | 1.89<br>2.03     | 110<br>110 | 0,271                  | 0.991<br>0.991 | 1.90<br>2.04 | 0.64<br>0.64 | 1.70<br>1.70 | 99,36<br>102,96            | 2.10<br>2.11 |     | 1      | 77<br>78            | 1.46<br>1.48 |                    | 1.00<br>1.00 |                      | 1.00<br>1.00 | 0.362<br>0.408    | 0,362<br>0,408 | 0.480<br>0.480          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 5.09<br>5.25    | 68.21<br>72.78   | 1.45<br>1.57          | 2.13<br>2.16     | 110<br>110 |                        | 0,990<br>0.990 | 2.14<br>2.17 | 0.64<br>0.64 | 1.70<br>1.70 | 109.15<br>116.48           | 2.11         |     | 1      | 80<br>83            | 1,47<br>1,45 |                    | 1.00         |                      | 1.00<br>1.00 | Infin.<br>Infin.  | 0.000          | 0.480<br>0.480          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 5,41<br>5,58    | 77.81<br>85.70   | 1.63<br>1.64          | 2.10<br>1.91     | 110<br>110 |                        | 0.989<br>0.989 | 2.11<br>1.92 | 0.63<br>0.61 | 1.70<br>1.70 | 124,55<br>137,21           | 2,07         |     | 1      | 86<br>90            | 1.40<br>1.31 |                    | 1.00         |                      | 1.00         | Infin.            | 0.000          | 0.480<br>0.479          | Non-Liq.<br>Non-Liq.             | Non-Lig.  | 0.00<br>0.00           |
| 5.74<br>5.91    | 100.29<br>115.78 | 1.65<br>1.63          | 1.65<br>1.41     | 110<br>110 |                        | 0,989<br>0,988 | 1.65<br>1.41 | 0.58<br>0.55 | 1.70<br>1.70 | 160,64<br>185,51           | 1.91<br>1.82 |     | 1      | 96<br>100           | 1.20<br>1.12 | 1.00<br>1.05       | 1,00         |                      | 1,00         | Infin.            | 0.000          | 0.479<br>0.479          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00           |
| 6,07<br>6,23    | 127.60<br>135.25 | 1,61<br>1,64          | 1.26<br>1.21     | 110<br>110 |                        | 0.988<br>0.988 | 1.27<br>1.22 | 0.54<br>0.53 | 1.70<br>1.70 | 204,49<br>216,77           | 1.76<br>1.73 |     | 1      | 100<br>100          | 1.08         | 1.10<br>1.15       | 1,00         | 221.2                | 1.00         | Infin.            | 0.000          | 0.479<br>0.479          | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00                   |
| 6.40<br>6.56    | 142.84<br>144.87 | 1.69<br>1.70          | 1.18<br>1.18     | 110<br>110 |                        | 0.987<br>0.987 | 1.19<br>1.18 | 0.52<br>0.52 | 1.70<br>1.70 | 228,95                     | 1.71<br>1.70 |     | 1      | 100<br>100          | 1.04<br>1.04 | 1,20<br>1,25       | 1,00         | 239,3                | 1.00         | Infin.            | 0.000          | 0 479<br>0 478          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 6.73<br>6.89    | 154.10<br>159.66 | 1.74<br>1.81          | 1.13<br>1.14     | 110<br>110 | 0.370                  | 0.986<br>0.986 | 1.13         | 0.51<br>0.51 | 1.70<br>1.68 | 247.01                     | 1.67<br>1.66 |     | 1      | 100                 | 1.02         | 1.30               | 1.00         | 251.8                | 1.00         | Infin.            | 0.000          | 0.478<br>0.478          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 7.05<br>7.22    | 165.12<br>169.35 | 1.78<br>1.74          | 1.08             | 110<br>110 | 0,388                  | 0.986<br>0.985 | 1.08         |              | 1.65<br>1.63 |                            | 1.64<br>1.62 |     | į      | 100                 |              | 1.40               |              | 257.5                | 1.00         | Infin.            | 0.000          | 0.478<br>0.478          | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 7.38<br>7.55    | 177.82<br>173.84 | 1.68<br>1.63          | 0.94             | 110<br>110 | 0.406                  | 0.985<br>0.985 | 0.95         | 0.50<br>0.50 | 1.61<br>1.60 | 270,69                     | 1.58<br>1.59 |     | 1      | 100                 | 1.00         | 1.50               | 1.00         | 271.7                |              | Infin.            | 0.000          | 0.478<br>0.477          | Non-Liq.<br>Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00                   |
| 7.71<br>7.87    | 173.84<br>174.47 | 1.63<br>1.63          | 0.94             | 110<br>110 | 0.424                  | 0.984<br>0.984 | 0.94<br>0.94 | 0.50<br>0.50 | 1.58<br>1.56 | 258,90                     | 1.59<br>1.60 |     | 1      | 100                 | 1.00         | 1_60               | 1.00         | 259,9                | 1.00         | Infin.            | 0,000          | 0.477                   | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 8.04<br>8.20    | 179.36<br>186.51 | 1.92                  | 1.07             | 110<br>110 | 0.442                  | 0.984          | 1.07         | 0.50<br>0.50 | 1.55         | 261.61                     | 1.63         |     | 1      | 100                 | 1.00         | 1.70               | 1.00         |                      | 1.00         | Infin.            | 0.000          | 0.477<br>0.477          | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 8.37<br>8.53    | 187.62           | 1.80                  | 0.96             | 110<br>110 | 0.460                  | 0.983          | 0.96         | 0.50         | 1.53         | 268,24                     | 1.64         |     | 1      | 100                 | 1.00         | 1.80               | 1.00         |                      | 1.00         | Infin.            | 0.000          | 0.477<br>0.476          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 8,69            | 196.66<br>203.40 | 1.97<br>2.06          | 1.01             | 110        | 0.478                  | 0.982          | 1.00         | 0.50         | 1.50         | 285.29                     | 1.60         |     | 1      | 100                 | 1.00         | 1.90               | 1.00         | 286.4                | 1.00         | Infin.<br>Infin.  | 0.000          | 0.476<br>0.476          | Non-Liq.                         | Non-Liq.  | 0.00<br>0.00           |
| 8.86<br>9.02    | 213.10<br>211.76 | 2.23                  | 1.05             | 110<br>110 | 0.496                  | 0.981          | 1.05         | 0.50         | 1.47<br>1.46 | 291,57                     | 1.59<br>1.62 |     | 1      | 100<br>100          | 1.00         | 2.00               | 1.00         | 292.7                | 1.00<br>1.00 | Infin.<br>Infin.  | 0.000          | 0.476<br>0.476          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00           |
| 9.19<br>9.35    | 215.66<br>219.54 | 2,34<br>2,54          | 1.09             | 110<br>110 | 0.514                  | 0.981          | 1.09<br>1.16 | 0.50<br>0.50 | 1.45<br>1.43 | 296.93                     | 1.61<br>1.63 |     | 1      | 100<br>100          | 1.00         | 2.10               | 1.00         |                      | 1.00         | Infin.<br>Infin.  | 0.000          | 0.476<br>0.475          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 9.51<br>9.68    | 229.63<br>235.06 | 2.68<br>2.79          | 1.17<br>1.18     | 110<br>110 | 0.532                  | 0.980          | 1.17<br>1.19 | 0.50         | 1,42<br>1,41 | 312.51                     | 1.62<br>1.62 |     | 1      | 100<br>100          |              |                    |              | 309.1<br>313.7       |              | Infin.<br>Infin.  | 0.000          | 0.475<br>0.475          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 9.84<br>10.01   | 237.58<br>233.01 | 2.88                  | 1.21<br>1.26     | 110<br>110 | 0.550                  |                | 1.21<br>1.26 |              | 1.40<br>1.39 |                            | 1,63<br>1,65 |     | 1      | 100<br>100          |              |                    |              |                      | 1.00<br>1.00 | Infin.<br>Infin.  | 0.000          | 0.475<br>0.475          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 10.17           | 237.10<br>243.13 | 2.96<br>3.06          | 1.25<br>1.26     | 110<br>110 |                        | 0,979<br>0,979 | 1.25<br>1.26 |              | 1.38<br>1.36 |                            | 1.64<br>1.64 |     | 1      | 100<br>100          |              |                    |              | 308,3<br>313,1       | 1.00<br>1.00 | Infin.            | 0.000          | 0.475<br>0.474          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
| 10.50<br>10.66  | 243.55<br>243.58 | 3.17                  | 1.30<br>1.32     | 110<br>110 |                        |                | 1.30<br>1.33 |              | 1.36<br>1.35 |                            | 1.65<br>1.66 |     | 1      | 100<br>100          |              |                    |              | 314,7<br>314,6       | 1.00         | Infin.            | 0.000          | 0.474<br>0.474          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00           |
|                 | 251.39<br>254.32 | 3.25<br>3.43          | 1.29<br>1.35     | 110<br>110 |                        |                | 1.30<br>1.35 |              | 1.33<br>1.33 |                            | 1.65<br>1.66 |     | 1      | 100<br>100          | 1,00         | 2,55               | 1,00         | 318,3                |              | Infin.<br>Infin.  | 0.000          | 0.474<br>0.474          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
|                 | 250.44<br>235.91 | 3.64<br>3.45          | 1.45<br>1.46     | 110<br>110 | 0.614                  | 0.977          | 1.46<br>1.47 | 0.52         | 1.32<br>1.32 | 312.74                     | 1.69<br>1.71 |     | 1      | 100                 | 1.03         | 2.65               | 1.00         | 324.1                |              | Infin.            | 0.000          | 0.474<br>0.473          | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 11,48           | 231 44<br>243 81 | 3.34<br>3.39          | 1.44<br>1.39     | 110<br>110 | 0,632                  | 976            | 1.45         | 0.52         | 1,31         | 285.58                     | 1.71<br>1.69 |     | 1      | 100                 | 1.05         | 2.75               | 1.00         | 300.1<br>308.0       | 1.00         | Infin.            | 0.000          | 0.473                   | Non-Liq.                         | Non-Liq.  | 0.00                   |
| 11.81           | 248.76<br>252.74 | 3 18<br>3 49          | 1.28<br>1.38     | 110<br>110 | 0,650                  | 975            | 1.28         | 0.51         | 1.28         | 300.06                     | 1.66<br>1.68 |     | 1      | 100                 | 1:01         | 2,85               | 1.00         | 303.9<br>312.7       | 1.00         | Infin.            | 0.000          | 0.473<br>0.473          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00           |
| 12.14           | 246.32<br>247.22 | 3.71                  | 1.51<br>1.55     | 110<br>110 | 0.668                  | 975            | 1.51<br>1.56 | 0.52         | 1.27         | 295.51                     | 1.72<br>1.73 |     | 1      | 100                 | 1.05         |                    | 1.00         | 311.7<br>313.3       | 1.00         | Infin:            | 0.000          | 0.473<br>0.473          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 12.47           | 246.81<br>246.30 | 3.92                  | 1.59<br>1.64     | 110<br>110 | 0.686                  | 974            | 1.59<br>1.65 | 0.53         | 1.26         | 292.77                     | 1.74<br>1.75 |     | į      | 100                 | 1.07         |                    | 1.00         | 313.0<br>313.4       | 1.00         | Infin.            | 0.000          | 0.472<br>0.472<br>0.472 | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                   |
| 12,80           |                  |                       | 1.67             | 110        |                        |                | 1.68         |              |              | 286 30                     |              |     | 1      |                     |              |                    |              | 310.9                |              |                   |                | 0.472                   | Non-Liq.                         |           | 0.00                   |

| Laye           | er Tip           | Friction     | Friction     | Total      | Eff Stres      | s              | _            | _            |              |                  |              | ⊕ Liqu | ef_ Rel_   |              |              |        | Clean              |              |                  |       | Induced        | Liquefac.              |          | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|--------|------------|--------------|--------------|--------|--------------------|--------------|------------------|-------|----------------|------------------------|----------|--------------|
| Dep            | h Qc             | Fs           | Ratio        | Unit Wt    |                |                |              |              |              | Corrected        | Ė            | Susc   |            |              | Н            |        | Sand               |              |                  | EQ    | M=7_5          | Safety                 | Probab.  | Strain       |
| (fee           | A STREET         | (tsf)        | 4.00         | (pcf)      | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n             | lc           | б (0 o |            |              | (m)          | KH     | Qc1n               | Кσ           | CRR <sub>7</sub> |       | CSR            | Factor                 | PL       | (%)          |
| 12,9           |                  | 4.05<br>4.24 | 1.66<br>1.69 | 110<br>110 | 0,713<br>0,722 | 0.973<br>0.973 | 1.67<br>1.70 | 0.54<br>0.54 | 1.24<br>1.23 | 284 13<br>290 33 | 1.76<br>1.76 | 1      | 100<br>100 | 1.08         | 3.20<br>3.25 | 1.00   | 308.4<br>315.3     | 1.00         | Infin.           | 0.000 | 0.472<br>0.472 | Non-Liq.<br>Non-Liq.   |          | 0.00         |
| 13,2           |                  | 4.23         | 1.66         | 110        | 0,731          | 0.972          | 1.66         | 0.53         | 1.22         | 292,76           | 1,76         | 1      | 100        | 1.08         | 3.30         | 1.00   | 316.1              | 1.00         | Infin_           | 0,000 | 0.471          | Non-Liq.               | Non-Liq. | 0.00         |
| 13.4           |                  | 4.01<br>3.54 | 1.51<br>1.19 | 110<br>110 | 0,740<br>0,749 | 0.972<br>0.972 | 1.52<br>1.20 | 0.52<br>0.50 | 1.21         | 301.15<br>331.97 | 1.72<br>1.61 | 1      | 100<br>100 | 1.05         | 3.35<br>3.40 | 1.00   | 316.9<br>333.2     | 1,00         | Infin.           | 0.000 | 0,471<br>0,471 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 13.7           | 358.75           | 4.85         | 1.35         | 110        | 0.758          | 0 971          | 1.35         | 0.50         | 1.18         | 399.79           | 1,61         | 1      | 100        | 1.00         | 3.45         | 1.00   | 401.3              | 1.00         | Infin            | 0.000 | 0.471          | Non-Liq.               |          | 0.00         |
| 13.9<br>14.1   |                  | 4.27<br>5.59 | 1.06<br>1.40 | 110<br>110 | 0.767<br>0.776 | 0.971<br>0.971 | 1.07<br>1.41 | 0.50<br>0.50 | 1.17<br>1.17 | 445 14<br>438 29 | 1.49<br>1.60 | 1      | 100        | 1.00         | 3.45<br>3.45 | 1.00   | 446.8<br>439.9     | 1.00         | Infin.           | 0,000 | 0,471<br>0,471 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 14.2           | 408,46           | 4.70         | 1.15         | 110        | 0.785          | 0.970          | 1.15         | 0.50         | 1.16         | 447.36           | 1.52         | 1      | 100        | 1,00         | 3.45         | 1.00   | 449.0              | 1.00         | Infin            | 0,000 | 0.470          | Non-Liq.               |          | 0.00         |
| 14.4           |                  | 5.55<br>5.04 | 1.28<br>1.29 | 110<br>110 | 0.794<br>0.803 | 0.970<br>0.970 | 1.28<br>1.30 | 0.50<br>0.50 | 1.15         | 474 00<br>421 92 | 1.55<br>1.58 | 1      | 100        | 1.00         | 3.45<br>3.45 | 1.00   | 475.8<br>423.5     | 1.00         | Infin.           | 0,000 | 0.470<br>0.470 | Non-Liq.               |          | 0.00         |
| 14.76          | 348.88           | 3.51         | 1.01         | 110        | 0.812          | 0.969          | 1.01         | 0.50         | 1.14         | 375,53           | 1.52         | -1     | 100        | 1.00         | 3.45         | 1.00   | 376.9              | 1,00         | infin.           | 0,000 | 0.470          | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 14.93<br>15.09 |                  | 3.21         | 0.92         | 110<br>110 | 0.821<br>0.830 | 0,969<br>0,969 | 0.93<br>0.90 | 0.50<br>0.50 | 1.14         | 372.12<br>390.04 | 1,49<br>1,47 | 1      | 100<br>100 | 1,00         | 3.45<br>3.45 | 1.00   |                    | 1,00         | Infin.           | 0,000 | 0.470          | Non-Liq.               |          | 0.00         |
| 15.26          |                  | 3.76         | 1.06         | 110        | 0.839          | 0.968          | 1.06         | 0.50         | 1.12         | 376.38           | 1,53         | 1      | 100        | 1.00         |              | 1.00   |                    | 1.00         | Infin.           | 0.000 | 0.470<br>0.469 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 15.42<br>15.58 |                  | 3.85<br>4.27 | 1.14<br>1.26 | 110<br>110 | 0,848<br>0,857 | 0.968<br>0.967 | 1.14<br>1.27 | 0.50         | 1.12         | 357.34           | 1.57         | 1      | 100        | 1.00         | 3.45         | 1.00   | 358.7              | 1.00         | Infin.           | 0,000 | 0.469          | Non-Liq.               | Non-Liq  | 0.00         |
| 15.75          |                  | 4.54         | 1.33         | 110        | 0.866          | 0.967          | 1.33         | 0.50         | 1.11         | 354_40<br>355_42 | 1,61<br>1,63 | 1      | 100<br>100 | 1.00         | 3.45<br>3.45 | 1.00   |                    | 1.00         | Infin.           | 0.000 | 0.469<br>0.469 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 15,91          |                  | 4.41         | 1.32         | 110        | 0,875          | 0,967          | 1.32         | 0.50         | 1.10         | 347.30           | 1,63         | 1      | 100        | 1.00         |              | 1.00   |                    | 1.00         | Infin            | 0.000 | 0.469          | Non-Liq.               | Non-Liq_ | 0.00         |
| 16.08          |                  | 3.85         | 1.13<br>1.16 | 110<br>110 | 0,884<br>0,893 | 0.966<br>0.966 | 1.14<br>1.16 | 0.50<br>0.50 | 1.09         | 350.34<br>347.98 | 1.58<br>1.59 | 1      | 100<br>100 | 1,00         | 3.45<br>3.45 | 1.00   |                    | 1.00         | Infin.           | 0.000 | 0.468<br>0.468 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 16.40          |                  | 4.11         | 1.35         | 110        | 0.902          | 0.966          | 1.35         | 0.51         | 1.08         | 311,54           | 1,67         | 1      | 100        | 1.02         | 3.45         | 1.00   | 317.6              | 1.00         | Infin_           | 0.000 | 0.468          | Non-Liq.               | Non-Liq. | 0.00         |
| 16.57<br>16.73 |                  | 3.63         | 1.51<br>1.97 | 110<br>110 | 0.911<br>0.920 | 0.965<br>0.965 | 1.51<br>1.98 | 0.54<br>0.58 | 1.08         | 245,31<br>204,91 | 1.77<br>1.91 | 1      | 100<br>100 | 1,08         |              | 1.00   |                    | 1.00         | Infin            | 0,000 | 0.468<br>0.468 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 16.90          | 186,05           | 3.36         | 1.80         | 110        | 0.929          | 0.965          | 1.81         | 0.58         | 1.08         | 188,60           | 1.90         | 1      | 100        | 1,19         |              | 1.00   |                    | 1.00         | Infin_           | 0,000 | 0.468          | Non-Liq.               |          | 0.00         |
| 17.06<br>17.22 |                  | 4.55<br>1.70 | 3.13<br>1.24 | 110<br>110 | 0,938<br>0,947 | 0.964          | 3.15<br>1.25 | 0.65<br>0.57 | 1.08         | 147,65<br>137,16 | 2.15<br>1.87 | 1      | 93<br>90   | 1.56<br>1.16 | 1.00         | 1.00   |                    | 1,00         | Infin.<br>Infin. | 0,000 | 0.467<br>0.467 | Non-Liq.               |          | 0.00         |
| 17.39          | 195,13           | 2.67         | 1.37         | 110        | 0.956          | 0.963          | 1.37         | 0.55         | 1.06         | 193,97           | 1.80         | - 1    | 100        | 1.11         |              | 1.00   |                    | 1.00         | Infin.           | 0,000 | 0 467          | Non-Liq.<br>Noп-Liq.   |          | 0.00<br>0.00 |
| 17.55<br>17.72 |                  | 3.14         | 0.84         | 110<br>110 | 0,965<br>0,974 | 0,963          | 0.84<br>0.99 | 0.50<br>0.50 | 1.05<br>1.04 | 370,21<br>359,90 | 1.46<br>1.52 | 1      | 100<br>100 | 1.00         |              | 1.00   |                    | 1.00         | Infin,           | 0,000 | 0.467          | Non-Liq.               |          | 0.00         |
| 17.88          | 334.19           | 2.48         | 0.74         | 110        | 0.983          | 0,962          | 0.75         | 0.50         | 1.04         | 326,66           | 1.45         | 1      | 100        | 1.00         |              | 1.00   |                    | 1.00         | Infin,           | 0,000 | 0.467<br>0.467 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 18.04<br>18.21 |                  | 2.71         | 1.07<br>1.71 | 110<br>110 | 0.992          | 0.962<br>0.962 | 1.08<br>1.72 | 0.50<br>0.58 | 1.03         | 246,22           | 1,65         | 1      | 100        | 1.00         |              |        |                    | 1.00         | Infin.           | 0.000 | 0.466          | Non-Liq.               | Non-Liq, | 0.00         |
| 18.37          |                  | 2.18         | 1.61         | 110        | 1.010          | 0.961          | 1.62         | 0.60         | 1.03         | 164.25<br>130.89 | 1.92<br>1.97 | 1      | 97<br>88   | 1,21<br>1,26 |              | 1.00   |                    | 1.00         | Infin.           | 0.000 | 0.466<br>0.466 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 18.54          |                  | 2.13         | 0.82         | 110        | 1.020          | 0.961          | 0.83         | 0.50         | 1.02         | 248.14           | 1.56         | 1      | 100        | 1.00         |              | 1.00   |                    | 1,00         | Infin.           | 0.000 | 0.466          | Non-Liq.               | Non-Liq. | 0.00         |
| 18.70          |                  | 2.48<br>3.61 | 0.71<br>0.95 | 110<br>110 | 1.029<br>1.038 | 0.960<br>0.960 | 0.71<br>0.95 | 0.50<br>0.50 | 1.01<br>1.01 | 332.78<br>361.60 | 1.43         | 1      | 100<br>100 | 1.00         |              | 1.00   |                    | 1.00         | Infin.<br>Infin. | 0.000 | 0.466<br>0.465 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 19,03          |                  | 3.90         | 0.93         | 110        | 1,047          | 0.960          | 0.93         | 0.50         | 1.01         |                  | 1.47         | 1      | 100        | 1.00         |              | 1.00   | 398.9              | 1.00         | Infin.           | 0.000 | 0.465          | Non-Liq.               | Non-Liq. | 0.00         |
| 19.19          |                  | 4.58<br>4.64 | 1.15<br>1.20 | 110<br>110 | 1,056<br>1,065 | 0.959<br>0.959 | 1.16<br>1.20 | 0.50<br>0.50 | 1.00         |                  | 1.57<br>1.59 | 1      | 100<br>100 | 1.00         |              | 1.00   |                    | 1.00         | Infin.           | 0.000 | 0.465<br>0.465 | Non-Liq.<br>Non-Liq.   |          | 0.00         |
| 19.52          |                  | 4.55         | 1.23         | 110        | 1.074          | 0.958          | 1.24         | 0.50         | 0.99         | 345,03           | 1.61         | 1      | 100        | 1.00         | 1.70         | 1.00   | 346.3              | 0.99         | Infin.           | 0.000 | 0.465          | Non-Liq.               |          | 0.00         |
| 19.69<br>19.85 |                  | 3.09<br>2.52 | 0.87<br>0.74 | 110<br>110 |                | 0.958<br>0.957 | 0.87<br>0.74 | 0.50<br>0.50 | 0.99         |                  | 1.50<br>1.46 | 1      | 100<br>100 | 1.00         |              |        |                    | 0.99         | Infin:<br>Infin: | 0.000 | 0.464<br>0.464 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 20.01          | 342,04           | 2.21         | 0.65         | 110        | 1.101          | 0.957          | 0.65         | 0.50         | 0.98         | 315,93           | 1.42         | 1      | 100        | 1.00         |              |        | 317.1              | 0.98         | Infin.           | 0.000 | 0.464          | Non-Liq.               |          | 0.00         |
| 20.18          |                  | 2.02         | 0.58         | 110<br>110 |                | 0.957<br>0.956 | 0.58         | 0.50<br>0.50 | 0.98<br>0.98 |                  | 1.38         | 1      | 100<br>100 | 1.00         |              |        |                    | 0.98<br>0.98 | Infin.           | 0.000 | 0.465<br>0.467 | Non-Liq.<br>Non-Liq.   |          | 0.00         |
| 20,51          |                  | 2.31         | 0.63         | 110        | 1.115          | 0.956          | 0.63         | 0.50         | 0.97         | 336.65           | 1.39         | 1      | 100        | 1,00         | 2.00         | 1.00   | 337.9              | 0.98         | Infin.           | 0.000 | 0.469          | Non-Liq.               |          | 0.00         |
| 20,67          |                  | 2.25         | 0.56         | 110<br>110 |                | 0.955<br>0.955 | 0.56<br>0.52 | 0.50         | 0.97<br>0.97 |                  | 1.33         | 1      | 100<br>100 | 1.00         |              |        |                    | 0.98         | Infin.<br>Infin. | 0.000 | 0.471<br>0.473 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 21.00          | 411.19           | 1.95         | 0.47         | 110        | 1_126          | 0.954          | 0.48         | 0.50         | 0.97         | 375,65           | 1.27         | 1      | 100        | 1.00         |              |        |                    | 0.98         | Infin.           | 0.000 | 0.474          | Non-Liq.               |          | 0.00         |
| 21.16<br>21.33 |                  | 3.64<br>4.66 | 0.90         | 110<br>110 |                |                | 0.91<br>1.08 |              | 0.97<br>0.97 |                  | 1.48<br>1.53 | 1      | 100<br>100 | 1.00         |              |        |                    | 0.97<br>0.97 | Infin.           | 0.000 | 0.476<br>0.478 | Non-Liq.               |          | 0.00         |
| 21,49          | 469.69           | 5.29         | 1.13         | 110        |                |                | 1.13         |              | 0.96         |                  | 1.52         | 1      | 100        | 1.00         |              |        |                    | 0.97         | Infin            | 0.000 | 0.470          | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 21.65<br>21.82 |                  | 3.56<br>2.37 | 0.95         | 110<br>110 |                |                | 0.95<br>0.71 |              | 0.96<br>0.96 |                  | 1.52         | 1      | 100<br>100 | 1.00         |              |        | 341.3<br>304.6     | 0.97         | Infin.           | 0.000 | 0.482          | Non-Liq.               |          | 0.00         |
| 21.98          | 327.25           | 1.94         | 0.59         | 110        |                |                |              |              | 0.96         |                  | 1.41         | 1      | 100        |              |              |        |                    | 0.97         | Infin.<br>Infin. | 0.000 | 0.483<br>0.485 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 22.15<br>22.31 |                  | 1.70<br>1.69 | 0.51         | 110<br>110 |                |                |              |              | 0.96<br>0.96 |                  | 1.37<br>1.35 | 1      | 100        | 1.00         |              |        |                    | 0.97         | Infin.           | 0.000 | 0.487          | Non-Liq.               |          | 0.00         |
| 22.47          | 342,42           | 1.62         | 0.47         | 110        |                |                |              |              | 0.95         |                  | 1.33         | 1      | 100<br>100 | 1.00<br>1.00 |              |        |                    | 0.96<br>0.96 | Infin.           | 0.000 | 0.489          | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 22.64<br>22.80 |                  | 1.50<br>1.60 | 0.42         | 110<br>110 |                |                |              |              | 0.95         |                  | 1.28         | 1      | 100        |              |              |        | 321.9              |              | Infin:           | 0.000 | 0.492          | Non-Liq.               | Non-Liq. | 0.00         |
| 22,97          | 275.06           | 1.75         | 0.64         | 110        |                |                |              |              | 0.95<br>0.95 |                  | 1.29<br>1.49 | 1      | 100<br>100 |              |              |        | 328.5<br>246.8     | 0.96<br>0.96 | Infin.           | 0.000 | 0.494<br>0.495 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 23.13<br>23.29 |                  | 1.67         | 0.47         | 110        |                |                |              |              | 0.95         |                  | 1.31         | 1      | 100        | 1.00         | 2.80         | 1.00   | 322.1              | 0.96         | Infin.           | 0.000 | 0.497          | Non-Liq.               | Non-Liq  | 0.00         |
| 23.46          | 371.26           | 1.63<br>1.97 | 0.53         | 110<br>110 |                |                |              |              | 0.95<br>0.94 |                  | 1.30<br>1.34 | 1      | 100<br>100 |              |              |        |                    | 0.96<br>0.96 | Infin.           | 0.000 | 0.498<br>0.500 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
|                | 356.90<br>361.74 | 1.94<br>2.11 | 0.54<br>0.58 | 110<br>110 |                |                | 0.54         | 0.50         | 0.94         | 317.18           | 1.36         | 1      | 100        | 1.00         | 2.95         | 1.00   | 318.4              | 0.95         | Infin.           | 0.000 | 0.502          | Non-Liq.               | Non-Liq  | 0.00         |
|                | 364.42           | 2.28         | 0.63         | 110        |                |                |              |              | 0.94<br>0.94 | 320.97<br>322.82 |              | 1      | 100<br>100 |              | 3.00         |        |                    | 0.95<br>0.95 | Infin.<br>Infin. | 0.000 | 0.503<br>0.505 | Non-Liq.<br>Non-Liq.   |          | 0.00         |
| 24.11<br>24.28 |                  | 2.35         | 0.64         | 110        |                |                |              | 0.50         | 0.94         | 325,48           | 1.40         | 1      | 100        | 1.00         | 3.10         | 1.00   | 326.7              | 0.95         | Infin.           | 0.000 | 0.506          | Non-Liq.               | Non-Liq. | 0.00         |
| 24.26          |                  | 2.30<br>2.76 | 0.61         | 110<br>110 |                |                |              |              |              | 332.74<br>348.68 | 1.38<br>1.41 | 1      |            |              | 3.15 3.20    |        |                    | 0.95<br>0.95 | Infin.           | 0.000 | 0.508          | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 24.61          | 439.09           | 2.71         | 0.62         | 110        | 1.212          | 0.943          | 0.62         | 0.50         | 0.93         | 386 66           | 1.34         | 1      | 100        | 1.00         | 3.25         | 1.00   | 388.1              | 0.95         | Infin.           | 0.000 | 0.511          | Non-Liq.               | Non-Liq. | 0.00         |
| 24.77<br>24.93 |                  | 3.14<br>3.64 | 0.64         | 110<br>110 |                |                |              |              |              |                  | 1.32<br>1.33 | 1      |            |              | 3.30         |        |                    | 0.95<br>0.94 | Infin.<br>Infin. | 0.000 | 0.512<br>0.514 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 25.10          | 499.75           | 2.73         | 0.55         | 110        | 1.224          | 0.942          | 0.55         | 0.50         | 0.93         | 438.10           | 1.27         | - 1    | 100        | 1.00         | 3.40         | 1.00   | 439.7              | 0.94         | Infin.           | 0.000 | 0.515          | Non-Liq.               | Non-Liq. | 0.00         |
| 25.26<br>25.43 | 478.20<br>506.69 | 2.89<br>3.13 | 0.60         | 110<br>110 |                |                |              |              |              |                  | 1.31         | 1      |            |              | 3.45         |        |                    | 0.94<br>0.94 |                  | 0.000 | 0.516<br>0.518 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 25.59          | 475.10           | 3.98         | 0.84         | 110        | 1,236          | 0.940          | 0.84         | 0.50         | 0.93         | 414.45           | 1.43         | 1      | 100        | 1.00         | 3.55         | 1.00   | 416.0              | 0.94         | Infin.           | 0.000 | 0.519          | Non-Liq.               | Non-Liq  | 0.00         |
|                | 412.87<br>387.95 | 3.59<br>2.71 | 0.87         | 110<br>110 |                |                |              |              |              |                  | 1.48<br>1.42 | 1      |            |              |              |        |                    | 0.94<br>0.94 |                  | 0.000 | 0.520<br>0.522 | Non-Liq.<br>Non-Liq.   |          | 0.00<br>0.00 |
| 26.08          | 382.12           | 2.49         | 0.65         | 110        | 1.247          | 0.938          | 0.65         | 0.50         | 0.92         | 331.55           | 1.40         | 1      | 100        | 1.00         | 3.65         | 1.00   | 332.8              | 0.94         | Infin.           | 0.000 | 0.523          | Non-Liq.               | Non-Liq  | 0.00         |
| 26.25<br>26.41 | 377.33<br>378.71 | 2.13         | 0.56         | 110<br>110 |                |                |              |              |              |                  | 1.36<br>1.36 | 1      |            |              |              |        |                    | 0.94<br>0.93 |                  |       | 0.524<br>0.526 | Non-Liq.               |          | 0.00         |
| 26.57          | 368,97           | 2.20         | 0.60         | 110        | 1.259          | 0.936          | 0.60         | 0.50         | 0.92         | 318.60           | 1,39         | i      | 100        | 1.00         | 3.65         | 1.00   | 319.8              | 0.93         |                  |       | 0,527          | Non-Liq.<br>Non-Liq.   |          | 0.00         |
| 26.74<br>26.90 | 347.99<br>340.27 | 2.18         | 0.63         | 110<br>110 |                |                |              |              |              |                  | 1.42<br>1.41 | 1      |            |              |              |        |                    | 0.93         |                  |       | 0.528          | Non-Lig.               |          | 0.00         |
| 27.07          | 342.93           | 1.87         | 0.55         | 110        | 1.271          | 0.934          | 0.55         | 0.50         | 0.91         | 294 66           | 1.39         | 1      |            |              |              |        |                    | 0.93<br>0.93 |                  |       | 0.529<br>0.531 | Non-Liq.  <br>Non-Liq. |          | 0.00         |
| 27.23<br>27.40 | 348.32<br>349.36 | 2.14<br>2.35 | 0.62<br>0.67 |            |                |                |              |              |              |                  | 1,42<br>1,45 | 1      |            |              |              |        |                    |              | Infin.           | 0.000 | 0.532          | Non-Liq.               | Non-Liq. | 0.00         |
| 27.56          | 359.08           | 2.55         | 0.71         | 110        | 1.282          | 0.932          | 0.71         | 0.50         | 0.91         | 307.17           | 1.45         | 1      |            |              |              |        | 300.4 (<br>308.3 ( | 0.93         |                  |       | 0.533<br>0.534 | Non-Liq.  <br>Non-Liq. |          | 0.00         |
| 27.72          | 348.61<br>328.38 | 2.28         | 0.65<br>0.69 |            |                |                |              |              |              |                  | 1.44<br>1.47 | 1      | 100        | 1.00         | 3.65         | 1.00 2 | 298,8              | 0.92         | Infin.           | 0.000 | 0.535          | Non-Liq.               | Non-Liq  | 0.00         |
|                | 520,00           | 2.20         | 3.30         |            | 1 E O (        |                | J. 1 U       | J.JU 1       | J. J I       | 213.33           | 1-79/        | - 1    | 100        | 1.00         | 3.65 1       | 1.00 2 | 281.0 (            | J.32         | Infin.           | 0.000 | 0.536          | Non-Liq.               | NOII-LIQ | 0.00         |

| Lay          | er Tip             | Frictio       | n Friction   | Total      | Eff Stres          | s              | _            |              | _            |                  |              | æ      | Liquef.  | Rel.       |              |              |              | Clean              | _            | _                |                | Induced        | Liquefac.            |                            | Volumetric   |
|--------------|--------------------|---------------|--------------|------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|--------|----------|------------|--------------|--------------|--------------|--------------------|--------------|------------------|----------------|----------------|----------------------|----------------------------|--------------|
| De           |                    | Fs            | Ratio        |            | at Midpt           | 00000          | -            | 2627         |              | Corrected        |              | S erid | Suscept  |            | i was        | Н            | 990          | Sand               | 10           |                  | EQ             | M=7.5          | Safety               | Probab                     | Strain       |
| (fe          |                    | (tsf)<br>2.37 | %<br>0.75    | (pcf)      | p'o (tsf)<br>1,294 | 0.930          | 0.75         | 0.50         | 0.90         | Qc1n<br>270_83   | 1,51         | 0      | (0 or 1) | Dr (%)     | 1.00         | (m)<br>3.65  | 1,00         | 271.8              | <b>Κ</b> σ   | Infin.           | 0.000          | 0,538          | Non-Lig              | P <sub>L</sub><br>Non-Liq. | 0.00         |
| 28.          | 22 301,08          | 2,13          | 0.71         | 110        | 1,298              | 0,929          | 0.71         | 0.50         | 0.90         | 255 81           | 1,51         |        | 1        | 100        | 1.00         | 3,65         | 1.00         | 256.8              | 0,92         | Infin_           | 0.000          | 0.539          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 28           |                    |               |              | 110<br>110 | 1,302              | 0.929          | 0.72         | 0.50<br>0.50 | 0.90         | 241.17<br>197.79 | 1,53<br>1,60 |        | 1        | 100        | 1.00         | 3,65<br>3,65 | 1.00         | 242.1<br>198.5     | 0.92         | Infin.           | 0,000          | 0.540<br>0.541 |                      | Non-Liq<br>Non-Liq         | 0.00<br>0.00 |
| 28           |                    |               |              | 110        | 1,310              | 0,927          | 0.72         | 0.50         | 0.90         | 167,50           | 1,65         |        | 1        | 98         | 1.00         | 3,65         | 1.00         | 168.5              | 0,92         | Infin.           | 0,000          | 0.542          | Non-Lig.             | Non-Liq.                   | 0.00         |
| 28,          |                    |               | 0.77<br>1.14 | 110<br>110 | 1,314<br>1,318     | 0.926<br>0.926 | 0,78<br>1,15 | 0.53         | 0.89         | 132.88<br>94.08  | 1,75<br>1,97 |        | 1        | 89<br>74   | 1,07<br>1,26 | 3,65<br>3,65 | 1.00         |                    | 0,92         | 0.349            | 0.320<br>0.218 | 0.543<br>0.544 | 0.59<br>0.40         | 85%<br>95%                 | 1.00<br>1.24 |
| 29.          |                    |               |              | 110        | 1,322              | 0.925          | 1,90         | 0.69         | 0.86         | 56,38            | 2.28         |        | 1        | 53         | 1.89         |              |              |                    | 0.94         |                  | 0.179          | 0,545          | 0.33                 | 98%                        | 1.41         |
| 29.          |                    | 1,25<br>1,04  | 3,30<br>3,72 | 110<br>110 | 1,325<br>1,329     | 0.924<br>0.923 | 3,42<br>3,91 | 0.81<br>0.85 | 0.83         | 28,87<br>20,70   | 2 67<br>2 81 |        | 0        |            |              |              |              |                    | 0,96<br>0,96 |                  |                | 0.546<br>0.547 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 29.0         | 18,87              | 0.73          | 3,87         | 110        | 1,333              | 0.923          | 4.16         | 0.90         | 0.81         | 13,46            | 2.98         |        | 0        |            |              |              |              |                    | 0,95         |                  |                | 0,548          | Non-Liq.             |                            | 0.00         |
| 30.0         |                    | 0.49<br>0.66  |              | 110<br>110 | 1,337<br>1,341     | 0.922<br>0.921 | 3.90<br>7.83 | 0.93<br>1.00 | 0.80<br>0.79 | 9.54<br>6.28     | 3.08<br>3.41 |        | 0        |            |              |              |              |                    | 0,95<br>0.95 |                  |                | 0.549<br>0.550 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 30.          | 8 57,63            | 0.77          | 1,33         | 110        | 1.345              | 0.920          | 1.36         | 0.69         | 0.85         | 45 11            | 2,26         |        | 1        | 44         | 1_84         |              | 1,00         | 83.0               | 0.95         | 0.133            | 0.127          | 0,551          | 0.23                 | 99%                        | 1.77         |
| 30.3         |                    | 0.99          | 0.84         | 110<br>110 | 1,349<br>1,353     | 0.919<br>0.918 | 0.85<br>1.09 | 0.57<br>0.60 | 0.87<br>0.86 | 95.56<br>92.04   | 1.88<br>1.96 |        | 4        | 75<br>73   | 1.17<br>1.25 |              | 1.26<br>1.26 | 141.6<br>146.0     | 0.91         | 0.344            | 0.312<br>0.335 | 0,551<br>0,552 | 0.57<br>0.61         | 87%<br>84%                 | 1.00<br>0,87 |
| 30,6         | 61,97              | 1_48          | 2,39         | 110        | 1,357              | 0,918          | 2,44         | 0.73         | 0.83         | 47.78            | 2,41         |        | 1        | 46         | 2.34         | 0,00         |              |                    | 0.95         | 0.210            |                | 0,553          | 0.36                 | 97%                        | 1.34         |
| 30 8         |                    | 1.22<br>0.26  | 4.64<br>1.81 | 110<br>110 | 1,361<br>1,364     | 0.917<br>0.916 | 4,90         | 0.88<br>0.88 | 0.80         | 18.78<br>9.74    | 2,91<br>2,91 |        | 0        |            |              |              |              |                    | 0.95         |                  |                | 0.554<br>0.555 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 31.1         | 7 13.19            | 0.23          | 1,73         | 110        | 1,368              | 0,915          | 1,93         | 0.89         | 0.80         | 8.89             | 2,94         |        | 0        |            |              |              |              |                    | 0,95         |                  |                | 0,556          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 31.3         |                    | 0.36<br>0.69  | 2,88<br>3,98 | 110<br>110 | 1,372<br>1,376     | 0,914          | 3,24<br>4,33 | 0.93<br>0.92 | 0.78<br>0.79 | 8.24<br>11.79    | 3,08         |        | 0        |            |              |              |              |                    | 0.95         |                  |                | 0.556<br>0.557 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 31.6         |                    | 0.92          | 2,37         | 110        | 1,380              | 0.912          | 2,46         | 0.78         | 0.81         | 28.56            | 2.58         |        | 1        | 25         | 3,20         |              | 1.00         | 91.5               | 0,95         | 0.151            | 0.143          | 0.558          | 0.26                 | 99%                        | 1.63         |
| 31.8         |                    | 1,30<br>1,43  | 3,63<br>2,44 | 110<br>110 | 1,384<br>1,388     | 0,911          | 3.78<br>2.50 | 0.83<br>0.74 | 0.80<br>0.82 | 25.97<br>44.14   | 2.73<br>2.44 |        | 0        | 43         | 2.48         |              | 1.00         | 109.5              | 0.95         | 0.202            | 0.191          | 0.559<br>0.559 | Non-Liq.<br>0.34     | Non-Liq.<br>97%            | 0.00<br>1.37 |
| 32.1         | 5 153,79           | 1.76          | 1.14         | 110        | 1,392              | 0,909          | 1,15         | 0.57         | 0.85         | 123,10           | 1.88         |        | 1        | 85         | 1,17         |              | 1.00         | 145_0              | 0.90         | 0.363            | 0.326          | 0.560          | 0.58                 | 86%                        | 1.00         |
| 32.3<br>32.4 |                    | 2.28<br>2.91  | 0.91<br>1.02 | 110<br>110 | 1,396<br>1,400     | 0.908<br>0.907 | 0.91         | 0.50<br>0.50 | 0.87<br>0.87 | 204.70<br>234.50 | 1,65<br>1,65 |        | 1        | 100<br>100 | 1,01         |              |              |                    | 0,90         | Infin.           | 0.000          | 0.561<br>0.561 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 32.6         | 4 309,86           | 3.53          | 1.14         | 110        | 1,403              | 0.906          | 1.14         | 0.51         | 0.87         | 252,58           | 1.67         |        | 1        | 100        | 1.01         | 1.15         | 1.00         | 257_2              | 0.89         | Infin.           | 0.000          | 0,562          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 32.8         |                    | 3.86<br>4.15  | 1.20<br>1.26 | 110<br>110 | 1,407<br>1,411     | 0.905<br>0.904 | 1.20<br>1.27 | 0.51<br>0.51 | 0.86<br>0.86 | 262,31<br>266,57 | 1.67<br>1.69 |        | 1        | 100<br>100 | 1.02         |              |              |                    | 0.89         | Infin.<br>Infin. | 0.000          | 0.563<br>0.563 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 33.1<br>33.3 |                    | 3.81<br>3.31  | 1.15<br>1.02 | 110<br>110 | 1,415<br>1,419     | 0.903          | 1.16         | 0.50         | 0.86         | 268,83           | 1.65         |        |          | 100        | 1.00         | 1,20         | 1.00         | 271.1              | 0.89         | Infin.           | 0.000          | 0.564          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 33 4         |                    | 3,39          | 1.11         | 110        | 1.419              | 0.902<br>0.901 | 1.02<br>1.11 | 0.50<br>0.51 | 0.86<br>0.86 | 263,54<br>247,92 | 1,62<br>1,66 |        |          | 100<br>100 | 1.00<br>1.01 |              |              |                    | 0.89         | Infin.           | 0.000          | 0.565<br>0.565 | Non-Liq.<br>Non-Liq. | •                          | 0.00         |
| 33.6         |                    | 3.87          | 1.35         | 110        | 1,427              | 0,900          | 1.35         | 0.53         | 0.85         |                  | 1.75         |        |          | 100        | 1.07         | 1.20         | 1.00         | 247.7              | 0.89         | Infin.           | 0,000          | 0.566          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 33.9         |                    | 4.63<br>5.00  | 1,67<br>1,87 | 110<br>110 | 1,431<br>1,435     | 0,899<br>0,898 | 1.68<br>1.88 | 0.56<br>0.57 | 0.85<br>0.84 |                  | 1.83         |        |          | 100<br>100 | 1.13<br>1.17 |              |              |                    | 0.89         | Infin.           | 0,000          | 0.566<br>0.567 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 34.1         |                    | 4.90<br>4.12  | 1.86         | 110        | 1.439<br>1.443     | 0.897          | 1.87         | 0.57         | 0.84         | 207.23           | 1.89         |        |          | 100        | 1.18         |              |              |                    | 0.88         | Infin.           | 0.000          | 0.567          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 34.4         |                    | 3.88          | 1.61<br>1.52 | 110<br>110 | 1.446              | 0.896<br>0.895 | 1.62<br>1.53 | 0.56<br>0.56 | 0.84<br>0.84 |                  | 1.85<br>1.82 |        |          | 100<br>100 | 1,14         |              |              |                    | 0.88<br>0.88 | Infin.           | 0,000          | 0.568<br>0.568 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 34.6         |                    | 3.66<br>3.63  | 1.56<br>1.70 | 110<br>110 | 1.450<br>1.454     | 0.894          | 1.56<br>1.72 | 0.57<br>0.58 | 0.84<br>0.83 |                  | 1.86<br>1.92 |        | 1        | 100<br>98  | 1.15<br>1.21 |              |              |                    | 88.0         | Infin            | 0.000          | 0,569          | Non-Liq.             | Non-Liq                    | 0.00         |
| 34.9         | 4 232.64           | 3.28          | 1.41         | 110        | 1,458              | 0.892          | 1.42         | 0.56         | 0.84         | 182,78           | 1.83         |        | 1        | 100        | 1.13         |              |              |                    | 0.88<br>0.88 | Infin<br>Infin   | 0.000          | 0.569<br>0.570 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 35.1<br>35.2 |                    | 3.08<br>2.85  | 1.15<br>1.04 | 110<br>110 | 1.462<br>1.466     | 0.890          | 1.16<br>1.04 | 0.52<br>0.51 | 0.84<br>0.85 |                  | 1.72<br>1.68 |        |          | 100<br>100 |              |              |              |                    | 0.88<br>0.88 | Infin            | 0.000          | 0.570<br>0.570 | Non-Liq.             |                            | 0.00         |
| 35,4         | 3 276,58           | 3.07          | 1,11         | 110        | 1.470              | 0.888          | 1.12         | 0.52         | 0.84         | 219.36           | 1.70         |        |          | 100        |              |              |              |                    | 0.88         | Infin            | 0.000          | 0.571          | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 35.6<br>35.7 |                    | 3.57<br>5.74  | 1.37<br>2.05 | 110<br>110 | 1.474<br>1.478     | 0.887<br>0.886 | 1.38<br>2.06 | 0.54<br>0.58 | 0.83         |                  | 1.79<br>1.91 |        |          | 100<br>100 |              |              |              |                    | 0.88<br>0.87 | Infin.           | 0.000          | 0.571<br>0.572 | Non-Liq.             |                            | 0.00<br>0.00 |
| 35.9         | 3 323,56           | 6.58          | 2.03         | 110        | 1.482              | 0.885          | 2.04         | 0.57         | 0.83         | 251.42           | 1.87         |        |          | 100        | 1.16         | 1.20         | 1.00         |                    | 0.87         | Infin.           | 0.000          | 0.572          | Non-Liq.             | •                          | 0.00         |
| 36.0         |                    | 6.05<br>3.90  | 3.16<br>1.47 | 110<br>110 | 1.485<br>1.489     | 0.883          | 3.18<br>1.48 | 0.66<br>0.55 | 0.80         |                  | 2,17<br>1,81 |        | 1        | 92<br>100  | 1,59<br>1,11 |              |              |                    | 0.87<br>0.87 | Infin.<br>Infin. | 0.000          | 0.572<br>0.573 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 36.4         |                    | 3,03          | 0.95         | 110        | 1.493              | 0.881          | 0.95         | 0.50         | 0.84         | 253,26           | 1.60         |        | 1        | 100        | 1.00         | 1.05         | 1.00         | 254.2              | 0.87         | Infin.           | 0.000          | 0.573          | Non-Liq.             |                            | 0.00         |
| 36.5<br>36.7 |                    | 3.09          | 0.93         | 110<br>110 | 1.497<br>1.501     | 0.880<br>0.878 | 0.93         | 0.50<br>0.50 | 0.84<br>0.84 |                  | 1.59<br>1.58 |        |          |            |              |              |              |                    | 0.87<br>0.87 | Infin.<br>Infin. | 0.000          | 0.573<br>0.573 | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 36.9         |                    | 4.23          | 1.05         | 110        |                    |                | 1.05         | 0.50         |              |                  | 1.57         |        |          |            |              |              |              |                    | 0.87         |                  | 0.000          | 0.574          | Non-Liq.             |                            | 0.00         |
| 37.0<br>37.2 |                    | 3.77<br>4.78  | 0.93         | 110<br>110 |                    | 0.876<br>0.875 | 1.20         | 0.50         | 0.84         | 319.76           | 1.62         |        |          | 100<br>100 | 1,00         | 1.25         | 100          | 321.0<br>314.9     | 0.87<br>0.87 | Infin.<br>Infin. | 0.000          | 0.574<br>0.574 | Non-Liq.             |                            | 0.00         |
| 37.4<br>37.5 |                    | 5.25          | 1.39         | 110        |                    |                | 1.39         |              |              |                  | 1.69         |        |          |            |              | 1.35         | 1.00         | 306,3              | 0_87         | Infin:           | 0.000          | 0.574          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 37.7         |                    | 4.91<br>3.31  | 1.75<br>1.37 | 110<br>110 |                    |                | 1.75<br>1.38 | 0.56<br>0.55 |              |                  | 1.85<br>1.82 |        |          |            |              |              |              | 248.4<br>207.4     | 0.86         |                  | 0.000          | 0.574<br>0.575 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 37,8<br>38,0 |                    | 2,46<br>2,27  | 1,02<br>0.88 | 110<br>110 |                    |                | 1.03         |              |              |                  | 1.72<br>1.65 |        |          |            |              |              |              | 196.8<br>202.6     |              |                  | 0.000          | 0.575          | Non-Liq.             |                            | 0.00         |
| 38,2         | 2 239.78           | 2.30          | 0.96         | 110        | 1,536              | 0.867          | 0.97         |              |              |                  | 1.70         |        |          |            |              |              |              | 193.5              | 0.86<br>0.86 |                  | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 38,3<br>38,5 |                    | 1.98<br>1.94  | 0.90         | 110<br>110 |                    |                | 0.91<br>0.74 |              |              |                  | 1.71<br>1.59 |        |          |            |              | 1.65<br>1.70 |              | 177.3<br>206.5     | 0.86         |                  | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 38.7         | 1 297.09           | 1.85          | 0.62         | 110        | 1.548              | 0.863          | 0.63         | 0.50         | 0.83         | 230.94           | 1.50         |        | 1        | 100        | 1,00         | 1.75         | 1.00         |                    | 0.86         | Infin.           | 0.000          | 0.575          | Non-Liq.             |                            | 0.00         |
| 38.8         |                    | 1.80<br>2.06  | 0.57<br>0.63 | 110<br>110 |                    |                | 0.58<br>0.63 |              |              |                  | 1.46<br>1.47 |        |          |            |              | 1.80<br>1.85 |              | 243.9<br>255.3     |              |                  | 0.000          | 0.575<br>0.575 | Non-Liq,<br>Non-Liq, | • ***                      | 0.00<br>0.00 |
| 39.2         | 1 337.25           | 2.27          | 0.67         | 110        | 1.560              | 0.859          | 0.67         | 0.50         | 0.82         | 261.32           | 1.49         |        | 1        | 100        | 1.00         | 1_90         | 1.00         | 262.3              | 0.86         | Infin.           | 0.000          | 0.575          | Non-Liq.             | Non-Liq                    | 0.00         |
| 39.3<br>39.5 |                    | 2.32          | 0.66<br>0.60 | 110<br>110 |                    |                | 0.67<br>0.61 |              |              |                  | 1.47<br>1.44 |        |          |            |              | 1.95<br>2.00 |              | 272.0<br>274.8     |              |                  | 0.000          | 0.576<br>0.576 | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 39.7         | 359.55             | 2,27          | 0.63         | 110        | 1.571              | 0.854          | 0.63         | 0.50         | 0.82         | 277.64           | 1.45         |        | 1 .      | 100        | 1.00         | 2.05         | 1.00         | 278.7              | 0.85         | Infin.           | 0.000          | 0.576          | Non-Liq.             | Non-Liq                    | 0.00         |
| 39.8<br>40.0 |                    | 2.53<br>2.75  | 0.71<br>0.82 | 110<br>110 |                    |                | 0.72         |              |              |                  | 1.49<br>1.55 |        |          |            |              | 2.10<br>2.15 |              | 275.4<br>258.7     |              |                  | 0.000          |                | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 40.1<br>40.3 |                    | 2,95          | 0.86         | 110        | 1.583              | 0.850          | 0.86         | 0.50         | 0.82         | 263_17           | 1.56         |        | 1        | 100        | 1.00         | 2.20         | 1.00         | 264.2              | 0.85         | Infin.           | 0.000          | 0.575          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 40.5         | 2 335,17           | 2,87<br>2,88  | 0.83<br>0.86 | 110<br>110 |                    |                |              |              |              |                  | 1.55<br>1.57 |        |          |            |              |              |              | 265.3<br>258.1     |              |                  |                | 0.575<br>0.575 | Non-Liq.             |                            | 0.00         |
| 40.6<br>40.8 |                    | 2.72<br>1.89  | 0.85<br>0.56 | 110        | 1,595              | 0.846          | 0.85         | 0.50         | 0.81         | 245.81           | 1.58         |        | 1 .      | 100        | 1.00         | 2.35         | 1.00         | 246.7              | 0.85         | Infin.           | 0.000          | 0.575          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 41.0         | 382,25             | 2.92          | 0.76         | 110<br>110 |                    |                |              |              |              |                  | 1.43<br>1.49 |        |          |            |              | 2.40<br>2.45 |              | 260.4 (<br>293.4 ( |              |                  |                |                | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 41.1         | 403,21<br>4 379.57 | 3.03<br>3.67  | 0.75<br>0.97 | 110<br>110 |                    |                | 0.76         | 0.50         | 0.81         | 308.04           | 1.47         |        | 1 1      | 100        | 1.00         | 2.50         | 1.00         | 309.2              | 0.85         | Infin.           | 0.000          | 0.575          | Non-Liq.             | Non-Liq                    | 0.00         |
| 41.5         | 396.71             | 3.17          | 0.80         | 110        |                    |                |              |              |              |                  | 1.57<br>1.50 |        |          |            |              |              |              | 290.6 (<br>303.4 ( |              |                  |                |                | Non-Liq.<br>Non-Liq. |                            | 0.00         |
| 41.6         |                    | 3.14<br>3.06  | 0.80<br>0.78 | 110<br>110 |                    |                |              |              |              |                  | 1.50<br>1.50 |        | 1 1      | 100        | 1.00         | 2.65         | 1.00         | 298,9              | 0.84         | Infin.           | 0.000          | 0.574          | Non-Liq.             | Non-Liq                    | 0.00         |
| 41.9         | 382,61             | 2.95          | 0.77         | 110        | 1,626              | 0.834          | 0.78         | 0.50         | 0.81         | 290.47           | 1.50         |        |          |            |              |              | 1.00         | 298.1 (<br>291.6 ( | 0.84         |                  |                |                | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
| 42.10        |                    | 2.84<br>2.80  | 0.75<br>0.73 | 110<br>110 |                    |                |              |              |              |                  | 1.49<br>1.48 |        |          |            |              |              |              | 289.5 (<br>289.8 ( |              |                  |                | 0.574          | Non-Liq.             | Non-Liq.                   | 0.00         |
| 42.4         | 383.78             | 2.53          | 0.66         | 110        | 1.638              | 0.829          | 0.66         | 0.50         | 0.80         | 290.31           | 1.45         |        | 1 1      | 100        | 1.00         | 2.90         | 1.00 2       | 291.4              | 0.84         | Infin.           | 0.000          | 0.573          | Non-Liq.<br>Non-Liq. | Non-Lig                    | 0.00         |
| 42.6<br>42.8 |                    | 2.51<br>2.69  | 0.63<br>0.67 |            |                    |                |              |              |              |                  | 1.43<br>1.44 |        |          |            |              | 2.95<br>3.00 |              | 300.3 (<br>304.2 ( |              |                  |                |                | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00 |
|              | 408.28             | 2.41          | 0.59         |            |                    |                |              |              |              | 307_81           |              |        |          |            | 1.00         |              |              | 309.0              |              |                  | 0.000          |                | Non-Liq.             |                            | 0.00         |

| Layer           | Tip              | Friction      | Friction     | Total        | Eff,Stres          | s              |              |              | _            |                  |              | ą     | Liquef.  | Rel        |              |              |      | Clear          | 1            |                  |                | Induce         | d Liquefac.          |                 | Volumetric   |
|-----------------|------------------|---------------|--------------|--------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|-------|----------|------------|--------------|--------------|------|----------------|--------------|------------------|----------------|----------------|----------------------|-----------------|--------------|
| Depth           | Qc               | Fs            | Ratio        |              | at Midpt           | 7              | _            |              |              | Corrected        |              | /eric | Suscept  |            | 0            | H            | 500  | Sand           |              |                  | EQ             | M=7.5          | Safety               | Probab          | Strain       |
| (feet)<br>43.14 | (tsf)<br>410.18  | (tsf)<br>2.68 | 0,65         | (pcf)<br>110 | p'o (tsf)<br>1,653 | rd<br>0.823    | 0.66         | n<br>0.50    | 0.80         | Qc1n<br>308.88   | lc<br>1.43   | 6     | (0 or 1) | 100        | 1.00         | (m)<br>3.10  | 1,00 | 310.0          |              | Infin.           | 0,000          | 0.572          | Factor<br>Non-Liq.   | P <sub>L</sub>  | 0.00         |
| 43,31           | 413.71           | 2.73          | 0,66         | 110          | 1,657              | 0.821          | 0.66         | 0.50         | 0.80         | 311,18           | 1.43         |       | 1        | 100        | 1.00         | 3,15         | 1,00 | 312.3          | 0,84         | Infin.           | 0,000          | 0,572          | Non-Liq.             |                 | 0.00         |
| 43 47<br>43 64  | 420 65<br>425 34 | 2.58<br>3.15  | 0.61<br>0.74 | 110<br>110   | 1,661<br>1,665     | 0.820<br>0.818 | 0.62<br>0.74 | 0.50         | 0.80         | 316,05<br>319,21 | 1.40<br>1.46 |       | 1        | 100        | 1.00         | 3,20         | 1.00 | 317.2<br>320.4 |              | Infin.           | 0,000          | 0.572<br>0.572 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 43.80           | 433.25           | 2.87          | 0.66         | 110          | 1,669              | 0.816          | 0.67         | 0.50         | 0.80         | 324,78           | 1.42         |       | 1        | 100        | 1.00         | 3,30         | 1,00 | 326.0          | 0.83         | Infin,           | 0,000          | 0,571          | Non-Liq.             | Non-Liq.        | 0.00         |
| 43.96<br>44.13  | 445 49<br>458 14 | 2.84          | 0.64<br>0.45 | 110<br>110   | 1,673<br>1,677     | 0.815<br>0.813 | 0.64<br>0.45 | 0.50         | 0.80         | 333,60<br>342,71 | 1,40<br>1,28 |       | 1        | 100<br>100 | 1.00         | 3,35         | 1.00 | 334.8<br>344.0 |              | Infin.           | 0,000          | 0,571<br>0,571 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 44.29           | 407.19           | 2.23          | 0,55         | 110          | 1,681              | 0.811          | 0.55         | 0.50         | 0.79         | 304.10           | 1,38         |       | 1        | 100        | 1,00         | -3,45        | 1,00 | 305,2          | 0.83         | Infin,           | 0,000          | 0,570          | Non-Liq.             | Non-Liq.        | 0.00         |
| 44.46<br>44.62  | 318.78<br>311.01 | 4.85<br>4.70  | 1,52<br>1,51 | 110<br>110   | 1,685<br>1,689     | 0.810          | 1.53<br>1.52 | 0.54<br>0.55 | 0.78<br>0.77 | 232,72<br>226,57 | 1.79<br>1.79 |       | 1        | 100        | 1.10         | 3,50<br>3,55 | 1.00 | 256 2<br>250 2 |              | Infin,<br>Infin  | 0,000          | 0,570<br>0,569 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 44.78           | 390.54           | 5.84          | 1,50         | 110          | 1.692              | 0.807          | 1.50         | 0.53         | 0.78         | 287.14           | 1.72         |       | 1        | 100        | 1.05         | 3,60         | 1.00 | 303.9          | 0,83         | Infin.           | 0,000          | 0.569          | Non-Liq.             | Non-Liq         | 0.00         |
|                 | 419.57<br>377.69 | 5.18<br>3.17  | 1,23<br>0,84 | 110<br>110   | 1,696<br>1,700     | 0.805<br>0.803 | 1.24<br>0.84 | 0.50         | 0.79         | 311,92<br>280,34 | 1,64<br>1,54 |       | 1        | 100<br>100 | 1.00         | 3.65<br>3.70 | 1.00 | 313.1<br>281.4 |              | Infin.           | 0.000          | 0,569<br>0,568 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 45.28<br>45.44  | 407.75           | 4.13<br>3.86  | 1.01<br>0.98 | 110          | 1.704              | 0.802          | 1.02         | 0.50         | 0.79         | 302,40           | 1,58         |       | 1        | 100        | 1.00         | 3,75         | 1.00 | 303.5          | 0,83         | Infin.           | 0.000          | 0.568          | Non-Liq.             | Non-Liq.        | 0.00         |
|                 | 392.74<br>382.50 | 3.90          | 1,02         | 110<br>110   | 1,708<br>1,712     | 0.800<br>0.798 | 0.99<br>1.02 | 0.50<br>0.50 | 0.79<br>0.79 | 290.89<br>282.94 | 1.58<br>1.60 |       | 1        | 100<br>100 | 1.00         | 3.80<br>3.85 | 1.00 | 292.0<br>284.0 |              | Infin.<br>Infin. | 0.000          | 0,567<br>0,567 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 373 19<br>367 93 | 3.69<br>3.54  | 0.99<br>0.96 | 110<br>110   | 1,716              | 0.797<br>0.795 | 0.99<br>0.97 | 0.50         | 0.79         | 275.71<br>271.49 | 1,59         |       | 1        | 100        | 1.00         | 3.90         | 1.00 | 276.7          |              | Infin.           | 0,000          | 0.567          | Non-Liq.             | Non-Liq.        | 0.00         |
|                 | 369.72           | 3 36          | 0.91         | 110          | 1,720<br>1,724     | 0.793          | 0.91         | 0.50<br>0.50 | 0.78<br>0.78 | 271,49           | 1.59<br>1.57 |       | 1        | 100<br>100 | 1.00         | 3.90         | 1.00 | 272.5<br>273.5 |              | Infin.<br>Infin. | 0,000          | 0,566<br>0,566 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 381.32<br>386.91 | 3.27          | 0.86<br>0.82 | 110<br>110   | 1,728<br>1,731     | 0.792<br>0.790 | 0.86         | 0.50<br>0.50 | 0.78         | 280.78<br>284.59 | 1.54<br>1.53 |       | 1        | 100        | 1.00         | 3,90         | 1,00 | 281.8          |              | Infin:           | 0,000          | 0.565          | Non-Liq.             |                 | 0.00         |
| 46,59           | 380.97           | 3.15          | 0.83         | 110          | 1.735              | 0.788          | 0.83         | 0.50         | 0.78         | 279.88           | 1.53         |       | i        | 100<br>100 | 1.00         | 3.90         | 1.00 | 285.7<br>280.9 |              | Infin,<br>Infin, | 0,000          | 0.565<br>0.564 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 341.92<br>315.47 | 3.27<br>3.20  | 0,96<br>1,01 | 110<br>110   | 1,739<br>1,743     | 0.787<br>0.785 | 0.96<br>1.02 | 0.50<br>0.50 | 0.78<br>0.78 | 250.78<br>230.52 | 1.61<br>1.65 |       | 1        | 100        | 1,00         | 3.90         | 1,00 | 251.7          |              | Infin.           | 0,000          | 0.564          | Non-Liq.             | Non-Liq.        | 0.00         |
| 47.08           | 363.49           | 3.46          | 0.95         | 110          | 1,747              | 0.783          | 0.96         | 0.50         | 0.78         | 266 07           | 1.59         |       | 1        | 100<br>100 | 1,01<br>1,00 | 3,90<br>3,90 | 1,00 | 232.8<br>267.1 | 0.82<br>0.82 | Infin.<br>Infin. | 0,000          | 0.563<br>0.563 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 379,91<br>382,41 | 4.34<br>5.30  | 1.14<br>1.38 | 110<br>110   | 1,751<br>1,755     | 0.782<br>0.780 | 1.15<br>1.39 | 0.50<br>0.52 | 0.78<br>0.77 | 277.81<br>276.50 | 1,64<br>1,71 |       | 1        | 100<br>100 | 1,00         | 3.90         | 1.00 | 277.9<br>289.5 |              | Infin.           | 0,000          | 0.562          | Non-Liq.             |                 | 0.00         |
| 47_57           | 369,25           | 5,87          | 1.59         | 110          | 1_759              | 0.778          | 1.60         | 0.54         | 0.76         | 264.21           | 1.77         |       | i        | 100        | 1,04         | 3.90         | 1.00 | 287.4          |              | Infin.           | 0.000          | 0.562<br>0.561 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 359,68<br>383,68 | 5.73<br>4.97  | 1,59<br>1,29 | 110<br>110   | 1,763<br>1,767     | 0,777<br>0,775 | 1.60<br>1.30 | 0.54<br>0.51 | 0.76<br>0.77 | 256 70<br>277 49 | 1.78<br>1.68 |       | 1        | 100<br>100 | 1,09         | 3.90         | 1.00 | 280.7<br>285.9 | 2.7          | Infin.           | 0.000          | 0.561<br>0.560 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 48.06           | 403.15           | 4.67          | 1.16         | 110          | 1,770              | 0.773          | 1.16         | 0.50         | 0.77         | 293,27           | 1,63         |       | 1        | 100        | 1,00         | 3.90         | 1.00 | 294.4          |              | Infin            | 0.000          | 0.560          | Non-Liq.             |                 | 0.00         |
|                 | 405.14<br>369.68 | 3.95          | 0.97<br>0.81 | 110<br>110   |                    | 0.772<br>0.770 | 0.98<br>0.82 | 0.50<br>0.50 | 0.77<br>0.77 | 294,40<br>268,22 | 1.57<br>1.54 |       | 1        | 100<br>100 | 1.00         | 3.90         | 1.00 | 295.5<br>269.2 |              | Infin.           | 0.000          | 0.559<br>0.559 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 48.56           | 336,91           | 2.26          | 0_67         | 110          | 1.782              | 0.768          | 0.67         | 0.50         | 0.77         | 244.06           | 1,51         |       | 1        | 100        | 1.00         | 3_90         | 1.00 | 245.0          | 0.81         | Infin.           | 0.000          | 0.558          | Non-Liq.             |                 | 0.00         |
|                 | 299.19<br>236.26 | 1.63<br>1.38  | 0,55<br>0,58 | 110<br>110   |                    | 0.767<br>0.765 | 0.55<br>0.59 | 0.50<br>0.50 | 0.77<br>0.77 | 216.35<br>170.38 | 1.49<br>1.58 |       | 1        | 100<br>99  | 1.00         | 3.90         | 1.00 | 217.2<br>171.0 | 0.81         | Infin.<br>Infin. | 0.000          | 0.558<br>0.557 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 49.05           | 139,68           | 1.94          | 1_39         | 110          | 1.794              | 0.763          | 1.41         | 0.62         | 0.72         | 94.13            | 2.03         |       | 1        | 74         | 1.34         | 0.00         | 1.00 | 125.9          | 0.81         | 0.265            | 0.215          | 0.556          | 0.39                 | 96%             | 1.16         |
| 49.21<br>49.38  | 65.30<br>49.82   | 2.32          | 3.55<br>4.03 | 110<br>110   |                    | 0.762<br>0.760 | 3.65<br>4.18 | 0.78<br>0.82 | 0.66<br>0.64 |                  | 2.58         |       | 1        | 38         | 3.23         |              | 1.00 | 128.1          | 0.90         | 0.276            | 0.248          | 0.556<br>0.555 | 0.45<br>Non-Liq.     | 93%<br>Non-Lig  | 1.14<br>0.00 |
| 49.54           | 44.18            | 1.88          | 4.26         | 110          | 1,806              | 0.758          | 4.44         | 0.84         | 0.64         | 25.53            | 2.78         |       | 0        |            |              |              |      |                | 0.90         |                  |                | 0.555          | Non-Liq.             | Non-Liq.        | 0.00         |
| 49.70<br>49.87  | 52 54<br>96 95   | 2 11 2 31     | 4.01<br>2.38 | 110<br>110   |                    | 0.757<br>0.755 | 4.15<br>2.42 | 0.82<br>0.71 | 0.64<br>0.68 |                  | 2,70<br>2,32 |       | 0        | 57         | 2,03         |              | 1.00 | 124.7          | 0.90         | 0.260            | 0,222          | 0.554<br>0.553 | Non-Liq.<br>0.40     | Non-Liq.<br>95% | 0.00<br>1.18 |
|                 | 125,29<br>125,58 | 2.02          | 1,61<br>1,65 | 110<br>110   |                    | 0.753<br>0.752 | 1.64<br>1.67 | 0.64<br>0.64 | 0.71<br>0.70 |                  | 2.11<br>2.12 |       | 1        | 69         | 1,48         |              | 1.00 | 122,2          | 0.85         | 0.250            | 0.212          | 0.553          | 0.38                 | 96%             | 1.21         |
|                 | 128 65           | 2.24          | 1.74         | 110          |                    |                | 1.77         | 0.65         | 0.70         |                  | 2.13         |       | i        | 69<br>70   | 1,49<br>1,51 |              | 1.00 | 123.1<br>127.4 | 0.85<br>0.85 | 0.253<br>0.272   | 0.215          | 0.552<br>0.552 | 0.39<br>0.42         | 96%<br>95%      | 1.19<br>1.14 |
|                 | 128,05<br>127.87 | 2,41          | 1.88<br>1.99 | 110<br>110   |                    | 0.748<br>0.747 | 1.91<br>2.02 | 0.66         | 0.70         |                  | 2.16<br>2.18 |       | 1        | 69<br>69   | 1.57<br>1.61 |              | 1.00 | 130,7<br>133,4 | 0.85         | 0.288            | 0.244          | 0.551          | 0.44                 | 94%             | 1.11         |
| 0.85            | 127.22           | 2,50          | 1.97         | 110          |                    | 0.745          | 2.00         | 0.66         | 0.69         |                  | 2.17         |       | i        | 69         | 1.61         |              | 1.00 | 132,2          | 0.85<br>0.85 | 0.301<br>0.295   | 0.255<br>0.250 | 0.550<br>0.550 | 0.46<br>0.45         | 93%<br>93%      | 1.08<br>1.09 |
|                 | 120.78<br>116.72 | 2 43          | 2.02         | 110<br>110   |                    | 0,743<br>0,742 | 2.05         | 0.67<br>0.67 | 0.69         |                  | 2.20         |       | 1        | 66<br>65   | 1.67<br>1.72 |              | 1.00 | 129.4<br>128.3 | 0.85<br>0.85 | 0.282            | 0.239          | 0.549<br>0.549 | 0.43                 | 94%             | 1.12         |
| 1.35            | 117.01           | 2.42          | 2.07         | 110          |                    |                | 2.10         | 0.67         | 0.69         |                  | 2.22         |       | i        | 65         | 1.72         |              | 1.00 | 128 4          | 0.85         | 0.277            | 0.234          | 0.548          | 0.43<br>0.43         | 94%<br>94%      | 1.13<br>1.13 |
|                 | 117.05<br>118.36 | 2.54          | 2.17         | 110<br>110   |                    |                | 2.20<br>2.15 | 0.68<br>0.68 | 0.68         |                  | 2 24<br>2 22 |       | 1        | 65<br>65   | 1.76<br>1.73 |              | 1.00 | 130.9<br>130.3 | 0.85<br>0.84 | 0,289<br>0,286   | 0.244          | 0.547<br>0.547 | 0.45<br>0.44         | 94%<br>94%      | 1.10         |
| 1.84            | 121.19           | 2.58          | 2.13         | 110          | 1.860              | 0.735          | 2.16         | 0.67         | 0.68         | 77.11            | 2.22         |       | i        | 66         | 1.71         |              | 1.00 | 132.2          |              | 0.295            | 0.249          | 0.546          | 0.46                 | 93%             | 1.11<br>1.09 |
| 2.00 ·          | 128.21<br>129.58 | 2,29          | 1.78<br>2.06 | 110<br>110   |                    |                |              |              | 0.69         |                  | 2.14         |       | 1        | 69<br>69   | 1.54<br>1.64 |              | 1.00 | 127.2<br>135.4 |              | 0,271<br>0.311   | 0 229<br>0 262 | 0.545<br>0.545 | 0.42<br>0.48         | 95%<br>92%      | 1.15<br>1.06 |
| 2,33            | 98.86            | 2.96          | 2,99         | 110          |                    |                |              | 0.73         | 0.66         |                  | 2.40         |       | 1        |            | 2.31         |              |      | 139.7          | 0.84         | 0.333            |                | 0.544          | 0.52                 | 90%             | 1.01         |
| 2 49<br>2 66    | 61.64<br>47.03   | 2.40<br>1.60  | 3.89<br>3.41 | 110<br>110   |                    |                |              | 0.80<br>0.82 | 0.63<br>0.62 |                  | 2.65<br>2.70 |       | 0        |            |              |              |      |                | 0.89         |                  |                | 0.543<br>0.543 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 2.82<br>2.99    | 25.94<br>23.82   | 1.33          | 5 12<br>4 58 | 110          |                    |                |              |              | 0.59         |                  | 3.06         |       | 0        |            |              |              |      |                | 0.89         |                  |                | 0.542          | Non-Liq.             | Non-Liq         | 0.00         |
| 3.15            | 25.73            | 0.89          | 3.46         | 110<br>110   |                    |                |              |              | 0.58<br>0.60 |                  | 3.06<br>2.95 |       | 0        |            |              |              |      |                | 0.89         |                  |                | 0.542<br>0.541 | Non-Liq.<br>Non-Liq. |                 | 0.00         |
| 3,31<br>3,48    | 17.66<br>15.40   | 0.88          | 4.99<br>5.10 | 110<br>110   |                    |                |              |              | 0.57<br>0.56 |                  | 3.22<br>3.28 |       | 0        |            |              |              |      |                | 0.89         |                  |                | 0.540          | Non-Liq.             | Non-Liq         | 0.00         |
| 3,64            | 16,91            | 0.99          | 5.82         | 110          | 1.903              | 0.717          | 6.56         |              | 0.56         | 7.92             | 3.28         |       | 0        |            |              |              |      |                | 0.89<br>0.89 |                  |                | 0.540<br>0.539 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 3.81<br>3.97    | 21.62<br>61.80   | 1,39<br>1,89  | 6.41<br>3.06 | 110<br>110   |                    |                |              |              | 0.56<br>0.63 |                  | 3.20<br>2.58 |       | 0        | 34         | 3.18         |              | 1 00 | 113.6          | 0.89<br>0.89 | 0,216            | 0.192          | 0,538<br>0,538 | Non-Liq.<br>0.36     | Non-Liq<br>97%  | 0.00<br>1.31 |
| 4.13            | 169.40           | 2.67          | 1.58         | 110          | 1_915              | 0.712          | 1.60         | 0.61         | 0.70         | 110.04           | 2.02         |       | i        |            | 1.32         |              |      | 145.4          | 0.79         | 0.366            | 0.192          | 0.537          | 0.54                 | 89%             | 0.88         |
|                 | 205.29<br>216.51 | 3.08          | 1.50<br>1.63 | 110<br>110   |                    |                |              |              |              |                  | 1,94<br>1.95 |       | 1        |            |              |              |      | 242.4<br>257.6 | 0.79<br>0.79 | Infin.           | 0.000          | 0.536<br>0.536 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 4,63 2          | 226.53           | 3,84          | 1.70         | 110          | 1.927              | 0.708          | 1.71         | 0.59         | 0.70         | 148.83           | 1.95         |       | 1        | 93         | 1.24         | 0.25         | 1,46 | 269.2          | 0.79         | Infin.           | 0.000          | 0.535          | Non-Liq.             |                 | 0.00         |
|                 | 253.78<br>261.07 | 4,49<br>5.47  | 1.77         | 110<br>110   |                    |                |              |              | 0.70<br>0.70 |                  | 1.93<br>1.98 |       | 1        |            |              |              |      | 297.4<br>317.1 | 0.79<br>0.79 | Infin.           | 0.000          | 0,534<br>0.534 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 5.12 2          | 254.36           | 6.20          | 2.44         | 110          | 1.938              | 0.703          | 2.46         | 0.62         | 0.69         | 163.85           | 2.04         |       | 1        | 97         | 1.36         |              | 1.00 | 222.6          | 0.78         | Infin.           | 0.000          | 0.533          | Non-Liq.             | Non-Liq.        | 0.00         |
|                 | 242,98<br>210.76 | 6.44<br>5.98  | 2.65<br>2.84 | 110<br>110   |                    |                |              |              |              |                  | 2.09<br>2.15 |       | 1        |            | 1.43<br>1.56 |              |      | 221.5<br>206.2 |              | Infin.<br>Infin. | 0.000          | 0.532<br>0.532 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 5,61 1          |                  | 5.45<br>4.96  | 3.03         | 110          | 1,950              | 0.698          | 3.06         | 0.67         | 0.66         | 111.22           | 2.22         |       | 1        | 81         | 1.72         |              | 1.00 | 191.6          | 0.78         | Infin.           | 0.000          | 0.531          | Non-Liq.             | Non-Liq         | 0.00         |
| 5,94 1          | 30,91            | 4.35          | 3.21<br>3.32 | 110<br>110   |                    |                |              |              | 0.65<br>0.64 |                  | 2.29<br>2.35 |       | 1        |            | 1.92<br>2.13 |              |      | 180.2<br>167.3 |              | Infin.<br>Infin. | 0.000          | 0.530<br>0.530 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 11.46<br>89.53   | 3.85          | 3,45<br>3,44 | 110          | 1.962              | 0.694          | 3.52         | 0.73         | 0.64         | 65.80            | 2,42         |       | 1        | 59         | 2.39         |              | 1.00 | 157.1          | 0.83         | 0.441            | 0.366          | 0.529          | 0.69                 | 77%             | 0.60         |
| 3.43            | 70.63            | 2.41          | 3.41         | 110<br>110   | 1.970              | 0.691          | 3.51         |              | 0.63<br>0.62 | 39.99            | 2.49<br>2.57 |       | 1        |            | 2.72<br>3.15 |              |      | 140.9<br>125.9 |              | 0.340<br>0.266   | 0.301<br>0.235 | 0.528<br>0.528 | 0.57<br>0.44         | 87%<br>94%      | 1.00<br>1.16 |
| 6.59<br>6.76    | 55.06<br>39.94   | 1.89<br>1.59  | 3.43         | 110<br>110   |                    |                | 3.55         | 0.81         | 0.60<br>0.59 | 30,35            | 2,66         |       | 0        |            |              |              |      |                | 0.88         |                  |                | 0,527          | Non-Liq.             | Non-Liq.        | 0.00         |
| 5.92            | 26.94            | 1.16          | 4.32         | 110          | 1.981              | 0.686          | 4.66         | 0.91         | 0.56         | 13.32            | 2,83<br>3,01 |       | 0        |            |              |              |      |                | 0.88<br>0.88 |                  |                | 0.526<br>0.526 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 24.31<br>17.67   | 0.74<br>0.69  | 3.02         | 110<br>110   |                    |                |              |              | 0.57<br>0.55 |                  | 2.95<br>3.17 |       | 0        |            |              |              |      |                | 0.88         |                  |                | 0.525          | Non-Liq.             | Non-Liq.        | 0.00         |
| 7.41            | 17.34            | 0.73          | 4.18         | 110          | 1,993              | 0.682          | 4.72         | 0.97         | 0.54         | 7_86             | 3.20         |       | 0        |            |              |              |      |                | 0.88<br>0.88 |                  |                | 0.524<br>0.524 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
|                 | 19.61<br>24.98   | 0.61          | 3.11<br>2.45 | 110<br>110   |                    |                |              |              | 0.56<br>0.57 |                  | 3.06<br>2.89 |       | 0        |            |              |              |      |                | 88.0<br>88.0 |                  |                | 0.523<br>0.523 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00 |
| 7.91            | 19.44            | 0.61          | 3.14         | 110          | 2.005              | 0.678          | 3.50         | 0.93         | 0.55         | 9.10             | 3.07         |       | 0        |            |              |              |      |                | 88.0         |                  |                | 0.522          | Non-Liq.             | Non-Liq.        | 0.00         |
| 8.07            | 18.43            | 0.58          | 3.12         | 110          | 2.009              | 0.676          | 3.50         | 0.94         | 0.55         | 8.52             | 3.09         |       | 0        |            |              |              |      |                | 0.88         |                  |                | 0.521          | Non-Liq.             | Non-Liq.        | 0.00         |

| Layer  | Tip    | Friction | Friction | Total    | Eff.Stress | S     |      |      |      |           |      | 9    | Liquef.  | Rel    |      |     |      | Clean |      |       |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|----------|------------|-------|------|------|------|-----------|------|------|----------|--------|------|-----|------|-------|------|-------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt. | at Midpt.  |       |      |      |      | Corrected | Ė    | in s | Suscept  | Dens.  |      | H   |      | Sand  |      |       | EQ    | M=7.5   | Safety    | Probab   | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)    | p'o (tsf)  | rd    | F    | n    | Ca   | Qc1n      | Ic   | ó    | (0 or 1) | Dr (%) | Kc   | (m) | KH   | Qc1n  | Κσ   | CRR75 | CRR   | CSR     | Factor    | P        | (%)        |
| 58.23  | 17.22  | 0.56     | 3.23     | 110      | 2,013      | 0,675 | 3,66 | 0.95 | 0,54 | 7,81      | 3,13 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.521   | Non-Lig.  | Non-Lig  | 0.00       |
| 58 40  | 17,30  | 0.55     | 3.17     | 110      | 2.016      | 0.673 | 3.59 | 0.95 | 0.54 | 7,85      | 3,13 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.520   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.56  | 18.04  | 0.54     | 2,97     | 110      | 2,020      | 0.672 | 3.35 | 0.94 | 0.55 | 8,27      | 3,09 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0:519   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.73  | 16.07  | 0.52     | 3,22     | 110      | 2,024      | 0.671 | 3.69 | 0.96 | 0.54 | 7.13      | 3,17 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.519   | Non-Liq.  | Non-Liq. | 0.00       |
| 58.89  | 15.75  | 0.49     | 3,08     | 110      | 2,028      | 0.669 | 3,53 | 0.96 | 0.54 | 6.95      | 3,17 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.518   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.06  | 15.86  | 0.51     | 3,23     | 110      | 2.032      | 0.668 | 3,71 | 0.96 | 0,53 | 6.98      | 3.18 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0,517   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.22  | 17.14  | 0.64     | 3.71     | 110      | 2,036      | 0.666 | 4.21 | 0.96 | 0.53 | 7.61      | 3.18 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.517   | Non-Liq.  | Non-Lig  | 0.00       |
| 59.38  | 19,02  | 1.05     | 5.54     | 110      | 2.040      | 0.665 | 6.21 | 0.98 | 0.53 | 8.43      | 3.24 |      | 0        |        |      | 1   |      |       | 0.88 |       |       | 0.516   | Non-Liq.  | Non-Liq. | 0.00       |
| 59.55  | 50,85  | 1.55     | 3.04     | 110      | 2.044      | 0.664 | 3.17 | 0.81 | 0.59 | 27.10     | 2.67 |      | 0        |        |      |     |      |       | 0.88 |       |       | 0.516   | Non-Liq.  | Non-Lig. | 0.00       |
| 59.71  | 71.44  | 1.83     | 2.56     | 110      | 2,048      | 0.662 | 2.64 | 0.75 | 0.61 | 39.86     | 2 49 |      | 1        | 39     | 2.71 |     | 1,00 | 107.9 | 0.88 | 0,197 | 0.172 | 0.515   | 0.33      | 97%      | 1.38       |
| 59.88  | 152.33 | 2.73     | 1.79     | 110      | 2,052      | 0.661 | 1.81 | 0.64 | 0.65 | 92.95     | 2.11 |      | 1        | 74     | 1.47 |     | 1.00 | 136.5 | 0.77 | 0.316 | 0.243 | 0.514   | 0.47      | 92%      | 1.04       |
|        | 157.44 | 0.00     | 0_00     | 110      | 2.055      | 0,660 | 0,00 | 0.75 | 0.61 | 88.95     | 2.49 |      | 1        | 72     | 1.00 |     | 1.00 | 89.0  | 0.77 | 0.145 | 0.112 | 0.514   | 0.22      | 99%      | 1.66       |
| 60.20  | 137.47 | 0.00     | 0.00     | 110      | 2,059      | 0,658 | 0.00 | 0.75 | 0.61 | 77.55     | 2.48 |      | 1        | 66     | 1.00 |     | 1.00 | 77.6  | 0.82 | 0.123 | 0.101 | 0.513   | 0.20      | 100%     | 1.86       |

Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

|                | •                          | lob No:<br>Date:    | 301953<br>8/14/20 | -001         | thool No.          |                |              | Med          | thods:       | Liquefact<br>Post-lique<br>Dry San | uefactio           | n S              | ettleme            | nt Ana     | ılysis fı    | om To              | kimats       | u & See                        | d (198       | 17)             | & Wride        | )              |                      |                           | Total<br>Liquefied<br>Thickness |
|----------------|----------------------------|---------------------|-------------------|--------------|--------------------|----------------|--------------|--------------|--------------|------------------------------------|--------------------|------------------|--------------------|------------|--------------|--------------------|--------------|--------------------------------|--------------|-----------------|----------------|----------------|----------------------|---------------------------|---------------------------------|
| EARTH          | QUAKE                      |                     | IATION:           |              | Plot:              | 4              |              |              |              | (M=7.5):                           |                    |                  |                    | p'o)*rd    | /MSF         |                    |              |                                |              |                 |                |                |                      |                           | (feet)<br>3.8                   |
|                | Ma                         | gnitude:<br>PGA, g: |                   | 7.5<br>0.75  |                    |                |              | CI           | ean Sa       | ınd Qc1n                           | = C <sub>0</sub> * | K <sub>c</sub> * | K <sub>H</sub> *Qc |            | U            |                    |              | <sub>7,5</sub> *Kσ/C<br>& Seed |              | Ishihara        | a &Yosh        | mine (1):      | 0                    | Probab                    | Total<br>Induced                |
| -              | GV                         | MSF:<br>VT, feet:   | 1,30              |              |                    |                | _            |              |              | ted soils:                         |                    | pc               |                    |            |              |                    |              |                                | Min SF       | of Lia          |                | uired SF:      | 1.50<br>0.24         | 3%<br>Max                 | Subsidence<br>(inches)          |
| Layer          | esign GV<br>Tip            | VT, feet:           | 20.0<br>Friction  | Total        | Eff.Stress         |                |              |              |              | ble soils:                         |                    | Ĺ                |                    |            | iting Ic     | for K <sub>H</sub> | 2.0          | ,                              |              |                 |                | Layers:        | 0.05                 | 99%                       | 0.5                             |
| Depth          | Qc                         | Fs                  | Ratio             | Unit Wt,     | at Midpt,          |                |              |              |              | Corrected                          |                    | eric             | Liquef.<br>Suscept | Dens       |              | Н                  |              | Clean<br>Sand                  |              |                 | EQ             | M=7.5          | Liquefac.<br>Safety  | Probab                    | Volumetric<br>Strain            |
| (feet)<br>0.16 | (tsf)<br>92.62             | (tsf)               | 1.20              | (pcf)<br>110 | p'o (tsf)<br>0,009 | rd<br>1,000    | 1,20         | n<br>0.56    | 1.70         | Qc1n<br>148,81                     | 1.84               | Ó                | (0 or 1)           | Dr (%)     | 1_13         | (m)<br>0.25        | 1.00         | Qc1n                           | 1.00         | CRR7            | 0.000          | 0.485          | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Lig | 0.00                            |
| 0.33<br>0.49   | 130.04<br>152.39           | 2.02<br>3.01        | 1.55<br>1.98      | 110<br>110   | 0.018              | 1.000          | 1.55<br>1.98 | 0.55<br>0.57 | 1.70<br>1.70 | 208,92<br>244,82                   | 1.82<br>1.86       |                  | 1                  | 100<br>100 | 1.12<br>1.16 | 0.25               |              | 234,3<br>282,8                 | 1.00         | Infin.          | 0.000          | 0.485<br>0.485 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00                    |
| 0.66<br>0.82   | 146.45<br>125.63           | 3.22<br>2.97        | 2.20<br>2.36      | 110<br>110   | 0.036              | 1,000          | 2.20<br>2.36 | 0.58<br>0.60 | 1.70<br>1.70 | 235,26<br>201,79                   | 1.91<br>1.97       |                  | 1                  | 100        | 1,20<br>1,27 | 0.25<br>0.25       | 1,00         | 282,0<br>255.7                 | 1.00         | Infin.          | 0.000          | 0.485<br>0.485 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 0.98<br>1.15   | 97.23<br>63.94             | 2.48<br>1.59        | 2.55              | 110<br>110   | 0,054              | 1,000          | 2.55<br>2.50 | 0 63<br>0 66 | 1.70<br>1.70 | 156.14<br>102.64                   | 2.07               |                  | 1                  | 95<br>78   | 1.40         | 0,20               | 1.00         | 218.4<br>165.7                 | 1,00         | Infin.          | 0.000          | 0.485<br>0.484 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 1.31           | 63.94<br>41.59             | 1.59                | 2.49              | 110<br>110   | 0.072              | 0.999          | 2.50<br>2.62 | 0.66<br>0.70 | 1.70         | 102.62<br>66.70                    | 2.18               |                  | 1                  | 78<br>60   | 1.61         |                    | 1.00         | 165,7<br>134.8                 | 1.00         | Infin.<br>0.308 | 0.000          | 0_484          | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 1.64           | 28.11                      | 0.74                | 2.64              | 110<br>110   | 0.090              | 0,998          | 2,64         | 0.74         | 1.70         | 45.02                              | 2.45               |                  | 1                  | 44         | 2,52         |                    | 1.00         | 113.6                          | 1.00         | 0.216           | 0.216          | 0.484          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 1.80           | 21.63                      | 0.56                | 2.55              | 110          | 0.108              | 0.998          | 2,57         | 0.77         | 1.70         | 33 20<br>34 58                     | 2.54               |                  | 1                  | 31<br>33   | 2,98         |                    | 1.00         | 98.9<br>101.1                  | 1.00         | 0.170<br>0.176  | 0.170<br>0.176 | 0.484<br>0.484 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 2.13           | 34.59<br>34.08             | 0.78                | 2.25              | 110<br>110   | 0.126              | 0.997          | 2 26         | 0.71         | 1.70<br>1.70 | 55,39<br>54,56                     | 2.34               |                  | 4                  | 52<br>52   | 2.07         |                    | 1.00         | 114.6<br>123.0                 | 1.00         | 0,220<br>0,253  | 0.220<br>0.253 | 0.483<br>0.483 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 2.46<br>2.62   | 31.06<br>26.71             | 0.81                | 2.60<br>2.65      | 110<br>110   | 0.144              | 0.996<br>0.996 | 2,61<br>2,67 | 0.73<br>0.75 | 1.70<br>1.70 | 49 69<br>42 69                     | 2.41<br>2.47       |                  | 1                  | 48<br>42   | 2,37<br>2,62 |                    | 1.00<br>1.00 | 117.7<br>111.6                 | 1.00         | 0.231<br>0.209  | 0.231<br>0.209 | 0.483<br>0.483 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 2.79<br>2.95   | 24.66<br>22.66             | 0.64                | 2.61<br>2.60      | 110<br>110   | 0.162              | 0.996<br>0.995 | 2.62<br>2.62 | 0.76<br>0.76 | 1.70<br>1.70 | 39.38<br>36.15                     | 2 49<br>2 52       |                  | 1                  | 38<br>35   | 2.72<br>2.86 |                    | 1.00<br>1.00 | 107.1<br>103.4                 | 1.00         | 0.194<br>0.183  | 0.194<br>0.183 | 0.483<br>0.482 | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 3.12<br>3.28   | 21.79<br>20.52             | 0.57<br>0.55        | 2.60<br>2.69      | 110<br>110   | 0.180              | 0 995<br>0 994 | 2.62<br>2.72 | 0.77<br>0.78 | 1.70<br>1.70 | 34.74<br>32.68                     | 2.53<br>2.56       |                  | 1                  | 33<br>30   | 2.93<br>3.10 |                    | 1,00<br>1,00 | 101.7<br>101.3                 | 1.00         | 0.178<br>0.177  | 0.178<br>0.177 | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 3.44<br>3.61   | 18.85<br>16.96             | 0.54<br>0.52        | 2.86<br>3.05      | 110<br>110   |                    | 0.994<br>0.994 | 2.89<br>3.09 | 0.79<br>0.81 | 1.70<br>1.70 | 29.98<br>26.93                     | 2.61<br>2.66       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.482<br>0.482 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 3.77<br>3.94   | 15.22<br>13.60             | 0.50<br>0.54        | 3.30<br>3.97      | 110<br>110   |                    | 0.993<br>0.993 | 3.34<br>4.03 | 0.82<br>0.85 | 1.70<br>1.70 | 24,12<br>21,50                     | 2,72<br>2,81       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.482<br>0.481 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 4.10<br>4.27   | 13.10<br>13.76             | 0.56<br>0.61        | 4.31<br>4.45      | 110<br>110   |                    | 0.993<br>0.992 | 4.38<br>4.52 | 0.86<br>0.86 | 1.70<br>1.70 | 20.69<br>21.73                     | 2.85<br>2.84       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.481<br>0.481 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 4.43<br>4.59   | 12.78<br>9.82              | 0.63<br>0.62        | 4.94<br>6.32      | 110<br>110   |                    | 0.992          | 5.03<br>6.49 | 0.88<br>0.93 | 1.70<br>1.70 | 20.14<br>15.37                     | 2.90<br>3.06       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.481<br>0.481 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 4.76<br>4.92   | 9.11<br>9.64               | 0.58<br>0.67        | 6.39<br>6.94      | 110<br>110   |                    | 0.991<br>0.991 | 6.58<br>7.14 | 0.93<br>0.94 | 1.70<br>1.70 | 14,22<br>15,05                     | 3.09               |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.480<br>0.480 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 5.09<br>5.25   | 11.05<br>26.79             | 0.51<br>0.51        | 4.60<br>1.91      | 110<br>110   |                    | 0.990          | 4.72<br>1.93 | 0.89<br>0.72 | 1.70<br>1.70 | 17.31<br>42.58                     | 2.93<br>2.38       |                  | 0                  | 41         | 2.22         |                    | 1.00         | 94.7                           | 1.00         | 0.159           | 0.159          | 0.480<br>0.480 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 5.41<br>5.58   | 43.87<br>61.57             | 0.61<br>0.87        | 1.40<br>1.42      | 110<br>110   | 0.298              | 0.989<br>0.989 | 1.41<br>1.42 | 0.65<br>0.61 | 1.70<br>1.70 | 70 01<br>98 44                     | 2 12<br>2 02       |                  | 1                  | 62<br>76   | 1,50<br>1,32 |                    | 1.00         | 105.0<br>130.2                 | 1.00         | 0.188<br>0.285  | 0.188<br>0.285 | 0.480<br>0.479 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                            |
| 5 74<br>5 91   | 81.48<br>104.49            | 1.27<br>1.77        | 1.55<br>1.69      | 110<br>110   | 0.316              | 0.989<br>0.988 | 1.56<br>1.70 | 0.60         | 1.70<br>1.70 | 130.42<br>167.37                   | 1.96<br>1.91       |                  | 1                  | 88<br>98   | 1.25         | 1.00<br>1.05       |              | 163.4<br>201.7                 | 1.00         | Infin.          | 0.000          | 0.479<br>0.479 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 6.07<br>6.23   | 121.74<br>129.40           | 2.26<br>2.54        | 1.85<br>1.96      | 110<br>110   | 0.334              | 0.988<br>0.988 | 1.86<br>1.97 | 0.58<br>0.58 | 1.70<br>1.70 | 195.08<br>207.37                   | 1.90               |                  | 1                  | 100<br>100 | 1.19         | 1.10               | 1.00         | 232.8<br>248.1                 | 1.00         | Infin.          | 0.000          | 0.479          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 6.40<br>6.56   | 133.71<br>136.13           | 2.63                | 1.97              | 110<br>110   | 0.352              | 0.987<br>0.987 | 1.98<br>1.97 | 0.58<br>0.57 | 1.70<br>1.70 | 214 28<br>218 15                   | 1.90<br>1.89       |                  | 1                  | 100        | 1.18         | 1.20               | 1.00         |                                | 1.00         | Infin.          | 0.000          | 0 479<br>0 478 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                            |
| 6.73<br>6.89   | 137.04<br>134.61           | 2.50                | 1.82              | 110<br>110   | 0.370              | 0.986<br>0.986 | 1.83         | 0.57         | 1.70<br>1.70 | 219 60<br>215 68                   | 1.86<br>1.84       |                  | 1                  | 100        | 1.16<br>1.14 | 1.20               | 1.00         | 254.6                          | 1.00         | Infin.          | 0.000          | 0.478<br>0.478 | Non-Liq.             | Non-Liq.                  | 0.00<br>0.00                    |
| 7.05<br>7.22   | 133.55<br>130.84           | 2.02                | 1.51              | 110<br>110   | 0.388              |                | 1.52         | 0.55         |              | 213.97<br>209.60                   | 1.81               |                  | i                  | 100        | 1.11         |                    | 1.00         | 238.6<br>233.0                 | 1.00         | Infin.          | 0.000          |                | Non-Liq.             | Non-Liq                   | 0.00                            |
| 7.38<br>7.55   | 125.34<br>121.32           | 1.72                | 1.37              | 110<br>110   | 0.406              | 0.985<br>0.985 | 1.38         |              |              | 199.24                             | 1.79               |                  | 1                  | 100        | 1.10         | 1.20               | 1.00         | 220.4                          | 1.00         | Infin.          | 0.000          | 0.478          | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 7.71<br>7.87   | 121.32<br>121.32<br>117.69 | 1.59                | 1.31<br>1.25      | 110<br>110   | 0.424              | 0.984          | 1.32         | 0.55         | 1.65         | 188.35                             | 1.79               |                  | 1                  | 100        | 1.10         | 1.20               | 1.00         |                                | 1.00         | Infin.          | 0.000          | 0.477          | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                            |
| 8.04<br>8.20   | 112.60                     | 1.47                | 1.22              | 110          | 0.442              |                | 1.25         | 0.55         | 1.63         | 180.43<br>170.99                   | 1.79               |                  | 1                  | 100<br>99  | 1.10         | 1.20               | 1.00         | 189.9                          |              | Infin.          | 0.000          | 0.477<br>0.477 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 8.37           | 94.02                      | 1.25                | 1.18              | 110<br>110   | 0.460              | 0.983          | 1.19         | 0.56         | 1.60         |                                    | 1.85               |                  | 1                  | 96<br>91   | 1.12         | 1.20               | 1.00         | 161.8                          | 1.00         | Infin.          | 0.000          | 0,477          | Non-Liq.             | Non-Liq                   | 0.00                            |
| 8.53<br>8.69   | 82.35<br>75.19             | 0.71                | 0.86              | 110<br>110   | 0.478              | 0.982          | 0.86         | 0.56         | 1.56         | 121.02<br>110.51                   | 1.81<br>1.85       |                  | 1                  | 85<br>81   | 1.11         | 1,20               |              |                                | 1.00         | 0.309           | 0.309          | 0.476<br>0.476 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 8.86<br>9.02   | 63,26<br>59,99             | 0.61                | 0.97              | 110<br>110   | 0.496              | 0.982<br>0.981 | 0.97         | 0.59         | 1.57<br>1.56 | 93.45<br>87.95                     | 1.93<br>1.94       |                  | 1                  | 74<br>71   | 1.21         | 1.20               | 1.00         | 113.9<br>108.8                 | 1.00         | 0.200           | 0.200          | 0.476          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 9.19<br>9.35   | 56.32<br>53.37             | 0.53                | 0.94              | 110<br>110   | 0.514              | 0.981<br>0.981 | 0.94<br>0.86 |              | 1.55<br>1.54 | 81.99<br>76.78                     | 1,96<br>1,96       |                  | 1                  | 69<br>66   | 1.25<br>1.25 | 1,20<br>1,20       | 1.00<br>1.00 | 96.4                           |              | 0.182<br>0.163  | 0.182<br>0.163 | 0.476<br>0.475 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 9.51<br>9.68   | 48.12<br>43.46             | 0.39                | 0.82<br>0.81      | 110<br>110   | 0.532              | 0.980<br>0.980 | 0.83<br>0.82 | 0.62         | 1.53<br>1.53 | 68.86<br>61.93                     | 1.99<br>2.03       |                  | 1                  | 61<br>57   | 1.29<br>1.34 | 1,20               | 1.00         | 82.7                           |              | 0.145<br>0.133  |                | 0,475<br>0,475 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 9.84<br>10.01  | 43.28<br>40.37             | 0.29<br>0.42        | 0.68<br>1.04      | 110<br>110   | 0.550              |                | 0.69<br>1.05 | 0.64         | 1.50<br>1.52 | 60.60<br>57.28                     | 1.99<br>2.12       |                  | 1                  | 56<br>54   | 1.29<br>1.48 | 0.05               | 1.71<br>1.00 |                                | 1.00         | 0.137           | 0.137          | 0.475<br>0.475 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 10.17<br>10.33 | 38.85<br>35.99             | 0.35<br>0.37        | 0.91<br>1.03      | 110<br>110   | 0.568              |                | 0.92<br>1.05 | 0.66         | 1.50<br>1.50 | 54.36<br>50.33                     | 2.10<br>2.16       |                  | 1                  | 52<br>48   | 1.46<br>1.58 |                    | 1.00<br>1.00 |                                |              | 0.126<br>0.126  | 0.126<br>0.126 | 0.475<br>0.474 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 10.50<br>10.66 | 35.23<br>32.68             | 0.33<br>0.32        | 0.94<br>0.98      | 110<br>110   |                    | 0.978<br>0.978 | 0.96<br>0.99 |              | 1.48<br>1.48 | 48.64<br>44.89                     | 2.15<br>2.19       |                  | 1                  | 47<br>44   | 1.55<br>1.64 |                    | 1.00<br>1.00 |                                |              | 0.120<br>0.117  | 0.120<br>0.117 | 0.474<br>0.474 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 10.83<br>10.99 | 29.98<br>26.35             | 0.30<br>0.27        | 0.99              | 110<br>110   |                    |                | 1.01<br>1.04 |              | 1.47<br>1.47 | 40.94<br>35.85                     | 2.22<br>2.28       |                  | 1                  | 40<br>34   | 1.73<br>1.89 |                    | 1.00<br>1.00 |                                |              | 0.113<br>0.109  |                | 0.474<br>0.474 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 11.15<br>11.32 | 21.42<br>14.65             | 0.31<br>0.21        | 1.43<br>1.40      | 110<br>110   |                    | 0.977<br>0.977 | 1.48<br>1.46 |              | 1.50<br>1.51 | 29.41<br>20.05                     | 2,44<br>2,57       |                  | 1                  | 26<br>10   | 2.47<br>3.16 |                    | 1.00         |                                | 1.00         | 0.115<br>0.104  | 0.115          | 0.474<br>0.473 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 11.48<br>11.65 | 9.05<br>7.19               | 0.21<br>0.20        | 2.30<br>2.77      | 110<br>110   | 0.632              |                | 2.47<br>3.04 | 0.87         | 1.57<br>1.58 | 12.46<br>9.77                      | 2.87<br>3.01       |                  | 0                  |            |              |                    |              |                                | 1.00<br>1.00 |                 |                | 0.473<br>0.473 | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00                            |
| 11.81<br>11.98 | 2.70<br>2.65               | 0.13<br>0.12        | 4.89<br>4.64      | 110<br>110   | 0,650              |                | 6.44<br>6.18 | 1.00         | 1.63<br>1.61 | 3.16                               | 3.60<br>3.60       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.473<br>0.473 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 12.14<br>12.30 | 3.48<br>2.50               | 0.11                | 3.10<br>3.84      | 110<br>110   | 0.668              | 0.975<br>0.974 | 3.84         | 1.00         | 1.58<br>1.56 | 4.21                               | 3.37<br>3.61       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.473          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 12.47<br>12.63 | 1.85<br>1.79               | 0.11                | 5.73<br>7.43      | 110<br>110   | 0.686              |                | 9.10         | 1.00         | 1.54<br>1.52 | 1.70                               | 3.90<br>4.00       |                  | 0                  |            |              |                    |              |                                | 1.00         |                 |                | 0.472          | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 12.80          | 5.10                       | 0.29                | 5.59              | 110          |                    | 973            |              |              | 1.50         |                                    | 3.36               |                  | o                  |            |              |                    |              |                                | 1.00         |                 |                | 0.472          | Non-Liq.             |                           | 0.00                            |

| Layer          | Tip              | Friction     | Friction     | Total      | Eff Stres      | s              |              | _            |              |                  | _            | 9   | Liquef.  | Rel        |              | _                      | -    | Clean              |              |                  |                | Induced        | Liquefac.                |          | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|-----|----------|------------|--------------|------------------------|------|--------------------|--------------|------------------|----------------|----------------|--------------------------|----------|--------------|
| Depth          |                  | Fs           | Ratio        |            | at Midpt       |                |              |              |              | Corrected        | d            | - 0 | Suscept  |            |              | Н                      |      | Sand               |              |                  | EQ             | M=7.5          | Safety                   | Probab.  | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Cq           | Qc1n             | lc           | ó   | (0 or 1) | Dr (%)     | Kc           | (m)                    | KH   | Qc1n               | Κσ           | CRR75            | CRR            | CSR            | Factor                   | PL       | (%)          |
| 12 96<br>13 12 | 30,82<br>81,21   | 0.58         | 1,88<br>1,36 | 110<br>110 | 0.713          | 0,973          | 1,92         | 0.73         | 1.34         | 38,00            | 2.42         |     | 1        | 37         | 2.37         |                        | 1.00 | 90_3               | 1.00         | 0.148            | 0.148          | 0,472          |                          | Non-Liq. | 0.00         |
| 13.12          | 92.10            | 1.26         | 1,36         | 110        | 0.722<br>0.731 | 0,973<br>0,972 | 1,37<br>1,38 | 0.61<br>0.60 | 1.26<br>1.25 | 96,14<br>107,89  | 2.01<br>1.98 |     | 1        | 75<br>80   | 1.32         | 1,00                   | 1.00 |                    | 1.00         | 0.269            | 0.269          | 0.472<br>0.471 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 13.45          | 131,97           | 1,30         | 0,99         | 110        | 0,740          | 0.972          | 0,99         | 0.54         | 1.21         | 150 49           | 1,77         |     | 1        | 94         | 1.09         | 1.05                   | 1.00 |                    | 1.00         | Infin            | 0,000          | 0.471          | Non-Liq.                 |          | 0.00         |
| 13.62<br>13.78 | 176,29<br>208,26 | 1.68<br>2.28 | 0,95<br>1,09 | 110<br>110 | 0,749<br>0,758 | 0.972<br>0.971 | 0.96<br>1.10 | 0.51<br>0.51 | 1.19         | 198 00<br>232 55 | 1,68<br>1,68 |     | 1        | 100        | 1.02         | 1,10                   | 1,00 |                    | 1,00         | Infin.           | 0,000          | 0.471          | Non-Liq.                 |          | 0.00         |
| 13.94          | 234.75           | 2.60         | 1.11         | 110        | 0.767          | 0.971          | 1.11         | 0.50         | 1.18         | 259 95           | 1.65         |     | 1        | 100<br>100 | 1.02         | 1,15<br>1,20           | 1.00 |                    | 1,00         | Infin.           | 0,000          | 0.471<br>0.471 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 14.11          | 244.80           | 2,82         | 1.15         | 110        | 0.776          | 0.971          | 1.16         | 0.50         | 1.17         | 269 60           | 1,65         |     | 1        | 100        | 1,00         | 1.25                   | 1,00 |                    | 1,00         | Infin.           | 0,000          | 0.471          | Non-Liq.                 |          | 0.00         |
| 14.27<br>14.44 | 272.06<br>294.29 | 2.98         | 1.09<br>1.14 | 110<br>110 | 0,785<br>0,794 | 0.970<br>0.970 | 1.10<br>1.14 | 0.50<br>0.50 | 1.16<br>1.15 | 297.68<br>320.23 | 1,61<br>1,60 |     | 1        | 100<br>100 | 1.00         | 1.30<br>1.35           | 1,00 | 298.8<br>321.4     | 1.00         | Infin.           | 0,000          | 0,470<br>0,470 | Non-Liq.                 |          | 0.00         |
| 14.60          | 316,23           | 3.17         | 1,00         | 110        | 0.803          | 0.970          | 1.00         | 0.50         | 1.15         | 342 22           | 1.54         |     | 1        | 100        | 1.00         |                        | 1.00 |                    | 1.00         | Infin            | 0.000          | 0.470          | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 14.76<br>14.93 | 316,63<br>294,75 | 3.35         | 1.06<br>1.16 | 110<br>110 | 0.812          | 0.969          | 1.06         | 0.50         | 1.14         | 340,73           | 1.56         |     | 1        | 100        | 1.00         |                        | 1.00 |                    | 1.00         | Infin            | 0.000          | 0,470          | Non-Liq.                 | Non-Liq. | 0.00         |
| 15.09          | 278.02           | 3.48         | 1,15         | 110        | 0.821<br>0.830 | 0,969          | 1.16<br>1.25 | 0.50<br>0.50 | 1.14         | 315.37<br>296.09 | 1,61<br>1,65 |     | 1        | 100        | 1.00<br>1.01 |                        | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0,470<br>0,470 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 15,26          | 279,30           | 3,53         | 1,26         | 110        | 0.839          | 0,968          | 1.27         | 0.51         | 1.12         | 295.90           | 1.66         |     | 1        | 100        | 1.01         |                        | 1.00 |                    | 1.00         | Infin_           | 0.000          | 0.469          | Non-Liq.                 |          | 0.00         |
| 15 42<br>15 58 | 288.00<br>292.46 | 3.58<br>3.59 | 1.24         | 110<br>110 | 0,848<br>0,857 | 0,968<br>0,967 | 1.25         | 0.50         | 1.12         | 303.25           | 1.65         |     | 1        | 100        | 1.00         | 1.5                    | 1.00 |                    | 1,00         | Infin.           | 0,000          | 0.469          | Non-Liq.                 |          | 0.00         |
| 15.75          | 272.56           | 3.89         | 1.43         | 110        | 0.866          | 0.967          | 1.43         | 0.52         | 1:11         | 306,22<br>285,01 | 1.64<br>1.71 |     | 1        | 100        | 1.00         | 100                    | 1.00 |                    | 1.00         | Infin.           | 0,000          | 0.469<br>0.469 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 15.91          | 276,67           | 3.59         | 1.30         | 110        | 0,875          | 0.967          | 1.30         | 0.51         | 1.10         | 287_18           | 1,67         |     | 1        | 100        | 1.02         | 1.55                   | 1.00 | 294.2              | 1.00         | Infin.           | 0,000          | 0.469          | Non-Liq.                 |          | 0.00         |
| 16.08<br>16.24 | 273.17<br>281.27 | 3.92<br>3.86 | 1.44<br>1.37 | 110<br>110 | 0,884<br>0,893 | 0.966<br>0.966 | 1.44<br>1.38 | 0.52<br>0.52 | 1.10         | 282,65<br>289,18 | 1.71<br>1.69 |     | 1        | 100<br>100 | 1.05         |                        | 1.00 |                    | 1.00         | Infin.           | 0,000          | 0.468          | Non-Liq.                 |          | 0.00         |
| 16.40          | 308 06           | 4,92         | 1.60         | 110        | 0,902          | 0.966          | 1.60         | 0.53         | 1.09         | 315,65           | 1.72         |     | 1        | 100        | 1.05         |                        | 1.00 |                    | 1,00         | Infin            | 0.000          | 0.468<br>0.468 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 16.57          | 298.32           | 4.41         | 1.48         | 110        | 0.911          | 0.965          | 1.48         | 0.52         | 1.08         | 303,79           | 1,71         |     | 1        | 100        | 1,04         |                        | 1,00 |                    | 1.00         | Infin.           | 0,000          | 0_468          | Non-Liq.                 | Non-Liq. | 0.00         |
| 16.73<br>16.90 | 317.60<br>332.36 | 4.08<br>5.17 | 1,28<br>1,56 | 110<br>110 | 0,920<br>0,929 | 0,965          | 1.29<br>1.56 | 0.50<br>0.52 | 1.07<br>1.07 | 320,96<br>335,03 | 1.64<br>1.70 |     | 1        | 100<br>100 | 1,00         |                        | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0.468<br>0.468 | Non-Liq.                 |          | 0.00         |
| 17,06          | 338.43           | 6.36         | 1.88         | 110        | 0.938          | 0,964          | 1,88         | 0.54         | 1.07         | 340,25           | 1.76         |     | i        |            |              |                        | 1.00 |                    | 1,00         | Infin            | 0.000          | 0.468          | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 17.22<br>17.39 | 307,99<br>269,28 | 5.82<br>4.43 | 1,89<br>1,64 | 110<br>110 | 0.947          | 0.964          | 1,90         | 0.55         | 1.06         | 308,23           | 1.79         |     | 1        |            | 1.10         |                        | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0.467          | Non-Liq.                 | Non-Liq. | 0.00         |
| 17.55          | 257.64           | 3.38         | 1.31         | 110        | 0,956          | 0.963<br>0.963 | 1.65<br>1.32 | 0.54<br>0.52 | 1.06<br>1.05 | 267,85<br>254,47 | 1.78<br>1.71 |     | 1        | 100<br>100 | 1,09         |                        | 1.00 | 7.0                | 1.00         | Infin<br>Infin   | 0.000          | 0 467<br>0 467 | Non-Liq,<br>Non-Liq,     |          | 0.00<br>0.00 |
| 17.72          | 229.45           | 3.27         | 1.42         | 110        | 0.974          | 0.963          | 1,43         | 0.54         | 1.05         | 225.75           | 1.77         |     | 1        | 100        | 1.09         | 1.55                   | 1.00 | 246,1              | 1,00         | Infin            | 0,000          | 0.467          | Non-Liq.                 |          | 0.00         |
| 17.88<br>18.04 | 185.15<br>157.27 | 3.15<br>2.43 | 1,70<br>1,54 | 110<br>110 | 0,983<br>0,992 | 0.962<br>0.962 | 1.71<br>1.55 | 0.58<br>0.58 | 1.04         | 181.55<br>153.30 | 1.89<br>1.91 |     | 1        | 100<br>95  | 1.18         |                        |      |                    | 1.00         | Infin            | 0,000          | 0.467          | Non-Liq.                 |          | 0.00         |
| 18.21          | 172,27           | 2.97         | 1.72         | 110        | 1.001          | 0.962          | 1.73         | 0.58         | 1.04         |                  | 1.91         |     | 1        |            | 1,20         | 19.00                  | 1.00 |                    | 1.00<br>1.00 | Infin.<br>Infin. | 0.000          | 0 466<br>0 466 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 18,37          | 148.03           | 3,30         | 2.23         | 110        | 1.010          | 0.961          | 2.24         | 0.62         | 1.03         |                  | 2.05         |     | 1        |            | 1,37         |                        | 1.00 | 195.6              | 1.00         | Infin.           | 0.000          | 0.466          | Non-Liq.                 |          | 0.00         |
| 18.54<br>18.70 | 212.42<br>249.14 | 3.34<br>2.81 | 1.57<br>1.13 | 110<br>110 | 1.020<br>1.029 | 0.961<br>0.960 | 1.58<br>1.13 | 0.56<br>0.51 | 1.02         |                  | 1.83<br>1.68 |     |          |            | 1.13         |                        | 1.00 |                    | 1.00         | Infin.<br>Infin. | 0.000          | 0.466<br>0.466 | Non-Liq.                 |          | 0.00         |
| 18,86          | 254,49           | 2,69         | 1.06         | 110        | 1.038          | 0.960          | 1_06         | 0.50         | 1.01         |                  | 1.65         |     |          |            | 1.01         |                        | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0.465          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 19.03          | 249.73<br>253.62 | 2.74         | 1.10<br>1.15 | 110<br>110 | 1.047<br>1.056 |                | 1.10         | 0.51         | 1.01         |                  | 1.67         |     |          |            |              |                        | 1.00 |                    | 1.00         | Infin.           | 0.000          | 0.465          | Non-Liq.                 | Non-Liq. | 0.00         |
| 19.36          | 260.64           | 3.02         | 1.16         | 110        |                | 0.959<br>0.959 | 1.15<br>1.16 | 0.51<br>0.51 | 1.00         |                  | 1.68<br>1.68 |     |          |            | 1.03         |                        | 1.00 |                    | 1.00         | Infin.<br>Infin. | 0.000          | 0 465<br>0 465 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 19,52          | 261,87           | 3.10         | 1.18         | 110        | 1.074          | 0.958          | 1.19         | 0.51         | 0.99         | 244,64           | 1.69         |     |          |            | 1.03         |                        |      |                    | 0.99         | Infin.           | 0.000          | 0.465          | Non-Liq.                 |          | 0.00         |
| 19,69          | 270.64<br>280.85 | 2.97<br>3.04 | 1.10         | 110<br>110 |                |                | 1.10         | 0.50         | 0.99         |                  | 1.65<br>1.64 |     |          |            |              |                        |      |                    | 0.99         | Infin:           | 0.000          | 0.464          | Non-Liq.                 |          | 0.00         |
| 20,01          | 294.22           | 3.15         | 1.07         | 110        |                |                | 1.07         | 0.50         | 0.98         |                  | 1.62         |     | 1/2      |            |              |                        |      |                    | 0.99<br>0.98 | Infin.           | 0.000          | 0 464<br>0 464 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 20.18          | 298.62           | 3.34         | 1.12         | 110        |                |                | 1.12         | 0.50         | 0.98         |                  | 1.64         |     |          |            |              |                        |      | 276,0              | 0.98         | Infin.           | 0.000          | 0.465          | Non-Liq.                 | Non-Liq. | 0.00         |
| 20.34          | 302,63<br>308,19 | 3.48<br>3.65 | 1.15         | 110<br>110 |                |                | 1.15<br>1.19 | 0.50<br>0.50 | 0.98<br>0.97 |                  | 1.64<br>1.65 |     |          |            |              |                        |      |                    | 0.98<br>0.98 |                  | 0.000          | 0.467<br>0.469 | Non-Liq.                 |          | 0.00         |
| 20.67          | 305.25           | 4.01         | 1_31         | 110        |                |                | 1,32         | 0.51         | 0.97         |                  | 1.69         |     |          |            |              |                        |      |                    | 0.98         |                  | 0.000          | 0.471          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 20.83          | 298,17<br>287,29 | 3,98         | 1.33         | 110<br>110 |                |                | 1.34         |              |              |                  | 1.70         |     |          |            |              |                        |      |                    | 0.98         |                  | 0.000          | 0,473          | Non-Liq.                 | Non-Liq  | 0.00         |
| 21.16          | 276.16           | 2.37         | 0.86         | 110        |                |                | 1.17<br>0.86 |              | 0.97<br>0.97 |                  | 1.66<br>1.57 |     |          |            |              |                        |      |                    | 0.98<br>0.97 |                  | 0.000          | 0,474<br>0,476 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 21,33          | 269.03           | 2,09         | 0.78         | 110        | 1.134          | 0.954          | 0.78         | 0.50         | 0.97         |                  | 1.55         |     |          |            |              |                        |      |                    | 0.97         | 100              | 0.000          | 0.478          | Non-Liq.                 |          | 0.00         |
| 21.49<br>21.65 | 271.73<br>275.51 | 1.47<br>1.48 | 0.54         | 110<br>110 |                |                | 0.54<br>0.54 |              | 0.96<br>0.96 |                  | 1.44<br>1.43 |     |          |            |              |                        |      |                    | 0.97         |                  | 0.000          | 0.480          | Non-Liq.                 |          | 0.00         |
| 21.82          | 269.27           | 1.33         | 0.49         | 110        |                |                | 0.50         |              |              |                  | 1.42         |     |          |            |              | 1.95                   |      | 250.6<br>244.4     | 0.97<br>0.97 |                  | 0.000          | 0.482<br>0.483 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
|                | 254.35           | 1.56         | 0,61         | 110        |                |                | 0.61         |              |              |                  | 1.50         |     |          |            |              | 2.05                   |      |                    | 0.97         | Infin.           | 0.000          | 0.485          | Non-Liq.                 |          | 0.00         |
| 22.15          | 231.17<br>179.26 | 1.90         | 0.82<br>1.46 | 110<br>110 |                |                | 0.82<br>1.47 |              |              |                  | 1.62<br>1.88 |     |          |            |              | 2.10                   |      | 209.0<br>187.7     |              |                  | 0.000          | 0.487<br>0.489 | Non-Liq.<br>Non-Liq.     |          | 0.00<br>0.00 |
| 22,47          | 221.58           | 3,22         | 1.45         | 110        | 1.161          | 0.950          | 1.46         | 0.55         | 0.95         | 197.87           | 1.82         |     |          |            | 1.12         | 2.20                   | 1.00 |                    | 0.96         |                  | 0.000          | 0.490          | Non-Liq.                 |          | 0.00         |
| 22.64<br>22.80 | 225.46<br>232.74 | 3,74<br>4,18 | 1,66         | 110<br>110 |                |                | 1.67<br>1.80 |              | 0.95<br>0.94 |                  | 1.86<br>1.87 |     |          |            |              | 2.25                   |      | 231,7              |              |                  | 0.000          | 0.492          | Non-Liq.                 |          | 0.00         |
| 22.97          | 236.02           | 4.51         | 1.91         | 110        |                |                | 1,92         |              |              |                  | 1.89         |     |          |            |              | 2.30                   |      | 241.8 (<br>248.2 ( | 0.96<br>0.96 |                  | 0.000          | 0.494<br>0.495 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 23.13          | 239.32           | 4.59         | 1.92         | 110        |                |                | 1,93         |              |              |                  | 1.89         |     | 1        | 100        | 1.18         | 2,40                   | 1.00 | 250.8              | 0.96         | Infin.           | 0.000          | 0.497          | Non-Liq.                 |          | 0.00         |
|                | 244.53<br>258.17 | 4.64<br>4.62 | 1.90<br>1.79 | 110<br>110 |                |                | 1,91<br>1,80 |              |              |                  | 1.88<br>1.85 |     |          |            |              | 2.45                   |      | 254.0 (<br>261.4 ( | 0.96<br>0.96 |                  | 0.000          | 0.498<br>0.500 | Non-Liq.<br>Non-Liq.     |          | 0.00         |
| 23.62          | 286.18           | 4.32         | 1.51         | 110        | 1.189          |                | 1.51         |              |              |                  | 1.76         |     |          |            |              | 2.55                   |      | 274.0              |              |                  | 0.000          | 0,502          | Non-Liq.                 |          | 0.00         |
| 23.79          | 333,44<br>392,53 | 4.00<br>3.80 | 1.20         | 110        |                |                |              |              |              |                  | 1.64         |     |          |            |              |                        |      |                    | 95           | Infin.           | 0.000          | 0.503          | Non-Liq.                 | Non-Liq  | 0.00         |
|                | 462.47           | 4.16         | 0.97<br>0.90 | 110<br>110 |                |                |              |              |              |                  | 1.52<br>1.45 |     |          |            |              |                        |      | 349.1 (<br>410.8 ( |              |                  | 0.000<br>0.000 | 0.505          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
|                | 467.10           | 5.33         | 1.14         | 110        | 1,204          | 0.945          | 1.14         | 0.50         | 0.94         | 412.73           | 1.54         |     | 4 .      |            |              |                        | 1.00 | 414.3              | 95           |                  |                | 0.508          | Non-Liq.                 |          | 0.00         |
|                | 447.32<br>439.29 | 4.90<br>6.79 | 1.09         | 110<br>110 |                |                |              |              |              |                  | 1.53         |     |          |            |              |                        |      | 396.0              |              |                  |                | 0.509          | Non-Liq.                 |          | 0.00         |
|                | 455.61           | 4.85         | 1.07         | 110        |                |                |              |              |              |                  | 1.66<br>1.52 |     |          |            |              |                        |      | 392.9 (<br>402.1 ( | 0.95         |                  |                | 0.511<br>0.512 | Non-Liq.                 |          | 0.00         |
|                | 451.26           | 5.70         | 1.26         | 110        |                |                |              |              | 0.93         | 396.12           | 1.58         |     | 1 .      | 100 1      | 1.00         | 2.95                   | 1_00 | 397.6              | 0.94         | Infin.           | 0.000          | 0.514          | Non-Liq.                 |          | 0.00         |
|                | 407.93<br>378.75 | 4.55<br>4.01 | 1.11         | 110<br>110 |                |                |              |              |              |                  | 1.57<br>1.57 |     |          |            |              | 3.00 °                 |      | 358.7 (<br>332.5 ( |              |                  |                | 0.515<br>0.516 | Non-Liq.                 |          | 0.00         |
| 25.43          | 353.85           | 3.37         | 0.95         | 110        |                |                |              |              |              |                  | 1.55         |     |          |            |              | 3.10                   |      | 310.0              |              |                  |                | 0.518          | Non-Liq.<br>Non-Liq.     |          | 0.00         |
|                | 340,03<br>328,46 | 2.76<br>3.20 | 0.81         | 110        |                |                |              |              |              |                  | 1:51         |     |          |            |              | 3,15                   |      | 297.4 (            |              |                  |                | 0.519          | Non-Liq.                 | Non-Liq. | 0.00         |
| 25 92          |                  | 3.29         | 0.97<br>1.03 | 110<br>110 |                |                |              |              |              |                  | 1.58<br>1.60 |     |          |            |              | 3.20 °                 |      | 286.8 (<br>278.8 ( |              |                  |                | 0.520<br>0.522 | Non-Liq.  <br>Non-Liq.   |          | 0.00         |
| 26.08          | 333,74           | 3.88         | 1.16         | 110        | 1.247          | 0.938          | 1.17         | 0.50         | 0.92         | 289 43           | 1,64         |     | 1 1      | 100 1      | .00          | 3,20 1                 | 1.00 | 290.5 (            | 94           | Infin            | 0.000          | 0,523          | Non-Liq.                 |          | 0.00         |
|                | 351.56<br>345.28 | 3.87<br>4.26 | 1.10<br>1.23 | 110<br>110 |                |                |              |              |              |                  | 1.60<br>1.65 |     |          |            |              | 3,20 1<br>3,20 1       |      | 305.6 (            |              |                  |                | 0.524          | Non-Liq.                 |          | 0.00         |
| 26.57          | 347.75           | 3,84         | 1.10         | 110        | 1.259          |                |              |              |              |                  | 1.61         |     |          |            |              |                        |      | 3013 (             |              |                  |                | 0.526<br>0.527 | Non-Liq.  <br>Non-Liq.   |          | 0.00<br>0.00 |
|                | 367.05           | 3.31         | 0.90         | 110        |                |                |              |              |              | 316.44           | 1.52         |     | 1 1      | 100 1      | .00          | 3.20 1                 | 1.00 | 317.6              | 0.93         | Infin            | 0.000          | 0,528          | Non-Liq. I               | Non-Liq  | 0.00         |
|                | 372.59<br>374.52 | 3.04         | 0.82<br>0.76 | 110<br>110 |                |                |              |              |              |                  | 1.49<br>1.47 |     |          |            |              | 3 20    1<br>3 20    1 |      | 321.9 (<br>323.1 ( |              |                  |                | 0.529<br>0.531 | Non-Liq.  <br>Non-Liq.   |          | 0.00<br>0.00 |
| 27.23          | 377.61           | 3.03         | 0.80         | 110        | 1,275          | 0.934          | 0.80         | 0.50         | 0.91         | 324.07           | 1.48         |     | 1 1      | 00 1       | .00          | 3.20 1                 | .00  | 325.3              | 93           | Infin.           | 0.000          | 0.532          | Non-Liq. I               |          | 0.00         |
|                | 381 19<br>399 40 |              | 1.03<br>1.27 | 110<br>110 |                |                |              |              |              |                  | 1.56<br>1.62 |     |          |            |              | 3.20 1                 |      | 327.9              |              |                  |                | 0.533          | Non-Liq. I               |          | 0.00         |
| 27.72          | 375.52           | 4.69         | 1.25         | 110        | 1.286          | 0.932          |              |              |              |                  | 1.63         |     |          |            |              | 3,20 1<br>3,20 1       |      | 343.1 C            |              |                  |                | 0.534<br>0.535 | Non-Liq. I<br>Non-Liq. I |          | 0.00         |
| 27.89          | 347.76           | 3.01         | 0.86         | 110        | 1 290          | 0.931 (        | 0.87         | 0.50         | 0.91         | 296.54           | 1.53         |     | 1 1      | 00 1       |              |                        |      | 297.6              |              | Infin.           |                |                | Non-Liq.                 |          | 0.00         |
|                |                  |              |              |            |                |                |              |              |              |                  |              |     |          |            |              |                        |      |                    |              |                  |                |                |                          |          |              |

| Layer           | Tip              | Friction     | Friction     | n Total    | Eff,Stres      | s              |                    |                      |                  |              | 0     | Liquef.             | Rel        | -            |              |              | Clear          | 1            | _                |                | Induce         | Liquefac             |                      | Volumetric    |
|-----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------------|----------------------|------------------|--------------|-------|---------------------|------------|--------------|--------------|--------------|----------------|--------------|------------------|----------------|----------------|----------------------|----------------------|---------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt       | rd             | F                  | n Co                 | Correcte<br>Qc1n | d<br>Ic      | /erid | Suscept<br>(0 or 1) | Dens       | K.           | H<br>(m)     | KH           | Sand<br>Qc1r   |              | CRR-             | EQ<br>CRR      | M=7,5<br>CSR   | •                    | Probab,              | Strain<br>(%) |
| 28 05<br>28 22  | 312,31<br>307,37 | 2.46<br>2.94 | 0.79         | 110<br>110 | 1.294<br>1.298 | 0.930          | 0.79 (             | .50 0.90             | 265.79           | 1 53         |       | 1                   | 100<br>100 | 1.00         | 3,20         | 1.00         | 266.8          | 0,92         | Infin.           | 0.000          | 0.538          | Non-Liq.             | Non-Liq.             | 0.00          |
| 28.38           | 341,79           | 2,65         | 0.78         | 110        | 1,302          | 0,929          | 0.78               | .50 0,90             | 290,11           | 1,50         |       | 1                   | 100        | 1.00         | 3.20         | 1.00         | 291.2          | 0.92         | Infin<br>Infin   | 0.000          | 0.539<br>0.540 | Non-Liq.             | Non-Liq.<br>Non-Liq. | 0.00<br>0.00  |
| 28.54<br>28.71  | 292.80<br>257.96 | 2.77<br>2.84 | 0.95<br>1.10 | 110<br>110 | 1,306<br>1,310 | 0.928<br>0.927 |                    | .50 0.90             |                  | 1.61<br>1.70 |       | 1                   | 100<br>100 | 1.00<br>1.04 | 3 20<br>3 20 |              |                |              | Infin<br>Infin   | 0.000          | 0.541<br>0.542 | Non-Liq.<br>Non-Liq. | Non-Liq.<br>Non-Liq. | 0.00<br>0.00  |
| 28.87<br>29.04  | 193.75<br>110.13 | 1.91<br>2.95 | 0,99<br>2,68 | 110<br>110 | 1,314<br>1,318 | 0.926          |                    | .53 0.89<br>.68 0.86 |                  | 1.75<br>2.25 |       | 1                   | 97<br>72   | 1.07<br>1.79 | 3 20         | 1.00         | 174,6<br>158.7 |              | Infin_<br>0_452  | 0.000          | 0.543<br>0.544 | Non-Liq.<br>0.76     | Non-Liq.<br>71%      | 0.00<br>0.57  |
| 29.20<br>29.36  | 64.38<br>90.04   | 2.45         | 3.80<br>3.54 | 110<br>110 | 1,322<br>1,325 | 0.925<br>0.924 |                    | .77 0.84<br>.73 0.85 |                  | 2,53<br>2,40 |       | 1                   | 48<br>63   | 2.93<br>2.32 |              | 1.00         | 147.0<br>165.2 | 0.96         | 0.376<br>Infin   | 0,359          | 0.545<br>0.546 | 0.66                 | 80%                  | 0.84          |
| 29.53<br>29.69  | 118.08<br>115.86 | 3.29<br>2.76 | 2.78         | 110<br>110 | 1.329          | 0 923          | 2.82               | .68 0.86             | 94.48            | 2.24         |       | 1                   | 74         | 1.77         |              | 1,00         | 167.5          | 0,91         | Infin.           | 0,000          | 0.547          | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 29.86           | 274,31           | 1,51         | 0,55         | 110        | 1.333          |                | 0.55               | .67 0.86<br>.50 0.89 | 229.50           | 2.20<br>1.47 |       | 1                   | 74<br>100  | 1.66<br>1.00 | 0.30         | 1.00<br>1.41 | 153.8<br>322.9 | 0.91         | 0,418<br>Infin.  | 0,381          | 0.548<br>0.549 | 0.70<br>Non-Liq.     |                      | 0.68<br>0.00  |
| 30.02<br>30.18  | 311.77<br>315.95 | 1.67<br>1.19 | 0,53<br>0,38 | 110<br>110 | 1,341<br>1,345 | 0,921<br>0,920 |                    | .50 0.89<br>.50 0.89 |                  | 1.42<br>1.32 |       | 1                   | 100<br>100 | 1.00         | 0.35         | 1.41<br>1.41 | 366.6<br>371.0 |              | Infin.           | 0.000          | 0.550<br>0.551 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 30.35           | 297,70<br>257.40 | 0.86         | 0,29         | 110<br>110 | 1.349<br>1.353 | 0.919<br>0.918 |                    | .50 0.89<br>.50 0.88 |                  | 1.27<br>1.40 |       | 1                   | 100<br>100 | 1.00         | 0.45         | 1.41<br>1.41 | 349.0<br>301.1 | 0.91         | Infin.           | 0.000          | 0.551<br>0.552 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00  |
| 30.68<br>30.84  | 200.41<br>117.72 | 1,87<br>2,01 | 0.93<br>1.71 | 110<br>110 | 1,357<br>1,361 |                |                    | .53 0.86<br>.63 0.85 | 165_04           | 1.73<br>2.09 |       | 1                   | 98<br>74   | 1.06         | 0.55         |              | 245.6<br>134.7 |              | Infin.           | 0.000          | 0.553          | Non-Liq.             | Non-Liq.             | 0.00          |
| 31.00           | 42,32            | 1.90         | 4,50         | 110        | 1,364          | 0.916          | 4.65               | .83 0.81             | 31,36            | 2.73         |       | 0                   | /-4        | 1.44         |              | 1,00         | 134.7          | 0.95         | 0.307            | 0.278          | 0.554<br>0.555 | 0.50<br>Non-Liq.     |                      | 1.06<br>0.00  |
| 31.17           | 31.82<br>41.78   | 1.64<br>1.18 | 5.14<br>2.82 | 110<br>110 | 1,368<br>1,372 | 0.914          | 2.92 0             | .87 0.80<br>.79 0.81 | 31.12            | 2.87<br>2.60 |       | 0                   | 28         | 3.31         |              | 1,00         | 103.1          | 0.95<br>0.95 | 0.182            | 0.173          | 0.556<br>0.556 | Non-Liq.<br>0.31     | Non-Liq<br>98%       | 0.00<br>1.45  |
| 31.50<br>31.66  | 54.16<br>56.06   | 1.35<br>1.68 | 2.48<br>3.00 | 110<br>110 | 1,376<br>1,380 |                |                    | .75 0.82<br>.76 0.82 |                  | 2,47<br>2,51 |       | 1                   | 40<br>41   | 2.62<br>2.84 |              | 1,00         | 107.2<br>119.8 | 0.95<br>0.95 | 0.194<br>0.240   | 0.185          | 0.557<br>0.558 | 0.33<br>0.41         | 97%<br>95%           | 1.40<br>1.24  |
| 31.82           | 60,54<br>82,92   | 2.05         | 3.38<br>2.65 | 110<br>110 | 1,384          |                |                    | .77 0.81<br>.71 0.82 | 45.52<br>63.52   | 2.53<br>2.35 |       | 1                   | 44<br>58   | 2.90<br>2.11 |              | 1,00         | 132.1<br>133.8 | 0.95         | 0.294            | 0.279          | 0,559<br>0,559 | 0.50<br>0.50         | 91%<br>91%           | 1.09          |
| 32.15<br>32.32  | 148,83<br>268,70 | 1.99         | 1.34<br>0.83 | 110<br>110 | 1,392          | 0.909          | 1.35 0             | 59 0.85              | 118,52           | 1.94         |       | 1                   | 84         | 1.23         | 1,00         | 1,00         | 146.5          | 0.90         | 0.372            | 0.334          | 0.560          | 0.60                 | 85%                  | 0.86          |
| 32.48           | 308.62           | 2.97         | 0.96         | 110        | 1_400          | 0.907          | 0.97 0             | 50 0.87<br>50 0.87   | 219,97<br>252,47 | 1.60<br>1.61 |       | 1                   | 100<br>100 | 1.00<br>1.00 | 1.05<br>1.10 | 1,00         | 220.8<br>253.4 | 0 90<br>0 89 | Infin<br>Infin   | 0,000          | 0,561<br>0,561 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 32.64<br>32.81  | 309.13<br>309.47 | 3.57<br>4.46 | 1.16<br>1.44 | 110<br>110 | 1.403<br>1.407 | 0.905          |                    | 51 0.87<br>53 0.86   | 251,87<br>250,13 | 1.67<br>1.75 |       | 1                   | 100<br>100 | 1.02<br>1.07 | 1.15<br>1.20 | 1.00         | 257.4<br>268.7 | 0.89<br>0.89 | Infin.<br>Infin. | 0.000          | 0.562<br>0.563 | Non-Liq.<br>Non-Liq. | •                    | 0.00<br>0.00  |
| 32.97<br>33.14  | 308.84<br>317.27 | 5.13<br>5.82 | 1.66<br>1.84 | 110<br>110 | 1.411<br>1.415 |                |                    | 55 0.85<br>56 0.85   | 248 16<br>253 92 | 1.80<br>1.83 |       | 1                   | 100<br>100 | 1.11         | 1.25<br>1.30 | 1.00         | 275.4<br>287.4 | 0.89         | Infin.           | 0.000          | 0.563<br>0.564 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 33.30<br>33.46  | 316.07<br>306.67 | 6.46<br>6.63 | 2.04<br>2.16 | 110<br>110 | 1.419<br>1.423 | 0.902          | 2.05 0             | 57 0.85<br>58 0.84   | 251.67<br>243.15 | 1.87<br>1.90 |       | 1                   | 100        | 1.16         | 1.35         | 1.00         | 293.2<br>289.5 | 0.89         | Infin.           | 0.000          | 0.565          | Non-Liq.             | Non-Liq.             | 0.00          |
| 33,63           | 295.70<br>287.84 | 6.52         | 2.20         | 110        | 1.427          | 0.900          | 2.21 0             | 58 0.84              | 233,68           | 1.91         |       | i                   | 100        | 1.20         | 1.45         | 1.00         | 282.0          | 0.89         | Infin.           | 0.000          | 0.565<br>0.566 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00  |
| 33.79<br>33.96  | 286.58           | 6.15<br>5.47 | 1.91         | 110<br>110 | 1.431<br>1.435 | 0.898          | 1.92 0             | 58 0.84<br>57 0.84   | 227,15<br>226,60 | 1.91<br>1.87 |       | 1                   | 100<br>100 | 1.20<br>1.16 | 1.50<br>1.55 | 1.00         | 273.3<br>264.5 | 0.89<br>0.89 | Infin.<br>Infin. | 0.000          | 0.566<br>0.567 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 34.12<br>34.28  | 285.14<br>290.96 | 4.97<br>4.93 | 1.74<br>1.70 | 110<br>110 | 1.439<br>1.443 |                |                    | 56 0.84<br>56 0.84   | 225,74<br>230,34 | 1.84         |       | 1                   | 100<br>100 | 1.14<br>1.13 | 1.55<br>1.55 | 1.00         | 257.8<br>260.3 | 88.0<br>88.0 | Infin.<br>Infin. | 0.000          | 0.567<br>0.568 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 34.45<br>34.61  | 290.25<br>288.91 | 5.14<br>4.35 | 1.77<br>1.51 | 110<br>110 | 1.446<br>1.450 |                |                    | 56 0.84<br>54 0.84   | 229.07<br>228.85 | 1.84<br>1.79 |       | 1                   | 100<br>100 | 1,14<br>1,10 | 1.55<br>1.55 | 1.00         | 261.8<br>252.1 | 0.88<br>0.88 | Infin.           | 0.000          | 0.568<br>0.569 | Non-Liq.<br>Non-Liq. | Non-Liq              | 0.00          |
| 34.78<br>34.94  | 290.18<br>286.57 | 4.30<br>4.37 | 1.48<br>1.53 | 110<br>110 | 1 454<br>1 458 | 0.893          | 1.49 0             | 54 0.84              | 229.67           | 1.78         |       | 1                   | 100        | 1.09         | 1.55         | 1.00         | 251,9          | 0.88         | Infin            | 0,000          | 0.569          | Non-Liq.             | Non-Liq              | 0.00          |
| 35.10           | 285,33           | 4.63         | 1,62         | 110        | 1.462          | 0.890          | 1.63 0             | 55 0.84              | 226,16<br>224,33 | 1.79         |       | i                   | 100        | 1.10<br>1.12 | 1.55<br>1.55 | 1.00         | 250,3<br>252,2 | 0.88<br>0.88 | Infin.           | 0.000          | 0.570<br>0.570 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 35,27<br>35,43  | 282,90<br>284,23 | 4.65<br>4.21 | 1.64<br>1.48 | 110<br>110 | 1.466<br>1.470 |                |                    | 56 0.83<br>54 0.84   | 221.92<br>223.46 | 1.83         |       | 1                   | 100<br>100 | 1.13<br>1.10 | 1.55<br>1.55 | 1.00         | 250.7<br>246.3 | 0.88<br>0.88 | Infin.           | 0.000          | 0,570<br>0,571 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 35.60<br>35.76  | 291.38<br>294.00 | 3.88<br>3.53 | 1.33<br>1.20 | 110<br>110 | 1.474<br>1.478 |                |                    | 53 0.84<br>52 0.84   | 229.77<br>232.40 | 1.74<br>1.71 |       | 1                   | 100<br>100 | 1.07<br>1.04 | 1.55<br>1.55 | 1.00         | 246.2<br>243.1 | 0.88<br>0.87 | Infin.           | 0.000          | 0.571<br>0.572 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 35,93<br>36,09  | 283,22<br>264,79 | 2.96<br>3.14 | 1.05<br>1.18 | 110<br>110 | 1.482<br>1.485 |                |                    | 51 0.84<br>53 0.84   | 224.32           | 1.67<br>1.73 |       | 1                   | 100<br>100 | 1.02<br>1.06 | 1.55<br>1.55 | 1,00         | 229,3<br>221.5 | 0.87<br>0.87 | Infin.           | 0.000          | 0.572<br>0.572 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 36 25<br>36 42  | 239.70<br>190.73 | 2.92         | 1.22         | 110<br>110 | 1.489          | 0.882          | 1.23 0             | 54 0.83              | 187.17           | 1.77         |       | 1                   | 100        | 1.09         | 1.55         | 1.00         | 204.4          | 0.87         | Infin.           | 0.000          | 0.573          | Non-Liq.             | Non-Liq.             | 0.00          |
| 36,58           | 172.32           | 1,04         | 0.60         | 110        | 1.497          | 0.880          | 0.61 0.            | 57 0.82<br>51 0.84   | 147.05<br>135.25 | 1.87<br>1.67 |       | 1                   | 93<br>89   | 1.16<br>1.02 | 1.55<br>1.55 | 1.00         | 171.2<br>138.5 | 0.87<br>0.87 | Infin.<br>0,327  | 0.000<br>0.285 | 0.573<br>0.573 | Non-Liq.<br>0.50     | Non-Liq<br>91%       | 0.00<br>1.03  |
| 36.75<br>36.91  | 139.82<br>130.14 | 0.84         | 0.60<br>0.77 | 110<br>110 |                |                |                    | 53 0.83<br>56 0.82   | 108.50<br>99.75  | 1.75<br>1.85 |       | 1                   | 80<br>77   |              |              | 1.00         | 116.7<br>114.3 | 0.87<br>0.87 | 0.228            | 0.198<br>0.190 | 0.573<br>0.574 | 0.35<br>0.33         | 97%<br>97%           | 1.28<br>1.31  |
| 37.07<br>37.24  | 111.04<br>70.92  | 0.59         | 0.53<br>2.10 | 110<br>110 |                |                |                    | 55 0.82<br>71 0.78   | 85.14<br>50.84   | 1.81<br>2.35 |       | 1                   | 70<br>49   | 1.11<br>2.12 | 1,55         | 1.00         | 95.2<br>107.6  | 0.87         | 0.160<br>0.196   | 0.139<br>0.182 | 0.574<br>0.574 | 0.24<br>0.32         | 99%<br>98%           | 1.57<br>1.39  |
| 37.40<br>37.57  | 56.54<br>26.06   | 1.73<br>1.68 | 3.06<br>6.46 | 110<br>110 | 1.517          | 0.873          | 3.15 0.            | 77 0.76<br>92 0.72   | 39.40<br>16.60   | 2.54<br>3.05 |       | 1                   |            | 2.99         |              |              | 117.9          |              | 0.232            |                | 0.574          | 0.38                 | 96%                  | 1.26          |
| 37.73<br>37.89  | 18.93<br>12.92   | 1.02         | 5.39<br>4.91 | 110        | 1.525          | 0.871          | 5.87 0.            | 94 0.71              | 11,65            | 3,12         |       | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.574<br>0.575 | Non-Liq.             | Non-Liq.             | 0.00<br>0.00  |
| 38.06           | 14.23            | 0,63         | 3.65         | 110<br>110 | 1.532          | 0.868          | 1.09 0.            | 98 0.70<br>95 0.70   | 7,50<br>8,45     | 3,26<br>3,13 |       | 0                   |            |              |              |              |                | 0.93<br>0.93 |                  |                | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 38.22<br>38.39  | 18.57<br>10.40   | 0.45         | 2.40<br>3.83 | 110<br>110 |                |                |                    | 98 0.72<br>00 0.69   | 11.59<br>5.76    | 2.91<br>3.29 |       | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 38.55<br>38.71  | 8.61<br>9.61     | 0.33         | 3.87<br>3.43 | 110<br>110 |                |                |                    | 00 0.69              | 4.58<br>5.21     | 3.39         |       | 0                   |            |              |              |              |                | 0.93         |                  |                | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
| 38.88<br>39.04  | 9.33<br>8.70     | 0.35         | 3.71<br>4.84 | 110<br>110 | 1.552          | 0.861          | 1.45 1.            | 00 0.68              | 5.01<br>4.59     | 3.34<br>3.44 |       | 0                   |            |              |              |              |                | 0.93         |                  |                | 0,575          | Non-Liq.             | Non-Liq              | 0.00          |
| 39.21           | 12,90            | 0,44         | 3.42         | 110        | 1.560          | 0.859          | .89 0.             | 96 0,69              | 7.39             | 3 17         |       | 0                   |            |              |              |              |                | 0.93         |                  |                | 0,575<br>0,575 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 39.37<br>39.53  | 17.45<br>20.31   | 0.56<br>0.80 | 3.19<br>3.94 | 110<br>110 | 1.567          |                | 1.50 0.<br>1.27 0. |                      | 10.51<br>12.38   | 3.02<br>3.01 |       | 0                   |            |              |              |              |                | 0.92<br>0.92 |                  |                | 0.576<br>0.576 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 39.70<br>39.86  | 31.28<br>28.06   | 0.98         | 3.12<br>3.45 | 110<br>110 |                |                | 3.29 0.<br>3.65 0. |                      | 20.13<br>17.76   | 2.78<br>2.85 |       | 0                   |            |              |              |              |                | 0.92         |                  |                | 0.576<br>0.575 | Non-Liq.<br>Non-Liq. |                      | 0.00          |
| 40.03<br>40.19  | 65.29<br>75.32   | 1.25<br>1.52 | 1.91<br>2.02 | 110<br>110 |                |                | .95 0.<br>.06 0.   |                      | 45,20<br>52,43   | 2.36<br>2.33 |       | 1                   |            | 2.16<br>2.04 |              | 1.00<br>1.00 | 97.7<br>106.9  | 0.92         |                  | 0.154<br>0.172 | 0.575<br>0.575 | 0.27                 | 99%<br>98%           | 1.53          |
| 40.35<br>40.52  | 68.28<br>76.08   | 1.42         | 2.08         | 110        | 1.587          | 0.849 2        | .12 0.             | 72 0,75              | 47.09            | 2:37         |       | 1                   | 46         | 2.20         |              | 1.00         | 103,6          | 0.92         | 0:183            | 0.169          | 0.575          | 0.29                 | 98%                  | 1.40<br>1.45  |
| 40.68           | 80.77            | 1.39         | 1,72         | 110<br>110 | 1.595          | 0.846 1        | .04 0.<br>.75 0.   | 9 0.75               | 52.82<br>56.49   | 2,32<br>2,26 |       | 1                   |            | 2.02<br>1.82 |              | 1.00         | 106.8<br>102.7 |              | 0.193<br>0.181   | 0.171<br>0.160 | 0,575<br>0,575 | 0.30<br>0.28         | 98%<br>99%           | 1.40<br>1.46  |
|                 | 107.08<br>126.77 | 1.51         | 1.41<br>1.67 | 110<br>110 |                |                | .43 0.<br>.69 0.   |                      | 76.62<br>90.84   | 2.10         |       | 1                   |            | 1.45<br>1.44 |              | 1.00         | 111.4<br>131.1 |              |                  | 0.184<br>0.245 | 0,575<br>0,575 | 0.32<br>0.43         | 98%<br>94%           | 1.34<br>1.11  |
|                 | 204.50<br>221.25 | 2.61<br>3.11 | 1,28<br>1,41 | 110<br>110 |                |                | .29 0.<br>.42 0.   |                      |                  | 1.85<br>1.86 |       | 1                   |            |              | 1.00         | 1.00         | 174.4<br>189.4 | 0.85         | Infin.           | 0.000          | 0.575          | Non-Liq.<br>Non-Liq. | Non-Liq              | 0.00          |
| 41.50           | 230.53<br>236.49 | 3.66<br>4.16 | 1.59<br>1.76 | 110<br>110 | 1,614          | 0.838 1        | .60 0.<br>.77 0.   | 7 0.78               | 169.74           | 1.89<br>1.92 |       | 1                   | 99         | 1.18         | 1,10         | 1.00         | 200.7          | 0.84         | Infin.           | 0.000          | 0,575          | Non-Liq.             | Non-Liq.             | 0.00          |
| 41.83           | 238.11           | 4.55         | 1.91         | 110        | 1.622          | 0.835 1        | .92 0.             | 9 0.78               | 173,63           | 1.94         |       | 1                   | 100        | 1.23         | 1.15         | 1.00         | 209.5          | 0.84         | Infin,           | 0.000          | 0.574<br>0.574 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
| 42.16           | 239,78<br>274,29 | 3.88         | 1.62<br>1.17 | 110<br>110 | 1.630          | 0.832 1        | .63 0.:<br>.18 0.: | 3 0.80               | 205.09           | 1.88<br>1.74 |       | 1                   |            |              | 1.15<br>1.15 |              | 207.4<br>218.5 |              |                  | 0.000          | 0.574<br>0.574 | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00  |
|                 | 291.71<br>285.46 | 2.41         | 0.83         | 110<br>110 |                |                | .83 0.:<br>.77 0.: |                      |                  | 1,60<br>1.59 |       |                     |            |              | 1.15<br>1.15 |              | 221.5<br>216.4 |              | Infin,           | 0,000          | 0.574<br>0.573 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00  |
| 42,65           | 273.88<br>343.04 | 2.74         | 1.00<br>1.21 | 110<br>110 | 1.642          | 0.827 1        | .01 0.<br>.21 0.   | 0.80                 | 205.39           | 1.68<br>1.68 |       | 1                   | 100        | 1.03         | 1.15<br>1.15 | 1.00         | 211.6<br>264.6 | 0.84         |                  | 0.000          | 0.573<br>0.573 | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00          |
|                 | 408.63           |              | 1.24         | 110        |                |                | .25 0.             |                      |                  | 1.64         |       |                     |            |              |              |              | 308.4          |              |                  |                | 0.573          | Non-Liq.             |                      | 0.00          |

| Layer  | Tip    | Friction | Friction | Total    | Eff_Stres | S     |      |      |      |           |      | 9   | Liquef.  | Rel    |      |      |      | Clean |      |        |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|----------|-----------|-------|------|------|------|-----------|------|-----|----------|--------|------|------|------|-------|------|--------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt. | at Midpt  |       |      |      |      | Corrected | d    | E S | Suscept  | Dens,  |      | Н    |      | Sand  |      |        | EQ    | M=7.5   | Safety    | Probab.  | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)    | p'o (tsf) | rd    | F    | n    | Ca   | Qc1n      | Ic   | ó   | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Κσ   | CRR7.5 | CRR   | CSR     | Factor    | PL       | (%)        |
|        | 577,81 | 9,13     | 1.58     | 110      | 1,653     | 0.823 | 1.59 | 0.50 | 0.80 | 435 30    | 1,65 | Т   | 1        | 100    | 1,00 | 1.15 | 1.00 | 437.0 | 0.84 | Infin  | 0.000 | 0.572   | Non-Lig.  | Non-Liq  | 0.00       |
|        | 597.92 | 9.45     | 1,58     | 110      | 1,657     | 0.821 | 1.58 | 0.50 | 0.80 | 450.30    | 1.64 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 452.0 | 0.84 | Infin: | 0.000 | 0.572   | Non-Liq.  | Non-Lig  | 0.00       |
|        | 392,43 | 8,74     | 2.23     | 110      | 1,661     | 0.820 | 2.24 | 0.57 | 0.77 | 285,78    | 1,87 |     | 1        | 100    | 1.16 | 1,15 | 1.00 | 332.9 | 0.83 | Infin. | 0,000 | 0.572   | Non-Liq.  | Non-Lig  | 0.00       |
|        | 395.33 | 5.19     | 1,31     | 110      | 1,665     | 0.818 | 1.32 | 0,51 | 0.79 | 295.31    | 1,67 |     | 1        | 100    | 1,02 | 1.15 | 1.00 | 302.0 | 0.83 | Infin  | 0,000 | 0.572   | Non-Liq.  | Non-Lig. | 0.00       |
|        | 397,94 | 3,38     | 0,85     | 110      | 1.669     | 0.816 | 0.85 | 0.50 | 0.80 | 298,21    | 1,52 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 299.3 | 0.83 | Infin. | 0,000 | 0.571   | Non-Liq.  | Non-Lig  | 0.00       |
|        | 401.09 | 1.69     | 0.42     | 110      | 1.673     | 0,815 | 0.42 | 0.50 | 0.80 | 300,23    | 1.30 |     | 1        | 100    | 1,00 | 1,15 | 1.00 | 301.4 | 0.83 | Infin. | 0.000 | 0,571   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 389,81 | 1.87     | 0.48     | 110      | 1,677     | 0,813 | 0.48 | 0,50 | 0.79 | 291.41    | 1.35 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 292.5 | 0.83 | Infin. | 0.000 | 0.571   | Non-Lig.  | Non-Lig. | 0.00       |
|        | 358,36 | 1.92     | 0,53     | 110      | 1.681     | 0.811 | 0.54 | 0.50 | 0.79 | 267.48    | 1,41 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 268.5 | 0,83 | Infin. | 0,000 | 0,570   | Non-Lig.  | Non-Lig. | 0.00       |
|        | 351.76 | 2.17     | 0,62     | 110      | 1,685     | 0.810 | 0.62 | 0,50 | 0.79 | 262,22    | 1.46 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 263.2 | 0.83 | Infin. | 0.000 | 0.570   | Non-Lig.  | Non-Liq. | 0.00       |
| 44.62  | 367.06 | 3.54     | 0.96     | 110      | 1.689     | 808,0 | 0.97 | 0.50 | 0.79 | 273,36    | 1.59 |     | 1        | 100    | 1.00 | 1.15 | 1.00 | 274.4 | 0.83 | Infin. | 0.000 | 0.569   | Non-Lig.  | Non-Liq. | 0.00       |
| 44.78  | 396.02 | 5.60     | 1.41     | 110      | 1.692     | 0.807 | 1.42 | 0.52 | 0.78 | 292.17    | 1.70 |     | 1        | 100    | 1.04 | 1.15 | 1.00 | 304.5 | 0.83 | Infin. | 0.000 | 0.569   | Non-Lig.  | Non-Lig. | 0.00       |
| 44.95  | 497.62 | 0.00     | 0.00     | 110      | 1.696     | 0.805 | 0.00 | 0.80 | 0.68 | 320,55    | 2,66 |     | 0        |        | 1.00 |      |      |       | 0.91 |        |       | 0.569   | Non-Lig.  | Non-Lig. | 0.00       |
| 45:11  | 534.51 | 0.00     | 0.00     | 110      | 1.700     | 0.803 | 0.00 | 0.81 | 0.68 | 342.84    | 2.68 |     | 0        |        | 1.00 |      |      |       | 0.91 |        |       | 0.568   | Non-Lia.  | Non-Lig. | 0.00       |

|                |                  | -                |                   | -            | chool No.          | 8              |                       | Me           | thods:       | Liquefa                  |              |    |                        |            |              |                    |                  |                      |              |                    | & Wride        | )                    |                      | 7                         | Total                  |
|----------------|------------------|------------------|-------------------|--------------|--------------------|----------------|-----------------------|--------------|--------------|--------------------------|--------------|----|------------------------|------------|--------------|--------------------|------------------|----------------------|--------------|--------------------|----------------|----------------------|----------------------|---------------------------|------------------------|
|                |                  | lob No:<br>Date: | 301953<br>8/14/20 |              |                    |                |                       |              |              |                          |              |    | Settlemer<br>ent by Pr |            | -            |                    |                  |                      |              |                    |                |                      |                      |                           | Liquefied<br>Thickness |
| EARTH          | Sou              | inding:          |                   | _            | Plot:              | 5              |                       | Induce       | 4 CSD        | (M=7.5):                 | -069         | *D | GA*(no/r               | ala\*edi   | MASE         |                    |                  |                      |              |                    |                |                      |                      |                           | (feet)                 |
| LAKI           |                  | gnitude:         |                   | 7.5          |                    |                |                       |              |              | ind Qc1n                 |              |    |                        | ) () (u)   | IVIOF        | SF =               | CRR <sub>7</sub> | , <sub>5</sub> *Κσ/C | SR           |                    |                |                      |                      | Probab                    | 1.8<br>Total           |
|                |                  | PGA, g:<br>MSF:  | 0.97<br>1.30      | 0.75         |                    | He             | it Maia               | ht of        |              | tod opilar               | 110          |    |                        |            | Us           | se Tokir           | matsu            | & Seed               | (0) or       | Ishihara           |                | mine (1):            | 0                    | Avg                       | Induced                |
|                | GV               | VT, feet:        | 20.0              |              |                    |                | -                     |              |              | ted soils:<br>ted soils: |              | pc |                        |            |              |                    |                  | J                    | Vin SF       | of Liq             |                | uired SF:<br>Layers: | 1:50<br>0.40         | 1%<br>Max                 | Subsidence<br>(inches) |
| Layer          | lesign GV<br>Tip |                  | 20.0<br>Friction  | Total        | Eff_Stress         |                | Limiting              | Ic for       | liquefia     | ble soils:               | 2.60         | a. | Liquef.                |            | ting Ic      | for K <sub>H</sub> | 2.0              | Clean                | lvg SF       | of Liq             | uefiable       | Layers:              | 0.03<br>Liquefac     | 95%                       | 0.2<br>Volumetric      |
| Depth          | Qc               | Fs               | Ratio             | Unit Wt      |                    |                |                       |              |              | Correcte                 | d            |    | Suscept                | Dens,      |              | Н                  |                  | Sand                 |              |                    | EQ             | M=7.5                | Safety               | Probab                    | Strain                 |
| (feet)<br>0.16 | (tsf)<br>7.20    | (tsf)<br>0.07    | 0.96              | (pcf)<br>110 | p'o (tsf)<br>0,009 | rd<br>1,000    | 0.96                  | n<br>0.82    | 1.70         | Qc1n<br>11,55            | lc<br>2.69   | ó  | (0 or 1)               | Dr (%)     | Kc           | (m)                | KH               | Qc1n                 | 1.00         | CRR <sub>7.5</sub> | CRR            | 0.485                | Factor<br>Non-Lig    | P <sub>C</sub><br>Non-Liq | 0.00                   |
| 0.33<br>0.49   | 11.97<br>16.98   | 0.11             | 0.92<br>0.86      | 110<br>110   | 0.018<br>0.027     | 1,000          | 0.92                  | 0.75         | 1.70<br>1.70 | 19 20<br>27 24           | 2.49         |    | 1                      | 8<br>23    | 2.70<br>2.08 |                    | 1.00             | 51.9                 | 1.00         | 0.093              | 0.093          | 0.485                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 0 66           | 18.41            | 0.17             | 0.90              | 110          | 0.036              | 1.000          | 0.90                  | 0.70         | 1.70         | 29.52                    | 2.32         |    | 1                      | 26         | 2.01         |                    | 1.00<br>1.00     | 56.7<br>59.5         | 1.00<br>1.00 | 0.097<br>0.100     | 0.097<br>0.100 | 0.485<br>0.485       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 0.82           | 16.13<br>12.95   | 0.16<br>0.14     | 1.01<br>1.06      | 110<br>110   | 0.045<br>0.054     | 1,000          | 1.01<br>1.06          | 0.73<br>0.75 | 1.70<br>1.70 | 25.85<br>20.72           | 2.40         |    | 1                      | 21<br>12   | 2.29<br>2.71 |                    | 1.00             | 59.2<br>56.1         | 1,00         | 0.099              | 0.099          | 0.485<br>0.485       | Non-Liq.<br>Non-Liq. | Non-Liq.<br>Non-Liq.      | 0.00<br>0.00           |
| 1.15<br>1.31   | 10.49<br>10.49   | 0.11             | 1.05<br>1.05      | 110<br>110   | 0.063              | 0.999          | 1.05<br>1.06          | 0.78<br>0.78 | 1.70<br>1.70 | 16.75<br>16.74           | 2.57<br>2.57 |    | 1                      | 3          | 3.13<br>3.13 |                    | 1.00             | 52.5<br>52.5         | 1,00         | 0.093              | 0.093          | 0.484<br>0.484       | Non-Liq.             |                           | 0.00<br>0.00           |
| 1,48           | 9.50             | 0.14             | 1.52              | 110          | 0,081              | 0,999          | 1.53                  | 0.81         | 1.70         | 15.13                    | 2.69         |    | 0                      | J          | J. 13        |                    | 1,00             | 52,5                 | 1.00         | 0 033              | 0.033          | 0.484                | Non-Liq.             | Non-Liq                   | 0.00                   |
| 1,64<br>1,80   | 11.89<br>17.29   | 0.21             | 1.77<br>1.93      | 110<br>110   | 0.090              | 0.998<br>0.998 | 1.79<br>1. <b>9</b> 4 | 0.80<br>0.77 | 1.70<br>1.70 | 18 96<br>27 62           | 2,64<br>2,53 |    | 0                      | 23         | 2,91         |                    | 1,00             | 80.4                 | 1.00         | 0.128              | 0.128          | 0.484<br>0.484       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 1,97<br>2,13   | 29.55<br>29.26   | 0.52<br>0.52     | 1.75<br>1.76      | 110<br>110   | 0.108<br>0.117     | 0.998<br>0.997 | 1.76                  | 0.70         | 1.70<br>1.70 | 47.31<br>46.83           | 2.32         |    | 1                      | 46<br>45   | 2,00         |                    | 1.00             | 94.8<br>94.6         | 1.00         | 0.159<br>0.159     | 0.159<br>0.159 | 0.484<br>0.483       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 2,30           | 27.77            | 0.48             | 1.74              | 110          | 0.126              | 0,997          | 1.75                  | 0.71         | 1.70         | 44.42                    | 2.34         |    | 1                      | 43         | 2,07         |                    | 1,00             | 92.1                 | 1.00         | 0.153              | 0.153          | 0.483                | Non-Liq.             | Non-Liq                   | 0.00                   |
| 2.46<br>2.62   | 25.48<br>22.54   | 0.44             | 1.74<br>1.76      | 110<br>110   | 0.144              | 0,996<br>0,996 | 1.75<br>1.77          | 0.72<br>0.73 | 1.70<br>1.70 | 40.72<br>35.99           | 2.37<br>2.41 |    | 1                      | 40<br>34   | 2.18<br>2.36 |                    | 1,00<br>1,00     | 88.8<br>85.1         | 1.00         | 0.145<br>0.137     | 0 145<br>0 137 | 0.483<br>0.483       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 2.79<br>2.95   | 20 15<br>17 63   | 0.37             | 1.83              | 110<br>110   |                    | 0,996<br>0,995 | 1.85                  | 0.75<br>0.78 | 1.70<br>1.70 | 32,13<br>28,07           | 2.46<br>2.58 |    | 1                      | 30<br>24   | 2.58<br>3.19 |                    | 1.00             | 83.0<br>89.5         | 1.00         | 0.133<br>0.147     | 0.133<br>0.147 | 0.483<br>0.482       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 3.12<br>3.28   | 13.94<br>11.33   | 0.43<br>0.42     | 3.06<br>3.69      | 110<br>110   | 0.171              | 0.995<br>0.994 | 3.10<br>3.75          | 0.83         | 1.70<br>1.70 | 22 12<br>17 92           | 2.73<br>2.85 |    | 0                      |            |              |                    | 1855             |                      | 1.00         | -9.0               | -8.            | 0.482                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 3.44           | 10,79            | 0.35             | 3.27              | 110          | 0.189              | 0.994          | 3 33                  | 0.86         | 1.70         | 17.03                    | 2.84         |    | 0                      |            |              |                    |                  |                      | 1.00         |                    |                | 0.482<br>0.482       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 3.61<br>3.77   | 19.14<br>28.87   | 0.32             | 1.69              | 110<br>110   |                    | 0.994<br>0.993 | 1.71<br>1.21          | 0.75<br>0.68 | 1.70<br>1.70 | 30,44<br>46,06           | 2.46         |    | 1                      | 27<br>45   | 2.58<br>1.74 |                    | 1.00             | 78.4<br>79.9         | 1.00         | 0.125<br>0.127     | 0.125<br>0.127 | 0 482<br>0 482       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 3.94<br>4.10   | 37.13<br>42.19   | 0.44             | 1.18<br>1.24      | 110<br>110   |                    | 0.993          | 1.19<br>1.25          | 0.65<br>0.64 | 1.70<br>1.70 | 59.31<br>67.43           | 2.13<br>2.10 |    | 1                      | 55<br>60   | 1,52<br>1,46 |                    | 1.00             | 90.2<br>98.5         | 1.00         | 0.148<br>0.169     | 0.148          | 0.481<br>0.481       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 4.27           | 42.88            | 0.62             | 1.43              | 110          | 0.235              | 0.992          | 1.44                  | 0.65         | 1.70         | 68.52                    | 2.14         |    | i                      | 61         | 1,53         |                    | 1.00             | 104.7                | 1.00         | 0.187              | 0.187          | 0.481                | Non-Liq.             | Non-Liq,                  | 0.00                   |
| 4.43<br>4.59   | 42.87<br>43.05   | 0.65             | 1.51<br>1.44      | 110<br>110   |                    | 0.992<br>0.991 | 1.52<br>1.44          | 0.65<br>0.65 | 1.70<br>1.70 | 68.49<br>68.77           | 2.15<br>2.14 |    | 1                      | 61<br>61   | 1.56<br>1.53 |                    | 1.00<br>1.00     | 106.9<br>105.0       | 1.00<br>1.00 | 0.194<br>0.188     | 0.194<br>0.188 | 0.481<br>0.481       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 4.76<br>4.92   | 40.55<br>37.17   | 0.64             | 1.58<br>1.58      | 110<br>110   |                    | 0.991<br>0.991 | 1.59<br>1.60          | 0.66<br>0.67 | 1.70<br>1.70 | 64.74<br>59.29           | 2.18         |    | 1                      | 59<br>55   | 1,63<br>1,70 |                    | 1.00             | 105.4<br>101.0       | 1.00         | 0.189<br>0.176     | 0.189<br>0.176 | 0.480<br>0.480       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 5.09<br>5.25   | 45.41<br>49.21   | 0.55<br>0.55     | 1.21              | 110<br>110   |                    | 0.990<br>0.990 | 1.22                  | 0.63         | 1.70<br>1.70 | 72.52<br>78.61           | 2.07         |    | 1                      | 63<br>67   | 1.41<br>1.33 |                    | 1.00             | 102.1                | 1.00         | 0.179<br>0.187     | 0.179<br>0.187 | 0.480<br>0.480       | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 5.41           | 48.56            | 0.56             | 1.16              | 110          | 0.298              | 0.989          | 1.16                  | 0.62         | 1.70         | 77.55                    | 2.04         |    | i                      | 66         | 1,35         |                    | 1.00             | 104.9                | 1.00         | 0.187              | 0_187          | 0.480                | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 5.58<br>5.74   | 48.19<br>48.82   | 0.59             | 1 22              | 110<br>110   |                    | 0.989<br>0.989 | 1.23<br>1.21          | 0.62<br>0.62 | 1.70<br>1.70 | 76.94<br>77.94           | 2.06<br>2.05 |    | 1                      | 66<br>66   | 1.38<br>1.37 |                    |                  |                      | 1.00         | 0.191<br>0.192     | 0.191<br>0.192 | 0.479<br>0.479       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 5.91<br>6.07   | 49.59<br>49.01   | 0.58<br>0.58     | 1.17<br>1.19      | 110<br>110   |                    | 0.988<br>0.988 | 1.18<br>1.19          | 0.62<br>0.62 | 1.70<br>1.70 | 79.16<br>78.21           | 2.03         |    | 1                      | 67<br>67   | 1.35<br>1.36 |                    |                  |                      | 1.00<br>1.00 | 0.193<br>0.191     | 0.193<br>0.191 | 0.479<br>0.479       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 6.23<br>6.40   | 48.87<br>48.92   | 0.58<br>0.59     | 1.19              | 110<br>110   | 0.343              | 0.988<br>0.987 | 1.20                  | 0.62<br>0.62 | 1.70         | 77.97<br>78.04           | 2.04         |    | 1                      | 67         | 1.36         |                    | 1.00             | 106.2                | 1.00         | 0.191              | 0.191          | 0.479                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 6.56           | 50.19            | 0.62             | 1.23              | 110          | 0.361              | 0.987          | 1.21<br>1.24          | 0.62         | 1.70<br>1.70 | 80 07                    | 2.05<br>2.04 |    | 1                      | 67<br>68   | 1.37<br>1.36 |                    | 1.00             | 109.1                | 1.00<br>1.00 | 0.192<br>0.201     | 0.192<br>0.201 | 0.479<br>0.478       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 6.73<br>6.89   | 54.54<br>60.79   | 0.64<br>0.78     | 1.17              | 110<br>110   |                    | 0.986<br>0.986 | 1.17<br>1.29          | 0.61<br>0.61 | 1.70<br>1.70 | 87.04<br>97.07           | 2.00<br>1.99 |    | 1                      | 71<br>76   | 1.30<br>1.29 |                    |                  |                      | 1.00         | 0.215<br>0.275     | 0.215<br>0.275 | 0.478<br>0.478       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 7.05<br>7.22   | 70.21<br>86.10   | 1.20<br>1.28     | 1.71<br>1.49      | 110<br>110   |                    |                | 1.72<br>1.49          |              |              | 112.19<br>137.71         | 2.03<br>1.93 |    | 1                      | 82<br>90   | 1.35<br>1.22 |                    |                  | 151.2<br>168.1       |              | 0.401<br>Infin.    | 0.401          | 0.478<br>0.478       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 7.38           | 112.25           | 1.15             | 1.02              | 110          | 0.406              | 0.985          | 1.02                  | 0.53         | 1.66         | 175.45                   | 1.74         |    | 1                      | 100        | 1.06         | 1.05               | 1.00             | 187.1                | 1.00         | Infin.             | 0.000          | 0.478                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 7.55<br>7.71   | 123.77<br>123.77 | 1.31             | 1.06              | 110<br>110   |                    | 0.985<br>0.984 | 1.06<br>1.06          | 0.52<br>0.53 | 1.63<br>1.62 | 190.49<br>188.51         | 1.72<br>1.73 |    | 1                      | 100<br>100 | 1.05<br>1.05 |                    |                  | 201.3<br>199.6       | 1.00         | Infin.<br>Infin.   | 0.000          | 0.477<br>0.477       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 7.87<br>8.04   | 137.24<br>143.26 | 1.24             | 0.90              | 110<br>110   |                    | 0.984<br>0.984 | 0.90<br>0.82          | 0.50         | 1.57<br>1.55 |                          | 1.65<br>1.61 |    | 1                      | 100<br>100 | 1.01         | 1.20<br>1.25       |                  | 204.9<br>209.6       |              | Infin.<br>Infin.   | 0.000          | 0.477<br>0.477       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 8.20<br>8.37   | 133.59<br>119.63 | 0.95<br>0.65     | 0.71<br>0.54      | 110<br>110   | 0.451              | 0.983<br>0.983 | 0.72<br>0.54          | 0.50<br>0.50 | 1,53         | 192.72                   | 1.60<br>1.56 |    | 1                      | 100        | 1.00         |                    | 1.00             | 193.4                | 1.00         | Infin.             | 0.000          | 0.477                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 8.53           | 108.61           | 0.64             | 0.59              | 110          | 0.469              | 0,982          | 0.59                  | 0.50         | 1,50         | 153,49                   | 1.62         |    | 1                      | 99<br>95   | 1.00         | 1.40               | 1.00             | 171.4<br>154.1       | 1.00         | Infin<br>0,420     | 0.000<br>0.420 | 0.476<br>0.476       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 8,69<br>8,86   | 97.77<br>91.00   | 0.53<br>0.48     | 0.54              | 110<br>110   |                    | 0.982<br>0.982 | 0.54<br>0.53          | 0.50<br>0.51 | 1.49<br>1.48 | 136 81<br>126 66         | 1.64<br>1.66 |    | 1                      | 90<br>87   |              | 1.45<br>1.50       |                  | 136.9<br>128.5       |              | 0.318              | 0.318<br>0.277 | 0.476<br>0.476       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 9.02<br>9.19   | 88.06<br>80.39   | 0.54<br>0.53     | 0.61<br>0.66      | 110<br>110   |                    | 0.981<br>0.981 | 0.62<br>0.66          |              |              | 122 80<br>112 21         | 1.71<br>1.76 |    | 1                      | 85<br>82   |              | 1.55<br>1.60       | 1.00             | 128.8<br>121.5       | 1.00         | 0.279<br>0.247     | 0.279<br>0.247 | 0.476<br>0.476       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 9.35           | 57.91            | 0.50             | 0.87              | 110          | 0.514              | 0.981          | 0.88                  | 0.59         | 1.53         | 83.01                    | 1.94         |    | 1                      | 69         | 1.23         | 1.65               | 1.00             | 102.3                | 1.00         | 0.180              | 0.180          | 0.475                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 9.51<br>9.68   | 67.62<br>67.40   | 0.54<br>0.52     | 0.79              | 110<br>110   |                    | 0.980<br>0.980 | 0.80<br>0.78          | 0.57<br>0.57 | 1.49<br>1.48 | 94.64<br>93.34           | 1.87<br>1.87 |    | 1                      |            |              | 1.70<br>1.75       |                  | 110.3<br>108.5       |              | 0.205<br>0.199     | 0.205<br>0.199 | 0 475<br>0 475       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 9_84<br>10_01  | 67.98<br>65.93   | 0.51<br>0.45     | 0.75              | 110<br>110   |                    | 0.980<br>0.979 | 0.76<br>0.69          | 0.57<br>0.56 | 1.46<br>1.44 | 93.14<br>89.29           | 1.86<br>1.85 |    | 1                      |            |              | 1.80<br>1.85       |                  | 107.8<br>102.7       |              | 0.197<br>0.181     | 0.197          | 0.475<br>0.475       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 10.17<br>10.33 | 65.84<br>64.79   | 0.44<br>0.46     | 0.67              | 110<br>110   | 0.559              | 0.979          | 0.68<br>0.71          | 0.56         | 1.43<br>1.42 | 88.34<br>86.44           | 1.85         |    | 1                      | 72         | 1.15         | 1.90               | 1.00             | 101.6                | 1.00         | 0.178              | 0.178          | 0.475                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 10.50          | 65.15            | 0.49             | 0.74              | 110          | 0.577              | 0.978          | 0.75                  | 0.57         | 1.42         | 86.37                    | 1.87<br>1.88 |    | 1                      | 71         | 1.17         | 1.95<br>2.00       | 1.00             | 100.8<br>101.9       | 1.00         | 0.175<br>0.178     | 0.178          | 0.474<br>0.474       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 10.66<br>10.83 | 65.57<br>66.76   | 0.48             | 0.74              | 110<br>110   |                    |                | 0.74<br>0.74          | 0.57<br>0.57 | 1.40<br>1.39 | 86.12<br>86.85           | 1.88         |    | 1                      |            | 1.17         | 2.05<br>2.10       |                  | 101.4<br>101.9       |              | 0.177<br>0.178     | 0.177<br>0.178 | 0.474<br>0.474       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 10.99<br>11.15 | 69.51<br>72.61   | 0.50<br>0.54     | 0.72              | 110<br>110   |                    | 0.977<br>0.977 | 0.73<br>0.74          |              | 1,37<br>1,36 | 89.46<br>92.59           | 1.86<br>1.86 |    | 1                      |            |              | 2.15<br>2.20       |                  | 103.8<br>107.0       |              |                    | 0.184<br>0.194 | 0.474<br>0.474       | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00           |
| 11.32          | 77.76            | 0.57             | 0.73              | 110          | 0.623              | 977            | 0.73                  | 0.56         | 1.34         | 98.03                    | 1.83         |    | 1                      | 76         | 1.13         | 2.25               | 1.00             | 111.4                | 1.00         | 0.209              | 0.209          | 0.473                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 11.48<br>11.65 | 84.82<br>92.40   | 0.65<br>0.51     | 0.76<br>0.55      | 110<br>110   | 0.641              | 976            | 0.77<br>0.56          | 0.52         | 1,30         | 112.72                   | 1.82<br>1.72 |    | 1                      |            |              |                    | 1.00             | 119.2<br>118.6       | 1.00         |                    | 0.238<br>0.235 | 0.473<br>0.473       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 11.81<br>11.98 | 100.55<br>108.89 | 0.65<br>0.74     | 0.64<br>0.67      | 110<br>110   |                    |                | 0.65                  |              |              |                          | 1.73<br>1.71 |    | 1                      |            |              |                    |                  | 129.2<br>137.7       |              | 0.281              | 0.281          | 0.473<br>0.473       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 12.14          | 120.07<br>132.01 | 0.79             | 0.66              | 110<br>110   | 0.668              | 975            | 0.66                  | 0.51         | 1.27         | 142.80                   | 1.68<br>1.66 |    | 1                      | 92         | 1.02         | 2.50               | 1.00             | 146.6<br>157.3       | 1.00         |                    | 0.373          | 0.473                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 12.47          | 144.08           | 1.04             | 0.72              | 110          | 0.686              | 974            | 0.72                  | 0.50         | 1.24         | 168.48                   | 1.65         |    | 1                      | 98         | 1.00         | 2.60               | 1.00             | 169.2                | 1.00         | Infin.             | 0,000          | 0.472<br>0.472       | Non-Liq.             | Non-Liq.                  | 0.00                   |
|                | 152.23<br>162.83 | 1.19             | 0.78<br>0.74      | 110<br>110   |                    |                | 0.79<br>0.74          |              |              |                          | 1.65<br>1.62 |    |                        |            |              | 2.65<br>2.70       |                  | 178.9<br>188.6       |              | Infin<br>Infin     | 0.000          | 0.472<br>0.472       | Non-Liq.<br>Non-Liq. |                           | 0.00                   |

|  | r    | Layer | Tip           | Friction | Friction | Total    | Eff.Stress | s      |        |       |        |           |      | 9   | Liquef.  | Rel    |      |      |        | Clean |      |        |       | Induced | Liquefac.  |          | Volumetric |
|--|------|-------|---------------|----------|----------|----------|------------|--------|--------|-------|--------|-----------|------|-----|----------|--------|------|------|--------|-------|------|--------|-------|---------|------------|----------|------------|
| 1.00      | 1    | Depth | Qc            | Fs       | Ratio    | Unit Wt. | at Midpt   |        |        |       |        | Corrected | i    | - 0 |          |        |      | Н    |        |       |      |        | EQ    |         |            |          |            |
| 1.20      | (300 |       | - Contraction |          |          |          | p'o (tsf)  |        |        |       |        |           | lc   | õ   | (0 or 1) | Dr (%) | Kc   | (m)  | KH     | Qc1n  | Kσ   | CRR75  | CRR   | CSR     | Factor     | PL       | (%)        |
| 1.20      |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 50       |        | 12.1 |      |        |       |      |        |       |         |            |          |            |
| 144 677 346 2  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 1500   2007      |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 1.00      | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 14.1   25.5   27.   14.1   15.5   1   | - 21 |       |               |          |          |          | 9.7        |        |        |       |        |           |      |     | 1        | 100    | 1.00 | 3,00 | 1.00   | 242.3 | 1,00 | Infin. | 0.000 | 0.471   |            |          |            |
| 14.2   26.2   27.7   12.7   12.7   12.7   12.7   13.7   14.7      | - 10 |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 14-44   20.00   2.44   1.25   1.15   1.05    |      |       |               |          |          |          |            |        |        |       |        | -         | 5.0  |     | 4        |        |      |      |        |       |      |        |       |         |            |          |            |
| 146   273   246   156   117    |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 14.0 20 30 4 5 5 5 6 7 7 7 8 7 8 9 7 8 9 7 8 9 7 8 9 8 9 9 9 9   | 1    | 14.60 |               |          | 1.99     |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1.50      | - 11 |       |               |          |          |          |            |        |        |       | 1.15   |           |      |     | 1        | 100    | 1,10 | 3.30 | 1.00   | 352.3 | 1,00 | Infin. |       | 0.470   |            |          |            |
| 1.5.0   1.5.   | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 0.00     |        |      |      |        |       |      | 7.0    |       |         |            |          |            |
| 15.5   27.59   6.0   23.9   17.0   0.06      | - 11 |       |               | - 22     |          |          |            |        |        |       |        |           |      |     | 10712    |        |      |      |        |       |      |        |       |         |            |          |            |
| 1558   2675   2676      | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 9371     |        |      |      |        |       |      |        |       |         |            |          |            |
| 1.7.7 Sept. 1.7.8 Sept. 1.7. Sept |      |       |               | 5.16     | 1.37     | 110      | 0.857      | 0.967  |        | 0.50  |        |           | 1.61 |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 100   24.42   24.10   20.9   170   26.8   26.8   26.9   26.2   26.5      | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 13.50    |        |      |      |        |       |      | Infin. | 0.000 | 0.469   |            |          |            |
| 18-24   94-19   94-19   94-19   95-89   94-19   95-89   94-19   95-89   94-19   95-99  |      |       |               |          |          |          |            |        |        |       |        |           |      |     | DT0      |        |      |      |        |       |      |        |       |         |            |          |            |
| 19.49   19.59   19.59   170   19.50    |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1000     |        |      |      |        |       |      |        |       |         |            |          |            |
| 155   265   27   27   27   27   27   27   27   2   | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 135.1    |        |      |      |        |       |      |        |       |         |            |          |            |
| 1596     1   | - 11 |       | -             |          |          |          |            |        |        |       |        |           | 1,39 |     | 1        | 100    | 1.00 | 3.85 | 1.00   |       |      |        |       |         |            |          |            |
| 17.02 477.04 1   | - 11 |       |               | 1.00     |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 1772 47740 395 692 110 0.917 1086 085 085 085 085 085 085 085 085 085 085  |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 17.95 94.551 4.96 94.79 110 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.9   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1.55   | 1    | 7.39  | 404,51        | 3.69     |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1.786   461-75   257   0.77   10   0.985   0.982   0.78   0.59   0.194   451-54   0.385   0.91   101   101   0.004   0.054   0.004   0.005     |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        | 100    | 1.00 | 4.15 | 1.00   | 421.9 | 1,00 | Infin. | 0.000 | 0.467   |            |          | 0.00       |
| 1904   4899   459   67   | - 11 |       |               | 250      |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1925   767-28   6.56   0.58   10   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1937   50-35   307   602   10   100   0.961   0.82   0.50   102   59897   124   1   100   100   4.06   100   5721   100   100   0.06    | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       | -,-     |            |          |            |
| 1854   76-43   480   0.89   10   1.00   0.991   0.83   0.99   1.05   0   |      |       |               |          |          |          | 1,010      | 0.961  | 0.62   | 0.50  | 1.02   | 569.97    | 1.24 |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1846   68-11   610   108   110   108   100   108   107   108   1   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1949   56-76   68-9   18-9   190   194-70   1959   194   1959   194   1959   194   1959   194   1959   194   1959   194   1959   194   1959   194      |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 1919 879-96 6-47 144 910 1056 0959 114 050 105 398.4 149 1 100 100 105 475 100 588.4 100 1176 000 0455 Non-Liq. 0.00 1192 4070 408 4070 140 140 110 110 105 095 110 107 095 10 |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 4        |        |      |      |        |       |      |        |       |         |            |          |            |
| 19.38 28.38 6.42 1.22 110 10.86 0.959 1.22 0.50 1.00 49.45 1.52 1 1 100 1.00 4.79 1.00 42.55 0.09 1.07 1.00 0.00 4.65 Nan-Lig. Nan-Lig. 0.00 1.05 4.05 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00 4.00 1.00 4.00 1.00 31.4 0.00 1.00 4.00 1.00  |      |       |               | 6.47     |          | 110      | 1.056      |        | 1.14   | 0.50  |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 19.95   376.34   3.90   3.90   110   1.052   0.95   0.99   3.994   1.49   1   1.00   1.00   4.95   1.00   3.99   1.00   0.00   4.95   0.00   0 | - 11 |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      | 100  |        |       |      |        |       |         |            |          | 0.00       |
| 1985 376-34 382 10.22 110 10.25 0.95 10.9 20.95 0.98 34/16 1.54 1 100 1.00 485 1.00 390.5 0.99 1111, 0.00 0.046 Non-Liq. |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 2011   380-06   445   1.77   1.17     |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 2018 380.08 4.45 1.17 110 1.117 0.957 117 0.50 0.98 350.22 1.59 1 0 100 100 5.05 100 486 1.00 3615 0.98 1mfm, 0.000 0.465 Non-Liq, Non-Liq, O.00 0.20 487 Non-Liq, No | 2    |       | 355,23        |          |          |          | _          |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 20.51   486.23   4.85   4.85   0.98   110   1.115   0.985   1.02   0.50   0.97   446.73   1.47   1.12   1.100   1.00   5.05   1.00   4.49   0.98   1.0116   1.000   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.0014   0.47   0.4   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 20.00   20.0   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | 1        |        |      |      |        |       |      |        |       |         |            |          |            |
| 20.88   32.02   4.88   0.94   110   1122   0.955   0.91   0.50   0.97   6.764   0.146   1.126   1.00   5.15   1.00   4.965   0.98   1.016   1.00   0.05   0.97   5.046   0.98   0.98   0.   |      |       |               |          |          |          |            |        |        |       |        |           | 1,00 |     | 4        |        |      |      |        |       |      |        |       |         | -          |          |            |
| 21.10   551.86   55.4   0.95   110   1.126   0.954   100   0.95   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | i        |        |      |      |        |       |      |        |       |         |            |          |            |
| 21.93   24.14   24.23   24.6   24.24   |      |       |               |          |          |          |            |        | 0.95   | 0.50  | 0.97   | 504.26    | 1.42 |     | 1        | 100    | 1,00 | 5.20 |        |       |      |        |       |         |            |          |            |
| 21.49   592.93   3.90   3.90   3.90   7.4   110   1.138   0.953   0.79   0.50   0.98   481.91   1.34   1   100   1.00   5.35   1.00   481.7   0.97   Infin.   0.00   0.482   0.97   Infin.   0.00   0.485   0.97   |      |       |               |          |          |          |            |        |        |       |        |           | 120  |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 2169   546,51   355   356   356   375   375   375   376   375   376      |      |       |               |          |          |          |            |        |        |       |        |           | 100  |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 21.82 465.36 3.51 0.75 110 1.146 0.952 0.76 0.50 0.96 421.62 1.39 1 1 100 1.00 5.45 1.00 423.2 0.97 Infin 0.000 0.483 Non-Liq Non-Liq 0.00 1.215 498.55 3.95 0.79 110 1.156 0.952 0.72 0.50 0.96 491.92 1.39 1 1 100 1.00 5.55 1.00 431.3 0.97 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.215 498.55 3.95 0.79 110 1.156 0.951 0.79 0.50 0.96 450.22 1.39 1 1 100 1.00 5.55 1.00 431.3 0.97 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.22 1.49 1.49 1 1 1.156 0.951 0.90 0.90 0.50 0.96 40.02 1.39 1 1 100 1.00 5.55 1.00 431.3 0.96 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.22 1.49 1 1.10 1.10 1.00 1.00 5.55 1.00 431.3 0.96 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.00 1.22 1.49 1 1.10 1.10 1.00 1.00 5.55 1.00 431.3 0.96 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.00 1.00 1.00 5.55 1.00 431.3 0.96 Infin 0.000 0.487 Non-Liq 0.00 1.00 1.00 1.00 1.00 5.55 1.00 4.00 1.00 1.00 1.00 0.487 Non-Liq 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 2213 488.55 3.95 0.79 110 1.154 0.951 0.79 0.50 0.96 450.22 1.39 1 100 1.00 5.55 1.00 451.9 0.97 Infin 0.000 0.487 Nort-Liq 0.00 0.22 47 467.81 4.30 0.98 110 1.156 0.950 0.88 0.50 0.95 420.97 1.44 1 100 1.00 5.50 1.00 4423 0.98 Infin 0.000 0.497 Nort-Liq 0.00 0.494 Nort-Liq 0.00 0.497  |      |       |               |          |          |          |            |        | 0.76   | 0.50  | 0.96   | 421,62    | 1,39 |     | 1        | 100    | 1.00 |      |        |       |      |        |       |         |            |          |            |
| 22.21   488.77   4.36   0.89   110   11.59   0.851   0.89   0.50   0.96   440.82   1.43   1   100   1.00   5.65   1.00   4.22   3.96   Infin.   0.000   0.480   Non-Liq.   Non   |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            | •        |            |
| 22.64 43.02 2 3.65 0.06 110 11.65 0.950 0.08 0.05 0.95 36.81 1.01 1.00 1.00 5.75 1.00 387.9 0.06 1nfin, 0.000 0.490 Non-Liq, Non-Liq, 0.00 2.280 388.9 0.0 0.75 110 1.173 0.949 0.75 0.00 0.95 36.81 1.04 1.00 1.00 5.75 1.00 387.9 0.06 1nfin, 0.000 0.492 Non-Liq, Non-Liq, 0.00 2.280 389.7 0.75 110 1.173 0.949 0.75 0.00 0.95 347.83 1.42 1 100 1.00 5.75 1.00 349.3 0.96 1nfin, 0.000 0.495 Non-Liq, Non-Liq, 0.00 2.381 389.7 0.75 110 1.177 0.948 0.75 0.00 0.95 347.83 1.42 1 100 1.00 5.75 1.00 349.3 0.96 1nfin, 0.000 0.495 Non-Liq, Non-Liq, 0.00 2.329 356.43 3.08 1.99 0.55 110 1.185 0.947 0.75 0.95 38.91 11 1.46 1 1.00 1.00 5.95 1.00 349.3 0.96 1nfin, 0.000 0.495 Non-Liq, Non-Liq, 0.00 2.329 34.83 1.99 0.55 110 1.185 0.947 0.75 0.50 0.95 317.11 1.46 1 1.00 1.00 5.95 1.00 319.3 0.96 1nfin, 0.000 0.497 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.185 0.947 0.58 0.50 0.95 317.11 1.46 1 1.00 1.00 5.95 1.00 319.3 0.96 1nfin, 0.000 0.497 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.185 0.947 0.58 0.50 0.94 306.08 1.33 1 1 1.00 1.00 5.95 1.00 319.3 0.96 1nfin, 0.000 0.497 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.185 0.947 0.58 0.50 0.94 306.08 1.33 1 1 1.00 1.00 6.05 1.00 307.2 0.96 1nfin, 0.000 0.500 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.185 0.947 0.58 0.50 0.94 305.08 1.33 1 1 1.00 1.00 6.05 1.00 3.07.2 0.96 1nfin, 0.000 0.500 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.193 0.946 0.85 0.50 0.94 305.48 1.33 1 1 1.00 1.00 6.05 1.00 3.07.5 0.95 1nfin, 0.000 0.500 Non-Liq, Non-Liq, 0.00 2.326 344.88 1.60 0.45 110 1.193 0.946 0.85 0.50 0.94 337.45 1.34 1 1.00 1.00 6.05 1.00 3.35 0.95 1nfin, 0.000 0.500 Non-Liq, Non-Liq, 0.00 2.326 0.35 0.34 1.00 1.00 0.45 1.00 |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            | •        |            |
| 2249   430,22   3.45   0.80   110   1.165   0.950   0.80   0.80   0.80   0.80   0.95   0.95   347,98   1.45   1   100   1.00   5.70   1.00   387,9   0.96   Infin.   0.000   0.492   Non-Liq.   Non-Liq.   0.00   2297   382,78   2.70   2.71   110   1.173   0.949   0.71   0.50   0.95   347,98   1.45   1   1.00   1.00   5.80   1.00   343,8   0.96   Infin.   0.000   0.494   Non-Liq.   Non-Liq.   0.00   0.234   Non-Liq.   |      |       |               |          |          |          |            |        |        |       |        |           |      |     | - 100    |        |      |      |        |       |      |        |       |         |            |          |            |
| 22.77 382.78 2.72 0.71 110 11.173 0.949 0.71 0.50 0.95 317.81 1.42 1 100 1.00 5.85 1.00 343.8 0.98 Infin. 0.000 0.495 Non-Liq. Non-Liq. 0.00 0.323.4 35.4 1.25 0.00 0.495 Non-Liq. Non-Liq. Non-Liq. 0.00 0.495 Non-Liq. Non-Liq. Non-Liq. 0.00 0.495 Non-Liq. |      | 2.64  | 430,22        | 3.45     | 0.80     |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 23.13 356.17 2.68 0.75 110 1.177 0.948 0.75 0.50 0.95 318.11 1.42 1 100 1.00 5.95 1.00 319.0 0.96 Infin. 0.00 0.497 Non-Liq. Non-Liq. 0.00 2.346 34.08 1.99 0.58 110 1.185 0.947 0.50 0.94 305.08 1.99 1 100 1.00 5.95 1.00 319.0 0.96 Infin. 0.00 0.500 Non-Liq. Non-Liq. 0.00 2.346 34.08 1.99 0.58 110 1.185 0.947 0.47 0.50 0.94 305.08 1.39 1 100 1.00 5.95 1.00 307.2 0.96 Infin. 0.00 0.500 Non-Liq. Non-Liq. 0.00 2.346 34.08 1.99 0.58 110 1.185 0.947 0.47 0.50 0.94 305.08 1.39 1 100 1.00 6.00 1.00 6.00 1.00 307.6 0.95 Infin. 0.000 0.500 Non-Liq. Non-Liq. 0.00 2.359 379 12 2.56 0.68 110 1.193 0.946 0.53 0.50 0.94 312.33 1.36 1 100 1.00 6.05 1.00 317.0 0.55 Infin. 0.000 0.500 Non-Liq. Non-Liq. 0.00 2.359 379 12 2.56 0.68 110 1.197 0.946 0.68 0.50 0.94 337.45 1.39 1 100 1.00 6.10 1.00 6.10 1.00 337.1 0.55 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 2.428 382.45 2.59 0.68 110 1.200 0.945 0.68 0.50 0.94 337.45 1.39 1 100 1.00 6.50 1.00 318.7 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 2.428 382.45 2.59 0.68 110 1.204 0.945 0.68 0.50 0.94 337.45 1.39 1 100 1.00 6.50 1.00 318.0 0.95 Infin. 0.000 0.508 Non-Liq. Non-Liq. 0.00 2.428 382.45 2.59 0.68 110 1.204 0.945 0.68 0.50 0.93 309.57 1.35 1 100 1.00 6.50 1.00 318.0 0.95 Infin. 0.000 0.508 Non-Liq. Non-Liq. 0.00 2.428 382.45 2.59 0.68 110 1.204 0.945 0.53 0.50 0.93 309.57 1.35 1 100 1.00 6.50 1.00 310.0 0.55 0.95 Infin. 0.000 0.508 Non-Liq. Non-Liq. 0.00 2.447 352.36 1.35 1.35 0.35 110 1.216 0.943 0.39 0.50 0.93 309.57 1.35 1 100 1.00 6.50 1.00 310.0 0.55 0.95 Infin. 0.000 0.508 Non-Liq. Non-Liq. 0.00 2.447 352.36 1.35 0.35 110 1.220 0.942 0.50 0.50 0.93 309.57 1.55 1 100 1.00 6.55 1.00 312.0 0.95 Infin. 0.000 0.512 Non-Liq. Non-Liq. Non-Liq. 0.00 2.449 346.66 1.81 0.50 110 1.220 0.942 0.50 0.50 0.93 309.57 1.55 1 100 1.00 6.55 1.00 32.7 0.94 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 2.55 377.11 1.91 0.51 1.01 1.220 0.942 0.50 0.50 0.93 322.96 1.35 1 100 1.00 6.65 1.00 32.7 0.94 Infin. 0.000 0.522 Non-Liq. Non-Liq. 0.00 2.55 377.11 1.91 0.51 1.01 1.220 0.945 0.50 0.93 326.84 |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         | Non-Liq.   | Non-Liq. | 0.00       |
| 23.29 366.43 2.35 0.66 110 1.181 0.948 0.66 0.50 0.95 317.81 1.42 1 1.00 1.00 5.90 1.00 319.0 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.378 34.88 1.90 0.55 1.00 0.95 1.00 1.185 0.947 0.57 0.94 0.50 0.94 306.08 1.39 1 100 1.00 6.00 1.00 307.6 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.379 352.04 1.86 0.55 1.00 1.193 0.946 0.35 0.50 0.94 305.89 1.41 1 100 1.00 6.05 1.00 319.5 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.379 352.04 1.86 0.55 1.00 1.193 0.946 0.35 0.50 0.94 305.89 1.41 1 100 1.00 6.05 1.00 319.5 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.411 381.50 0.41 0.50 0.94 0.55 0.94 305.99 1.41 1 100 1.00 6.05 1.00 319.5 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.411 381.50 0.40 0.35 0.50 0.94 305.99 1.41 1 100 1.00 6.05 1.00 319.5 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.411 381.50 0.41 0.50 0.94 305.99 1.41 1 100 1.00 6.05 1.00 319.7 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.414 0.83 1.00 0.945 0.88 0.50 0.94 307.4 1.41 1 100 1.00 6.20 1.00 319.0 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.414 0.82 0.42 0.42 0.83 0.94 0.81 0.50 0.94 307.4 1.41 1 100 1.00 6.25 1.00 321.0 0.95 Infin. 0.00 0.50 Non-Liq. Non-Liq. 0.00 2.414 0.82 0.42 0.40 0.40 0.40 0.40 0.40 0.94 0.40 0.40  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 23.48 343.88 1.99 0.58 110 1.185 0.947 0.58 0.50 0.94 306.08 1.39 1 100 1.00 5.95 1.00 307.6 0.95 Infin. 0.000 0.500 Non-Liq. Non-Liq. 0.00 23.79 352.04 1.86 0.53 110 1.189 0.947 0.50 0.94 307.5 0.94 307.3 1.38 1 100 1.00 6.05 1.00 307.6 0.95 Infin. 0.000 0.503 Non-Liq. Non-Liq. 0.00 23.95 379.12 2.56 0.68 110 1.197 0.946 0.88 0.50 0.94 33.589 1.41 1 100 1.00 6.05 1.00 337.1 0.95 Infin. 0.000 0.503 Non-Liq. Non-Liq. 0.00 24.28 382.45 2.59 0.68 110 1.200 0.945 0.68 0.50 0.94 33.74 1.44 1 1 100 1.00 6.05 1.00 337.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 24.28 382.45 2.59 0.68 110 1.200 0.944 0.61 0.50 0.94 33.91 1.44 1 1 100 1.00 6.25 1.00 339.0 0.95 Infin. 0.000 0.506 Non-Liq. Non-Liq. 0.00 24.28 382.45 2.59 0.68 110 1.200 0.944 0.61 0.50 0.94 33.91 1.40 1 1 100 1.00 6.25 1.00 339.0 0.95 Infin. 0.000 0.506 Non-Liq. Non-Liq. 0.00 24.61 345.67 1.94 0.53 110 1.200 0.944 0.61 0.50 0.94 33.91 1.40 1 1 100 1.00 6.25 1.00 339.0 0.95 Infin. 0.000 0.506 Non-Liq. Non-Liq. 0.00 24.61 345.67 1.94 0.53 110 1.212 0.943 0.53 0.50 0.93 30.957 1.27 1 1 100 1.00 6.25 1.00 30.3 0.95 Infin. 0.000 0.511 Non-Liq. Non-Liq. 0.00 24.21 34.93 361.68 1.81 0.50 110 1.224 0.942 0.50 0.50 0.93 30.957 1.27 1 1 100 1.00 6.40 1.00 316.4 0.94 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 25.25 360.60 1.90 0.52 110 1.228 0.941 0.52 0.50 0.50 0.93 32.47 1.32 1 1 100 1.00 6.40 1.00 324.2 0.94 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 25.25 37.11 0.91 0.52 110 1.228 0.941 0.50 0.50 0.93 32.75 0.51 1.35 1 1 100 1.00 6.65 1.00 324.2 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.25 37.11 0.91 0.52 110 1.228 0.941 0.50 0.50 0.93 32.75 0.51 1.35 1 1 100 1.00 6.65 1.00 32.13 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.25 37.11 0.91 0.52 110 1.228 0.941 0.50 0.50 0.93 32.87 0.94 Infin. 0.00 0.518 Non-Liq. Non-Liq. 0.00 25.25 37.11 0.91 0.91 0.91 0.91 0.93 0.95 0.92 32.75 0.135 1 1 100 1.00 6.65 1.00 32.7 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.25 37.11 0.91 0.91 0.91 0.91 0.93 0.93 0.93 0.93 32.7 0.93 1.10 0.10 0.00 0.52 37.0 0.94 I |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 23.79 32.04 1.86 0.05 1.07 1.193 0.946 0.53 0.50 0.94 30.646 1.33 1 1 100 1.00 6.05 1.00 315.5 0.95 Infin. 0.000 0.502 Non-Liq. Non-Liq. 23.79 32.04 1.86 0.53 1.01 1.93 0.946 0.53 0.50 0.94 335.89 1.41 1 1 100 1.00 6.05 1.00 337.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 0.00 1.00 6.05 1.00 37.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 0.00 1.00 6.05 1.00 37.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 0.00 1.00 6.05 1.00 37.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 0.00 0.00 1.00 6.05 1.00 37.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0   |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 23.95 379.12 2.56 0.68 110 1.197 0.946 0.68 0.50 0.94 335.89 1.41 1 1 100 1.00 6.10 1.00 337.1 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 24.41 381.50 2.41 0.63 110 1.200 0.945 0.68 0.50 0.94 337.45 1.39 1 100 1.00 6.25 1.00 339.0 0.95 Infin. 0.000 0.505 Non-Liq. Non-Liq. 0.00 24.44 382.80 2.22 0.61 110 1.208 0.944 0.61 0.50 0.94 319.81 1.40 1 100 1.00 6.25 1.00 339.0 0.95 Infin. 0.000 0.509 Non-Liq. Non-Liq. 0.00 24.44 382.80 2.22 0.61 110 1.208 0.944 0.61 0.50 0.94 319.81 1.40 1 100 1.00 6.25 1.00 321.0 0.95 Infin. 0.000 0.509 Non-Liq. Non-Liq. 0.00 24.61 34.67 1.84 0.53 110 1.212 0.943 0.53 0.50 0.93 304.16 1.30 1.00 1.00 6.35 1.00 310.7 0.95 Infin. 0.000 0.512 Non-Liq. Non-Liq. 0.00 24.77 352.36 1.35 0.38 110 1.216 0.943 0.53 0.50 0.93 304.16 1.34 1 100 1.00 6.35 1.00 310.7 0.95 Infin. 0.000 0.512 Non-Liq. Non-Liq. 0.00 24.93 0.53 0.95 Infin. 0.000 0.512 Non-Liq. Non-Liq. 0.00 24.93 0.53 0.95 Infin. 0.000 0.512 Non-Liq. Non-Liq. 0.00 24.93 0.50 0.95 322.96 1.35 0.38 110 1.220 0.942 0.50 0.50 0.93 317.26 1.34 1 100 1.00 6.35 1.00 310.7 0.95 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 25.10 38.87 1.44 0.50 110 1.224 0.942 0.50 0.50 0.93 322.98 1.33 1 100 1.00 6.35 1.00 310.7 0.95 Infin. 0.000 0.514 Non-Liq. Non-Liq. Non-Liq. 0.00 25.10 38.87 1.44 0.50 110 1.224 0.942 0.50 0.50 0.93 322.98 1.33 1 100 1.00 6.55 1.00 32.57 0.94 Infin. 0.000 0.515 Non-Liq. Non-Liq. 0.00 25.43 37.11 1.91 0.51 110 1.228 0.941 0.52 0.50 0.93 322.98 1.33 1 100 1.00 6.55 1.00 32.57 0.94 Infin. 0.000 0.515 Non-Liq. Non-Liq. 0.00 25.43 37.11 1.91 0.51 110 1.238 0.940 0.55 0.50 0.93 324.47 1.32 1 100 1.00 6.55 1.00 32.57 0.94 Infin. 0.000 0.516 Non-Liq. Non-Liq. 0.00 25.59 377.11 1.91 0.51 110 1.238 0.940 0.55 0.50 0.93 324.47 1.32 1 100 1.00 6.55 1.00 32.57 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.99 377.11 1.91 0.51 110 1.236 0.940 0.55 0.50 0.93 32.447 1.32 1 100 1.00 6.55 1.00 32.57 0.94 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 25.99 377.11 1.91 0.51 110 1.240 0.939 0.55 0.50 0.92 337.36 1.35 1 100 1.00 6.65 1.00 32.57 0. |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          | 0.00       |
| 24.11 381.50 2.41 0.63 110 1.200 0.945 0.63 0.50 0.94 337.45 1.39 1 100 1.00 6.15 1.00 338.7 0.95 Infin, 0.000 0.506 Non-Liq, Non-Liq, 0.00 24.28 382.45 2.59 0.68 110 1.204 0.945 0.68 0.50 0.94 37.74 1.41 1 100 1.00 6.20 1.00 339.0 0.95 Infin, 0.000 0.506 Non-Liq, Non-Liq, 0.00 24.61 345.67 1.94 0.53 110 1.212 0.943 0.53 0.50 0.93 304.61 1.37 1 100 1.00 6.25 1.00 305.3 0.95 Infin, 0.000 0.509 Non-Liq, Non-Liq, 0.00 24.61 345.67 1.94 0.53 110 1.216 0.942 0.50 0.93 304.61 1.37 1 100 1.00 6.30 1.00 305.3 0.95 Infin, 0.000 0.509 Non-Liq, Non-Liq, 0.00 24.77 352.36 1.35 0.38 110 1.216 0.942 0.50 0.93 309.57 1.27 1 100 1.00 6.30 1.00 305.3 0.95 Infin, 0.000 0.514 Non-Liq, 0.00 24.93 381.66 1.81 0.50 110 1.220 0.942 0.50 0.50 0.93 317.26 1.34 1 100 1.00 6.40 1.00 318.4 0.94 Infin, 0.000 0.514 Non-Liq, 0.00 25.10 388.75 1.84 0.50 110 1.224 0.942 0.50 0.50 0.93 322.08 1.33 1 100 1.00 6.45 1.00 324.2 0.94 Infin, 0.000 0.514 Non-Liq, Non-Liq, 0.00 25.26 386.01 1.90 0.52 110 1.228 0.941 0.49 0.50 0.93 324.47 1.32 1 100 1.00 6.55 1.00 324.2 0.94 Infin, 0.000 0.516 Non-Liq, Non-Liq, 0.00 25.57 377.11 1.91 0.51 110 1.236 0.940 0.51 0.50 0.93 324.47 1.32 1 100 1.00 6.55 1.00 325.7 0.94 Infin, 0.000 0.516 Non-Liq, Non-Liq, 0.00 25.57 377.11 1.91 0.51 110 1.228 0.941 0.50 0.93 324.47 1.32 1 100 1.00 6.55 1.00 325.7 0.94 Infin, 0.000 0.518 Non-Liq, Non-Liq, 0.00 25.57 377.11 1.91 0.51 110 1.228 0.940 0.51 0.50 0.92 337.86 1.39 1 100 1.00 6.65 1.00 335.0 0.94 Infin, 0.000 0.520 Non-Liq, Non-Liq, 0.00 25.57 377.11 1.91 0.51 110 1.226 0.930 0.50 0.92 337.86 1.39 1 100 1.00 6.65 1.00 336.0 0.94 Infin, 0.000 0.520 Non-Liq, Non-Liq, 0.00 25.57 386.49 1.78 0.50 110 1.255 0.937 0.50 0.92 337.86 1.39 1 100 1.00 6.65 1.00 337.5 0.94 Infin, 0.000 0.520 Non-Liq, Non-Liq, 0.00 0.524 Non-Liq, Non-Liq, 0.00 0.525 Non-Liq, Non-Liq, 0.00 0.525 Non-Liq, Non-Liq, 0.00 0.526 Non |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 24.28  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 24.44 362.80 2.22 0.61 110 1.208 0.944 0.61 0.50 0.94 319.81 1.40 1 100 1.00 6.25 1.00 321.0 0.95 Infin. 0.000 0.509 Non-Liq. Non-Liq. 0.00 24.61 345.67 1.84 0.53 110 1.212 0.943 0.53 0.50 0.93 304.16 1.37 1 100 1.00 6.35 1.00 305.3 0.95 Infin. 0.000 0.511 Non-Liq. 0.00 0.51 Non-Liq. Non-Liq. 0.00 24.93 361.66 1.81 0.50 110 1.220 0.942 0.50 0.50 0.93 304.16 1.33 1 100 1.00 6.35 1.00 310.7 0.95 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 0.515 Non-Liq. | 24   | 4.28  | 382.45        | 2,59     |          |          |            |        |        |       |        |           |      |     | 51       |        |      |      |        |       |      |        |       |         |            |          |            |
| 24.77 352.36 1.35 0.38 110 1.216 0.943 0.39 0.50 0.93 309.57 1.27 1 100 1.00 6.35 1.00 310.7 0.95 Infin 0.000 0.512 Non-Liq, Non-Liq, 0.00 24.93 361.66 1.81 0.50 110 1.220 0.942 0.50 0.50 0.93 317.26 1.34 1 100 1.00 6.40 1.00 318.4 0.94 Infin 0.000 0.514 Non-Liq, Non-Liq, 0.00 25.10 368.75 1.84 0.50 110 1.228 0.941 0.52 0.50 0.93 322.98 1.33 1 100 1.00 6.45 1.00 324.2 0.94 Infin 0.000 0.515 Non-Liq, Non-Liq, 0.00 25.43 371.63 1.81 0.49 110 1.228 0.941 0.52 0.50 0.93 322.98 1.33 1 100 1.00 6.50 1.00 321.3 0.94 Infin 0.000 0.516 Non-Liq, Non-Liq, 0.00 25.59 371.63 1.81 0.49 110 1.236 0.940 0.51 0.50 0.93 322.98 1.33 1 100 1.00 6.50 1.00 321.3 0.94 Infin 0.000 0.518 Non-Liq, Non-Liq, 0.00 25.57 376.28 2.06 0.55 110 1.236 0.940 0.51 0.50 0.93 322.76 1.33 1 100 1.00 6.60 1.00 330.0 0.94 Infin 0.000 0.518 Non-Liq, Non-Liq, 0.00 25.75 376.28 2.06 0.55 110 1.240 0.939 0.55 0.50 0.92 337.36 1.39 1 100 1.00 6.65 1.00 328.7 0.94 Infin 0.000 0.520 Non-Liq, Non-Liq, 0.00 25.75 376.28 2.06 0.55 110 1.240 0.939 0.64 0.50 0.92 337.36 1.39 1 100 1.00 6.65 1.00 338.6 0.94 Infin 0.000 0.520 Non-Liq, Non-Liq, 0.00 26.08 387.53 2.18 0.56 110 1.247 0.938 0.57 0.50 0.92 337.36 1.39 1 100 1.00 6.85 1.00 337.5 0.94 Infin 0.000 0.520 Non-Liq, Non-Liq, 0.00 26.28 387.53 2.18 0.56 110 1.255 0.937 0.50 0.92 337.36 1.32 1 100 1.00 6.85 1.00 337.5 0.94 Infin 0.000 0.520 Non-Liq, Non-Liq, 0.00 26.25 390.12 1.95 0.50 110 1.255 0.937 0.50 0.92 337.88 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin 0.000 0.524 Non-Liq, Non-Liq, 0.00 26.57 386.49 1.78 0.94 1.78 0.935 0.94 0.50 0.92 337.88 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin 0.000 0.525 Non-Liq, Non-Liq, 0.00 26.77 384.18 1.88 0.94 1.78 0.94 1.78 0.935 0.94 0.50 0.92 337.88 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin 0.000 0.525 Non-Liq, Non-Liq, 0.00 27.20 373.66 1.90 0.51 110 1.257 0.935 0.51 0.50 0.91 323.41 1.34 1 100 1.00 6.85 1.00 324.5 0.93 Infin 0.000 0.525 Non-Liq, Non-Liq, 0.00 27.20 373.66 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 323.41 1.34 1 100 1.00 7.05 1.00 324.5 0.93 Infin 0.000  |      |       |               | 2,22     |          | 110      | 1.208      | 0.944  | 0.61 ( | .50   | 0.94   | 319.81    | 1.40 |     | 1        | 100    | 1.00 | 6.25 | 1.00   | 321.0 | 0.95 | Infin. | 0.000 | 0.509   | Non-Liq.   | Non-Liq  |            |
| 24.93 361.66 1.81 0.50 110 1.220 0.942 0.50 0.50 0.93 317.26 1.34 1 100 1.00 6.40 1.00 318.4 0.94 Infin. 0.000 0.514 Non-Liq. Non-Liq. 0.00 25.10 368.75 1.84 0.50 110 1.224 0.942 0.50 0.50 0.93 322.98 1.33 1 100 1.00 6.45 1.00 324.2 0.94 Infin. 0.000 0.515 Non-Liq. Non-Liq. 0.00 25.53 371.63 1.81 0.49 110 1.232 0.941 0.52 0.50 0.93 324.47 1.32 1 100 1.00 6.50 1.00 321.3 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.59 377.11 1.91 0.51 110 1.236 0.940 0.51 0.50 0.93 324.47 1.32 1 100 1.00 6.65 1.00 325.7 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.75 376.28 2.06 0.55 110 1.240 0.939 0.55 0.50 0.92 327.50 1.35 1 100 1.00 6.65 1.00 320.0 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.99 388.18 2.48 0.64 110 1.243 0.939 0.64 0.50 0.92 337.36 1.39 1 100 1.00 6.65 1.00 320.7 0.94 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 26.08 387.53 2.18 0.56 110 1.247 0.938 0.57 0.50 0.92 337.36 1.35 1 100 1.00 6.65 1.00 337.5 0.94 Infin. 0.000 0.522 Non-Liq. Non-Liq. 0.00 26.64 385.52 1.93 0.50 110 1.251 0.938 0.57 0.50 0.92 337.38 1.32 1 100 1.00 6.85 1.00 337.5 0.94 Infin. 0.000 0.523 Non-Liq. Non-Liq. 0.00 26.74 386.48 1.88 0.49 1.78 0.46 110 1.255 0.937 0.50 0.50 0.92 337.38 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.38 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.81 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.88 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.88 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.88 1.33 1 100 1.00 6.85 1.00 335.0 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.74 386.18 1.88 0.49 110 1.255 0.937 0.50 0.50 0.92 337.88 1.33 1 |      |       |               |          |          |          |            |        |        |       |        |           |      |     | (6)      |        |      |      |        |       |      |        |       |         |            |          |            |
| 25.10 368.75 1.84 0.50 110 1.224 0.942 0.50 0.50 0.93 322.98 1.33 1 100 1.00 6.45 1.00 324.2 0.94 Infin. 0.000 0.515 Non-Liq. Non-Liq. 0.00 25.26 366.01 1.90 0.52 110 1.228 0.941 0.52 0.50 0.93 320.06 1.35 1 100 1.00 6.50 1.00 321.3 0.94 Infin. 0.000 0.516 Non-Liq. Non-Liq. 0.00 25.43 371.63 1.81 0.49 110 1.232 0.941 0.49 0.50 0.93 324.47 1.32 1 100 1.00 6.50 1.00 325.7 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.59 377.11 1.91 0.51 110 1.236 0.940 0.51 0.50 0.93 328.74 1.33 1 100 1.00 6.60 1.00 330.0 0.94 Infin. 0.000 0.518 Non-Liq. Non-Liq. 0.00 25.75 376.28 2.06 0.55 110 1.240 0.939 0.55 0.50 0.92 327.50 1.35 1 100 1.00 6.60 1.00 330.0 0.94 Infin. 0.000 0.519 Non-Liq. Non-Liq. 0.00 25.9 388.18 2.48 0.64 110 1.243 0.939 0.65 0.50 0.92 337.36 1.39 1 100 1.00 6.65 1.00 328.7 0.94 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 25.9 387.53 2.18 0.56 110 1.247 0.938 0.57 0.50 0.92 337.36 1.39 1 100 1.00 6.75 1.00 338.6 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.25 390.12 1.95 0.50 110 1.251 0.938 0.50 0.50 0.92 337.36 1.32 1 100 1.00 6.80 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 385.52 1.93 0.50 110 1.251 0.938 0.50 0.50 0.92 333.78 1.32 1 100 1.00 6.80 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 385.52 1.93 0.50 110 1.255 0.937 0.50 0.50 0.92 333.78 1.32 1 100 1.00 6.80 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 384.18 0.49 110 1.255 0.936 0.49 0.50 0.92 333.78 1.32 1 100 1.00 6.85 1.00 335.0 0.93 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.77 376.27 1.93 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.00 1.00 329.8 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.00 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.00 1.00 329.8 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.00 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.00 1.00 329.8 0.93 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.00 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.00 1.00 329.9  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 25.26  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 25.59 377.11 1.91 0.51 110 1.236 0.940 0.51 0.50 0.93 328.74 1.33 1 100 1.00 6.60 1.00 330.0 0.94 Infin. 0.000 0.519 Non-Liq. Non-Liq. 0.00 25.75 376.28 2.06 0.55 110 1.240 0.939 0.55 0.50 0.92 327.50 1.35 1 100 1.00 6.65 1.00 338.6 0.94 Infin. 0.000 0.520 Non-Liq. Non-Liq. 0.00 25.92 388.81 2.48 0.64 110 1.243 0.939 0.64 0.50 0.92 337.96 1.35 1 100 1.00 6.75 1.00 338.6 0.94 Infin. 0.000 0.522 Non-Liq. Non-Liq. 0.00 26.25 390.12 1.95 0.50 110 1.251 0.938 0.50 0.50 0.92 337.98 1.32 1 100 1.00 6.85 1.00 335.0 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 385.52 1.93 0.50 110 1.255 0.937 0.50 0.92 337.98 1.32 1 100 1.00 6.85 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 385.52 1.93 0.50 110 1.255 0.937 0.50 0.92 333.46 1.32 1 100 1.00 6.85 1.00 335.0 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.47 384.18 1.88 0.49 110 1.259 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.85 1.00 335.0 0.93 Infin. 0.000 0.527 Non-Liq. Non-Liq. 0.00 26.77 376.27 1.93 0.51 110 1.263 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 335.0 0.93 Infin. 0.000 0.528 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 329.8 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 329.9 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 321.9 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.275 0.934 0.51 0.50 0.91 320.91 330.91 1.55 1 100 1.00 7.05 1.00 332.2 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.23 373.66 1.90 0.51 110 1.286 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.23 373.44 4.16 1.06 110 1.286 0.932 1.01 0.50 0.91 330.91 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.23 373.44 4.16 1.06 110 1.286 0.932 1.01 0.50 0.91 330.91 1.55 1 100 1.00 7.25 1.00 33 |      |       |               |          |          | 110      | 1.228      | 0.941  | 0.52   | .50   | 0.93   | 320.06    | 1.35 |     | 1        | 100    | 1.00 | 6,50 | 1.00   | 321.3 | 94   | Infin. | 0.000 | 0.516   |            |          | 0.00       |
| 25.75  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         | Non-Liq.   | Non-Liq, |            |
| 25.92 388.18 2.48 0.64 110 1.243 0.939 0.64 0.50 0.92 337.36 1.39 1 100 1.00 6.70 1.00 338.6 0.94 Infin, 0.000 0.522 Non-Liq, Non-Liq, 0.00 26.08 397.53 2.18 0.56 110 1.247 0.938 0.57 0.50 0.92 337.98 1.32 1 100 1.00 6.80 1.00 337.5 0.94 Infin, 0.000 0.523 Non-Liq, Non-Liq, 0.00 26.57 390.12 1.95 0.50 110 1.251 0.938 0.50 0.92 337.98 1.32 1 100 1.00 6.80 1.00 337.5 0.94 Infin, 0.000 0.524 Non-Liq, Non-Liq, 0.00 26.57 386.49 1.78 0.46 110 1.255 0.937 0.50 0.50 0.92 333.48 1.32 1 100 1.00 6.85 1.00 337.5 0.94 Infin, 0.000 0.526 Non-Liq, Non-Liq, 0.00 26.57 386.49 1.78 0.46 110 1.255 0.936 0.46 0.50 0.92 333.78 1.30 1 100 1.00 6.85 1.00 332.5 0.93 Infin, 0.000 0.526 Non-Liq, Non-Liq, 0.00 26.77 384.18 1.88 0.49 110 1.263 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 332.5 0.93 Infin, 0.000 0.528 Non-Liq, Non-Liq, 0.00 27.07 376.27 1.93 0.51 110 1.267 0.935 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.00 1.00 329.8 0.93 Infin, 0.000 0.529 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.45 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin, 0.000 0.529 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.45 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin, 0.000 0.523 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 328.45 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin, 0.000 0.523 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.2 0.93 Infin, 0.000 0.531 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.97 1.55 1 100 1.00 7.25 1.00 324.2 0.93 Infin, 0.000 0.533 Non-Liq, Non-Liq, 0.00 27.23 373.44 4.16 1.06 110 1.286 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin, 0.000 0.535 Non-Liq, Non-Liq, 0.00 27.23 373.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 377.4 0.92 Infin, 0.000 0.535 Non-Liq, Non-Liq, 0.00   |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 26.08 387.53 2.18 0.56 110 1.247 0.938 0.57 0.50 0.92 336.26 1.35 1 100 1.00 6.75 1.00 337.5 0.94 Infin. 0.000 0.523 Non-Liq. Non-Liq. 0.00 26.25 390.12 1.95 0.50 110 1.251 0.938 0.50 0.50 0.50 0.92 337.98 1.32 1 100 1.00 6.80 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.41 385.52 1.93 0.50 110 1.255 0.937 0.50 0.50 0.92 333.46 1.32 1 100 1.00 6.85 1.00 334.7 0.93 Infin. 0.000 0.526 Non-Liq. Non-Liq. 0.00 26.57 386.49 1.78 0.46 110 1.259 0.936 0.46 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 332.5 0.93 Infin. 0.000 0.528 Non-Liq. Non-Liq. 0.00 26.97 384.18 1.88 0.49 110 1.263 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 332.5 0.93 Infin. 0.000 0.528 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.267 0.935 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 329.8 0.93 Infin. 0.000 0.528 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 328.51 1.34 1 100 1.00 7.05 1.00 321.9 0.93 Infin. 0.000 0.531 Non-Liq. Non-Liq. 0.00 27.23 373.66 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 320.97 1.34 1 100 1.00 7.05 1.00 321.9 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.25 373.66 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 320.97 1.33 1 100 1.00 7.05 1.00 321.9 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.25 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00 27.25 386.83 3.91 1.01 110 1.286 0.932 1.06 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00 27.25 383.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00   |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 26.57 386.49 1.78 0.46 110 1.251 0.938 0.50 0.50 0.92 337.98 1.32 1 100 1.00 6.80 1.00 339.2 0.94 Infin. 0.000 0.524 Non-Liq. Non-Liq. 0.00 26.57 Non-Liq. Non-Liq. Non-Liq. 0.00 26.57 Non-Liq. |      |       |               | 2,18     | 0.56     | 110      | 1,247      | 0,938  | 0.57   | .50   | 0.92   | 336.26    | 1:35 |     | 1        |        | 1.00 | 6.75 | 1.00   | 337.5 | 0.94 |        |       |         |            |          |            |
| 26.57 386.49 1.78 0.46 110 1.259 0.936 0.46 0.50 0.92 333.78 1.30 1 100 1.00 6.90 1.00 335.0 0.93 Infin. 0.000 0.527 Non-Liq. Non-Liq. 0.00 26.74 384.18 1.88 0.49 110 1.263 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 332.5 0.93 Infin. 0.000 0.527 Non-Liq. Non-Liq. 0.00 26.90 381.61 1.93 0.51 110 1.267 0.935 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 329.8 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 323.41 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin. 0.000 0.531 Non-Liq. Non-Liq. 0.00 27.40 376.94 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.9 0.93 Infin. 0.000 0.532 Non-Liq. Non-Liq. 0.00 27.56 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 332.2 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      | Infin. | 0.000 | 0.524   | Non-Liq.   | Non-Liq  | 0.00       |
| 26.74 384.18 1.88 0.49 110 1.263 0.936 0.49 0.50 0.92 331.26 1.32 1 100 1.00 6.95 1.00 332.5 0.93 Infin, 0.000 0.528 Non-Liq, Non-Liq, 0.00 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 328.53 1.33 1 100 1.00 7.05 1.00 329.8 0.93 Infin, 0.000 0.529 Non-Liq, Non-Liq, 0.00 27.03 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin, 0.000 0.531 Non-Liq, Non-Liq, 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.9 0.93 Infin, 0.000 0.532 Non-Liq, Non-Liq, 0.00 27.25 373.66 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 320.99 1.33 1 100 1.00 7.15 1.00 324.9 0.93 Infin, 0.000 0.533 Non-Liq, Non-Liq, 0.00 27.56 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 332.2 0.93 Infin, 0.000 0.535 Non-Liq, Non-Liq, 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin, 0.000 0.535 Non-Liq, Non-Liq, 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 26.90 381.61 1.93 0.51 110 1.267 0.935 0.51 0.50 0.91 328.53 1.33 1 1.00 1.00 7.05 1.00 329.8 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 323.41 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin. 0.000 0.529 Non-Liq. Non-Liq. 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin. 0.000 0.531 Non-Liq. Non-Liq. 0.00 27.40 376.94 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 322.99 1.33 1 1.00 1.00 7.15 1.00 324.2 0.93 Infin. 0.000 0.532 Non-Liq. Non-Liq. 0.00 27.75 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 332.4 0.92 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 27.07 376.27 1.93 0.51 110 1.271 0.934 0.51 0.50 0.91 323.41 1.34 1 100 1.00 7.05 1.00 324.6 0.93 Infin. 0.000 0.531 Non-Liq. Non-Liq. 0.00 27.23 373.66 1.90 0.51 110 1.275 0.934 0.51 0.50 0.91 320.67 1.34 1 100 1.00 7.05 1.00 324.9 0.93 Infin. 0.000 0.531 Non-Liq. Non-Liq. Non-Liq. 0.00 27.40 376.94 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 322.99 1.33 1 100 1.00 7.15 1.00 324.2 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.75 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 332.4 0.92 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00   | 26   | 90    | 381.61        | 1.93     | 0.51     | 110      | 1.267      | 935    | 0.51   | .50   | 0.91   | 328.53    | 1.33 |     | 1 .      |        |      |      |        |       |      |        |       |         |            |          |            |
| 27.40 376.94 1.90 0.51 110 1.279 0.933 0.51 0.50 0.91 322.99 1.33 1 100 1.00 7.15 1.00 324.2 0.93 Infin. 0.000 0.533 Non-Liq. Non-Liq. 0.00 27.56 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.25 1.00 332.2 0.93 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      | 1,00   | 324,6 | 93   | Infin. | 0.000 | 0,531   | Non-Liq. I | Non-Liq. | 0.00       |
| 27.56 386.83 3.91 1.01 110 1.282 0.932 1.01 0.50 0.91 330.99 1.55 1 100 1.00 7.20 1.00 332.2 0.93 Infin. 0.000 0.534 Non-Liq. Non-Liq. 0.00 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 27.72 393.44 4.16 1.06 110 1.286 0.932 1.06 0.50 0.91 336.15 1.56 1 100 1.00 7.25 1.00 337.4 0.92 Infin. 0.000 0.535 Non-Liq. Non-Liq. 0.00  |      |       |               |          |          |          |            |        |        |       |        |           |      |     |          |        |      |      |        |       |      |        |       |         |            |          |            |
| 4.7.89 <mark>437.24 5.53</mark> 1.26 110 1.290 0.931 1.27 0.50 0.91 373.12 1.60 11 100 1.00 7.30 1.00 374.5 0.92 Infin, 0.000 0.536 <b>Non-Liq, Non-Liq, 0.00</b>  |      |       |               |          |          | 110      | 1,286      | 932 1  | .06 0  | .50 ( | 0.91   | 336 15    | 1.56 |     | 4        | 100 1  | .00  | 7.25 | 1.00 3 | 337.4 | 92   | Infin. | 0.000 | 0,535   | Non-Liq.   | Non-Liq. | 0.00       |
|  | 1 2/ | .09   | 137.24        | 5.53     | 1.26     | 110      | 1,290 (    | 1931 1 | .27 0  | .50 ( | J.91 ( | 3/3.12 1  | 1,60 |     | 4        | 100 1  | 00   | 7.30 | 1.00 3 | 374.5 | 92   | Infin, | 0.000 | 0.536   | Non-Liq. I | Non-Lig. | 0.00       |

| Depth   Color   Per      | lumetric     |   | Liquefac.  | Induced |       |        |      | Clean |      |      |      | Rel    | Lique |       |          |      |      |      |       | Eff.Stress                    | Total    | Friction | Friction | Tip    | Layer      |
|--|--------------|---|------------|---------|-------|--------|------|-------|------|------|------|--------|-------|-------|----------|------|------|------|-------|-------------------------------|----------|----------|----------|--------|------------|
| 2822 4850 4 0.91 10 1298 0297 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   | Strain       | Probab                                  |            |         | EQ    |        |      |       |      | Н    |      | t Dens | Susce |       |          |      |      |      |       | * Section Company             |          |          |          |        | 1100000000 |
| 2824 46502 4-40 0.99   110   | (%)          |   |            |         |       |        |      |       |      |      | _    |        |       |       |          |      |      | _    |       | and a few or it has been been | - Herman | 100      | -        | -      | -          |
| 2834 3869.91 356 088 110 1302 0929 098 050 050 3151 168 1 100 100 7.45 100 3127 082 1nfn 0.000 054 Non-Hall, Non-Hall 2321 370.46 4.13 109 110 1300 0927 130 050 03400 183 1 100 110 1.07 750 110 3250 050 3158 1 100 110 120 100 758 100 3158 052 1nfn 0.000 054 Non-Hall, Non-Hall 2321 370.46 4.15 109 110 1310 0927 130 050 03400 183 1 100 110 1.07 750 110 3198 052 1nfn 0.000 054 Non-Hall, Non-Hall 2321 370.46 4.15 109 110 1310 0927 130 050 03400 183 1 100 110 1.07 750 110 3198 052 1nfn 0.000 054 Non-Hall, Non-Hall 2321 370.46 4.15 100 110 1310 0927 100 1316 0920 110 1310 0927 100 1316 0920 110 1310 0927 100 1316 0920 110 1310 0920 100 1316 0920 110 1310 0920 100 1316 0920 110 1310 0920 100 100 100 770 100 1316 0920 110 100 00 054 Non-Hall, Non-Hall 2321 37725 235 100 110 1325 0928 0828 1 100 100 100 770 100 100 770 100 178 100 100 00 054 Non-Hall, Non-Hall 2321 37725 235 100 110 1325 0928 0828 1 100 100 100 770 100 100 770 100 178 100 178 100 00 054 Non-Hall, Non-Hall 2321 37725 235 100 110 1325 0928 0828 1 100 100 100 770 100 100 770 100 178 100 178 100 00 054 Non-Hall, Non-Hall 2321 37725 235 100 110 1325 0928 0828 1 100 110 1327 0928 0828 1 100 110 1327 0928 0828 1 100 110 1325 0928 0828 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 110 1327 0928 1 100 120 120 120 120 120 120 120 120 1   | 0.00         |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 2873 38646 439 128 110 1334 0928 128 07 80 109 318 89 159 1 100 100 7.58 1.00 318 0.92 1676 0.000 354 Non-High, Non-High Carlos 383, 14 329 083 170 134 0928 0.84 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85  | 0.00         |   |            | 0,540   | 0.000 | Infin. | 0.92 | 312.7 | 1.00 | 7.45 | 1.00 | 100    | - 1   | 1.56  | 311_51   | 0.90 | 0.50 | 0.98 | 0.929 | 1,302                         | 110      | 0.98     | 3.58     |        |            |
| 2867   396.64   496   425   10   1314   028   125   030   030   332.8   182   1   100   100   765   100   338.6   025   rifin   0.000   0.544   Mon-Liq   1.001   1.002   1.003   1.   | 0.00         |   | •          |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 22-20   387-78   239   376   110   13.22   0.25   0.76   0.50   0.89   23.88   1.48   1   100   1.00   7.76   1.00   228   1.09   1   1   1   1   1   1   1   1   2   2  | 0.00         |   |            |         |       |        |      |       |      |      |      |        | - 120 |       | 335_32   | 0.90 | 0.50 | 1.25 | 0.926 | 1,314                         | 110      | 1.25     | 4.96     | 396.64 | 28.87      |
| 2949 397-30  | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1,120 |       |          |      |      |      |       |                               |          |          |          |        |            |
| 2848   384.77   2.96   0.81   110   1.337   0.922   0.84   0.85   0.89   324.84   1.40   1   100   1.00   7.95   1.00   324.2   0.91   1161   0.000   0.549   Non-Liq, Non-Liq, O. 1.00   3.95   3.96   1.269   3.96   3.96   1.269   3.96   3   | 0.00         |   | -          |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          | 2.51     | 376.30 | 29.36      |
| 2989   397.70   246   0.64   110   1.337   0.92   0.64   0.50   0.69   326.74   1.43   1   100   100   7.09   1.00   326.7   0.91   1.01   0.00   0.55   0.51   0.69   326.7   3.09      | 0.00         |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 3002   389.61   2.66   0.69   110   1.341   0.921   0.69   0.50   0.69   0.50   0.69   0.526.97   1.43   1   100   1.00   0.05   0.526   0.05   0.06   0.05   0.0   | 0.00         |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 9358 9858 4 270 070 170 130 1349 0919 070 050 089 2319 8 1.44 1 1 100 100 8.05 1.00 2321 091   | 0.00         | Non-Liq                                 | Non-Liq.   |         |       |        |      |       |      |      | 100  |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 9.55   973.85   274   0.73   110   1.353   0.918   0.74   0.50   0.88   311.37   1.46   1   1.00   1.00   8.10   1.00   312.0   0.91   1.0fn   0.00   0.552   Non-Lig   Non-Lig   0.91   0.91   0.95   0.95   0.98   311.37   1.46   1   1.00   1.00   8.10   1.00   312.0   0.91   1.0fn   0.00   0.554   Non-Lig   Non-Lig   0.91  | 0.00         | -                                       | -          |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 390.0   390.0   225   0.58   110   1.381   0.917   0.58   0.50   0.88   323.95   1.34   1   1.00   1.00   8.20   1.00   32.97   0.90   1.016   0.00   0.055   Non-Liq. Non-Liq.   1.00   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   1.00   3.01   | 0.00         |   |            |         |       | Infin. | 0.91 | 312.5 | 1.00 | 8.10 | 1.00 | 100    | 1     | 1,46  | 311,37   | 0.88 | 0.50 | 0.74 | 0.918 | 1.353                         |          |          |          |        |            |
| 3117   382,73   225   036   037   052   110   1384   0916   059   050   083   1364   1   100   100   825   100   3297   020   Infin.   0.000   0.555   Non-Liq.   Non-Liq.   0.3133   378,82   24   0.64   110   1372   0914   0.85   0.50   0.88   31076   1.42   1   100   1.00   8.25   1.00   3119   0.80   Infin.   0.000   0.555   Non-Liq.   Non-Liq.   0.3168   0.90   0.91   0.77   0.91   | 0.00         |   |            |         |       |        |      |       |      |      |      |        |       | 1.7/. |          |      |      |      |       |                               |          |          |          |        |            |
| 37.68   24.2   0.64   110   1.372   0.914   0.65   0.50   0.88   310.76   1.42   1   100   1.00   8.35   1.00   311.9   0.90   1.071   0.00   0.556   Nom-Liq   Nom-Liq   1.366   0.000   0.557   Nom-Liq   Nom-Liq   1.366   0.000   0.558   Nom-Liq   Nom-Liq   1.366   0.000   0.559   Nom-Liq   Nom-Liq   1.366   0.000   0.550   0.000    | 0.00         |   | -          |         |       |        |      |       |      |      |      |        |       |       | 328,50   | 0.88 | 0.50 | 0.53 | 0.916 | 1.364                         | 110      | 0.52     | 2.07     | 396,06 | 31,00      |
| 31.68 400.92 2.99 0.77 110 1.376 0.913 0.77 0.50 0.88 322.92 1.46 1 10 10.00 8.46 1.00 324 0.90 1.77 0.000 0.557 Non-Liq Non-Liq 131.82 406.82 2.99 0.74 110 1.384 0.911 0.87 0.50 0.88 330.65 1.45 1 100 1.00 8.45 1.00 336.3 0.90 117 0.000 0.559 Non-Liq Non-Liq 131.82 406.82 3.52 0.87 110 1.384 0.911 0.87 0.50 0.87 335.05 1.50 1 100 1.00 8.45 1.00 336.3 0.90 117 0.000 0.559 Non-Liq Non-Liq 131.92 41.09 4.27 1.00 1.00 8.45 1.00 346.3 0.90 1.00 0.00 0.559 Non-Liq Non-Liq 132.15 377.63 3.97 1.05 110 1.392 0.990 1.05 0.50 0.87 310.05 1.58 1 1 100 1.00 8.45 1.00 31.2 0.90 117 0.000 0.559 Non-Liq Non-Liq 132.15 377.63 3.97 1.05 110 1.392 0.990 1.05 0.50 0.87 310.05 1.58 1 1 100 1.00 8.45 1.00 31.0 0.90 1.07 0.00 0.559 Non-Liq Non-Liq 132.15 37.63 3.49 0.90 1.05 110 1.392 0.990 1.05 0.50 0.87 310.05 1.58 1 1 100 1.00 8.45 1.00 31.0 0.90 1.07 0.00 0.559 Non-Liq Non-Liq 132.43 381.30 3.40 0.90 1.07 1.00 1.00 1.05 0.00 1.00 1.00 1.00 1.00   | 0.00         |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 31,62   400,82   352   087   110   1380   0912   075   050   088   330,85   1,45   1   100   1,00   8,45   1,00   331,9   090   1,01   0,00   0,55   0,00    | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 10.00 |       |          |      |      |      |       |                               |          |          |          | 391.03 |            |
| 31.99 418.90 427 102 110 1.388 0.910 1.02 0.50 0.87 344.55 1.54 1 100 1.00 8.45 1.00 345.8 0.90 1670 0.00 0.559 Non-Liq. Non-Liq. 23.23 379.13 6 2.56 0.87 110 1.400 0.907 0.67 0.50 0.87 310.85 1.43 1 100 1.00 8.45 1.00 312.0 0.90 1670 0.00 0.559 Non-Liq. Non-Liq. 23.24 383.06 2.56 0.87 110 1.400 0.907 0.67 0.50 0.87 310.85 1.43 1 100 1.00 8.45 1.00 312.0 0.90 1670 0.00 0.559 Non-Liq. Non-Liq. 23.24 383.06 2.56 0.87 110 1.400 0.907 0.67 0.50 0.87 313.65 1.43 1 100 1.00 8.45 1.00 312.0 0.90 1670 0.00 0.551 Non-Liq. Non-Liq. 23.24 383.06 2.56 0.87 110 1.400 0.907 0.50 0.87 305.87 1.49 1 100 1.00 8.45 1.00 312.0 0.90 1670 0.00 0.559 Non-Liq. Non-Liq. 23.24 383.06 2.56 0.87 110 1.400 0.907 0.50 0.87 305.87 1.49 1 100 1.00 8.45 1.00 312.0 0.90 1670 0.00 0.559 Non-Liq. Non-Liq. 23.24 383.05 2.90 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1   | 0.00         | Non-Liq                                 | Non-Liq.   |         |       |        |      |       |      |      |      |        | 10000 |       |          |      |      |      |       |                               |          |          |          |        |            |
| 32.15   377.89   3.37   1.05   1.10   1.392   0.909   1.05   0.50   0.87   310.95   1.88   1   100   1.00   8.45   1.00   312.0   0.90   1.0fm   0.000   0.560   0.861   0.861   0.322   32.33   37.31   32.45   37.412   2.59   0.67   1.10   1.403   0.900   0.67   0.50   0.87   30.587   1.48   1   1.00   1.00   8.45   1.00   312.0   0.90   1.0fm   0.000   0.561   Non-Liq.   Non-Liq.   0.324   33.41   32.25   3.74   12.25   0.78   1.10   1.403   0.900   0.79   0.50   0.87   30.587   1.48   1   1.00   1.00   8.45   1.00   31.60   0.89   1.0fm   0.000   0.562   Non-Liq.   Non-Liq.   0.324   1.08   1.07   1.00   1.00   0.845   1.00   31.60   0.89   1.00   0.562   Non-Liq.   Non-Liq.   0.324   0.89   1.07   0.00   0.563   Non-Liq.   Non-Liq.   0.324   0.89   1.07   0.00   0.563   Non-Liq.   Non-Liq.   0.324   0.89   1.00   0.00   0.564   Non-Liq.   Non-Liq.   0.00   0.564   Non-Liq.   0.00   0.564   Non-Liq.   Non-Liq.   0.00   0.564   Non-L   | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1000  |       |          |      |      |      |       |                               |          |          |          |        |            |
| 32.64 387.47 2 293 0.78 110 1.400 0.907 0.67 0.50 0.87 31.96 1.43 1 100 1.00 8.45 1.00 37.0 0.99 Infin 0.000 0.552 Non-Liq, Non-Liq, 23.81 381.30 3.49 0.92 110 1.407 0.905 0.92 0.50 0.87 331.91 1.53 1 100 1.00 8.45 1.00 37.0 0.99 Infin 0.000 0.552 Non-Liq, Non-Liq, 23.81 381.30 3.49 0.92 110 1.407 0.905 0.92 0.50 0.87 331.91 1.53 1 100 1.00 8.45 1.00 37.0 0.99 Infin 0.000 0.552 Non-Liq, Non-Liq, 23.81 381.30 3.49 0.92 110 1.415 0.903 0.92 0.80 0.87 331.91 1.53 1 100 1.00 8.45 1.00 312.5 0.89 Infin 0.000 0.552 Non-Liq, Non-Liq, 23.14 32.25 3.31  | 0.00         | Non-Liq.                                | Non-Liq.   | 0.560   | 0,000 | Infin. | 0.90 | 311.2 | 1.00 | 8.45 | 1.00 | 100    | 1     | 1,58  | 310.05   | 0.87 | 0.50 | 1.05 | 0,909 | 1,392                         | 110      | 1.05     | 3.97     | 377.63 |            |
| 32.81 381.30 3.49 9.29 100 1.403 0.906 0.79 0.50 0.87 31.22 1.53 1 100 1.00 8.45 1.00 37.0 0.69 Infin 0.000 0.563 Non-Liq, Non-Liq, 0.32.81 381.30 3.49 9.29 110 1.415 0.904 0.77 0.50 0.87 313.29 1.55 1 1 100 1.00 8.45 1.00 32.7 0.69 Infin 0.000 0.563 Non-Liq, Non-Liq, 0.33.49 32.83 3.51 0.92 110 1.416 0.903 0.92 0.50 0.88 338.69 1.54 1.5 1 100 1.00 8.45 1.00 334.4 0.69 Infin 0.000 0.563 Non-Liq, Non-Liq, 0.33.49 37.57 2.47 0.55 110 1.423 0.901 0.55 0.68 308.65 1.54 1 100 1.00 8.45 1.00 334.6 0.69 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.49 37.57 2.47 0.55 110 1.423 0.901 0.55 0.68 282.52 1.46 1 100 1.00 8.45 1.00 30.4 0.69 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.69 346.56 2.29 0.66 110 1.427 0.900 0.56 0.50 0.68 282.52 1.46 1 100 1.00 8.45 1.00 2.24 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.79 33.9.90 1.65 0.56 110 1.435 0.899 0.55 0.50 0.68 282.52 1.46 1 1 100 1.00 8.45 1.00 2.24 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.79 33.9.90 1.65 0.36 110 1.435 0.899 0.55 0.50 0.86 282.52 1.46 1 1 100 1.00 8.45 1.00 283.6 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.79 33.9.90 1.65 0.36 110 1.435 0.899 0.55 0.50 0.86 282.52 1.46 1 1 100 1.00 8.45 1.00 283.6 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.79 33.9.90 1.65 0.36 110 1.435 0.899 0.55 0.50 0.86 282.52 1.46 1 1 100 1.00 8.45 1.00 283.6 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.33.79 33.9.90 1.65 0.36 110 1.435 0.899 0.55 0.50 0.86 282.52 1.02 1.00 1.00 8.45 1.00 284.6 0.00 2.64 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.34.28 302.21 0.99 0.32 110 1.435 0.899 0.65 0.50 0.86 283.44 1.30 1 1 100 1.00 8.45 1.00 284.5 0.00 284.0 0.99 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.34.28 302.21 0.99 0.32 110 1.445 0.899 0.55 0.50 0.86 283.44 1.30 1 1 100 1.00 8.45 1.00 2.24 0.89 Infin 0.000 0.565 Non-Liq, Non-Liq, 0.34.28 302.21 0.99 0.32 1.00 1.00 0.35 Non-Liq, Non-Liq, 0.34 1.25 | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1     | .,    |          |      |      |      |       |                               |          |          |          |        |            |
| 32.77 408.55 3.13 0.77 110 1.411 0.904 0.77 0.50 0.87 333.19 1.48 1 100 1.00 8.45 1.00 33.4 0.89 infin. 0.000 0.583 Non-Liq. Non-Liq. 0.33.13 380.84 382.63 3.51 0.92 110 1.419 0.902 0.93 0.50 0.86 303.30 1.43 1 100 1.00 8.45 1.00 31.0 0.89 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.33.48 373.57 2.42 0.65 110 1.427 0.900 0.66 0.50 0.86 303.30 1.43 1 100 1.00 8.45 1.00 31.0 0.89 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.33.49 373.57 2.42 0.65 110 1.427 0.900 0.66 0.50 0.86 282.52 1.48 1 100 1.00 8.45 1.00 30.80 0.89 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.33.79 339.90 1.86 0.55 110 1.427 0.900 0.66 0.50 0.86 2875.10 1.41 1 100 1.00 8.45 1.00 30.80 0.89 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.33.79 339.90 1.86 0.55 110 1.435 0.899 0.55 0.50 0.86 2875.10 1.41 1 100 1.00 8.45 1.00 28.40 0.99 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.33.79 339.57 1.16 0.36 110 1.435 0.899 0.56 0.50 0.86 2875.10 1.41 1 100 1.00 8.45 1.00 28.40 0.99 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.34.12 318.65 1.04 0.33 110 1.435 0.899 0.35 0.50 0.86 2875.12 1.29 1 100 1.00 8.45 1.00 28.40 0.89 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.34.28 302.21 0.99 infin. 0.000 0.586 Non-Liq. Non-Liq. 0.000 0.586 Non-Liq. No | 0.00         |   | , .        | 0.562   | 0,000 | Infin  | 0.89 | 307.0 | 1.00 | 8,45 | 1.00 | 100    | 1     | 1.49  | 305,87   | 0.87 | 0.50 | 0.79 | 0.906 | 1.403                         | 110      | 0.78     | 2.93     | 374,12 | 32,64      |
| 33.03 380.084 352 0.93 110 1.415 0.903 0.92 0.50 0.86 311.54 1.53 1 100 1.00 845 1.00 31.27 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.03 380.084 352 0.93 110 1.423 0.901 0.65 0.80 0.86 309.65 1.54 1 100 1.00 845 1.00 310.8 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.63 346.56 2.29 0.86 110 1.423 0.901 0.65 0.80 0.86 282.52 1.48 1 100 1.00 845 1.00 283.6 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.69 346.56 2.29 0.86 110 1.427 0.900 0.65 0.86 282.52 1.48 1 100 1.00 845 1.00 283.6 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.69 325.76 1.16 0.36 110 1.435 0.899 0.35 0.50 0.86 275.10 1.41 1 100 1.00 845 1.00 283.6 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.99 30 1.86 5.54 10 1.443 0.899 0.35 0.50 0.86 275.12 1.29 1 100 1.00 845 1.00 283.6 0.89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.33.99 30 1.86 5.54 10 1.443 0.899 0.35 0.50 0.86 275.12 1.29 1 100 1.00 845 1.00 284.0 89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.34.28 30.221 0.98 0.33 110 1.443 0.896 0.33 0.50 0.86 257.12 1.29 1 100 1.00 845 1.00 284.0 89 Infin. 0.000 0.565 Non-Liq. Non-Liq. 0.34.28 30.221 0.98 0.32 110 1.443 0.896 0.33 0.50 0.86 243.46 1.31 1 100 1.00 845 1.00 284.0 88 Infin. 0.000 0.567 Non-Liq. Non-Liq. 0.34.45 271.69 0.85 0.31 110 1.445 0.893 0.55 0.86 251.84.75 1.83 1 100 1.00 845 1.00 284.0 88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.34.45 271.69 0.85 0.31 110 1.450 0.893 0.59 0.83 1.53 0.59 0.83 1.33.65 1.94 1 100 1.00 845 1.00 1.00 845 1.00 284.0 88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.34.78 17.10 1.450 0.893 0.59 0.89 0.89 0.79 8.691 0.94 1.59 0.994  | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1,200 |       |          |      |      |      |       |                               |          |          |          |        |            |
| 33.69 36.84 3.52 0.55 110 1.419 0.902 0.93 0.50 0.86 30.30 1.45 1 100 1.00 8.45 1.00 310.8 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 33.68 348.56 2.29 0.55 110 1.423 0.990 0.55 0.50 0.86 30.30 1.43 1 100 1.00 8.45 1.00 283.6 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 33.79 33.9.90 1.86 0.55 110 1.431 0.899 0.55 0.50 0.86 25.21 1.80 1 1 100 1.00 8.45 1.00 2761 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 33.79 33.9.90 1.86 0.55 110 1.431 0.899 0.55 0.50 0.86 25.24 1.30 1 100 1.00 8.45 1.00 2761 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 34.12 318.65 1.04 0.33 110 1.435 0.899 0.35 0.50 0.86 253.24 1.30 1 100 1.00 8.45 1.00 284.1 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 34.12 318.65 1.04 0.33 110 1.435 0.899 0.35 0.86 243.46 1.31 1 100 1.00 8.45 1.00 284.1 0.89 Infin. 0.000 0.555 Non-Liq. Non-Liq. O. 34.28 30.21 0.98 0.32 110 1.443 0.896 0.33 0.50 0.86 243.46 1.31 1 100 1.00 8.45 1.00 284.1 0.89 Infin. 0.000 0.556 Non-Liq. Non-Liq. O. 34.28 30.31 1.74 0.75 1.74 0. | 0.00         |   | -          |         |       |        |      |       |      |      |      |        | i     | 1,53  | 311,54   | 0.86 | 0.50 | 0.92 | 0.903 | 1,415                         | 110      | 0.92     | 3.51     | 382,63 | 33.14      |
| 33.79 339.90 1.86 0.55 110 1.427 0.900 0.66 0.50 0.86 282.52 1.48 1 100 1.00 8.45 1.00 283.6 0.89 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.33.79 339.90 1.86 0.55 110 1.431 0.899 0.55 0.50 0.86 283.24 1.30 1 100 1.00 8.45 1.00 284.2 0.89 Infin. 0.000 0.567 Non-Liq. Non-Liq. 0.3412 318.65 1.04 0.33 110 1.439 0.897 0.33 0.50 0.86 283.24 1.30 1 100 1.00 8.45 1.00 284.2 0.89 Infin. 0.000 0.567 Non-Liq. Non-Liq. 0.3412 318.65 1.04 0.33 110 1.439 0.896 0.35 0.50 0.86 283.24 1.30 1 100 1.00 8.45 1.00 284.2 0.89 Infin. 0.000 0.567 Non-Liq. Non-Liq. 0.3412 318.65 1.04 0.33 110 1.439 0.896 0.33 0.50 0.86 283.24 1.30 1 100 1.00 8.45 1.00 284.2 0.89 Infin. 0.000 0.567 Non-Liq. Non-Liq. 0.3412 318.65 1.04 0.33 110 1.439 0.896 0.33 0.50 0.86 283.24 1.30 1 100 1.00 8.45 1.00 284.2 0.89 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.3412 210 0.85 0.31 110 1.443 0.896 0.33 0.50 0.86 283.44 61.34 1 100 1.00 8.45 1.00 284.2 0.88 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.3412 210 0.85 0.31 110 1.450 0.895 0.31 0.50 0.86 218.46 1.34 1 100 1.00 8.45 1.00 283.1 0.88 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.3412 0.89 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.3512 0.35 | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 33.98 39.90 1.86 0.55 110 1.431 0.899 0.55 0.50 0.86 275.10 1.41 1 100 1.00 8.45 1.00 276.1 0.89 1.81 0.000 0.566 Non-Liq Non-Liq 0.33.98 325.76 1.16 0.36 1.10 1.435 0.898 0.36 0.50 0.86 257.12 1.29 1 100 1.00 8.45 1.00 264.2 0.89 1.61 0.000 0.567 Non-Liq 0.34.12 318.65 1.04 0.33 110 1.435 0.898 0.36 0.50 0.86 257.12 1.29 1 100 1.00 8.45 1.00 264.2 0.89 1.61 0.000 0.568 Non-Liq Non-Liq 0.34.2 30.2 1.09 0.32 110 1.443 0.896 0.33 0.50 0.86 243.46 1.31 1 100 1.00 8.45 1.00 258.1 0.88 1.61 0.000 0.568 Non-Liq Non-Liq 0.34.4 0.34 1.34 1.34 1.34 1.34 1.34 1.34 1.34 1  | 0.00         |   |            |         |       |        |      |       |      |      | 100  |        | 0.50  |       |          |      |      |      |       |                               |          |          |          |        |            |
| 34.12 318.65 1.04 0.33 110 1.439 0.897 0.33 0.50 0.86 257.12 1.29 1 100 1.00 8.45 1.00 258.1 0.88 Infin. 0.000 0.567 Non-Liq. Non-Liq. Non-Liq. 34.45 271.69 0.85 0.31 110 1.443 0.896 0.33 0.50 0.86 243.46 1.31 1 100 1.00 8.45 1.00 244.4 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 34.45 271.69 0.85 0.31 110 1.443 0.896 0.33 0.50 0.86 218.46 1.34 1 100 1.00 8.45 1.00 219.3 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 34.45 271.69 0.85 0.31 110 1.450 0.894 0.76 0.50 0.85 184.75 1.63 1 100 1.00 8.45 1.00 185.4 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 34.78 172.13 2.62 1.52 110 1.454 0.893 1.53 0.59 0.83 133.65 1.94 1 89 1.23 8.45 1.00 165.6 0.88 Infin. 0.000 0.569 Non-Liq. Non-Liq. 34.78 172.13 2.62 1.52 110 1.456 0.892 2.34 0.67 0.81 87.10 2.21 1 71 1.68 1.00 140.6 0.89 0.372 0.372 0.570 0.57 86% 0.35 0.77 0.57 86% 0.35 0.77 0.57 86.39 110 1.466 0.899 0.62 0.89 6.62 8.00 0.57 8.00 | 0.00         | Non-Liq.                                | Non-Liq.   |         |       |        |      |       |      |      |      |        | 13(5) |       |          |      |      |      |       |                               |          |          |          |        |            |
| 34.28 302.21 0.99 0.85 0.31 110 1.443 0.895 0.33 0.50 0.86 243.46 1.31 1 100 1.00 8.45 1.00 244.4 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.34.78 1.34.61 230.31 1.74 0.76 110 1.450 0.894 0.76 0.50 0.85 184.75 1.63 1 100 1.00 8.45 1.00 185.4 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.34.78 172.13 2.62 1.52 110 1.450 0.894 0.76 0.50 0.85 184.75 1.63 1 100 1.00 8.45 1.00 185.6 0.88 Infin. 0.000 0.568 Non-Liq. Non-Liq. 0.34.78 172.13 2.62 1.52 110 1.450 0.893 1.53 0.59 0.83 133.65 1.94 1 89 1.23 8.45 1.00 185.6 0.88 Infin. 0.000 0.569 Non-Liq. Non-Liq. 0.34.78 172.13 2.62 1.52 110 1.458 0.892 2.34 0.67 0.81 87.10 2.21 1 1.68 1.00 140.7 0.91 0.39 0.308 0.370 0.57 0.57 86% 0.35.10 177.37 2.49 3.21 110 1.456 0.893 1.52 0.86 0.75 2.967 2.86 0.35.10 1.00 140.7 0.91 0.39 0.308 0.570 0.54 88% 1.35.43 1.07 3.05 7.42 110 1.476 0.886 7.57 0.88 0.75 2.967 2.86 0.35.44 1.07 3.05 7.42 110 1.476 0.886 2.81 0.70 0.88 0.75 2.967 2.80 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.9  | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 13.5  |       |          |      |      |      |       |                               |          |          |          |        |            |
| 34.61 230.31 1.74 0.76 110 1.450 0.894 0.76 0.50 0.85 184.75 1.83 1 100 1.00 8.45 1.00 185.4 0.88 Infin. 0.000 0.559 Non-Liq. Non-Liq. 0.34.78 172.13 2.62 1.52 110 1.454 0.893 1.53 0.59 0.83 133.65 1.94 1 89 1.23 8.45 1.00 165.6 0.88 Infin. 0.000 0.559 Non-Liq. Non-Liq. 0.34.94 115.70 2.67 2.31 110 1.458 0.892 2.34 0.67 0.81 87.10 2.21 1 71 1.68 1.00 146.4 0.88 0.372 0.570 0.570 0.57 86% 0.35.10 77.37 2.49 3.21 110 1.462 0.890 3.28 0.74 0.79 56.46 2.44 1 53 2.49 1.00 140.7 0.91 0.399 0.309 0.309 0.550 Non-Liq. Non-Liq. 0.35.4 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.  | 0.00         | Non-Liq                                 | Non-Liq.   | 0,568   | 0,000 | Infin. |      |       |      |      |      |        | 33    |       |          |      |      |      |       |                               |          |          |          |        |            |
| 34.78  | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 22    |       |          |      |      |      |       |                               |          |          |          |        |            |
| 35.10 77.37 2.49 3.21 110 1.462 0.890 3.28 0.74 0.79 56.46 2.44 1 53 2.49 1.00 140.7 0.91 0.339 0.308 0.570 0.54 88% 1 35.27 43.09 2.75 6.39 110 1.466 0.889 6.62 0.86 0.75 29.67 2.86 0 0.94 0.571 Non-Liq. Non-Liq. 0.34 0.77 0.91 0.339 0.308 0.570 Non-Liq. Non-Liq. 0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.3  | 0.00         |   |            |         |       |        | 0.88 | 165.6 | 1.00 | 8.45 | 1.23 | 89     | 1     | .94   | 133,65   | 0.83 | 0.59 | 1.53 | 0.893 | 1.454                         | 110      | 1.52     | 2.62     | 172,13 | 34.78      |
| 35.27  | 0.86<br>1.00 |   |            |         |       |        |      |       |      |      |      |        | 102   |       |          |      |      |      |       |                               |          |          |          |        |            |
| 35.60 117.22 3.50 2.98 110 1.474 0.887 3.02 0.69 0.79 86.91 2.29 1 71 1.91 1.00 166.1 0.88 Infin. 0.000 0.571 Non-Liq. Non-Liq. 0 35.76 102.95 2.85 2.77 110 1.478 0.886 2.81 0.70 0.79 75.92 2.30 1 65 1.96 1.00 149.1 0.90 0.389 0.351 0.572 0.61 83% 0.37 0.59 0.59 0.59 0.59 0.59 0.59 0.59 0.59   | 0.00         |   |            |         | 0,000 | 0,000  |      | 140.7 | 1.00 |      | 2.50 | 00     | 0     | 2,86  | 29.67    | 0.75 | 0.86 | 6.62 | 0,889 | 1.466                         | 110      | 6.39     | 2.75     | 43,09  | 35,27      |
| 35.76  | 0.00         |   |            |         | 0.000 | Infin  |      | 166.1 | 1.00 |      | 1 01 | 71     |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 36.09 66.61 1.85 2.78 110 1.485 0.883 2.84 0.74 0.78 47.83 2.45 1 46 2.53 1.00 121.1 0.93 0.245 0.229 0.572 0.40 95% 1 36.25 123.04 2.42 1.97 110 1.489 0.882 1.99 0.65 0.80 92.00 2.14 1 73 1.53 1.00 140.7 0.87 0.339 0.296 0.573 0.52 90% 1 36.42 104.40 2.38 2.28 110 1.493 0.881 2.31 0.68 0.79 76.94 2.24 1 66 1.77 1.00 136.3 0.90 0.315 0.284 0.573 0.50 91% 1 36.58 92.52 2.48 2.68 110 1.497 0.880 2.72 0.71 0.78 67.30 2.33 1 60 2.05 1.00 138.1 0.90 0.355 0.293 0.573 0.51 90% 1 36.75 72.66 3.21 4.42 110 1.501 0.878 4.52 0.78 0.76 51.20 2.57 1 49 3.16 1.00 161.8 0.93 1.65 0.00 0.574 Non-Liq. Non-Liq. 0 37.07 154.86 4.78 3.09 110 1.509 0.876 3.12 0.67 0.79 114.09 2.22 1 82 1.72 1.00 196.3 0.87 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.0   | 0.00<br>0.80 |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          | 2.77     | 2.85     | 102.95 | 35,76      |
| 36.25  | 0.00         |   |            |         | 0.000 | 0.045  |      | 101.1 | 1.00 |      | 2 52 | 46     |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 36.42 104.40 2.38 2.28 110 1.493 0.881 2.31 0.68 0.79 76.94 2.24 1 166 1.77 1.00 136.3 0.90 0.315 0.284 0.573 0.50 91% 1 36.58 92.52 2.48 2.68 110 1.497 0.880 2.72 0.71 0.78 67.30 2.33 1 60 2.05 1.00 138.1 0.90 0.325 0.293 0.573 0.51 90% 1 36.91 1.00 138.3 0.90 0.315 0.284 0.573 0.50 91% 1 60 2.05 1.00 138.1 0.90 0.325 0.293 0.573 0.51 90% 1 36.91 1.00 138.1 0. | 1.22<br>1.00 |   |            |         |       |        |      |       |      |      |      |        | 3343  |       |          |      |      |      |       |                               |          |          |          |        |            |
| 36.75  | 1.05         | 91%                                     | 0.50       |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 36.91 123.96 4.33 3.51 110 1.505 0.877 3.55 0.71 0.78 89.76 2.33 154.06 4.78 3.09 110 1.509 0.876 3.12 0.67 0.79 114.09 2.22 1 82 1.72 1.00 196.3 0.87 1nfin. 0.000 0.574 Non-Liq. 0 1.513 0.875 2.38 0.65 0.79 113.04 2.13 1.52 1.00 171.8 0.87 1nfin. 0.000 0.574 Non-Liq. 0 1.52.31 3.58 2.35 110 1.513 0.875 2.38 0.65 0.79 113.04 2.13 1.52 1.00 171.8 0.87 1nfin. 0.000 0.574 Non-Liq. 0 1.52.31 1.52 1.52 1.00 171.8 0.87 1nfin. 0.000 0.574 Non-Liq. 0 1.52.31 1.52 1.52 1.52 1.52 1.52 1.52 1.52 1.5  | 1.03<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 37.24 152.31 3.58 2.35 110 1.513 0.875 2.38 0.65 0.79 113.04 2.13 1 82 1.52 1.00 171.8 0.87 Infin. 0.000 0.574 Non-Liq. 0 37.40 132.82 2.22 1.67 110 1.517 0.873 1.69 0.63 0.80 98.98 2.07 1 76 1.40 1.00 138.4 0.87 0.326 0.283 0.574 0.49 91% 1 37.73 105.83 2.40 2.26 110 1.521 0.872 2.30 0.68 0.78 7.06 2.24 1 66 1.76 1.00 135.9 0.90 0.314 0.281 0.574 0.49 91% 1 37.73 67.92 2.37 3.48 110 1.525 0.871 3.56 0.76 0.76 47.47 2.52 1 46 2.88 1.00 136.6 0.93 0.317 0.295 0.575 0.51 90% 1 37.89 210.25 2.15 1.02 110 1.528 0.869 1.03 0.54 0.82 161.91 1.76  | 0.00         | lon-Liq                                 | Non-Liq.   | 0.574   | 0.000 | Infin. | 0.87 | 184.4 |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 37.40 132.82 2.22 1.67 110 1.517 0.873 1.69 0.63 0.80 98.98 2.07 1 76 1.40 1.00 138.4 0.87 0.326 0.283 0.574 0.49 91% 1 37.57 105.83 2.40 2.26 110 1.521 0.872 2.30 0.68 0.78 77.06 2.24 1 66 1.76 1.00 135.9 0.90 0.314 0.281 0.574 0.49 91% 1 37.73 67.92 2.37 3.48 110 1.525 0.871 3.56 0.76 0.76 47.47 2.52 1 46 2.88 1.00 136.6 0.93 0.317 0.295 0.575 0.51 90% 1 37.89 210.25 2.15 1.02 110 1.528 0.869 1.03 0.54 0.82 161.91 1.76 1 97 1.08 0.60 1.15 201.7 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq.   | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 37,73 67,92 2.37 3.48 110 1.525 0.871 3.56 0.76 0.76 47.47 2.52 1 46 2.88 1.00 136.6 0.93 0.317 0.295 0.575 0.51 90% 1 37.89 210.25 2.15 1.02 110 1.528 0.869 1.03 0.54 0.82 161.91 1.76 1 97 1.08 0.60 1.15 201.7 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 1.03         | 91%                                     | 0.49       | 0.574   | 0.283 | 0.326  | 0.87 | 138.4 | 1.00 |      | 1.40 | 76     | 1     | .07   | 98.98    | 0.80 | 0.63 | 1.69 |       |                               |          |          |          |        |            |
| 37,89 210.25 2.15 1.02 110 1.528 0.869 1.03 0.54 0.82 161.91 1.76 1 97 1.08 0.60 1.15 201.7 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. O  | 1.05<br>1.05 |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 38.06   301.78   1.89   0.62   110   1.532   0.868   0.63   0.50   0.83   235.81   1.50     1   100   1.00   0.60   1.15   271.8   0.86   Infin.   0.000   0.575   Non-Lia. Non-Lia.   | 0.00         | lon-Liq                                 | Non-Liq.   | 0.575   | 0.000 | Infin. | 0.86 | 201.7 | 1.15 | 0.60 | 1.08 | 97     | 1     | .76   | 161.91   | 0.82 | 0.54 | 1.03 | 0,869 | 1.528                         | 110      | 1.02     | 2.15     | 210.25 | 37,89      |
| 0000 04450 000 005   | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 38,39 339,90 2.19 0.64 110 1.540 0.865 0.65 0.50 0.83 265,07 1.47 1 100 1.00 0.60 1.15 305,5 0.86 Infin. 0,000 0.575 Non-Liq. Non-Liq. 0   | 0.00         |   |            |         | 0.000 | Infin. |      |       | 1.15 | 0.60 | 1.00 | 100    | 1     | .47   | 265.07   | 0.83 | 0.50 | 0.65 | 865   | 1.540                         | 110      | 0.64     | 2.19     | 339.90 | 38,39      |
| 0074 074 45 040 050 440 4500 4500 4500 4   | 0.00         |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 38.88 396.18 1.74 0.44 110 1.552 0.861 0.44 0.50 0.83 307.98 1.31 1 100 1.00 0.65 1.15 355.0 0.86 Infin, 0.000 0.575 Non-Liq, Non-Liq, 0   | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | i     | .31   | 307,98   | 0.83 | 0.50 | 0.44 | 861   | 1,552                         | 110      | 0.44     | 1.74     | 396.18 | 38,88      |
| 39.04 405.84 1.92 0.47 110 1.556 0.860 0.47 0.50 0.82 315.12 1.32 1 100 1.00 0.70 1.15 363.2 0.86 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 0.00         |   |            |         | 0.000 |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 39,37 383,75 3.81 0.99 110 1.564 0.857 1.00 0.50 0.82 297,15 1.57 1 100 1.00 0.70 1.15 342.5 0.86 Infin, 0.000 0.576 Non-Liq, Non-Liq, 0   | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | i     |       |          |      |      |      |       |                               | 110      | 0.99     | 3.81     | 383.75 | 39,37      |
| 39.53 290.03 4.33 1.49 110 1.567 0.856 1.50 0.55 0.81 219.94 1.79 1 100 1.10 0.70 1.15 279.6 0.85 Infin 0.000 0.576 Non-Liq. Non-Liq. 0  | 0.00         | lon-Liq                                 | Non-Liq.   | 0.576   | 0.000 |        | 0.85 | 279.6 |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          |        |            |
| 39.86 126.34 3.03 2.39 110 1.575 0.853 2.42 0.67 0.77 90.32 2.21 1 73 1.68 1.00 151.9 0.85 0.406 0.346 0.575 0.60 84% 0  | 0.00<br>0.73 |   |            |         |       |        |      |       |      |      |      |        | 1     |       |          |      |      |      |       |                               |          |          |          | 126.34 | 39.86      |
| 40.03 296.00 2.40 0.81 110 1.579 0.852 0.82 0.50 0.82 227.78 1.59 1 100 1.00 0.70 1.10 249.4 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 0.00         | lon-Liq                                 | Non-Liq. 1 | 0.575   | 0.000 | Infin. | 0.85 | 249.4 | 1.10 | 0.70 | 1.00 | 100    | 1     | .59   | 227,78 1 | 0.82 | 0.50 | 0.82 | .852  | 1,579                         | 110      |          |          |        |            |
| 10.00 000 00 00 000 000 000 000 000 000  | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 40.52 358.58 2.73 0.76 110 1.591 0.847 0.76 0.50 0.82 275.16 1.51 1 100 1.00 0.70 1.10 301.3 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 0.00         | lon-Liq                                 | Non-Liq. I | 0.575   | 0.000 | Infin. | 0.85 | 301.3 | 1.10 | 0.70 | 1.00 | 100    | 1     | .51   | 275.16 1 | 0.82 | 0.50 | 0.76 | .847  | 1.591                         | 110      | 0.76     | 2.73     | 358.58 | 40.52      |
| 40.05 004.44 0.40 4.00 4.00 0.04 0.00 0.04 0.00 0.04   | 0.00<br>0.00 | -00                                     |            |         |       |        |      |       |      |      |      |        | 570   |       |          |      |      |      |       |                               |          |          |          |        |            |
| 41.01 369.03 2.40 0.65 110 1.603 0.843 0.65 0.50 0.81 282.17 1.45 1 100 1.00 0.70 1.10 309.0 0.85 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 0.00         | • |            | 0.575   | 0.000 | Infin. | 0.85 | 309.0 | 1.10 | 0.70 | 1.00 | 100    | 1     | .45   | 282_17 1 | 0.81 | 0.50 | 0.65 | .843  | 1.603                         | 110      | 0.65     | 2.40     | 869.03 | 41,01      |
|  | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 41.50 407.71 2.69 0.66 110 1.614 0.838 0.66 0.50 0.81 310.74 1.43 1 100 1.00 0.70 1.10 340.3 0.84 Infin. 0.000 0.575 Non-Liq. Non-Liq. 0   | 0.00         |   |            |         |       |        |      |       |      |      | 1.00 |        | 1     | 43    | 310.74 1 | 0.81 | 0.50 | 0.66 | 838   | 1.614                         | 110      | 0.66     | 2.69     | 107.71 | 41.50      |
| 44.00 400 57 0.00 0.04 440 4.000 0.000   | 0.00         |   |            |         |       |        |      |       |      |      |      |        | (7)   |       |          |      |      |      |       |                               |          |          |          |        |            |
| 41.99 524.35 3.52 0.67 110 1.626 0.634 0.67 0.50 0.81 398.53 1.36 1 100 1.00 0.70 1.10 436.4 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.  | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | 1     |       | 398,53 1 | 0.81 | 0.50 | 0.67 | 834   | 1,626                         | 110      | 0.67     | 3.52     | 24.35  | 41.99      |
| 42.16 610.77 2.62 0.43 110 1.630 0.832 0.43 0.50 0.81 463.86 1.17 1 100 1.00 0.70 1.10 508.0 0.84 Infin. 0.000 0.574 Non-Liq. Non-Liq. 0.  | 0.00         | lon-Liq                                 | Non-Liq. 1 | 0,574   |       |        | 0.84 | 508.0 |      | 0.70 |      | 100    |       |       |          |      |      |      |       |                               |          |          |          |        |            |
| 42.49 652.94 0.00 0.00 110 1.638 0.829 0.00 0.83 0.70 429.16 2.73 0 1.00 0.92 0.573 Non-Liq. Non-Liq. 0  | 0.00<br>0.00 |   |            |         |       |        |      |       |      |      |      |        | 100   |       |          |      |      | 0.00 | 829   |                               | 110      | 0.00     | 0.00     | 52.94  | 42,49      |
| 40.00 000.00 0.00 440 4404 0.00 0.00 0.  | 0.00         |   |            |         |       |        |      |       |      |      | 1.00 |        | 0     | 74    | 455.52 2 | 0.69 | 0.83 | 0.00 | 827   | 1,642 0                       | 110      | 0.00     | 0.00     | 96.03  | 42.65      |

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-6A Plot: (feet) **EARTHQUAKE INFORMATION** Induced CSR (M=7\_5): = 0\_65\*PGA\*(po/p'o)\*rd/MSF 2.1 Magnitude: 7.5 6.77 SF = CRR<sub>7</sub> s\*Kg/CSR Clean Sand Qc1n = Co\*Kc\*KH\*Qc Probab Total PGA, g: 0.97 0,75 Use Tokimatsu & Seed (0) or Ishihara & Yoshmine (1): Avg Induced MSF 1:30 Unit Weight of unsaturated soils: 110 ocf Required SF: 1.50 3% Subsidence GWT feet: 20.0 Unit Weight of saturated soils: 110 Min SF of Liquefiable Layers: 0.36 Max (Inches) Design GWT, feet: 20.0 Limiting Ic for liquefiable soils: 2.60 Limiting Ic for KH: 2.0 Avg SF of Liquefiable Layers: 0.03 0.3 Lave Friction Friction Total Eff.Stress Tip Liquef Rel Clean Induced Liquefac. Volumetric Safety Depth Qc Fs Ratio Unit Wt. at Midot Corrected Suscept Dens. Н Sand EQ M=7.5 Probab Strain (tsf) % Qc1n CRR75 (feet) (tsf) (pcf) p'o (tsf) (0 or 1) Dr (%) (m) Qc1n CRR CSR Factor (%) 0.16 6.69 0.01 0.21 0.009 1,000 0.21 0.76 10,74 2,50 110 1.70 1.00 1.00 1.00 0.059 0 10.7 0.059 0.485 Non-Lia, Non-Lia 0.00 0,33 14.12 0.04 0,28 0.018 1.000 0.28 0.67 1.70 22.66 2.22 15 1.00 1.00 22.7 1,00 0.069 0.069 0.485 Non-Lia. Non-Lia 0.00 0.49 16.59 0.09 0.55 0.027 1.000 0.56 0.69 110 1.70 26.61 2.26 1.83 1.00 48.7 1.00 0.091 0.091 0.485 Non-Lia. Non-Lia 0.00 110 0.66 21.13 0.18 0.84 0.036 1.000 0.84 0.68 1.70 33.89 2.25 32 1.00 1,81 61,3 1,00 0.101 0.101 0.485 Non-Liq. Non-Liq. 0.00 75.1 0.485 0.82 29.41 0.29 0.98 110 0.045 1.000 0.98 0.66 1.70 47.18 2 17 46 1.59 1:00 1.00 0.119 0.119 Non-Liq. Non-Liq. 0.00 0.98 35.60 0.35 0.99 0.054 110 1.000 0.99 0.64 1.70 57.12 2.10 54 1 46 1.00 83.2 1.00 0.1340.134 0.485 Non-Liq. Non-Liq 0.00 1.15 34.08 0.35 1.03 110 0.063 0.999 0.65 52 1.03 1.70 54.66 2.13 1.51 1.00 82.3 1.00 0.1320.132 0.484 Non-Liq. Non-Liq 0.00 1.31 34.08 0.35 1,03 110 0.072 0.999 1.04 0.65 1.70 54.64 2.13 52 1,51 1.00 1.00 82.3 0.132 0.132 0.484 Non-Lig. Non-Lig. 0.00 1.48 30.11 0.33 1.11 110 0.081 0.999 0.66 1.70 48.25 2.19 47 1.64 1.00 79.2 1.00 0.126 0,126 0.484 Non-Lig. Non-Lig. 0.00 1 64 28 15 0.27 0.96 110 0.090 0.998 0.96 0.66 1.70 45.09 2.18 44 1.62 1.00 72.8 1,00 0.116 0.116 0.484 Non-Liq. Non-Liq. 0.00 Non-Liq. Non-Liq. 1.80 29.07 0.35 1.20 110 0.099 0.998 1.20 0.67 1.70 46.55 2.22 45 1.72 1.00 80.2 1.00 0,128 0.128 0.484 0.00 1.97 26.19 0.39 1.47 0.108 0.998 110 1.48 0.70 1.70 41.91 2.31 41 1.99 1.00 83.4 1.00 0.134 0.134 0.484 Non-Liq. Non-Liq. 0.00 2.13 2.07 0.117 0.42 110 0.997 2.08 1.70 2.49 30 0.75 32.61 2.72 1.00 88.5 1.00 0.145 0.145 0.483 Non-Liq. Non-Liq 0.00 2,30 15.45 0.44 2.83 110 0.126 0.997 2.85 0.81 1.70 0 24.62 2.67 1.00 0.483 Non-Liq. Non-Liq 0.00 2,46 12.62 0.37 2 95 110 0.135 0.996 2.98 0.83 1.70 20.06 2.75 1.00 0.483 Non-Lig. Non-Lig 0.00 110 2.62 13.50 0.27 2 01 0.144 0.996 2.04 0.80 1.70 2.63 21.46 0 1.00 0.483 Non-Liq. Non-Liq. 0.00 2:79 20.18 0.31 1.56 110 0.153 0.996 1.57 0.73 1.70 32.18 2.42 30 2 39 1.00 77 O 1.00 0.123 0.123 0.483 Non-Liq. Non-Liq. 0.00 2.95 25.28 0.31 1.23 0.995 110 0.162 1.23 0.69 1.70 40.36 2.28 39 1.88 1.00 76.0 1.00 0.121 0.121 0.482 Non-Liq. Non-Liq. 0.00 0.171 3.12 31.76 0.36 1.12 110 0.995 0.66 1.70 50.76 2.18 49 81.6 1.13 1.61 1.00 1.00 0.131 0.131 0.482 Non-Liq. Non-Liq 0.00 3.28 35,56 0.38 1.08 110 0.180 0.994 1.09 0.65 1.70 56.85 1.50 2.13 53 1.00 1:00 0.482 85.5 0.138 0.138 Non-Lig. Non-Lig. 0.00 3,44 40,16 0.39 0.98 0.98 110 0,189 0,994 0.63 1.70 64.22 2.06 58 1.38 1.00 88.8 1.00 0.145 0.145 0.482 Non-Liq. Non-Liq 0.00 3.61 45.45 0.46 1.00 110 0.198 0.994 1.01 0.61 1.70 72,71 2.02 64 1.33 1.00 96.5 1.00 0.164 0.164 0.482 Non-Liq. Non-Liq. 0.00 3.77 52.79 0.51 0.96 110 0.208 0.993 0.97 0.60 1-70 84.49 1.96 70 1.25 0.65 1\_12 118.5 1.00 0.235 0.235 0.482 Non-Liq. Non-Liq. 0.00 58.72 3.94 0.56 0.217 0.993 0.58 94.00 0.95 110 0.95 1.70 1.92 74 1 20 0.70 1.12 127 1 1.00 0.271 0.271 0.481 Non-Liq. Non-Liq. 0.00 4.10 64.33 0.60 0.993 0.94 110 0,226 0.94 0.57 1.70 103.00 1.88 78 1.17 0.75 1.12 135.7 1.00 0.312 0.312 0.481 Non-Liq. Non-Liq. 0.00 4.27 69.66 0.83 1.19 110 0.235 0.992 1.19 0.59 1.70 111.55 1,93 81 1.21 1.12 151.9 0.406 0.481 0.80 1.00 0.406 Non-Liq. Non-Liq. 0.00 4.43 74.65 1.28 110 0.992 1.72 1.71 0.244 0.61 1.70 119.56 2.01 1.32 1.00 157.6 1.00 0.444 0.444 0.481 Non-Liq. Non-Liq. 0.00 4.59 78.74 2.11 2.68 110 0.253 0.991 2.69 0.65 1.70 126.11 2.14 86 1.54 1.00 194.3 1.00 Infin. 0.000 0.481 Non-Liq. Non-Liq. 0.00 4.76 95.41 2.01 2.11 110 0.262 0.991 2 12 0.61 1.70 152 88 2.01 94 1.31 1.00 200.9 Infin. 0.000 0.480 1.00 Non-Liq. Non-Liq. 0.00 4.92 90,35 1.38 0.271 1.53 110 0.991 1.54 0.58 1.70 144.74 1.92 92 1.21 1.00 1.00 175.8 1.00 Infin 0.000 0.480Non-Liq. Non-Liq. 0.00 5.09 73.79 0.57 0.78 110 0.280 0.990 0.78 0.54 118.12 1.70 1.79 1.10 84 1.05 1.00 130.0 1.00 0.285 0.285 0.480 Non-Lig. Non-Lig. 0.00 5.25 64.99 0.41 0.63 110 0.289 0.990 0.63 0.54 1.70 103.96 1.78 1.09 78 1.10 1.00 0.480 113.6 1.00 0.216 0.216 0.00 Non-Lia. Non-Lia 0,989 5.41 60.11 0.48 0.81 0.57 0.80 110 0.298 1.70 96.11 1.87 75 1.16 1.15 1.00 111.7 1.00 0.210 0.210 0.480 Non-Liq. Non-Liq. 0.00 5.58 57.62 0.71 1.23 110 0.307 0.989 1 24 0.61 1.70 92 09 200 1.30 73 1.20 1.00 120.0 1.00 0.241 0.241 0.479 Non-Liq. Non-Liq. 0.00 5.74 60.32 0.70 1.16 110 0.316 0.989 1 16 0.60 1.70 96 42 1 97 75 1.26 1.25 1.00 121.7 0.247 0.479 1.00 0.247 Non-Lig. Non-Lig. 0.00 5.91 59.79 0.67 110 0.325 0.988 0.60 1.11 1.12 1.70 95.55 1.96 75 1.25 1.30 1.00 119.7 1.00 0.239 0.239 0.479 Non-Liq. Non-Liq. 0.00 6.07 56.99 0.42 0.74 0,334 0.988 110 0.75 0.57 91.04 1.86 1.70 73 1.16 1.35 105.8 1.00 1.00 0.190 0.190 0.479 Non-Liq. Non-Liq. 0.00 6,23 64.88 0.50 0.77 110 0.343 0.988 0.77 0.56 1.70 103.70 1.83 78 1.40 1.13 1.00 117.4 0,230 0.479 1.00 0.230 Non-Lia, Non-Lia 0.00 0.352 0.52 6.40 81.28 0.52 0.64 110 0.987 0.64 1.70 130.04 1.70 88 1.04 1.45 1.00 135.6 1.00 0.312 0.312 0.479 Non-Lia. Non-Lia. 0.00 6.56 88.72 0.58 0.65 110 0.361 0.987 0.66 0.51 141.98 1.68 1.02 1.50 1.00 145.7 0.478 1.70 91 1.00 0.368 0.368 Non-Liq. Non-Liq. 0.00 0.78 1.00 6.73 90.02 0.70 110 0.370 0.986 0.78 0.52 1.70 144.05 1.72 92 1.05 1.55 1.00 151.9 0.406 0.406 0.478 Non-Liq. Non-Liq. 0.00 6.89 95.98 0.75 0.78 0.379 0.986 153.61 110 0.79 0.52 1.70 1.70 95 1.04 1.60 1.00 160.1 1.00 Infin. 0.000 0.478 Non-Liq. Non-Liq. 0.00 106.17 0.82 0.77 0,388 0.77 166.59 110 0.986 0.51 1.67 1.67 98 1.02 1.65 170.1 1.00 1.00 Infin. 0.000 0.478 Non-Lig. Non-Lig. 0.00 120.42 0.87 7.22 0.72 110 0.397 0.985 0.72 0.50 1.63 185.20 1.62 100 1.00 1.70 1.00 185.9 0.000 1.00 Infin. 0.478 Non-Lig. Non-Lig. 0.00 7.38 147.55 0.97 0.66 110 0.406 0.985 0.66 0.50 1.61 224.51 1.53 100 1.00 1.75 1.00 225.3 1.00 Infin 0.000 0.478 Non-Lig. Non-Lig. 0.00 7.55 167.64 1 10 0.66 110 0.415 0.985 0.66 0.50 1.60 252 36 1.49 100 1.00 1.80 253.3 1.00 1.00 Infin. 0.000 0.477 Non-Liq. Non-Liq. 0.00 167.64 Infin. 7 - 711.10 0.66 110 0.4240.984 0.66 0.50 1.58 249.65 1.49 100 1.00 1.85 1.00 250.6 1.00 0.000 0.477 Non-Lig. Non-Lig. 0.00 7 87 175 94 0.433 1.23 0.70 110 0.984 0.70 0.50 1.56 259.28 1.50 100 1.00 1.90 1.00 260.3 1.00 Infin 0.000 0.477 Non-Liq. Non-Liq. 0.00 8.04 183,17 1.23 0.67 0.442 0.984 110 0.67 0.50 1.55 267.18 1.95 1.48 1.00 1.00 268.2 100 1.00 Infin. 0.000 0.477Non-Liq. Non-Liq. 0.00 189.37 0.451 8.20 0.94 0.50 110 0.983 0.50 0.50 1.53 273,46 1.38 1.00 2.00 274.5 100 1.00 1.00 Infin. 0.000 0.477 Non-Lia, Non-Lia, 0.00 8.37 193.49 1.24 0.64 0.460 0.983 0.50 276.65 110 0.64 1 52 1.45 100 1.00 2.05 1.00 277.7 1.00 Infin. 0.000 0.476 Non-Liq. Non-Liq. 0.00 1.50 8.53 194.51 1.46 0.75 110 0.469 0.982 0.75 0.50 275.42 1.51 1.00 2.10 276.4 100 1.00 1.00 Infin 0.000 0.476 Non-Liq. Non-Liq. 0.00 8.69 195.90 1,50 0.77 110 0.478 0.982 0.77 0.50 1.49 274.75 1.51 100 1.00 2.15 1.00 275.8 1.00 Infin 0.000 0.476 Non-Lig. Non-Lig. 0.00 8.86 199.53 1.67 0.84 110 0.487 0.982 0.50 0.84 1.47 277.23 1.54 100 1.00 2 20 1.00 278.3 1.00 Infin 0.000 0.476 Non-Liq. Non-Liq. 0.00 9.02 202.65 1.56 0.77 110 0.496 0.77 0.981 0.50 279,00 1.46 1,51 100 1.00 2.25 1.00 280.0 1.00 Infin. 0.000 0.476 Non-Liq. Non-Liq. 0.00 1.62 9.19 204.68 0.79 0.505 0.981 0.80 0.50 1.45 279.26 1.52 100 1.00 2.30 1.00 280.3 1.00 0.000 0.476 Infin. Non-Liq. Non-Liq. 0.00 9.35 192.88 1.56 0.81 0.514 0.981 0.50 110 0.81 1.43 260.79 1.54 100 1.00 2.35 1.00 261.8 1.00 Infin. 0.000 0.475 Non-Lig. Non-Lig. 0.00 1.42 9.51 173.28 1.31 0.75 110 0.523 0.980 0.76 0.50 232.18 1.56 1.00 2.40 1.00 233.0 100 1.00 Infin. 0.000 0.475 Non-Liq. Non-Liq. 0.00 1.00 9.68 160.53 1 12 0.70 110 0.532 0.980 0.70 0.50 1.41 213.20 1.56 100 1.00 2 45 214.0 0.000 0.475 Non-Liq. Non-Liq. 1.00 Infin. 0.00 9.84 160,48 0.541 0.98 0.61 110 0.980 0.50 0.61 1.40 211.34 1.53 100 1.00 2.50 1.00 212 1 1.00 Infin 0.000 0.475 Non-Liq. Non-Liq. 0.00 10,01 167.93 0.95 0.57 0.550 0.979 0.57 110 0.50 1.39 219.35 1.49 100 1.00 2.55 1.00 220.2 1.00 Infin 0.000 0.475 Non-Lig. Non-Lig. 0.00 10.17 179,44 0.62 110 0.559 0.979 0.62 0.50 1.38 232.52 1.50 100 1.00 2.60 1.00 233.4 0.475 1.00 0.000 Non-Lia, Non-Lia, Infin. 0.00 10.33 196.39 1 47 0.75 0.568 0.979 0.75 252.52 110 0.50 1,36 1.53 100 1.00 2.65 1.00 253.5 1.00 0.000 0.474 Non-Liq. Non-Liq. Infin. 0.00 1,35 10.50 212.87 1.68 0.79 110 0.577 0.978 0.790.50 271.61 1.52 100 1.00 2.70 1.00 272.6 1.00 Infin. 0.000 0.474 Non-Liq. Non-Liq. 0.00 10.66 218 59 1.72 0.79 110 0.586 0.978 0.790.50 1.34 276.76 1.52 100 1.00 2.75 1.00 277.8 Infin. 0.000 0.474 Non-Liq. Non-Liq. 1.00 0.00 10.83 0.595 219.09 0.67 1.46 110 0.978 0.67 0.50 1.33 275.28 1.47 100 1.00 2.80 1.00 276.3 1.00 Infin. 0.000 0.474Non-Liq. Non-Liq. 0.00 10.99 218.78 1.57 0.72 0.604 0.72 110 0.977 0.50 1.32 272.81 1.49 100 1.00 273.8 2.85 1.00 1.00 Infin. 0.000 0.474 Non-Lig. Non-Lig. 0.00 11.15 227.29 1.90 0.84 0.614 0.977 0.84 0.50 1.31 281.35 1.53 100 1.00 2.90 1.00 282.4 0.474 1.00 Infin. 0.000 Non-Lia. Non-Lia. 0.00 11 32 240.17 1.92 0.80 0.623 0.977 110 0.80 0.50 1.30 295.17 1.50 100 1.00 2.95 1.00 296.3 1.00 0.000 0.473 Non-Liq. Non-Liq. Infin. 0.00 11.48 222.62 1.81 0.81 110 0.632 0.976 0.82 0.50 1 29 271 57 1.53 100 1.00 3.00 1.00 272.6 1.00 Infin. 0.000 0.473 Non-Liq. Non-Liq. 0.00 11.65 216.62 2.13 0.98 110 0.641 0.976 0.98 0.50 1.29 262.35 1.61 100 1.00 3.05 1.00 263.3 Infin 0.000 0.473 Non-Liq. Non-Liq. 1.00 0.00 11.81 220.47 2.23 1.01 110 0.650 0.975 0.50 265.16 1.01 1.28 1.61 100 1.00 3.10 1.00 266.1 1.00 Infin 0.000 0.473 Non-Liq. Non-Liq. 0.00 11.98 211.90 2.36 1.11 110 0.659 0.975 1.12 0.50 1.27 253.63 1.66 100 1.01 256.5 3.15 1.00 1.00 Infin. 0.000 0.473 Non-Liq. Non-Liq 0.00 12.14 218.21 2.15 0.99 110 0.668 0.975 0.99 0.50 1.26 258.84 1.61 100 1.00 3.20 259.8 0.000 0.473 1.00 1.00 Infin. Non-Lig. Non-Lig 0.00 12.30 217.25 171 0.79 110 0.677 0.974 0.79 0.50 1.25 255.96 1.54 100 1.00 3.25 1.00 256.9 1.00 Infin. 0.000 0.472 Non-Lig. Non-Lig. 0.00 12.47 227.19 1 31 0.58 110 0.686 0.974 0.58 0.50 1-24 265 93 1.43 100 1.00 3.30 1.00 266.9 1.00 Infin 0.000 0.472 Non-Liq. Non-Liq. 0.00 12.63 246.00 0.55 1.35 110 0.695 0.974 0.55 0.50 1.23 286 13 1.40 100 1.00 3.35 1.00 287.2 1.00 Infin. 0.000 0.472 0.00 Non-Liq. Non-Liq 12.80 271.55 2.19 0.81 110 0.704 0.973 0.81 0.50 1.23 313,89 1.49 100 1.00 3.40 1.00 315.1 1.00 Infin. 0.000 0.472 Non-Liq. Non-Liq. 0.00

| Layer          | Tip              | Friction     | Friction     | Total      | Eff.Stress     | s              |              |              |              |                  |              | 9    | Liquef. | Rel        |              |        |        | Clean              | _            | _                 |                | Induced        | Liquefac.              |            | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|------|---------|------------|--------------|--------|--------|--------------------|--------------|-------------------|----------------|----------------|------------------------|------------|--------------|
| Depth          |                  | Fs           | Ratio        | Unit Wt    | at Midpt       |                |              |              |              | Corrected        | I            | ou s | uscept  | Dens       |              | Н      |        | Sand               |              |                   | EQ             | M=7,5          | Safety                 | Probab,    | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Cq           | Qc1n             | lc           | Ó (  | 0 or 1) | 70700      | Kc           | (m)    | KH     | Qc1n               |              | - Charles and the |                | CSR            | Factor                 | PL         | (%)          |
| 12.96<br>13.12 | 298.70<br>297.19 | 2.19         | 0.73<br>0.85 | 110<br>110 | 0.713          | 0.973<br>0.973 | 0.74<br>0.85 | 0.50         | 1.22         | 343,15<br>339,26 | 1.43         |      | 1       | 100        | 1.00         |        | 1.00   | 344.4<br>340.5     | 1,00         | Infin,            | 0,000          | 0.472          | Non-Liq.               |            | 0.00         |
| 13.29          | 297.26           | 2.68         | 0.90         | 110        | 0.731          | 0.972          | 0.90         | 0.50         | 1.20         | 337.23           | 1,51         |      | 1       | 100        | 1.00         |        | 1.00   | 338.5              | 1.00         | Infin.            | 0.000          | 0.472<br>0.471 | Non-Liq.<br>Non-Liq.   |            | 0.00<br>0.00 |
| 13,45          | 299.77           | 2.66         | 0.89         | 110        | 0.740          | 0.972          | 0.89         | 0.50         | 1.20         | 337,99           | 1,50         |      | 1       | 100        | 1.00         |        | 1.00   | 339.3              | 1.00         | Infin.            | 0,000          | 0.471          | Non-Liq.               | Non-Liq.   | 0.00         |
| 13.62<br>13.78 | 299.47<br>293.58 | 2.65         | 0.88<br>1.06 | 110<br>110 | 0,749<br>0,758 | 0.972<br>0.971 | 0.89<br>1.06 | 0.50<br>0.50 | 1.19         | 335,60<br>327,01 | 1,50<br>1,57 |      | 1       | 100<br>100 | 1.00         |        | 1.00   | 336.9<br>328.2     | 1.00         | Infin.            | 0.000          | 0.471          | Non-Liq.               |            | 0.00         |
| 13.94          | 298 13           | 3.07         | 1.03         | 110        | 0,767          | 0.971          | 1.03         | 0.50         | 1.17         | 330.12           | 1.56         |      | 1       | 100        | 1.00         |        | 1.00   | 331.4              | 1.00         | Infin             | 0.000          | 0.471<br>0.471 | Non-Liq.<br>Non-Liq.   |            | 0.00<br>0.00 |
| 14.11          | 301.85           | 3.04         | 1.01         | 110        | 0,776          | 0.971          | 1.01         | 0.50         | 1.17         | 332,29           | 1,55         |      | 1       | 100        | 1,00         |        | 1.00   | 333.5              | 1,00         | Infin.            | 0.000          | 0.471          | Non-Liq.               | Non-Liq    | 0.00         |
| 14.27<br>14.44 | 298,45<br>300,98 | 3.68<br>2.74 | 1.23<br>0.91 | 110<br>110 | 0.785<br>0.794 | 0.970<br>0.970 | 1.24<br>0.91 | 0.50         | 1.16<br>1.15 | 326,64<br>327,53 | 1.62<br>1.52 |      | 1       | 100<br>100 | 1.00         | 3.85   | 1,00   | 327.9<br>328.8     | 1.00         | Infin             | 0.000          | 0.470<br>0.470 | Non-Liq.<br>Non-Liq.   |            | 0.00<br>0.00 |
| 14.60          | 315,50           | 2.80         | 0.89         | 110        | 0.803          | 0.970          | 0.89         | 0.50         | 1.15         |                  | 1.50         |      | 1       | 100        | 1.00         |        |        |                    | 1.00         | Infin.            | 0.000          | 0.470          | Non-Liq.               |            | 0.00         |
| 14.76<br>14.93 | 313.59<br>322.37 | 3.04         | 0.97         | 110<br>110 | 0.812<br>0.821 | 0,969          | 0.97         | 0.50<br>0.50 | 1.14         |                  | 1.53         |      | 1       | 100        | 1.00         |        | 1,00   |                    | 1.00         | Infin.            | 0.000          | 0_470          | Non-Liq.               |            | 0.00         |
| 15.09          | 336.14           | 3.51         | 1.04         | 110        |                | 0.969          | 1.08<br>1.05 | 0.50         | 1.14         | 345,00<br>357,81 | 1.56<br>1.54 |      | 1       | 100<br>100 | 1.00         |        | 1.00   |                    | 1.00         | Infin.            | 0,000          | 0.470<br>0.470 | Non-Liq.<br>Non-Liq.   |            | 0.00<br>0.00 |
| 15.26          | 323,66           | 3.11         | 0.96         | 110        | 0.839          | 0,968          | 0.96         | 0.50         | 1.12         |                  | 1.52         |      | 1       | 100        | 1,00         |        |        |                    | 1.00         |                   | 0.000          | 0.469          | Non-Liq.               |            | 0.00         |
| 15.42<br>15.58 | 317.94<br>320.07 | 3.08         | 0.97<br>0.96 | 110<br>110 | 0.848<br>0.857 | 0.968<br>0.967 | 0.97<br>0.96 | 0.50<br>0.50 | 1.12<br>1.11 | 334,75<br>335,21 | 1.53<br>1.53 |      | 1       | 100<br>100 | 1.00         |        | 1.00   |                    | 1.00         | Infin.            | 0,000          | 0.469<br>0.469 | Non-Liq.               |            | 0.00         |
| 15.75          | 310.52           | 2.97         | 0.96         | 110        |                | 0.967          | 0.96         | 0.50         | 1.11         |                  | 1.54         |      | 1       | 100        | 1.00         |        |        | 324.7              | 1.00         | Infin:            | 0,000          | 0.469          | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 15.91          | 314.10           | 3.02         | 0.96         | 110        |                | 0.967          | 0.96         | 0.50         | 1.10         |                  | 1.54         |      | 1       | 100        | 1.00         |        |        |                    | 1,00         |                   | 0,000          | 0.469          | Non-Liq.               | Non-Liq.   | 0.00         |
| 16.08<br>16.24 | 315 60<br>327 26 | 2.97         | 0.94<br>0.85 | 110<br>110 | 0,884<br>0,893 | 0.966<br>0.966 | 0.94<br>0.85 | 0.50<br>0.50 | 1.09         |                  | 1.53<br>1.49 |      | 1       | 100<br>100 | 1.00         |        |        |                    | 1.00         |                   | 0,000          | 0.468<br>0.468 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 16 40          | 328.11           | 2.94         | 0.89         | 110        | 0,902          | 0.966          | 0.90         | 0.50         | 1.08         | 334,91           | 1.51         |      | 1       | 100        | 1.00         |        |        |                    | 1.00         | Infin             | 0.000          | 0.468          | Non-Liq.               |            | 0.00         |
| 16.57<br>16.73 | 357.30<br>379.84 | 2.93         | 0.82         | 110<br>110 | 0.911<br>0.920 | 0.965<br>0.965 | 0.82<br>0.80 | 0.50<br>0.50 | 1.08         |                  | 1.45         |      | 1       |            | 1.00         |        |        |                    | 1.00         |                   | 0.000          | 0.468          | Non-Liq.               |            | 0.00         |
| 16.90          | 393.42           | 4.35         | 1.11         | 110        |                | 0.965          | 1.11         | 0.50         | 1.07<br>1.07 |                  | 1.43         |      | 4       | 100<br>100 | 1.00         |        |        |                    | 1.00         | Infin.            | 0.000          | 0.468<br>0.468 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 17.06          | 393,65           | 3.67         | 0.93         | 110        | 0.938          | 0.964          | 0.93         | 0.50         | 1.06         | 394.14           | 1.48         |      | 1       | 100        | 1,00         | 4.70   | 1,00   | 395.6              | 1.00         | Infin.            | 0.000          | 0,467          | Non-Liq.               | Non-Liq.   | 0.00         |
| 17.22<br>17.39 | 403.88<br>384.75 | 3.66         | 0.91         | 110<br>110 |                | 0.964          | 0.91<br>0.80 | 0.50<br>0.50 | 1.06<br>1.05 |                  | 1.46         |      | 1       |            | 1.00         |        |        |                    | 1.00         | Infin.            | 0.000          | 0.467          | Non-Liq.               |            | 0.00         |
| 17.55          | 418.46           | 2.70         | 0.64         | 110        | 0.965          | 0.963          | 0.65         | 0.50         | 1.05         |                  | 1.34         |      | 1       |            | 1.00         |        |        |                    | 1.00         | Infin             | 0.000          | 0.467<br>0.467 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 17.72          | 426.59           | 3.76         | 0.88         | 110        |                | 0.963          | 0.88         | 0.50         | 1.04         |                  | 1.44         |      | 1       |            | 1.00         | 4.90   | 1.00   | 420.8              | 1.00         | Infin.            | 0,000          | 0.467          | Non-Liq.               | Non-Liq.   | 0.00         |
| 17.88<br>18.04 | 438.49<br>459.63 | 4.30<br>3.50 | 0.98         | 110<br>110 |                | 0.962<br>0.962 | 0.98<br>0.76 | 0.50<br>0.50 | 1.04         |                  | 1.47<br>1.37 |      | 1       |            | 1.00         |        |        |                    | 1.00         | Infin.<br>Infin   | 0.000          | 0.467<br>0.466 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 18.21          | 446.70           | 3.76         | 0.84         | 110        | 1.001          | 0.962          | 0.84         | 0.50         | 1_03         |                  | 1.42         |      | 1       |            | 1.00         |        |        |                    | 1.00         |                   | 0.000          | 0.466          | Non-Liq.               |            | 0.00         |
| 18.37<br>18.54 | 433.53<br>420.70 | 3.52<br>4.05 | 0.81         | 110<br>110 |                | 0.961          | 0.81         | 0.50         | 1.02         |                  | 1.41         |      | 1       |            | 1.00         |        |        |                    | 1.00         | Infin.            | 0.000          | 0.466          | Non-Liq.               |            | 0.00         |
| 18.70          | 427.38           | 4.04         | 0.95         | 110        |                | 0.961<br>0.960 | 0.96<br>0.95 | 0.50<br>0.50 | 1.02<br>1.01 |                  | 1.48<br>1.47 |      | 1       |            | 1.00         |        |        |                    | 1.00         | Infin.<br>Infin.  | 0.000          | 0.466<br>0.466 | Non-Liq.<br>Non-Liq.   |            | 0.00<br>0.00 |
| 18.86          | 433.11           | 4.37         | 1.01         | 110        |                | 0.960          | 1.01         | 0.50         | 1.01         |                  | 1.49         |      | 1       | 100        | 1.00         | 5.20   | 1.00   | 413.9              | 1.00         |                   | 0.000          | 0.465          | Non-Liq.               |            | 0.00         |
| 19.03          | 406.01<br>382.11 | 4.03         | 0.99         | 110<br>110 |                | 0.960<br>0.959 | 0.99<br>1.09 | 0.50<br>0.50 | 1.01         |                  | 1.51<br>1.55 |      | 1       |            | 1.00<br>1.00 |        |        |                    | 1.00         |                   | 0.000          | 0.465<br>0.465 | Non-Liq.               |            | 0.00         |
| 19.36          | 381.05           | 4.09         | 1.07         | 110        |                | 0.959          | 1.08         | 0.50         | 1.00         |                  | 1.55         |      | i       |            | 1.00         |        |        |                    | 1.00         |                   | 0.000          | 0.465          | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 19.52          | 379.85           | 4.12         | 1.08         | 110        |                | 0.958          | 1.09         | 0.50         | 0.99         |                  | 1.56         |      | 1       |            | 1.00         |        |        |                    | 0.99         |                   | 0.000          | 0.465          | Non-Liq.               | Non-Liq    | 0.00         |
| 19,69<br>19,85 | 382,89<br>384.60 | 4.14<br>3.97 | 1.08         | 110<br>110 |                | 0.958<br>0.957 | 1.08<br>1.04 | 0.50<br>0.50 | 0.99         |                  | 1.55<br>1.54 |      | 1       |            | 1.00         |        |        |                    | 0.99         |                   | 0.000          | 0.464<br>0.464 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 20.01          | 377.72           | 4.35         | 1.15         | 110        | 1.101          | 0.957          | 1.16         | 0.50         | 0.98         | 349.00           | 1.58         |      | 1       |            | 1.00         |        |        |                    | 0.98         |                   | 0.000          | 0.464          | Non-Liq.               |            | 0.00         |
| 20.18          | 371.25<br>361.72 | 4.23<br>4.14 | 1.14         | 110<br>110 |                | 0.957<br>0.956 | 1.14<br>1.15 | 0.50         | 0.98         |                  | 1.58         |      | 1       |            | 1.00         |        |        |                    | 0.98         |                   | 0.000          | 0.465          | Non-Liq.               |            | 0.00         |
| 20.51          | 347.60           | 4.05         | 1.16         | 110        |                | 0.956          | 1.17         | 0.50         | 0.98<br>0.97 |                  | 1.59<br>1.61 |      | i       |            | 1.00<br>1.00 |        |        |                    | 0.98         |                   | 0.000          | 0.467<br>0.469 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 20,67          | 339.34           | 3.76         | 1.11         | 110        |                | 0.955          | 1.11         | 0.50         | 0.97         | -                | 1.60         |      | 1       |            | 1.00         | 5.20   | 1.00   | 312.1              | 0.98         | Infin.            | 0.000          | 0.471          | Non-Liq.               |            | 0.00         |
| 20.83          | 332.14<br>334.58 | 3.55<br>3.14 | 1.07         | 110<br>110 |                | 0.955<br>0.954 | 1.07<br>0.94 | 0.50         | 0.97<br>0.97 |                  | 1.59<br>1.55 |      | 1       |            | 1.00<br>1.00 |        |        |                    | 0.98         |                   | 0.000          | 0.473<br>0.474 | Non-Liq.               |            | 0.00         |
| 21.16          | 327.20           | 2.80         | 0.86         | 110        |                | 0.954          | 0.86         | 0.50         |              |                  | 1.52         |      | 1       |            |              |        |        |                    | 0.97         |                   | 0.000          | 0.474          | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 21.33<br>21.49 | 310.59<br>293.79 | 2.46<br>1.87 | 0.79         | 110        |                | 0.954          | 0.80         | 0.50         | 0.97         |                  | 1.51         |      | 1       |            |              |        |        |                    | 0.97         |                   | 0.000          | 0.478          | Non-Liq.               |            | 0.00         |
| 21.65          | 272.37           | 1.43         | 0.52         | 110<br>110 |                | 0.953<br>0.953 | 0.64<br>0.53 | 0.50<br>0.50 | 0.96<br>0.96 |                  | 1.46<br>1.43 |      | 1       |            |              |        |        |                    | 0.97<br>0.97 |                   | 0.000          | 0.480<br>0.482 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 21.82          | 224,93           | 2.27         | 1.01         | 110        | 1.146          | 0.952          | 1.01         | 0.51         | 0.96         | 203_01           | 1.69         |      | 1       | 100        | 1.03         | 5,20   | 1.00   |                    | 0.97         |                   | 0.000          | 0.483          | Non-Liq.               |            | 0.00         |
| 21.98<br>22.15 | 164 58<br>113 74 | 3.51<br>3.46 | 2.13<br>3.04 | 110<br>110 |                | 0.952<br>0.951 | 2.15<br>3.07 | 0.62<br>0.68 | 0.95<br>0.94 |                  | 2.03<br>2.25 |      | 1       |            | 1.34<br>1.81 |        |        | 196.2<br>181.0     | 0.97<br>0.97 |                   | 0.000          | 0.485          | Non-Liq.               |            | 0.00         |
| 22.31          | 96,23            | 3.59         | 3.73         | 110        |                | 0.951          | 3.78         | 0.72         | 0.94         |                  | 2.37         |      | i       |            | 2.19         |        |        | 184.7              |              |                   | 0.000          | 0.487<br>0.489 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 22.47<br>22.64 | 51,22<br>53,23   | 2.75         | 5.37<br>3.66 | 110        |                | 0.950          | 5.50         | 0.81         | 0.93         |                  | 2.68         |      | 0       |            | D 00         |        |        |                    | 0.98         |                   |                | 0.490          | Non-Liq.               |            | 0.00         |
| 22.80          | 95.82            | 1.95<br>1.58 | 1.65         | 110<br>110 |                | 0 950<br>0 949 | 3.74<br>1.67 | 0.77<br>0.64 | 0.93         |                  | 2.55<br>2.11 |      | 1       |            | 3.02<br>1.48 |        |        | 138.0<br>124.3     | 0.98<br>0.97 |                   | 0.318<br>0.251 | 0.492<br>0.494 | 0.65<br>0.51           | 81%<br>90% | 1.02<br>1.17 |
|                | 193.72           | 2.53         | 1.30         | 110        | 1.173          | 0.949          | 1.31         | 0.55         | 0.94         | 171.87           | 1.82         |      | 1       | 99         | 1,12         | 1.00   | 1.00   | 193.5              | 0.96         | Infin.            | 0.000          | 0.495          | Non-Liq.               |            | 0.00         |
|                | 228.65<br>278.92 | 2.09         | 0.91<br>1.02 | 110<br>110 |                | 0.948<br>0.948 |              | 0.51<br>0.50 |              |                  | 1.66<br>1.63 |      | 1       |            |              |        |        |                    | 0.96         |                   | 0.000          | 0.497          | Non-Liq.               |            | 0.00         |
| 23.46          | 376.36           | 2.41         | 0.64         | 110        | 1.185          |                |              | 0.50         |              |                  | 1.40         |      |         |            |              |        |        | 249.4<br>336.3     | 0.96<br>0.96 |                   | 0.000          | 0.498<br>0.500 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
|                | 310.45<br>306.26 | 2.46<br>2.29 | 0.79<br>0.75 | 110        |                |                |              | 0.50         |              |                  | 1.52         |      |         |            |              |        |        |                    | 0.95         |                   | 0.000          | 0.502          | Non-Liq.               |            | 0.00         |
|                | 308.85           | 2.26         | 0.73         | 110<br>110 |                |                |              | 0.50<br>0.50 |              |                  | 1.51<br>1.50 |      |         |            |              |        |        |                    | 0.95<br>0.95 |                   | 0.000          | 0.503<br>0.505 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 24.11          | 306.71           | 2.22         | 0.72         | 110        | 1.200          | 0.945          | 0.73         | 0.50         | 0.94         | 271.08           | 1.50         |      | 1       | 100        | 1.00         | 1,35   | 1.00   | 272.1              | 0.95         | Infin.            | 0.000          | 0.506          | Non-Liq.               | Non-Liq.   | 0.00         |
| 24 28          | 307.77<br>305.26 | 2.19<br>1.72 | 0.71<br>0.56 | 110<br>110 |                |                |              |              |              |                  | 1.49<br>1.42 |      |         |            |              |        |        |                    | 0.95         |                   | 0.000          | 0.508          | Non-Liq.               |            | 0.00         |
| 24.61          | 305,26           | 1.99         | 0.65         | 110        |                |                |              |              |              |                  | 1.42         |      |         |            |              |        |        | 269.9<br>269.5     | 0.95<br>0.95 |                   | 0.000          | 0.509<br>0.511 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
|                | 310.72           | 2.04         | 0.66         | 110        | 1,216          | 0.943          | 0.66         | 0.50         | 0.93         | 272.86           | 1.47         |      | 1       | 100        | 1.00         | 1.50   | 1.00   | 273.9              | 0.95         | Infin.            | 0.000          | 0.512          | Non-Liq.               | Non-Liq.   | 0.00         |
| 24.93<br>25.10 |                  | 1.96<br>2.01 | 0.63<br>0.61 | 110<br>110 |                |                |              |              |              |                  | 1.45<br>1.43 |      |         |            |              |        |        | 275.3<br>289.2     | 0.94<br>0.94 |                   |                | 0.514<br>0.515 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 25.26          | 344.97           | 1.95         | 0.57         | 110        | 1,228          | 941            | 0.57         | 0.50         | 0,93         | 301.60           | 1.39         |      |         |            |              |        |        | 302.7              |              |                   |                | 0.516          | Non-Liq.               |            | 0.00         |
| 25.43<br>25.59 |                  | 2.30<br>2.26 | 0.65         | 110<br>110 |                |                |              |              |              |                  | 1.43         |      |         | 100 1      | 1.00         |        | 1.00   | 307.6              | 0.94         | Infin.            | 0.000          | 0.518          | Non-Liq.               | Non-Liq.   | 0.00         |
| 25.75          | 366.29           | 2.65         | 0.62         | 110        |                |                |              |              |              |                  | 1.40<br>1.45 |      |         |            |              |        |        |                    | 0.94<br>0.94 |                   | 0.000          | 0.519<br>0.520 | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 25.92          | 360,95           | 2.59         | 0.72         | 110        | 1.243          | 939            | 0.72         | 0.50         | 0.92         | 313.61           | 1.45         |      | 1       | 100 1      | 1.00         | 1.50   | 1.00   | 314.8              | 0.94         | Infin.            | 0.000          | 0.522          | Non-Liq.               | Non-Liq    | 0.00         |
| 26.08<br>26.25 |                  | 2.62<br>2.85 | 0.74<br>0.81 | 110<br>110 |                |                |              |              |              |                  | 1.47<br>1.50 |      |         |            |              |        |        | 309.6 (            | 0.94         |                   |                | 0.523<br>0.524 | Non-Liq.               |            | 0.00         |
| 26.41          | 345.76           | 2.67         | 0.77         | 110        | 1.255          | 0.937          | 0.77         | 0.50         | 0.92         | 298.96           | 1.49         |      |         |            |              |        |        |                    | 0.93         |                   |                | 0.526          | Non-Liq.<br>Non-Liq.   |            | 0.00         |
| 26.57<br>26.74 |                  | 2.56<br>2.19 | 0.77         | 110        |                |                |              |              |              |                  | 1,50         |      |         | 100 1      | 1.00         | 1.50   | 1.00   | 287.6              | 0.93         | Infin.            | 0.000          | 0.527          | Non-Liq.               | Non-Liq    | 0.00         |
| 26.74          |                  | 1.96         | 0.62         | 110<br>110 |                |                |              |              |              |                  | 1.47<br>1.45 |      |         |            |              |        |        | 278.8 (<br>271.1 ( |              |                   |                | 0.528<br>0.529 | Non-Liq.  <br>Non-Liq. |            | 0.00         |
| 27.07          | 312,94           | 1.77         | 0.57         | 110        | 1.271          | 934            | 0.57         | 0.50         | 0.91         | 268.79 1         | I-43         |      | 1       | 100 1      | 1.00         | 1.50   | 1.00 2 | 269.8              | 0.93         | Infin.            | 0.000          | 0.531          | Non-Liq.               | Non-Liq    | 0.00         |
| 27 23<br>27 40 |                  | 2.06<br>1.97 | 0.69         | 110<br>110 |                |                |              |              |              |                  | 1.50<br>1.54 |      |         |            |              |        |        | 256.2 (<br>235.6 ( |              |                   |                | 0.532          | Non-Liq.               |            | 0.00<br>0.00 |
| 27.56          | 243,92           | 1.79         | 0.73         | 110        | 1.282          | 932            | 0.74         | 0.50         | 0.91         |                  | 1.58         |      | 955     |            |              |        |        | 209.1 (            |              |                   |                | 0.533<br>0.534 | Non-Liq.  <br>Non-Liq. |            | 0.00         |
| 27.72<br>27.89 |                  |              | 1.01         | 110        |                |                |              |              |              |                  | 74           |      | 1       | 99 1       | 1.06         | 1.50 1 | I:00 ′ | 184.4 (            | 92           | Infin. (          | 0.000          | 0.535          | Non-Liq. I             | Non-Liq.   | 0.00         |
| 1 21.09        | 120,00           | 2.20         | 1.71         | 110        | 1.290          | 931            | 1.73         | 0.62         | 0.88         | 106.29 2         | 2,05         |      | 1       | 79 1       | 1.37         | 1      | i.u0 ′ | 146.0 (            | J.92         | 0.370 (           | J.341          | U 536          | 0.64                   | 82%        | 0.86         |

| ayer            | Tip                        |              | Friction     | Total             | Eff,Stres              | ss             |              |              |              |                   |              | g Liqu | ef Rel                 |              |              |      | Clean          |              |                   | _              | Induced        | Liquefac             |                    | Volume        |
|-----------------|----------------------------|--------------|--------------|-------------------|------------------------|----------------|--------------|--------------|--------------|-------------------|--------------|--------|------------------------|--------------|--------------|------|----------------|--------------|-------------------|----------------|----------------|----------------------|--------------------|---------------|
| Depth<br>(feet) | Qc<br>(tsf)                | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.<br>(pcf) | at Midpt,<br>p'o (tsf) |                | F            | n            | Ca           | Corrected<br>Qc1n | d<br>Ic      | -      | ept Dens.<br>1) Dr (%) | Kc           | (m)          | KH   | Sand<br>Qc1n   | Κσ           | CRR <sub>75</sub> | EQ<br>CRR      | M=7.5<br>CSR   | Safety<br>Factor     | Probab.            | Strair<br>(%) |
| 8 05            | 101 99<br>51 11            | 2.28         | 2.23<br>3.51 | 110<br>110        | 1,294<br>1,298         | 0.930<br>0.929 | 2.26<br>3.60 | 0.67<br>0.78 | 0.87<br>0.85 | 83 14<br>40 13    | 2,21<br>2,58 | 1      | 69<br>39               | 1,69<br>3.19 | - Street A   |      | 140.6<br>128.0 | 0.94         | 0.338<br>0.275    | 0.318          | 0.538          | 0.59                 | 85%                | 1.00          |
| 8.38            | 52,32                      | 1.72         | 3.29         | 110               | 1,302                  | 0.929          | 3.37         | 0.77         | 0.85         | 41.07             | 2,55         | 1      | 40                     | 3,03         |              |      | 124.6          | 0.96         | 0.260             | 0,264<br>0,249 | 0 539<br>0 540 | 0.49<br>0.46         | 91%<br>93%         | 1.14<br>1.18  |
| 8.54            | 56.72<br>70.59             | 1.37<br>1.56 | 2.42         | 110<br>110        | 1,306<br>1,310         | 0.928<br>0.927 | 2.47<br>2.25 | 0.74<br>0.71 | 0.86<br>0.86 | 44.85<br>56.31    | 2.43         | 1      | 44<br>53               | 2.44         |              | 1.00 |                | 0.96<br>0.94 | 0.202             | 0.194          | 0.541<br>0.542 | 0.36<br>0.39         | 97%<br>96%         | 1.36<br>1.29  |
| 8.87            | 114,33                     | 1.68         | 1.47         | 110               | 1.314                  | 0.926          | 1.49         | 0.62         | 0.87         | 93.36             | 2.05         | 1      | 74                     | 1.37         |              | 1_00 | 127.5          | 0.92         | 0.273             | 0.250          | 0.543          | 0.46                 | 93%                | 1.14          |
| 9.04            | 212.27<br>270.62           | 1.59<br>2.46 | 0.75         | 110<br>110        | 1.318                  | 0,926<br>0,925 | 0.76<br>0.91 | 0.50<br>0.50 | 0.90         | 178,67<br>227,75  | 1.64<br>1.62 | 1      | 100<br>100             | 1.00         | 1.00         |      |                | 0.92         | Infin.            | 0.000          | 0.544<br>0.545 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 9.36            | 330.54                     | 2.18         | 0.66         | 110               | 1.325                  | 0.924          | 0.66         | 0.50         | 0.89         | 278.01            | 1.46         | 1      | 100                    | 1.00         | 1,10         | 1.00 | 279.0          | 0.91         | Infin.            | 0.000          | 0.546          | Non-Liq.             | Non-Liq            | 0.00          |
| 9.53<br>9.69    | 349.39<br>360.66           | 1.96<br>1.80 | 0.56<br>0.50 | 110<br>110        | 1.329<br>1.333         | 0.923<br>0.923 | 0.56<br>0.50 | 0.50<br>0.50 | 0.89<br>0.89 | 293.49<br>302.55  | 1.39<br>1.35 | 1      | 100<br>100             | 1.00         | 1.15<br>1.20 |      |                | 0.91         | Infin.            | 0.000          | 0.547<br>0.548 | Non-Liq.<br>Non-Liq. | Non-Liq<br>Non-Liq | 0.00<br>0.00  |
| 9.86<br>0.02    | 367,26<br>360,19           | 1.69<br>1.58 | 0.46         | 110<br>110        | 1.337<br>1.341         | 0.922          | 0.46<br>0.44 | 0.50         | 0.89         | 307.65<br>301.27  | 1.32         | 1      | 100<br>100             | 1.00         | 1.25<br>1.30 |      |                | 0.91         | Infin.<br>Infin.  | 0.000          | 0.549<br>0.550 | Non-Liq.             |                    | 0.00          |
| 0.18            | 364.67                     | 1.25         | 0.34         | 110               | 1,345                  | 0.920          | 0.34         | 0.50         | 0.89         | 304.58            | 1.24         | i      | 100                    | 1.00         | 1.35         |      |                | 0.91         | Infin             | 0.000          | 0.551          | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
| 0.35            | 376.58<br>377.16           | 1.54         | 0.41         | 110<br>110        | 1.349<br>1.353         | 0.919<br>0.918 | 0.41         | 0.50<br>0.50 | 0.89         | 314.11<br>314.13  | 1.28         | 1      | 100<br>100             | 1.00         | 1.40<br>1.45 |      |                | 0.91         | Infin.            | 0.000          | 0.551<br>0.552 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 0.68            | 333.76                     | 1.64         | 0.49         | 110               | 1.357                  | 0.918          | 0.49         | 0.50         | 0.88         | 277.45            | 1.37         | 1      | 100                    | 1.00         | 1.50         | 1.00 | 278.5          | 0.91         | infin             | 0.000          | 0.553          | Non-Liq.             | Non-Liq.           | 0.00          |
| 0.84<br>1.00    | 317.96<br>293.92           | 1.81<br>1.53 | 0.57         | 110<br>110        | 1.361<br>1.364         | 0.917<br>0.916 | 0.57<br>0.52 | 0.50<br>0.50 | 0.88<br>0.88 | 263,88<br>243,49  | 1.43<br>1.43 | 1      | 100<br>100             | 1,00         | 1.55<br>1.60 |      |                | 0.90         | Infin.            | 0.000          | 0.554<br>0.555 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 1.17<br>1.33    | 298.19<br>299.06           | 1.57<br>1.55 | 0.53<br>0.52 | 110<br>110        | 1,368                  | 0.915<br>0.914 | 0.53<br>0.52 | 0.50<br>0.50 | 0.88         | 246,69<br>247,06  | 1.43         | 1      | 100                    | 1.00         |              |      |                | 0.90         | Infin.            | 0,000          | 0.556          | Non-Liq.             | Non-Liq            | 0.00          |
| 1.50            | 301.92                     | 1.67         | 0.55         | 110               | 1,376                  | 0.913          | 0.55         | 0.50         | 0.88<br>0.88 | 249.07            | 1.44         | i      | 100<br>100             | 1.00         | 1.70<br>1.75 |      |                | 0.90         | Infin<br>Infin    | 0.000          | 0.556<br>0.557 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 296.78<br>282.25           | 1.60<br>1.66 | 0.54         | 110<br>110        | 1,380<br>1,384         | 0.912<br>0.911 | 0.54<br>0.59 | 0.50<br>0.50 | 0.88<br>0.87 | 244,47<br>232,11  | 1.44<br>1.48 | 1      | 100<br>100             | 1.00         | 1.80<br>1.85 |      |                | 0.90         | Infin.            | 0.000          | 0.558<br>0.559 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 1,99            | 283,26                     | 2.04         | 0.72         | 110               | 1,388                  | 0.910          | 0.73         | 0.50         | 0.87         | 232,61            | 1.54         | 1      | 100                    | 1.00         | 1.90         | 1.00 | 233.5          | 0.90         | Infin.            | 0,000          | 0.559          | Non-Liq.             |                    | 0.00          |
|                 | 279.05<br>264.05           | 2.52<br>3.05 | 0.90         | 110<br>110        | 1,392<br>1,396         | 0.909          | 0.91<br>1.16 | 0.50<br>0.52 | 0.87<br>0.87 | 228,81<br>214,79  | 1.62<br>1.72 | 1      | 100<br>100             | 1.00         | 1.95         |      |                | 0.90         | Infin.            | 0.000          | 0.560<br>0.561 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 2 48            | 250.59                     | 3.28         | 1.31         | 110               | 1.400                  | 0.907          | 1.32         | 0.54         | 0.86         | 202,48            | 1.77         | 1      | 100                    | 1.09         | 2.05         | 1.00 | 221,2          | 0.89         | Infin.            | 0.000          | 0.561          | Non-Liq.             | Non-Liq.           | 0.00          |
|                 | 244.23<br>239.79           | 3.15<br>3.02 | 1.29<br>1.26 | 110<br>110        | 1.403<br>1.407         | 0.906<br>0.905 | 1.30<br>1.27 | 0.54<br>0.54 | 0.86<br>0.86 | 196.97<br>193.10  | 1.78<br>1.78 | 1      | 100<br>100             | 1.09<br>1.09 |              |      |                | 0.89         | Infin.<br>Infin.  | 0.000          | 0.562<br>0.563 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
|                 | 240.83<br>267.29           | 2.74<br>2.26 | 1.14<br>0.85 | 110<br>110        | 1.411<br>1.415         | 0.904          | 1.14<br>0.85 | 0.53<br>0.50 | 0.86<br>0.86 | 194.23<br>217.28  | 1.74<br>1.61 | 1      | 100                    | 1.07         | 2.20         | 1.00 | 207.7          | 0.89         | Infin.            | 0,000          | 0.563          | Non-Liq.             | Non-Liq.           | 0.00          |
| .30             | 269.49                     | 1.86         | 0.69         | 110               | 1.419                  | 0.902          | 0.69         | 0.50         | 0.86         | 217.28            | 1.55         | 1      | 100<br>100             | 1.00         |              |      |                | 0.89<br>0.89 | Infin.<br>Infin   | 0.000          | 0.564<br>0.565 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
|                 | 270.31<br>241.91           | 2.15<br>2.18 | 0.80         | 110<br>110        | 1.423<br>1.427         | 0.901          | 0.80         | 0.50<br>0.51 | 0.86         | 219.14<br>195.27  | 1.59<br>1.67 | 1      | 100<br>100             | 1.00         | 2.35         |      |                | 0.89         | Infin.            | 0.000          | 0.565<br>0.566 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| .79             | 219,65                     | 2.12         | 0.96         | 110               | 1.431                  | 0.899          | 0.97         | 0.52         | 0.85         | 176.09            | 1.72         | 1      | 100                    | 1.05         | 2.45         | 1.00 | 185.7          | 0.89         | Infin.            | 0.000          | 0.566          | Non-Liq.             |                    | 0.00          |
|                 | 236.69<br>253.42           | 2.44         | 1.03         | 110<br>110        | 1.435<br>1.439         | 0.898<br>0.897 | 1.04<br>1.05 | 0.52<br>0.52 | 0.85<br>0.85 | 189.61<br>203.12  | 1.72<br>1.70 | 1      | 100<br>100             | 1.05         |              |      |                | 0.89<br>0.88 | Infin.            | 0.000          | 0.567<br>0.567 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
|                 | 273.96                     | 3.02         | 1.10         | 110               | 1.443                  | 0.896          | 1.11         | 0.52         | 0.85         | 219.46            | 1.70         | 1      | 100                    | 1,03         | 2,60         | 1.00 | 227.9          | 0.88         | Infin.            | 0.000          | 0.568          | Non-Liq.             | Non-Liq            | 0.00          |
|                 | 296 13<br>315 65           | 3.44<br>3.90 | 1.16<br>1.24 | 110<br>110        | 1.446<br>1.450         | 0.895<br>0.894 | 1.17<br>1.24 | 0.51<br>0.52 | 0.85<br>0.85 | 237.10<br>252.37  | 1.69<br>1.69 | 1      | 100<br>100             | 1.03         |              |      |                | 0.88<br>0.88 |                   | 0.000          | 0.568<br>0.569 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 329.54<br>341.71           | 4.18<br>4.12 | 1.27<br>1.21 | 110<br>110        | 1.454<br>1.458         | 0.893<br>0.892 | 1.28<br>1.21 | 0.52<br>0.51 | 0.85<br>0.85 | 263.22<br>273.33  | 1.69<br>1.66 | 1      | 100<br>100             | 1.03         |              |      |                | 0.88         |                   | 0.000          | 0.569<br>0.570 | Non-Liq.             | Non-Liq            | 0.00          |
| .10             | 357.73                     | 3.87         | 1.08         | 110               | 1.462                  | 0.890          | 1.08         | 0.50         | 0.85         | 286.45            | 1.61         | i      | 100                    | 1.00         | 2.85         | 1.00 | 287.5          | 0.88         |                   | 0.000          | 0.570          | Non-Liq,<br>Non-Liq, |                    | 0.00<br>0.00  |
|                 | 368.55<br>371.34           | 3.45<br>3.32 | 0.94         | 110<br>110        | 1.466<br>1.470         | 0.889<br>0.888 | 0.94<br>0.90 | 0.50<br>0.50 | 0.85<br>0.85 | 294.76<br>296.60  | 1.56<br>1.54 | 1      | 100<br>100             | 1.00         |              |      |                | 0.88         |                   | 0.000          | 0.570<br>0.571 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 374.83<br>374.45           | 3.14<br>2.75 | 0.84         | 110<br>110        | 1.474<br>1.478         | 0.887          | 0.84         | 0.50         | 0.85         | 299.00            | 1.52         | 1      | 100                    | 1.00         |              |      |                | 0.88         | Infin             | 0.000          | 0.571          | Non-Liq.             | Non-Liq.           | 0.00          |
|                 | 379.11                     | 2.45         | 0.65         | 110               | 1.482                  | 0.886<br>0.885 | 0.74<br>0.65 | 0.50<br>0.50 | 0.85<br>0.85 | 298.29<br>301.62  | 1.47<br>1.43 | 1      | 100<br>100             | 1.00<br>1.00 |              |      |                | 0.87<br>0.87 |                   | 0.000          | 0.572<br>0.572 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 370.12<br>350.96           | 2.21         | 0.60         | 110<br>110        | 1.485<br>1.489         | 0.883<br>0.882 | 0.60<br>0.66 | 0.50<br>0.50 | 0.84<br>0.84 |                   | 1.41<br>1.46 | 1      | 100<br>100             |              |              |      |                | 0.87<br>0.87 |                   | 0.000          | 0.572<br>0.573 | Non-Liq.             |                    | 0.00          |
| 42              | 332.11                     | 2.24         | 0.67         | 110               | 1.493                  | 0.881          | 0.68         | 0.50         | 0.84         | 263.03            | 1.49         | i      | 100                    |              |              | 1.00 | 264.0          | 0.87         |                   | 0.000          | 0.573          | Non-Liq.<br>Non-Liq. | • • • •            | 0.00          |
|                 | 320.02<br>314.68           | 4.38<br>4.59 | 1.37<br>1.46 | 110<br>110        | 1.497<br>1.501         | 0.880<br>0.878 | 1.38<br>1.47 | 0.53<br>0.54 | 0.83         |                   | 1.73<br>1.76 | 1      | 100<br>100             |              |              |      |                | 0.87<br>0.87 |                   | 0.000          | 0.573<br>0.573 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 91              | 323.64                     | 4.64         | 1.43         | 110               | 1,505                  | 0.877          | 1.44         | 0.53         |              | 252.50            | 1.74         | 1      | 100                    | 1.07         | 3.40         | 1.00 | 270.5          | 0.87         | Infin.            | 0.000          | 0.574          | Non-Liq.             | Non-Liq.           | 0.00          |
|                 | 352 97<br>339 32           | 4.40<br>4.58 | 1.35         | 110<br>110        | 1.509<br>1.513         | 0.876          | 1.25         | 0.51         | 0.83         | 277.26<br>265.01  | 1.67<br>1.71 | 1      | 100<br>100             | 1.02         | 3.45         |      | 283.2<br>277.9 | 0.87<br>0.87 |                   | 0.000          | 0.574<br>0.574 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 311.75<br>316.65           | 3.95<br>3.97 | 1.27<br>1.25 | 110<br>110        |                        |                | 1.27<br>1.26 | 0.52<br>0.52 |              |                   | 1.71<br>1.70 | 1      | 100                    |              |              |      | 255.1          |              | Infin.            | 0,000          | 0.574          | Non-Liq.             | Non-Liq            | 0.00          |
| 73              | 324.98                     | 4.11         | 1.27         | 110               | 1.525                  |                | 1.27         | 0.52         |              |                   | 1.70         | i      | 100<br>100             |              |              |      |                | 0.86<br>0.86 |                   | 0.000          | 0.574<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
|                 | 313 50<br>336 26           | 4.12<br>4.69 | 1.31         | 110<br>110        |                        |                | 1.32<br>1.40 | 0.53<br>0.53 | 0.82<br>0.82 |                   | 1.72<br>1.73 | 1      |                        |              |              |      | 257.1<br>275.8 | 0.86<br>0.86 |                   | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 22              | 355,50                     | 7.68         | 2.16         | 110               | 1.536                  | 0.867          | 2.17         | 0.57         | 0.81         | 270.57            | 1.87         | 1      | 100                    | 1.16         | 3.80         | 1.00 | 315.7          | 0.86         | Infin.            | 0.000          | 0,575          | Non-Liq.             | Non-Liq            | 0.00          |
| 55              | 365.48<br>420.69           | 7.76<br>8.65 | 2.12         | 110<br>110        |                        |                | 2.13<br>2.06 | 0.57<br>0.55 |              |                   | 1.86<br>1.81 | 1      |                        |              |              |      | 321.5<br>360.0 |              |                   | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 390.62<br>316.05           | 7.43<br>7.07 | 1.90<br>2.24 | 110<br>110        |                        |                | 1.91<br>2.25 | 0.55<br>0.58 |              |                   | 1.80<br>1.91 | 1      |                        |              | 3.95<br>4.00 |      | 331.8<br>287.2 |              |                   | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. | Non-Liq            | 0.00          |
| 04              | 282,97                     | 4.44         | 1.57         | 110               | 1.556                  | 0.860          | 1.58         | 0.55         | 0.81         | 214.87            | 1.82         | 1      | 100                    | 1.12         | 4.05         | 1.00 | 241.6          | 0.86         | Infin.            | 0.000          | 0.575          | Non-Liq.             |                    | 0.00          |
|                 | 275 95<br>269 76           | 3.83<br>4.26 | 1.39<br>1.58 | 110<br>110        |                        |                | 1.39<br>1.59 | 0.54<br>0.56 |              |                   | 1.78<br>1.83 | 1      |                        |              | 4 10<br>4 15 |      | 230.8<br>231.8 |              |                   | 0.000          | 0.575<br>0.576 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 53              | 267.47                     | 4.03         | 1.51         | 110               | 1.567                  | 0.856          | 1.51         | 0.55         | 0.80         | 202.11            | 1.82         | 1      | 100                    | 1-12         | 4-20         | 1.00 | 227.7          | 0.85         | Infin             | 0.000          | 0 576          | Non-Liq.             | Non-Liq.           | 0.00          |
| 36              | 286,57<br>266.83           | 4.17<br>3.87 | 1.45<br>1.45 | 110<br>110        |                        |                | 1.46<br>1.46 | 0.54<br>0.55 |              |                   | 1.79<br>1.81 | 1      |                        |              |              |      | 239.5<br>225.1 | 0.85<br>0.85 |                   | 0.000          | 0.576<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 266 44<br>264 65           |              | 1.37<br>1.38 | 110<br>110        | 1.579                  | 0.852          | 1.38         | 0.55<br>0.55 | 0.80         | 201.22            | 1.79<br>1.79 | 1      | 100                    | 1.10         | 4.35         | 1.00 | 222.2          | 0.85         | Infin.            | 0.000          | 0.575          | Non-Liq.             | Non-Liq.           | 0.00          |
| 35 2            | 262.76                     | 3.62         | 1.38         | 110               | 1.587                  | 0.849          | 1.38         | 0.55         | 0.80         | 197.73            | 1.80         | 1      | 100                    | 1.10         |              | 1.00 | 219.3          |              | Infin.            | 0.000<br>0.000 | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
|                 | 263.40<br>268.30           |              | 1.40         | 110<br>110        |                        |                |              | 0.55<br>0.52 |              |                   | 1.80<br>1.72 | 1      |                        |              |              |      | 220.0<br>214.4 | 0.85<br>0.85 |                   | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00<br>0.00  |
| 85 2            | 273,61                     | 3,26         | 1.19         | 110               | 1.599                  | 0.844          | 1.20         | 0.53         | 0.80         | 206 64            | 1.74         | į      | 100                    | 1.06         | 4.60         | 1.00 | 220.5          | 0.85         | Infin             | 0,000          | 0.575          | Non-Liq.             | Non-Liq.           | 0.00          |
|                 | 279 17<br>277 56           |              | 1.23<br>1.27 | 110<br>110        |                        |                |              | 0.53<br>0.53 |              |                   | 1.74<br>1.76 | 1      |                        |              |              |      | 225.4<br>225.1 | 0.85<br>0.85 |                   | 0.000          | 0.575<br>0.575 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
| 34 2            | 264.17<br>267.65           | 3.63         | 1.38         | 110               | 1.610                  | 0.840          | 1.38         | 0.55         | 0.79         | 197.18            | 1.80         | 1      | 100                    | 1.11         | 4.75         | 1.00 | 218.8          | 0.85         | Infin.            | 0.000          | 0.575          | Non-Liq.             | Non-Liq.           | 0.00          |
| 67              | 269,53                     |              | 1.30<br>1.28 | 110<br>110        |                        |                |              | 0.54<br>0.54 |              |                   | 1.78<br>1.77 | 1      |                        |              | 4.80<br>4.85 |      | 218.7<br>219.2 | 0.84<br>0.84 |                   | 0.000          | 0.575<br>0.574 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 264.07<br>253.52           |              | 1.30<br>1.31 | 110<br>110        | 1.622                  | 0.835          | 1.30         |              | 0.79         | 196.79            | 1.78<br>1.80 | 1      | 100                    | 1.09         |              | 1.00 |                | 0.84         | Infin-            | 0.000          | 0.574          | Non-Liq.             | Non-Liq            | 0.00          |
| 16              | 253.46                     | 3.37         | 1.33         | 110               | 1.630                  | 0.832          | 1.34         | 0.55         | 0.79         | 187.81            | 1.80         | -1     | 100                    | 1.11         | 5.00         | 1.00 | 208.7          | 0.84         | Infin.            | 0.000<br>0.000 | 0.574<br>0.574 | Non-Liq.<br>Non-Liq. | Non-Liq            | 0.00<br>0.00  |
| 22 1            | 248.94                     |              | 1.33<br>1.33 | 110<br>110        |                        |                |              |              |              |                   | 1.81<br>1.82 | 1      |                        | 1.11<br>1.12 |              |      | 205.4          |              |                   | 0.000          | 0.574<br>0.573 | Non-Liq.<br>Non-Liq. |                    | 0.00          |
|                 | 240.19                     |              |              |                   |                        |                |              |              |              |                   |              |        |                        |              | 5.15         |      | 196.2          |              |                   | 0.000          |                |                      |                    | 0.00          |
| 49 2<br>65 2    | 240.19<br>239.26<br>235.68 | 3.01         | 1.26<br>1.37 | 110<br>110        |                        |                |              |              |              |                   | 1.80<br>1.84 | 1      |                        | 1.11<br>1.13 |              |      | 196.6          |              |                   | 0.000          |                | Non-Liq.<br>Non-Liq. |                    | 0.00          |

| Layer           | Tip              | Friction     |              |            | Eff, Stress           | 3              |              |              |              |                   |              | O | iquef. F              |      |              |              |              | Clean          |              |                  |                | Induced        | Liquefac             |                 | Volumetric    |
|-----------------|------------------|--------------|--------------|------------|-----------------------|----------------|--------------|--------------|--------------|-------------------|--------------|---|-----------------------|------|--------------|--------------|--------------|----------------|--------------|------------------|----------------|----------------|----------------------|-----------------|---------------|
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)  | Ratio<br>%   | Unit Wt.   | at Midpt<br>p'o (tsf) | rd             | F            | n            | Co           | Corrected<br>Qc1n | ł<br>Ic      | ~ | uscept D<br>D or 1) D |      | Ka           | H<br>(m)     | KH           | Sand<br>Qc1n   | Κσ           | CRR,             | EQ<br>CRR      | M=7_5<br>CSR   | Safety<br>Factor     | Probab.         | Strain<br>(%) |
| 43 14<br>43 31  | 238.08<br>216.71 | 3.09         | 1.30<br>1.45 | 110<br>110 | 1,653<br>1,657        | 0.823<br>0.821 | 1.31<br>1.46 | 0.55<br>0.57 | 0.78<br>0.77 | 174,63<br>157,24  | 1.81         |   | 1 1                   | 00   | 1,12<br>1,17 | 5 30<br>5 35 | 1.00         |                | 0.84         | Infin.           | 0.000          | 0.572<br>0.572 | Non-Liq.             | Non-Liq.        | 0.00          |
| 43.47           | 215.92           | 2,85         | 1.32         | 110        | 1,661                 | 0.820          | 1.33         | 0.56         | 0.78         | 157,06            | 1.85         |   | 1 9                   | 96   | 1,15         | 5.40         | 1.00         | 180,7          | 0.83         | Infin            | 0.000          | 0.572          | Non-Liq.             | Non-Liq.        | 0.00          |
| 43,64<br>43,80  | 228.43<br>245.66 | 2.91<br>2.77 | 1.27<br>1.13 | 110<br>110 | 1,665<br>1,669        | 0.818<br>0.816 | 1.28<br>1.14 | 0.55<br>0.54 | 0.78<br>0.78 | 166,65<br>180,61  | 1.82<br>1.76 |   | 56                    |      | 1,12<br>1,08 | 5 45<br>5 50 | 1.00         | 188.0<br>195.6 | 0.83         | Infin,<br>Infin, | 0.000          | 0.572<br>0.571 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 43.96<br>44.13  | 253.66<br>255.03 | 2.83         | 1.12<br>0.89 | 110<br>110 | 1.673<br>1.677        | 0.815<br>0.813 | 1.12         | 0.53<br>0.51 | 0.78         | 186,64<br>189,39  | 1,75<br>1,67 |   |                       |      | 1.07         | 5.55<br>5.60 | 1.00         | 200.4<br>193.6 | 0.83         | Infin,<br>Infin. | 0.000          | 0.571<br>0.571 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 44.29<br>44.46  | 249.25<br>256.60 | 2.48         | 0.99         | 110        | 1.681                 | 0.811          | 1.00         | 0.52         | 0.79         | 183,72            | 1.72         |   | 1 1                   | 00   | 1_05         | 5.65         | 1.00         | 193.3          | 0.83         | : Infin.         | 0.000          | 0.570          | Non-Liq.             | Non-Liq         | 0.00          |
| 44.62           | 265,56           | 3,34         | 1.10<br>1.26 | 110<br>110 | 1.685<br>1.689        | 0.810<br>0.808 | 1.11<br>1.26 | 0.53<br>0.54 | 0.78<br>0.78 |                   | 1.74<br>1.77 |   | 1 1                   | 00   | 1.06<br>1.09 | 5 70<br>5 75 | 1,00<br>1,00 | 201.3<br>211.6 | 0.83<br>0.83 | Infin,<br>Infin, | 0.000          | 0.570<br>0.569 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 44.78<br>44.95  | 290.32<br>335.88 | 3.34<br>3.42 | 1.15<br>1.02 | 110<br>110 | 1 692<br>1 696        | 0.807<br>0.805 | 1.16<br>1.02 | 0.52<br>0.50 | 0.78<br>0.79 | 213,36<br>249,45  | 1.72<br>1.63 |   |                       |      | 1.05         | 5.75<br>5.75 | 1.00         | 224.7<br>250.4 | 0.83         | Infin.           | 0.000          | 0.569<br>0.569 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 45.11<br>45.28  | 394.83<br>449.80 | 2,84<br>3,22 | 0.72<br>0.72 | 110<br>110 | 1.700<br>1.704        | 0.803<br>0.802 | 0.72<br>0.72 | 0.50<br>0.50 | 0.79<br>0.79 | 293,12<br>333,72  | 1.47<br>1.43 |   |                       |      | 1,00         | 5.75<br>5.75 | 1,00         | 294.2<br>335.0 | 0.83         | Infin.           | 0.000          | 0.568<br>0.568 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 45.44           | 447.17           | 4.13         | 0.92         | 110        | 1,708                 | 0.800          | 0.93         | 0.50         | 0.79         | 331.38            | 1,52         |   | 1 1                   | 00   | 1.00         | 5.75         | 1.00         | 332.6          | 0.83         | Infin.           | 0,000          | 0.567          | Non-Liq.             | Non-Liq         | 0.00          |
| 45.60<br>45.77  | 452.93<br>475.52 | 3.89<br>3.64 | 0.86<br>0.77 | 110<br>110 | 1.712<br>1.716        | 0.798<br>0.797 | 0.86<br>0.77 | 0.50<br>0.50 | 0.79<br>0.79 | 335.27<br>351.66  | 1.49<br>1.44 |   |                       |      | 1,00<br>1,00 | 5.75<br>5.75 | 1.00         | 336.5<br>353.0 | 0.82<br>0.82 | Infin.           | 0.000          | 0.567<br>0.567 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 45,93<br>46,10  | 444 46<br>446 58 | 2.97         | 0.67<br>0.54 | 110<br>110 | 1,720<br>1,724        | 0.795<br>0.793 | 0.67<br>0.54 | 0.50<br>0.50 | 0.78<br>0.78 |                   | 1.42         |   |                       |      | 1,00<br>1,00 | 5.75<br>5.75 | 1.00         | 329.5<br>330.7 | 0.82         | Infin.<br>Infin. | 0.000          | 0.566<br>0.566 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 46.26<br>46.42  | 425.00<br>414.92 | 2.48<br>2.66 | 0.58<br>0.64 | 110<br>110 | 1,728<br>1,731        | 0.792<br>0.790 | 0.59<br>0.64 | 0.50<br>0.50 | 0.78<br>0.78 |                   | 1.39<br>1.42 |   |                       |      | 1.00         | 5.75<br>5.75 | 1.00         | 314.3<br>306.4 | 0.82         | Infin.           | 0.000          | 0.565<br>0.565 | Non-Liq.             | Non-Liq         | 0.00          |
| 46.59           | 394.40           | 2,71         | 0.69         | 110        | 1.735                 | 0.788          | 0.69         | 0.50         | 0.78         | 289.79            | 1.46         |   | 1 1                   | 00   | 1.00         | 5.75         | 1.00         | 290,9          | 0.82         | Infin            | 0,000          | 0.564          | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00          |
| 46.75<br>46.92  | 375.24<br>360.27 | 2.77<br>2.57 | 0.74<br>0.71 | 110<br>110 | 1,743                 |                | 0.74<br>0.72 | 0.50<br>0.50 | 0.78<br>0.78 | 264,00            | 1.50<br>1.50 |   |                       |      | 1,00<br>1,00 | 5.75<br>5.75 | 1.00<br>1.00 | 276.4<br>265.0 | 0.82<br>0.82 | Infin.           | 0.000          | 0.564<br>0.563 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 47.08<br>47.24  | 348.31<br>321.44 | 2.26<br>1.84 | 0.65         | 110<br>110 | 1.747<br>1.751        | 0.783<br>0.782 | 0.65<br>0.58 | 0.50<br>0.50 | 0.78<br>0.78 |                   | 1.48<br>1.47 |   |                       |      | 1.00<br>1.00 | 5.75<br>5.75 | 1.00         | 255,9<br>235,8 | 0.82         | Infin.<br>Infin. | 0.000          | 0.563<br>0.562 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 47.41<br>47.57  | 279.99<br>223.67 | 1.88         | 0.67         | 110<br>110 | 1,755                 | 0.780          | 0.68         | 0.50<br>0.50 | 0.78         | 204.20            | 1.56<br>1.66 |   | 1 1                   | 00   | 1.00         | 5.75         | 1.00         | 205,0          | 0.82         | Infin.           | 0.000          | 0.562          | Non-Liq.             | Non-Liq.        | 0.00          |
| 47.74           | 164.82           | 2.03         | 1.23         | 110        | 1.763                 | 0.777          | 1.25         | 0.59         | 0.74         | 114.21            | 1.93         |   | 1 8                   | 32   |              | 5.75<br>5.75 | 1.00         | 164.1<br>139.7 | 0.82         | Infin.<br>0,334  | 0.000          | 0.561<br>0.561 | Non-Liq.<br>0.48     | 92%             | 0.00<br>1.01  |
| 47,90<br>48,06  | 121.59<br>91.32  | 2,53<br>2,37 | 2.08<br>2.60 | 110<br>110 | 1.767<br>1.770        |                | 2.11<br>2.65 | 0.67<br>0.72 | 0.71<br>0.69 | 80.43<br>58.48    | 2.20         |   |                       |      | 1.66<br>2.18 |              | 1.00         | 133,7<br>127.5 | 0.86<br>0.86 | 0.302            | 0.259<br>0.234 | 0.560<br>0.560 | 0.46<br>0.42         | 93%<br>95%      | 1.08<br>1.14  |
| 48,23<br>48,39  | 116.79<br>231.35 | 2.86<br>2.98 | 2.45<br>1.29 | 110<br>110 |                       |                | 2.48<br>1.30 | 0.69<br>0.56 | 0.70<br>0.75 |                   | 2.27<br>1.83 |   | 17                    |      | 1.84<br>1.13 | 1.00         | 1.00         | 140.3<br>184.6 | 0.86<br>0.81 | 0.337<br>Infin.  | 0.289          | 0.559<br>0.559 | 0.52<br>Non-Liq.     | 90%<br>Non-Lig  | 1.01<br>0.00  |
| 48.56<br>48.72  | 280.33<br>300.38 | 2.88<br>2.56 | 1.03<br>0.85 | 110<br>110 | 1.782                 | 0.768          | 1.03<br>0.86 | 0.52         | 0.76<br>0.77 | 201_01            | 1.70<br>1.62 |   | 1 10                  | 00   | 1.04         | 1.05         | 1.00         | 209,2          | 0.81         | Infin,           | 0.000          | 0.558          | Non-Liq.             | Non-Liq.        | 0.00          |
| 48,88           | 311.53           | 2.58         | 0.83         | 110        | 1.790                 | 0.765          | 0.83         | 0.50         | 0.77         | 225.07            | 1,60         |   | 1 10                  | 00   | 1.00         | 1.10         | 1.00         | 218.0<br>225.9 | 0.81<br>0.81 | Infin.<br>Infin. | 0.000          | 0.558<br>0.557 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 49,05<br>49,21  | 325,26<br>339,47 | 2.50<br>2.81 | 0.77         | 110<br>110 |                       |                | 0.77<br>0.83 |              | 0.77<br>0.77 |                   | 1.56<br>1.57 |   |                       |      |              | 1.20<br>1.25 | 1,00         | 235.7<br>245.8 | 0.81<br>0.81 | Infin.           | 0.000          | 0,556<br>0,556 | Non-Liq.<br>Non-Liq. |                 | 0.00          |
| 49.38<br>49.54  | 344.98<br>351.47 | 3.24         | 0.94         | 110<br>110 |                       |                | 0.94         |              | 0.77<br>0.76 |                   | 1.61<br>1.65 |   |                       |      |              | 1.30<br>1.35 | 1,00         | 249.5<br>254.5 | 0.81         | Infin.           | 0.000          | 0.555<br>0.555 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 49.70<br>49.87  | 357.74<br>374.88 | 3.92         | 1.10<br>0.99 | 110<br>110 | 1.810                 | 0.757          | 1.10         | 0.50         | 0.76<br>0.76 | 256.89            | 1.65<br>1.60 |   | 1 10                  | 00 ' | 1.00         | 1.40         | 1.00         | 258.4          | 0,81         | Infin.           | 0.000          | 0.554          | Non-Liq.             | Non-Liq.        | 0.00          |
| 50.03           | 395.53           | 3.14         | 0.79         | 110        | 1,817                 | 0.753          | 0.80         | 0.50         | 0.76         | 283,93            | 1.51         |   | 1 10                  | 00 - | 1.00         | 1.45<br>1.50 | 1.00         | 270.3<br>285.0 | 0.81<br>0.81 | Infin<br>Infin   | 0.000          | 0.553<br>0.553 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 50.20<br>50.36  | 406.66<br>421.58 | 2.61<br>2.63 | 0.64<br>0.62 | 110<br>110 |                       |                | 0.64<br>0.63 |              | 0.76<br>0.76 |                   | 1.44<br>1.42 |   |                       |      |              | 1.50<br>1.50 | 1.00         | 292.7<br>303.2 | 0.80         | Infin.           | 0.000          | 0.552<br>0.552 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 50.52<br>50.69  | 433.35<br>439.99 | 2.55<br>2.57 | 0.59         | 110<br>110 |                       |                | 0.59         |              | 0.76<br>0.76 |                   | 1.39<br>1.39 |   |                       |      |              | 1.50<br>1.50 | 1.00         | 311.4<br>315.8 | 0.80         | Infin.           | 0.000          | 0,551<br>0,550 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 50,85<br>51,02  | 441.89<br>455.49 | 2.61<br>2.77 | 0.59         | 110<br>110 | 1.837                 | 0.745          | 0.59<br>0.61 | 0.50         | 0.76<br>0.76 | 315.66            | 1.39         |   | 1 10                  | 00 1 | 1.00         | 1.50         | 1.00         | 316.8          | 0.80         | Infin.           | 0.000          | 0.550          | Non-Liq.             | Non-Liq.        | 0.00          |
| 51.18           | 472.21           | 3,30         | 0.70         | 110        | 1.845                 | 0.742          | 0.70         | 0.50         | 0.76         | 336.69            | 1.39<br>1.42 |   | 1 10                  | 00 1 | 1.00         | 1.50<br>1.50 | 1.00         | 338.0          | 0.80         | Infin<br>Infin   | 0.000          | 0.549<br>0.549 | Non-Liq,<br>Non-Liq, | Non-Liq.        | 0.00<br>0.00  |
| 51,35<br>51,51  | 504.84<br>459.09 | 3.77<br>4.28 | 0.75<br>0.93 | 110<br>110 |                       |                | 0.75<br>0.94 |              | 0.76<br>0.76 |                   | 1.43<br>1.53 |   |                       |      |              | 1.50<br>1.50 | 1.00         | 361.0<br>327.8 | 0.80         | Infin.<br>Infin. | 0.000          | 0.548<br>0.547 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 51.67<br>51.84  | 422.99<br>454.99 | 4.23<br>5.33 | 1.00         | 110<br>110 |                       |                | 1.00<br>1.18 |              | 0.75<br>0.75 |                   | 1.57<br>1.61 |   |                       |      |              | 1.50<br>1.50 | 1.00         | 301.6<br>324.2 | 08.0         | Infin.           | 0.000          | 0.547<br>0.546 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 52.00<br>52.17  | 493,38<br>477.89 | 5.94<br>5.21 | 1.20         | 110<br>110 |                       |                | 1.21<br>1.09 | 0.50<br>0.50 | 0.75         | 349.99            | 1.60<br>1.57 |   |                       | 00 1 |              |              | 1.00         | 351.3          |              | Infin.           | 0.000          | 0.545          | Non-Liq.             | Non-Liq         | 0.00          |
| 52.33           | 440.86           | 3.78         | 0.86         | 110        | 1,872                 | 0,730          | 0.86         | 0.50         | 0.75         |                   | 1.51         |   |                       | 00 1 | 1.00         |              | 1.00         | 313.1          |              | Infin.           | 0.000          | 0.545          | Non-Liq.             | Non-Liq         | 0.00          |
| 52.49<br>52.66  | 459.07<br>325.12 | 3.21<br>2.21 | 0.70<br>0.68 | 110<br>110 | 1,880                 | 0.727          | 0 70<br>0 68 | 0.50         | 0.75<br>0.75 |                   | 1.43<br>1.53 |   |                       |      |              |              | 1.00         | 325.7<br>230.1 |              | Infin.           | 0.000          | 0.543<br>0.543 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
| 52.82<br>52.99  | 240,31<br>196,52 | 2.13         | 0.89<br>1.05 | 110<br>110 |                       |                | 0.89<br>1.06 |              | 0.74<br>0.72 |                   | 1.71<br>1.83 |   | 1 9                   |      |              | 1.50         | 1.00         | 175.1<br>151.2 |              | Infin<br>0.401   | 0,000<br>0,318 | 0.542<br>0.542 | Non-Liq.<br>0.59     | Non-Liq.<br>85% | 0.00<br>0.74  |
| 53.15<br>53.31  | 141.14<br>110.78 | 1.74<br>1.92 | 1.23<br>1.73 | 110<br>110 | 1,892                 | 0,722          | 1.25<br>1.76 | 0.61         | 0.70<br>0.68 | 92.47             | 2.00<br>2.19 |   | 1 7<br>1 6            | 4 1  |              | 1.50         |              | 120.5<br>114.7 | 0.79         | 0.243<br>0.220   | 0.192<br>0.185 | 0.541<br>0.540 | 0.36<br>0.34         | 97%<br>97%      | 1.22          |
| 53.48           | 75.09            | 1.81         | 2 41         | 110        | 1.899                 | 0_719          | 2.47         | 0.74         | 0.65         | 44.95             | 2.43         |   | 1 4                   | 4 2  | 2,44         |              | 1.00         | 109.6          | 0.89         | 0.202            | 0.180          | 0.540          | 0.33                 | 97%             | 1.36          |
| 53.64<br>53.81  | 58.78<br>71.04   | 1.67<br>1.45 | 2.83<br>2.05 | 110<br>110 | 1.907                 | 0.716          | 2.93<br>2.10 | 0.73         | 0.63<br>0.65 | 42.53             | 2.57<br>2.40 |   | 1 3                   | 1 2  | 3.14<br>2.32 |              | 1.00         | 107.0<br>98.7  | 0.89         | 0.170            |                | 0.539<br>0.538 | 0.32<br>0.28         | 98%<br>99%      | 1.40<br>1.51  |
| 53.97<br>54.13  | 81.60<br>70.69   | 1.36<br>1.16 | 1.67<br>1.64 | 110<br>110 |                       |                | 1.71<br>1.69 |              | 0.66<br>0.66 |                   | 2.29<br>2.34 |   | 1 4                   |      | 1.92         |              | 1.00         | 95.8<br>89.0   |              | 0.162<br>0.146   |                | 0.538<br>0.537 | 0.27<br>0.24         | 99%<br>99%      | 1.56<br>1.66  |
| 54.30<br>54.46  | 44.26<br>37.41   | 1.08         | 2.45<br>2.69 | 110<br>110 |                       |                | 2,56<br>2,84 |              | 0.62<br>0.61 |                   | 2.64<br>2.73 |   | 0                     |      |              |              |              |                | 0.89         |                  |                | 0.536<br>0.536 | Non-Liq.<br>Non-Liq. | Non-Liq         | 0.00<br>0.00  |
| 54,63           | 29,79            | 1.23         | 4.12         | 110        | 1.927                 | 0.708          | 4.40         | 0.89         | 0.59         | 15.43             | 2.95         |   | 0                     |      |              |              |              |                | 0.89         |                  |                | 0.535          | Non-Liq.             | Non-Liq.        | 0.00          |
| 54.79<br>54.95  | 31.13<br>44.13   | 1.67         | 5,36<br>3,85 | 110<br>110 | 1.934                 | 0.705          | 5.72<br>4.02 | 0.84         | 0.58<br>0.60 | 24.02             | 3.01<br>2.77 |   | 0                     |      |              |              |              |                | 0.89         |                  |                | 0,534<br>0,534 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00<br>0.00  |
| 55 12<br>55 28  | 95.31<br>136.83  | 2.21 2.52    | 2.32<br>1.84 | 110<br>110 |                       |                | 2,37<br>1.87 |              | 0.65<br>0.67 |                   | 2,34<br>2,14 |   | 1 5                   |      | 2.08<br>1.53 |              | 1.00         | 119.4<br>131.8 |              | 0,238            | 0.199          | 0.533<br>0.532 | 0.37<br>0.43         | 96%<br>94%      | 1.24<br>1.09  |
|                 | 185,97<br>219,92 | 2.78<br>3.19 | 1.49<br>1.45 | 110<br>110 |                       |                | 1,51<br>1,47 |              | 0.69<br>0.70 |                   | 1.97<br>1.91 |   | 1 8                   |      |              | 0.45<br>0.45 |              | 192.9<br>218.4 | 0.78         | Infin.           | 0.000          | 0.532<br>0.531 | Non-Liq.<br>Non-Liq. | Non-Liq         | 0.00<br>0.00  |
| 55.77           | 244.90<br>256.05 | 3.67         | 1.50         | 110        | 1.954                 | 0.697          | 1.51         | 0.57         | 0.70         | 161.53            | 1,88         |   | 1 9                   | 7 1  | 1-17         | 0.45         | 1.26         | 239.9          | 0.78         | Infin.           | 0.000          | 0.530          | Non-Liq.             | Non-Liq.        | 0.00          |
| 56.10           | 257.95           | 3.99         | 1,56         | 110<br>110 | 1 962                 | 0.694          | 1.57<br>1.64 | 0.58         | 0.70<br>0.70 | 169.41            | 1.88<br>1.90 |   | 1 9                   | 9 1  | 1.19         |              | 1.26         | 250.5<br>254.1 | 0.78         | Infin.           | 0.000          | 0.530<br>0.529 | Non-Liq.<br>Non-Liq. | Non-Liq         | 0.00<br>0.00  |
| 56.43           | 260.48<br>262.97 | 4.35<br>4.01 | 1.67<br>1.52 | 110<br>110 |                       |                | 1.68<br>1.54 |              | 0.70<br>0.70 |                   | 1.90<br>1.87 |   | 1 9:<br>1 10          |      |              |              | 1.26<br>1.26 | 257.2<br>254.4 |              | Infin.           | 0.000          | 0.528<br>0.528 | Non-Liq.<br>Non-Liq. |                 | 0.00<br>0.00  |
|                 | 252.09<br>232.68 | 3.88         | 1.54<br>1.63 | 110<br>110 | 1.974                 | 0.689          | 1.55         | 0.57         | 0.70<br>0.69 | 165.32            | 1.89<br>1.93 |   | 1 9<br>1 9            | В 1  | 1.18         | 0.45         | 1.26<br>1.26 | 245.7<br>232.8 | 0.78         | Infin.           | 0.000          | 0.527<br>0.526 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00          |
| 56.92           | 183.02<br>160.88 | 3.54         | 1.93         | 110        | 1.981                 | 0.686          | 1.95         | 0.63         | 0.67         | 115.43            | 2.06         |   | 1 8                   | 3 1  | 1.39         |              | 1.00         | 161_0          | 0.78         | Infin.           | 0.000          | 0.526          | Non-Liq.             | Non-Liq.        | 0.00          |
| 57.25           | 152,41           | 2.48         | 1.63         | 110<br>110 | 1,989                 | 0.683          | 1.65         | 0.63         | 0.67<br>0.67 | 95.58             | 2.08<br>2.07 |   | 1 7:                  | 5 1  | 41           |              | 1.00         | 142.7<br>134.1 | 0.78         |                  | 0.236          | 0.525<br>0.524 | 0.52<br>0.45         | 90%<br>93%      | 1.00<br>1.07  |
| 57,58           | 121.85<br>78.30  | 1.74         | 1.70         | 110<br>110 | 1.997                 | 0.680          | 2.28         | 0.73         | 0.66<br>0.63 | 45.38             | 2.16<br>2.40 |   | 1 6                   |      | .58<br>2.33  |              | 1.00<br>1.00 | 118.0<br>105.7 |              | 0.233            |                | 0.524<br>0.523 | 0.37<br>0.32         | 96%<br>98%      | 1.25<br>1.41  |
| 57.74<br>57.91  | 46,88<br>32,55   |              | 2,86<br>3,17 | 110<br>110 |                       |                |              |              | 0.60<br>0.58 |                   | 2.67<br>2.85 |   | 0                     |      |              |              |              |                | 0.88<br>0.88 |                  |                | 0.523<br>0.522 | Non-Liq.<br>Non-Liq. | Non-Liq.        | 0.00          |
| 58,07           | 26.44            |              | 3.01         | 110        |                       |                |              |              | 0.57         |                   | 2.92         |   | 0                     |      |              |              |              |                | 0.88         |                  |                | 0.521          | Non-Liq.             |                 | 0.00          |

| Layer  | Tip   |       | Friction |         | Eff, Stres |       |      |      |      |          |      | p Liquef. Rel    |                |     |    | Clean |      |       |     | Induced | Liquefac. |          | Volumetric |
|--------|-------|-------|----------|---------|------------|-------|------|------|------|----------|------|------------------|----------------|-----|----|-------|------|-------|-----|---------|-----------|----------|------------|
| Depth  | Qc    | Fs    | Ratio    | Unit Wt | at Midpt   |       |      |      |      | Correcte | d    | Suscept Dens     |                | Н   |    | Sand  |      |       | EQ  | M=7.5   | Safety    | Probab   | Strain     |
| (feet) | (tsf) | (tsf) | %        | (pcf)   | p'o (tsf)  | rd    | _ F_ | n    | Co   | Qc1n     | lc   | 8 (0 or 1) Dr (% | K <sub>c</sub> | (m) | KH | Qc1n  | Κσ   | CRR75 | CRR | CSR     | Factor    | P        | (%)        |
| 58.23  | 32.25 | 0.58  | 1.80     | 110     | 2.013      | 0.675 | 1.92 | 0.82 | 0.59 | 16.89    | 2.70 | 0                |                |     |    |       | 0.88 | -     |     | 0.521   | Non-Lig.  | Non Lia  | 0.00       |
| 58,40  | 30.59 | 0.70  | 2.28     | 110     | 2,016      | 0.673 | 2.44 | 0.84 | 0.58 | 15.67    | 2.79 | 0                |                |     |    |       | 0.88 |       |     | 0.520   | Non-Liq.  |          | 0.00       |
| 58,56  | 19.12 | 0.58  | 3.04     | 110     | 2.020      | 0.672 | 3.40 | 0.93 | 0.55 | 8.86     | 3.07 | 0                |                |     |    |       | 0.88 |       |     | 0.519   | Non-Liq.  |          | 0.00       |
| 58,73  | 20.40 | 0.44  | 2.17     | 110     | 2.024      | 0.671 | 2.41 | 0.89 | 0.56 | 9.72     | 2.95 | 0                |                |     |    |       | 0.88 |       |     | 0.519   | Non-Liq.  |          |            |
| 8 89   | 29.72 | 0.45  | 1.52     | 110     | 2.028      | 0.669 | 1.63 | 0.82 | 0.59 | 15.38    | 2.70 | o o              |                |     |    |       | 0.88 |       |     | 0.518   |           |          | 0.00       |
| 9.06   | 18.72 | 0.48  | 2.57     | 110     | 2.032      | 0.668 | 2.89 | 0.92 | 0.55 | 8.65     | 3.04 | Ď                |                |     |    |       | 0.88 |       |     |         | Non-Liq.  |          | 0.00       |
| 9.22   | 15.04 | 0.45  | 2.97     | 110     | 2.036      | 0.666 | 3.44 |      | 0.53 | 6.54     | 3.18 | n                |                |     |    |       | 0.88 |       |     | 0.517   | Non-Liq.  |          | 0.00       |
| 59,38  | 14.96 | 0.42  | 2.81     | 110     | 2.040      | 0.665 | 3.25 |      | 0.53 | 6.50     | 3.17 | 0                |                |     |    |       |      |       |     | 0.517   | Non-Liq.  |          | 0.00       |
| 9.55   | 14.95 | 0.43  | 2.89     | 110     |            | 0.664 | 3.35 |      | 0.53 | 6.47     | 3.18 | 0                |                |     |    |       | 0.88 | ()    |     |         | Non-Liq.  |          | 0.00       |
| 9.71   | 15.06 | 0.48  | 3.17     | 110     | 2.048      | 0.662 | 3.67 | 0.97 | 0.53 | 6.49     | 3.20 | 0                |                |     |    |       | 0.88 |       |     | 0.516   | Non-Liq.  |          | 0.00       |
| 9.88   | 16.51 | 0.00  | 0.01     | 110     | 2.052      | 0.661 | 0.01 | 0.83 | 0.58 | 7.89     |      | U                | 4.00           |     |    |       | 88.0 |       |     | 0,515   | Non-Liq.  | Non-Liq. | 0.00       |
| 30.04  | 19.45 | 0.00  | 0.01     | 110     | 2.052      | 0.660 |      |      |      |          | 2.74 | 0                | 1,00           |     |    |       | 88.0 |       |     | 0,514   | Non-Liq.  | Non-Liq  | 0.00       |
| 80.20  |       |       | 0.00     |         |            |       | 0.01 | 0.82 | 0.58 | 9.57     | 2.69 | 0                | 1.00           |     |    |       | 0.88 |       |     | 0,514   | Non-Liq.  | Non-Liq. | 0.00       |
| 10.20  | 26.53 | 0.00  | 0.00     | 110     | 2.059      | 0.658 | 0.00 | 0.79 | 0.59 | 13.65    | 2.61 | 0                | 1.00           |     |    | 1     | 0.88 |       |     | 0.513   | Non-Liq.  | Non-Lig. | 0.00       |

|                 |                  | lob No:         | 301953       | -001              | chool No.              | 8              |              | Met          | thods:       | Liquefac            | uefactio     | on S | ettleme             | nt Ana     | lysis fro    | om Tol       | kimatsı      | u & See            | d (198       | 7)                | & Wride        | )                      |                      |            | Total<br>Liquefied         |
|-----------------|------------------|-----------------|--------------|-------------------|------------------------|----------------|--------------|--------------|--------------|---------------------|--------------|------|---------------------|------------|--------------|--------------|--------------|--------------------|--------------|-------------------|----------------|------------------------|----------------------|------------|----------------------------|
| FARTE           | Soi              | unding:         |              |                   | Plot:                  | 7              |              | Induce       | nd CSR       | Dry San<br>(M=7,5): |              |      |                     |            |              | lourna       | l of G&      | .GE, Vo            | il 124,      | No. 4             |                |                        |                      |            | Thickness<br>(feet)<br>1.3 |
| LAKII           |                  | gnilude:        | 6.77         | 7.5               |                        |                |              |              |              | and Qc1n            |              |      |                     | p 0) 10,   |              |              |              | <sub>5</sub> *Κσ/C |              |                   |                |                        |                      | Probab     | Total                      |
|                 |                  | PGA, g:<br>MSF: | 1.30         | 0,75              |                        | Ur             | it Weig      | ht of ur     | nsatura      | ted soils:          | 110          | рс   | f                   |            | Us           | e Toki       | matsu i      | & Seed             | (0) or       | Ishihara          |                | mine (1):<br>uired SF: | 0<br>1.50            | Avg<br>1%  | Induced<br>Subsidence      |
| r               | GV<br>Design GV  | VT, feet:       | 20.0<br>20.0 |                   |                        |                | Unit We      | eight of     | satura       | ted soils:          | 110          | pc   |                     | Limit      | ling Ic      | for K        | 20           |                    |              |                   | uefiable       | Layers:                | 0.33                 | Max<br>97% | (inches)<br>0.1            |
| Layer           |                  |                 | Friction     | Total             | Eff,Stress             |                | rr.          | i io ioi i   | iquena       | DIE SUIIS.          | 2.00         | de   | Liquef              | =          | ing ic       | OI KH        | 2.0          | Clean              |              | Of Liqu           | иенаріе        | Layers:                | Liquefac             |            | Volumetric                 |
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)     | Ratio<br>%   | Unit Wt,<br>(pcf) | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Co           | Corrected<br>Qc1n   | d<br>Ic      |      | Suscept<br>(0 or 1) |            | Kc           | (m)          | KH           | Sand<br>Qc1n       | Kra          | CRR <sub>75</sub> | EQ             | M=7.5<br>CSR           | Safety<br>Factor     | Probab.    | Strain<br>(%)              |
| 0.16            | 7.32             | 0.09            | 1,28         | 110               | 0,009                  | 1,000          | 1.29         | 0.83         | 1.70         | 11.75               | 2.74         | Ĭ    | 0                   |            |              | 1111         |              |                    | 1,00         | 14/00             |                | 0,485                  | Non-Liq.             | Non-Liq    | 0.00                       |
| 0.33<br>0.49    | 12,26<br>14,26   | 0.12<br>0.15    | 1,00<br>1,02 | 110<br>110        | 0,018<br>0,027         | 1,000          | 1.00<br>1.03 | 0.76<br>0.74 | 1.70<br>1.70 | 19 67<br>22 87      | 2.50<br>2.44 |      | 1                   | 9<br>16    | 2.75<br>2.50 |              | 1,00<br>1,00 | 54.0<br>57.1       | 1.00<br>1.00 | 0 095<br>0 097    | 0.095<br>0.097 | 0 485<br>0 485         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 0 66<br>0 82    | 13.52<br>11:35   | 0 15<br>0 14    | 1,09<br>1,22 | 110<br>110        | 0,036<br>0,045         | 1,000          | 1.10<br>1.22 | 0.75<br>0.78 | 1.70<br>1.70 | 21.67<br>18.16      | 2.48<br>2.57 |      | 1                   | 13<br>6    | 2,66<br>3,14 |              | 1.00         | 57.7<br>57.0       | 1.00<br>1.00 | 0.098             | 0.098          | 0.485<br>0.485         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 0.98            | 9.04<br>7.13     | 0.12            | 1.33         | 110<br>110        | 0.054                  | 1,000          | 1.34         | 0.81         | 1.70<br>1.70 | 14.44<br>11.36      | 2.67<br>2.72 |      | 0                   |            |              |              |              |                    | 1_00<br>1_00 |                   |                | 0.485<br>0.484         | Non-Liq.<br>Non-Liq. | Non-Liq    | 0.00                       |
| 1,31<br>1,48    | 7.13<br>6.14     | 0.08<br>0.08    | 1,07<br>1,27 | 110<br>110        | 0,072<br>0,081         | 0.999          | 1.08<br>1.29 | 0.82<br>0.85 | 1.70<br>1.70 | 11.34<br>9.74       | 2.72         |      | 0                   |            |              |              |              |                    | 1.00         |                   |                | 0 484<br>0 484         | Non-Liq.             | Non-Liq    | 0.00                       |
| 1,64            | 6,75             | 0.14            | 2.01         | 110               | 0.090                  | 0.998          | 2.04         | 0.87         | 1.70         | 10.70               | 2.88         |      | 0                   |            |              |              |              |                    | 1.00         |                   |                | 0.484                  | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00                       |
| 1,80<br>1,97    | 12.03<br>26.83   | 0.25<br>0.46    | 2.04<br>1.71 | 110<br>110        | 0,099<br>0,108         | 0,998<br>0,998 | 2.05<br>1.72 | 0.81<br>0.71 | 1.70<br>1.70 | 19 17<br>42 94      | 2.67<br>2.34 |      | 1                   | 42         | 2,10         |              | 1,00         | 90.0               | 1.00<br>1.00 |                   | 0.148          | 0.484<br>0.484         | Non-Liq.<br>Non-Liq. | Non-Liq    | 0.00<br>0.00               |
| 2.13<br>2.30    | 27.70<br>30.71   | 0.58<br>0.62    | 2.10         | 110<br>110        | 0,117<br>0,126         | 0,997<br>0,997 | 2.11<br>2.02 | 0.72<br>0.71 | 1.70<br>1.70 | 44 32<br>49 14      | 2.39         |      | 1                   | 43<br>47   | 2,27<br>2,10 |              |              | 100.6<br>103.0     | 1,00<br>1,00 | 0.175<br>0.182    | 0.175<br>0.182 | 0.483<br>0.483         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 2,46<br>2,62    | 35.14<br>34.66   | 0.59<br>0.52    | 1.69<br>1.49 | 110<br>110        | 0.135<br>0.144         | 0.996          | 1.70<br>1.49 | 0.68<br>0.67 | 1.70<br>1.70 | 56,25<br>55,46      | 2.25         |      | 1                   | 53<br>52   | 1,80<br>1,71 |              | 1.00         | 101.0<br>95.1      | 1.00         | 0.176<br>0.160    | 0.176<br>0.160 | 0.483<br>0.483         | Non-Liq.<br>Non-Liq. |            | 0.00                       |
| 2.79<br>2.95    | 30.29<br>25.72   | 0.43            | 1.42<br>1.42 | 110<br>110        | 0.153<br>0.162         | 0,996<br>0,995 | 1.43         | 0.68<br>0.70 | 1.70<br>1.70 | 48,42<br>41,07      | 2.25         |      | 1                   | 47<br>40   | 1,81<br>1,98 |              | 1.00         | 87.5<br>81.4       | 1.00         | 0.142<br>0.130    | 0.142<br>0.130 | 0.483<br>0.482         | Non-Liq.<br>Non-Liq. | Non-Liq    | 0.00<br>0.00               |
| 3.12<br>3.28    | 22.47<br>20.80   | 0.33            | 1.49<br>1.47 | 110<br>110        | 0.171<br>0.180         | 0.995<br>0.994 | 1.50         | 0.72<br>0.73 | 1.70<br>1.70 | 35 83<br>33 13      | 2.37         |      | į                   | 34<br>31   | 2 19         |              | 1.00         | 78.6<br>76.0       | 1.00         | 0.125<br>0.121    | 0.125<br>0.121 | 0 482<br>0 482         | Non-Liq.             | Non-Liq.   | 0.00                       |
| 3.44            | 20.45            | 0,30            | 1.47         | 110               | 0.189                  | 0.994          | 1.48         | 0.73         | 1.70         | 32,55               | 2.40         |      | į                   | 30         | 2.32         |              | 1.00         | 75.4               | 1.00         | 0.120             | 0.120          | 0.482                  | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00                       |
| 3.61            | 20.73<br>19.90   | 0.30            | 1.45<br>1.58 | 110<br>110        | 0.198<br>0.208         | 0.994<br>0.993 | 1.47<br>1.59 | 0.73<br>0.74 | 1.70<br>1.70 | 32,99<br>31.64      | 2.39         |      | 1                   | 31<br>29   | 2.29<br>2.44 |              | 1.00<br>1.00 | 75.5<br>77.1       | 1.00         | 0.120<br>0.123    | 0.120<br>0.123 | 0 482<br>0 482         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 3.94<br>4.10    | 17.21<br>11.84   | 0.35<br>0.37    | 2.05<br>3.08 | 110<br>110        | 0.217<br>0.226         | 0.993          | 2.08<br>3.14 | 0.77<br>0.85 | 1.70<br>1.70 | 27,31<br>18,66      | 2.55         |      | 0                   | 23         | 3.03         |              | 1,00         | 82.8               | 1.00         | 0,133             | 0.133          | 0.481<br>0.481         | Non-Liq.<br>Non-Liq. |            | 0.00                       |
| 4.27<br>4.43    | 7.47<br>7.87     | 0.32            | 4.24<br>3.41 | 110<br>110        | 0.235                  | 0.992          | 4.38<br>3.51 | 0.92         | 1.70<br>1.70 | 11.63<br>12.25      | 3.04<br>2.96 |      | 0                   |            |              |              |              |                    | 1.00         |                   |                | 0.481<br>0.481         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 4.59<br>4.76    | 13.03<br>17.56   | 0.25            | 1.89<br>1.13 | 110<br>110        | 0.253                  | 0.991<br>0.991 | 1.93<br>1.15 | 0.80<br>0.73 | 1.70<br>1.70 | 20.53<br>27.80      | 2.63<br>2.40 |      | 0                   | 24         | 2.30         |              | 1.00         | 63.9               | 1.00         | 0.104             | 0.104          | 0.481<br>0.480         | Non-Liq.             | Non-Liq.   | 0.00                       |
| 4.92<br>5.09    | 25 00<br>28 21   | 0.25<br>0.27    | 0.99         | 110<br>110        | 0.271                  | 0.991          | 1.00         | 0.68         | 1.70         | 39.74<br>44.88      | 2.23         |      | 1                   | 39         | 1.75         |              | 1,00         | 69.6               | 1.00         | 0.111             | 0.111          | 0.480                  | Non-Liq.             | Non-Liq.   | 0.00                       |
| 5.25            | 26.74            | 0.32            | 1_19         | 110               | 0.289                  | 0,990          | 1.20         | 0.66         | 1.70         | 42.50               | 2.25         |      | 1                   | 44<br>41   | 1.63         |              | 1.00         | 73.1<br>76.9       | 1.00         | 0.116<br>0.122    | 0.116<br>0.122 | 0.480<br>0.480         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 5.41<br>5.58    | 27.54<br>30.42   | 0.33            | 1.20<br>1.08 | 110<br>110        | 0.307                  | 0.989<br>0.989 | 1.21<br>1.10 | 0.68<br>0.66 | 1.70<br>1.70 | 43.77<br>48.39      | 2.25<br>2.18 |      | 1                   | 43<br>47   | 1.79<br>1.63 |              | 1,00<br>1,00 | 78.2<br>78.9       | 1.00         | 0.124<br>0.126    | 0.124<br>0.126 | 0.480<br>0.479         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 5 74<br>5 91    | 35.07<br>42.76   | 0.33            | 0.95         | 110<br>110        |                        | 0.989<br>0.988 | 0.96<br>1.00 | 0.64<br>0.62 | 1.70<br>1.70 | 55.84<br>68.19      | 2.10         |      | 1                   | 53<br>61   | 1.46<br>1.36 |              | 1.00         | 81.3<br>92.6       | 1.00         | 0.130<br>0.154    | 0.130<br>0.154 | 0.479<br>0.479         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 6.07<br>6.23    | 59.96<br>82.48   | 0.60<br>0.78    | 1.00<br>0.94 | 110<br>110        |                        | 0.988          | 1.01<br>0.94 | 0.59<br>0.55 | 1.70<br>1.70 | 95.81<br>131.98     | 1.93<br>1.80 |      | 1                   | 75<br>88   | 1.22         | 1.00         |              | 116.9<br>146.8     | 1.00         | 0.228             | 0.228          | 0,479<br>0,479         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 6.40<br>6.56    | 98,15<br>106.99  | 0.89            | 0.91<br>0.94 | 110<br>110        | 0.352                  | 0.987<br>0.987 | 0.91<br>0.95 | 0.53<br>0.52 | 1.70<br>1.70 | 157.14<br>171.33    | 1.74<br>1.72 |      | 1                   | 96<br>99   | 1.06         | 1.10<br>1.15 | 1.00         | 167.6<br>180.9     | 1.00         | Infin<br>Infin    | 0.000          | 0.479<br>0.478         | Non-Liq.<br>Non-Liq. | Non-Liq    | 0.00                       |
| 6.73<br>6.89    | 112.07<br>112.25 | 1.09            | 0.97         | 110<br>110        | 0.370                  | 0.986<br>0.986 | 0.98         | 0.52         | 1.70         | 179.48              | 1.72         |      | 1                   | 100        | 1.05         | 1.20         | 1.00         | 188,9              | 1.00         | Infin.            | 0.000          | 0.478                  | Non-Liq.             | Non-Liq.   | 0.00                       |
| 7.05            | 111.68           | 1.25            | 1.12         | 110               | 0.388                  | 0 986          | 1.13         | 0.54         | 777          |                     | 1.76         |      | 1                   | 100        | 1.08         | 1,30         | 1.00         | 191.9<br>193.6     | 1,00         | Infin.            | 0.000          | 0.478<br>0.478         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 7.22<br>7.38    | 113.57<br>110.25 | 1.36<br>1.39    | 1.19<br>1.26 | 110<br>110        | 0.406                  | 0.985<br>0.985 | 1.20<br>1.27 | 0.55         |              |                     | 1.78<br>1.80 |      | 1                   | 100<br>100 |              | 1.35<br>1.40 |              |                    | 1.00<br>1.00 | Infin.<br>Infin.  | 0.000          | 0.478<br>0.478         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 7.55<br>7.71    | 100.97<br>100.97 | 1.35<br>1.35    | 1.34<br>1.34 | 110<br>110        |                        | 0.985<br>0.984 | 1.34<br>1.34 | 0.56<br>0.56 | 1.69<br>1.67 | 160.87<br>159.07    | 1.85<br>1.85 |      | 1                   | 97<br>96   |              |              |              |                    | 1.00         | Infin.<br>Infin.  | 0.000          | 0 477<br>0 477         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 7.87<br>8.04    | 95.77<br>92.93   | 1.34            | 1.40<br>1.41 | 110<br>110        |                        | 0.984<br>0.984 | 1.40<br>1.42 | 0.57<br>0.58 | 1.67<br>1.65 | 150 26<br>144 62    | 1.88<br>1.90 |      | 1                   |            |              |              |              | 176.7<br>172.1     |              | Infin.<br>Infin.  | 0.000          | 0.477<br>0.477         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
| 8.20<br>8.37    | 90.79<br>87.38   | 1.03            | 1.14<br>1.14 | 110<br>110        | 0.451                  | 0.983<br>0.983 | 1.14<br>1.15 | 0,56         | 1.61<br>1.60 | 137.80              | 1.85<br>1.86 |      | 1                   | 90         | 1:14         | 1.65         | 1.00         | 157.8<br>152.6     |              | 0.446<br>0.410    | 0.446<br>0.410 | 0.477<br>0.476         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 8.53<br>8.69    | 82.47<br>86.06   | 0.96            | 1.17<br>1.17 | 110<br>110        | 0.469                  | 0.982<br>0.982 | 1.18<br>1.17 |              | 1.60<br>1.57 | 123.63              | 1.89<br>1.88 |      | 1                   | 86         | 1.18         | 1.75         | 1.00         | 146.1<br>149.3     | 1.00         | 0.370             | 0.370          | 0.476                  | Non-Liq.             | Non-Liq.   | 0.00                       |
| 8.86            | 93.45            | 1.08            | 1.15         | 110               | 0.487                  | 0.982          | 1.16         | 0.56         | 1.55         | 136.07              | 1.85         |      | 1                   | 90         | 1.15         | 1.85         | 1.00         | 156.8              | 1.00         | 0.390             | 0.390          | 0.476<br>0.476         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00                       |
| 9.02<br>9.19    | 102.02<br>107.28 | 1.14            | 1.12<br>1.09 | 110<br>110        | 0.505                  | 0.981<br>0.981 | 1.13<br>1.10 | 0.55         | 1.52<br>1.50 | 151.44              | 1.82<br>1.80 |      | 1                   | 94         | 1,11         | 1.95         | 1.00         | 164.7<br>168.7     | 1.00         | Infin.            | 0.000          | 0.476<br>0.476         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 9.35<br>9.51    | 109.34<br>111.98 | 1.18<br>1.16    | 1.07         | 110<br>110        |                        | 0.981<br>0.980 | 1.08<br>1.04 |              | 1.48<br>1.47 |                     | 1.80<br>1.78 |      | 1                   |            |              | 2 00 2 05    |              | 169.1<br>169.5     |              | Infin.<br>Infin.  | 0.000          | 0.475<br>0.475         | Non-Liq.<br>Non-Liq. |            | 0.00                       |
|                 | 118.26<br>127.36 | 1.20<br>1.25    | 1.01<br>0.98 | 110<br>110        |                        | 0.980<br>0.980 | 1.02<br>0.99 |              | 1.45<br>1.42 |                     | 1.76<br>1.73 |      | 1                   |            |              | 2.10         |              | 174.2<br>181.7     |              | Infin.            | 0.000          | 0.475<br>0.475         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
|                 | 137 13<br>144 79 | 1.33            | 0.97         | 110<br>110        |                        | 0.979<br>0.979 | 0.97<br>0.98 |              | 1.41<br>1.39 |                     | 1.71<br>1.70 |      | 1                   | 100        | 1.04         | 2.20<br>2.25 | 1.00         | 190.2<br>197.4     | 1.00         | Infin.            | 0.000          | 0.475<br>0.475         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 10.33           | 155.29<br>160.35 | 1.57<br>1.65    | 1.01         | 110<br>110        | 0.568                  | 0.979          | 1.02         | 0.52         | 1.38         | 201.47              | 1.69<br>1.69 |      | 1                   | 100        | 1.03         | 2.30         | 1_00         | 208.8              | 1.00         | Infin.            | 0.000          | 0.474                  | Non-Liq.             | Non-Liq.   | 0.00                       |
| 10.66           | 162.80           | 1.74            | 1:07         | 110               | 0.586                  | 0.978          | 1.07         | 0.52         | 1.36         | 208.10              | 1.70         |      | 1                   | 100        | 1-04         |              | 1.00         | 213.4<br>216.7     | 1.00         | Infin.<br>Infin   | 0.000          | 0.474<br>0.474         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00<br>0.00               |
| 10,99           | 163.62<br>165.03 | 1.48            | 0.90<br>0.96 | 110<br>110        | 0.604                  | 0.978<br>0.977 | 0.91<br>0.96 | 0.51         | 1.33         | 206.59              | 1.65<br>1.67 |      | 1                   | 100        | 1.02         |              | 1.00         | 207.4<br>210.8     | 1.00         | Infin.<br>Infin.  | 0.000          | 0.474<br>0.474         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00                       |
| 11.32           | 165.44<br>170.54 | 1.62<br>1.67    | 0.98<br>0.98 | 110<br>110        | 0.623                  | 0.977<br>0.977 |              | 0.51         |              |                     | 1.68<br>1.67 |      | 4                   |            | 1.02         | 2.55<br>2.60 | 1.00         |                    | 1.00<br>1.00 | Infin.            | 0.000          | 0.474<br>0.473         | Non-Liq.<br>Non-Liq. |            | 0.00<br>0.00               |
|                 | 193.35<br>234.30 | 1.66<br>1.88    | 0.86         | 110<br>110        |                        | 0.976<br>0.976 |              |              |              |                     | 1.59<br>1.52 |      | 1                   |            | 1.00         | 2,65         | 1.00         | 236.6              |              | Infin.            | 0.000          | 0.473<br>0.473         | Non-Liq.<br>Non-Liq. | Non-Liq    | 0.00<br>0.00               |
| 11.81           | 311.45<br>345.03 | 1.81            | 0.58<br>0.58 | 110<br>110        | 0.650                  | 0,975          | 0.58         | 0.50         | 1.28         | 374.90              | 1.33         |      | 1                   | 100        | 1.00         | 2.75         | 1.00         | 376.3              | 1.00         | Infin.            | 0.000          | 0.473<br>0.473         | Non-Liq.<br>Non-Liq. | Non-Liq.   | 0.00                       |
| 12.14           | 350.57<br>323.89 | 2 01 2 04       | 0.57<br>0.63 | 110<br>110<br>110 | 0.668                  |                | 0.58         | 0.50         | 1,26         | 416.32              | 1.30<br>1.35 |      | 1                   | 100        | 1.00         | 2.85         | 1.00         | 417.9              | 1.00         | Infin.            | 0.000          | 0.473                  | Non-Liq.             | Non-Liq    | 0.00                       |
| 12.47           | 284.79           | 2,15            | 0.75         | 110               | 0.686                  | 974            | 0.76         | 0.50         | 1.24         | 333.56              | 1.45         |      | 1                   | 100        | 1.00         | 2.90<br>2.95 | 1.00         | 383.4<br>334.8     | 1.00         | Infin             | 0.000          | 0.472                  | Non-Liq.             | Non-Liq    | 0.00                       |
|                 | 272.50<br>284.55 |                 | 0.79<br>0.75 | 110<br>110        |                        | 0.974<br>0.973 |              | 0.50         |              |                     | 1.48<br>1.45 |      | 1                   |            |              |              |              | 318.2<br>330.2     |              |                   | 0.000          | 0.472<br>0.472         | Non-Liq.<br>Non-Liq. |            | 0.00                       |

| Layer          | Tip  | Friction      | Friction     | Total      | Eff.Stress     | 3              |              |              |                |                  |              | e l | Liquef. | Rel_       |              |              |      | Clean          |              |                  | =              | Induced        | Liquefac.            |                | Volumetric   |
|----------------|--|---------------|--------------|------------|----------------|----------------|--------------|--------------|----------------|------------------|--------------|-----|---------|------------|--------------|--------------|------|----------------|--------------|------------------|----------------|----------------|----------------------|----------------|--------------|
| Depth          |  | Fs            | Ratio        |            | at Midpt,      |                |              |              |                | Corrected        | i            | D S | uscept  | Dens       |              | Н            |      | Sand           |              |                  | EQ             | M=7.5          | Safety               | Probab         | Strain       |
| (feet)         | (tsf)<br>288,27                            | (tsf)<br>2.12 | %            | (pcf)      | p'o (tsf)      | rd             | F 0.74       | Л            | C <sub>0</sub> | Qc1n             | lc           | Ó ( | 0 or 1) |            |              | (m)          | KH   | Qc1n           |              | CRR75            |                | CSR            | Factor               | PL             | (%)          |
| 12.96<br>13.12 | 289.02                                     | 2.12          | 0.73<br>0.74 | 110<br>110 | 0.713<br>0.722 | 0.973<br>0.973 | 0.74<br>0.74 | 0.50         | 1.22           | 331,14<br>329,91 | 1.44<br>1.45 |     | 1       | 100<br>100 | 1.00         | 3.10         | 1.00 | 332.4<br>331.1 | 1.00         | Infin.           | 0.000          | 0.472<br>0.472 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 13.29          | 293.05                                     | 2.33          | 0.80         | 110        | 0,731          | 0.972          | 0.80         | 0.50         | 1.20           | 332.44           | 1.47         |     | 1       | 100        | 1.00         | 3.15         | 1.00 | 333.7          | 1.00         | Infin            | 0.000          | 0.471          | Non-Liq.             | Non-Liq.       | 0.00         |
| 13.45<br>13.62 | 289 <sub>.</sub> 11<br>286 <sub>.</sub> 16 | 2.34          | 0.81         | 110<br>110 | 0,740<br>0,749 | 0.972<br>0.972 | 0.81<br>0.83 | 0.50         | 1.20<br>1.19   | 325 94<br>320 65 | 1,48<br>1,49 |     | 1       | 100<br>100 | 1.00         | 3.15         | 1.00 | 327.2<br>321.8 | 1.00         | Infin.           | 0.000          | 0.471<br>0.471 | Non-Liq.<br>Non-Liq. | 200            | 0.00<br>0.00 |
| 13,78          | 285.79                                     | 2.45          | 0.86         | 110        | 0 758          | 0.971          | 0.86         | 0.50         | 1.18           | 318,31           | 1,51         |     | 1       | 100        | 1.00         | 3.15         | 1.00 | 319.5          | 1,00         | Infin.           | 0,000          | 0,471          | Non-Liq.             |                | 0.00         |
| 13.94          | 290,46<br>293,63                           | 3.11          | 1.07<br>1.07 | 110<br>110 | 0.767<br>0.776 | 0.971<br>0.971 | 1.07<br>1.07 | 0.50<br>0.50 | 1.17<br>1.17   | 321,61<br>323,22 | 1.58<br>1.58 |     | 1       | 100<br>100 | 1.00         | 3.15<br>3.15 | 1.00 | 322.8<br>324.4 | 1.00         | Infin.           | 0,000          | 0.471<br>0.471 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 14,27          | 305,18                                     | 2.93          | 0.96         | 110        | 0.785          | 0,970          | 0.96         | 0.50         | 1.16           | 334.02           | 1,53         |     | 1       | 100        | 1.00         | 3.15         | 1,00 | 335,3          | 1,00         | Infin            | 0.000          | 0.470          | Non-Liq.             | Non-Liq.       | 0.00         |
| 14.44          | 274.68<br>264.68                           | 2.47<br>1.89  | 0.90<br>0.71 | 110<br>110 | 0,794<br>0,803 | 0,970<br>0,970 | 0.90         | 0.50         | 1.15<br>1.15   | 298 83<br>286 29 | 1.54<br>1.48 |     | 1       | 100<br>100 | 1.00         | 3.15<br>3.15 | 1.00 | 299.9<br>287.4 | 1.00         | Infin.           | 0,000          | 0,470<br>0,470 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 14.76          | 260.78                                     | 1.87          | 0.72         | 110        | 0.812          | 0.969          | 0.72         | 0.50         | 1.14           | 280 48           | 1.48         |     | 1       | 100        | 1.00         | 3.15         | 1,00 | 281.5          | 1,00         | Infin.           | 0,000          | 0.470          | Non-Liq.             |                | 0.00         |
| 14,93          | 254.73<br>243.62                           | 1.85          | 0.73<br>0.71 | 110<br>110 | 0.821<br>0.830 | 0.969          | 0.73<br>0.71 | 0.50<br>0.50 | 1.14<br>1.13   | 272,43<br>259,08 | 1.50<br>1.50 |     | 1       | 100<br>100 | 1.00         | 3.15<br>3.15 | 1.00 | 273.4<br>260.0 | 1.00         | Infin.           | 0.000          | 0.470<br>0.470 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 15.26          | 247.90                                     | 1.73          | 0.70         | 110        | 0.839          | 0.968          | 0.70         | 0.50         | 1.12           | 262,22           | 1,50         |     | 1       | 100        | 1.00         | 3.15         | 1.00 | 263.2          | 1.00         | Infin            | 0.000          | 0.469          | Non-Liq.             |                | 0.00         |
| 15.42<br>15.58 | 243.67<br>240.87                           | 1.34          | 0.55<br>0.77 | 110<br>110 | 0.848<br>0.857 | 0.968          | 0.55<br>0.77 | 0.50<br>0.50 | 1.12<br>1.11   | 256,34<br>252,04 | 1,43<br>1,54 |     | 1       | 100<br>100 | 1.00         | 3.15         | 1.00 | 257.3<br>253.0 | 1.00         | Infin.           | 0.000          | 0.469<br>0.469 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 15.75          | 227.67                                     | 1.80          | 0.79         | 110        | 0.866          | 0.967          | 0.79         | 0.50         | 1.11           | 236,93           | 1.57         |     | 1       | 100        | 1.00         | 3.15         | 1.00 | 237.8          | 1.00         | Infin_           | 0,000          | 0.469          | Non-Liq.             |                | 0.00         |
| 15.91<br>16.08 | 215.03<br>169.50                           | 1.51<br>0.84  | 0.70<br>0.50 | 110<br>110 | 0.875<br>0.884 | 0.967          | 0.71<br>0.50 | 0.50         | 1.10<br>1.09   | 222.56<br>174.33 | 1.55<br>1.53 |     | 1       | 100<br>100 | 1.00         | 3.15<br>3.15 | 1.00 | 223.4<br>175.0 | 1.00         | Infin.           | 0.000          | 0,469<br>0,468 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 16.24          | 113,63                                     | 0.81          | 0.71         | 110        | 0,893          | 0.966          | 0.72         | 0.54         | 1.10           | 116.73           | 1.77         |     | 1       | 83         | 1.08         |              | 1.00 | 127.1          | 1,00         | 0.271            | 0.271          | 0.468          | Non-Liq.             | Non-Liq.       | 0.00         |
| 16.40<br>16.57 | 74.42<br>41.55                             | 0.94          | 1.26<br>2.51 | 110<br>110 | 0,902<br>0,911 | 0.966          | 1.28<br>2.57 | 0.63<br>0.74 | 1.11<br>1.12   | 76.80<br>42.93   | 2.07<br>2.46 |     | 1       | 66<br>42   | 1.40<br>2.56 |              | 1.00 | 107.3<br>109.7 | 1,00         | 0.195<br>0.203   | 0,195          | 0.468<br>0.468 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 16.73          | 20.49                                      | 1.00          | 4.87         | 110        | 0.920          | 0.965          | 5.10         | 0.87         | 1.13           | 20,90            | 2.89         |     | 0       |            |              |              | 1200 | 10011          | 1.00         | 0.200            | O.LOO          | 0.468          | Non-Liq.             | Non-Liq.       | 0.00         |
| 16.90<br>17.06 | 17.66<br>17.13                             | 0.87          | 4.92<br>4.64 | 110<br>110 | 0.929<br>0.938 | 0.965<br>0.964 | 5.19<br>4.91 | 0.89         | 1.12<br>1.11   | 17.75<br>17.03   | 2.95<br>2.94 |     | 0       |            |              |              |      |                | 1,00         |                  |                | 0.468<br>0.467 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 17.22          | 45,69                                      | 0.87          | 1.91         | 110        | 0.947          | 0.964          | 1.95         | 0.71         | 1.08           | 45.77            | 2,36         |     | 1       | 44         | 2.14         |              | 1.00 | 98.1           | 1.00         | 0.168            | 0,168          | 0.467          | Non-Liq.             | Non-Liq.       | 0.00         |
| 17 39<br>17 55 | 85.88<br>131.32                            | 0.98          | 1.14<br>0.92 | 110<br>110 | 0.956<br>0.965 | 0.963<br>0.963 | 1.15<br>0.93 | 0.61<br>0.55 | 1.06<br>1.05   | 85,36<br>129,57  | 2.00<br>1.80 |     | 1<br>1  | 70<br>88   | 1.30         | 1.00         | 1,00 | 111.2<br>144.3 | 1.00         | 0.208            | 0,208          | 0.467<br>0.467 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 17.72          | 175.08                                     | 1.51          | 0.86         | 110        | 0.974          | 0,963          | 0.87         | 0.52         | 1.04           | 171,70           | 1,69         |     | 1       | 99         | 1,03         | 1.05         | 1.00 | 178.1          | 1.00         | Infin            | 0,000          | 0.467          | Non-Liq.             | Non-Liq        | 0.00         |
| 17.88<br>18.04 | 212,23<br>246,62                           | 1.86<br>1.63  | 0.88         | 110<br>110 |                | 0.962<br>0.962 | 0.88<br>0.66 | 0.50<br>0.50 | 1.04<br>1.03   | 207.10<br>239.71 | 1.64<br>1.51 |     | 1       |            | 1,00         |              | 1.00 | 207.9<br>240.6 | 1.00         | Infin.           | 0.000          | 0.467<br>0.466 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 18,21          | 274,39                                     | 2.22          | 0.81         | 110        | 1.001          | 0.962          | 0.81         | 0.50         | 1.03           | 265,59           | 1.54         |     | 1       | 100        | 1,00         | 1.10         | 1.00 | 266,6          | 1.00         | Infin.           | 0.000          | 0.466          | Non-Liq.             | Non-Liq.       | 0.00         |
| 18.37<br>18.54 | 300,69<br>310,01                           | 2.46<br>2.49  | 0.82         | 110<br>110 |                | 0.961<br>0.961 | 0.82<br>0.81 | 0.50<br>0.50 | 1.02<br>1.02   | 289,83<br>297,51 | 1.52<br>1.50 |     | 1       | 100<br>100 | 1.00         |              | 1.00 | 290.9<br>298.6 | 1.00         | Infin.           | 0.000          | 0.466<br>0.466 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 18.70          | 331.14                                     | 2.83          | 0.85         | 110        | 1.029          | 0,960          | 0.86         | 0.50         | 1.01           | 316,45           | 1,51         |     | 1       | 100        | 1.00         | 1.10         | 1.00 | 317.6          | 1.00         | Infin.           | 0.000          | 0.466          | Non-Liq.             | Non-Liq.       | 0.00         |
| 18.86<br>19.03 | 350.78<br>364.85                           | 3.15<br>3.25  | 0.90         | 110<br>110 |                | 0.960<br>0.960 | 0.90         | 0.50         | 1.01<br>1.01   |                  | 1.51         |     | 1       |            | 1.00         | 1.10         | 1.00 | 335.1<br>347.0 | 1.00         | Infin.           | 0.000          | 0 465<br>0 465 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 19.19          | 366.79                                     | 3.32          | 0.91         | 110        | 1.056          | 0.959          | 0.91         | 0.50         | 1.00           | 346.08           | 1.50         |     | 1       | 100        | 1.00         | 1.10         | 1.00 | 347.4          | 1.00         | Infin.           | 0.000          | 0.465          | Non-Liq.             | Non-Liq.       | 0.00         |
| 19.36<br>19.52 | 364.13<br>351.02                           | 3.25<br>3.25  | 0.89         | 110<br>110 |                | 0.959<br>0.958 | 0.89         | 0.50<br>0.50 | 1.00<br>0.99   |                  | 1.50<br>1.52 |     | 1       |            | 1.00         |              | 1.00 | 343.4<br>329.6 | 1.00         | Infin.<br>Infin. | 0.000          | 0.465<br>0.465 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 19.69          | 348,92<br>359,19                           | 2.58          | 0.74         | 110        |                | 0.958          | 0.74         | 0.50         | 0.99           |                  | 1.45         |     | 1       |            | 1.00         |              | 1.00 | 326.2          | 0.99         | Infin.           | 0.000          | 0.464          | Non-Liq.             | Non-Liq        | 0.00         |
| 19.85<br>20.01 | 376,67                                     | 3.47<br>4.05  | 0.97<br>1.08 | 110<br>110 |                | 0.957<br>0.957 | 0.97<br>1.08 | 0.50         | 0.98<br>0.98   |                  | 1.53<br>1.56 |     |         |            | 1.00         | 1.10         |      |                | 0.99         | Infin.<br>Infin. | 0.000          | 0.464<br>0.464 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 20.18          | 404.77<br>377.36                           | 4.12<br>4.95  | 1.02         | 110<br>110 |                | 0,957          | 1.02         | 0.50         | 0.98<br>0.98   |                  | 1.52         |     |         |            | 1.00         |              | 1.00 | 374.4          | 0.98         | Infin:           | 0.000          | 0.465          | Non-Liq.             | Non-Liq        | 0.00         |
| 20.51          | 335.46                                     | 4.86          | 1.45         | 110        |                | 0.956<br>0.956 | 1.32<br>1.45 | 0.50<br>0.52 | 0.96           |                  | 1.63<br>1.70 |     |         |            | 1.00         | 1.10         | 1.00 | 348.4<br>319.6 | 0.98<br>0.98 | Infin.<br>Infin. | 0.000          | 0.467<br>0.469 | Non-Liq.<br>Non-Liq. |                | 0.00         |
| 20.67          | 292,50<br>287,91                           | 6.92<br>3.88  | 2.37<br>1.35 | 110<br>110 |                | 0.955<br>0.955 | 2.37<br>1.35 | 0.58<br>0.52 | 0.97<br>0.97   |                  | 1.91         |     |         |            | 1.20         |              | 1.00 | 320.0          | 0.98         | Infin.           | 0.000          | 0.471          | Non-Liq.             | Non-Liq.       | 0.00         |
| 21.00          | 326.82                                     | 2.70          | 0.82         | 110        |                | 0.954          | 0.83         | 0.52         | 0.97           |                  | 1.71<br>1.51 |     |         |            | 1.05         | 1.10         | 1.00 | 275.8<br>299.5 | 0.98<br>0.98 | Infin.<br>Infin. | 0.000          | 0.473<br>0.474 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 21.16<br>21.33 | 125.71<br>116.66                           | 3.38<br>3.47  | 2.69         | 110<br>110 |                | 0.954<br>0.954 | 2.71<br>3.00 | 0.66<br>0.68 | 0.96<br>0.95   |                  | 2.18         |     | 1       |            | 1,62         |              | 1,00 |                | 0.97         | Infin.           | 0.000          | 0.476          | Non-Liq.             | Non-Liq.       | 0.00         |
| 21.49          | 242,49                                     | 3.92          | 1.62         | 110        |                | 0.953          | 1.63         | 0.55         | 0.96           |                  | 2.23<br>1.82 |     | 1       |            | 1.75<br>1.12 | 1.00         | 1,00 | 182.7<br>247.1 | 0.97<br>0.97 | Infin.<br>Infin. | 0.000          | 0.478<br>0.480 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 21.65          | 336,70<br>383,91                           | 4.03<br>3.24  | 1.20<br>0.84 | 110<br>110 |                | 0.953<br>0.952 | 1.20<br>0.85 | 0.50<br>0.50 | 0.96<br>0.96   |                  | 1.63<br>1.48 |     |         |            | 1.00         |              | 1.00 | 306.4          |              | Infin.           | 0.000          | 0.482          | Non-Liq.             | Non-Liq.       | 0.00         |
| 21.98          | 357.67                                     | 2.57          | 0.72         | 110        |                | 0.952          | 0.72         | 0.50         | 0.96           |                  | 1.44         |     |         |            |              | 1.10<br>1.15 |      | 348.9<br>324.5 |              | Infin.<br>Infin. | 0.000          | 0.483<br>0.485 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 22,15          | 353.56<br>349.51                           | 1.87<br>1.82  | 0.53         | 110<br>110 |                | 0.951<br>0.951 | 0.53<br>0.52 | 0.50<br>0.50 | 0.96<br>0.96   |                  | 1.35<br>1.35 |     |         |            |              |              |      |                | 0.97         | Infin.           | 0.000          | 0.487          | Non-Liq.             |                | 0.00         |
| 22,47          | 344.99                                     | 1.95          | 0.56         | 110        | 1.161          | 0.950          | 0.57         | 0.50         | 0.95           |                  | 1.38         |     |         |            | 1.00<br>1.00 |              | 1.00 | 316.0<br>311.3 | 0.96<br>0.96 | Infin.<br>Infin. | 0.000          | 0.489<br>0.490 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 22.64          | 338.66<br>324.89                           | 2.25<br>2.52  | 0.67<br>0.78 | 110<br>110 |                | 0.950<br>0.949 | 0.67<br>0.78 | 0.50<br>0.50 | 0.95<br>0.95   |                  | 1.44<br>1.50 |     |         |            | 1.00         |              | 1.00 |                | 0.96<br>0.96 | Infin.<br>Infin. | 0.000          | 0.492<br>0.494 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 22,97          | 321.85                                     | 2.86          | 0.89         | 110        | 1.173          | 0.949          | 0.89         | 0.50         | 0.95           | 287,84           | 1.55         |     |         |            |              |              | 1.00 |                | 0.96         | Infin.           | 0.000          | 0.495          | Non-Liq.             |                | 0.00         |
|                | 325.14<br>321.77                           | 3,11          | 0.96         | 110<br>110 |                | 0.948<br>0.948 | 0.96<br>1.01 | 0.50<br>0.50 | 0.95<br>0.95   |                  | 1.57<br>1.59 |     |         |            |              |              |      | 291.4<br>287.9 |              | Infin.           | 0.000          | 0.497<br>0.498 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 23,46          | 319.42                                     | 3.46          | 1.08         | 110        | 1.185          | 0.947          | 1.09         | 0.50         | 0.94           | 284.23           | 1.62         |     | 1       | 100        | 1.00         | 1.40         | 1,00 | 285.3          | 0.96         | Infin.           | 0.000          | 0_500          | Non-Liq.             | Non-Liq.       | 0.00         |
|                | 320.77<br>324.18                           | 3.46<br>3.64  | 1.08         | 110<br>110 |                |                | 1.08<br>1.13 | 0.50<br>0.50 |                |                  | 1.61<br>1.62 |     |         |            |              | 1.40<br>1.40 |      | 286.0<br>288.6 |              | Infin.<br>Infin. | 0.000          | 0.502<br>0.503 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 23.95          | 329.34                                     | 3.59          | 1.09         | 110        | 1,197          | 0.946          | 1.09         | 0.50         | 0.94           | 291.64           | 1.61         |     | 1       | 100        | 1.00         | 1.40         | 1.00 | 292.7          | 0.95         | Infin.           | 0.000          | 0.505          | Non-Liq.             | Non-Liq        | 0.00         |
|                | 336.72<br>342.31                           | 2.85          | 0.85         | 110<br>110 |                |                | 0.85<br>0.70 | 0.50<br>0.50 |                |                  | 1.52<br>1.45 |     |         |            |              |              |      | 298.8<br>303.3 |              | Infin.           | 0.000          | 0.506<br>0.508 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 24,44          | 363.48                                     | 2.12          | 0.58         | 110        | 1,208          | 944            | 0.58         | 0.50         | 0.94           | 320.41           | 1.38         |     | 1       | 100        | 1.00         | 1.40         | 1.00 | 321.6          | 0,95         | Infin.           | 0,000          | 0.509          | Non-Liq.             | Non-Liq        | 0.00         |
|                | 368.92<br>350.00                           | 1.84<br>2.34  | 0.50         | 110<br>110 |                |                | 0.50<br>0.67 | 0.50<br>0.50 |                |                  | 1.33<br>1.43 |     |         |            |              |              |      |                | 0.95         | Infin.<br>Infin. | 0.000          | 0.511<br>0.512 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 24.93          | 320.76                                     | 2.58          | 0.80         | 110        | 1.220          | 942            | 0.81         | 0.50         | 0.93           | 281,26           | 1.52         |     | 1       | 100        | 1.00         | 1.40         | 1.00 | 282.3          | 0.94         | Infin.           | 0.000          | 0.514          | Non-Liq.             | Non-Liq.       | 0.00         |
| 25.10<br>25.26 | 290.38<br>281.78                           | 2.75<br>2.86  | 0.95         | 110<br>110 |                |                | 0.95<br>1.02 | 0.50<br>0.50 |                |                  | 1.60<br>1.63 |     |         |            |              | 1.40<br>1.40 |      | 255.1<br>247.1 | 0.94         | Infin.<br>Infin. | 0.000          | 0.515<br>0.516 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 25.43          | 270.13                                     | 2.52          | 0.93         | 110        | 1.232          | 0.941          | 0.94         | 0.50         | 0.93           | 235.55           | 1,62         |     | 1       | 100        | 1.00         | 1.40         | 1.00 | 236.4          | 0.94         | Infin.           | 0.000          | 0,518          | Non-Liq.             | Non-Liq.       | 0.00         |
|                | 259.39<br>232.66                           | 2.62<br>2.59  | 1.01<br>1.11 | 110<br>110 |                |                | 1.01<br>1.12 |              |                |                  | 1.66<br>1.72 |     |         |            |              | 1.40<br>1.40 |      | 228.5<br>212.8 |              | Infin.<br>Infin. | 0.000          | 0.519<br>0.520 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 25,92          | 153.15                                     | 2.60          | 1.70         | 110        | 1.243          | 0.939          | 1.71         | 0.60         | 0.91           | 130 23           | 1.99         |     | 1       | 88         | 1.28         | 1.40         | 1.00 | 167.9          | 0.94         | Infin.           | 0.000          | 0.522          | Non-Liq.             | Non-Liq.       | 0.00         |
| 26,08<br>26,25 | 77.71<br>33.55                             | 1.98<br>1.53  | 2.55<br>4.55 | 110<br>110 |                |                | 2.59<br>4.72 |              | 0.89<br>0.87   |                  | 2.33<br>2.79 |     | 1<br>0  | 59         | 2.05         |              | 1.00 | 131.9          | 0.95<br>0.97 | 0.293            | 0.279          | 0.523<br>0.524 | 0.53<br>Noл-Liq.     | 89%<br>Non-Liq | 1.09<br>0.00 |
| 26,41          | 22,88                                      | 0.79          | 3.47         | 110        | 1,255          | 937            | 3.67         | 0.86         | 0.86           | 17.64            | 2,85         |     | 0       |            |              |              |      |                | 0.97         |                  |                | 0,526          | Non-Liq.             | Non-Liq        | 0.00         |
| 26.57<br>26.74 | 18.15<br>18.25                             | 0.50<br>0.55  | 2.75<br>3.03 | 110<br>110 |                |                | 2.95<br>3.26 |              | 0.86<br>0.86   |                  | 2.88<br>2.91 |     | 0       |            |              |              |      |                | 0.97<br>0.97 |                  |                | 0,527<br>0,528 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 26.90<br>27.07 | 17,74                                      | 0.85          | 4.80         | 110        | 1.267          | 935            | 5.17         | 0.92         | 0.85           | 13,19            | 3,04         |     | 0       |            |              |              |      |                | 0,96         |                  |                | 0.529          | Non-Liq.             | Non-Liq        | 0.00         |
| 27.23          | 23.20<br>36.59                             | 1.17<br>1.63  | 5.05<br>4.44 | 110<br>110 | 1.275          |                |              |              | 0.85<br>0.86   |                  | 2.96<br>2.76 |     | 0<br>0  |            |              |              |      |                | 0.96<br>0.96 |                  |                | 0.531<br>0.532 | Non-Liq.<br>Non-Liq. |                | 0.00<br>0.00 |
| 27.40<br>27.56 | 72.79<br>107.63                            | 1.23<br>1.36  | 1.69<br>1.26 | 110<br>110 |                |                |              |              | 0.88<br>0.89   |                  | 2.24         |     |         |            | 1.76<br>1.32 |              |      | 104.4<br>118.1 |              | 0.186<br>0.233   | 0.176<br>0.216 | 0.533<br>0.534 | 0.33<br>0.40         | 97%            | 1.43         |
| 27.72          | 139 45                                     | 1.46          | 1.05         | 110        | 1,286          | 932            | 1.06         | 0.57         | 0.89           | 116,81           | 1.88         |     | 1       | 83         | 1.17         | 1,00         | 1.00 | 136.8          | 0.92         | 0.318            | 0.294          | 0.535          | 0.55                 | 95%<br>88%     | 1.25<br>1.04 |
| 27.89          | 170.39                                     | 1.41          | 0.83         | 110        | 1 290 (        | 0.931          | 0.83         | 0.53         | 0.90           | 143.88           | 1.74         |     | 1       | 92         | 1,06         | 1.05         | 1.00 | 153.6          | 0,92         | 0,417            | 0.385          | 0.536          | 0.72                 | 75%            | 0.68         |

| Layer          | Tip              | Friction     | Friction     | Total      | Eff.Stres:     | s              |              | _            |              |                  |              | m    | Liquef   | Rel        |              | -            |      | Clean          |              |                  |       | Induced        | Liquefac.                |                | Volumetric   |
|----------------|------------------|--------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|------|----------|------------|--------------|--------------|------|----------------|--------------|------------------|-------|----------------|--------------------------|----------------|--------------|
| Depth          | Qc               | Fs           | Ratio        |            | at Midpt       |                |              |              |              | Corrected        | 1            | erid | Suscept  |            |              | Н            |      | Sand           |              |                  | EQ    | M=7.5          | Safety                   | Probab.        | Strain       |
| (feet)         | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n             | lc           | ó    | (0 or 1) |            |              | (m)          | KH   | Qc1n           |              | CRR75            |       | CSR            | Factor                   | PL             | (%)          |
| 28 05<br>28 22 | 178 25<br>181 74 | 1.31         | 0.74<br>0.71 | 110<br>110 | 1,294<br>1,298 | 0.930          | 0.74<br>0.72 | 0.52<br>0.51 | 0.90         | 150,76<br>153,64 | 1.69<br>1.68 |      | 1        | 94<br>95   | 1.03         | 1,10<br>1,15 | 1.00 | 156_1<br>157_5 | 0.92         | 0.434            | 0.400 | 0,538          | 0.74<br>0.76             | 73%<br>71%     | 0.63<br>0.60 |
| 28.38          | 186.28           | 1.33         | 0.71         | 110        | 1,302          | 0 929          | 0.72         | 0.51         | 0.90         | 157.35           | 1.67         |      | 1        | 96         | 1.01         | 1.20         | 1.00 | 160.3          | 0.92         | Infin            | 0,000 | 0,539          | Non-Liq.                 |                | 0.00         |
| 28,54<br>28,71 | 196,98<br>209,17 | 1.43         | 0.73<br>0.71 | 110        | 1,306          | 0.928          | 0.73         | 0.50         | 0.90         | 166 32           | 1,65         |      | 1        | 98         | 1.01         | 1.25         | 1.00 | 168.0          | 0.92         | Infin.           | 0,000 | 0,541          | Non-Liq.                 |                | 0.00         |
| 28.87          | 214.42           | 1.53         | 0.71         | 110<br>110 | 1,310<br>1,314 | 0.927<br>0.926 | 0.71<br>0.72 | 0.50         | 0.90         | 176,57<br>180,76 | 1,63<br>1,62 |      | 1        | 100<br>100 | 1,00<br>1,00 | 1,30<br>1,35 | 1,00 | 177.2<br>181.4 | 0.92         | Infin.           | 0.000 | 0,542<br>0,543 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 29.04          | 222.85           | 1.72         | 0.77         | 110        | 1,318          | 0.926          | 0.78         | 0.50         | 0.90         | 187,63           | 1,63         |      | 1        | 100        | 1.00         | 1,40         | 1.00 |                | 0.92         | Infin.           | 0 000 | 0.544          | Non-Liq.                 |                | 0.00         |
| 29.20<br>29.36 | 230,47<br>237,69 | 3.36         | 1.46<br>1.42 | 110<br>110 | 1,322<br>1,325 | 0.925<br>0.924 | 1.47<br>1.43 | 0.56<br>0.55 | 0.88         | 191.40           | 1.83         |      | 1        | 100        | 1.13         |              | 1,00 | 216.3          | 0.91         | Infin            | 0,000 | 0.545          | Non-Liq.                 |                | 0.00         |
| 29.53          | 254.47           | 3.24         | 1.27         | 110        | 1.329          | 0.923          | 1.28         | 0.53         | 0.89         | 197,33<br>211,82 | 1,81<br>1,75 |      | 1        | 100<br>100 | 1.11         |              | 1,00 | 220.6<br>228.1 | 0,91<br>0,91 | Infin.           | 0,000 | 0,546<br>0,547 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 29.69          | 245.50           | 3.18         | 1.29         | 110        | 1,333          | 0.923          | 1.30         | 0.54         | 0.88         | 203.76           | 1.77         |      | 1        | 100        | 1.08         | 1,60         | 1,00 | 221,8          | 0,91         | Infin.           | 0.000 | 0.548          | Non-Liq.                 | Non-Liq        | 0.00         |
| 29.86<br>30.02 | 248,87<br>247.02 | 2.73         | 1.10<br>1.22 | 110<br>110 | 1,337<br>1,341 | 0.922<br>0.921 | 1.10         | 0.52<br>0.53 | 0.89         | 207.09<br>204.68 | 1,71<br>1.75 |      | 1        | 100<br>100 | 1.04         | 1.65<br>1.70 | 1.00 | 217.2<br>219.8 | 0,91         | Infin.           | 0.000 | 0,549<br>0,550 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 30.18          | 244.70           | 3.20         | 1.31         | 110        | 1.345          | 0.920          | 1.32         | 0.54         | 0.88         | 202.04           | 1.77         |      | 1        | 100        | 1.09         |              | 1.00 |                | 0.91         | Infin            | 0,000 | 0.551          | Non-Liq.                 |                | 0.00         |
| 30.35          | 244.48           | 3.08         | 1.26         | 110        | 1.349          | 0.919          | 1.27         | 0.54         | 88.0         | 201.72           | 1.76         |      | 1        | 100        | 1.08         |              | 1,00 | 218,7          | 0,91         | Infin.           | 0.000 | 0.551          | Non-Liq.                 |                | 0.00         |
| 30.68          | 224.10           | 2.76         | 1.33<br>1.23 | 110<br>110 | 1.353<br>1.357 | 0.918          | 1.33<br>1.24 | 0.54<br>0.54 | 0.87<br>0.87 | 195 44<br>183 96 | 1.79<br>1.78 |      | 1        | 100<br>100 | 1.10         | 1.5          | 1.00 | 215.5<br>202.0 | 0.91         | Infin,<br>Infin, | 0,000 | 0,552<br>0,553 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 30.84          | 259.52           | 1.36         | 0.53         | 110        | 1,361          | 0.917          | 0.53         | 0.50         | 0.88         | 215_17           | 1.48         |      | 1        | 100        | 1.00         |              | 1.00 |                | 0.90         | Infin.           | 0,000 | 0.554          | Non-Liq.                 |                | 0.00         |
| 31.00          | 304.23<br>162.49 | 2.26         | 0.74<br>1.29 | 110<br>110 | 1.364<br>1.368 | 0.916<br>0.915 | 0.75<br>1.30 | 0.50<br>0.58 | 0.88         | 252,07<br>131,26 | 1.53         |      | 1        | 100<br>88  | 1.00         |              | 1.00 |                | 0.90         | Infin.<br>0.437  | 0,000 | 0 555<br>0 556 | Non-Liq.<br>0.71         |                | 0.00         |
| 31 33          | 321.89           | 2.01         | 0.63         | 110        | 1,372          | 0.914          | 0.63         | 0.50         | 0.88         | 266.01           | 1.46         |      | i        | 100        | 1.00         |              | 1.00 | 267.0          | 0.90         | Infin.           | 0.000 | 0.556          | Non-Liq.                 | 76%<br>Non-Liq | 0.62<br>0.00 |
| 31.50          | 318.50           | 1.97         | 0.62         | 110        | 1,376          | 0,913          | 0.62         | 0.50         | 0.88         | 262,82           | 1,46         |      | 1        |            | 1.00         |              | 1.00 |                | 0,90         | Infin.           | 0,000 | 0,557          | Non-Liq.                 | Non-Liq.       | 0.00         |
| 31.66<br>31.82 | 313.67<br>300.42 | 1.90         | 0.60<br>0.62 | 110<br>110 | 1,380<br>1,384 | 0.912          | 0.61<br>0.62 | 0.50<br>0.50 | 0.88<br>0.87 | 258.44<br>247.13 | 1,46         |      | 1        | 100<br>100 | 1.00         |              | 1.00 | 259.4<br>248.0 | 0.90         | Infin.           | 0,000 | 0.558<br>0.559 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 31,99          | 281.46           | 1.96         | 0.70         | 110        | 1,388          | 0,910          | 0.70         | 0.50         | 0.87         | 231,13           | 1,54         |      | 4        | 100        | 1.00         | 2.30         | 1,00 | 232.0          | 0.90         | Infin            | 0.000 | 0.559          | Non-Liq.                 |                | 0.00         |
| 32.15<br>32.32 | 265,77<br>254,71 | 2.01         | 0.76<br>0.87 | 110<br>110 | 1,392<br>1,396 | 0.909          | 0.76<br>0.88 | 0.50<br>0.50 | 0.87<br>0.87 | 217,87<br>208,46 | 1.58<br>1.64 |      | 1        | 100<br>100 | 1.00         |              |      |                | 0.90         | Infin,           | 0,000 | 0.560          | Non-Liq.                 |                | 0.00         |
| 32.48          | 258.16           | 2.21         | 0.86         | 110        | 1,400          | 0 907          | 0.86         | 0.50         | 0.87         | 211,00           | 1.63         |      | 4        |            | 1.00         |              | 1.00 |                | 0,90         | Infin.           | 0,000 | 0.561<br>0.561 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 32,64          | 281.06           | 1.84         | 0.66         | 110        | 1,403          | 0.906          | 0.66         | 0.50         | 0.87         | 229,50           | 1.52         |      | 1        | 100        | 1.00         | 2.50         | 1,00 | 230.4          | 0,89         | Infin.           | 0,000 | 0.562          | Non-Liq.                 | Non-Liq        | 0.00         |
| 32,81<br>32,97 | 311,55<br>355,20 | 1.75         | 0.56         | 110<br>110 | 1,407<br>1,411 | 0.905          | 0.56         | 0.50<br>0.50 | 0.87<br>0.87 | 254,16<br>289,53 | 1.44         |      | 1        | 100<br>100 | 1.00         |              | 1,00 | 255,1<br>290,6 | 0,89         | Infin.           | 0.000 | 0.563<br>0.563 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 33 14          | 376.15           | 1.82         | 0.48         | 110        | 1.415          | 0.903          | 0.48         | 0.50         | 0.86         | 306,25           | 1.34         |      | 1        | 100        | 1.00         | 2.65         | 1,00 | 307.4          | 0.89         | Infin            | 0.000 | 0.564          | Non-Liq.                 | Non-Liq.       | 0.00         |
| 33.30<br>33.46 | 382,53<br>385,73 | 1.72<br>1.70 | 0.45         | 110<br>110 | 1.419<br>1.423 | 0.902          | 0.45<br>0.44 | 0.50<br>0.50 | 0.86<br>0.86 | 311,03<br>313,21 | 1.31<br>1.30 |      | 1        |            | 1.00         |              | 1,00 |                | 0.89         | Infin.           | 0.000 | 0.565          | Non-Liq.                 |                | 0.00         |
| 33.63          | 388.54           | 1.78         | 0.46         | 110        | 1.427          | 0.900          | 0.46         | 0.50         | 0.86         | 315.06           | 1.31         |      | 1        |            | 1.00         |              | 1,00 |                | 0.89         | Infin.           | 0,000 | 0.565<br>0.566 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 33.79          | 373,85           | 1.92         | 0.51         | 110        | 1.431          | 0.899          | 0.52         | 0.50         | 0.86         | 302.69           | 1.36         |      | 1        |            | 1.00         |              | 1.00 |                | 0.89         | Infin.           | 0.000 | 0.566          | Non-Liq.                 | Non-Liq.       | 0.00         |
| 33.96<br>34.12 | 360,84<br>336,62 | 2.35<br>1.68 | 0.65         | 110<br>110 | 1,435<br>1,439 | 0.898<br>0.897 | 0.65<br>0.50 | 0.50<br>0.50 | 0.86<br>0.86 | 291.71<br>271.68 | 1.44         |      | 1        |            | 1,00         |              | 1.00 |                | 0.89         | Infin.           | 0,000 | 0.567<br>0.567 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 34.28          | 305,48           | 2.24         | 0.73         | 110        | 1.443          | 0.896          | 0.74         | 0.50         | 0.86         | 246 11           | 1.53         |      | 1        | 100        | 1.00         |              | 1.00 |                | 0.88         | Infin.           | 0,000 | 0.568          | Non-Liq.                 |                | 0.00         |
| 34.45<br>34.61 | 270.74<br>265.04 | 2.54         | 0.94<br>1.04 | 110        | 1.446          | 0.895          | 0.94         | 0.50         | 0.85         | 217,56           | 1.65         |      | 1        |            | 1.00         |              |      |                | 0.88         | Infin.           | 0.000 | 0.568          | Non-Liq.                 |                | 0.00         |
| 34.78          | 265.84           | 2.71         | 1.02         | 110<br>110 | 1,450<br>1,454 | 0.894          | 1.04<br>1.03 | 0.51<br>0.51 | 0.85<br>0.85 | 211,86<br>212,34 | 1.69<br>1.68 |      | 1        |            | 1.03         |              |      |                | 0.88         | Infin.           | 0,000 | 0.569<br>0.569 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 34.94          | 292.81           | 2.65         | 0.91         | 110        | 1,458          | 0.892          | 0.91         | 0.50         | 0,85         | 234,57           | 1,61         |      | 1        | 100        | 1_00         | 3.20         | 1.00 | 235.4          | 0.88         | Infin            | 0.000 | 0.570          | Non-Liq.                 | Non-Liq        | 0.00         |
| 35.10<br>35.27 | 308.71<br>337.12 | 2.64<br>3.28 | 0.85         | 110<br>110 | 1,462<br>1,466 | 0.890<br>0.889 | 0.86<br>0.98 | 0.50<br>0.50 | 0.85<br>0.85 |                  | 1.58         |      | 1        |            | 1.00         |              | 1.00 |                | 0.88         | Infin.           | 0.000 | 0.570<br>0.570 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 35.43          | 331.83           | 3.25         | 0.98         | 110        | 1.470          | 0.888          | 0.98         | 0.50         | 0.85         |                  | 1.60         |      | 1        |            | 1.00         |              | 100  |                | 0.88         | Infin            | 0,000 | 0.570          | Non-Liq.                 |                | 0.00         |
| 35.60<br>35.76 | 342.49<br>363.18 | 4.15<br>4.86 | 1.21<br>1.34 | 110<br>110 | 1.474<br>1.478 | 0.887<br>0.886 | 1.22<br>1.34 | 0.51<br>0.51 | 0.85<br>0.84 |                  | 1.67<br>1.69 |      | 1        |            | 1.01         |              |      |                | 0.88         | Infin            | 0.000 | 0.571          | Non-Liq.                 |                | 0.00         |
| 35.93          | 393.50           | 4.20         | 1.07         | 110        |                | 0.885          | 1.07         | 0.50         | 0.85         |                  | 1.58         |      | i        |            |              |              | 1.00 |                | 0.87<br>0.87 | Infin.           | 0.000 | 0.572<br>0.572 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 36.09          | 486.11           | 3.26         | 0.67         | 110        |                |                | 0.67         | 0.50         | 0.84         |                  | 1.37         |      | 1        |            |              |              | 1,00 |                | 0.87         | Infin.           | 0,000 | 0.572          | Non-Liq.                 | Non-Liq        | 0.00         |
| 36.25<br>36.42 | 452.81<br>475.07 | 3.01         | 0.66         | 110<br>110 |                |                | 0.67<br>0.64 | 0.50<br>0.50 | 0.84         |                  | 1.39<br>1.36 |      | 1        |            | 1.00         |              | 1.00 |                | 0.87<br>0.87 | Infin.           | 0.000 | 0.573<br>0.573 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 36.58          | 497.46           | 2.63         | 0.53         | 110        | 1,497          | 0.880          | 0.53         | 0.50         | 0.84         |                  | 1.29         |      | i        |            |              |              | 1.00 |                | 0.87         | Infin            | 0.000 | 0.573          | Non-Liq.                 |                | 0.00         |
| 36.75<br>36.91 | 519.74<br>525.93 | 2.73         | 0.52         | 110<br>110 |                |                | 0.53<br>0.51 | 0.50<br>0.50 | 0.84         |                  | 1.27         |      | 1        |            |              |              |      |                | 0.87         | Infin.           | 0,000 | 0.573          | Non-Liq.                 |                | 0.00         |
| 37.07          |                  | 2.96         | 0.53         | 110        |                |                | 0.53         | 0.50         | 0.84         |                  | 1.26         |      | 1        |            |              |              | 1.00 |                | 0.87<br>0.87 | Infin.           | 0.000 | 0.574<br>0.574 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
|                | 576:13           | 3.26         | 0.57         | 110        |                |                | 0.57         | 0.50         | 0.84         |                  | 1.27         |      | 1        |            |              |              |      |                | 0.87         | Infin            | 0.000 | 0.574          | Non-Liq.                 | Non-Liq.       | 0.00         |
|                | 579.03<br>555.02 | 2.97<br>2.54 | 0.51         | 110<br>110 |                |                | 0.51<br>0.46 | 0.50<br>0.50 | 0.84<br>0.83 |                  | 1.23         |      | 1        |            |              |              |      |                | 0.87<br>0.86 | Infin.<br>Infin. | 0.000 | 0.574<br>0.574 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
|                | 538.68           | 2.11         | 0.39         | 110        | 1.525          | 0.871          | 0.39         | 0.50         | 0.83         | 422,95           | 1.17         |      | 1        | 100        | 1.00         | 4.05         | 1.00 | 424.5          | 0.86         | Infin.           | 0.000 | 0.575          | Non-Liq.                 |                | 0.00         |
| 37,89<br>38,06 | 534.75<br>523.23 | 2.52<br>3.08 | 0.47         | 110<br>110 |                |                | 0.47<br>0.59 | 0.50<br>0.50 | 0.83         |                  | 1.23<br>1.31 |      |          |            |              | 4.10<br>4.15 |      | 420.9<br>411.3 | 0.86         | Infin.<br>Infin. | 0.000 | 0.575<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 38,22          | 482.86           | 4.31         | 0.89         | 110        |                |                | 0.90         | 0.50         | 0.83         |                  | 1.47         |      |          |            |              |              |      |                | 0.86         | Infin.           | 0.000 | 0.575          | Non-Liq.                 |                | 0.00         |
| 38.39<br>38.55 | 499.56           | 3,91<br>3,38 | 0.78         | 110<br>110 |                |                | 0.78<br>0.67 | 0.50<br>0.50 | 0.83         |                  | 1.42<br>1.36 |      |          |            |              |              |      |                | 0.86         | Infin.           | 0.000 | 0.575          | Non-Liq.                 | Non-Liq        | 0.00         |
|                | 443 92           | 3.01         | 0.68         | 110        |                |                | 0.67         | 0.50         | 0.83         |                  | 1.41         |      |          |            |              |              |      |                | 0.86<br>0.86 | Infin.<br>Infin. | 0.000 | 0.575<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00         |
| 38.88          | 474.86           | 3.10         | 0.65         | 110        | 1.552          | 0.861          | 0.65         | 0.50         | 0.83         | 369.38           | 1.37         |      | 1        | 100        | 1.00         | 4.40         | 1.00 | 370,8          | 0.86         | Infin.           | 0.000 | 0.575          | Non-Liq.                 | Non-Liq        | 0.00         |
|                | 482.80<br>449.71 | 3.73<br>3.94 | 0.77         | 110<br>110 |                |                | 0.77<br>0.88 | 0.50<br>0.50 | 0.82         |                  | 1.43<br>1.49 |      |          |            |              |              |      | 376,5<br>350,2 | 0.86<br>0.86 | Infin.           | 0.000 | 0.575<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 39,37          | 400.90           | 3.48         | 0.87         | 110        | 1.564          | 0.857          | 0.87         | 0.50         | 0.82         | 310.48           | 1.52         |      | 1        | 100        | 1.00         | 4.55         | 1.00 | 311.6          | 0.86         | Infin.           | 0.000 | 0.576          | Non-Liq.                 |                | 0.00         |
|                | 328.20<br>242.12 | 3.74<br>2.76 | 1.14<br>1.14 | 110<br>110 |                |                | 1.15<br>1.15 | 0.51<br>0.54 |              |                  | 1.67<br>1.76 |      |          |            |              |              |      |                | 0.85         | Infin.           | 0.000 | 0.576          | Non-Liq.                 |                | 0.00         |
|                | 241.13           | 3.50         | 1.45         | 110        |                |                | 1.46         |              | 0.80         |                  | 1.84         |      |          |            |              |              |      | 198.8<br>206.7 | 0.85         | Infin.<br>Infin. | 0.000 | 0.576<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
|                | 216.57           | 3.02         | 1.39         | 110        |                | 0.852          | 1.40         | 0.57         |              |                  | 1.86         |      | 1        |            | 1.15         | 4.75         | 1.00 | 187.5          | 0.85         | Infin.           | 0.000 | 0.575          | Non-Liq.                 | Non-Liq.       | 0.00         |
|                | 226.70<br>302.13 | 2.34<br>1.99 | 1.03<br>0.66 | 110<br>110 |                |                | 1.04<br>0.66 | 0.53<br>0.50 |              |                  | 1.75<br>1.52 |      | 1        |            |              | 4.80<br>4.85 |      |                | 0.85<br>0.85 | Infin.           |       | 0.575<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
| 40,52          | 323,21           | 1.80         | 0.56         | 110        | 1.591          | 0.847          | 0.56         | 0.50         | 0,82         | 247.90           | 1.45         |      | 1        | 100        | 1.00         | 4.90         | 1.00 | 248.8          | 0.85         | Infin.           | 0.000 | 0.575          | Non-Liq.                 | Non-Liq.       | 0.00         |
|                | 290,82<br>234,61 | 1.95<br>2.52 | 0.67<br>1.08 | 110<br>110 |                |                | 0.67<br>1.08 |              |              |                  | 1.54<br>1.75 |      |          |            |              | 4.95<br>5.00 |      | 223.5<br>190.3 | 0.85         | Infin:<br>Infin: |       | 0.575          | Non-Liq.                 |                | 0.00         |
| 41.01          | 223,18           | 3.14         | 1.41         | 110        | 1,603          | 0.843          | 1.42         | 0.56         |              |                  | 1.86         |      | í        |            |              | 5.05         |      | 191.2          |              | Infin:           |       | 0.575<br>0.575 | Non-Liq.<br>Non-Liq.     |                | 0.00<br>0.00 |
|                | 246 49<br>236 31 | 3.45         | 1.40         | 110        |                |                | 1.41         |              |              |                  | 1.82         |      |          | 100        | 1.12         | 5.10         | 1.00 | 207.2          | 0.85         | Infin:           | 0.000 | 0.575          | Non-Liq.                 | Non-Liq        | 0.00         |
|                | 209.85           | 3.97<br>2.42 | 1.68<br>1.15 | 110<br>110 |                |                | 1.69<br>1.16 |              |              |                  | 1.90<br>1.81 |      | 1        |            |              | 5.15<br>5.20 |      | 207 6<br>174 5 | 0.85<br>0.84 | Infin.           |       | 0.575<br>0.575 | Non-Liq. ∣<br>Non-Liq. ∣ |                | 0.00<br>0.00 |
| 41.67          | 228.87           | 2.31         | 1.01         | 110        | 1.618          | 0,837          | 1.01         | 0.53         | 0.80         | 171.46           | 1.74         |      | 1        | 99         | 1.07         | 5.25         | 1.00 | 183.4          | 0.84         | Infin.           | 0.000 | 0,574          | Non-Liq.                 | Non-Liq        | 0.00         |
|                | 272.51<br>324.45 | 1.92<br>1.75 | 0.70<br>0.54 | 110<br>110 |                |                | 0.71<br>0.54 |              |              |                  | 1.57<br>1.44 |      |          |            |              | 5.30<br>5.35 |      |                | 0.84<br>0.84 | Infin.           |       | 0.574<br>0.574 | Non-Liq.  <br>Non-Liq.   |                | 0.00<br>0.00 |
| 42.16          | 358.84           | 1.94         | 0.54         | 110        | 1,630          | 0.832          | 0.54         | 0.50         | 0.81         | 272.02           | 1.41         |      | 1        | 100        | 1.00         | 5.40         | 1.00 | 273.0          |              | Infin.           | 0.000 | 0.574          | Non-Liq.                 |                | 0.00         |
|                | 372.30<br>381.00 | 2.11         | 0.57<br>0.52 | 110<br>110 |                |                | 0.57<br>0.53 |              |              |                  | 1.41<br>1.38 |      |          |            |              | 5.45<br>5.50 |      |                | 0.84<br>0.84 |                  |       | 0.574          | Non-Liq.                 |                | 0.00         |
| 42.65          | 390.56           | 2.06         | 0.53         | 110        | 1.642          | 0.827          | 0.53         | 0.50         |              |                  | 1.37         |      |          |            |              | 5.50<br>5.55 |      | 289 3<br>296 2 |              |                  |       | 0.573<br>0.573 | Non-Liq.  <br>Non-Liq.   |                | 0.00<br>0.00 |
| 42 81<br>42 98 | 394.48           | 2.14 2.30    | 0.54         | 110        |                |                |              |              |              |                  | 1.38         |      |          | 100 1      | 1.00         | 5.55         | 1.00 | 298.8          | 0.84         | Infin-           | 0.000 | 0.573          | Non-Liq.                 | Non-Liq.       | 0.00         |
| 72.00          | 001104           | 2.00         | 0.00         | 110        | 1.649 (        | 0.824          | 0.59         | 0.50         | 0.80         | 295.44           | 1.41         |      | 1        | 100 ′      | 1.00         | J. 35 '      | 1.00 | 296.5          | U.04         | Infin.           | 0.000 | 0.573          | Non-Liq.                 | von-Liq        | 0.00         |

| Layer  | Tip    | Friction | Friction | Total   | Eff Stres | s     |      |      |      |          |      | g L  | .iquef_ | Rel_   |                |      |      | Clean |      |         |       | Induced | Liquefac. |          | Volumetric |
|--------|--------|----------|----------|---------|-----------|-------|------|------|------|----------|------|------|---------|--------|----------------|------|------|-------|------|---------|-------|---------|-----------|----------|------------|
| Depth  | Qc     | Fs       | Ratio    | Unit Wt | at Midpt  |       |      |      |      | Correcte | d    | S S  | uscept  | Dens,  |                | Н    |      | Sand  |      |         | EQ    | M=7.5   | Safety    | Probab   | Strain     |
| (feet) | (tsf)  | (tsf)    | %        | (pcf)   | p'o (tsf) | rd    | F    | n    | Cq   | Qc1n     | lc   | ð (( | ) or 1) | Dr (%) | K <sub>c</sub> | (m)  | KH   | Qcin  | Κσ   | CRR75   | CRR   | CSR     | Factor    | PL       | (%)        |
| 43.14  | 388.72 | 2.40     | 0.62     | 110     | 1.653     | 0.823 | 0.62 | 0.50 | 0.80 | 292.66   | 1.43 |      | 1       | 100    | 1,00           | 5,55 | 1,00 | 293.8 | 0.84 | Infin.  | 0.000 | 0,572   | Non-Liq.  | Non-Liq. | 0.00       |
| 43 31  | 387,56 | 2,49     | 0.64     | 110     | 1,657     | 0.821 | 0,65 | 0.50 | 0.80 | 291.43   | 1.44 |      | 1       | 100    | 1.00           | 5.55 | 1.00 | 292.5 | 0.84 | Infin.  | 0,000 | 0.572   | Non-Liq.  | Non-Liq. | 0.00       |
| 43.47  | 388.39 | 2,43     | 0,62     | 110     | 1,661     | 0,820 | 0,63 | 0.50 | 0.80 | 291,71   | 1.43 |      | 1       | 100    | 1.00           | 5.55 | 1.00 | 292.8 | 0.83 | Infin.  | 0.000 | 0,572   | Non-Liq.  | Non-Liq. | 0.00       |
| 43,64  | 394.80 | 2,34     | 0.59     | 110     | 1.665     | 0.818 | 0,60 | 0.50 | 0.80 | 296,20   | 1.41 |      | 1       | 100    | 1.00           | 5,55 | 1.00 | 297.3 | 0.83 | Infin.  | 0.000 | 0.572   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 409.10 | 2,46     | 0,60     | 110     | 1,669     | 0,816 | 0,60 | 0.50 | 0.80 | 306,61   | 1.40 |      | 1       | 100    | 1.00           | 5.55 | 1,00 | 307.8 | 0.83 | Infin.  | 0.000 | 0.571   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 411.66 | 2,41     | 0.59     | 110     | 1,673     | 0,815 | 0.59 | 0.50 | 0.80 | 308 17   | 1_39 |      | 1       | 100    | 1.00           | 5.55 | 1,00 | 309.3 | 0.83 | Infin   | 0,000 | 0,571   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 423.11 | 2.33     | 0,55     | 110     | 1.677     | 0.813 | 0,55 | 0.50 | 0.79 | 316,41   | 1.37 |      | 1       | 100    | 1.00           | 5.55 | 1,00 | 317.6 | 0.83 | Infin.  | 0,000 | 0.571   | Non-Liq.  | Non-Liq  | 0.00       |
| 44.29  | 427.48 | 3.38     | 0.79     | 110     | 1,681     | 0.811 | 0.79 | 0.50 | 0.79 | 319.31   | 1.48 |      | 1       | 100    | 1,00           | 5.55 | 1,00 | 320.5 | 0.83 | Infin.: | 0.000 | 0.570   | Non-Liq.  | Non-Liq. | 0.00       |
| 44.46  | 465.12 | 8.79     | 1,89     | 110     | 1,685     | 0.810 | 1.90 | 0.54 | 0.78 | 341_03   | 1.77 |      | 1       | 100    | 1.08           | 5.55 | 1.00 | 370,8 | 0.83 | Infin.  | 0.000 | 0.570   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 532.93 | 7.53     | 1.41     | 110     | 1,689     | 0.808 | 1.42 | 0.50 | 0.79 | 397.46   | 1,62 |      | 1       | 100    | 1,00           | 5.55 | 1,00 | 399.0 | 0.83 | Infin.  | 0,000 | 0,569   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 591.21 | 6 48     | 1.10     | 110     | 1,692     | 0.807 | 1,10 | 0.50 | 0.79 | 440,56   | 1.51 |      | 1       | 100    | 1,00           | 5.55 | 1.00 | 442.2 | 0.83 | Infin.  | 0.000 | 0.569   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 507,18 | 5.63     | 1.11     | 110     | 1.696     | 0.805 | 1.11 | 0.50 | 0.79 | 377,32   | 1,55 |      | 1       | 100    | 1.00           | 5.55 | 1.00 | 378.7 | 0.83 | Infin.  | 0.000 | 0.569   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 476.27 | 2.22     | 0.47     | 110     | 1,700     | 0.803 | 0.47 | 0.50 | 0.79 | 353,84   | 1,28 |      | 1       | 100    | 1.00           | 5.55 | 1,00 | 355.2 | 0.83 | Infin.  | 0.000 | 0.568   | Non-Liq.  | Non-Liq. | 0.00       |
| 45.28  | 485.36 | 1.77     | 0.36     | 110     | 1,704     | 0.802 | 0.37 | 0.50 | 0.79 | 360,20   | 1.20 |      | 1       | 100    | 1.00           | 5.55 | 1.00 | 361.5 | 0.83 | Infin.  | 0.000 | 0.568   | Non-Liq.  | Non-Liq. | 0.00       |
|        | 498.42 | 2.45     | 0.49     | 110     | 1,708     | 0.800 | 0.49 | 0.50 | 0.79 | 369,50   | 1,28 |      | 1       | 100    | 1.00           | 5.55 | 1.00 | 370.9 | 0.83 | Infin.  | 0.000 | 0.567   | Non-Liq.  | Non-Liq. | 0.00       |
| 45.60  | 485.91 | 5.77     | 1.19     | 110     | 1.712     | 0.798 | 1.19 | 0.50 | 0.79 | 359,78   | 1,59 |      | 4       | 100    | 1.00           | 5.55 | 1.00 | 361_1 | 0.82 | Infin.  | 0.000 | 0.567   | Non-Liq.  | Non-Lig. | 0.00       |
|        | 460.62 | 7.80     | 1.69     | 110     | 1,716     | 0.797 | 1.70 | 0.53 | 0.78 | 336,16   | 1.73 |      | 1       | 100    | 1.06           | 5,55 | 1.00 | 357_1 | 0.82 | Infin.  | 0.000 | 0.567   | Non-Lig.  | Non-Lig  | 0.00       |
| 45_93  | 491.30 | 0.00     | 0.00     | 110     | 1.720     | 0.795 | 0.00 | 0.80 | 0.68 | 313,04   | 2,66 |      | 0       |        | 1.00           |      |      |       | 0.91 |         |       | 0.566   | Non-Lig.  | Non-Lig. | 0.00       |
| 46_10  | 606.17 | 0.00     | 0.00     | 110     | 1.724     | 0.793 | 0.00 | 0.82 | 0.67 | 382,66   | 2.71 |      | 0       |        | 1.00           |      |      |       | 0.91 |         |       | 0.566   | Non-Liq.  | Non-Liq. | 0.00       |
| 46.26  | 616.78 | 0.00     | 0.00     | 110     | 1,728     | 0.792 | 0.00 | 0.82 | 0.67 | 388.36   | 2.72 |      | 0       |        | 1.00           |      |      |       | 0.91 |         |       | 0.565   | Non-Liq.  |          | 0.00       |

| Seismically Induced Settlement of Dry Sand Analysis – Groundwater at 8 feet |  |
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|              |  | Project:<br>Job No:    |              | _          | chool No.      | 8              |              | Me           | thods:       | Liquefac<br>Post-liqu |              | -     |          | _          |              |                    |        | method<br>su & See | •      |                    | & Wride        | )              |                      |          | Total<br>Liquefied   |
|--------------|--|------------------------|--------------|------------|----------------|----------------|--------------|--------------|--------------|-----------------------|--------------|-------|----------|------------|--------------|--------------------|--------|--------------------|--------|--------------------|----------------|----------------|----------------------|----------|----------------------|
|              | 90                                     | Date:<br>unding:       | 8/14/20      | 18         | Plot           | 1              |              |              |              | Dry San               | d Settl      | eme   | nt by Pr | adel, /    | ASCE         | Journa             | of G   | ßGE, Vo            | 124,   | No. 4              |                |                |                      |          | Thickness            |
| EARTH        |  | INFORM                 |              |            | ]              |                |              | Induce       | ed CSF       | (M=7,5):              | = 0.6        | 5*P(  | GA*(po/s | o'o)*rd    | /MSF         |                    |        |                    |        |                    |                |                |                      |          | (feet)<br>0.0        |
|              | Ma                                     | agnitude:              | 6.77         | 7.5        |                |                |              |              |              | and Qc1n              |              |       |          | ,          |              | SF =               | : CRR  | 7.5*Kσ/C           | SR     |                    |                |                |                      | Probab   |                      |
|              |  | PGA, g:                | 0.65         | 0,50       |                |                |              |              |              |                       |              |       |          |            | Us           | se Toki            | imatsu | & Seed             | (0) or | Ishihara           | a &Yosh        | mine (1):      | 0                    | Avg      | Induced              |
|              |  | MSF:                   | 1,30         |            |                | Ur             | nit Weig     | tht of ur    | nsatura      | ited soils:           | 100          | pc    | f        |            |              |                    |        |                    |        |                    | Req            | uired SF:      | 1.50                 | 0%       | Subsidence           |
|              |  | NT, feet:<br>NT, feet: | 20.0<br>8.0  |            |                |                |              |              |              | ited soils:           |              | рс    | F        | A family   | line in      | fa. W              | 20     |                    |        |                    |                | Layers:        | 0.00                 | Max      | (inches)             |
| Layer        | Tip                                    |                        | Friction     | Total      | Eff Stres      |                | Limiting     | IC for       | nquena       | ble soils:            | 2.60         | -     | Liquef,  | Rel.       | ting ic      | for K <sub>H</sub> | 2.0    | Clean              | lvg Si | of Liq             | uefiable       | Layers:        | 0.00                 | 0%       | 0.1                  |
| Depth        | Qc                                     | Fs                     | Ratio        |            | at Midpt       |                |              |              |              | Corrected             | d            | eride | Suscept  |            |              | Н                  |        | Sand               |        |                    | EQ             | M=7.5          | Liquefac.<br>Safety  | Probab.  | Volumetric<br>Strain |
| (feet)       | (tsf)                                  | (tsf)                  | %            | (pcf)      | p'o (tsf)      | rd             | F            | n            | Ca           | Qc1n                  | lc           |       | (0 or 1) |            | Kc           | (m)                | KH     | Qc1n               | Κσ     | CRR <sub>7.5</sub> |                | CSR            | Factor               | Pi       | (%)                  |
| 0.16         | 82,43                                  |                        | 1.22         | 100        | 0.008          | 1,000          | 1.22         | 0.57         | 1,70         | 132,44                | 1.88         | Ť     | 1        | 88         | 1.17         | 0.05               | 1.00   | 154.7              | 1.00   | 0,424              | 0.424          | 0,323          |                      | Non-Liq. | 0.00                 |
| 0.33         | 77.94                                  | 1.37                   | 1.76         | 100        | 0.016          | 1.000          | 1.76         | 0.61         | 1.70         | 125.21                | 2.01         |       | 1        | 86         | 1.31         |                    | 1.00   | 164.0              | 1.00   | Infin              | 0.000          | 0,323          | Non-Liq.             | Non-Liq  | 0.00                 |
| 0.49         | 66.43<br>56.46                         | 1.48                   | 2.23<br>2.35 | 100<br>100 | 0.025<br>0.033 | 1.000          | 2.23<br>2.35 | 0.65<br>0.67 | 1.70<br>1.70 | 106.70<br>90.67       | 2.13         |       | 1        | 80<br>73   | 1.51<br>1.65 |                    | 1.00   |                    | 1.00   | Infin.<br>0.394    | 0.000          | 0.323          |                      | Non-Liq  | 0.00                 |
| 0.82         | 50.54                                  | 1.16                   | 2.30         | 100        | 0.033          | 1.000          | 2.30         | 0.67         | 1.70         | 81.14                 | 2.22         |       | 1        | 68         | 1.72         |                    | 1.00   |                    | 1.00   | 0.334              | 0.334          | 0.323          | Non-Liq.<br>Non-Lig. | Non-Liq. | 0.00<br>0.00         |
| 0.98         | 45,66                                  | 1.04                   | 2.28         | 100        | 0.049          | 1.000          | 2.28         | 0.68         | 1.70         | 73.29                 | 2.25         |       | 1        | 64         | 1.80         |                    | 1.00   | 132.1              | 1.00   | 0,294              | 0,294          | 0.323          | Non-Liq.             |          | 0.00                 |
| 1.15<br>1.31 | 40 24<br>40 24                         | 0.94<br>0.94           | 2,33         | 100<br>100 | 0.057<br>0.066 | 0.999          | 2.33         | 0.70         | 1.70         | 64.57                 | 2.30         |       | 1        | 59         | 1.94         |                    | 1.00   | 125.2              | 1.00   | 0.263              | 0.263          | 0.323          | Non-Liq.             |          | 0.00                 |
| 1.48         | 34.62                                  | 0.81                   | 2.33         | 100        | 0.000          | 0.999          | 2.33         | 0.70<br>0.71 | 1.70         | 64.55<br>55.51        | 2.35         |       | 1        | 59<br>52   | 1.94<br>2.11 |                    | 1.00   | 125.2<br>117.0     | 1.00   | 0.263              | 0.263<br>0.229 | 0.323          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00         |
| 1.64         | 31.09                                  | 0,64                   | 2 05         | 100        | 0.082          | 0.998          | 2.06         | 0.71         | 1.70         | 49,82                 | 2,34         |       | 1        | 48         | 2.10         |                    | 1.00   |                    | 1.00   | 0.186              | 0.186          | 0.323          | Non-Liq.             |          | 0.00                 |
| 1.80         | 30.58                                  | 0.62                   | 2.01         | 100        | 0.090          | 0.998          | 2.02         | 0.71         | 1.70         | 48,99                 | 2,34         |       | 1        | 47         | 2.10         |                    | 1.00   | 102.7              | 1.00   | 0.181              | 0.181          | 0.323          | Non-Liq.             | Non-Liq. | 0.00                 |
| 1.97<br>2.13 | 32 <sub>0</sub> 3<br>31 <sub>0</sub> 2 | 0.75<br>0.74           | 2.33         | 100<br>100 | 0.098<br>0.107 | 0.998<br>0.997 | 2.34<br>2.41 | 0.72<br>0.72 | 1.70         | 51,31<br>49,67        | 2.37         |       | 1        | 49<br>48   | 2.20         |                    | 1.00   |                    | 1.00   | 0.213              | 0.213<br>0.214 | 0,322          | Non-Liq.             |          | 0.00                 |
| 2.30         | 29.95                                  | 0.70                   | 2.34         | 100        | 0.115          | 0.997          | 2.35         | 0.73         | 1.70         | 47 94                 | 2.39         |       | 1        | 46         | 2.29         |                    | 1.00   |                    | 1.00   | 0.203              | 0.203          | 0.322          | Non-Liq.<br>Non-Liq. |          | 0.00                 |
| 2.46         | 29 19                                  | 0,66                   | 2.26         | 100        | 0.123          | 0.996          | 2.27         | 0.73         | 1.70         | 46.70                 | 2.39         |       | 1        | 45         | 2.28         |                    | 1.00   | 106.7              | 1.00   | 0.193              | 0.193          | 0.322          | Non-Liq.             |          | 0.00                 |
| 2.62         | 29.17<br>29.42                         | 0.63                   | 2.17<br>2.12 | 100<br>100 | 0.131<br>0.139 | 0.996          | 2.18<br>2.13 | 0.72         | 1.70         | 46 66                 | 2.38         |       | 1        | 45         | 2.24         |                    | 1.00   |                    | 1.00   | 0.186              | 0.186          | 0.322          | Non-Liq.             |          | 0.00                 |
| 2.75         | 29 77                                  | 0.62                   | 2.08         | 100        | 0.139          | 0.996<br>0.995 | 2.09         | 0.72<br>0.72 | 1.70<br>1.70 | 47.05<br>47.60        | 2.37         |       | 1        | 46<br>46   | 2.20         |                    | 1.00   | 103.6<br>103.3     | 1.00   | 0.183<br>0.182     | 0.183<br>0.182 | 0,322          | Non-Liq.<br>Non-Liq. |          | 0.00                 |
| 3.12         | 29.70                                  | 0.60                   | 2,02         | 100        | 0.156          | 0.995          | 2.03         | 0.71         | 1.70         | 47.47                 | 2.36         |       | 1        | 46         | 2.14         |                    | 1.00   | 101.7              | 1.00   | 0.178              | 0.178          | 0.322          | Non-Liq.             |          | 0.00                 |
| 3.28         | 28.88                                  | 0.57                   | 1.96         | 100        | 0.164          | 0.994          | 1.97         | 0.72         | 1.70         | 46,14                 | 2.36         |       | 1        | 45         | 2.15         |                    | 1,00   | 99.1               | 1.00   | 0,170              | 0.170          | 0.321          | Non-Liq.             | Non-Liq. | 0.00                 |
| 3.44<br>3.61 | 26.80<br>26.96                         | 0.52<br>0.49           | 1.95<br>1.80 | 100<br>100 | 0.172<br>0.180 | 0.994<br>0.994 | 1.96<br>1.81 | 0.72<br>0.72 | 1.70<br>1.70 | 42,79<br>43,03        | 2.38         |       | 1        | 42<br>42   | 2.24         |                    | 1.00   | 95.7<br>92.3       | 1.00   | 0.162<br>0.153     | 0.162<br>0.153 | 0.321          | Non-Liq.             |          | 0.00                 |
| 3.77         | 29.75                                  | 0.49                   | 1.63         | 100        | 0.189          | 0.993          | 1.64         | 0.70         | 1.70         | 47.50                 | 2.30         |       | 1        | 46         | 1.94         |                    | 1.00   | 92.2               | 1.00   | 0.153              | 0.153          | 0.321          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00         |
| 3.94         | 32,57                                  | 0.49                   | 1.50         | 100        | 0.197          | 0.993          | 1.51         | 0.68         | 1.70         | 52.02                 | 2.24         |       | 4        | 50         | 1.78         |                    | 1,00   |                    | 1,00   | 0.154              | 0.154          | 0.321          | Non-Liq.             |          | 0.00                 |
| 4.10<br>4.27 | 34.78<br>36.24                         | 0.51<br>0.53           | 1.46<br>1.47 | 100<br>100 | 0.205<br>0.213 | 0.993          | 1.47         | 0.67         | 1.70         | 55,56                 | 2.21         |       | 4        | 52         | 1.70         |                    | 1.00   |                    | 1.00   | 0.159              | 0.159          | 0.321          | Non-Liq.             |          | 0.00                 |
| 4.43         | 38.86                                  | 0.53                   | 1.47         | 100        | 0.213          | 0.992          | 1.48<br>1.48 | 0.67<br>0.66 | 1.70<br>1.70 | 57.89<br>62.08        | 2.20         |       | 1        | 54<br>57   | 1.67<br>1.62 |                    | 1.00   |                    | 1.00   | 0.164<br>0.174     | 0.164<br>0.174 | 0.321          | Non-Liq.<br>Non-Liq. |          | 0.00                 |
| 4.59         | 44,03                                  | 0.63                   | 1.44         | 100        | 0,230          | 0.991          | 1.45         | 0.65         | 1.70         | 70,38                 | 2.13         |       | 1        | 62         | 1.51         |                    | 1.00   |                    | 1.00   | 0.192              | 0.192          | 0.320          | Non-Liq.             |          | 0.00                 |
| 4.76         | 50.25                                  | 0.69                   | 1,36         | 100        | 0.238          | 0.991          | 1.37         | 0.63         | 1.70         | 80.36                 | 2,07         |       | 1        | 68         | 1.40         |                    | 1.00   |                    | 1.00   | 0.214              | 0.214          | 0.320          | Non-Liq.             |          | 0.00                 |
| 4.92<br>5.09 | 56.32<br>62.37                         | 0.74                   | 1.31         | 100<br>110 | 0 246<br>0 255 | 0.991          | 1.31<br>1.19 | 0.61<br>0.60 | 1.70<br>1.70 | 90.10<br>99.81        | 2.02<br>1.96 |       | 1        | 73<br>77   | 1.33         | 0.55               | 1.00   | 119.7<br>148.2     | 1.00   | 0.240              | 0.240          | 0.320          | Non-Liq.             |          | 0.00                 |
| 5.25         | 67.00                                  | 0.84                   | 1.26         | 110        | 0.264          | 0.990          | 1.26         | 0.59         | 1.70         | 107.23                | 1.95         |       | 1        | 80         | 1.24         | 0.60               | 1.19   |                    | 1.00   | 0.450              | 0.450          | 0.320          | Non-Liq.<br>Non-Liq. |          | 0.00                 |
| 5,41         | 67.37                                  | 0.89                   | 1.32         | 110        | 0.273          | 0.989          | 1.32         | 0.60         | 1.70         | 107.81                | 1,97         |       | 1        | 80         | 1,26         | 0.65               | 1.19   | 160.9              | 1.00   | Infin.             | 0.000          | 0.320          | Non-Liq.             | Non-Liq  | 0.00                 |
| 5.58<br>5.74 | 67.34<br>67.46                         | 0.91                   | 1.35         | 110<br>110 | 0.282<br>0.291 | 0.989          | 1.36<br>1.38 | 0.60         | 1.70         | 107.75                | 1.97         |       | 1        | 80         | 1.27         | 0.70               | 1.19   |                    | 1.00   | Infin              | 0.000          | 0.320          | Non-Liq.             |          | 0.00                 |
| 5.74         | 67.82                                  | 0.93                   | 1.37         | 110        | 0.300          | 0.989          | 1.38         | 0.60<br>0.60 | 1.70<br>1.70 | 107,93<br>108,49      | 1.98<br>1.98 |       | 1        | 80<br>80   | 1.27<br>1.27 | 0.75<br>0.80       | 1.19   |                    | 1.00   | Infin<br>Infin     | 0.000          | 0.320          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00         |
| 6.07         | 65,23                                  | 0.93                   | 1.42         | 110        | 0.309          | 0.988          | 1.42         | 0.61         | 1.70         | 104.32                | 2,00         |       | 1        | 79         | 1.30         | 0.85               | 1.19   |                    | 1.00   | Infin              | 0.000          | 0.319          | Non-Liq.             | •        | 0.00                 |
| 6.23         | 63.78                                  | 0.93                   | 1.46         | 110        | 0.318          | 0.988          | 1.47         | 0.61         | 1.70         | 101.97                | 2.01         |       | 1        | 78         | 1,32         |                    | 1.00   | 134.5              |        | 0.306              | 0.306          | 0.319          | Non-Liq.             | Non-Liq. | 0.00                 |
| 6.40<br>6.56 | 65.72<br>71.05                         | 0.95                   | 1.45<br>1.40 | 110<br>110 | 0.327<br>0.336 | 0.987<br>0.987 | 1.45<br>1.41 | 0.61<br>0.60 | 1.70<br>1.70 | 105.07<br>113.62      | 2,00<br>1,97 |       | 1        | 79<br>82   | 1.30<br>1.26 | 1.00               | 1.00   |                    | 1.00   | 0.319              | 0,319<br>0,357 | 0.319<br>0.319 | Non-Liq.             |          | 0.00                 |
| 6.73         | 77.49                                  | 1.08                   | 1.39         | 110        | 0.345          | 0.986          | 1.40         | 0.59         | 1.70         | 123.96                | 1.94         |       | 1        | 86         | 1.23         |                    | 1.00   |                    | 1.00   |                    | 0.412          | 0.319          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00         |
| 6.89         | 86.69                                  | 1.16                   | 1.34         | 110        | 0.354          | 0.986          | 1.34         | 0.58         | 1.70         | 138.72                | 1.89         |       | 1        | 90         | 1.18         | 1.10               | 1.00   | 164.5              | 1.00   | Infin              | 0.000          | 0.319          | Non-Liq.             |          | 0.00                 |
| 7 05<br>7 22 | 98.48<br>114.53                        | 1.28<br>1.41           | 1.30         | 110<br>110 | 0.363          | 0.986          | 1.31         | 0.56         | 1.70         | 157.65                | 1.85         |       | 1        | 96         | 1.14         |                    | 1.00   |                    | 1.00   | Infin.             | 0,000          | 0.319          | Non-Liq.             |          | 0.00                 |
|              | 122.82                                 | 1.49                   | 1.21         | 110        |                | 0.985          | 1.23         | 0.54<br>0.53 | 1.70<br>1.70 | 183.43<br>196.73      | 1.78<br>1.76 |       | 1        | 100<br>100 | 1.09         | 1.20               | 1.00   |                    | 1.00   | Infin.             | 0.000          | 0.318<br>0.318 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00         |
| 7.55         | 128,68                                 | 1.53                   | 1.19         | 110        | 0.390          | 0.985          | 1.19         | 0.53         | 1.70         | 205.54                | 1.74         |       | 1        | 100        | 1.06         |                    |        | 219.4              | 333    | Infin.             | 0.000          | 0.318          | Non-Liq.             | 500      | 0.00                 |
|              | 128.68                                 | 1.53                   | 1.19         | 110        |                |                | 1:19         | 0.53         | 1.68         | 203,25                | 1:74         |       | 1        | 100        | 1.07         |                    | 1.00   |                    | 1.00   | Infin.             | 0.000          | 0.318          | Non-Liq.             | Non-Lig  | 0.00                 |
|              | 134.06<br>139.69                       | 1.56<br>1.63           | 1.17<br>1.16 | 110<br>110 |                |                | 1.17<br>1.17 | 0.53         | 1.65<br>1.63 |                       | 1.73<br>1.72 |       | 1        | 100<br>100 | 1.06<br>1.05 |                    |        |                    | 1.00   |                    | 0.000          | 0.318          | Non-Liq.             |          | 0.00                 |
| 0.04         | 100.00                                 | 1.00                   | 1410         | 110        | 0,417          | 0.504          | 19017        | 0.52         | 1,05         | 214,20                | 1.14         |       | 1,8      | 100        | 1.05         | 1.45               | 1.00   | 225.9              | 1.00   | Infin.             | 0.000          | 0.318          | Non-Liq.             | NOU-FIG  | 0.00                 |

|              |                 | Project:<br>Job No: |                   | -          | thool No.      | 8              |              | Me   | thods:       | Liquefa<br>Post-liq |                    | -                 | _                  | -        |              |                    |       |                |        |                | & Wride)       | )                    |                      |   | Total<br>Liquefled     |
|--------------|-----------------|---------------------|-------------------|------------|----------------|----------------|--------------|--|--------------|---------------------|--------------------|-------------------|--------------------|----------|--------------|--------------------|-------|----------------|--------|----------------|----------------|----------------------|----------------------|---|------------------------|
| -            | So              | Date:<br>unding:    | 8/14/20<br>CPT-2A |            | Plot           | 2              |              |  |              | Dry Sar             | d Settle           | eme               | nt by Pra          | adel, A  | ASCE.        | Journa             | of G  | ßGE, Vo        | l 124, | No. 4          |                |                      |                      |   | Thickness<br>(feet)    |
| EARTH        | QUAKE           |                     |                   |            |                |                |              |  |              | (M=7.5):            |                    |                   |                    | oʻo)*rd  | MSF          |                    |       |                |        |                |                |                      |                      | CONTRACTOR OF THE PARTY OF THE | 0.0                    |
|              | Ma              | ignitude:           | 6.77              | 7.5        |                |                |              | С  | lean Si      | and Qc1n            | = C <sub>Q</sub> * | K <sub>c</sub> *l | √ <sub>H</sub> *Qc |          |              |                    |       | 7.5*Ko/C       |        |                |                |                      |                      | Probab  |                        |
|              |                 | PGA, g:<br>MSF:     | <b>0.65</b>       | 0.50       |                | l le           | nit \Maic    | abt of u   | nentura      | ted soils:          | 100                | pcf               |                    |          | Us           | e Toki             | matsu | & Seed         | (0) or | Ishihara       |                | mine (1):            | 0                    | Avg   | Induced                |
|              | GV              | VT. feet:           |                   |            | İ              |                |              |  |              | ted soils:          |                    | pci               |                    |          |              |                    |       |                | Win SF | of Lin         |                | uired SF:<br>Layers: | 1.50<br>0.00         | 0%<br>Max   | Subsidence<br>(inches) |
| D            | esign GV        |                     | 8.0               |            |                |                |              | The State of the S |              | ble soils:          |                    | Poi               |                    | Limi     | ting Ic      | for K <sub>H</sub> | 2.0   |                |        |                |                | Layers:              | 0.00                 | 0%  | 0.1                    |
| Layer        | Tip             | Friction            | Friction          | Total      | Eff,Stres      | s              |              |  |              |                     |                    | 9                 | Liquef             | Rel      |              |                    |       | Clean          |        | ^              |                | Induced              | Liquefac.            |   | Volumetric             |
| Depth        | Qc              | Fs                  | Ratio             |            | at Midpt       |                |              |  | 0.20         | Correcte            |                    | -                 | Suscept            |          |              | Н                  |       | Sand           |        |                | EQ             | M=7,5                | Safety               | Probab  | Strain                 |
| (feet)       | (tsf)           | (tsf)               | %                 | (pcf)      | p'o (tsf)      |                | F            | n  | Ca           | Qc1n                | lc                 | ó                 | (0 or 1)           | Dr (%)   | Kc           | (m)                | KH    | Qc1n           |        | CRR75          | CRR            | CSR                  | Factor               | PL  | (%)                    |
| 0.16         | 8.00<br>11.37   | 0.09                | 1.13<br>0.97      | 100<br>100 | 0.008          | 1,000          | 1.13<br>0.97 | 0.81<br>0.76   | 1.70<br>1.70 | 12.84<br>18.24      | 2.68               |                   | 0                  | 6        | 2.85         |                    | 1.00  | 52.1           | 1.00   | 0.093          | 0.093          | 0.323                | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 0.49         | 14.06           | 0.14                | 1.00              | 100        | 0.025          | 1.000          | 1.00         | 0.74   | 1.70         | 22.55               | 2.44               |                   | 1                  | 15       | 2.50         |                    | 1.00  | 56.3           | 1.00   | 0.097          | 0,093          | 0.323                | Non-Lig.             |   | 0.00                   |
| 0,66         | 15,85           | 0.14                | 0.90              | 100        | 0.033          | 1.000          | 0.90         | 0.72   | 1.70         | 25.42               | 2.38               |                   | 1                  | 20       | 2.22         |                    | 1.00  | 56.4           | 1.00   | 0.097          | 0.097          | 0.323                | Non-Liq.             |   | 0.00                   |
| 0.82         | 15,82<br>15,42  | 0.14                | 0.88<br>0.78      | 100<br>100 | 0,041<br>0.049 | 1,000          | 0.89<br>0.79 | 0.72<br>0.72   | 1.70<br>1.70 | 25.35<br>24.70      | 2,37               |                   | 1                  | 20<br>19 | 2.21         |                    | 1.00  | 55.9           | 1.00   | 0.096          | 0.096          | 0.323                | Non-Liq.             |   | 0.00                   |
| 1.15         | 12,24           | 0.12                | 0.78              | 100        | 0.049          | 0.999          | 0.79         | 0.74   | 1.70         | 19.58               | 2,36               |                   | 1                  | 9        | 2.15         |                    | 1.00  | 53.1<br>49.8   | 1.00   | 0.094          | 0.094          | 0.323                | Non-Liq.<br>Non-Liq. |   | 0.00<br>0.00           |
| 1.31         | 12,24           | 0.10                | 0.81              | 100        | 0.066          | 0.999          | 0.81         | 0.74   | 1.70         | 19.56               | 2.45               |                   | 1                  | 9        | 2.55         |                    | 1.00  | 49.8           | 1.00   | 0.092          | 0.092          | 0.323                | Non-Liq.             |   | 0.00                   |
| 1.48<br>1.64 | 10.64<br>11.63  | 0.13                | 1.17<br>1.72      | 100<br>100 | 0.074          | 0.999          | 1.18<br>1.73 | 0.78   | 1.70<br>1.70 | 16.98<br>18.56      | 2,59<br>2,64       |                   | 1                  | 3        | 3,25         |                    | 1,00  | 55.1           | 1.00   | 0.096          | 0,096          | 0.323                | Non-Liq.             |   | 0.00                   |
| 1.80         | 19.13           | 0.20                | 1.72              | 100        | 0.090          | 0.998          | 1.73         | 0.74   | 1.70         | 30.59               | 2.43               |                   | 1                  | 28       | 2.45         |                    | 1.00  | 74.9           | 1.00   | 0.119          | 0.119          | 0.323                | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 1.97         | 35,11           | 0.52                | 1.48              | 100        | 0.098          | 0.998          | 1.48         | 0.67   | 1.70         | 56.26               | 2.21               |                   | 1                  | 53       | 1.70         |                    | 1.00  | 95.4           | 1,00   | 0.161          | 0.161          | 0.322                | Non-Liq.             |   | 0.00                   |
| 2.13         | 43.24           | 0.60                | 1.40              | 100        | 0.107          | 0.997          | 1.40         | 0.65   | 1.70         | 69.31               | 2.13               |                   | 1                  | 62       | 1,50         |                    | 1,00  | 104.3          | 1,00   | 0.185          | 0,185          | 0.322                | Non-Liq.             |   | 0.00                   |
| 2,30         | 43.08<br>41.08  | 0.62                | 1.43<br>1.46      | 100<br>100 | 0.115<br>0.123 | 0,997          | 1.44<br>1.46 | 0.65<br>0.65   | 1.70<br>1.70 | 69.04<br>65.81      | 2.13               |                   | 1                  | 61<br>59 | 1.52<br>1.56 |                    | 1,00  | 105.0<br>102.9 | 1,00   | 0.188<br>0.181 | 0.188<br>0.181 | 0.322                | Non-Liq.<br>Non-Liq. |   | 0.00<br>0.00           |
| 2.62         | 38.58           | 0.56                | 1.46              | 100        | 0.131          | 0.996          | 1.46         | 0.66   | 1.70         | 61.78               | 2.18               |                   | i                  | 57       | 1,61         |                    | 1,00  | 99.6           | 1.00   | 0.172          | 0.172          | 0.322                | Non-Liq.             |   | 0.00                   |
| 2,79         | 35,25           | 0.53                | 1.50              | 100        | 0,139          | 0.996          | 1.50         | 0.67   | 1.70         | 56.42               | 2.21               |                   | 1                  | 53       | 1,70         |                    | 1,00  | 96.1           | 1.00   | 0.163          | 0.163          | 0.322                | Non-Liq.             | Non-Liq.  | 0.00                   |
| 2.95<br>3.12 | 32,60<br>29,61  | 0.49<br>0.45        | 1.50<br>1.52      | 100<br>100 | 0,148<br>0,156 | 0.995<br>0.995 | 1.51<br>1.52 | 0.68<br>0.69   | 1.70<br>1.70 | 52 14<br>47 33      | 2.24               |                   | 1                  | 50<br>46 | 1.78<br>1.88 |                    | 1.00  | 92,6<br>89.0   | 1.00   | 0.154<br>0.146 | 0.154<br>0.146 | 0.322                | Non-Liq.             |   | 0.00                   |
| 3.28         | 26.41           | 0.40                | 1.51              | 100        | 0.164          | 0.994          | 1.52         | 0.70   | 1.70         | 42.17               | 2.32               |                   | 1                  | 41       | 2.01         |                    | 1.00  | 84.6           | 1.00   | 0.136          | 0.136          | 0.322                | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 3.44         | 23.64           | 0.34                | 1.44              | 100        | 0.172          | 0.994          | 1.45         | 0.71   | 1.70         | 37.71               | 2.34               |                   | 1                  | 36       | 2,10         |                    | 1.00  | 79.2           | 1.00   | 0.126          | 0.126          | 0.321                | Non-Liq.             |   | 0.00                   |
| 3.61         | 21.08<br>18.23  | 0.29                | 1.36<br>1.67      | 100<br>100 | 0.180          | 0.994          | 1.37<br>1.69 | 0.72<br>0.75   | 1.70<br>1.70 | 33.58<br>28.99      | 2.37               |                   | 1                  | 32       | 2.20         |                    | 1.00  | 73.8           | 1.00   | 0.117          | 0.117          | 0.321                | Non-Liq.             |   | 0.00                   |
| 3.94         | 15.34           | 0.30                | 1.98              | 100        | 0.197          | 0.993          | 2.00         | 0.78   | 1.70         | 24.33               | 2.58               |                   | 1                  | 25<br>18 | 2.64<br>3.21 |                    | 1.00  | 76.6<br>78.0   | 1.00   | 0.122<br>0.124 |                | 0.321                | Non-Liq.<br>Non-Liq. |   | 0.00<br>0.00           |
| 4.10         | 12,99           | 0.35                | 2.73              | 100        | 0.205          | 0.993          | 2.77         | 0.83   | 1.70         | 20.54               | 2.72               |                   | 0                  |          |              |                    |       | 10.0           | 1.00   | 8              | 20             | 0.321                | Non-Liq.             |   | 0.00                   |
| 4.27         | 11.82           | 0.38                | 3.20<br>3.30      | 100        | 0.213          | 0.992          | 3.26         | 0.85   | 1.70         | 18,65               | 2.80               |                   | 0                  |          |              |                    |       |                | 1.00   |                |                | 0.321                | Non-Liq.             |   | 0.00                   |
| 4.43         | 11.89           | 0.34                | 2.04              | 100<br>100 | 0.221<br>0.230 | 0.992<br>0.991 | 3.37<br>2.08 | 0.86<br>0.81   | 1.70<br>1.70 | 16.26<br>18.74      | 2.86<br>2.68       |                   | 0                  |          |              |                    |       |                | 1.00   |                |                | 0.321<br>0.320       | Non-Liq.<br>Non-Liq. |   | 0.00<br>0.00           |
| 4.76         | 26.79           | 0.25                | 0.93              | 100        | 0.238          | 0.991          | 0.94         | 0.67   | 1.70         | 42.66               | 2.19               |                   | 1                  | 41       | 1,65         |                    | 1.00  | 70.3           | 1.00   | 0.112          | 0,112          | 0.320                | Non-Liq.             |   | 0.00                   |
| 4.92         | 35.67           | 0.30                | 0.84              | 100        | 0.246          | 0.991          | 0.85         | 0.63   | 1,70         | 56.92               | 2,06               |                   | 1                  | 53       | 1.39         |                    | 1.00  |                | 1.00   | 0,126          | 0.126          | 0.320                | Non-Liq.             | Non-Liq.  | 0.00                   |
| 5,09<br>5,25 | 41.25           | 0,36                | 0.88<br>0.92      | 110<br>110 | 0.255<br>0.264 | 0.990          | 0.89         | 0.61<br>0.61   | 1.70<br>1.70 | 65.87<br>70.72      | 2.02               |                   | 1                  | 60<br>62 | 1.33         |                    | 1,00  | 87.7<br>92.7   | 1.00   | 0.143<br>0.154 | 0.143<br>0.154 | 0.320                | Non-Liq.<br>Non-Liq. |   | 0.00<br>0.00           |
| 5.41         | 46.60           | 0.44                | 0.94              | 110        | 0.273          | 0.989          | 0.95         | 0.61   | 1.70         | 74.44               | 2.00               |                   | 1                  | 65       | 1.30         | 1.00               | 1.00  |                | 1.00   | 0.164          | 0.164          | 0.320                | Non-Liq.             |   | 0.00                   |
| 5.58         | 50 22           | 0.47                | 0.93              | 110        | 0.282          | 0.989          | 0.94         | 0.60   | 1.70         | 80 24               | 1.97               |                   | 1                  | 68       | 1,26         | 1.05               | 1.00  | 101.4          | 1.00   | 0.177          | 0.177          | 0.320                | Non-Liq.             | Non-Liq   | 0.00                   |
| 5.74<br>5.91 | 54.67<br>56.65  | 0,47                | 0.87              | 110<br>110 | 0.291<br>0.300 | 0.989          | 0.87<br>0.86 | 0.58<br>0.58   | 1.70<br>1.70 | 87.38<br>90.54      | 1.92<br>1.90       |                   | 1                  | 71<br>73 | 1.21<br>1.19 | 1.10               | 1.00  |                | 1.00   | 0.190          | 0.190          | 0.320                | Non-Liq.             |   | 0.00                   |
| 6.07         | 56.48           | 0.50                | 0.89              | 110        | 0.309          | 0.988          | 0.90         | 0.58   | 1.70         | 90.54               | 1.90               |                   | 1                  | 73<br>73 | 1.19         | 1.15               | 1.00  |                | 1.00   | 0.198          | 0.198<br>0.201 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 6.23         | 58.52           | 0.53                | 0.91              | 110        | 0.318          | 0.988          | 0.92         | 0.58   | 1.70         | 93.52               | 1.91               |                   | 1                  | 74       | 1.20         | 1.25               | 1.00  | 112.4          | 1.00   | 0.212          | 0.212          | 0.319                | Non-Liq.             |   | 0.00                   |
| 6.40<br>6.56 | 61.73<br>65.05  | 0.57<br>0.55        | 0.92<br>0.84      | 110<br>110 | 0.327          | 0.987<br>0.987 | 0.93         | 0.58<br>0.56   | 1.70<br>1.70 | 98.66<br>103.98     | 1.89<br>1.85       |                   | 1                  | 76<br>78 | 1.18         | 1.30               |       |                | 1.00   | 0.230          | 0.230          | 0.319                | Non-Liq.             |   | 0.00                   |
| 6.73         | 67.42           | 0.56                | 0.83              | 110        | 0.336          | 0.986          | 0.83         | 0.56   | 1.70         | 103.98              | 1.85               |                   | 1                  | 78<br>80 | 1,15<br>1,13 | 1,35               | 1.00  | 119,7<br>122,6 | 1.00   | 0.239          | 0.239<br>0.252 | 0.319                | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 6.89         | 72,04           | 0.64                | 0.89              | 110        | 0.354          | 0.986          | 0.89         | 0.56   | 1.70         | 115.18              | 1.83               |                   | 1                  | 83       | 1.13         | 1.45               | 1.00  |                | 1.00   | 0.287          | 0.287          | 0.319                | Non-Liq.             |   | 0.00                   |
| 7.05<br>7.22 | 79.98<br>84.69  | 0.56<br>0.74        | 0.70<br>0.87      | 110        | 0.363          | 0.986          | 0.71         | 0.53   | 1.70         | 127.93              | 1.73               |                   | 1                  | 87       | 1.06         | 1.50               | 1.00  |                | 1.00   | 0.314          | 0.314          | 0.319                | Non-Liq.             |   | 0.00                   |
| 7.38         | 84.27           | 0.74                | 0.87              | 110<br>110 | 0.372<br>0.381 | 0.985          | 0.88<br>0.84 | 0.54<br>0.54   | 1.70<br>1.70 | 135.48<br>134.79    | 1.77<br>1.76       |                   | 1                  | 89<br>89 | 1.09         | 1.55<br>1.60       | 1.00  |                | 1.00   | 0.380          | 0.380          | 0.318                | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| 7.55         | 88.99           | 0.71                | 0.80              | 110        | 0.390          | 0.985          | 0.81         | 0.53   | 1.69         | 141.78              | 1.73               |                   | i                  | 91       |              |                    | 1.00  |                | 1.00   | 0.400          | 0.400          | 0.318                | Non-Liq.             |   | 0.00                   |
| 7.71         | 88.99           | 0.71                | 0.80              | 110        | 0.399          | 0.984          | 0.81         | 0.53   | 1.67         | 140.22              | 1.74               |                   | 1                  | 91       | 1.06         |                    | 1.00  |                | 1.00   | 0,392          | 0.392          | 0.318                | Non-Liq.             | Non-Liq.  | 0.00                   |
| 7.87<br>8.04 | 97 16<br>104 13 | 0.72<br>0.76        | 0.74              | 110<br>110 | 0.408<br>0.417 | 0.984<br>0.984 | 0.74<br>0.73 | 0.52<br>0.51   | 1.63<br>1.61 | 149.46<br>157.45    | 1.69<br>1.67       |                   | 1                  | 94<br>96 |              | 1.75<br>1.80       | 1.00  | 155.1<br>161.0 |        | 0.427<br>Infin | 0.427          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |   | 0.00                   |
| # 0,04       | .0 11 10        | 0,10                | 3.10              | 110        | V-711          | J.507          | 0.75         | 0.01   | 1.01         | 101,40              | 1,07               |                   | 7.                 | 30       | 1,02         | 1,00               | 1,00  | 10 [-0         | 1.00   | unitja         | 0.000          | 0,516                | MOII-FIE             | NON-LIQ   | 0.00                   |

|       |              |                  | -                      | Oxnard<br>301953 | -          | thool No.      | 8              |              | Me           | thods:       | Liquefa          |              |      |         | _          |              |                    |                |                |        |                  | & Wride        | )              |                      |           | Total<br>Liquefled |
|-------|--------------|------------------|------------------------|------------------|------------|----------------|----------------|--------------|--------------|--------------|------------------|--------------|------|---------|------------|--------------|--------------------|----------------|----------------|--------|------------------|----------------|----------------|----------------------|-----------|--------------------|
|       |              | Sou              | Date:<br>unding:       | 8/14/20<br>CBT-3 | 18         | Plot:          | 3              |              |              |              | Dry San          |              |      |         |            | •            |                    |                |                | ,      | ,                |                |                |                      |           | Thickness          |
| E     | ARTH         |                  | INFORM                 |                  |            | 1              |                |              | Induce       | d CSR        | (M=7,5):         | = 0.65       | 5*P( | 3A*(po/ | 'p'o)*rd   | MSF          |                    |                |                |        |                  |                |                |                      |           | (feet)<br>0.0      |
|       |              | Ma               | gnitude:               | 6.77             | 7.5        |                |                |              |              |              | and Qc1n         |              |      |         |            |              | SF =               | CRR            | 7.5*Kσ/C       | SR     |                  |                |                |                      | Probab    | Total              |
|       |              |                  | PGA, g:                |                  | 0.50       |                |                |              |              |              |                  |              |      |         |            | Us           | e Toki             | matsu          | & Seed         | (0) or | Ishihara         | a &Yosh        | mine (1):      | 0                    | Avg       | Induced            |
| -     |              | 01               | MSF:                   | 1.30             |            | -              |                |              |              |              | ited soils:      | 100          | pc   |         |            |              |                    |                |                |        |                  |                | uired SF:      | 1.50                 | 0%        | Subsidence         |
| J     | De           | esign GV         | VT, feet:<br>VT, feet: | 20.0<br>8.0      |            |                |                |              |              |              | ited soils:      | 110          | pc   |         | Limi       | lina le      | for K <sub>H</sub> | 20             |                |        |                  |                | Layers:        | 0.00                 | Max<br>0% | (inches)<br>0.0    |
| T     | ayer         | Tip              | Friction               | Friction         | Total      | Eff_Stres      |                |              |              | are product  |                  |              | Φ    | Liquef  |            |              |                    |                | Clean          | ing o  |                  | womanio        |                | Liquefac.            |           | Volumetric         |
| 10    | epth         | Qc               | Fs                     | Ratio            | Unit Wt.   | at Midpt,      |                |              |              |              | Correcte         | d            |      | Suscep  |            |              | Н                  |                | Sand           |        |                  | EQ             | M=7,5          | Safety               | Probab.   | Strain             |
| penal | feet)        | (tsf)            | (tsf)                  | %                | (pcf)      | p'o (tsf)      | rd             | F            | n            | Cq           | Qc1n             | lc           | ó    | (0 or 1 |            |              | (m)                | K <sub>H</sub> | Qc1n           |        | CRR75            |                | CSR            | Factor               | PL        | (%)                |
| 111   | ) 16<br>) 33 | 61.63<br>79.05   | 0.93                   | 1.50<br>1.94     | 100<br>100 | 0.008          | 1,000          | 1.50<br>1.94 | 0.62<br>0.62 | 1.70<br>1.70 | 99.01<br>126.99  | 2.03         |      | 1       | 76<br>87   | 1.34         |                    | 1.00           | 133.0<br>171.2 | 1.00   | 0.299<br>Infin.  | 0.299          | 0.323          | Non-Liq.<br>Non-Liq. | 1.0       | 0.00<br>0.00       |
|       | .49          | 78.13            | 1.93                   | 2.46             | 100        | 0.025          | 1.000          | 2.46         | 0.64         | 1.70         | 125.50           | 2.12         |      | 1       | 86         | 1.48         |                    | 1.00           | 186.4          | 1.00   | Infin.           | 0.000          | 0.323          | Non-Liq.             |           | 0.00               |
|       | ).66<br>).82 | 68.31<br>54.87   | 1.84                   | 2.70<br>2.77     | 100        | 0.033          | 1.000          | 2.70<br>2.77 | 0.66         | 1.70         | 109.71           | 2.18         |      | 1       | 81         | 1.63         |                    | 1.00           | 178.6          | 1.00   | Infin.           | 0.000          | 0,323          | Non-Liq.             |           | 0.00               |
|       | 98           | 47 14            | 1.21                   | 2.56             | 100        | 0.041          | 1.000          | 2.77         | 0.68         | 1.70<br>1.70 | 88,10<br>75,67   | 2.26         |      | 1       | 72<br>65   | 1.82<br>1.88 |                    | 1.00           | 159.9<br>142.1 | 1.00   | 0.460<br>0.347   | 0 460<br>0 347 | 0.323          | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | 15           | 39.47            | 1.02                   | 2.57             | 100        | 0.057          | 0,999          | 2.58         | 0.71         | 1.70         | 63.33            | 2,33         |      | 1       | 58         | 2.06         |                    | 1.00           |                | 1.00   | 0.287            | 0.287          | 0.323          | Non-Liq.             |           | 0.00               |
|       | .31<br>.48   | 39.47<br>31.24   | 1.02<br>0.82           | 2.57<br>2.63     | 100<br>100 | 0.066<br>0.074 | 0.999          | 2.58<br>2.64 | 0.71<br>0.73 | 1.70<br>1.70 | 63,32<br>50.08   | 2,33         |      | 1       | 58<br>48   | 2.06         |                    | 1.00           |                | 1.00   | 0.287            | 0.287          | 0,323          | Non-Liq.             | Non-Liq.  | 0.00               |
|       | 64           | 24.89            | 0.66                   | 2.65             | 100        | 0.082          | 0.998          | 2.66         | 0.75         | 1.70         | 39.86            | 2.49         |      | 1       | 39         | 2.72         |                    | 1.00           | 118.7<br>108.3 | 1.00   | 0.236<br>0.198   | 0 236<br>0 198 | 0,323<br>0,323 | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | .80          | 19.86            | 0.33                   | 1.65             | 100        | 0.090          | 0.998          | 1.66         | 0.74         | 1.70         | 31,77            | 2.44         |      | 1       | 29         | 2,48         |                    | 1,00           | 78.7           | 1.00   | 0.125            | 0.125          | 0.323          | Non-Liq.             | Non-Liq   | 0.00               |
|       | .97<br>.13   | 20.55            | 0.42                   | 2.06<br>2.29     | 100        | 0.098          | 0.998<br>0.997 | 2.07<br>2.30 | 0.75<br>0.76 | 1.70<br>1.70 | 32,86<br>32,64   | 2.49         |      | 1       | 31<br>30   | 2.70<br>2.85 |                    | 1.00           | 88.6<br>93.0   | 1.00   | 0.145<br>0.155   | 0.145<br>0.155 | 0 322<br>0 322 | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | 30           | 19.65            | 0.48                   | 2.45             | 100        | 0.115          | 0.997          | 2.46         | 0.77         | 1.70         | 31,39            | 2.55         |      | 4       | 29         | 3.02         |                    | 1.00           | 94.8           | 1.00   |                  | 0.159          | 0.322          | Non-Liq.             |           | 0.00               |
|       | .46<br>.62   | 18.16<br>15.20   | 0.52                   | 2.85<br>3.77     | 100        | 0.123          | 0.996          | 2.87         | 0.79         | 1.70         | 28,98            | 2.62         |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.322          | Non-Liq.             |           | 0.00               |
|       | .62<br>.79   | 13.95            | 0.57<br>0.57           | 4.06             | 100        | 0.131          | 0.996<br>0.996 | 3.80<br>4.10 | 0.83         | 1.70<br>1.70 | 24,21<br>22,19   | 2.76<br>2.81 |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.322          | Non-Liq.<br>Non-Liq. |           | 0.00               |
| 2     | .95          | 11.38            | 0.56                   | 4.92             | 100        | 0.148          | 0.995          | 4.99         | 0.89         | 1.70         | 18.05            | 2.93         |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.322          | Non-Liq.             |           | 0.00               |
|       | .12<br>.28   | 12.18<br>12.71   | 0.59                   | 4.85<br>4.68     | 100        | 0.156<br>0.164 | 0.995          | 4.92<br>4.74 | 0.88<br>0.87 | 1.70         | 19.32<br>20.16   | 2.90<br>2.88 |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.322          | Non-Liq.             |           | 0.00               |
|       | 44           | 11.57            | 0.62                   | 5.32             | 100        | 0.172          | 0.994          | 5.40         | 0.89         | 1.70<br>1.70 | 18 31            | 2.95         |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.321          | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | 61           | 11.06            | 0.51                   | 4.57             | 100        | 0.180          | 0.994          | 4.64         | 0.88         | 1.70         | 17,48            | 2,92         |      | 0       |            |              |                    |                |                | 1.00   |                  |                | 0.321          | Non-Liq.             |           | 0.00               |
|       | .77<br>.94   | 20.97<br>29.22   | 0.48<br>0.55           | 2.28<br>1.88     | 100<br>100 | 0.189<br>0.197 | 0.993          | 2.30<br>1.90 | 0.76<br>0.71 | 1,70<br>1,70 | 33,39<br>46,63   | 2,51<br>2,34 |      | 1       | 31<br>45   | 2.81         |                    | 1.00           | 93.8<br>97.6   | 1.00   | 0.157<br>0.166   | 0.157<br>0.166 | 0.321          | Non-Liq.             |           | 0.00               |
| 4     | 10           | 37.87            | 0.68                   | 1.79             | 100        | 0.205          | 0.993          | 1.80         | 0.68         | 1.70         | 60.52            | 2.24         |      | 1       | 56         | 1.77         |                    | 1.00           | 107.4          | 1.00   | 0.105            | 0.195          | 0.321          | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | 27           | 45.79            | 0.82                   | 1.80             | 100        | 0.213          | 0.992          | 1.81         | 0.66         | 1.70         | 73.23            | 2,18         |      | 1       | 64         | 1,62         |                    | 1.00           | 118.8          | 1.00   | 0.236            | 0.236          | 0.321          | Non-Liq.             |           | 0.00               |
|       | 43<br>59     | 52.76<br>58.36   | 0.97<br>1.00           | 1.84<br>1.72     | 100<br>100 | 0.221          | 0,992          | 1.85<br>1.73 | 0.65<br>0.64 | 1.70<br>1.70 | 84,42<br>93,40   | 2.14<br>2.09 |      | 1       | 70<br>74   | 1,54<br>1,44 |                    | 1.00           |                | 1.00   | 0.284            | 0.284<br>0.306 | 0.321<br>0.320 | Non-Liq.             |           | 0.00               |
| 4     | 76           | 62,10            | 1.17                   | 1.89             | 100        | 0.238          | 0.991          | 1.90         | 0.64         | 1.70         | 99.40            | 2.10         |      | 1       | 77         | 1.46         |                    | 1.00           |                | 1.00   | 0.362            | 0.362          | 0.320          | Non-Liq.             |           | 0.00               |
|       | .92<br>.09   | 64.35<br>68.21   | 1.31<br>1.45           | 2.03             | 100<br>110 | 0.246<br>0.255 | 0.991          | 2.04<br>2.14 | 0.64<br>0.64 | 1.70<br>1.70 | 103.00           | 2.11         |      | 1       | 78         | 1,48         |                    | 1.00           |                | 1.00   | 0.408            | 0,408          | 0.320          | Non-Liq.             |           | 0.00               |
|       | 25           | 72.78            | 1.57                   | 2.16             | 110        | 0.264          | 0.990          | 2.17         | 0.64         | 1.70         | 109.19<br>116.52 | 2.11         |      | 1       | 80<br>83   | 1.47<br>1.45 |                    | 1.00           | 160.8<br>168.6 | 1.00   | Infin.<br>Infin. | 0.000          | 0.320          | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       | 41           | 77.81            | 1.63                   | 2.10             | 110        | 0.273          | 0.989          | 2.11         | 0.63         | 1.70         | 124,59           | 2.07         |      | 1       | 86         | 1.40         |                    | 1.00           | 174.2          | 1.00   | Infin.           | 0.000          | 0.320          | Non-Liq.             |           | 0.00               |
|       | 58<br>74     | 85.70<br>100.29  | 1.64<br>1.65           | 1.91<br>1.65     | 110<br>110 | 0.282          | 0.989          | 1.92<br>1.65 | 0.61<br>0.58 | 1.70<br>1.70 | 137.25<br>160.68 | 2,01<br>1,91 |      | 1       | 90<br>97   | 1.31         | 1.00               | 1.00           |                | 1.00   | Infin.<br>Infin. | 0.000          | 0.320          | Non-Liq.             |           | 0.00               |
|       |              | 115.78           | 1.63                   | 1.41             | 110        | 0.300          | 0.988          | 1.41         | 0.55         | 1.70         | 185.55           | 1.82         |      | 1       | 100        | 1.12         |                    | 1.00           |                | 1.00   | Infin.           | 0.000          | 0.320          | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       |              | 127.60           | 1.61                   | 1.26             | 110        |                | 0.988          | 1.27         | 0.54         | 1.70         | 204.53           | 1.76         |      | 1       | 100        | 1.08         |                    | 1.00           |                | 1.00   | Infin.           | 0.000          | 0.319          | Non-Lig.             |           | 0.00               |
|       |              | 135,25<br>142.84 | 1.64<br>1.69           | 1.21<br>1.18     | 110<br>110 |                | 0.988<br>0.987 | 1.22<br>1.19 | 0.53<br>0.52 | 1.70<br>1.70 | 216.81<br>228.99 | 1.73<br>1.71 |      | 1       | 100<br>100 | 1.06<br>1.04 |                    | 1.00           | 230.1<br>239.3 | 1.00   | Infin.<br>Infin. | 0.000          | 0.319<br>0.319 | Non-Liq.<br>Non-Liq. |           | 0.00               |
| 6     | 56           | 144.87           | 1.70                   | 1.18             | 110        | 0.336          | 0.987          | 1.18         | 0.52         | 1.70         | 232 24           | 1.70         |      | 1       | 100        | 1.04         |                    | 1.00           |                | 1.00   | Infin.           | 0.000          | 0.319          | Non-Liq.             |           | 0.00               |
|       |              | 154.10<br>159.66 | 1.74                   | 1.13             | 110        |                | 0.986          | 1.13         | 0.51         | 1.70         | 247.05           | 1.67         |      | 1       | 100        | 1.02         |                    | 1.00           | 251.9          | 1.00   | Infin.           | 0.000          | 0.319          | Non-Liq.             | Non-Liq.  | 0.00               |
|       |              | 165.12           | 1.81<br>1.78           | 1.14<br>1.08     | 110<br>110 |                | 0.986<br>0.986 | 1.14<br>1.08 | 0.51<br>0.50 | 1.70<br>1.70 | 255.97<br>264.73 | 1.66<br>1.63 |      | 1       | 100<br>100 | 1.01         |                    | 1.00           | 259.7<br>265.7 | 1.00   | Infin.<br>Infin. | 0.000          | 0.319<br>0.319 | Non-Liq.<br>Non-Liq. |           | 0.00               |
| 7     | 22           | 169.35           | 1.74                   | 1.02             | 110        | 0,372          | 0.985          | 1.03         | 0.50         | 1.69         | 269.21           | 1.61         |      | 1       | 100        | 1.00         |                    | 1.00           | 270.2          | 1.00   | Infin.           | 0.000          | 0.318          | Non-Liq.             |           | 0.00               |
| II >  |              | 177 82<br>173 84 | 1.68                   | 0.94             | 110        |                | 0.985<br>0.985 | 0.95<br>0.94 | 0.50<br>0.50 | 1.67<br>1.65 | 279.33<br>269.88 | 1.57<br>1.58 |      | 1       | 100        |              |                    | 1.00           | 280.4          |        | Infin.           | 0.000          | 0.318          | Non-Liq.             |           | 0.00               |
|       |              | 173.84           | 1.63                   | 0.94             | 110        |                | 0.984          | 0.94         | 0.50         | 1.63         | 266.80           | 1.59         |      | 1       | 100<br>100 |              |                    | 1.00<br>1.00   | 270.9<br>267.8 | 1.00   | Infin.<br>Infin. | 0.000          | 0.318<br>0.318 | Non-Liq.<br>Non-Liq. |           | 0.00               |
|       |              | 174.47           | 1.63                   | 0.94             | 110        |                | 0.984          | 0.94         | 0.50         | 1.61         | 264,78           | 1.59         |      | 1       | 100        | 1.00         | 1.65               | 1.00           | 265.8          | 1.00   | Infin.           | 0.000          | 0.318          | Non-Liq.             | Non-Liq.  | 0.00               |
| 11 8  | 04           | 179.36           | 1.92                   | 1.07             | 110        | 0.417          | 0.984          | 1.07         | 0.50         | 1.59         | 269,25           | 1.63         |      | 1       | 100        | 1.00         | 1.70               | 1.00           | 270.3          | 1.00   | Infin.           | 0,000          | 0.318          | Non-Liq.             | Non-Liq   | 0.00               |

|                |                  | roject:<br>ob No: |              | _          | chool No.          | 8              |              | Me           | thods:       | Liquefac         |              |      |         |           |              |                    |       |                      |        |                  | 3 Wride           | )              |                      |          | Total<br>Liquefied |
|----------------|------------------|-------------------|--------------|------------|--------------------|----------------|--------------|--------------|--------------|------------------|--------------|------|---------|-----------|--------------|--------------------|-------|----------------------|--------|------------------|-------------------|----------------|----------------------|----------|--------------------|
|                |                  |                   | 8/14/20      |            | . Plot:            | 4              |              |              |              | Dry San          |              |      |         |           | •            |                    |       |                      | ,      | ,                |                   |                |                      |          | Thickness          |
| EARTH          | IQUAKE           |                   |              |            | TIOL.              | 4              |              | Induce       | nd CSE       | R (M=7.5):       | = 0.65       | 5*PG | A*(no/n | o)*rd/    | MSF          |                    |       |                      |        |                  |                   |                |                      |          | (feet)<br>0.0      |
|                |                  | gnitude:          | 6.77         | 7.5        |                    |                |              |              |              | and Qc1n         |              |      |         | , o, iai  | 14101        | SF =               | CRR   | <sub>7.5</sub> *Κσ/C | SR     |                  |                   |                |                      | Probab   | Total              |
|                |                  | PGA, g:           | 0.65         | 0,50       |                    |                |              |              |              |                  | _            | -    |         |           | Us           | e Toki             | matsu | & Seed               | (0) or | Ishihara         | a &Yosh           | mine (1):      | 0                    | Avg      | Induced            |
|                |                  | MSF:              | 1.30         | 1.7        |                    | Ur             | nit Weig     | ght of u     | nsalura      | ated soils:      | 100          | pcf  |         |           |              |                    |       |                      |        |                  |                   | uired SF:      | 1.50                 | 0%       | Subsidence         |
|                | GV               | T, feet:          | 20.0         |            |                    |                | Unit W       | eight of     | satura       | ated soils:      | 110          | pcf  |         |           |              |                    |       |                      | Vin SF | of Liqu          | uefiable          | Layers:        | 0.00                 | Max      | (inches)           |
| fr -           | esign GV         |                   | 8.0          |            |                    |                | Limiting     | g Ic for     | liquefia     | able soils:      | 2.60         |      |         | Limit     | ing Ic       | for K <sub>H</sub> | 2.0   | P                    | vg SF  | of Liqu          | uefiable          | Layers:        | 0.00                 | 0%       | 0.0                |
| Layer          | Tip              |                   | Friction     |            | Eff Stres          | S              |              |              |              |                  |              | 0    | Liquef  | Rel.      |              |                    |       | Clean                |        |                  |                   |                | Liquefac.            |          | Volumetric         |
| Depth          | Qc               | Fs                | Ratio        |            |                    | 227            | 9            |              | •            | Corrected        | -            |      | uscept  |           | 22           | H                  | 221   | Sand                 | الليب  |                  | EQ                | M=7,5          | Safety               | Probab   | Strain             |
| (feet)<br>0.16 | (tsf)<br>92.62   | (tsf)             | 1.20         | (pcf)      | p'o (tsf)<br>0.008 | 1.000          | 1.20         | 0.56         | 1.70         | Qc1n<br>148.81   | 1.84         | 0    | 0 or 1) |           |              | (m)                | KH    | Qc1n                 |        | CRR75            | State of the last | CSR            | Factor               | PL       | (%)                |
| 0.18           | 130.04           | 2.02              | 1.55         | 100        | 0.008              | 1,000          | 1.55         | 0.55         | 1.70         | 208 92           | 1.82         |      | 1       | 93<br>100 | 1.13<br>1.12 | 0.25               | 1.00  | 168.8<br>234.3       | 1.00   | Infin            | 0.000             | 0.323          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00       |
| 0.49           | 152.39           | 3.01              | 1.98         | 100        | 0.025              | 1.000          | 1.98         | 0.57         | 1.70         | 244.82           | 1.86         |      | 1       | 100       | 1.16         | 0.25               | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.323          | Non-Liq.             |          | 0.00               |
| 0.66           | 146.45           | 3.22              | 2.20         | 100        | 0,033              | 1.000          | 2.20         | 0.58         | 1.70         | 235.26           | 1.91         |      | 1       | 100       | 1.20         | 0.25               | 1.00  |                      | 1.00   | Infin.           | 0,000             | 0.323          | Non-Liq.             |          | 0.00               |
| 0.82           | 125.63<br>97.23  | 2.97<br>2.48      | 2.36<br>2.55 | 100<br>100 | 0.041<br>0.049     | 1.000          | 2.36         | 0.60<br>0.63 | 1.70<br>1.70 | 201.80<br>156.15 | 1.97         |      | 1       | 100<br>95 | 1.27         | 0.25               | 1.00  |                      | 1.00   | Infin.           | 0,000             | 0.323          | Non-Liq.             |          | 0.00               |
| 1.15           | 63.94            | 1.59              | 2.49         | 100        | 0,049              | 0.999          | 2.50         | 0.66         | 1.70         | 102.65           | 2.18         |      | 1       | 95<br>78  | 1.61         |                    | 1.00  |                      | 1.00   | Infin.<br>Infin. | 0.000             | 0.323          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00       |
| 1.31           | 63.94            | 1.59              | 2.49         | 100        | 0,066              | 0,999          | 2.50         | 0.66         | 1.70         | 102,63           | 2.18         |      | 1       | 78        | 1.61         |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.323          | Non-Liq.             |          | 0.00               |
| 1.48           | 41.59            | 1.09              | 2.61         | 100        | 0.074              | 0.999          | 2,62         | 0.70         | 1.70         | 66.71            | 2.32         |      | 1       | 60        | 2.02         |                    | 1.00  |                      | 1.00   | 0.308            | 0.308             | 0.323          | Non-Liq.             |          | 0.00               |
| 1.64           | 28.11 20.76      | 0.74              | 2.64<br>2.55 | 100<br>100 | 0.082              | 0.998          | 2.64         | 0.74         | 1.70<br>1.70 | 45.04<br>33.21   | 2.45<br>2.54 |      | 1       | 44<br>31  | 2.52<br>2.98 |                    | 1.00  | 113.6<br>98.9        | 1.00   | 0.216            | 0.216<br>0.170    | 0.323          | Non-Liq.             |          | 0.00<br>0.00       |
| 1.97           | 21.63            | 0.56              | 2.58         | 100        | 0.098              | 0.998          | 2.60         | 0.77         | 1.70         | 34.60            | 2.53         |      | 1       | 33        | 2.92         |                    | 1.00  |                      | 1.00   | 0.176            | 0.176             | 0.323          | Non-Liq.<br>Non-Liq. |          | 0.00               |
| 2.13           | 34.59            | 0.78              | 2.25         | 100        | 0.107              | 0,997          | 2.26         | 0.71         | 1.70         | 55.41            | 2.34         |      | 1       | 52        | 2.07         |                    | 1.00  |                      | 1.00   | 0.220            | 0.220             | 0.322          | Non-Liq.             |          | 0.00               |
| 2,30           | 34.08            | 0.89              | 2.61         | 100        | 0.115              | 0.997          | 2.62         | 0.72         | 1.70         | 54.58            | 2,39         |      | 1       | 52        | 2,25         |                    | 1,00  |                      | 1_00   | 0.253            | 0.253             | 0.322          | Non-Liq.             |          | 0.00               |
| 2,46<br>2,62   | 31.06<br>26.71   | 0.81<br>0.71      | 2.60<br>2.65 | 100<br>100 | 0.123<br>0.131     | 0.996<br>0.996 | 2.61<br>2.67 | 0.73<br>0.75 | 1.70<br>1.70 | 49.71<br>42.71   | 2.41         |      | 1       | 48<br>42  | 2.37         |                    | 1.00  |                      | 1.00   | 0.231            | 0.231             | 0.322          | Non-Liq.             |          | 0.00               |
| 2.79           | 24.66            | 0.64              | 2.61         | 100        | 0.139              | 0.996          | 2.62         | 0.75         | 1.70         | 39.40            | 2.49         |      | 1       | 38        | 2.72         |                    | 1.00  | 107.1                | 1.00   | 0.194            | 0.194             | 0.322          | Non-Liq.<br>Non-Liq. |          | 0.00               |
| 2.95           | 22.66            | 0.59              | 2.60         | 100        | 0.148              | 0.995          | 2.62         | 0.76         | 1.70         | 36.17            | 2.52         |      | 1       | 35        | 2,86         |                    | 1,00  |                      | 1.00   | 0.183            | 0.183             | 0.322          | Non-Liq.             |          | 0.00               |
| 3.12           | 21.79 20.52      | 0.57<br>0.55      | 2.60<br>2.69 | 100<br>100 | 0.156<br>0.164     | 0.995          | 2.62         | 0.77         | 1.70         | 34.76            | 2,53         |      | 1       | 33        | 2,93         |                    | 1.00  |                      | 1,00   | 0.178            | 0.178             | 0.322          | Non-Liq.             |          | 0.00               |
| 3.44           | 18.85            | 0.53              | 2.86         | 100        | 0.164              | 0.994          | 2.72         | 0.78<br>0.79 | 1.70<br>1.70 | 32.71<br>30.01   | 2.56<br>2.61 |      | 0       | 30        | 3,10         |                    | 1.00  | 101.3                | 1.00   | 0.177            | 0,177             | 0.321<br>0.321 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00       |
| 3.61           | 16.96            | 0.52              | 3.05         | 100        | 0.180              | 0.994          | 3.09         | 0.81         | 1.70         | 26.96            | 2.66         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.321          | Non-Liq.             |          | 0.00               |
| 3.77           | 15.22            | 0.50              | 3.30         | 100        | 0.189              | 0.993          | 3.34         | 0.82         | 1.70         | 24.15            | 2.72         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.321          | Non-Liq.             |          | 0.00               |
| 3.94<br>4.10   | 13,60<br>13,10   | 0.54<br>0.56      | 3.97<br>4.31 | 100<br>100 | 0.197<br>0.205     | 0.993          | 4.03<br>4.37 | 0.85<br>0.86 | 1.70         | 21.54<br>20.72   | 2.81<br>2.85 |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.321          | Non-Liq.             |          | 0.00               |
| 4.27           | 13.76            | 0.61              | 4.45         | 100        | 0.203              | 0.993          | 4.52         | 0.86         | 1.70<br>1.70 | 20.72            | 2.84         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0,321<br>0,321 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00       |
| 4.43           | 12.78            | 0.63              | 4.94         | 100        | 0.221              | 0.992          | 5.02         | 0.88         | 1.70         | 20.18            | 2.89         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.321          | Non-Liq.             |          | 0.00               |
| 4.59           | 9.82             | 0.62              | 6.32         | 100        | 0.230              | 0.991          | 6.48         | 0.92         | 1.70         | 15.41            | 3.06         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.320          | Non-Liq.             | Non-Liq. | 0.00               |
| 4.76<br>4.92   | 9.11<br>9.64     | 0.58              | 6.39<br>6.94 | 100<br>100 | 0.238<br>0.246     | 0.991<br>0.991 | 6.56<br>7.12 | 0.93         | 1.70<br>1.70 | 14.26<br>15.09   | 3.08         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.320          | Non-Liq.             |          | 0.00               |
| 5.09           | 11.05            | 0.51              | 4.60         | 110        | 0.255              | 0.990          | 4.71         | 0.89         | 1.70         | 17.35            | 2 93         |      | 0       |           |              |                    |       |                      | 1.00   |                  |                   | 0.320<br>0.320 | Non-Liq.<br>Non-Liq. |          | 0.00               |
| 5.25           | 26.79            | 0.51              | 1.91         | 110        | 0.264              | 0.990          | 1.93         | 0.72         | 1.70         | 42,62            | 2.38         |      | 1       |           | 2,22         |                    | 1.00  | 94.7                 | 1.00   | 0.159            | 0.159             | 0.320          | Non-Liq.             |          | 0.00               |
| 5.41<br>5.58   | 43.87<br>61.57   | 0.61<br>0.87      | 1.40<br>1.42 | 110        | 0.273<br>0.282     | 0.989          | 1.41         | 0.65         | 1.70         | 70.05            | 2.12         |      | 1       |           | 1,50         |                    | 1.00  | 105:1                |        | 0.188            | 0.188             | 0.320          | Non-Liq.             |          | 0.00               |
| 5.74           | 81.48            | 1.27              | 1.42         | 110<br>110 | 0.282              | 0.989          | 1.42<br>1.56 | 0.61<br>0.60 | 1.70<br>1.70 | 98.48<br>130.45  | 2.02<br>1.96 |      | 1       | 76<br>88  | 1.32<br>1.25 | 1.00               | 1.00  |                      | 1.00   | 0 285<br>Infin   | 0.285             | 0.320          | Non-Liq.<br>Non-Liq. |          | 0.00               |
| 5.91           | 104.49           | 1.77              | 1.69         | 110        | 0.300              | 0.988          | 1.70         | 0.58         | 1.70         | 167.41           | 1.91         |      | 1       | 98        | 1.20         | 1.05               | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             |          | 0.00               |
| 6.07           | 121.74           | 2.26              | 1.85         | 110        | 0.309              | 0.988          | 1.86         | 0.58         | 1.70         | 195.12           | 1.90         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             | Non-Liq. | 0.00               |
| 6.23<br>6.40   | 129.40<br>133.71 | 2.54<br>2.63      | 1.96<br>1.97 | 110<br>110 | 0.318              | 0.988          | 1.97<br>1.97 | 0.58<br>0.58 | 1.70<br>1.70 | 207.41<br>214.32 | 1.90         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             |          | 0.00               |
| 6.56           | 136.13           | 2.67              | 1.96         | 110        | 0.336              | 0.987          | 1.97         | 0.58         | 1.70         | 214.32           | 1.90         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin<br>Infin   | 0.000             | 0.319<br>0.319 | Non-Liq.<br>Non-Liq. |          | 0.00               |
| 6.73           | 137.04           | 2.50              | 1.82         | 110        |                    | 0.986          | 1.83         | 0.57         | 1.70         | 219.64           | 1.86         |      | i       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             |          | 0.00               |
| 6.89           | 134.61           | 2.27              | 1.69         | 110        | 0.354              | 0.986          | 1.69         | 0.56         | 1.70         | 215.72           | 1.84         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             | Non-Liq. | 0.00               |
| 7.05<br>7.22   | 133.55<br>130.84 | 2.02              | 1.51<br>1.47 | 110<br>110 |                    | 0.986          | 1.52<br>1.47 | 0.55<br>0.55 | 1.70<br>1.70 | 214.01<br>209.64 | 1.81<br>1.80 |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.319          | Non-Liq.             |          | 0.00               |
| 7.38           | 125.34           | 1.72              | 1.37         | 110        |                    | 0.985          | 1.38         | 0.55         | 1.70         | 209.64           | 1.79         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.<br>Infin. | 0.000             | 0.318<br>0.318 | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00       |
| 7.55           | 121.32           | 1.59              | 1.31         | 110        | 0.390              | 0.985          | 1.32         | 0.54         | 1.70         | 194.31           | 1.79         |      | 1       |           |              |                    | 1.00  | 213.9                |        | Infin            | 0.000             | 0.318          | Non-Liq.             |          | 0.00               |
| 7.71           | 121.32           | 1,59              | 1.31         | 110        |                    | 0.984          | 1.32         | 0.54         | 1.70         | 194.14           | 1.79         |      | 1       |           |              |                    | 1.00  |                      | 1.00   | Infin.           | 0.000             | 0.318          | Non-Liq.             |          | 0.00               |
| 7.87<br>8.04   | 117.69<br>112.60 | 1.47              | 1.25<br>1.22 | 110<br>110 |                    | 0.984          | 1.25<br>1.22 | 0.54<br>0.55 | 1.68<br>1.66 |                  | 1.78<br>1.79 |      | 1       |           |              | 1.20               | 1.00  | 204.2<br>194.4       | 1.00   | infin.<br>Infin. | 0.000             | 0.318          | Non-Liq.             |          | 0.00               |
| 0.04           | . 12.00          | 1.01              | 1.22         | 110        | O 17               | J 504          | 1.22         | 0.55         | 1,00         | 170.00           | 1-19         |      | AC.     | 100       | i + 1U       | 1.20               | 1,00  | 134,4                | 1,00   | uum.             | 0.000             | 0.318          | Non-Liq.             | MOU-FIG  | 0.00               |

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefled Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-5 Plot: 5 (feet) EARTHQUAKE INFORMATION Induced CSR (M=7,5): = 0,65\*PGA\*(po/p'o)\*rd/MSF 0.0 Magnitude: Clean Sand Qc1n = CQ\*Kc\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab Total PGA, g: 0.65 0.50 Use Tokimalsu & Seed (0) or Ishihara & Yoshmine (1): 0 Induced Avg MSF: 1\_30 Unit Weight of unsaturated soils: 100 pcf Required SF: 1.50 0% Subsidence GWT, feet: 20.0 Unit Weight of saturated soils: 110 pcf Min SF of Liquefiable Layers: 0.00 Max (inches) Design GWT, feet Limiting Ic for liquefiable soils: 2.60 8.0 Limiting Ic for K<sub>H</sub>: 2.0 Avg SF of Liquefiable Layers: 0% 0.00 g Liquef. Layer Friction Friction Total Eff.Stress Clean Induced Liquefac. Volumetric Depth Qc Unit Wt. at Midpt. Fs Ratio Suscept Dens Probab. Corrected Н Sand FΩ M=7.5 Safety Strain (feet) (tsf) (tsf) % (pcf) p'o (tsf) rd F Qc1n (0 or 1) Dr (%) Qc1n CRR75 CRR CSR (m) Κσ Factor 0.16 7.20 0.07 0.96 100 0,008 1.000 0.96 0,82 1.70 11.56 2,69 1.00 0.323 Non-Lig. Non-Lig 0.00 0.33 11.97 0.11 0.92 100 0.016 1.000 0.92 0.75 1.70 19.21 2.49 2.70 1.00 51.9 1.00 0.093 0.093 0.323 Non-Liq. Non-Liq 0.00 0.4916.98 0.15 0.86 100 0.025 1.000 0.86 0.71 1.70 27.24 2.08 1.00 56.7 2.34 23 1,00 0.097 0.097 0.323 Non-Liq. Non-Liq. 0.00 0.66 18.41 0.17 0.90 100 0.033 1.000 0.90 0.70 1.70 29.53 2.32 26 2.01 1-00 59.5 1.00 0,100 0,100 0\_323 Non-Liq. Non-Liq. 0.00 0.82 16.13 0.16 1.01 0.041 1.000 100 1.01 1.70 0.73 25.85 2.39 21 2.29 1.00 59.2 1.00 0.099 0.099 0.323 Non-Liq. Non-Liq. 0.00 0.75 0.98 12.95 0.14 1.06 100 0,049 1,000 20,73 1,06 1.70 12 2.71 2,49 1:00 56.1 1.00 0.096 0.096 0.323 Non-Liq. Non-Liq 0.00 3,13 1,15 10.49 0.11 1.05 100 0.057 0.999 1.05 0.78 1.70 16.76 2.57 1.00 52,5 1.00 0.093 0,093 0.323 Non-Liq. Non-Liq. 0.00 1.31 10.49 0.11 1.05 100 0.066 0.999 1.06 0.78 1.70 16,75 2.57 3.13 1.00 52.5 1.00 0.093 0.093 0.323 Non-Liq. Non-Liq. 0.00 1.48 9.50 0.14 1.52 100 0.074 0.999 1.53 0.81 1.70 15.15 2 69 0 1.00 0.323 Non-Liq. Non-Liq. 0.00 1.64 0.21 Non-Liq. Non-Liq. 11.89 1.77 100 0.082 0.998 1.79 0.80 1.70 18.97 264 0 1.00 0.323 0.00 1,80 17.29 0.090 0.33 1.93 100 0.998 1.94 0.77 27.64 2.53 23 2.91 1.00 80.4 1.70 1.00 0.128 0.128 0.323 Non-Liq. Non-Liq. 0.00 1.97 29.55 1.75 100 0.098 0.998 1.76 0.70 1.70 47.32 2.32 46 2.00 1.00 94.8 1.00 0.159 0.159 0.322 Non-Liq. Non-Liq 0.00 29,26 0.52 2.13 1.76 100 0.107 0.997 1.77 0.70 1.70 46.84 2.32 45 2.02 1.00 94.6 1.00 0.159 0.159 0.322 Non-Liq. Non-Liq. 0.00 1.74 2,30 27.77 0.48 100 0.115 0.997 1.75 0.71 1.70 44 44 2.34 43 2.07 1.00 92.1 1.00 0.153 0.153 0.322 Non-Liq. Non-Liq. 0.00 88.8 2.46 25.48 0.44 174 100 0.123 0.996 1.75 0.72 1.70 40.74 2.37 40 2.18 1.00 1.00 0.145 0.145 0.322 Non-Liq. Non-Liq. 0.00 2.62 22.54 0.40 1.76 100 0.131 0.996 1.77 0.73 1.70 36.01 2.41 34 2.36 1.00 85.1 1.00 0.137 0.137 0.322 Non-Liq. Non-Liq. 0.00 2.79 0.37 20,15 1.83 100 0.996 0.139 1.84 0.75 1.70 32 15 2 46 1 30 2.58 1.00 83.0 1.00 0.133 0.133 0.322 Non-Liq. Non-Liq. 0.00 2,95 17.63 0.42 2.37 100 0.148 0.995 2.39 0.78 28.09 1.70 2.58 24 3.19 1.00 89.5 1.00 0.147 0.147 0.322 Non-Liq. Non-Liq. 0.00 3.12 13.94 0.43 3.06 100 0.156 0.995 3.10 0.63 1.70 22.15 0 1.00 0.322 Non-Lig. Non-Lig. 0.00 3.28 11.33 0.42 3 69 100 0,164 0.994 3.74 0.86 1.70 17.94 2.85 1.00 0.321 Non-Liq. Non-Liq. 0.00 3.44 10.79 0.35 3 27 100 0.172 0.994 3.32 0.86 1.70 17.06 2,84 0 1.00 0.321 Non-Liq. Non-Liq. 0.00 3.61 0.32 1.00 19.14 1.69 100 0.180 0.994 1.70 0.75 1.70 30.46 2.46 28 2.57 1.00 78 A 0.125 0.125 0.321 Non-Lig. Non-Lig. 0.00 3.77 0.35 28.87 1.20 0.189 1.21 100 0.993 0.68 1.70 46.09 2.23 45 1.73 1.00 799 1.00 0.127 0.127 0.321 Non-Liq. Non-Liq. 0.00 3,94 37.13 0.44 1.18 100 0.197 0,993 1.19 0.65 1.70 59.34 2.13 55 1.52 1.00 90.2 1.00 0.148 0.148 0.321 Non-Liq. Non-Liq. 0.00 4.10 42.19 0.52 1.24 0.205 0.993 1.25 0.64 1.70 67.46 2.10 60 1.46 1.00 98.5 1.00 0.169 0.169 0.321 Non-Liq. Non-Liq. 0.00 1.43 4 27 42,88 0.62 100 0.213 0,992 1.44 0.65 1.70 68,56 2.14 1.53 1.00 104.7 1.00 0.187 0.187 0.321 Non-Liq. Non-Liq. 0.00 4.43 42.87 0.65 1.51 100 0.221 0.992 1.52 0.65 1.70 68.53 2.15 106.9 61 1.56 1.00 1.00 0.194 0.194 0.321 Non-Liq. Non-Liq. 0.00 4.59 43.05 0.62 1.44 100 0.230 0.991 1.44 0.65 1.70 68.80 2 14 61 1.53 1.00 105.0 1.00 0.188 0.188 0.320 Non-Liq. Non-Liq. 0.00 4.76 0.64 1.58 40.55 100 1.59 0.238 0.991 0.66 1.70 64.77 2.18 59 1.63 1.00 105 4 1.00 0.189 0.189 0.320 Non-Liq. Non-Liq. 0.00 4.92 37.17 0.59 1.58 100 0.246 0.991 1.60 0.67 1.70 59.33 2.21 55 1.70 101.0 1.00 1.00 0.176 0.176 0.320 Non-Liq. Non-Liq. 0.00 5.09 45.41 0.55 1.21 110 0.255 0.990 1.22 0.63 1.70 72.56 2.07 64 1.41 1,00 1.00 0.179 0.320 Non-Lia. Non-Lia. 102.1 0.179 0.00 5 25 49.21 0.55 1.12 110 0.264 0.990 1.13 0.62 78.65 1.33 1.70 2.02 67 1.00 104.9 1.00 0.187 0.187 0.320 Non-Liq. Non-Liq. 0.00 5 41 48 56 0.56 1 16 110 0.273 n gag 1.16 0.62 1.70 77.59 2.04 66 1.35 1.00 104.9 1.00 0.187 0.187 0.320 Non-Liq. Non-Liq. 0.00 5.58 0.59 1.22 48.19 110 0.282 0.989 1 23 0.62 1.70 76.98 2.06 66 1.38 1.00 106.1 1.00 0.191 0.191 0.320 Non-Liq. Non-Liq. 0.00 5.74 48.82 0.59 1.20 110 0.291 0.989 1.21 0.62 1.70 77.98 2.05 67 1.37 1.00 106.5 1.00 0.192 0.192 0.320 Non-Liq. Non-Liq. 0.00 0.58 5.91 49.59 1.17 110 0.300 0.988 1.18 0.62 79.20 2.03 67 1.70 1.35 1.00 106.6 1.00 0.193 0.193 0.319 Non-Liq. Non-Liq. 0.00 6.07 49,01 0.58 0.309 1.19 110 0.988 1.19 0.62 1.70 78.25 2.04 67 1.36 1.00 106.2 0.319 1.00 0.192 0.192 Non-Lia, Non-Lia 0.00 1.19 6.23 48.87 0.58 110 0.318 0.988 1.20 0.62 1.70 78.01 2.04 67 1.36 1.00 106.2 1.00 0.191 0.191 0.319 Non-Lig. Non-Lig. 0.00 6.40 48.92 0.59 1.20 110 0.327 0.987 1.21 0.62 1.70 78.08 2.05 67 1.36 1.00 106.6 0.193 1.00 0.193 0.319 Non-Liq. Non-Liq. 0.00 6.56 50.19 0.62 1.23 110 0.336 0.987 1.24 0.62 1.70 80.11 2.04 68 1.36 1.00 109.1 1.00 0.201 0.201 0.319 Non-Liq. Non-Liq. 0.00 6.73 0.64 54.54 1.17 110 0.345 0.986 1.17 0.61 87.08 0.00 1.70 2.00 71 1.30 1.00 113.3 1.00 0.215 0.215 0.319 Non-Liq. Non-Liq. 60.79 6.89 0.78 1.29 110 0.354 0.986 0.61 97.11 76 1.29 1.70 1.99 1.29 0.90 1.02 128.0 1.00 0.275 0.275 0.319 Non-Liq. Non-Liq. 0.00 7.05 70.21 1.20 0.363 1.71 110 0.986 1.72 0.62 1.70 112 23 2.03 82 1.35 1.00 151.2 1.00 0.401 0.401 0.319 Non-Lig. Non-Lig. 0.00 7.22 86.10 1.28 1.49 110 0.372 0.985 1.49 0.59 137.75 1.70 1.93 90 1.22 1.00 1.00 168.1 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.38112.25 1.15 1.02 110 0.381 0.985 1.02 0.53 1.70 179.75 100 1.06 1.05 1,00 190.8 1.73 1.00 Infin 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.55 1.31 1.00 123.77 1.06 110 0.390 0.985 1.06 0.52 1.68 196.22 1.71 100 1.05 1.10 1.00 206.2 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.71 123.77 1.31 0.399 1.06 110 0.984 1.06 0.52 194.07 1.66 1.72 100 1.05 1.15 1.00 204.3 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.87 137.24 1.24 0.90 110 0.408 0.984 0.90 0.50 208.49 1.61 1.65 100 1.00 1.20 1.00 209.3 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 8.04 143.26 0.82 0.417 0.984 0.82 1.59 214.93 1.61 100 1.00 1.25 1.00 215.7 1.00 Infin. 0.000 0.318 Non-Lig. Non-Lig. 0.00

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-6A Plot: 6 (feet) EARTHQUAKE INFORMATION: Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF 0.0 Magnitude: 6.77 7.5 Clean Sand Qc1n = Cq\*Kc\*KH\*Qc SF = CRR<sub>7.5</sub>\*Ko/CSR Probab Total PGA, a: 0.65 0.50 Use Tokimatsy & Seed (0) or Ishihara & Yoshmine (1): Avg Induced Unit Weight of unsaturated soils: MSF 1.30 Required SF: 1.50 0% Subsidence GWT, feet 20.0 Unit Weight of saturated soils: 110 pcf Min SF of Liquefiable Lavers: 0.00 Max (inches) Design GWT, feet: 8.0 Limiting Ic for liquefiable soils: 2.60 Limiting Ic for K<sub>H</sub> 2.0 Avg SF of Liquefiable Layers: 0.00 0% 0.1 Laver Tip Eriction Eriction Total Eff Stress Liquef. Rel Clear Induced Liquefac. Volumetric Ratio Unit Wt, at Midpt Depth Qc Fs Corrected Suscept Dens, Sand EQ M=7.5 Probab. Safety Strain CRR<sub>7.5</sub> (feet) (tsf) (tsf) p'o (tsf) Qc1n (0 or 1) Dr (%) (pcf) rd (m) Qc1n Κσ CRR CSR Factor 0.16 6.69 0.01 0.21 100 0.008 1.000 0.21 0.76 1 70 10 74 2.50 1,00 1.00 10.7 1.00 0.059 0.059 0.323 Non-Liq. Non-Liq. 0.00 0.04 1.000 0.33 14.12 0.28 100 0.016 0.28 0.67 1.70 22 66 222 15 1.00 1.00 1.00 0.069 0.069 Non-Liq. Non-Liq. 22.7 0.323 0.00 0.49 16.59 0.09 0.55 100 0.025 1.000 0.56 0.69 26.62 1.70 2.26 22 1.83 1.00 48.7 1.00 0.091 0.091 0.323 Non-Liq. Non-Liq. 0.00 0.66 21.13 0.18 0.84 100 0.033 1,000 0.84 0.68 1.70 33.90 2.25 32 1.81 1.00 61.3 1.00 0.101 0.101 0.323 Non-Liq. Non-Liq. 0.00 0.82 29,41 0.29 0.98 100 0.041 1.000 0.98 0.66 1.70 47.19 2.17 46 1.59 75.1 0.119 0.119 1.00 1.00 0.323 Non-Lia, Non-Lia 0.00 0.98 35.60 0.35 0.99 100 0.049 1,000 0.99 0.64 1.70 57.12 2.10 54 1.46 1.00 83.2 1.00 0.134 0.134 0.323 0.00 Non-Lia, Non-Lia 1.15 34.08 0.35 1.03 100 0.057 0.999 1.03 0.65 1.70 54 67 2.13 52 1.51 Non-Liq. Non-Liq. 1.00 82.4 1.00 0.132 0.132 0.323 0.00 1.31 34.08 0.35 Non-Liq. Non-Liq. 1.03 100 0.066 0.999 1.03 0.65 1.70 54.65 2 13 52 1.51 1.00 823 1.00 0.132 0.132 0.323 0.00 1.48 30.11 0.33 1.11 100 0.074 0.999 1.11 0.66 1.70 48.26 2.19 1 47 1 64 1 00 792 1.00 0.126 0.126 0.323 Non-Liq. Non-Liq. 0.00 1.64 28.15 0.27 0.96 100 0.082 0.998 0.96 0.66 1.70 45.10 2.18 44 1 62 1.00 728 1.00 0.116 0.116 0.323 Non-Lig. Non-Lig. 0.00 1,80 29.07 0.35 1.20 100 0.090 0.998 1.20 0.67 1.70 46.56 2.22 45 1.72 1.00 1.00 Non-Liq. Non-Liq. 80.2 0.128 0.128 0.323 0.00 1.97 26.19 0.39 1.47 100 0.098 0.998 1.48 0.70 1.70 Non-Liq. Non-Liq. 41.92 2.31 1.99 1:00 83.3 1.00 0.134 0.134 0.322 0.00 2.13 20.41 0.42 2.07 100 0.107 0.997 2.08 0.75 1.70 32.62 2.49 30 2.71 1.00 88,5 1.00 0.145 0.145 0.322 Non-Liq. Non-Liq. 0.00 15.45 2.30 0.44 2.83 100 0.115 0.997 2.85 0.81 170 24 64 2.67 0 1.00 0,322 Non-Liq. Non-Liq. 0.00 2,46 12.62 0.37 2.95 100 0.123 0.996 2.98 0.83 1.70 20.08 2.75 0 1.00 0.322 Non-Liq. Non-Liq. 0.00 2,62 13.50 0.27 2.01 100 0.131 0.996 2.03 0.80 1.70 21.48 2.63 0 1.00 0.322 Non-Liq. Non-Liq. 0.00 2,79 20.18 0.31 1.56 100 0.139 0.996 1.57 0.73 1.70 32.20 2.42 2,39 1.00 77.0 30 0.123 0.123 Non-Lig. Non-Lig. 1,00 0.322 0.00 2.95 25.28 0.31 1.23 100 0.148 0,995 1.23 0.69 1.70 40.38 2.28 1.88 1.00 76.0 1,00 0,121 0.322 Non-Liq. Non-Liq. 0.121 0.00 3.12 31.76 0.36 1 12 100 0.156 0.995 1.13 0.66 1.70 50.78 2,17 1.00 49 1,61 81.6 1.00 0.131 0.131 0.322 Non-Liq. Non-Liq. 0.00 35.56 0.38 3.28 1.08 100 0.164 0.994 1.08 0.65 1.70 56.87 2.13 53 1,50 1.00 85.5 1,00 0.138 0.138 0.321 Non-Liq. Non-Liq. 0.00 3.44 40.16 0.39 0.98 100 0.172 0.994 0.98 0.63 1.70 64.25 2.06 58 1.38 1.00 88.8 1.00 0.145 0.145 0.321 Non-Liq. Non-Liq. 0.00 3.61 45.45 0.46 1.00 100 0.180 0,994 1.01 0.61 1.70 72.74 2.02 64 1.33 1.00 96.5 1.00 0.164 0.164 0.321 Non-Liq. Non-Liq 0.00 3.77 52.79 0.51 0.96 100 0.189 0.993 0.97 0.60 1.70 84.52 1.96 70 1.25 0.65 1.12 118.5 1.00 0.235 0.235 0.321 Non-Liq. Non-Liq 0.00 3.94 58.72 0.56 0.95 100 0.197 0.993 0.95 0.58 1.70 94.04 1.92 74 1,20 0.70 1.12 127.1 1.00 0.271 0.271 0.321 Non-Lig. Non-Lig. 0.00 4.10 64 33 0.60 0.94 100 0.205 0.993 0.94 0.57 1.70 103.04 1.88 78 1,17 0.75 1.12 135.7 1.00 0.313 0.313 0.321 Non-Liq. Non-Liq. 0.00 4.27 69.66 0.83 1.19 100 0.213 0.992 1.19 0.59 1.70 111 59 1 92 81 1.21 0.80 1.12 151.9 1.00 0.406 0.406 0.321 Non-Liq. Non-Liq. 0.00 1.71 0.221 4.43 74.65 1.28 100 0.992 1.72 0.61 1.70 119.59 2.01 84 1 32 1 00 157 6 1.00 0 444 0.444 0.321 Non-Liq. Non-Liq. 0.00 4.59 78.74 2.11 2.68 100 0.230 0.991 2.69 0.65 1.70 126.15 86 1.54 0.000 2.14 1.00 194.3 1.00 Infin. 0.320 Non-Liq. Non-Liq. 0.00 4.76 95.41 2.01 2.11 100 0.238 0.991 2.12 0.61 1.70 152.92 2.01 94 1.31 1.00 200.9 0.000 0.320 1.00 Infin. Non-Lig. Non-Lig. 0.00 4.92 0.58 90.35 1.38 1.53 100 0:246 0.991 1.53 1.70 144,78 1.21 1.00 1.00 175.8 1.00 Infin. 0.000 0.320 Non-Liq. Non-Liq. 0.00 5.09 73.79 0.57 0.78 110 0.255 0.990 0.78 0.54 1.70 118.16 1.79 1.10 1.05 130.1 84 1.00 1.00 0.285 0.285 0.320 Non-Liq. Non-Liq. 0.00 5.25 64.99 0.41 0.63 110 0.264 0.990 0.63 0.541.70 104.00 1.78 78 1.09 1.10 1.00 113.7 1.00 0.217 0.217 0.320 Non-Liq. Non-Liq. 0.00 5,41 60.11 0.48 0.80 110 0.273 0.989 0.81 0.57 1.70 96.15 1.87 75 1.16 1.15 1.00 111.7 1.00 0.210 0.210 0.320 Non-Liq. Non-Liq. 0.00 5.58 57,62 0.71 1.23 110 0.282 0.989 1.24 0.61 1,70 92,13 2.00 73 1.30 1.20 1.00 120.0 1.00 0.241 0.241 0.320 Non-Liq. Non-Liq. 0.00 5.74 60.32 0.70 1.16 110 0.291 0.989 1.16 0.60 1.70 96.45 1.97 75 1,26 1.25 1.00 121.7 1.00 0.248 0.248 0.320 Non-Lig. Non-Lig. 0.00 5.91 59.79 0.67 1.11 110 0.300 0.988 1.12 0.60 1.70 95.59 1.96 75 1.25 1.30 1,00 119.7 1.00 0.239 0.239 0.319 Non-Liq. Non-Liq. 0.00 6.07 56.99 0.42 0.74 110 0.309 0.988 0.75 0.57 1.70 91.07 1.86 73 1.16 1.35 1.00 105.8 1.00 0.190 0.190 0.319 Non-Liq. Non-Liq. 0.00 6.23 64.88 0.50 0.77 110 0.318 0.988 0.77 0.56 1.70 103.74 1.83 78 1.13 1.40 1.00 117.4 1.00 0.231 0.231 0.319 Non-Liq. Non-Liq. 0.00 6.40 81,28 0.52 0.64 110 0.327 0.987 0.64 0.52 130.08 1.70 1.70 88 1.04 1.45 1.00 135.6 1.00 0.312 0.312 0.319 Non-Liq. Non-Liq. 0.00 6.56 88.72 0.58 0.65 110 0.336 0.987 0.66 0.51 1.70 142.02 1.68 91 1.02 1.50 1.00 145.7 1.00 0.368 0.368 0.319 Non-Lig. Non-Lig. 0.00 90.02 0.70 6.73 0.78 110 0.345 0.986 0.78 0.52 1.70 144.09 1.72 92 1.05 1.55 1.00 151.9 0.406 0.406 0.319 Non-Lia. Non-Lia. 1.00 0.00 6.89 95.98 0.75 0.78 110 0.354 0.986 0.79 0.52 1.70 153.65 1.70 1.04 1.60 1.00 160.1 1.00 0.000 0.319 Non-Liq. Non-Liq. Infin. 0.00 7.05 106.17 0.82 0.77 110 0.363 0.986 0.77 0.51 1.70 170.01 1 66 99 1.01 1.65 1.00 172.8 1.00 Infin. 0.000 0.319 Non-Liq. Non-Liq. 0.00 7.22 120.42 0.87 0.72 110 0.372 0.985 0.72 0.50 1 69 191 26 161 100 1.00 1.70 1.00 192.0 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.38 147.55 0.97 0.66 0.381 0.985 0.66 0.50 231 68 110 1.67 1.52 100 1.00 1.75 1.00 232.5 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.55 167-64 1.10 0.66 110 0.390 0.985 0.66 0.50 1.65 260.23 1.48 100 1.00 1.80 261.2 1.00 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 167.64 1.10 0.66 7.71 110 0.399 0.984 0.66 0.50 1.63 257.26 1.48 100 1.00 1.85 1.00 258.2 0.000 1.00 Infin. 0.318 0.00 Non-Lig. Non-Lig. 0.984 7.87 175.94 1.23 0.70 110 0.408 0.70 0.50 1.61 267.01 1.49 100 1.00 1.90 1.00 268.0 1.00 Infin. 0.000 0.318 Non-Lia. Non-Lia. 0.00 1.59 8.04 183 17 1 23 0.67 110 0.417 0.984 0.67 0.50 274.98 1.47 100 1.00 1.95 1.00 276.0 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00

Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

Project: Oxnard High School No. 8 Methods: Liquefaction Analysis using 1998 NCEER workshop methods (Robertson & Wride) Total Job No: 301953-001 Post-liquefaction Settlement Analysis from Tokimatsu & Seed (1987) Liquefied Date: 8/14/2018 Dry Sand Settlement by Pradel, ASCE Journal of G&GE, Vol 124, No. 4 Thickness Sounding: CPT-7 Plot: 7 (feet) EARTHQUAKE INFORMATION: Induced CSR (M=7.5): = 0.65\*PGA\*(po/p'o)\*rd/MSF 0.0 SF = CRR<sub>7.5</sub>\*K<sub>0</sub>/CSR Magnitude: 7.5 Clean Sand Qc1n = Cq\*Kc\*KH\*Qc 6.77 Probab Total PGA. a: 0.50 0.65 Use Tokimatsu & Seed (0) or Ishihara & Yoshmine (1): n Induced Avg MSF 1.30 Unit Weight of unsaturated soils: 100 pcf Required SF: 1.50 0% Subsidence GWT, feet: 20.0 Unit Weight of saturated soils: 110 pcf Min SF of Liquefiable Layers: 0.00 Max (inches) Design GWT, feet: 8.0 Limiting Ic for liquefiable soils: 2.60 Limiting Ic for K<sub>H</sub>: 2.0 Avg SF of Liquefiable Layers: 0.00 0% 0.2 Layer Tip Friction Friction Total Eff.Stress Liquef. Rel. Clear Induced Liquefac. Volumetric Depth Qc Ratio Unit Wt. at Midpt Suscept Dens. Corrected Sand EQ M=7.5 Safety Strain Probab (feet) (tsf) (tsf) p'o (lsf) CRR<sub>2</sub> (pcf) rd Qc1n lc (0 or 1) Dr (%) (m) Qc1n Κσ CRR CSR Factor 11.75 2.74 0.16 7.32 0.09 1 28 100 0.008 1,000 1,29 0.83 1.70 1,00 0.323 Non-Liq. Non-Liq. 0.00 12.26 0.33 0.12 1.00 100 0.016 1.000 1.00 0.76 1.70 19.67 2.50 2.75 1:00 54.0 1.00 0.095 0.095 0.323 Non-Liq. Non-Liq. 0.00 0.49 0.15 1.02 14.26 100 0.025 1.000 57.1 1.03 0.74 1.70 22.87 2.44 16 2.50 1.00 1.00 0.097 0.097 0.323 Non-Liq. Non-Liq. 0.00 0.66 13.52 0.15 1.09 100 0.033 1.000 0.75 1,10 1.70 21.67 2,48 2.66 1.00 13 57.7 1:00 0.098 0.098 0.323 Non-Liq. Non-Liq. 0.00 0.82 11.35 0.14 1.22 100 0.041 1,000 1,22 0.78 1.70 18.17 2.57 6 3.14 57.0 1.00 1.00 0.097 0.097 0.323 Non-Lig. Non-Lig. 0.00 0.98 9.04 0.12 0.049 0 1.33 100 1.000 1,33 0.81 1.70 14.45 2.67 Non-Liq. Non-Liq. 1.00 0.323 0.00 11,36 1.15 7.13 0.08 1.07 100 0.057 0.999 1.07 0.82 1.70 0 2.72 1,00 0.323 Non-Liq. Non-Liq. 0.00 1.31 7.13 0.08 1.07 100 0.066 0.999 1.08 0.82 1.70 11.35 2.72 0 0.323 Non-Liq. Non-Liq. 1,00 0.00 1.48 6.14 0.08 1.27 100 0.074 0.999 1.29 0.85 1.70 9.75 2.81 0 1.00 0.323 Non-Liq. Non-Liq. 0.00 1.64 2.01 0.082 0.14 100 0.998 2.04 0.87 1.70 10.71 2.88 0 1.00 0.323 Non-Liq. Non-Liq. 0.00 1.80 12.03 0.25 2.04 100 0.090 0.998 2.05 0.81 1.70 19.18 0 2.67 1.00 0.323 Non-Lig. Non-Lig. 0.00 1.97 26.83 0.46 0.098 0.998 1.71 100 1.72 0.71 1.70 42.95 2.34 42 2.10 1.00 90.0 1,00 0.148 0.148 0.322 Non-Lig. Non-Lig. 0.00 2.13 27.70 0.58 2 10 100 0.107 0.997 0.72 1.70 44.34 2.39 2.27 2.11 43 1.00 100.6 1.00 0.175 0.175 0.322 Non-Liq. Non-Liq. 0.00 30.71 1.00 2.30 0.62 2 02 100 0.115 0.997 2.02 0.71 1.70 49 16 2 34 47 2.10 103.0 1.00 0.182 Non-Liq. Non-Liq. 0.182 0.322 0,00 2.46 35.14 0.59 1.69 100 0.123 0.996 1.70 0.68 1.70 56.27 2.25 53 1.80 1.00 101 0 1.00 0.176 0.176 0.322 Non-Liq. Non-Liq. 0.00 2,62 34.66 0.52 1.49 100 0.131 0,996 1.49 0.67 1.70 55.48 52 2.22 1.71 1.00 95.1 1.00 0.160 0.160 0.322 Non-Liq. Non-Liq. 0.00 2.79 30.29 0.43 1.42 100 0.139 0.996 1.43 0.68 1.70 48.45 2.25 47 1.81 1.00 87.5 1.00 0.142 0.142 0.322 Non-Lig. Non-Lig. 0.00 2.95 25.72 0.37 1.42 0.148 0.995 1.43 0.70 0.130 0.130 100 1.70 41.09 2.31 40 1.98 1.00 81.4 1.00 0.322 Non-Liq. Non-Liq. 0.00 3.12 22.47 0.33 1 49 100 0.156 0.995 1.50 0.72 1:70 35.85 2.37 34 2.19 1.00 78.6 1.00 0.125 0.125 0.322 Non-Liq. Non-Liq. 0.00 20.80 Non-Liq. Non-Liq. 3.28 0.31 1 47 100 0.164 0.994 1.48 0.73 1.70 33.16 2.39 31 2.29 1,00 76.0 1:00 0.121 0,121 0.321 3.44 20.45 0.30 1.47 100 0.172 0.994 1.48 0.73 1.70 32.58 2.40 30 2.31 1:00 75.4 1:00 0.120 0.120 0:321 Non-Liq. Non-Liq. 0.00 3,61 20.73 0.30 1 45 100 0.180 0.994 1.46 0.73 1.70 33.02 2.39 31 2.29 1.00 75.5 1.00 0.120 0.120 0.321 Non-Liq. Non-Liq. 0.00 3,77 0.31 19,90 1.58 100 0.189 0.993 1.59 0.74 1.70 31.67 2.43 29 77.1 2.44 1.00 1.00 0.123 0.123 0.321 Non-Liq. Non-Liq. 0.00 3,94 17.21 0.35 2.05 100 0.993 2.07 82.8 0.197 0.77 1.70 27.34 2,55 3.03 1.00 1,00 0,133 0.321 0.133 Non-Lia, Non-Lia 0.00 4.10 11.84 0.37 3 08 100 0.205 0.993 3.14 0.84 1.70 18.70 2.79 0 1.00 0.321 Non-Lig. Non-Lig. 0.00 4.27 7.47 0.32 4 24 100 0.213 0.992 4.37 0.92 1.70 11.66 3.04 0 1.00 0.321 Non-Liq. Non-Liq. 0.00 4,43 7.87 0.27 3.41 100 0.221 0.992 3.50 0.90 1.70 12.29 2.96 0 1.00 0.321 Non-Liq. Non-Liq. 0.00 4.59 13.03 0.25 1.89 0.230 0,991 0.80 100 1.92 1.70 20.57 2.63 0 1.00 0.320 Non-Liq. Non-Liq. 0.00 17.56 0.20 4.76 1.13 100 0.238 0.991 1.15 0.73 1.70 27.83 2.40 24 2,30 1.00 63.9 0.104 0.104 Non-Liq. Non-Liq. 1.00 0.320 0.00 4 92 25.00 0.25 0.99 0.246 1\_00 0.68 100 0.991 1.70 39.77 2.23 39 1.75 1.00 69.6 1.00 0.111 0.111 0.320 Non-Liq. Non-Liq. 0.00 5.09 28.21 0.27 0.97 110 0.255 0.990 0.98 0.66 170 44.92 2.18 44 1,63 1.00 73.1 1.00 0.116 0.320 Non-Liq. Non-Liq. 0.00 0.122 0.122 5.25 26.74 0.32 1.19 110 0.264 0.990 1.20 0.68 1.70 42.54 2 25 41 1,81 1.00 76.9 1.00 0.320 Non-Liq. Non-Liq. 0.00 5.41 27.54 0.33 1.20 110 0.273 0.989 1 21 0.68 1.70 43.81 2 25 43 1.78 1.00 78 2 1.00 0 124 0.124 0.320 Non-Liq. Non-Liq. 0.00 5.58 30.42 0.33 1.08 0.989 110 0,282 1.09 0.66 48.43 47 1.70 2.18 1.63 1.00 78.9 1.00 0.126 0.126 0.320 Non-Liq. Non-Liq 0.00 5.74 35.07 0.33 0.95 110 0,291 0.989 0.96 0.64 1.70 55.88 2.10 53 1.45 1.00 1.00 81.3 0.130 0.130 0.320 Non-Lia, Non-Lia 0.00 5.91 42.76 0.43 0.99 110 0,300 0.988 1.00 0.62 1.70 68.22 2.04 61 1.36 1.00 92.6 1.00 0.154 0.154 0.319 Non-Liq. Non-Liq. 0.00 6.07 59.96 0.60 1 00 110 0.309 0.988 1.01 0.59 1.70 95.85 1.93 75 1.21 1.00 1.00 116.9 1.00 0.229 0.229 0.319 Non-Liq. Non-Liq. 0.00 82.48 0.78 6.23 0.94 110 0.318 0.988 0.94 0.55 1.70 132.02 1.80 88 1.11 1.05 1.00 146.9 1.00 0.375 0.375 0.319 Non-Liq. Non-Liq. 0.00 6.40 0.89 0.91 98.15 0.327 0.987 0.91 110 0.53 1.70 157.18 1.74 96 1.06 1.10 1.00 167.6 1.00 Infin. 0.000 0.319 Non-Liq. Non-Liq. 0.00 6.56 106.99 1.01 0.94 110 0.336 0.987 0.95 0.52 1.70 171.37 1.05 1.72 99 1.15 1.00 180.9 1.00 Infin: 0.000 0.319 Non-Liq. Non-Liq. 0.00 112.07 1.09 0.97 6.73 110 0.345 0.986 0.98 0.52 1.70 179,52 100 1.05 1.20 1.00 188.9 1.72 1.00 Infin: 0.000 0.319 Non-Lia, Non-Lia, 0.00 6.89 112.25 1.18 1.05 0.354 0.986 1.05 0.53 1.25 110 1.70 179,79 1.74 100 1.06 1.00 191.9 1.00 0.000 0.319 Infin. Non-Lig. Non-Lig. 0.00 7.05 111.68 1 25 1 12 110 0.363 0.986 1.13 0.54 1.70 178.86 1.08 1.30 1.00 1.76 100 193.7 1.00 Infin. 0.000 0.319 Non-Liq. Non-Liq. 0.00 1.00 7.22 113.57 1.36 1.19 110 0.372 0.985 1.20 0.54 1.70 181.89 1.77 100 1.09 1.35 1.00 198.7 Infin 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.38 110.25 1.39 1.26 0.381 0.985 1.27 110 0.55 176.54 1.70 1.80 100 1.11 1.40 1.00 196.3 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.55 100.97 1.35 1.34 110 0.390 0.985 1.34 0.56 1.70 161.61 1.85 97 1.14 1.45 1.00 185.3 1 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 7.71 100,97 1.35 1.34 110 0.399 0.984 1.34 0.56 1.70 161.60 1.85 97 1.14 185.3 1.50 1.00 1.00 0.000 0.318 Infin. Non-Liq. Non-Liq. 0.00 7.87 95 77 1.34 1.40 110 0.408 0.984 1.40 0.57 1.70 153,23 1.88 1.17 1.00 179.4 1.00 0.000 0.318 Infin. Non-Liq. Non-Liq. 0.00 1.70 8.04 92.93 1.31 1.41 110 0.417 0.984 1.42 0.57 148.65 1.89 93 1.18 1,60 1.00 175.7 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00

| Seismically Induced Settlement of Dry Sand Analysis – Groundwater at 20 feet |
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|                |                  | Project:<br>Job No: |                   | _          | chool No.               | 8              |              | Me           | thods:       | Liquefac         |              |      |                    |            |              |                      |                  |  | •            |                    | & Wride        | )                    |                      |                      | Total<br>Liquefied   |
|----------------|------------------|---------------------|-------------------|------------|-------------------------|----------------|--------------|--------------|--------------|------------------|--------------|------|--------------------|------------|--------------|----------------------|------------------|--|--------------|--------------------|----------------|----------------------|----------------------|----------------------|--|
|                |                  | Date:               | 8/14/20           |            |                         |                |              |              |              | Dry San          |              |      |                    |            | •            |                      |                  |  | •            | ,                  |                |                      |                      |                      | Thickness  |
| EART           | So:<br>HQUAKE    | unding:<br>INFORM   |                   |            | Plot                    | 1              |              | Induce       | d CSR        | k (M=7.5):       | = 0.6        | 5*P  | GA*(no/i           | o'o)*rd    | /MSF         |                      |                  |  |              |                    |                |                      |                      |                      | (feet)<br>0.0  |
|                |                  | gnitude:            | 6.77              | 7.5        |                         |                |              |              |              | and Qc1n         |              |      |                    | 50,10      |              | SF =                 | CRR <sub>7</sub> | , <sub>5</sub> *Κσ/C                     | SR           |                    |                |                      |                      | Probab               | The state of the s |
| 1              |                  | PGA, g:             |                   | 0,50       |                         | 11-            | .::          | .h.t. a.f    |              |                  | 440          |      |                    |            | Ų            | se Tokir             | natsu            | & Seed                                   | (0) or       | Ishihara           |                | mine (1):            | 0                    | Avg                  | Induced  |
|                | GV               | MSF:<br>VT, feet:   | 1.30              |            | 1                       |                | _            |              |              | ited soils:      | 110          | pc   |                    |            |              |                      |                  |  | Min SF       | of Lia             |                | uired SF:<br>Layers: | 1,50<br>0.00         | 0%<br>Max            | Subsidence<br>(inches)   |
| (mm            | Design GV        |                     | 20.0              |            |                         | - 5            |              | - 17         |              | ble soils:       |              | Ľ    |                    |            | ting lo      | for K <sub>H</sub> : | 2.0              | 1  |              |                    |                | Layers:              | 0.00                 | 0%                   | 0.1  |
| Layer          |                  | Friction            | Friction<br>Ratio |            | Eff.Stress<br>at Midpt. | 3              |              |              |              | Corrected        | 4            | ende | Liquef.<br>Suscept |            |              | н                    |                  | Clean                                    |              |                    | EQ             | Induced<br>M=7.5     | Liquefac<br>Safety   | Probab               | Volumetric<br>Strain   |
| (feet)         |                  | (tsf)               | %                 | (pcf)      | p'o (tsf)               | rđ             | F            | n            | Ca           | Qc1n             | lc           |      | (0 or 1)           |            |              | (m)                  | K <sub>H</sub>   | Qc1n                                     | Κσ           | CRR <sub>7.5</sub> |                | CSR                  | Factor               | P <sub>L</sub>       | (%)  |
| 0.16           | 82.43<br>77.94   | 1.01                | 1.22<br>1.76      | 110<br>110 | 0.009                   | 1.000          | 1.22<br>1.76 | 0.57<br>0.61 | 1.70<br>1.70 | 132,43<br>125,21 | 1.88<br>2.01 | T    | 1                  | 88<br>86   | 1.17<br>1.31 | 0.05                 | 1.00<br>1.00     | 154.7<br>164.0                           | 1.00<br>1.00 | 0.424<br>Infin     | 0,424          | 0,323                | •                    | Non-Liq              |  |
| 0.49           | 66,43            | 1,48                | 2,23              | 110        | 0,027                   | 1.000          | 2,23         | 0.65         | 1.70         | 106.70           | 2.13         |      | 1                  | 80         | 1,51         |                      | 1.00             | 161.4                                    |              | Infin.             | 0,000          | 0,323<br>0,323       |                      | Non-Liq<br>Non-Liq   |  |
| 0,66           | 56 46<br>50 54   | 1 33                | 2 35<br>2 30      | 110<br>110 | 0.036<br>0.045          | 1.000          | 2,35         | 0.67<br>0.67 | 1.70<br>1.70 | 90.66<br>81.14   | 2,20         |      | 1                  | 73<br>68   | 1.65<br>1.72 |                      | 1.00             | 150 0<br>139 9                           | 1,00         | 0.394              | 0,394          | 0.323                | -                    | Non-Liq<br>Non-Liq   |  |
| 0.98           | 45,66<br>40,24   | 1.04<br>0.94        | 2.28<br>2.33      | 110<br>110 | 0.054                   | 1,000<br>0,999 | 2,28         | 0,68         | 1.70         | 73.28            | 2,25         |      | 1                  | 64         | 1,80         |                      | 1.00             | 132.1                                    | 1.00         | 0.294              | 0.294          | 0.323                | Non-Liq.             | Non-Liq              | 0.00   |
| 1.31           | 40,24            | 0,94                | 2,33              | 110        | 0.072                   | 0,999          | 2,33         | 0,70<br>0,70 | 1.70<br>1.70 | 64.56<br>64.54   | 2,30<br>2,30 |      | 1                  | 59<br>59   | 1,94<br>1,94 |                      | 1,00             | 125.2<br>125.2                           | 1.00         | 0.263<br>0.263     | 0.263<br>0.263 | 0.323<br>0.323       |                      | Non-Liq.             | 0.00   |
| 1 48           | 34,62<br>31.09   | 0.81<br>0.64        | 2,34              | 110<br>110 | 0,081<br>0,090          | 0,999          | 2,35         | 0,71<br>0,71 | 1.70<br>1.70 | 55.50<br>49.81   | 2,35         |      | 1                  | 52<br>48   | 2.11         |                      | 1.00             | 117 <sub>.</sub> 0<br>104 <sub>.</sub> 5 | 1.00         | 0.229<br>0.186     | 0 229          | 0.323                |                      | Non-Liq.             | 0.00<br>0.00   |
| 1.80           | 30,58            | 0.62                | 2,01              | 110        | 0.099                   | 0,998          | 2.02         | 0,71         | 1.70         | 48,98            | 2,34         |      | 1                  | 47         | 2,10         |                      | 1.00             | 102,7                                    | 1,00         | 0,181              | 0.181          | 0.323                | Non-Liq.             | Non-Liq              | 0.00   |
| 1.97<br>2.13   | 32.03<br>31.02   | 0.75<br>0.74        | 2,33<br>2,40      | 110<br>110 | 0.108<br>0.117          | 0,998<br>0,997 | 2.34<br>2.41 | 0.72<br>0.73 | 1.70<br>1.70 | 51,29<br>49,65   | 2,37         |      | 1                  | 49<br>48   | 2.20         |                      | 1.00             | 112.8<br>112.8                           | 1.00         | 0.213              | 0.213          | 0.322                |                      | Non-Liq.             | 0.00   |
| 2.30           | 29,95<br>29,19   | 0.70<br>0.66        | 2.34<br>2.26      | 110<br>110 | 0.126<br>0.135          | 0,997          | 2,35         | 0.73<br>0.73 | 1,70<br>1,70 | 47.92<br>46.69   | 2.39         |      | 1                  | 46<br>45   | 2.29         |                      | 1.00             | 109.8<br>106.7                           | 1.00         | 0.203              | 0,203          | 0.322                | Non-Liq.             | Non-Liq              | 0.00   |
| 2.62           | 29.17            | 0.63                | 2.17              | 110        | 0,144                   | 0.996          | 2.18         | 0.72         | 1.70         | 46.64            | 2.38         |      | 1                  | 45         | 2.24         |                      | 1.00             | 104.4                                    | 1.00         | 0_193<br>0_186     | 0.193<br>0.186 | 0.322<br>0.322       | Non-Liq.             | Non-Liq.<br>Non-Liq. | 0.00   |
| 2.79<br>2.95   | 29 42<br>29 77   | 0.62<br>0.62        | 2.12              | 110<br>110 | 0,153<br>0,162          | 0.996          | 2.13         | 0.72<br>0.72 | 1.70<br>1.70 | 47.03<br>47.57   | 2.37         |      | 1                  | 46<br>46   | 2.20         |                      | 1.00             | 103.6<br>103.3                           | 1.00         | 0.183<br>0.182     | 0,183          | 0.322                | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00   |
| 3.12<br>3.28   | 29.70<br>28.88   | 0.60<br>0.57        | 2.02<br>1.96      | 110<br>110 | 0.171<br>0.180          | 0.995<br>0.994 | 2,04<br>1,98 | 0.72         | 1_70         | 47_45            | 2,36         |      | 9                  | 46         | 2.14         |                      | 1.00             | 101.7                                    | 1.00         | 0.178              | 0.178          | 0.322                | Non-Liq.             | Non-Liq              | 0.00   |
| 3,44           | 26,80            | 0.52                | 1.95              | 110        | 0.189                   | 0.994          | 1.97         | 0.72<br>0.72 | 1.70<br>1.70 | 46.11<br>42.76   | 2.36<br>2.38 |      | 1                  | 45<br>42   | 2.15<br>2.24 |                      | 1.00             | 99.1<br>95.7                             | 1.00         | 0.170<br>0.162     | 0,170<br>0,162 | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. | Non-Liq              | 0.00<br>0.00   |
| 3,61           | 26.96<br>29.75   | 0.49<br>0.49        | 1.80<br>1.63      | 110<br>110 | 0,198<br>0,208          | 0,994          | 1.81<br>1.65 | 0.72<br>0.70 | 1.70<br>1.70 | 43.00<br>47.47   | 2.36         |      | 1                  | 42<br>46   | 2.15<br>1.94 |                      | 1.00             | 92.3<br>92.2                             | 1.00         | 0.153<br>0.153     | 0,153<br>0,153 | 0,321<br>0,321       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 3.94           | 32,57            | 0.49                | 1,50              | 110        | 0.217                   | 0,993          | 1.51         | 0,68         | 1.70         | 51,99            | 2.24         |      | 1                  | 50         | 1.78         |                      | 1.00             | 92.7                                     | 1.00         | 0.154              | 0,154          | 0.321                | Non-Liq.             | Non-Liq.             | 0.00   |
| 4.10<br>4.27   | 34.78<br>36.24   | 0.51<br>0.53        | 1.46<br>1.47      | 110<br>110 | 0 226<br>0 235          | 0.993          | 1.47<br>1.48 | 0.67<br>0.67 | 1.70<br>1.70 | 55.52<br>57.85   | 2.21         |      | 1                  | 52<br>54   | 1.70<br>1.67 |                      | 1.00             | 94.6<br>96.7                             | 1.00         | 0.159<br>0.164     | 0.159          | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 4 43<br>4 59   | 38.86<br>44.03   | 0.57<br>0.63        | 1.47<br>1.44      | 110<br>110 |                         | 0,992<br>0,991 | 1.48<br>1.45 | 0.66<br>0.65 | 1.70<br>1.70 | 62.05<br>70.34   | 2.18         |      | 1                  | 57<br>62   | 1,62<br>1,51 |                      | 1.00<br>1.00     | 100.3<br>106.4                           | 1.00         | 0.174<br>0.192     | 0.174<br>0.192 | 0.321<br>0.320       | Non-Liq.             | Non-Liq.             | 0.00   |
| 4.76           | 50.25            | 0.69                | 1.36              | 110        | 0,262                   | 0,991          | 1.37         | 0.63         | 1.70         | 80.32            | 2,07         |      | 1                  | 68         | 1,41         |                      | 1.00             | 112.9                                    | 1.00         | 0.214              | 0.214          | 0.320                | Non-Liq.<br>Non-Liq. |                      | 0.00   |
| 4.92<br>5.09   | 56.32<br>62.37   | 0.74<br>0.74        | 1.31<br>1.19      | 110<br>110 |                         | 0.991<br>0.990 | 1.31<br>1.19 | 0.61<br>0.60 | 1.70<br>1.70 | 90.06<br>99.77   | 2.02         |      | 1                  | 72<br>77   | 1.33         |                      |                  |  | 1.00         | 0.239              | 0.239          | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 5,25<br>5,41   | 67.00<br>67.37   | 0.84                | 1.26<br>1.32      | 110<br>110 |                         | 0.990<br>0.989 | 1.27<br>1.32 | 0.59<br>0.60 | 1.70<br>1.70 | 107,19<br>107,77 | 1.95<br>1.97 |      | 1                  | 80<br>80   | 1.25<br>1.26 |                      | 1.19             | 158.4                                    | 1.00         | 0,449              | 0.449          | 0,320                | Non-Liq.             | Non-Liq              | 0.00   |
| 5.58           | 67.34            | 0.91                | 1_35              | 110        | 0.307                   | 0.989          | 1.36         | 0.60         | 1.70         | 107.71           | 1.97         |      | i                  | 80         | 1.27         | 0.70                 | 1.19             | 162,0                                    | 1.00         | Infin.<br>Infin.   | 0.000          | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 5.74<br>5.91   | 67.46<br>67.82   | 0.93                | 1.37<br>1.37      | 110<br>110 |                         | 0,989<br>0.988 | 1,38<br>1,38 | 0.60<br>0.60 | 1.70<br>1.70 |                  | 1.98         |      | 1                  | 80<br>80   | 1.27         |                      |                  |  | 1.00         | Infin.<br>Infin.   | 0.000          | 0.320<br>0.319       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 6.07<br>6.23   | 65.23<br>63.78   | 0.93                | 1.42              | 110<br>110 |                         | 0.988<br>0.988 | 1.43<br>1.47 | 0.61<br>0.61 | 1.70<br>1.70 |                  | 2.00         |      | 1                  | 79<br>78   | 1,30<br>1,32 | 0.85                 | 1.19             | 160.7                                    | 1.00         | Infin.             | 0.000          | 0.319                | Non-Liq.             | Non-Liq.             | 0.00   |
| 6.40           | 65,72            | 0.95                | 1.45              | 110        | 0.352                   | 0.987          | 1.45         | 0.61         | 1,70         | 105.03           | 2.00         |      | i                  | 79         | 1.30         |                      | 1.00             |  | 1.00         | 0.306<br>0.319     | 0.306<br>0.319 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. |                      | 0.00   |
| 6.56<br>6.73   | 71.05<br>77.49   | 1.00                | 1.40<br>1.39      | 110<br>110 |                         | 0.987<br>0.986 | 1.41<br>1.40 | 0.60<br>0.59 | 1.70<br>1.70 |                  | 1.97<br>1.94 |      | 1                  | 82<br>86   | 1,26<br>1,23 |                      |                  |  | 1.00         | 0.357              | 0.357<br>0.411 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 6.89<br>7.05   | 86.69<br>98.48   | 1.16<br>1.28        | 1,34              | 110<br>110 |                         | 0.986          | 1.34         | 0.58         | 1.70         | 138,69           | 1.89         |      | 1                  | 90         | 1.18         | 1.10                 | 1.00             | 164.5                                    | 1.00         | Infin.             | 0.000          | 0.319                | Non-Liq.             | Non-Liq.             | 0.00   |
| 7,22           | 114,53           | 1,41                | 1,23              | 110        |                         | 0.986<br>0.985 | 1.31<br>1.23 |              | 1.70<br>1.70 |                  | 1.85<br>1.78 |      | 1                  | 96<br>100  |              | 1.15                 |                  | 180.6<br>201.2                           |              |                    | 0.000          | 0.319<br>0.318       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 7.38<br>7.55   | 122,82<br>128,68 | 1.49<br>1.53        | 1.21              | 110<br>110 |                         | 0.985<br>0.985 | 1.21<br>1.19 | 0.54<br>0.53 | 1.67<br>1.65 |                  | 1.76<br>1.75 |      | 1                  | 100<br>100 | 1.08<br>1.07 |                      |                  | 209.5<br>214.1                           | 1.00         | Infin.<br>Infin:   | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 7.71           | 128.68<br>134.06 | 1,53                | 1.19              | 110        | 0.424                   | 0.984          | 1.19         | 0.53         | 1.63         | 197.34           | 1.75         |      | 1                  | 100        | 1.07         | 1.35                 | 1.00             | 212.2                                    | 1.00         | Infin.             | 0.000          | 0.318                | Non-Liq.             | Non-Liq.             | 0.00   |
| 7.87<br>8.04   | 139.69           | 1.56<br>1.63        | 1.17<br>1.16      | 110<br>110 |                         |                | 1.17<br>1.17 | 0.53<br>0.53 | 1,60<br>1,58 |                  | 1.74<br>1.73 |      | 1                  | 100<br>100 | 1.06<br>1.06 |                      |                  | 215,9<br>220,8                           |              | Infin.<br>Infin.   | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |                      | 0.00   |
| 8,20<br>8,37   | 147.04<br>151.94 | 1.72<br>1.71        | 1.17<br>1.12      | 110<br>110 |                         |                | 1.17<br>1.13 |              | 1,56<br>1,54 |                  | 1.72<br>1.70 |      | 1                  | 100<br>100 |              | 1.50<br>1.55         |                  | 228,1<br>229,4                           |              | Infin.<br>Infin.   | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 8.53           | 158.05           | 1,80                | 1.14              | 110        | 0.469                   | 0.982          | 1.14         | 0.52         | 1.52         | 226.66           | 1.69         |      | 1                  | 100        | 1.03         | 1.60                 | 1,00             | 235,3                                    | 1.00         | Infin.             | 0.000          | 0.318                | Non-Liq.             | Non-Liq.             | 0.00   |
| 8.69<br>8.86   | 163.87<br>169.68 | 1.92<br>2.08        | 1.17<br>1.22      | 110<br>110 |                         |                | 1.18<br>1.23 |              | 1.51<br>1.50 |                  | 1.70<br>1.70 |      | 1                  | 100<br>100 | 1.04<br>1.04 |                      |                  |  | 1.00<br>1.00 | Infin<br>Infin     | 0.000          | 0.317<br>0.317       | Non-Liq.<br>Non-Liq. |                      | 0.00   |
| 9.02<br>9.19   | 174.27<br>179.31 | 2.26                | 1.30              | 110<br>110 |                         |                | 1.30         |              | 1.49<br>1.47 |                  | 1.72<br>1.71 |      | 1                  | 100<br>100 |              | 1.75<br>1.80         |                  | 257.2<br>261.0                           |              | Infin<br>Infin     | 0.000          | 0.317<br>0.317       | Non-Liq.             | Non-Liq.             | 0.00   |
| 9.35           | 181.08           | 2,35                | 1.30              | 110        | 0.514                   | 981            | 1,30         | 0.52         | 1.46         | 248.69           | 1.71         |      | 1                  | 100        | 1.05         | 1.85                 | 1.00             | 261.3                                    |              | Infin.             | 0.000          | 0.317                | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00   |
| 9.51<br>9.68   | 191.53<br>202.38 | 2.42                | 1.26<br>1.27      | 110<br>110 |                         |                | 1.27<br>1.27 |              | 1.44         |                  | 1.69<br>1.68 |      | 1                  | 100<br>100 |              | 1.90<br>1.95         |                  | 269.1<br>279.3                           |              | Infin.<br>Infin.   | 0.000          | 0.317<br>0.317       | Non-Liq.             |                      | 0.00<br>0.00   |
| 9.84<br>10.01  | 214.08<br>227.79 | 2.69<br>2.91        | 1.26<br>1.28      | 110<br>110 |                         |                | 1.26<br>1.28 |              | 1.41<br>1.39 |                  | 1.67<br>1.66 |      | 1                  | 100        | 1.02         | 2 00                 | 1.00             | 289.1                                    | 1.00         | Infin.             | 0.000          | 0.317                | Non-Liq.             | Non-Liq              | 0.00   |
| 10,17          | 242,24           | 3,22                | 1.33              | 110        | 0.559                   | 0.979          | 1,33         | 0.51         | 1.38         | 315,27           | 1.66         |      | 1                  | 100        | 1.01         | 2.05                 | 1.00             | 302 9<br>319 4                           | 1.00         |                    | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |                      | 0.00   |
|                | 244.06<br>249.05 | 3,47<br>3.55        | 1.42              | 110<br>110 |                         |                | 1.43<br>1.43 |              |              |                  | 1.68<br>1.68 |      | 1                  | 100<br>100 |              | 2.15                 |                  | 325.7<br>329.2                           |              |                    | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
|                | 254.87<br>256.89 | 3.69                | 1_45              | 110        | 0.586                   | 978            | 1.45         | 0,51         | 1,35         | 325.19           | 1,68         |      | 1                  | 100        | 1.03         | 2.25                 | 1.00             | 334.7                                    | 1:00         | Infin.             | 0.000          | 0.316                | Non-Liq.             | Non-Liq.             | 0.00   |
| 10,99          | 258.54           | 3,79                | 1.48<br>1.53      | 110<br>110 | 0,604                   | 977            | 1.48<br>1.53 | 0.52         | 1.34         | 325.83           | 1.69<br>1.70 |      | 1                  | 100        | 1.04         | 2.30 ′               | 1,00             | 336.5<br>339.6                           | 1.00         |                    | 0.000          |                      | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
|                | 252.91<br>241.86 | 3.87                | 1.53<br>1.53      | 110<br>110 |                         |                | 1,53<br>1,53 |              |              |                  | 1.71<br>1.72 |      | 1                  |            |              |                      |                  | 331.4<br>317.7                           |              |                    | 0.000          |                      | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 11.48          | 235,08           | 3,50                | 1.49              | 110        | 0.632                   | 976            | 1.49         | 0.52         | 1.31         | 290,38           | 1.72         |      | 1                  | 100        | 1.05         | 2.50                 | 1.00             | 306.4                                    | 1.00         | Infin.             | 0.000          | 0.315                | Non-Liq.             | Non-Liq.             | 0.00   |
| 11.81          | 233.08<br>236.89 | 3.34<br>2.82        | 1.43<br>1.19      | 110<br>110 | 0,650                   |                | 1.44<br>1.19 |              |              |                  | 1.71<br>1.65 |      |                    |            |              |                      |                  | 299 4<br>286 6                           |              |                    |                |                      | Non-Liq.<br>Non-Liq. |                      | 0.00   |
| 11.98<br>12.14 | 239.86<br>232.44 | 3.05                | 1.27<br>1.35      | 110<br>110 |                         |                | 1.27<br>1.35 |              |              |                  | 1,67<br>1,70 |      |                    |            | 1.02         |                      | .00              | 293.1<br>288.9                           | 1.00         | Infin.             |                | 0.315                | Non-Liq.<br>Non-Liq. | Non-Liq.             | 0.00<br>0.00   |
| 12.30          | 231.56<br>226.67 | 3.17                | 1.37              | 110        | 0.677                   | 974            | 1.37         | 0.52         | 1.26         | 275.23           | 1.70         |      | 1                  | 100        | 1.04         | 2,70 1               | .00              | 287.5                                    | 1,00         | Infin.             | 0.000          | 0.315                | Non-Liq.             | Non-Liq              | 0.00   |
| 12.63          | 224.32           | 3,05                | 1.35<br>1.36      | 110<br>110 |                         |                |              |              |              |                  | 1.71<br>1.71 |      |                    |            |              | 2.70 1<br>2.70 1     |                  | 280.0<br>276.6                           | 1.00<br>1.00 |                    | 0.000          |                      | Non-Liq.<br>Non-Liq. |                      | 0.00<br>0.00   |
| 12.80          | 219,31           |                     | 1.39              | 110        |                         | 973            |              |              |              | 256.14           |              |      |                    |            |              |                      |                  | 272 0                                    |              | Infin.             |                |                      | Non-Liq.             |                      | 0.00   |

| ayer.        | Tip              | Friction     | Friction     | Total      | Eff_Stres      | s     |              |              |      |                  |              | ø     | Liquef   | Rel       |      |      |      | Clean          |      |        |       | Induced        | Liquefac.            |   | Volumetri |
|--------------|------------------|--------------|--------------|------------|----------------|-------|--------------|--------------|------|------------------|--------------|-------|----------|-----------|------|------|------|----------------|------|--------|-------|----------------|----------------------|---|-----------|
| epth         | Qc               | Fs           | Ratio        | Unit Wt,   | at Midpt       |       |              |              |      | Corrected        | 1            | Brick | Suscept  | Dens_     |      | Н    |      | Sand           |      |        | EQ    | M=7.5          | Safety               | Probab                                  | Strain    |
| feet)        | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd    | F            | n            | Ca   | Qc1n             | lc           | õ     | (0 or 1) | Dr (%)    | Kc   | (m)  | KH   | Qc1n           | Κσ   | CRR75  | CRR   | CSR            | Factor               | P,                                      | (%)       |
| 2,96         | 214,97           | 3.04         | 1,41         | 110        | 0.713          | 0.973 | 1.42         | 0.53         | 1.23 | 249,70           | 1.74         |       | 1        | 100       | 1.07 | 2.70 | 1.00 | 267.1          | 1.00 | Infin. | 0.000 | 0,314          | Non-Lig.             | Non-Lia                                 | 0.00      |
| 3.12         | 210.39           | 2,92         | 1,39         | 110        | 0.722          | 0.973 | 1.39         | 0.53         | 1.23 | 242,78           | 1.74         |       | 1        | 100       | 1.07 | 2,70 | 1.00 | 260.0          | 1.00 | Infin. | 0.000 | 0.314          | Non-Lig.             |   | 0.00      |
| 3.29         | 202.73           | 2,85         | 1.41         | 110        | 0.731          | 0.972 | 1.41         | 0.54         | 1.22 | 232,77           | 1.76         |       | 1        | 100       | 1_08 | 2,70 | 1,00 | 251.7          | 1.00 | Infin. | 0,000 | 0,314          | Non-Liq.             | Non-Liq.                                | 0.00      |
| 3.45         | 202,03           | 2,75         | 1.36         | 110        | 0.740          | 0.972 | 1.36         | 0.53         | 1.21 | 230,22           | 1.75         |       | 1        | 100       | 1_07 | 2.70 | 1.00 | 247,7          | 1,00 | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq.                                | 0.00      |
| 3.62         | 202,36           | 2,74         | 1.36         | 110        | 0.749          | 0.972 | 1.36         | 0.53         | 1.20 | 229.11           | 1.75         |       | 1        | 100       | 1.07 | 2.70 | 1.00 | 246.5          |      | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq.                                | 0.00      |
| 3.78         | 210.84           | 2.87         | 1.36         | 110        | 0,758          | 0_971 | 1.37         | 0.53         | 1.19 | 237.04           | 1.74         |       | 1        | 100       | 1.07 | 2,70 | 1.00 | 253.8          |      |        | 0,000 | 0.314          | Non-Liq.             | Non-Liq.                                | 0.00      |
| 3.94         | 228.51           | 2.41         | 1.05         | 110        | 0.767          | 0.971 | 1.06         | 0.50         | 1.17 | 252,83           | 1,64         |       | 1        | 100       | 1.00 | 2.70 | 1.00 | 253.8          |      |        | 0,000 | 0.314          | Non-Liq.             |   | 0.00      |
| 4.11         | 285.52           | 2.69:        | 0.94         | 110        | 0.776          | 0,971 | 0.94         | 0.50         | 1.17 | 314,27           | 1,54         |       | 1        | 100       | 1.00 | 2:70 | 1.00 | 315.4          |      |        | 0.000 | 0.314          | Non-Liq.             |   | 0.00      |
| 4.27         | 292.87           | 2.62         | 0,89         | 110        | 0.785          | 0.970 | 0.90         | 0.50         | 1.16 | 320,51           | 1,52         |       | 1        | 100       | 1,00 | 2.70 | 1.00 | 321.7          |      |        | 0.000 | 0_314          | Non-Liq.             |   | 0.00      |
| 4.44         | 251.89<br>209.49 | 2.37         | 0.94         | 110        | 0,794          | 0,970 | 0.94         | 0.50         | 1.15 | 273.97           | 1,58         |       | 1        | 100       | 1.00 | 2,70 | 1.00 | 275.0          |      | Infin, | 0,000 | 0_313          | Non-Liq.             |   | 0.00      |
| 4.60<br>4.76 | 185.30           | 2 12<br>1 81 | 1,01<br>0,97 | 110        | 0.803          | 0.970 | 1.02         | 0.51         | 1.15 | 226.74           | 1,66         |       | 1        | 100       | 1.01 | 2.70 | 1.00 | 229.5          |      |        | 0,000 | 0.313          | Non-Liq.             |   | 0.00      |
|              | 177.04           | 1.72         | 0.97         | 110<br>110 | 0,812<br>0,821 | 0.969 | 0.98<br>0.97 | 0.51<br>0.52 | 1.15 | 199.73           | 1,68         |       | 1        | 100       | 1.03 | 2.70 | 1.00 | 205.8          |      |        | 0,000 | 0,313          | Non-Liq.             | •                                       | 0.00      |
| 5 09         | 163.66           | 1.53         | 0.94         | 110        | 0.830          | 0.969 | 0.97         | 0.52         | 1.14 | 189.90<br>174.67 | 1.70<br>1.71 |       | 1        | 100       | 1,04 | 2.70 | 1.00 | 197.4          |      |        | 0.000 | 0.313          | Non-Liq.             |   | 0.00      |
| 5.26         | 131,77           | 1.43         | 1.09         | 110        | 0.839          | 0.968 | 1.10         | 0.52         | 1.13 | 140.77           | 1.83         |       | 1        | 100<br>91 | 1.05 | 2.70 | 1.00 |                | 1,00 |        | 0.000 | 0.313          | Non-Liq.             | •                                       | 0.00      |
| 5.42         | 90.92            | 1.82         | 2.00         | 110        | 0.848          | 0.968 | 2.02         | 0.64         | 1.14 | 98.18            | 2.12         |       | 1        | 91<br>76  | 1.50 | 2,70 | 1.00 | 159 1<br>147 1 | 1.00 |        | 0.454 | 0.313          | Non-Liq.             |   | 0.00      |
| 5.58         | 71.71            | 1.75         | 2.45         | 110        | 0.857          | 0.967 | 2.48         | 0.69         | 1.16 | 77.37            | 2.26         |       | 1        | 66        | 1.82 |      | 1.00 | 141.2          | 33   |        | 0.376 | 0.313          | Non-Liq.             | , | 0.00      |
|              | 110.76           | 2.45         | 2.21         | 110        | 0.866          | 0.967 | 2.22         | 0.64         | 1.14 | 118.01           | 2.10         |       | 1        | 84        | 1.46 |      | 1.00 | 171.7          |      |        | 0.000 | 0.313<br>0.313 | Non-Liq.             |   | 0.00      |
|              | 111.12           | 2.74         | 2.46         | 110        | 0.875          | 0.967 | 2.48         | 0.65         | 1.13 | 117.85           | 2.14         |       | 1        | 84        | 1.52 |      | 1.00 | 179.7          |      |        | 0.000 | 0.313          | Non-Liq.             |   | 0.00      |
|              | 114.52           | 2.87         | 2.51         | 110        | 0.884          | 0.966 | 2.52         | 0.65         | 1.12 | 120.66           | 2.14         |       | 1        | 85        | 1.52 |      | 1.00 | 183.7          |      |        | 0.000 | 0.312          | Non-Liq.<br>Non-Liq. |   | 0.00      |
| 24           | 142.13           | 2.72         | 1.91         | 110        | 0.893          | 0.966 | 1.92         | 0.60         | 1.11 | 147.88           | 1.99         |       | 1        | 93        | 1.28 | 1.00 | 1.00 | 190.7          |      |        | 0.000 | 0.312          | Non-Liq.             | - 10                                    | 0.00      |
|              | 171.27           | 2.46         | 1.44         | 110        | 0.902          | 0.966 | 1.45         | 0.56         | 1.09 | 176.09           | 1.84         |       | 1        | 100       | 1.14 |      | 1.00 |                | 1.00 |        | 0.000 | 0.312          | Non-Liq.             |   | 0.00      |
|              | 179.24           | 2,28         | 1.27         | 110        | 0.911          | 0.965 | 1.28         | 0.55         | 1.08 | 182.87           | 1.79         |       | 1        |           | 1.10 |      | 1.00 |                | 1.00 |        | 0.000 | 0.312          | Non-Liq.             |   | 0.00      |
| 73           | 203 64           | 2.08         | 1.02         | 110        | 0,920          | 0.965 | 1.03         |              | 1.07 |                  | 1.69         |       | 1        | 100       |      | 1.15 | 1000 |                | 1.00 |        | 0.000 | 0.312          | Non-Liq.             |   | 0.00      |
| 90           | 253,20           | 2.34         | 0.92         | 110        | 0.929          | 0.965 | 0.93         | 0.50         | 1.07 |                  | 1.59         |       | 1        | 100       |      |      | 7.0  | 255 4          |      |        | 0.000 | 0.312          | Non-Liq.             |   | 0.00      |
| .06          | 288,82           | 2.54         | 0.88         | 110        | 0,938          | 0.964 | 0.88         |              | 1.06 |                  | 1.54         |       | 1        |           |      | -    | 1000 | 290.0          |      |        | 0.000 | 0.312          | Non-Lig.             |   | 0.00      |
| .22          | 315,97           | 2.96         | 0.94         | 110        | 0.947          | 0.964 | 0.94         | 0.50         | 1.06 | 314.66           | 1.54         |       | 1        | 100       |      |      |      | 2.2            | 1.00 |        | 0.000 | 0.311          | Non-Lig.             | 100                                     | 0.00      |
| 39           | 322,57           | 2,98         | 0.92         | 110        | 0.956          | 0.963 | 0.93         | 0.50         | 1.05 | 319.73           | 1.53         |       | 1        | 100       |      | 1.35 |      |                | 1.00 |        | 0.000 | 0.311          | Non-Lig.             | , ,                                     | 0.00      |
| .55          | 346,12           | 4.11         | 1,19         | 110        | 0.965          | 0.963 | 1.19         | 0.50         | 1.05 | 341.52           | 1,60         |       | 1        | 100       | 1,00 | 1.40 | 1.00 | 342.8          | 1,00 |        | 0,000 | 0.311          | Non-Lig.             |   | 0.00      |
| 72           | 402,20           | 6.00         | 1.49         | 110        | 0.974          | 0.963 | 1.50         | 0.50         | 1.04 | 395,22           | 1.65         |       | 1        | 100       | 1,00 | 1.45 | 1_00 | 396.7          | 1.00 | Infin. | 0,000 | 0,311          | Non-Liq.             |   | 0.00      |
| 88           | 358,55           | 6.07         | 1.69         | 110        | 0.983          | 0.962 | 1.70         | 0.52         | 1.04 | 351,16           | 1.72         |       | 1        | 100       | 1,05 | 1.50 | 1.00 | 370.5          | 1.00 | Infin. | 0.000 | 0.311          | Non-Liq.             |   | 0.00      |
| 04           | 345,21           | 4,98         | 1.44         | 110        | 0.992          | 0.962 | 1.45         | 0.51         | 1.03 | 336,13           | 1,67         |       | 1        | 100       | 1,02 | 1,55 | 1.00 | 343.7          | 1.00 | Infin. | 0.000 | 0.311          | Non-Lig.             |   | 0.00      |
|              | 360.17           | 4.43         | 1.23         | 110        | 1,001          | 0,962 | 1.23         | 0.50         | 1.03 | 348,93           | 1.61         |       | 1        | 100       | 1,00 | 1,60 | 1,00 | 350 2          | 1.00 | Infin. | 0.000 | 0.311          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 359.99           | 3.79         | 1.05         | 110        | 1,010          | 0,961 | 1.06         |              | 1.02 |                  | 1.55         |       | 1        |           |      | 1.65 |      | 348.5          |      | Infin  | 0.000 | 0.311          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 354.62           | 3.03         | 0.86         | 110        | 1.020          | 0.961 | 0.86         |              | 1.02 | 340,46           | 1.49         |       | 1        |           |      |      | 1.00 | 341.7          |      | Infin. | 0,000 | 0,310          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 344,24           | 2.99         | 0.87         | 110        | 1.029          | 0,960 | 0.87         | 0.50         | 1.01 |                  | 1.50         |       | 1        | 100       | 1,00 | 1,75 | 1.00 | 330.2          | 1.00 | Infin. | 0.000 | 0.310          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 332.45           | 3.04         | 0.91         | 110        |                | 0.960 | 0.92         | 0.50         | 1.01 |                  | 1.53         |       | 1        |           |      |      |      |                | 1.00 | Infin. | 0.000 | 0.310          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 327.71           | 2.96         | 0.90         | 110        |                | 0.960 | 0.91         |              | 1.01 |                  | 1.53         |       | 1        |           |      |      |      |                | 1.00 |        | 0,000 | 0.310          | Non-Liq.             |   | 0.00      |
|              | 307 45           | 2.73         | 0.89         | 110        | 1,056          | 0.959 | 0.89         |              | 1.00 |                  | 1.54         |       | 1        |           |      |      |      |                | 1.00 |        | 0.000 | 0.310          | Non-Liq.             | Non-Liq.                                | 0.00      |
|              | 274.72           | 2.45         | 0.89         | 110        | 1.065          | 0.959 | 0.89         |              | 1.00 |                  | 1.58         |       | 1        |           |      |      |      |                | 1.00 |        | 0.000 | 0.310          | Non-Liq.             |   | 0.00      |
|              | 271.54           | 4.15         | 1.53         | 110        | 1.074          | 0.958 | 1.53         |              | 0.99 |                  | 1_76         |       | 1        |           |      |      |      | 275.2          |      |        | 0.000 | 0.310          | Non-Liq.             |   | 0.00      |
|              | 279.83           | 3.92         | 1.40         | 110        | 1.083          | 0.958 | 1.41         |              | 0.99 |                  | 1.73         |       | 7        |           |      |      |      | 276.0          |      |        | 0.000 | 0.310          | Non-Liq.             |   | 0.00      |
|              | 285.99           | 4.02         | 1.41         | 110        | 1.092          | 0.957 | 1.41         |              | 0.98 |                  | 1.72         |       | 1        |           |      |      |      |                | 0.99 |        | 0.000 | 0,309          | Non-Liq.             | 100                                     | 0.00      |
| .01          | 315.42           | 2.61         | 0.83         | 110        | 1_101          | 0.957 | 0.83         | 0.50         | 0.98 | 291.27           | 1.52         |       | 3        | 100       | 1,00 | 2.15 | 1.00 | 292.4          | 0.98 | Infin. | 0.000 | 0.309          | Non-Liq.             | Non-Lig.                                | 0.00      |

|                |                    | Project:<br>lob No: |                  | _          | chool No.      | 8              |              | Me           | thods:       | Liquefac             |              | -          | _                |               |              |                    |                  |                    | •            |                    | & Wride        | )                    |                      |           | Total                                   |
|----------------|--------------------|---------------------|------------------|------------|----------------|----------------|--------------|--------------|--------------|----------------------|--------------|------------|------------------|---------------|--------------|--------------------|------------------|--------------------|--------------|--------------------|----------------|----------------------|----------------------|-----------|---|
|                | 20000              |                     | 8/14/20          |            |                |                |              |              |              | Post-liqu<br>Dry San |              |            |                  |               |              |                    |                  |                    |              |                    |                |                      |                      |           | Liquefled<br>Thickness                  |
| EART           | Sou<br>HQUAKE      | inding:<br>INFORM   |                  | ١.         | Plot:          | 2              |              | Induce       | d CSR        | (M=7.5):             | = 0.69       | 5*PG/      | \*/no/n'         | 'o)*rd/       | MSE          |                    |                  |                    |              |                    |                |                      |                      |           | (feet)<br>0.0                           |
|                | Ma                 | gnilude:            | 6.77             | 7.5        |                |                |              |              |              | ind Qc1n             |              |            | ,                | 0, 10,        |              | SF =               | CRR <sub>7</sub> | <sub>5</sub> *Κσ/C | SR           |                    |                |                      |                      | Probab    | V 1000000000000000000000000000000000000 |
|                |                    | PGA, g:<br>MSF:     | 1.30             | 0,50       |                | He             | it Maia      | sht of ur    | neatura      | ted soils:           | 110          | nof        |                  |               | Us           | e Toki             | matsu            | & Seed             | (0) or       | Ishihara           |                | mine (1):            | 0                    | Avg       | Induced                                 |
|                | GV                 | VT, feet:           | 20.0             |            | 1              |                | _            |              |              | ted soils:           | 110          | pcf<br>pcf |                  |               |              |                    |                  |                    | Min SF       | of Liqu            |                | uired SF:<br>Layers: | 1.50<br>0.00         | 0%<br>Max | Subsidence<br>(inches)                  |
| Laye           | Design GV<br>r Tip | -                   | 20.0<br>Friction | Total      | Eff.Stress     |                | Limiting     | lc for       | iquefia      | ble soils:           | 2.60         |            |                  |               | ling lc      | for K <sub>H</sub> | 2.0              | _                  |              | of Liqu            | uefiable       | Layers:              |                      | 0%        | 0.2                                     |
| Depti          | ,                  | Fs                  | Ratio            |            | at Midpt.      | 5              |              |              |              | Corrected            | d            | -          | iquef.<br>iscept | Rel.<br>Dens. |              | Н                  |                  | Clean              |              |                    | EQ             | Induced<br>M=7.5     | Liquefac.<br>Safety  | Probab.   | Volumetric<br>Strain                    |
| (feet          |                    | (tsf)               | %                | (pcf)      | p'o (tsf)      | rd             | F            | n            | Co           | Qc1n                 | Ic           | ð (0       | or 1)            | Dr (%)        | Kc           | (m)                | KH               | Qc1n               |              | CRR <sub>7.5</sub> | CRR            | CSR                  | Factor               | Pt        | (%)                                     |
| 0.16<br>0.33   | 11.37              | 0.09                | 1.13<br>0.97     | 110<br>110 | 0.009<br>0.018 | 1,000<br>1,000 | 1.13<br>0.97 | 0.81<br>0.76 | 1.70<br>1.70 | 12.84<br>18.24       | 2.68<br>2.52 |            | 1                | 6             | 2.86         |                    | 1.00             | 52.1               | 1.00         | 0.093              | 0,093          | 0.323                | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 0.49           | 14.06<br>15.85     | 0.14                | 1.00<br>0.90     | 110<br>110 | 0.027          | 1.000          | 1.00<br>0.90 | 0.74<br>0.72 | 1.70<br>1.70 | 22.55<br>25.41       | 2.44<br>2.38 |            | 1                | 15<br>20      | 2,50         |                    | 1.00             | 56.3<br>56.4       | 1.00         | 0.097<br>0.097     | 0.097<br>0.097 | 0.323                | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 0,82           | 15.82<br>15.42     | 0.14<br>0.12        | 0.88<br>0.78     | 110<br>110 | 0.045          | 1,000          | 0.89<br>0.79 | 0.72<br>0.72 | 1.70<br>1.70 | 25.35<br>24.69       | 2.37<br>2.36 |            | 1                | 20<br>19      | 2.21         |                    | 1.00             | 55 9<br>53 1       | 1.00         | 0.096              | 0.096          | 0.323                | Non-Liq.             | Non-Liq   | 0.00                                    |
| 1,15           | 12.24              | 0.10                | 0.81             | 110        | 0,063          | 0,999          | 0.81         | 0.74         | 1.70         | 19,57                | 2,45         |            | 1                | 9             | 2,55         |                    | 1.00             | 49.8               | 1.00         | 0.092              | 0,094<br>0,092 | 0 323<br>0 323       | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 1,31<br>1,48   | 12.24<br>10.64     | 0.10<br>0.13        | 0.81<br>1.17     | 110<br>110 | 0.072<br>0.081 | 0.999          | 0.81<br>1.18 | 0.74<br>0.78 | 1.70<br>1.70 | 19.55<br>16.97       | 2.45<br>2.59 |            | 1                | 9             | 2 55<br>3 25 |                    | 1.00             | 49.8<br>55.1       | 1.00         | 0.092<br>0.096     | 0.092          | 0.323                | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 1,64           | 11.63<br>19.13     | 0.20                | 1.72<br>1.53     | 110<br>110 |                | 0.998          | 1.73<br>1.53 | 0.80<br>0.74 | 1.70<br>1.70 | 18.54<br>30.58       | 2.64<br>2.43 |            | 0                | 28            | 2.45         |                    | 1.00             | 74.9               | 1.00         | 0.119              | 0.119          | 0.323                | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 1.97           | 35.11<br>43.24     | 0.52<br>0.60        | 1.48             | 110        | 0.108          | 0.998          | 1.48         | 0.67         | 1,70         | 56,24                | 2.21         |            | 1                | 53            | 1.70         |                    | 1.00             | 95.4               | 1.00         | 0.161              | 0.161          | 0.322                | Non-Liq.             | Non-Liq   | 0.00                                    |
| 2.30           | 43.08              | 0.62                | 1.43             | 110<br>110 | 0.126          | 0.997<br>0.997 | 1.40<br>1.44 | 0.65<br>0.65 | 1.70<br>1.70 | 69.29<br>69.02       | 2.13         |            | 1                | 62<br>61      | 1.50<br>1.52 |                    | 1,00<br>1,00     | 104.3<br>105.0     | 1.00<br>1.00 | 0.185<br>0.188     | 0.185<br>0.188 | 0.322<br>0.322       | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 2.46<br>2.62   | 41.08<br>38.58     | 0.60<br>0.56        | 1.46<br>1.46     | 110<br>110 |                | 0.996<br>0.996 | 1.46<br>1.46 | 0.65<br>0.66 | 1.70<br>1.70 | 65 79<br>61 76       | 2.16<br>2.18 |            | 1                | 59<br>57      | 1.56<br>1.61 |                    | 1.00             | 102.9<br>99.6      | 1.00<br>1.00 | 0.181              | 0.181<br>0.172 | 0.322                | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 2.79           | 35.25<br>32.60     | 0.53<br>0.49        | 1.50             | 110<br>110 | 0.153          | 0.996          | 1.50         | 0.67<br>0.68 | 1.70         | 56.39<br>52.12       | 2 22 2 24    |            | 1                | 53<br>50      | 1.70         |                    | 1.00             | 96.1               | 1.00         | 0.163              | 0.163          | 0.322                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 3.12           | 29.61              | 0.45                | 1.52             | 110        | 0.171          | 0.995          | 1.53         | 0.69         | 1.70         | 47_30                | 2.28         |            | 1                | 46            | 1.88         |                    | 1.00             | 92.6<br>89.0       | 1.00         | 0.154<br>0.146     | 0 154<br>0 146 | 0.322<br>0.322       | Non-Liq.<br>Non-Liq. | Non-Liq   | 0.00<br>0.00                            |
| 3.28<br>3.44   | 26 41<br>23 64     | 0.40                | 1.51<br>1.44     | 110<br>110 |                | 0.994<br>0.994 | 1.52<br>1.45 | 0.70<br>0.71 | 1.70<br>1.70 | 42.15<br>37.68       | 2.32         |            | 1                | 41<br>36      | 2.01         |                    | 1.00<br>1.00     | 84.6<br>79.2       | 1.00         | 0.136<br>0.126     | 0.136<br>0.126 | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 3.61<br>3.77   | 21.08<br>18.23     | 0.29                | 1.36<br>1.67     | 110<br>110 |                | 0.994          | 1.37<br>1.69 | 0.72<br>0.75 | 1.70<br>1.70 | 33.55<br>28.96       | 2.37<br>2.48 |            | 1                | 32<br>25      | 2.20<br>2.65 |                    | 1.00<br>1.00     | 73.8<br>76.6       | 1.00         | 0.117              | 0.117          | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 3.94<br>4.10   | 15.34              | 0.30                | 1.98             | 110        | 0.217          | 0.993          | 2.00         | 0.78         | 1.70         | 24.30                | 2.58         |            | 1                | 18            | 3.21         |                    | 1.00             | 78.0               | 1.00         | 0.124              |                | 0.321                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 4.27           | 12.99<br>11.82     | 0.35<br>0.38        | 2.73<br>3.20     | 110<br>110 | 0.235          | 0.993<br>0.992 | 2.77<br>3.26 | 0.83<br>0.85 | 1.70<br>1.70 | 20 51<br>18 62       | 2.72         |            | 0                |               |              |                    |                  |                    | 1.00<br>1.00 |                    |                | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 4.43<br>4.59   | 10.34<br>11.89     | 0.34                | 3.30<br>2.04     | 110<br>110 |                | 0.992          | 3.38         | 0.87<br>0.81 | 1.70<br>1.70 | 16 22<br>18 70       | 2,86<br>2,68 |            | 0                |               |              |                    |                  |                    | 1.00         |                    |                | 0.321<br>0.320       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 4.76<br>4.92   | 26.79<br>35.67     | 0.25<br>0.30        | 0.93             | 110<br>110 | 0.262          | 0.991<br>0.991 | 0.94<br>0.85 | 0.67<br>0.63 | 1.70<br>1.70 | 42.63<br>56.88       | 2.19         |            | 1                | 41<br>53      | 1.65         |                    | 1.00             | 70.3               | 1.00         | 0.112              | 0.112          | 0.320                | Non-Liq,             | Non-Liq.  | 0.00                                    |
| 5.09           | 41.25              | 0.36                | 0.88             | 110        | 0.280          | 0.990          | 0.89         | 0.61         | 1,70         | 65.83                | 2.02         |            | 1                | 59            | 1.39<br>1.33 |                    | 1.00<br>1.00     | 79.2<br>87.7       | 1.00         | 0 126<br>0 143     | 0 126<br>0 143 | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 5.25<br>5.41   | 44.28<br>46.60     | 0.41                | 0.92             | 110<br>110 |                | 0.990<br>0.989 | 0.93<br>0.95 | 0.61<br>0.61 | 1.70<br>1.70 | 70.69<br>74.40       | 2.01         |            | 1                | 62<br>65      | 1,31<br>1,30 | 1.00               | 1.00             | 92.7<br>96.8       | 1.00         | 0.154<br>0.164     | 0 154<br>0 164 | 0.320                | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 5.58<br>5.74   | 50.22<br>54.67     | 0.47                | 0.93             | 110<br>110 |                | 0.989          | 0.94<br>0.87 | 0.60<br>0.58 | 1.70<br>1.70 | 80 20<br>87 34       | 1.97         |            | 1                | 68<br>71      | 1.26<br>1.21 |                    |                  | 101.4<br>105.9     |              | 0.177<br>0.190     | 0.177<br>0.190 | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 5.91<br>6.07   | 56.65<br>56.48     | 0.48<br>0.50        | 0.85             | 110        | 0.325          | 0.988          | 0.86         | 0.58         | 1.70         | 90.50                | 1.90         |            | 1                | 73            | 1.19         | 1.15               | 1.00             | 108.2              | 1.00         | 0.198              | 0.198          | 0.319                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 6,23           | 58.52              | 0.53                | 0.91             | 110<br>110 | 0.343          | 0.988<br>0.988 | 0.90<br>0.92 | 0.58<br>0.58 | 1.70<br>1.70 | 90.22<br>93.48       | 1.92<br>1.91 |            | 1                | 73<br>74      |              |                    |                  | 109.0<br>112.4     |              | 0.201<br>0.212     | 0.201<br>0.212 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 6.40<br>6.56   | 61.73<br>65.05     | 0.57<br>0.55        | 0.92<br>0.84     | 110<br>110 |                | 0.987<br>0.987 | 0.93<br>0.85 | 0.58<br>0.56 | 1.70<br>1.70 | 98.62<br>103.94      | 1.90<br>1.85 |            | 1                |               |              |                    |                  | 117.2<br>119.6     |              | 0,230              | 0.230<br>0.239 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 6.73<br>6.89   | 67.42<br>72.04     | 0.56<br>0.64        | 0.83             | 110<br>110 |                | 0.986<br>0.986 | 0.84         | 0.56<br>0.56 | 1.70<br>1.70 |                      | 1.84<br>1.83 |            | 1                | 80<br>83      |              |                    |                  | 122.6<br>130.6     | 1.00         | 0.251<br>0.287     | 0.251<br>0.287 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 7.05           | 79.98              | 0.56                | 0.70             | 110        | 0.388          | 0.986          | 0.71         | 0.53         | 1.70         | 127.76               | 1.73         |            | 1                | 87            | 1.06         | 1.50               | 1.00             | 135.9              | 1.00         | 0.314              | 0.314          | 0,319                | Non-Liq.             |           | 0.00                                    |
| 7.22<br>7.38   | 84.69<br>84.27     | 0.74                | 0.87             | 110<br>110 | 0.406          | 0.985          | 0.88<br>0.84 |              | 1.70<br>1.67 | 135.25<br>132.75     | 1.77<br>1.77 |            | 1                | 89<br>89      | 1.09<br>1.08 | 1.55<br>1.60       | 1.00<br>1.00     | 147.6<br>144.4     | 1.00         | 0.379<br>0.360     | 0.379<br>0.360 | 0.318<br>0.318       | Non-Liq.             |           | 0.00                                    |
| 7.55<br>7.71   | 88.99<br>88.99     | 0.71<br>0.71        | 0.80             | 110<br>110 |                | 0.985<br>0.984 | 0.81<br>0.81 | 0.53<br>0.53 | 1.64<br>1.63 |                      | 1.74<br>1.75 |            | 1                | 90<br>90      |              |                    |                  | 147.5<br>146.2     |              | 0.378              | 0.378<br>0.371 | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 7.87<br>8.04   | 97.16<br>104.13    | 0.72<br>0.76        | 0.74             | 110<br>110 |                | 0 984<br>0 984 | 0.74<br>0.73 |              | 1.59<br>1.56 |                      | 1.70<br>1.68 |            |                  | 92            | 1.04         | 1.75               | 1.00             | 151.8              |              | 0.405              | 0.405<br>0.445 | 0,318<br>0,318       | Non-Liq.             | Non-Liq   | 0.00                                    |
| 8.20           | 109.72             | 0.85                | 0.77             | 110        | 0.451          | 0.983          | 0.78         | 0.51         | 1.55         | 159,96               | 1,68         |            | 1                | 96            | 1.03         | 1.85               | 1.00             | 164.9              | 1.00         | Infin.             | 0.000          | 0.318                | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 8.37<br>8.53   | 127.90<br>139.29   | 0.84<br>1.12        | 0.66             | 110<br>110 |                | 0.983<br>0.982 | 0.66<br>0.80 | 0.50<br>0.50 | 1.52<br>1.50 |                      | 1.59<br>1.63 |            |                  |               |              |                    |                  | 183.3<br>197.8     |              | Infin<br>Infin     | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
| 8 69<br>8 86   | 174.32<br>197.20   | 1.33<br>1.54        | 0.76<br>0.78     | 110<br>110 |                | 0.982<br>0.982 | 0.77<br>0.78 |              |              |                      | 1.55<br>1.52 |            |                  |               |              | 2.00<br>2.05       |                  | 245.3<br>275.0     |              | Infin.<br>Infin.   | 0.000          | 0.317                | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 9.02<br>9.19   | 211.19<br>221.47   | 1.71<br>1.88        | 0.81             | 110<br>110 | 0.496          | 0.981          | 0.81         | 0.50         | 1.46         | 290.78               | 1:51         |            | 1                | 100           | 1.00         | 2.10               | 1.00             | 291.9              | 1.00         | Infin.             | 0.000          | 0.317                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 9,35           | 230,78             | 2.04                | 0.88             | 110        | 0.514          | 0.981          | 0.85         | 0.50         | 1.43         | 312.17               | 1.52<br>1.52 |            | 1 .              | 100           | 1.00         | 2.15               | 1.00             | 303.4<br>313.3     | 1.00         | Infin-<br>Infin-   | 0.000          | 0.317<br>0.317       | Non-Liq.<br>Non-Liq. | Non-Liq   | 0.00<br>0.00                            |
| 9.51<br>9.68   | 234.50<br>232.94   | 2.16<br>2.27        | 0.92<br>0.98     | 110<br>110 |                |                | 0.92<br>0.98 |              |              |                      | 1.53<br>1.56 |            |                  |               |              | 2.25<br>2.30       |                  | 315.6<br>310.8     | 1.00         | Infin.<br>Infin.   | 0.000          | 0.317<br>0.317       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 9.84           | 231.57<br>230.54   | 2.35                | 1.01<br>1.04     | 110<br>110 |                |                | 1.02<br>1.05 |              |              |                      | 1.57<br>1.59 |            |                  |               |              |                    |                  | 306.4<br>302.5     |              | Infin.             |                | 0.317<br>0.316       | Non-Liq.<br>Non-Liq. | Non-Liq   | 0.00<br>0.00                            |
| 10.17          | 237.18<br>247.31   | 2.50<br>2.55        | 1.05<br>1.03     | 110        | 0.559          | 0.979          | 1.06         | 0.50         | 1.38         | 307.58               | 1.58         |            | 1 .              | 100           | 1.00         | 2.45               | 1.00             | 308.7              | 1.00         | Infin.             | 0.000          | 0.316                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 10.50          | 243.77             | 2.52                | 1.03             | 110<br>110 | 0.577          | 0.978          | 1.03<br>1.04 | 0.50         | 1.35         | 311-14               | 1.57<br>1.58 |            |                  |               |              | 2.50<br>2.55       |                  | 319.4<br>312.3     |              | Infin.             |                | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 10.66<br>10.83 | 237,97<br>236.70   | 2.56<br>2.58        | 1.07             | 110<br>110 |                |                | 1.08<br>1.09 |              |              |                      | 1.60<br>1.61 |            |                  |               |              | 2.60<br>2.65       |                  | 302.5<br>298.6     |              | Infin.             |                | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |           | 0.00                                    |
|                | 231.19<br>223.52   | 3.35<br>4.80        | 1.45<br>2.15     | 110<br>110 | 0.604          | 977            | 1.45<br>2.15 | 0.52         | 1.34         | 291.69               | 1.71<br>1.85 |            | 1 .              | 100           |              | 2.70               | 1.00             | 305.6<br>330.3     | 1.00         | Infin.             | 0.000          | 0.316<br>0.316       | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 11.32          | 231-18             | 4.24                | 1.83             | 110        | 0.623          | 0.977          | 1.84         | 0.55         | 1,34         | 291.09               | 1,79         |            | 1                | 100           | 1.10         | 2.80               | 1.00             | 321.9              | 1.00         | Infin.             | 0.000          | 0.316                | Non-Liq.             | Non-Liq   | 0.00                                    |
| 11.48<br>11.65 | 277.74<br>232.79   | 2.16                | 1.28<br>0.93     | 110<br>110 | 0.641          | 976            | 1.29<br>0.93 | 0.50         | 1.29         | 281.99               | 1.63<br>1.57 |            |                  |               |              | 2.85<br>2.90       |                  | 340.3<br>283.0     |              |                    |                | 0.315<br>0.315       | Non-Liq.<br>Non-Liq. |           | 0.00<br>0.00                            |
| 11.81<br>11.98 | 242,50<br>238,61   |                     | 0.76<br>1.00     | 110<br>110 |                |                |              |              |              |                      | 1.49<br>1.59 |            |                  |               |              | 2.95<br>3.00       |                  | 292.8<br>286.1     |              |                    |                | 0.315<br>0.315       | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00                            |
| 12.14<br>12.30 | 226.91<br>230.52   | 2.22                | 0.98<br>0.93     | 110<br>110 | 0,668          | 975            | 0.98         | 0.50         | 1.26         | 269.19               | 1.60         |            | 1 1              | 100           | 1.00         | 3.05<br>3.10       | 1.00             | 270.2<br>272.7     | 1.00         | Infin              | 0.000          | 0.315                | Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00                                    |
| 12.47          | 221.89<br>219.46   | 1.76                | 0.79<br>0.72     | 110<br>110 | 0.686          | 974            | 08.0         | 0.50         | 1.24         | 259.71               | 1.54         |            | 1 1              | 100           | 1.00         | 3.15<br>3.20       | 1.00             | 260.7              | 1.00         | Infin              | 0.000          | 0.315                | Non-Liq.             | Non-Liq.  | 0.00                                    |
| 12.63          |                    |                     | ULL              | 110        | U 080 (        | 1.374          | U1/          | 0.50         | 1.23         | 255,17               | 1.27         |            |                  |               |              | 3 7/1              | T UU 2           | 256.1              | L.UU         | Infin.             | 0.000          | 0.315                | Non-Liq.             | NOD-LIG   | 0.00                                    |

| _ayer        | Tip              | Friction     | Friction     | Total      | Eff.Stress     | S     |              |              |      |                  |              | 0   | Liquef.            | Rel        |      |      |      | Clean |      |                   |       | Induced | Liquefac.            |          | Volumetra |
|--------------|------------------|--------------|--------------|------------|----------------|-------|--------------|--------------|------|------------------|--------------|-----|--------------------|------------|------|------|------|-------|------|-------------------|-------|---------|----------------------|----------|-----------|
| Depth        | Qc               | Fs           | Ratio        | Unit Wt.   | at Midpt       |       |              |              |      | Corrected        | d            | SUC | Liquef,<br>Suscept | Dens:      |      | Н    |      | Sand  |      |                   | EQ    | M=7.5   | Safety               | Probab.  | Strain    |
| (feet)       | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd    | F            | n            | Co   | Qc1n             | ſc           |     | (0 or 1)           |            | Kc   | (m)  | Ku   | Qcin  | Κσ   | CRR <sub>75</sub> | CRR   | CSR     | Factor               | P        | (%)       |
| 2.96         | 195.33           | 1.35         | 0,69         | 110        | 0.713          | 0.973 | 0.70         | 0.50         | 1.22 | 224.11           | 1.54         |     | 1                  | 100        | 1.00 | 3.30 | 1.00 | 225.0 | 1.00 | Infin.            | 0.000 | 0.314   | Non-Lig.             | Non-Lia  | 0.00      |
| 3 12         | 189 89           | 1.37         | 0.72         | 110        | 0.722          | 0.973 | 0.72         | 0.50         | 1,21 | 216,47           | 1.57         |     | 1                  | 100        | 1.00 | 3.35 | 1.00 | 217.3 | 1.00 | Infin.            | 0.000 | 0.314   | Non-Liq.             |          | 0.00      |
| 3.29         | 182.75           | 2.89         | 1,58         | 110        | 0.731          | 0.972 | 1.59         | 0.56         | 1.23 | 211,28           | 1,82         |     | -1                 | 100        | 1.13 | 3,40 | 1.00 | 238.6 | 1.00 | Infin.            | 0,000 | 0.314   | Non-Liq.             | Non-Liq. | 0.00      |
| 3_45         | 189.66           | 3.51         | 1.85         | 110        | 0.740          | 0.972 | 1.86         | 0.57         | 1,23 | 218,84           | 1,87         |     | -1                 | 100        | 1.16 | 3,45 | 1.00 | 255.0 | 1.00 | Infin.            | 0.000 | 0.314   | Non-Liq.             | Non-Liq. | 0.00      |
| 3 62         | 243,92           | 3.67         | 1,50         | 110        | 0.749          | 0.972 | 1.51         | 0.53         | 1.20 | 275.93           | 1.74         |     | -1                 | 100        | 1.06 | 3,50 | 1.00 | 294_2 | 1.00 | Infin.            | 0,000 | 0.314   | Non-Liq.             | Non-Liq. | 0.00      |
| 3.78         | 196,55           | 3.12         | 1,59         | 110        | 0.758          | 0.971 | 1.59         | 0.55         | 1.20 | 222.44           | 1.81         |     | 1                  | 100        | 1.12 | 3.55 | 1.00 | 249 0 | 1,00 | Infin_            | 0.000 | 0.314   | Non-Liq.             | Non-Liq  | 0.00      |
| 3 94         | 166,33           | 2.01         | 1,21         | 110        | 0,767          | 0.971 | 1.22         | 0.54         | 1.19 | 186,17           | 1,77         |     | 1                  | 100        | 1.09 | 3.60 | 1.00 | 203.2 | 1.00 | Infin.            | 0.000 | 0.314   | Non-Liq.             | Non-Liq. | 0.00      |
| 4.11         | 168.09           | 2.05         | 1.22         | 110        | 0,776          | 0.971 | 1.22         | 0.54         | 1.18 | 186,97           | 1,77         | €.  | 1                  | 100        | 1,09 | 3.65 | 1.00 | 204.2 |      | Infin.            | 0.000 | 0.314   | Non-Liq.             | Non-Liq. | 0.00      |
| 1,27         | 186,64           | 4.05         | 2.17         | 110        | 0,785          | 0,970 | 2.18         | 0.59         | 1.19 | 209,42           | 1.94         |     | 1                  |            | 1,22 | 3,70 | 1.00 | 257.4 |      | Infin_            | 0.000 | 0.314   | Non-Liq.             |          | 0.00      |
| 4.44         | 201.80           | 4.71         | 2,33         | 110        | 0,794          | 0,970 | 2.34         | 0.59         | 1.18 | 225,11           | 1,94         |     | 1                  | 100        | 1.23 |      | 1.00 |       | 1.00 | Infin_            | 0.000 | 0.313   | Non-Liq.             |          | 0.00      |
| 4.60         | 281.02           | 4.40         | 1.57         | 110        | 0,803          | 0,970 | 1.57         | 0.53         | 1.16 | 306,15           | 1,72         |     | 1                  | 100        | 1,05 | 3.80 | 1.00 |       | 1.00 | Infin             | 0.000 | 0,313   | Non-Liq.             |          | 0.00      |
| 4.76         | 344.71           | 3.37         | 0.98         | 110        | 0,812          | 0,969 | 0.98         | 0.50         | 1.14 | 371,03           | 1,51         |     | 1                  | 100        | 1,00 | 3.85 | 1.00 | -     | 1.00 | Infin_            | 0.000 | 0.313   | Non-Liq.             |          | 0.00      |
| 4,93<br>5.09 | 284.50<br>313.45 | 2.91<br>2.95 | 1.02<br>0.94 | 110<br>110 | 0,821<br>0.830 | 0.969 | 1.03<br>0.94 | 0.50         | 1.14 | 304,37           | 1,58         |     | 1                  | 100        | 1,00 | 3,90 | 1.00 | -     | 1.00 | Infin.            | 0,000 | 0.313   | Non-Liq.             |          | 0.00      |
| 5.26         | 330.55           | 3.27         | 0.99         | 110        | 0.839          | 0.968 | 0.94         | 0.50<br>0.50 | 1.13 | 333,60<br>349,94 | 1,52         |     |                    | 100        | 1.00 | 3.95 | 1.00 |       | 1,00 | Infin.            | 0,000 | 0.313   | Non-Liq.             |          | 0.00      |
|              | 347.21           | 3.40         | 0.98         | 110        | 0.848          | 0.968 | 0.98         | 0.50         | 1.12 | 349,94           | 1.53<br>1.51 |     | 1                  | 100        | 1,00 | 4.00 | 1.00 | 351.2 |      | Infin.            | 0.000 | 0.313   | Non-Liq.             |          | 0.00      |
| 5.58         | 369.08           | 4.35         | 1.18         | 110        | 0.857          | 0.967 | 1.18         | 0.50         | 1.11 | 386.68           | 1.56         |     | 1                  | 100<br>100 | 1.00 | 4.05 | 1.00 | 7.0   | 1,00 | Infin.            | 0,000 | 0.313   | Non-Liq.             |          | 0.00      |
| .75          | 398.50           | 4.30         | 1.08         | 110        | 0.866          | 0.967 | 1.08         | 0.50         | 1.11 | 415.38           | 1.52         |     | 1                  | 100        | 1.00 | 0.00 | 1.00 |       | 1.00 | Infin             | 0,000 | 0.313   | Non-Liq.             |          | 0.00      |
|              | 418.82           | 3.93         | 0.94         | 110        | 0.875          | 0.967 | 0.94         | 0.50         | 1.10 | 434.34           | 1.46         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 | infin.            | 0,000 | 0.313   | Non-Liq.             |          | 0.00      |
|              | 410.39           | 4.19         | 1.02         | 110        | 0.884          | 0.966 | 1.02         | 0.50         | 1.09 | 423.39           | 1.49         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 | Infin.            | 0,000 | 0.312   | Non-Liq.<br>Non-Liq. |          | 0.00      |
|              | 419.61           | 4.80         | 1.14         | 110        | 0.893          | 0.966 | 1.15         | 0.50         | 1.09 | 430.73           | 1.53         |     | 1                  | 100        | 1.00 | 4.30 |      |       | 1.00 |                   | 0,000 | 0.312   | Non-Liq.             |          | 0.00      |
|              | 443.67           | 4.84         | 1.09         | 110        | 0.902          | 0.966 | 1.09         | 0.50         | 1.08 | 453.18           | 1.50         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.312   | Non-Liq.             | 5.0      | 0.00      |
| 57           | 437.41           | 4.97         | 1.14         | 110        | 0.911          | 0.965 | 1.14         | 0.50         | 1.08 | 444.55           | 1.52         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.312   | Non-Liq.             | 5.0      | 0.00      |
|              | 435.84           | 4.65         | 1.07         | 110        | 0.920          | 0.965 | 1.07         | 0.50         | 1.07 |                  | 1.50         |     | 1                  |            | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.312   | Non-Liq.             |          | 0.00      |
| 90           | 448.38           | 4.22         | 0.94         | 110        | 0.929          | 0.965 | 0.94         | 0.50         | 1.07 | 451.26           | 1.45         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.312   | Non-Liq.             |          | 0.00      |
| 06           | 457.41           | 3.79         | 0.83         | 110        | 0.938          | 0.964 | 0.83         |              | 1.06 |                  | 1.40         |     | 1                  |            | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.312   | Non-Liq.             |          | 0.00      |
| 22           | 450.04           | 4.42         | 0.98         | 110        | 0.947          | 0.964 | 0.99         | 0.50         | 1.06 | 448.58           | 1.46         |     | 1                  | 100        | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.311   | Non-Lig.             |          | 0.00      |
| .39          | 437,15           | 4.09         | 0.94         | 110        | 0.956          | 0.963 | 0.94         | 0.50         | 1.05 | 433,64           | 1.45         |     | 1                  |            | 1.00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.311   | Non-Liq.             |          | 0.00      |
| .55          | 447.32           | 4,19         | 0.94         | 110        | 0,965          | 0.963 | 0.94         | 0.50         | 1.05 | 441.66           | 1.45         |     | 1                  | 100        | 1.00 | 4.70 | 1.00 | 443.3 | 1.00 |                   | 0.000 | 0.311   | Non-Lig.             |          | 0.00      |
| .72          | 476.04           | 4,81         | 1.01         | 110        | 0,974          | 0,963 | 1.01         | 0.50         | 1.04 | 467,89           | 1.46         |     | 1                  | 100        | 1.00 | 4.75 | 1.00 | 469.6 | 1.00 |                   | 0.000 | 0.311   | Non-Liq.             |          | 0.00      |
| 88           | 526.73           | 4.25         | 0.81         | 110        | 0,983          | 0,962 | 0.81         | 0.50         | 1.04 | 515,42           | 1.36         |     | 1                  | 100        | 1,00 | 4.80 | 1.00 | 517.3 | 1.00 | Infin.            | 0.000 | 0.311   | Non-Liq.             |          | 0.00      |
| .04          | 498.22           | 4.85         | 0.97         | 110        | 0.992          | 0.962 | 0.98         | 0.50         | 1.03 | 485,24           | 1.44         |     | 1                  | 100        | 1,00 | 4.85 | 1,00 | 487.1 | 1.00 | Infin_            | 0.000 | 0.311   | Non-Lig.             |          | 0.00      |
| 21           | 506.10           | 5.27         | 1.04         | 110        | 1_001          | 0.962 | 1.04         | 0.50         | 1.03 | 490,70           | 1.46         |     | 1                  | 100        | 1,00 | 4,90 | 1,00 | 492,5 | 1.00 | Infin_            | 0.000 | 0.311   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 512.17           | 6,70         | 1,31         | 110        | 1.010          | 0,961 | 1.31         | 0.50         | 1.02 | 494,36           | 1.55         |     | 1                  | 100        | 1.00 | 4.95 | 1,00 | 496,2 | 1.00 | Infin.            | 0.000 | 0,311   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 559.50           | 8.56         | 1.53         | 110        | 1.020          | 0.961 | 1.53         | 0.50         | 1.02 | 537.73           | 1.59         |     | 1                  | 100        | 1,00 | 5.00 | 1,00 | 539,7 | 1.00 | Infin.            | 0.000 | 0.310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 562,50           | 8.26         | 1.47         | 110        | 1.029          | 0.960 | 1.47         | 0.50         | 1_01 | 538,24           | 1.57         |     | 1                  | 100        | 1,00 | 5,05 | 1,00 | 540,2 | 1,00 | Infin.            | 0.000 | 0.310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 559,79           | 8.82         | 1,58         | 110        |                | 0.960 | 1.58         | 0.50         | 1.01 | 533,30           | 1.60         |     | 1                  | 100        | 1,00 | 5.10 | 1,00 | 535,3 | 1.00 | Infin.            | 0,000 | 0,310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 547,34           | 8.23         | 1,50         | 110        |                | 0.960 | 1.51         |              | 1.01 |                  | 1.59         |     | 1                  |            | 1.00 |      | 1,00 |       | 1.00 |                   | 0.000 | 0.310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 552.34           | 7.74         | 1.40         | 110        |                | 0.959 | 1.40         |              | 1.00 | 521.65           | 1.56         |     | 1                  |            | 1,00 |      | 1.00 |       | 1.00 |                   | 0.000 | 0.310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 492.99           | 7.25         | 1.47         | 110        |                |       | 1.47         |              | 1.00 |                  | 1.60         |     | 1                  |            | 1.00 |      | 1,00 |       | 1.00 |                   | 0.000 | 0.310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 443.38           | 5.21         | 1.18         | 110        |                |       | 1.18         |              | 0.99 |                  | 1.55         |     | 1                  |            | 1.00 |      | 1,00 |       | 0.99 |                   | 0.000 | 0,310   | Non-Liq.             | Non-Liq. | 0.00      |
|              | 430.83           | 4.17         | 0.97         | 110        |                | 0.958 | 0.97         |              | 0.99 |                  | 1.49         |     | 1                  |            | 1_00 |      | 1.00 | 403.0 |      |                   | 0.000 | 0,310   | Non-Liq.             |          | 0.00      |
|              | 411.08           | 3,30         | 0.80         | 110        |                | 0.957 | 0.80         | 0.50         | 0.98 |                  | 1.43         |     | 1                  |            | 1.00 |      | 1.00 |       | 0.99 |                   | 0.000 | 0.309   | Non-Liq.             | Non-Liq. | 0.00      |
| 0.01         | 393,49           | 2,98         | 0.76         | 110        | 1.101          | 0.957 | 0.76         | 0.50         | 0.98 | 363.61           | 1.43         |     | 1                  | 100        | 1.00 | 5.45 | 1.00 | 365.0 | 0.98 | Infin.            | 0.000 | 0.309   | Non-Liq.             | Non-Lig. | 0.00      |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

| Cutto   Cutt   |       |                  |               |              | _          | chool No.  | 8     |          | Me       | thods:  | Liquefac   |      |       |         |          |         |                    |       |                      |        |          | & Wride | )       |          |          | Total        |
|--|-------|------------------|---------------|--------------|------------|------------|-------|----------|----------|---------|------------|------|-------|---------|----------|---------|--------------------|-------|----------------------|--------|----------|---------|---------|----------|----------|--------------|
| Part      |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          | -       |                    |       |                      | •      | ,        |         |         |          |          | ,            |
| May    | FART  |                  |               |              |            | Plot:      | 3     |          | Induce   | 4 CSB   | (M-7.5):   | -06  | 5+0   | ICA*(po | (n'a)*cd | MCE     |                    |       |                      |        |          |         |         |          |          | (feet)       |
| Mart      |       |                  |               |              | 7.5        |            |       |          |          |         |            |      |       |         | p 0) 10  | NIOI    | SF =               | CRR,  | , <sub>5</sub> *Κσ/C | SR     |          |         |         |          | Probab   |              |
| The color   The    |       |                  | _             |              | 0.50       |            | Lie   | nit Maio | bt of ur | acoturo | tod coile  | 110  |       |         |          | Us      | e Toki             | matsu | & Seed               | (0) or | Ishihara |         | 7 '     |          | 1000     | 1933 A 100 A |
| Company   Comp   |       |                  | VT, feet:     |              |            | 1          |       |          |          |         |            |      | ٠.    |         |          |         |                    |       |                      | Vin Si | of Liq   |         |         |          |          |              |
|  |       |                  |               |              | Total      | Eff Strong |       | Limiting | lc for   | iquefia | ble soils: | 2.60 | (2)   | 1:      |          | ting Ic | for K <sub>H</sub> | 2.0   | - 4                  |        |          |         | Layers: | 0.00     | 0%       | 0.1          |
|  |       |                  |               |              |            |            |       |          |          |         | Corrected  | d    | eride | Suscep  |          |         | н                  |       |                      |        |          | EQ      |         |          |          |              |
| 9.33   100   |       |                  | - Independent |              |            |            |       |          |          |         |            |      |       | (0 or 1 |          | _       | (m)                |       |                      |        |          |         |         |          | PL       | (%)          |
| 166   167    | 0.33  | 79,05            | 1.53          | 1.94         | 110        | 0.018      | 1.000 | 1.94     |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 1   1   1   2   2   2   3   3   4   3   5   2   3   5   3   3   3   3   3   3   3   3  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 151 944 7 102 257 119 0.062 0.069 248 0.71 170 63.32 238 1 38 2.06 1.00 120 170 0.072 0.072 0.062 248 1.00 1.00 120 0.072 0.07 |       |                  |               |              |            |            |       |          |          | 1.70    | 88.09      | 2.26 |       |         | 72       | 1.82    |                    | 1.00  | 159.9                | 1.00   | 0.460    | 0.460   | 0.323   | Non-Liq. | Non-Liq  | 0.00         |
| 148  | 1_15  | 39,47            | 1.02          | 2.57         | 110        | 0.063      | 0,999 | 2,58     | 0.71     | 1.70    | 63,32      | 2,33 |       | 1       | 58       | 2.06    |                    | 1.00  | 130.5                | 1.00   | 0.287    | 0,287   |         |          |          |              |
| 1848   1848   1849      |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 197 2005 042 200 110 0110 097 207 170 208 240 17 170 208 240 1 31 270 150 88 210 0146 6145 022 Non-Halp Non-Halp 020 200 2014 017 097 207 170 170 170 207 207 170 170 207 207 170 170 207 207 170 170 207 207 207 170 207 207 207 207 207 207 207 207 207 2  |       |                  |               |              |            |            |       |          |          |         |            |      |       | 1       |          |         |                    |       |                      |        |          |         |         | Non-Liq. | Non-Liq. | 0.00         |
| 1965   1968   246   110   118   119   118   119   118   119   11   | 1.97  | 20,55            | 0.42          | 2.06         | 110        | 0.108      | 0.998 | 2.07     | 0.75     | 1.70    | 32.85      | 2.49 |       |         | 31       | 2.70    |                    | 1.00  | 88.6                 | 1,00   | 0.145    | 0_145   | 0.322   | Non-Liq. | Non-Liq. | 0.00         |
| 1.50   | 2,30  | 19,65            | 0.48          | 2.45         | 110        | 0.126      | 0.997 | 2.46     | 0.77     | 1.70    | 31.37      | 2,55 |       | 1       |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 279 1338 67 40 110 0.152 0.056 4.07 100 0.152 0.056 4.07 0.27 0.27 0.27 0.27 0.27 0.27 0.27 0  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 1218   0.59   4.68   110   0.17   0.086   4.2   0.08   1.70   1.70   1.50   2.08   0.0   | 2.79  |                  |               | 4.06         | 110        | 0.153      | 0.996 | 4.10     | 0.85     | 1.70    | 22.17      | 2,81 |       | 0       |          |         |                    |       |                      | 1,00   |          |         | 0.322   | Non-Liq. | Non-Liq. | 0.00         |
| 344   11.57   612   522   110   0.189   614   618   619   7.7   612   625   62   10   10   10   10   10   10   10   1  | 3.12  | 12.18            | 0.59          | 4.85         | 110        | 0.171      | 0.995 | 4.92     | 0.88     | 1.70    | 19,30      | 2,90 |       | 0       |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 361   1.108   0.51   4.55   1.00   0.198   0.699   4.66   0.891   1.76   0.292   0.77   0.292   0.77   0.292   0.77   0.292   0.77   0.292   0 |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 394   2822   0.55   188   110   0.217   0.988   1.90   0.71   1.70   0.696   0.24   1   56   1.70    |       |                  |               |              |            |            |       |          |          |         |            |      |       |         | 31       | 2.81    |                    | 1.00  | 03.8                 |        | 0.157    | 0.157   | 0.321   | Non-Liq. | Non-Liq. | 0.00         |
| 4279 6.79 6.82 180 110 0.236 0.982 131 0.86 170 73.0 2.18 1 1 70 154.0 170 178.0 179 | 3,94  | 29.22            | 0.55          | 1.88         | 110        | 0,217      | 0,993 | 1.90     | 0.71     | 1.70    | 46.60      | 2.34 |       | 1       | 45       | 2.09    |                    | 1.00  | 97.6                 | 1.00   | 0.166    | 0,166   | 0,321   | Non-Liq. | Non-Liq. | 0.00         |
| 4.43   | 4,27  | 45,79            | 0.82          |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 476 62-10 1.77 1.98 110 0.282 0.991 1.90 0.64 1.70 9.396 2.10 1 1 77 1.48 1.00 1.44.7 1.00 1.36.2 0.320 0.300 Non-Lin, Non-Lin, 0.00 0.500 0.66.2 1.45 0.31 1.00 0.271 0.391 0.291 0.24 0.64 1.70 10.985 2.11 1 78 1.48 1.00 1.69.8 1.00 1.671 0.00 0.320 Non-Lin, Non-Lin, 0.00 0.500 0.621 1.45 0.31 1.00 0.990 0.992 0.24 0.64 1.70 10.915 0.211 1 80 1.47 1.00 169.8 1.00 1.071 0.00 0.320 Non-Lin, Non-Lin, 0.00 0.341 7.781 1.68 1.00 1.071 0.289 0.992 0.24 0.04 1.70 10.916 0.21 1 80 1.47 1.00 169.8 1.00 1.071 0.00 0.320 Non-Lin, Non-Lin, 0.00 0.341 7.781 1.68 1.00 1.071 0.391 0.992 0.992 0.24 0.04 1.70 1.07 1.07 1.07 1.07 1.07 1.07 1.07   |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         | Non-Liq. | Non-Liq. | 0.00         |
| 9.99 68.21 1.45 2.13 110 0.280 0.990 2.14 0.64 1.70 10915 2.11 1 80 1.47 1.00 18.08 1.00 16.01 0.00 0.320 Non-La, Non-La, O.0. 0.325 Non-La, Non-La, Non-La, Non-La, O.0. 0.325 Non-La,  |       |                  |               | 1.89         |            | 0.262      | 0.991 | 1.90     | 0.64     | 1.70    | 99.36      | 2,10 |       | 1       | 77       | 1.46    |                    | 1.00  | 144.7                | 1.00   | 0.362    | 0.362   | 0.320   | Non-Liq. | Non-Liq. | 0.00         |
| 5.41 77.81 1,53 2.40 110 0.289 0.989 2.11 0.81 7,70 124.55 2.07 1 1 88 1.40 1.00 174.2 1.00 187, 100 0.320 Mon-Liu, Non-Liu, Non- | 5.09  | 68,21            | 1.45          | 2.13         | 110        | 0.280      | 0.990 | 2.14     | 0.64     | 1.70    | 109.15     | 2.11 |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 5.59 85.70 1.64 1.95 1.10 0.37 0.989 1.12 0.61 1.70 137.21 2.01 1 90 1.31 1.00 179.9 1.00 1.01 1.00 0.320 0.30 Non-Liq. Non-Liq. 0.00 0.37 1.76 0.00 1.30 1.00 1.00 1.00 1.00 1.00 1.00  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 15.78   15.98   1.44   110   0.329   0.988   1.47   0.55   1.70   24.94   1.76   1.70   1.7   |       |                  |               |              |            |            |       |          |          |         |            |      |       | -       |          |         | 1.00               |       | 179.9                | 1.00   | Infin    | 0.000   | 0.320   | Non-Liq. | Non-Liq. | 0.00         |
| 1829 18525 1848 129 110 0349 0988 122 035 170 21677 173 0 1 100 106 1215 100 2331 100 1016 107 000 2331 000 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 100 2301 000 1016 1016 | 5.91  | 115.78           | 1.63          | 1.41         | 110        | 0.325      | 0.988 | 1.41     | 0.55     | 1.70    | 185,51     | 1.82 |       | 1       | 100      | 1.12    | 1.05               | 1.00  | 209.1                | 1.00   | Infin.   | 0,000   | 0.319   | Non-Liq. | Non-Liq. |              |
| 14487   7.70   1.78   1.10   0.381   0.381   0.381   1.18   0.52   1.70   232.20   1.70   1   10   1.02   1.02   1.02   1.02   1.01   1.05   1.00   0.31   0.00   0.00   0.31   0.00   0.00   0.31   0.00     | 6.23  | 135.25           | 1.64          | 1.21         |            | 0.343      |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 154.10 1.74 1.13 1.10 0.370 0.986 1.13 0.51 1.70 247.01 1.67 1.07 1.07 0.70 1.07 1.07 0.70 1.07 1.07   |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 7.05   165.12   1.78   1.08   1.10   0.398   0.998   0.995   0.95   0.55   257.24   1.64   1   100   1.00   1.40   1.00   257.5   1.00   Infin.   0.000   0.319   Non-Liq.   Non-Liq.   0.00   0.75    |       |                  |               |              |            | 0.370      | 0.986 | 1.13     | 0.51     | 1.70    | 247_01     | 1.67 |       | 1       | 100      | 1.02    | 1.30               | 1.00  | 251,8                | 1.00   | Infin.   | 0.000   | 0.319   | Non-Liq. | Non-Liq. | 0.00         |
| 7.78   17.82   1.88   0.94   110   0.40   0.985   0.8   0.8   0.8   0.94 | 7.05  | 165.12           | 1.78          | 1.08         | 110        | 0.388      | 0.986 | 1.08     | 0.50     | 1.65    | 257.24     | 1.64 |       | 1       | 100      | 1.00    | 1.40               | 1.00  | 257.5                | 1.00   |          | 0.000   |         |          |          |              |
| 7.55   17.84   16.3   0.94   110   0.415   0.985   0.94   0.50   1.60   2.6172   1.59   1   100   1.00   1.55   1.00   2.57   1.00   1.016   1.00   0.00   0.318   Non-Liq   0.00   0.77   17.73   17.384   1.63   0.94   110   0.424   0.994   0.50   1.55   2.581   1.180   1   1.00   1.00   1.65   1.00   2.59   1.00   1.016   1.00   0.00   0.318   Non-Liq   0.00   0.318   0.00   0.318   0.00   0.318   0.00   0.318   0.00   0.318   0.00   0.318   0.00    |       |                  |               |              |            |            |       |          |          |         |            |      |       | 1       |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 7.87 174.47 163 0.94 110 0.433 0.984 0.94 0.50 1.56 257.11 1.60 1 100 1.00 1.85 1.00 258.1 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 18.80 18.51 2.06 1.10 110 0.451 0.983 1.11 0.50 1.55 281.61 1.63 1 100 1.00 1.75 1.00 270.3 1.00 Infin. 0.000 0.318 Non-Liq. Non-Liq. 0.00 18.83 187.62 1.80 0.98 1.00 0.983 0.98 0.50 1.52 288.24 1.59 1 100 1.00 1.05 1.05 1.00 1.05 1.05  |       |                  |               |              |            |            |       |          |          |         |            |      |       | 1       |          |         |                    | 1.00  | 262.7                | 1.00   | Infin.   | 0.000   | 0.318   | Non-Liq. | Non-Liq. | 0.00         |
| 186.51   2.06   1.10   1.10   0.451   0.983   1.11   0.50   1.53   269.32   1.54   1   1.00   1.00   1.75   1.00   270.3   1.00   1.01   1.01   0.00   0.318   Non-Liq. Non-Liq.   0.00   0.318   0.   | 7,87  | 174.47           | 1.63          | 0.94         | 110        | 0.433      | 0.984 | 0.94     | 0.50     | 1.56    | 257.11     | 1.60 |       |         | 100      | 1.00    | 1.65               | 1.00  | 258.1                | 1.00   | Infin:   | 0.000   | 0.318   | Non-Liq. | Non-Liq. | 0.00         |
| 8.53   196.66   1.97   1.00   1.10   0.468   0.982   1.01   0.50   1.50   278.47   1.60   1   100   1.00   1.85   1.00   279.5   1.00   Infin.   0.000   0.317   Non-Liq.   Non- | 8.20  | 186.51           | 2.06          | 1.10         | 110        | 0.451      | 0.983 | 1.11     | 0,50     | 1,53    |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 8.69   203.40   2.06   1.01   110   0.478   0.982   1.01   0.50   1.49   285.29   1.59   1   100   1.00   1.90   1.00   286.4   1.00   Infin   0.000   0.317   Non-Liq   Non-Liq   0.00  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 9.02 211,76 2.34 1.10 110 0.496 0.981 1.11 0.50 1.46 291.57 1.62 1 100 1.00 2.00 1.00 292.7 1.00 1nfin. 0.000 0.317 Non-Liq. 0.00 9.35 119.54 2.54 1.16 110 0.550 0.981 1.09 0.50 1.45 294.28 1.61 1 100 1.00 2.05 1.00 295.4 1.00 1nfin. 0.000 0.317 Non-Liq. Non-Liq. 0.00 9.35 129.54 2.54 1.16 110 0.514 0.981 1.17 0.50 1.42 396.93 1.63 1 100 1.00 2.10 1.00 298.0 1.00 1nfin. 0.000 0.317 Non-Liq. Non-Liq. 0.00 9.35 129.54 2.54 1.16 110 0.534 0.980 1.17 0.50 1.42 396.93 1.63 1 100 1.00 2.10 1.00 298.0 1.00 1nfin. 0.000 0.317 Non-Liq. Non-Liq. 0.00 9.35 129.54 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0  |       |                  |               |              |            |            |       |          |          |         | 285,29     | 1,59 |       |         | 100      | 1.00    | 1.90               | 1.00  | 286.4                | 1.00   | Infin.   | 0.000   | 0.317   | Non-Liq. | Non-Liq. | 0.00         |
| 9.35   | 9.02  | 211.76           | 2.34          | 1.10         | 110        | 0.496      | 0.981 | 1.11     | 0.50     | 1.46    | 291.57     | 1.62 |       | 1       | 100      | 1.00    | 2.00               | 1.00  | 292.7                | 1.00   |          | 0.000   |         |          |          |              |
| 9.51   229.63   2.68   1.17   110   0.523   0.980   1.17   0.50   1.42   307.91   1.62   1   100   1.00   2.15   1.00   309.1   1.00   1.01   1.00   0.00   0.317   Non-Liq.   Non-Liq.   0.00   0.984   237.58   2.88   1.21   110   0.541   0.980   1.21   0.550   1.40   312.51   1.62   1   100   1.00   2.25   1.00   313.7   1.00   Infin.   0.000   0.317   Non-Liq.   0.00   0.00   0.00   0.317   Non-Liq.   0.00   0. |       | 219.54           |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 9.84   237.58   2.88   1.21   110   0.541   0.980   1.21   0.50   1.40   313.21   1.63   1   100   1.00   2.25   1.00   314.4   1.00   1.0in,   0.000   0.317   Non-Liq.   0.00   0.017   Non-Liq.   0.00   0.017   Non-Liq.   0.00   0.017   Non-Liq.   0.00   0.017   Non-Liq.   0.00    |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          | 0.00         |
| 10.17   237.10   2.96   1.25   110   0.559   0.979   1.25   0.50   1.38   307.65   1.64   1   100   1.00   2.35   1.00   308.3   1.00   1.07   1.00   0.316   Non-Liq. Non-Liq | 9.84  | 237.58           | 2.88          | 1.21         | 110        | 0.541      | 0.980 | 1.21     | 0.50     | 1-40    | 313.21     | 1.63 |       | 1       | 100      | 1.00    | 2,25               | 1.00  | 314.4                | 1.00   | Infin.   | 0.000   | 0.317   | Non-Liq. | Non-Liq  | 0.00         |
| 10.50  | 10.17 | 237.10           | 2.96          | 1.25         | 110        | 0.559      | 0.979 | 1,25     | 0.50     | 1.38    | 307.65     |      |       |         |          |         |                    | 1.00  | 308.3                | 1_00   |          |         |         |          |          |              |
| 10.66  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 10.99  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         | 100      | 1.01    | 2,50               | 1.00  | 314.6                | 1.00   | Infin.   | 0.000   | 0.316   | Non-Liq. | Non-Liq. | 0.00         |
| 11.32  | 10.99 | 254.32           | 3.43          | 1.35         | 110        | 0.604      | 977   | 1,35     | 0,51     | 1,33    | 318,41     | 1.66 |       | 1       | 100      | 1.01    | 2,60               | 1.00  | 323.3                | 1.00   | Infin    | 0.000   | 0.316   | Non-Liq. | Non-Liq. | 0.00         |
| 11.48 231.44 3.34 1.44 110 0.632 0.976 1.45 0.52 1.31 285.58 1.71 1 100 1.05 2.75 1.00 300.1 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 11.65 243.81 3.39 1.39 110 0.641 0.976 1.40 0.51 1.29 297.60 1.69 1 100 1.03 2.80 1.00 308.0 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 11.81 248.76 3.18 1.28 110 0.650 0.975 1.28 0.51 1.28 300.06 1.66 1 100 1.03 2.90 1.00 303.9 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 11.98 252.74 3.49 1.38 110 0.659 0.975 1.39 0.51 1.27 303.78 1.68 1 100 1.03 2.90 1.00 312.7 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.14 246.82 3.71 1.51 110 0.668 0.975 1.51 0.52 1.27 295.51 1.72 1 100 1.05 2.95 1.00 312.7 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.14 246.81 3.92 1.55 110 0.670 0.974 1.56 0.53 1.27 294.93 1.73 1 100 1.05 2.95 1.00 313.3 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.66 246.30 4.04 1.64 110 0.695 0.974 1.55 0.53 1.25 290.63 1.75 1 100 1.07 3.05 1.00 313.4 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.66 246.30 4.04 1.64 110 0.695 0.974 1.55 0.53 1.25 290.63 1.75 1 100 1.07 3.05 1.00 313.4 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.66 246.30 4.04 1.64 110 0.695 0.974 1.55 0.53 1.25 290.63 1.75 1 100 1.07 3.05 1.00 313.4 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00 12.66 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1   | 11.32 | 235.91           | 3.45          | 1.46         | 110        | 0.623      | 977   | 1,47     | 0.52     | 1.32    |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 11.81  |       |                  |               |              |            |            |       |          |          |         |            |      |       |         |          |         |                    |       | 300.1                | 1.00   | Infin.   | 0.000   | 0.315   | Non-Liq. | Non-Liq  | 0.00         |
| 12.14  | 11.81 | 248.76           | 3.18          | 1.28         | 110        | 0.650      | 975   | 1.28     | 0.51     | 1.28    | 300.06     | 1.66 |       | 1       | 100      | 1.01    | 2,85               | 1.00  | 303.9                | 1.00   | Infin.   | 0.000   | 0.315   | Non-Liq. | Non-Liq. | 0.00         |
| 12.47  | 12.14 | 246.32           | 3.71          | 1.51         | 110        | 0.668      | 975   | 1,51     | 0.52     | 1.27    | 295.51     | 1.72 |       | 1       | 100      | 1.05    | 2,95               | 1.00  | 311.7                | 1,00   | Infin.   | 0.000   | 0,315   | Non-Liq. | Non-Liq. | 0.00         |
| 12.63 246.30 4.04 1.64 110 0.695 0.974 1.65 0.53 1.25 290.63 1.75 1 100 1.07 3.10 1.00 313.4 1.00 Infin. 0.000 0.315 Non-Liq. Non-Liq. 0.00  | 12.47 | 246.81           | 3.92          | 1.59         | 110        | 0.686      |       |          |          |         |            |      |       |         |          |         |                    |       |                      |        |          |         |         |          |          |              |
| 12,80 <mark>244,00 4.09</mark> 1.67 110 0,704 0,973 1.68 0,54 1,25 286,30 1,76 1 100 1.08 3,15 1,00 310,9 1.00 Infin, 0,000 0,315 Non-Liq, Non-Liq, 0.00   |       | 246.30<br>244.00 |               | 1.64<br>1.67 | 110<br>110 |            |       | 1.65     | 0.53     | 1 25    | 290.63     |      |       | 1       | 100      | 1.07    | 3,10               | 1.00  | 313.4                | 1.00   | Infin.   | 0.000   | 0.315   | Non-Liq. | Non-Liq. | - 4          |

| ayer  | Tip              | Friction | Friction     | Total      | Eff Stres      | S              |              |        |      |           |      | 9   | Liquef.  | Rel.   |      |      |      | Clean |      |        |       | Induced | Liquefac. |                | Volumetri |
|-------|------------------|----------|--------------|------------|----------------|----------------|--------------|--------|------|-----------|------|-----|----------|--------|------|------|------|-------|------|--------|-------|---------|-----------|----------------|-----------|
| epth  | Qc               | Fs       | Ratio        | Unit Wt.   | at Midpt       |                |              |        |      | Corrected | d    | ŭ S | Suscept  | Dens.  |      | Н    |      | Sand  |      |        | EQ    | M=7:5   | Safety    | Probab         | Strain    |
| feet) | (tsf)            | (tsf)    | %            | (pcf)      | p'o (tsf)      | rd             | F            | n      | Co   | Qc1n      | lc   | ò   | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Κσ   | CRR75  | CRR   | CSR     | Factor    | P <sub>t</sub> | (%)       |
| 2.96  | 243,85           | 4.05     | 1,66         | 110        | 0.713          | 0,973          | 1,67         | 0.54   | 1.24 | 284.13    | 1.76 |     | 1        | 100    | 1.08 | 3.20 | 1.00 | 308.4 | 1,00 | Infin  | 0.000 | 0.314   | Non-Lig.  | Non-Lia        | 0.00      |
| 3_12  | 250.82           | 4.24     | 1.69         | 110        | 0,722          | 0.973          | 1,70         | 0.54   | 1.23 | 290.33    | 1.76 |     | 1        | 100    | 1.08 | 3,25 | 1.00 | 315.3 |      | Infin. | 0.000 | 0.314   | Non-Lig.  |                | 0.00      |
| 3.29  | 254,86           | 4.23     | 1.66         | 110        | 0,731          | 0.972          | 1.66         | 0,53   | 1,22 | 292.76    | 1.76 |     | 1        | 100    | 1.08 | 3,30 | 1.00 | 316.1 | 1,00 | Infin. | 0,000 | 0.314   | Non-Lig.  |                | 0.00      |
| 3.45  | 265.02           | 4.01     | 1,51         | 110        | 0.740          | 0.972          | 1.52         | 0.52   | 1,21 | 301,15    | 1.72 |     | 1        | 100    | 1.05 | 3,35 | 1.00 | 316.9 | 1.00 | Infin. | 0.000 | 0.314   | Non-Lig.  | 2.5            | 0.00      |
| 3.62  | 296.24           | 3.54     | 1.19         | 110        | 0.749          | 0 972          | 1,20         | 0,50   | 1.19 | 331,97    | 1,61 |     | 1        | 100    | 1,00 | 3.40 | 1.00 | 333.2 | 1.00 | Infin. | 0,000 | 0.314   | Non-Lig.  | Non-Lig.       | 0.00      |
| 3.78  | 358,75           | 4.85     | 1,35         | 110        | 0.758          | 0.971          | 1.35         | 0.50   | 1.18 | 399.79    | 1,61 |     | <b>1</b> | 100    | 1,00 | 3.45 | 1.00 | 401.3 | 1.00 | Infin. | 0,000 | 0.314   | Non-Liq.  | Non-Liq.       | 0.00      |
| 94    | 401,73           | 4.27     | 1.06         | 110        | 0.767          | 0.971          | 1.07         | 0,50   | 1.17 | 445.14    | 1.49 |     | 1        | 100    | 1,00 | 3.45 | 1.00 | 446.8 | 1.00 | Infin. | 0.000 | 0.314   | Non-Liq.  | Non-Liq.       | 0.00      |
| 1.11  | 397.89           | 5.59     | 1,40         | 110        | 0.776          | 0.971          | 1,41         | 0,50 : | 1,17 | 438.29    | 1.60 |     | =1]      | 100    | 1.00 | 3.45 | 1.00 | 439.9 | 1.00 | Infin. | 0.000 | 0.314   | Non-Liq.  | Non-Liq.       | 0.00      |
| 27    | 408.46           | 4,70     | 1.15         | 110        | 0.785          | 0.970          | 1.15         | 0,50   | 1,16 | 447.36    | 1.52 |     | 1        | 100    | 1.00 | 3.45 | 1.00 | 449.0 | 1,00 | Infin. | 0,000 | 0.314   | Non-Liq.  | Non-Liq.       | 0.00      |
| 1.44  | 435.23           | 5,55     | 1.28         | 110        | 0.794          | 0_970          | 1.28         | 0.50   | 1,15 | 474.00    | 1,55 |     | 1        | 100    | 1.00 | 3.45 | 1.00 | 475.8 | 1.00 | Infin. | 0.000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 389.69           | 5,04     | 1.29         | 110        | 0.803          | 0_970          | 1,30         | 0,50   | 1.15 | 421,92    | 1.58 |     | 1        | 100    | 1,00 | 3.45 | 1.00 | 423.5 | 1.00 | Infin. | 0.000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 348,88           | 3.51     | 1.01         | 110        | 0.812          | 0,969          | 1,01         | 0.50   | 1.14 | 375,53    | 1.52 |     | 1        | 100    | 1.00 | 3.45 | 1.00 | 376.9 |      | Infin. | 0.000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
| 100   | 347.64           | 3.21     | 0.92         | 110        | 0.821          | 0,969          | 0.93         | 0,50   | 1.14 | 372.12    | 1.49 |     | 1        | 100    | 1.00 | 3.45 | 1.00 | 373.5 |      | Infin. | 0,000 | 0,313   | Non-Liq.  | Non-Liq.       | 0.00      |
| 09    | 366,34           | 3.29     | 0.90         | 110        | 0.830          | 0,969          | 0.90         | 0.50   | 1,13 | 390,04    | 1,47 |     | 1        | 100    | 1,00 | 3.45 | 1.00 | 391.5 |      | Infin. | 0,000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 355,46           | 3.76     | 1,06         | 110        | 0,839          | 0,968          | 1.06         | 0.50   | 1.12 | 376.38    | 1.53 |     | 1        | 100    | 1,00 | 3.45 | 1.00 | 377.8 | 1.00 | Infin. | 0.000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 339,34           | 3.85     | 1,14         | 110        | 0.848          | 0,968          | 1,14         | 0.50   | 1.12 | 357.34    | 1,57 |     | 1        | 100    | 1.00 | 3.45 | 1,00 | 358.7 | 1,00 | Infin  | 0_000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
| .58   | 338.34           | 4.27     | 1,26         | 110        | 0,857          | 0,967          | 1.27         | 0.50   | 1.11 | 354_40    | 1,61 |     | 1        | 100    | 1,00 | 3.45 | 1.00 | 355.7 | 1.00 | Infin. | 0_000 | 0.313   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 341.10           | 4.54     | 1,33         | 110        | 0,866          | 0,967          | 1.33         | 0.50   | 1.11 | 355,42    | 1,63 |     | 1        | 100    | 1.00 |      | 1.00 | 356.7 |      | Infin. | 0.000 | 0.313   | Non-Liq.  | Non-Liq        | 0.00      |
| ,91   | 335.06           | 4,41     | 1.32         | 110        | 0.875          | 0.967          | 1.32         | 0.50   | 1.10 | 347.30    | 1,63 |     | 1        |        | 1,00 |      | 1.00 | 348.6 | 2.4  | Infin. | 0.000 | 0.312   | Non-Liq.  | Non-Liq.       | 0.00      |
|       | 339.73           | 3.85     | 1,13         | 110        | 0.884          | 0,966          | 1.14         | 0.50   | 1.09 | 350,34    | 1,58 |     | 1        | 100    | 1,00 |      | 1.00 |       | 1,00 | Infin_ | 0.000 | 0.312   | Non-Liq.  | Non-Liq        | 0.00      |
|       | 339.17           | 3.94     | 1.16         | 110        | 0,893          | 0,966          | 1.16         | 0.50   | 1.09 | 347,98    | 1.59 |     | 1        |        | 1,00 |      | 1,00 |       | 1,00 | Infin  | 0,000 | 0.312   | Non-Liq.  |                | 0.00      |
|       | 304.89           | 4.11     | 1.35         | 110        | 0,902          | 0.966          | 1.35         | 0,51   | 1.08 | 311,54    | 1,67 |     | 1        | 100    | 1.02 |      | 1,00 |       | 1,00 | Infin  | 0,000 | 0.312   | Non-Liq.  | Non-Liq        | 0.00      |
|       | 240.39           | 3.63     | 1,51         | 110        | 0.911          | 0.965          | 1.51         | 0.54   | 1.08 | 245,31    | 1,77 |     | 1        | 100    | 1,08 |      | 1,00 |       | 1.00 | Infin_ | 0,000 | 0.312   | Non-Liq.  | Non-Liq        | 0.00      |
|       | 200.85           | 3.97     | 1.97         | 110        | 0.920          | 0 965          | 1.98         | 0.58   | 1_08 | 204.91    | 1,91 |     | 1        | 100    | 1,20 |      | 1,00 |       | 1.00 | Infin_ | 0,000 | 0.312   | Non-Liq.  |                | 0.00      |
|       | 186.05           | 3,36     | 1.80         | 110        | 0.929          | 0.965          | 1.81         | 0.58   | 1.08 | 188,60    | 1.90 |     | 1        | 100    | 1,19 | 3.45 |      | 225,2 |      | Infin. | 0,000 | 0.312   | Non-Liq.  |                | 0.00      |
|       | 145,35           | 4.55     | 3.13         | 110        | 0.938          | 0.964          | 3.15         | 0.65   | 1.08 |           | 2.15 |     | 1        | 93     | 1.56 |      | 1.00 |       | 1,00 | Infin. | 0,000 | 0.312   | Non-Liq.  | 100            | 0.00      |
|       | 137.21           | 1.70     | 1.24         | 110        | 0.947          | 0,964          | 1.25         | 0.57   | 1.06 |           | 1.87 |     | 1        | 90     | 1.16 |      | 1_00 | 160.3 |      | Infin. | 0,000 | 0.311   | Non-Liq.  | •              | 0.00      |
|       | 195.13<br>375.11 | 2.67     | 1.37         | 110        | 0,956          | 0,963          | 1.37         |        | 1.06 | 193,97    | 1.80 |     | 1        | 100    | 1.11 |      | 1.00 |       | 1.00 | Infin. | 0.000 | 0.311   | Non-Liq.  | 100            | 0.00      |
|       | 366.40           | 3.14     | 0.84         | 110        | 0.965          | 0.963          | 0.84         | 0.50   | 1.05 | 370,21    | 1.46 |     | 1        |        | 1.00 |      | 1.00 |       | 1.00 |        | 0.000 | 0.311   | Non-Liq.  | •              | 0.00      |
|       |                  | 3.61     | 0.98         | 110        | 0,974          | 0.963          | 0.99         |        | 1.04 |           | 1.52 |     | 1        |        | 1.00 |      | 1.00 | 361.2 |      |        | 0.000 | 0.311   | Non-Liq.  |                | 0.00      |
|       | 334.19           | 2.48     | 0.74         | 110        | 0,983          | 0,962          | 0.75         |        | 1.04 |           | 1,45 |     | 1        |        | 1.00 |      | 1,00 |       | 1.00 |        | 0.000 | 0.311   | Non-Liq.  |                | 0.00      |
|       | 253.24<br>169.29 | 2.71     | 1.07         | 110        | 0,992          | 0,962          | 1.08         |        | 1.03 |           | 1.65 |     | 1        |        | 1.00 |      | 1,00 |       | 1.00 |        | 0.000 | 0.311   | Non-Liq.  |                | 0.00      |
|       | 135.74           | 2.90     | 1.71<br>1.61 | 110        | 1.001          |                | 1.72         |        | 1,03 |           | 1.92 |     | 1        |        | 1.21 |      | 1.00 |       | 1,00 |        | 0.000 | 0.311   | Non-Liq.  |                | 0.00      |
|       | 258.73           | 2.13     | 0.82         | 110<br>110 | 1,010<br>1,020 | 0.961<br>0.961 | 1.62<br>0.83 |        | 1.03 |           | 1.97 |     | 8        |        | 1,26 |      | 1.00 |       | 1.00 |        | 0.000 | 0.311   | Non-Liq.  |                | 0.00      |
|       | 348.17           | 2.13     | 0.71         | 110        | 1.020          |                |              |        | 1.02 |           | 1.56 |     | 1        |        | 1,00 |      | 1,00 | 249.1 |      |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 379.90           | 3.61     | 0.71         | 110        | 1.029          | 0.960          | 0.71         |        | 1.01 |           | 1.43 |     | 1        |        | 1.00 |      | 1,00 | 334.0 |      |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 419.21           | 3.90     | 0.93         | 110        | 1.036          | 0.960<br>0.960 | 0.95<br>0.93 |        | 1.01 |           | 1.51 |     | 1        |        | 1.00 |      | 1.00 |       | 1.00 |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 396.96           | 4.58     | 1.15         | 110        | 1.047          | 0.959          | 1.16         |        | 1.00 |           | 1.47 |     | 1        |        | 1.00 |      | 1.00 | 398.9 |      |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 387.05           | 4.64     | 1.20         | 110        | 1.065          | 0.959          | 1.20         |        | 1.00 |           | 1.57 |     | 1        |        | 1.00 |      | 1.00 |       | 1.00 |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 368.81           | 4.55     | 1.23         | 110        |                | 0.959          | 1.20         |        | 0.99 |           | 1.59 |     | 1        |        | 1.00 |      | 1,00 |       | 1.00 |        | 0,000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 354.61           | 3.09     | 0.87         | 110        |                | 0.958          | 0.87         |        | 0.99 |           | 1.50 |     | 1        |        | 1.00 |      | 1.00 |       | 0.99 |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 342.37           | 2.52     | 0.74         | 110        |                | 0.957          | 0.74         |        | 0.99 |           | 1.46 |     | 1        |        | 1.00 |      | 1.00 |       | 0.99 |        | 0.000 | 0.310   | Non-Liq.  |                | 0.00      |
|       | 342.37           | 2.52     | 0.65         | 110        |                | 100            | 0.65         |        |      |           |      |     | 3        |        | 1.00 |      | 1.00 | 318.7 |      |        | 0.000 | 0.309   | Non-Liq.  |                | 0.00      |
| UI    | 0-12,04          | 2,21     | 0.00         | 110        | 12101          | 0.957          | 0.00         | 0.50   | 0.98 | 315.93    | 1_42 |     | 9        | 100    | 1.00 | 1.85 | 1.00 | 317.1 | 0.98 | Infin. | 0.000 | 0.309   | Non-Liq.  | Non-Liq        | 0.00      |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

|                 |                  | lob No:<br>Date:    | 301953<br>8/14/20 | -001        | chool No.              |                |              | Me           | thods:       | Liquefa<br>Post-liq<br>Dry Sar | uefactio           | on S             | Settleme            | nt Ana     | ılysis 1       | rom To       | okimats      | u & See        | ed (198      | 37)              | & Wride        | )                     |                      |                           | Total<br>Liquefied<br>Thickness |
|-----------------|------------------|---------------------|-------------------|-------------|------------------------|----------------|--------------|--------------|--------------|--------------------------------|--------------------|------------------|---------------------|------------|----------------|--------------|--------------|----------------|--------------|------------------|----------------|-----------------------|----------------------|---------------------------|---------------------------------|
| EARTH           | QUAKE            |                     | ATION:            |             | Plot:                  | 4              |              |              |              | (M=7.5):                       |                    |                  |                     | p'o)*rd    | /MSF           |              |              |                |              |                  |                |                       |                      |                           | (feet)<br>0.0                   |
|                 |                  | gnitude:<br>PGA, g: | 6.77<br>0.65      | 7,5<br>0,50 |                        |                |              | С            | lean Sa      | and Qc1n                       | = C <sub>Q</sub> * | K <sub>c</sub> * | 'K <sub>H</sub> *Qc |            |                |              |              | 7,5*Ko/C       |              | lehihor          | o 9 Voch       | mino (1)              | . ^                  | Probab                    | 0000000                         |
|                 |                  | MSF:                | 1.30              | 0,00        | <b>(b)</b>             | Ur             | nit Weig     | ht of ur     | nsatura      | ted soils:                     | 110                | рс               | :f                  |            | U              | SE TUR       | imatsu       | @ 3660         | ı (o) oı     | ISHIHAI          |                | ımine (1)<br>uired SF |                      | Avg<br>0%                 | Induced<br>Subsidence           |
| D               | GV<br>lesign GV  | VT, feet:           | 20.0              |             |                        |                |              |              |              | ted soils:                     |                    | рс               | :F                  | 1 im       | itina la       | for K.       | 2.0          |                |              |                  |                | Layers<br>Layers      |                      | Max<br>0%                 | (inches)<br>0.2                 |
| Layer           | Tip              |                     | Friction          | Total       | Eff.Stress             |                | Limiting     | 10 101       | iiquono      | DIO SOIIG.                     | 2.00               | ge               | Liquef.             |            | ing i          | , tol tol    | 2.0          | Clear          |              | OI LIQ           | uenable        |                       | Liquefac.            |                           | Volumetric                      |
| Depth<br>(feet) | Qc<br>(tsf)      | Fs<br>(tsf)         | Ratio<br>%        | Unit Wt.    | at Midpt,<br>p'o (tsf) | rd             | F            | n            | Co           | Correcte<br>Qc1n               | d<br>Ic            |                  | Suscept<br>(0 or 1) |            | K <sub>c</sub> | H<br>(m)     | KH           | Sand           |              | CDD              | EQ<br>CRR      | M=7.5<br>CSR          |                      | Probab.                   | Strain                          |
| 0.16            | 92.62            | 1.11                | 1,20              | 110         | 0.009                  | 1.000          | 1.20         | 0.56         | 1.70         | 148.81                         | 1.84               |                  | 1                   | 93         | 1.13           |              |              | Qc1n<br>168,8  | 1.00         | CRR <sub>7</sub> | 0.000          | 0,323                 | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Liq | 0.00                            |
| 0.33            | 130 04<br>152 39 | 2.02<br>3.01        | 1.55<br>1.98      | 110<br>110  | 0.018<br>0.027         | 1.000          | 1.55<br>1.98 | 0.55<br>0.57 | 1.70<br>1.70 | 208.92<br>244.82               | 1.82<br>1.86       |                  | 1                   | 100<br>100 | 1.12<br>1.16   |              |              | 234.3<br>282.8 | 1.00         | Infin.<br>Infin. | 0.000          | 0.323                 | Non-Liq.             | Non-Liq<br>Non-Liq        | 0.00<br>0.00                    |
| 0.66<br>0.82    | 146.45<br>125.63 | 3.22<br>2.97        | 2.20<br>2.36      | 110<br>110  | 0.036<br>0.045         | 1.000          | 2.20         | 0.58         | 1.70         | 235,26                         | 1.91               |                  | 1                   | 100        | 1.20           | 0.25         | 1.00         | 282.0          | 1.00         | Infin.           | 0.000          | 0.323                 | Non-Liq.             | Non-Liq                   | 0.00                            |
| 0.98            | 97,23            | 2.48                | 2.55              | 110         | 0.054                  | 1.000<br>1.000 | 2.55         | 0.60<br>0.63 | 1.70<br>1.70 | 201.79<br>156.14               | 1.97<br>2.07       |                  | 1<br>1              | 100<br>95  | 1.27<br>1.40   |              | 1.00         | 255.7<br>218.4 | 1.00<br>1.00 | Infin.<br>Infin. | 0.000          | 0.323<br>0.323        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 1.15            | 63.94<br>63.94   | 1.59<br>1.59        | 2,49              | 110<br>110  | 0,063<br>0,072         | 0.999          | 2.50<br>2.50 | 0.66<br>0.66 | 1.70<br>1.70 | 102.64<br>102.62               | 2,18<br>2.18       |                  | 1                   | 78<br>78   | 1.61<br>1.61   |              | 1.00         | 165.7<br>165.7 |              | Infin.<br>Infin. | 0,000          | 0.323                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 1.48<br>1.64    | 41.59<br>28.11   | 1.09<br>0.74        | 2.61<br>2.64      | 110<br>110  | 0.081                  | 0.999          | 2.62<br>2.64 | 0.70<br>0.74 | 1.70<br>1.70 | 66.70<br>45.02                 | 2.32<br>2.45       |                  | 1<br>1              | 60<br>44   | 2.02<br>2.52   |              | 1.00         | 134.8<br>113.6 | 1.00         | 0.308<br>0.216   | 0.308          | 0.323                 | Non-Liq.             | Non-Liq                   | 0.00                            |
| 1.80            | 20.76            | 0,53                | 2,55              | 110         | 0.099                  | 0.998          | 2.57         | 0.77         | 1.70         | 33.20                          | 2,54               |                  | 1                   | 31         | 2.98           |              | 1.00         | 98.9           | 1.00         | 0.170            | 0.170          | 0.323                 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 1.97<br>2.13    | 21.63<br>34.59   | 0.56<br>0.78        | 2,58<br>2,25      | 110<br>110  |                        | 0.998<br>0.997 | 2.60<br>2.26 | 0.77<br>0.71 | 1.70<br>1.70 | 34.58<br>55.39                 | 2,53<br>2,34       |                  | 1<br>1              | 33<br>52   | 2.92<br>2.07   |              | 1.00         | 101.1<br>114.6 | 1.00         | 0.176<br>0.220   | 0.176<br>0.220 | 0.322                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 2,30<br>2,46    | 34.08<br>31.06   | 0.89                | 2.61<br>2.60      | 110<br>110  |                        | 0.997          | 2.62<br>2.61 | 0.72<br>0.73 | 1.70<br>1.70 | 54.56<br>49.69                 | 2,39               | -                | 1<br>1              | 52<br>48   | 2.25<br>2.37   |              | 1.00         | 123.0<br>117.7 | 1.00         | 0.253            | 0.253          | 0.322                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 2.62<br>2.79    | 26.71<br>24.66   | 0.71<br>0.64        | 2.65<br>2.61      | 110<br>110  | 0.144                  | 0.996          | 2.67<br>2.62 | 0.75         | 1.70         | 42.69                          | 2.47               |                  | 1                   | 42         | 2.62           |              | 1,00         | 111,6          | 1.00         | 0.209            | 0.209          | 0,322                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 2.95            | 22,66            | 0.59                | 2.60              | 110         | 0.162                  | 0.996<br>0.995 | 2.62         | 0.76<br>0.76 | 1.70<br>1.70 | 39 38<br>36 15                 | 2,49<br>2,52       |                  | 1                   | 38<br>35   | 2.72<br>2.86   |              | 1,00<br>1,00 | 107.1<br>103.4 | 1.00         | 0.194<br>0.183   | 0.194<br>0.183 | 0.322<br>0.322        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 3.12<br>3.28    | 21.79<br>20.52   | 0.57<br>0.55        | 2.60<br>2.69      | 110<br>110  |                        | 0.995<br>0.994 | 2.62<br>2.72 | 0.77<br>0.78 | 1.70<br>1.70 | 34.74<br>32.68                 | 2.53<br>2.56       |                  | 1<br>1              | 33<br>30   | 2.93<br>3.10   |              | 1,00         | 101.7<br>101.3 | 1.00         | 0.178<br>0.177   | 0.178<br>0.177 | 0.322                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 3.44<br>3.61    | 18.85<br>16.96   | 0.54<br>0.52        | 2.86<br>3.05      | 110<br>110  |                        | 0.994<br>0.994 | 2.89<br>3.09 | 0.79<br>0.81 | 1.70<br>1.70 | 29.98<br>26.93                 | 2.61<br>2.66       |                  | 0                   |            |                |              |              |                | 1.00<br>1.00 |                  |                | 0.321                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 3.77            | 15.22            | 0.50                | 3.30              | 110         | 0.208                  | 0.993          | 3.34         | 0.82         | 1.70         | 24.12                          | 2,72               |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.321                 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 3.94<br>4.10    | 13.60<br>13.10   | 0.54<br>0.56        | 3.97<br>4.31      | 110<br>110  | 0.226                  | 0.993<br>0.993 | 4.03<br>4.38 | 0.85<br>0.86 | 1.70<br>1.70 | 21.50<br>20.69                 | 2.81<br>2.85       |                  | 0                   |            |                |              |              |                | 1.00<br>1.00 |                  |                | 0.321<br>0.321        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 4.27<br>4.43    | 13.76<br>12.78   | 0,61                | 4.45<br>4.94      | 110<br>110  |                        | 0.992          | 4.52<br>5.03 | 0.86<br>0.88 | 1.70<br>1.70 | 21.73<br>20.14                 | 2.84               |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.321                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 4.59<br>4.76    | 9.82<br>9.11     | 0.62<br>0.58        | 6.32<br>6.39      | 110<br>110  | 0.253                  | 0.991<br>0.991 | 6.49<br>6.58 | 0.93<br>0.93 | 1.70<br>1.70 | 15.37<br>14.22                 | 3.06               |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.320                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 4.92            | 9.64             | 0,67                | 6.94              | 110         | 0.271                  | 0.991          | 7.14         | 0.94         | 1.70         | 15.05                          | 3.09               |                  | Ō                   |            |                |              |              |                | 1.00<br>1.00 |                  |                | 0 320<br>0 320        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 5.09<br>5.25    | 11.05<br>26.79   | 0.51<br>0.51        | 4.60<br>1.91      | 110<br>110  |                        | 0.990<br>0.990 | 4.72<br>1.93 | 0.89<br>0.72 | 1.70<br>1.70 | 17.31<br>42.58                 | 2.93               |                  | 0<br>1              | 41         | 2.22           |              | 1.00         | 94.7           | 1.00         | 0.159            | 0.159          | 0.320<br>0.320        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 5.41<br>5.58    | 43.87<br>61.57   | 0.61<br>0.87        | 1.40              | 110<br>110  |                        | 0.989<br>0.989 | 1.41<br>1.42 | 0.65<br>0.61 | 1.70<br>1.70 | 70.01<br>98.44                 | 2.12               |                  | 1                   | 62<br>76   | 1.50<br>1.32   |              | 1.00         | 105.0<br>130.2 | 1.00         | 0.188<br>0.285   | 0.188<br>0.285 | 0.320                 | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 5.74            | 81.48            | 1.27<br>1.77        | 1.55              | 110         | 0.316                  | 0.989          | 1.56         | 0.60         | 1.70         | 130,42                         | 1.96               |                  | 1                   | 88         | 1.25           | 1.00         | 1.00         | 163.4          | 1.00         | Infin.           | 0.000          | 0.320                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 5.91<br>6.07    | 104.49<br>121.74 | 2.26                | 1.69<br>1.85      | 110<br>110  | 0.334                  | 0.988<br>0.988 | 1.70<br>1.86 | 0.58<br>0.58 | 1.70<br>1.70 | 167.37<br>195.08               | 1.91<br>1.90       |                  | 1                   | 98<br>100  | 1.20           | 1.05<br>1.10 | 1.00         | 201.7<br>232.8 | 1.00         | Infin.<br>Infin. | 0.000          | 0.319<br>0.319        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 6.23<br>6.40    | 129.40<br>133.71 | 2.54<br>2.63        | 1.96<br>1.97      | 110<br>110  |                        | 0.988<br>0.987 | 1.97<br>1.98 | 0.58<br>0.58 | 1.70<br>1.70 | 207.37<br>214.28               | 1.90<br>1.90       |                  | 1                   | 100<br>100 | 1.19           | 1.15<br>1.20 |              | 248.1<br>254.9 | 1.00         | Infin.<br>Infin. | 0.000          | 0.319                 | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 6.56<br>6.73    | 136.13<br>137.04 | 2.67<br>2.50        | 1.96<br>1.82      | 110<br>110  |                        | 0.987<br>0.986 | 1.97<br>1.83 | 0.57<br>0.57 | 1.70<br>1.70 | 218.15<br>219.60               | 1.89<br>1.86       |                  | 1                   | 100<br>100 | 1.18           | 1.20<br>1.20 | 1.00         | 258.3<br>254.6 | 1.00         | Infin,           | 0.000          | 0.319                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 6.89            | 134.61           | 2.27                | 1.69              | 110         | 0.379                  | 0.986          | 1.69         | 0.56         | 1.70         | 215.68                         | 1,84               |                  | 1                   | 100        | 1.14           | 1.20         | 1.00         | 246.3          | 1.00<br>1.00 | Infin.           | 0.000          | 0.319<br>0.319        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 7.05<br>7.22    | 133.55<br>130.84 | 2.02<br>1.92        | 1.51<br>1.47      | 110<br>110  |                        | 0.986<br>0.985 | 1.52<br>1.47 |              | 1.70<br>1.70 | 213.97<br>209.60               | 1.81<br>1.80       |                  | 1                   | 100<br>100 |                | 1.20         |              | 238.6<br>233.0 |              | Infin.<br>Infin. | 0.000          | 0.319<br>0.318        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 7.38<br>7.55    | 125.34<br>121.32 | 1.72<br>1.59        | 1.37              | 110<br>110  |                        | 0.985<br>0.985 | 1.38<br>1.32 | 0.55<br>0.55 | 1.69<br>1.67 | 199.24<br>190.42               | 1.79<br>1.79       |                  | 1                   | 100<br>100 | 1.10           | 1.20         | 1.00         |                | 1.00         | Infin.           | 0.000          | 0.318<br>0.318        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 7.71<br>7.87    | 121.32<br>117.69 | 1.59<br>1.47        | 1.31<br>1.25      | 110<br>110  | 0.424                  | 0.984<br>0.984 | 1.32<br>1.25 | 0.55<br>0.55 | 1.65<br>1.63 | 188.35<br>180.43               | 1.80<br>1.79       |                  | 1                   | 100        | 1.10           | 1.20         | 1.00         | 208 6          | 1.00         | Infin.           | 0.000          | 0.318                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 8.04            | 112.60           | 1.37                | 1.22              | 110         | 0.442                  | 0.984          | 1.22         | 0.55         | 1.61         | 170.99                         | 1.80               |                  | 1                   | 100<br>99  | 1.10<br>1.11   |              |              | 199.4<br>189.9 | 1.00         | Infin.           | 0.000          | 0.318<br>0.318        | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 8.20<br>8.37    | 105.92<br>94.02  | 1,25<br>1,10        | 1.18<br>1.17      | 110<br>110  |                        |                | 1.19<br>1.18 | 0.55<br>0.56 | 1.60<br>1.60 | 159.50<br>141.18               | 1.81<br>1.85       |                  | 1                   | 96<br>91   | 1.12           | 1.20<br>1.20 |              | 178.5<br>161.8 |              | Infin.<br>Infin. | 0.000          | 0.318<br>0.318        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 8.53<br>8.69    | 82,35<br>75.19   | 0.71                | 0.86              | 110<br>110  |                        | 0.982<br>0.982 | 0.86<br>0.92 | 0.55<br>0.56 | 1.56<br>1.56 | 121.02<br>110.51               | 1.81<br>1.85       |                  | 1<br>1              | 85<br>81   | 1.11<br>1.15   | 1.20         |              | 135.0<br>127.3 |              | 0.309            | 0.309<br>0.272 | 0.318<br>0.317        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 8.86<br>9.02    | 63.26<br>59.99   | 0.61<br>0.57        | 0.97              | 110<br>110  | 0.487                  | 0.982<br>0.981 | 0.97<br>0.96 | 0.59         | 1.57<br>1.56 | 93.45<br>87.95                 | 1.93               |                  | 1                   | 74         | 1.21           | 1.20         | 1.00         | 113,9          | 1.00         | 0.217            | 0.217          | 0.317                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 9.19            | 56,32            | 0.53                | 0.94              | 110         | 0.505                  | 0.981          | 0.94         | 0.60         | 1,55         | 81,99                          | 1.94<br>1.96       |                  | 1<br>1              | 71<br>69   | 1.23<br>1.25   | 1.20         | 1.00<br>1.00 |                | 1.00         | 0.182            | 0.182          | 0.317<br>0.317        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 9.35<br>9.51    | 53.37<br>48.12   | 0.45<br>0.39        | 0.85<br>0.82      | 110<br>110  |                        | 0.981<br>0.980 | 0.86<br>0.83 |              | 1.54<br>1.53 | 76.78<br>68.86                 | 1.96<br>1.99       |                  | 1<br>1              | 66<br>61   | 1.25<br>1.29   | 1.20<br>1.20 | 1.00         | 96.4<br>88.9   | 1.00<br>1.00 | 0.163<br>0.145   | 0.163<br>0.145 | 0.317<br>0.317        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 9.68<br>9.84    | 43.46<br>43.28   | 0.35                | 0.81<br>0.68      | 110<br>110  |                        | 0.980<br>0.980 | 0.82<br>0.69 |              | 1,53<br>1,50 | 61.93<br>60.60                 | 2.03<br>1.99       |                  | 1                   | 57<br>56   | 1.34<br>1.29   | 0.05         | 1.00<br>1.71 |                |              | 0.133            | 0.133          | 0.317<br>0.317        | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 10.01<br>10.17  | 40.37<br>38.85   | 0.42<br>0.35        | 1.04<br>0.91      | 110<br>110  | 0.550                  |                | 1.05<br>0.92 | 0.64         | 1.52<br>1.50 | 57.28<br>54.36                 | 2.12<br>2.10       |                  | 1                   | 54         | 1.48           | 4,90         | 1.00         | 84.9           | 1.00         | 0.137            | 0.137          | 0.318                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 10.33           | 35,99            | 0.37                | 1.03              | 110         | 0.568                  | 0.979          | 1.05         | 0.66         | 1.50         | 50.33                          | 2.16               |                  | 1                   | 52<br>48   | 1.46<br>1.58   |              | 1.00<br>1.00 |                | 1.00         | 0.126            |                | 0.316<br>0.316        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 10.50<br>10.66  | 35.23<br>32.68   | 0.33                | 0.94<br>0.98      | 110<br>110  |                        | 0.978<br>0.978 | 0.96<br>0.99 |              | 1.48<br>1.48 | 48.64<br>44.89                 | 2.15               |                  | 1<br>1              | 47<br>44   | 1.55<br>1.64   |              | 1.00<br>1.00 |                |              | 0.120            |                | 0.316<br>0.316        | Non-Liq.<br>Non-Liq. |                           | 0.00                            |
| 10.83<br>10.99  | 29.98<br>26.35   | 0.30                | 0.99<br>1.02      | 110<br>110  |                        |                | 1.01<br>1.04 |              | 1.47<br>1.47 | 40.94<br>35.85                 | 2.22               |                  | 1                   | 40<br>34   | 1.73<br>1.89   |              | 1.00<br>1.00 | 70.8<br>67.7   |              | 0.113<br>0.109   |                | 0.316<br>0.316        | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00                    |
| 11.15<br>11.32  | 21.42<br>14.65   | 0.31                | 1.43              | 110<br>110  | 0.614                  | 0.977          | 1.48         | 0.74         | 1.50         | 29.41                          | 2.44               |                  | 1                   | 26         | 2.47           |              | 1.00         | 72.5           | 1.00         | 0.115            | 0.115          | 0.316                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 11.48           | 9,05             | 0.21                | 2,30              | 110         | 0.632                  | 0.976          | 1.46<br>2.47 | 0.87         | 1.51<br>1.57 | 20.05<br>12.46                 | 2.57<br>2.87       |                  | 1<br>0              | 10         | 3.16           |              | 1.00         | 63.4           | 1.00         | 0.104            | U.1U4          | 0.316<br>0.315        | Non-Liq,<br>Non-Liq, |                           | 0.00<br>0.00                    |
| 11.65<br>11.81  | 7.19<br>2.70     | 0.20                | 2.77<br>4.89      | 110<br>110  |                        |                | 3.04<br>6.44 |              | 1.58<br>1.63 | 9.77<br>3.16                   | 3.01<br>3.60       |                  | 0<br>0              |            |                |              |              |                | 1.00         |                  |                | 0,315<br>0.315        | Non-Liq,<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 11.98<br>12.14  | 2.65<br>3.48     | 0.12<br>0.11        | 4.64<br>3.10      | 110<br>110  | 0.659                  | 0.975          | 6.18         | 1.00         | 1.61<br>1.58 | 3.02<br>4.21                   | 3.60<br>3.37       |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.315<br>0.315        | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                            |
| 12.30           | 2,50             | 0.10                | 3.84              | 110         | 0.677                  | 0.974          | 5.27         | 1.00         | 1.56         | 2.69                           | 3.61               |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.315                 | Non-Liq.             | Non-Liq.                  | 0.00                            |
| 12.47<br>12.63  | 1.85<br>1.79     | 0.13                | 5.73<br>7.43      | 110<br>110  | 0.695                  | ).974          | 12.14        | 1.00         | 1.54<br>1.52 |                                | 3.90<br>4.00       |                  | 0<br>0              |            |                |              |              |                | 1.00         |                  |                | 0.315<br>0.315        | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00                    |
| 12.80           | 5.10             | 0.29                | 5.59              | 110         | 0.704                  | 0.973          | 6.48         | 1.00         | 1.50         | 6.25                           | 3,36               |                  | 0                   |            |                |              |              |                | 1.00         |                  |                | 0.315                 | Non-Liq.             |                           | 0.00                            |

| Layer        | Tip              | Friction | Friction     | Total      | Eff_Stress     | S     |              |              |      |                  |              | 9    | Liquef.  | Rel.       |      |      |      | Clean          |      |        |       | Induced        | Liquefac             |          | Volumetri    |
|--------------|------------------|----------|--------------|------------|----------------|-------|--------------|--------------|------|------------------|--------------|------|----------|------------|------|------|------|----------------|------|--------|-------|----------------|----------------------|----------|--------------|
| Depth        | Qc               | Fs       | Ratio        | Unit Wt.   | at Midpt,      |       |              |              |      | Correcte         | ď            | eric | Suscept  | Dens       |      | Н    |      | Sand           |      |        | EQ    | M=7,5          | Safety               | Probab.  | Strain       |
| (feet)       | (tsf)            | (tsf)    | %            | (pcf)      | p'o (tsf)      | rd    | F            | n            | Ca   | Qc1n             | Ic           | õ    | (0 or 1) | Dr (%)     | Kc   | (m)  | KH   | Qc1n           | Κσ   | CRR75  | CRR   | CSR            | Factor               | PL       | (%)          |
| 2.96         | 30,82            | 0,58     | 1,88         | 110        | 0.713          | 0.973 | 1,92         | 0.73         | 1.34 | 38.00            | 2,42         | _    | 1        | 37         | 2 37 |      | 1,00 | 90.3           | 1,00 | 0.148  | 0.148 | 0.314          | Non-Liq.             | Non-Lig  | 0.00         |
| 3_12         | 81,21            | 1.11     | 1,36         | 110        | 0.722          | 0.973 | 1_37         | 0,61         | 1.26 | 96,14            | 2,01         |      | 1        | 75         | 1.32 |      | 1,00 | 126.7          | 1,00 | 0.269  | 0.269 | 0.314          | Non-Liq.             |          | 0.00         |
| 3.29         | 92,10            | 1.26     | 1,37         | 110        | 0.731          | 0_972 | 1_38         | 0,60         | 1,25 | 107,89           | 1.98         |      | 1        | 80         | 1,27 | 1.00 | 1,00 | 137.9          | 1,00 | 0.324  | 0.324 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.45         | 131.97           | 1.30     | 0,99         | 110        | 0.740          | 0.972 | 0_99         | 0.54         | 1.21 | 150,49           | 1.77         |      | 1        | 94         | 1.09 | 1,05 | 1,00 | 164.4          | 1,00 | Infin. | 0.000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.62         | 176,29           | 1.68     | 0.95         | 110        | 0.749          | 0.972 | 0.96         | 0,51         | 1,19 | 198,00           | 1.68         |      | 1        | 100        | 1.02 | 1.10 | 1,00 | 203.4          | 1,00 | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.78         | 208,26           | 2,28     | 1,09         | 110        | 0.758          | 0.971 | 1.10         | 0.51         | 1,19 | 232,55           | 1.68         |      | 1        | 100        | 1.02 |      | 1.00 | 238.3          |      | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.94         | 234.75           | 2,60     | 1,11         | 110        | 0,767          | 0.971 | 1:11         | 0.50         | 1.18 | 259.95           | 1.65         |      | 1        | 100        | 1,00 | 1,20 |      | 261.3          |      | Infin_ | 0,000 | 0.314          | Non-Liq.             | Non-Liq  | 0.00         |
| 4.11         | 244 80           | 2.82     | 1.15         | 110        | 0,776          | 0,971 | 1.16         | 0.50         | 1017 | 269.60           | 1.65         |      | 1        | 100        | 1,00 |      | 1.00 | 271.7          |      | Infin_ | 0.000 | 0_314          | Non-Liq.             |          | 0.00         |
| 4.27         | 272 06           | 2,98     | 1.09         | 110        | 0.785          | 0,970 | 1.10         | 0.50         | 1,16 | 297.68           | 1,61         |      | 1        | 100        | 1.00 |      | 1.00 | 298.8          |      | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 4.44         | 294.29           | 3.35     | 1.14         | 110        | 0,794          | 0,970 | 1.14         | 0.50         | 1.15 | 320,23           | 1,60         |      | 1        | 100        | 1.00 |      | 1.00 | 321.4          |      | Infin. | 0.000 | 0.313          | Non-Liq.             |          | 0.00         |
| 4.60         | 316.23           | 3.17     | 1.00         | 110        | 0,803          | 0,970 | 1,00         | 0.50         | 1.15 | 342,22           | 1.54         |      | 1        | 100        | 1,00 | 1,40 |      | 343.5          |      |        | 0.000 | 0.313          | Non-Liq.             |          | 0.00         |
| 4.76<br>4.93 | 316,63<br>294,75 | 3.35     | 1.06         | 110        | 0.812          | 0,969 | 1.06         | 0.50         | 1.14 | 340.73           | 1.56         |      | 1        | 100        | 1.00 |      | 1.00 | 342.0          |      |        | 0,000 | 0_313          | Non-Liq.             |          | 0.00         |
| 5 09         | 278.02           | 3.41     | 1.16         | 110<br>110 | 0.821          | 0.969 | 1.16         | 0.50         | 1,14 | 315 37           | 1,61         |      | 1        | 100        | 1,00 |      | 1.00 | 316.5          |      |        | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
| 5.26         | 279.30           | 3.53     | 1,25<br>1,26 | 110        | 0.830<br>0.839 | 0.969 | 1.25         | 0.50         | 1,13 | 296.09           | 1,65         |      | 1        | 100        | 1,01 |      | 1.00 | 299.0          |      |        | 0.000 | 0.313          | Non-Liq.             | 1-       | 0.00         |
| 5.42         | 288.00           | 3.58     | 1.24         | 110        | 0.848          | 0.968 | 1.27<br>1.25 | 0.51         | 1.12 | 295.90           | 1,66         |      | 1        | 100        |      |      | 1.00 | 299.6          |      |        | 0.000 | 0,313          | Non-Liq.             |          | 0.00         |
| 5.58         | 292.46           | 3.59     | 1.23         | 110        | 0.857          | 0.967 | 1.23         |              | 1.12 | 303,25           | 1,65         |      | 1        | 100        | 1.00 |      | 1.00 | 304.4          | 7.3  |        | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
|              | 272.56           | 3.89     | 1.43         | 110        | 0.866          | 0.967 | 1.43         | 0.50<br>0.52 | 1.11 | 306,22<br>285,01 | 1.64<br>1.71 |      | 1        | 100        | 1.00 | 1.55 | 1.00 | 307.4          |      |        | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
| 5.91         | 276.67           | 3.59     | 1.30         | 110        | 0.875          | 0.967 | 1.30         | 0.52         | 1.10 | 287.18           | 1.67         |      | 4        | 100<br>100 | 1.04 |      | 1.00 |                | 1.00 |        | 0.000 | 0.313          | Non-Liq.             | •        | 0.00         |
|              | 273.17           | 3.92     | 1.44         | 110        | 0.884          | 0.966 | 1.44         | 0.52         | 1.10 | 282.65           | 1.71         |      | 4        | 100        | 1.02 |      | 1.00 | 294.2          |      |        | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 5.24         | 281.27           | 3.86     | 1.37         | 110        | 71             | 0.966 | 1.38         | 0.52         | 1.09 | 289.18           | 1.69         |      | 1        | 100        | 1.03 |      | 1.00 | 297.2<br>299.7 |      |        | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 3.40         | 308.06           | 4.92     | 1.60         | 110        | 0.902          | 0.966 | 1.60         | 0.53         | 1.09 | 315.65           | 1.72         |      | 1        | 100        | 1.05 |      | 1.00 |                | 1.00 |        | 0.000 | 0.312<br>0.312 | Non-Liq.             |          | 0.00         |
| 5.57         | 298.32           | 4.41     | 1.48         | 110        |                | 0.965 | 1.48         | 0.52         | 1.08 | 303.79           | 1.71         |      | 1        | 100        | 1.04 |      | 1.00 | 317.6          |      | 100    | 0.000 | 0.312          | Non-Liq.             | 100      | 0.00         |
|              | 317.60           | 4.08     | 1.28         | 110        |                | 0.965 | 1.29         | 0.50         | 1.07 | 320.96           | 1.64         |      | á        | 100        | 1.00 |      | 1.00 | 321.4          |      |        | 0.000 | 0.312          | Non-Liq.             |          |              |
| 3.90         | 332.36           | 5.17     | 1.56         | 110        |                | 0.965 | 1.56         | 0.52         | 1.07 | 335.03           | 1.70         |      | 4        | 100        | 1.04 |      | 1.00 | 349.0          |      |        | 0.000 | 0.312          | Non-Liq.<br>Non-Liq. | •        | 0.00<br>0.00 |
| 7.06         | 338.43           | 6.36     | 1.88         | 110        |                |       | 1.88         |              | 1.07 | 340.25           | 1.76         |      | 4        | 100        | 1.08 |      | 1.00 | 369.5          |      |        | 0.000 | 0.312          | Non-Liq.             | •        | 0.00         |
| 7.22         | 307.99           | 5.82     | 1.89         | 110        |                | 0.964 | 1.90         | 0.55         | 1.06 | 308.23           | 1.79         |      | 1        |            | 1.10 | 19.  | 1.00 | 340.3          |      |        | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 7.39         | 269.28           | 4.43     | 1.64         | 110        |                | 0.963 | 1.65         |              | 1.06 | 267.85           | 1.78         |      | 4        | 100        | 1.09 |      | 1.00 |                | 1.00 |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
|              | 257.64           | 3.38     | 1.31         | 110        |                | 0.963 | 1.32         |              | 1.05 | 254.47           | 1.71         |      | 4        | 100        | 1.05 |      | 1.00 |                | 1.00 |        | 0.000 | 0.311          | Non-Liq.             | 500      | 0.00         |
|              | 229.45           | 3.27     | 1.42         | 110        |                | 0.963 | 1.43         |              | 1.05 |                  | 1.77         |      | 1        |            | 1.09 |      |      | 246.1          |      |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 88           | 185.15           | 3.15     | 1.70         | 110        |                | 0.962 | 1.71         |              | 1.04 | 181.55           | 1.89         |      | 1        |            |      |      |      | 215.2          |      |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 3.04         | 157.27           | 2.43     | 1.54         | 110        |                | 0.962 | 1.55         |              | 1.04 | 153.30           | 1.91         |      | 1        |            |      |      |      | 184.1          |      |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 3.21         | 172.27           | 2.97     | 1.72         | 110        | 1.001          | 0.962 | 1.73         | 0.58         | 1.03 | 167.15           | 1.92         |      | 1        |            |      | 1.55 |      |                | 1.00 |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 3,37         | 148.03           | 3,30     | 2.23         | 110        | 1.010          | 0.961 | 2.24         | 0.62         | 1.03 | 142.99           | 2.05         |      | 1        |            | 1.37 |      |      |                | 1.00 |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 54           | 212.42           | 3.34     | 1.57         | 110        | 1,020          | 0.961 | 1.58         | 0.56         | 1_02 | 203,98           | 1.83         |      | 1        | 100        | 1.13 | 1.00 | 1.00 | 231.6          | 1.00 |        | 0.000 | 0.310          | Non-Liq.             |          | 0.00         |
| 3.70         | 249 14           | 2.81     | 1.13         | 110        | 1.029          | 0.960 | 1.13         | 0.51         | 1_01 | 237.92           | 1.68         |      | 1        | 100        | 1.02 | 1.05 | 1.00 | 244.5          | 1.00 | Infin. | 0.000 | 0.310          | Non-Lig.             |          | 0.00         |
| .86          | 254.49           | 2.69     | 1.06         | 110        | 1.038          | 0.960 | 1.06         | 0.50         | 1.01 | 241,92           | 1.65         |      | 1        | 100        | 1.01 | 1.10 | 1.00 | 244.0          | 1.00 |        | 0.000 | 0.310          | Non-Lig.             |          | 0.00         |
| .03          | 249.73           | 2.74     | 1.10         | 110        | 1.047          | 0.960 | 1.10         | 0.51         | 1_01 | 236,35           | 1.67         |      | 1        | 100        | 1,02 | 1.15 | 1.00 | 241.6          | 1.00 |        | 0.000 | 0.310          | Non-Liq.             |          | 0.00         |
|              | 253.62           | 2,91     | 1.15         | 110        | 1.056          | 0.959 | 1.15         | 0.51         | 1.00 | 239.00           | 1.68         |      | 1        | 100        | 1.03 | 1.20 | 1.00 |                | 1.00 |        | 0.000 | 0.310          | Non-Lig.             |          | 0.00         |
|              | 260.64           | 3.02     | 1.16         | 110        | 1.065          | 0.959 | 1.16         | 0.51         | 1.00 | 244,56           | 1.68         |      | 1        | 100        | 1.02 | 1.25 | 1.00 | 251.5          | 1.00 |        | 0.000 | 0.310          | Non-Liq.             |          | 0.00         |
|              | 261.87           | 3.10     | 1.18         | 110        | 1.074          | 0.958 | 1_19         | 0.51         | 0.99 | 244.64           | 1,69         |      | 1        | 100        | 1.03 | 1.30 | 1.00 | 252.7          | 0.99 | Infin. | 0.000 | 0.310          | Non-Lig.             |          | 0.00         |
|              | 270.64           | 2.97     | 1.10         | 110        | 1.083          | 0_958 | 1_10         | 0.50         | 0.99 | 251.84           | 1,65         |      | 1        | 100        | 1.01 | 1.35 | 1.00 | 254.3          | 0.99 | Infin. | 0.000 | 0.310          | Non-Lig.             |          | 0.00         |
|              | 280.85           | 3.04     | 1.08         | 110        | 1.092          | 0.957 | 1.09         | 0.50         | 0.98 | 260.31           | 1.64         |      | 1        | 100        | 1.00 | 1.40 | 1.00 | 261.3          | 0.99 |        | 0.000 | 0.309          | Non-Liq.             |          | 0.00         |
| 0.01         | 294.22           | 3.15     | 1.07         | 110        | 1.101          | 0.957 | 1_07         | 0.50         | 0.98 | 271.62           | 1.62         |      | 1        | 100        | 1.00 | 1.45 | 1.00 | 272.6          | 0.98 | Infin. | 0.000 | 0.309          | Non-Lig.             |          | 0.00         |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L., Stringer, GE, Earth Systems Southwest

|                | J<br>999         | lob No:<br>Date:             | 301953<br>8/14/20 | -001         | chool No.      |                |              | Me           | thods:       | Liquefac<br>Post-liqu<br>Dry San | uefactio     | on S | ettleme           | nt Anal  | lysis fr     | om Tol               | kimatsu      | ı & See            | d (198       | 17)              | & Wride        | )                      |                      |                            | Total<br>Liquefled<br>Thickness |
|----------------|------------------|------------------------------|-------------------|--------------|----------------|----------------|--------------|--------------|--------------|----------------------------------|--------------|------|-------------------|----------|--------------|----------------------|--------------|--------------------|--------------|------------------|----------------|------------------------|----------------------|----------------------------|---------------------------------|
| EART           | IQUAKE<br>Ma     | gnitude:                     | ATION:<br>6.77    | 7,5          | Plot:          | 5              |              |              |              | (M≃7.5):<br>and Qc1n             |              |      |                   | o'o)*rd/ |              |                      |              | <sub>5</sub> *Κσ/C |              |                  |                |                        |                      | Probab                     | (feet)<br>0.0<br>Total          |
| _              |                  | PGA, g:<br>MSF:<br>VT, feet: | 1.30              | 0,50         |                |                |              |              |              | ted soils:                       |              | рс   |                   |          | Us           | se Tokii             | matsu        |                    | . ,          |                  | Req            | mine (1):<br>uired SF: | 1,50                 | Avg<br>0%                  | Induced<br>Subsidence           |
|                | esign GV         | VT, feet:                    |                   | Total        | Eff.Stress     |                |              | 100          |              | ted soils;<br>ble soils:         |              | рс   |                   |          | ting Ic      | for K <sub>H</sub> : | 2,0          | ,                  |              |                  |                | Layers:                | 0.00                 | Max<br>0%                  | (inches)<br>0.2                 |
| Layer          |                  | Fs                           | Ratio             | Unit Wt      | at Midpt,      |                |              |              |              | Corrected                        |              |      | Liquef<br>Suscept | Dens     | 2 350        | Н                    | ve:          | Sand<br>Sand       |              | (Caracana)       | EQ             | M=7.5                  | Liquefac<br>Safety   | Probab.                    | Volumetric<br>Strain            |
| (feet)<br>0.16 | 7.20             | (tsf)<br>0.07                | 0.96              | (pcf)<br>110 |                | 1.000          | 0,96         | 0.82         | 1.70         | Qc1n<br>11.55                    | 2.69         | Ó    | (0 or 1)          |          |              | (m)                  | KH           | Qc1n               | 1.00         | CRR <sub>7</sub> | CRR            | 0,323                  | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Liq, | 0.00                            |
| 0,33           | 11.97<br>16.98   | 0.11                         | 0.92<br>0.86      | 110<br>110   |                | 1,000<br>1,000 | 0,92<br>0,86 | 0.75<br>0.71 | 1.70<br>1.70 | 19.20<br>27.24                   | 2.49<br>2.34 |      | 1                 | 8<br>23  | 2.70<br>2.08 |                      | 1.00<br>1.00 | 51,9<br>56.7       | 1.00         | 0.093            | 0,093<br>0,097 | 0.323                  | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 0,66           | 18.41<br>16.13   | 0.17<br>0.16                 | 0.90<br>1.01      | 110<br>110   | 0,036<br>0,045 | 1,000<br>1,000 | 0.90<br>1.01 | 0.70<br>0.73 | 1.70<br>1.70 | 29.52<br>25.85                   | 2.32<br>2.40 |      | 1                 | 26<br>21 | 2.01<br>2.29 |                      | 1.00         | 59.5<br>59.2       | 1.00<br>1.00 | 0.100            | 0.100          | 0.323                  | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 0,98<br>1,15   | 12.95<br>10.49   | 0.14                         | 1.06<br>1.05      | 110<br>110   | 0,054          | 1,000<br>0,999 | 1,06<br>1,05 | 0.75<br>0.78 | 1.70<br>1.70 | 20.72<br>16.75                   | 2,49<br>2,57 |      | 1                 | 12<br>3  | 2.71<br>3.13 |                      | 1.00         | 56,1<br>52,5       | 1.00         | 0.096            | 0.096          | 0.323                  | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 1.31<br>1.48   | 10.49<br>9.50    | 0.11                         | 1.05<br>1.52      | 110<br>110   |                | 0,999          | 1.06<br>1.53 | 0.78<br>0.81 | 1.70<br>1.70 | 16.74<br>15.13                   | 2,57<br>2,69 |      | 1                 | 3        | 3,13         |                      | 1.00         | 52.5               | 1.00         | 0.093            |                | 0.323<br>0.323         | Non-Liq.<br>Non-Liq. | Non-Liq                    | 0.00                            |
| 1.64<br>1.80   | 11.89<br>17.29   | 0.21                         | 1.77<br>1.93      | 110<br>110   | 0.090          | 0,998          | 1.79<br>1.94 | 0.80<br>0.77 | 1.70<br>1.70 | 18.96<br>27.62                   | 2,64         |      | 0                 | 23       | 2.91         |                      | 1.00         | 80.4               | 1.00         | 0.128            | 0.128          | 0.323                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 1.97           | 29.55<br>29.26   | 0.52                         | 1.75<br>1.76      | 110<br>110   | 0.108          | 0.998          | 1.76<br>1.77 | 0.70         | 1.70<br>1.70 | 47.31<br>46.83                   | 2.32         |      | i<br>1            | 46<br>45 | 2.00         |                      | 1,00         | 94.8               | 1.00         | 0.159            | 0.159          | 0.322                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 2.30           | 27.77<br>25.48   | 0.48                         | 1.74<br>1.74      | 110          | 0.126          | 0.997          | 1.75         | 0.71         | 1.70         | 44.42                            | 2,34         |      | 1                 | 43       | 2.02         |                      | 1,00         | 94.6<br>92.1       | 1.00         | 0.159            | 0.159<br>0.153 | 0.322                  | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00                            |
| 2,62           | 22,54            | 0.40                         | 1.76              | 110<br>110   | 0.144          | 0.996          | 1.75<br>1.77 | 0.72<br>0.73 | 1.70<br>1.70 | 40.72<br>35.99                   | 2,37<br>2,41 |      | 1                 | 40<br>34 | 2.18<br>2.36 |                      | 1.00<br>1.00 | 88,8<br>85,1       | 1.00         | 0.145<br>0.137   | 0,145<br>0,137 | 0.322<br>0.322         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 2.79           | 20.15<br>17.63   | 0.37                         | 1.83<br>2.37      | 110<br>110   | 0,162          | 0.996<br>0.995 | 1.85<br>2.39 | 0.75<br>0.78 | 1.70<br>1.70 | 32.13<br>28.07                   | 2.46<br>2.58 |      | 1                 | 30<br>24 | 2,58<br>3,19 |                      | 1.00<br>1.00 | 83.0<br>89.5       | 1.00<br>1.00 | 0.133<br>0.147   | 0.133<br>0.147 | 0.322<br>0.322         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 3,12<br>3,28   | 13,94            | 0.43<br>0.42                 | 3.06<br>3.69      | 110<br>110   |                | 0.995<br>0.994 | 3.10<br>3.75 | 0.83<br>0.86 | 1.70<br>1.70 | 22.12<br>17.92                   | 2.73<br>2.85 |      | 0                 |          |              |                      |              |                    | 1.00         |                  |                | 0.322<br>0.321         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 3.44           | 10.79<br>19.14   | 0.35<br>0.32                 | 3.27<br>1.69      | 110<br>110   |                | 0.994<br>0.994 | 3.33<br>1.71 | 0.86<br>0.75 | 1.70<br>1.70 | 17.03<br>30.44                   | 2.84<br>2.46 |      | 0                 | 27       | 2.58         |                      | 1.00         | 78.4               | 1.00         | 0.125            | 0,125          | 0.321<br>0.321         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 3.77<br>3.94   | 28,87<br>37.13   | 0.35                         | 1.20<br>1.18      | 110<br>110   |                | 0.993          | 1.21<br>1.19 | 0.68<br>0.65 | 1.70<br>1.70 | 46.06<br>59.31                   | 2.23         |      | 1                 | 45<br>55 | 1.74<br>1.52 |                      | 1.00<br>1.00 | 79.9<br>90.2       | 1.00         | 0.127<br>0.148   | 0.127<br>0.148 | 0.321                  | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 4.10<br>4.27   | 42.19<br>42.88   | 0.52<br>0.62                 | 1.24<br>1.43      | 110<br>110   |                | 0.993          | 1.25<br>1.44 | 0.64<br>0.65 | 1.70<br>1.70 | 67.43<br>68.52                   | 2.10         |      | 1                 | 60<br>61 | 1.46<br>1.53 |                      | 1.00         | 98.5<br>104.7      | 1.00         | 0.169<br>0.187   | 0.169<br>0.187 | 0.321<br>0.321         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 4.43<br>4.59   | 42.87<br>43.05   | 0.65<br>0.62                 | 1.51<br>1.44      | 110<br>110   |                | 0.992<br>0.991 | 1.52<br>1.44 | 0,65<br>0.65 | 1.70<br>1.70 | 68.49<br>68.77                   | 2.15<br>2.14 |      | 1                 | 61<br>61 | 1.56<br>1.53 |                      | 1.00         | 106.9<br>105.0     | 1.00         | 0.194<br>0.188   | 0.194          | 0.321                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 4.76<br>4.92   | 40.55<br>37.17   | 0.64                         | 1.58<br>1.58      | 110<br>110   | 0.262          | 0.991          | 1.59         | 0.66<br>0.67 | 1.70<br>1.70 | 64.74<br>59.29                   | 2.18         |      | 1                 | 59<br>55 | 1.63<br>1.70 |                      | 1,00         | 105.4<br>101.0     | 1.00         | 0.189<br>0.176   | 0.189<br>0.176 | 0.320                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 5.09<br>5.25   | 45 41<br>49 21   | 0.55<br>0.55                 | 1.21              | 110<br>110   | 0.280          | 0.990          | 1.22         | 0.63         | 1.70<br>1.70 | 72 52<br>78 61                   | 2.07         |      | 1                 | 63       | 1,41         |                      | 1,00         | 102.1              | 1.00         | 0.179            | 0.179          | 0.320                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 5.41<br>5.58   | 48.56<br>48.19   | 0.56<br>0.59                 | 1.16              | 110          | 0.298          | 0.989          | 1.16         | 0.62         | 1.70         | 77.55                            | 2.04         |      | 1                 | 67<br>66 | 1,33         |                      | 1,00         | 104.9              | 1.00         | 0.187<br>0.187   | 0.187<br>0.187 | 0.320                  | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00                            |
| 5.74           | 48.82            | 0.59                         | 1,20              | 110<br>110   | 0.316          | 0.989<br>0.989 | 1.23         | 0.62         | 1.70<br>1.70 | 76.94<br>77.94                   | 2.06         |      | 1                 | 66<br>66 | 1,38<br>1,37 |                      | 1.00         | 106.5              |              | 0.191<br>0.192   | 0.191<br>0.192 | 0.320<br>0.320         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 5.91<br>6.07   | 49.59            | 0.58                         | 1.17<br>1.19      | 110<br>110   | 0.334          | 0.988<br>0.988 | 1.18<br>1.19 | 0.62<br>0.62 | 1.70<br>1.70 | 79.16<br>78.21                   | 2.03         |      | 1                 | 67<br>67 | 1,35<br>1,36 |                      |              | 106.6<br>106.2     | 1.00<br>1.00 | 0 193<br>0 191   | 0.193<br>0.191 | 0.319<br>0.319         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 6.23<br>6.40   | 48.87<br>48.92   | 0.58<br>0.59                 | 1.19              | 110<br>110   | 0.352          | 0.988<br>0.987 | 1.20<br>1.21 | 0.62<br>0.62 | 1.70<br>1.70 | 77.97<br>78.04                   | 2.04         |      | 1                 | 67<br>67 | 1.36<br>1.37 |                      |              |                    | 1.00<br>1.00 | 0.191<br>0.192   | 0.191<br>0.192 | 0.319<br>0.319         | Non-Liq.<br>Non-Liq. |                            | 0.00                            |
| 6.56<br>6.73   | 50.19<br>54.54   | 0.62<br>0.64                 | 1.23<br>1.17      | 110<br>110   |                | 0.987<br>0.986 | 1.24<br>1.17 | 0.62<br>0.61 | 1.70<br>1.70 | 80.07<br>87.04                   | 2.04         |      | 1                 | 68<br>71 | 1.36<br>1.30 |                      |              |                    | 1.00         | 0.201<br>0.215   | 0.201<br>0.215 | 0.319<br>0.319         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 6.89<br>7.05   | 60.79<br>70.21   | 0.78<br>1.20                 | 1.29<br>1.71      | 110<br>110   |                | 0.986<br>0.986 | 1.29<br>1.72 | 0.61<br>0.62 | 1.70<br>1.70 | 97.07<br>112.19                  | 1.99<br>2.03 |      | 1                 |          | 1.29<br>1.35 | 0.90                 |              | 127.9<br>151.2     |              | 0.275            | 0.275<br>0.401 | 0.319<br>0.319         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 7.22<br>7.38   | 86.10<br>112.25  | 1.28<br>1.15                 | 1.49<br>1.02      | 110<br>110   |                | 0.985<br>0.985 | 1.49<br>1.02 | 0.59<br>0.53 | 1.70<br>1.66 |                                  | 1.93<br>1.74 |      | 1                 |          |              |                      |              | 168,1<br>187,1     | 1.00         | Infin.           | 0.000          |                        | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 7.55<br>7.71   | 123 77<br>123 77 | 1.31<br>1.31                 | 1.06<br>1.06      | 110<br>110   | 0.415          | 0.985<br>0.984 | 1.06<br>1.06 | 0.52<br>0.53 | 1.63<br>1.62 | 190,49                           | 1.72<br>1.73 |      | 1                 | 100      | 1.05<br>1.05 | 1,10                 | 1,00         | 201.3              | 1.00         | Infin.           | 0.000          | 0.318                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 7.87<br>8.04   | 137.24<br>143.26 | 1.24<br>1.17                 | 0.90              | 110<br>110   | 0.433          | 0.984          | 0.90<br>0.82 | 0.50<br>0.50 | 1.57         | 202.88                           | 1.65<br>1.61 |      | 1                 | 100      | 1.01         | 1.20                 | 1.00         | 204.9              | 1.00         | Infin.           | 0.000          | 0.318                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 8.20<br>8.37   | 133.59<br>119.63 | 0.95                         | 0.71              | 110<br>110   | 0.451          | 0.983          | 0.72<br>0.54 | 0.50         | 1.53         | 192.72                           | 1.60<br>1.56 |      | 1                 | 100      | 1,00         | 1.30                 | 1.00         | 193.4              | 1.00         | Infin.           | 0.000          | 0.318                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 8.53<br>8.69   | 108.61<br>97.77  | 0.64<br>0.53                 | 0.59              | 110<br>110   | 0.469          | 0.982<br>0.982 | 0.59         | 0.50         | 1,50         | 153,49                           | 1.62         |      | 1                 | 95       | 1.00         | 1.40                 | 1.00         |                    | 1.00         | Infin<br>0.420   | 0.000          | 0.318                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 8.86           | 91.00            | 0.48                         | 0.52              | 110          | 0.487          | 0.982          | 0.54         | 0.50         |              | 126,66                           | 1.64<br>1.66 |      | 1                 | 87       | 1.00         | 1.50                 | 1.00         | 128.5              | 1.00         | 0.318            | 0.318          | 0.317                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 9.02           | 88.06            | 0.54                         | 0.61              | 110<br>110   | 0.505          | 0.981<br>0.981 | 0.62<br>0.66 | 0.54         | 1.49         | 112.21                           | 1.71<br>1.76 |      | 1                 | 82       | 1.08         | 1.60                 | 1.00         | 128.8<br>121.5     | 1.00         | 0.279<br>0.247   | 0.279<br>0.247 | 0.317<br>0.317         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 9.35<br>9.51   | 57.91<br>67.62   | 0.50<br>0.54                 | 0.87<br>0.79      | 110<br>110   | 0.523          | 0.981<br>0.980 | 0.88<br>0.80 | 0.57         | 1.53<br>1.49 | 94.64                            | 1.94<br>1.87 |      | 1                 |          | 1.16         | 1.70                 | 1.00         | 102.3<br>110.3     | 1.00         | 0.180<br>0.205   | 0.180<br>0.205 | 0.317<br>0.317         | Non-Liq.<br>Non-Liq. |                            | 0.00                            |
| 9.68<br>9.84   | 67.40<br>67.98   | 0.52<br>0.51                 | 0.77<br>0.75      | 110<br>110   |                | 0.980<br>0.980 | 0.78<br>0.76 | 0.57<br>0.57 | 1.48<br>1.46 |                                  | 1.87<br>1.86 |      | 1                 |          | 1.16<br>1.15 | 1.75<br>1.80         |              | 108.5<br>107.8     |              | 0.199<br>0.197   | 0 199<br>0 197 | 0.317<br>0.317         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 10.01<br>10.17 | 65.93<br>65.84   | 0.45<br>0.44                 | 0.68<br>0.67      | 110<br>110   |                | 0.979<br>0.979 | 0.69<br>0.68 |              | 1.44<br>1.43 |                                  | 1.85<br>1.85 |      | 1                 |          |              |                      |              | 102.7<br>101.6     |              | 0.181<br>0.178   | 0.181<br>0.178 | 0.316<br>0.316         | Non-Liq.<br>Non-Liq. |                            | 0.00<br>0.00                    |
| 10.33<br>10.50 | 64.79<br>65.15   | 0.46<br>0.49                 | 0.70              | 110<br>110   |                | 0.979<br>0.978 | 0.71<br>0.75 |              | 1.42<br>1.42 |                                  | 1.87<br>1.88 |      | 1                 |          | 1.16<br>1.17 | 1.95<br>2.00         |              | 100.8<br>101.9     |              |                  | 0.175<br>0.178 | 0.316<br>0.316         | Non-Liq.<br>Non-Liq. | Non-Liq.                   | 0.00<br>0.00                    |
| 10.66<br>10.83 | 65.57<br>66.76   | 0.48                         | 0.74              | 110<br>110   |                |                | 0.74<br>0.74 |              | 1.40<br>1.39 |                                  | 1.88<br>1.88 |      | 1                 |          |              | 2,05                 | 1.00         | 101.4              | 1.00         | 0.177<br>0.178   | 0.177<br>0.178 | 0.316<br>0.316         | Non-Liq.<br>Non-Liq. | Non-Liq                    | 0.00<br>0.00                    |
| 10.99<br>11.15 | 69.51<br>72.61   | 0.50<br>0.54                 | 0.72<br>0.74      | 110<br>110   | 0.604          | 977            | 0.73<br>0.74 | 0,57         | 1.37<br>1.36 | 89.46                            | 1.86<br>1.86 |      | 1                 | 72       | 1.16         | 2.15                 | 1.00         | 103.8<br>107.0     | 1.00         | 0.184<br>0.194   |                | 0.316<br>0.316         | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 11.32<br>11.48 | 77.76<br>84.82   | 0.57                         | 0.73              | 110<br>110   | 0.623          | 977            | 0.73<br>0.77 | 0.56         | 1.34         | 98.03                            | 1.83<br>1.82 |      | 1                 | 76       | 1.13         | 2.25                 | 1.00         | 111.4              | 1.00         | 0.209            | 0.209          | 0.316                  | Non-Liq.             | Non-Liq                    | 0.00                            |
| 11.65<br>11.81 | 92.40<br>100.55  | 0.51<br>0.65                 | 0.55              | 110<br>110   | 0.641          | 976            | 0.56         | 0.52         | 1.30         | 112.72                           | 1.72         |      | 1                 | 82       | 1.05         | 2.35                 | 1.00         | 119.2<br>118.6     | 1.00         | 0.235            | 0.235          | 0.315                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 11.98          | 108.89<br>120.07 | 0.74                         | 0.67              | 110          | 0.659          | 975            | 0.65         | 0.52         | 1.28         | 131-02                           | 1.73<br>1.71 |      | 1                 | 88       | 1.05         | 2.45                 | 1.00         |                    | 1.00         |                  | 0.281          | 0.315                  | Non-Liq.             | Non-Liq.                   | 0.00                            |
|                | 132,01           | 0.79                         | 0.66<br>0.68      | 110<br>110   | 0.677          | 974            | 0.66         | 0.50         | 1.25         | 155.55                           | 1.68<br>1.66 |      | 1                 | 95       | 1.01         | 2.55                 | 1.00         | 146.6<br>157.3     | 1.00         | 0.442            | 0.373          | 0.315<br>0.315         | Non-Liq.             | Non-Liq                    | 0.00                            |
| 12.63          | 144.08           | 1.04                         | 0.72              | 110<br>110   | 0,695          | 974            | 0.72         | 0.50         | 1.24         | 177.08                           | 1.65<br>1.65 |      |                   | 100      | 1.01         | 2.60                 | 1.00         | 169.2<br>178.9     | 1.00         | Infin.           | 0.000          | 0.315<br>0.315         | Non-Liq.             | Non-Liq.                   | 0.00                            |
| 12.80          | 162.83           | 1.20                         | 0.74              | 110          | 0.704          | 973            | 0.74         | 0.50         | 1,23         | 187.89                           | 1.62         |      | :1)               | 100      | 1.00         | 2.70                 | 1.00         | 188.6              | 1.00         | Infin.           | 0.000          | 0.315                  | Non-Liq.             | Non-Liq.                   | 0.00                            |

| ayer  | Tip              | Friction     | Friction     | Total      | Eff Stres      | s     |              |              |      |                  |      | a L  | iquef | Rel        |      |      |      | Clean          |      |                    |       | Induced        | Liquefac.            |                | Volumeti |
|-------|------------------|--------------|--------------|------------|----------------|-------|--------------|--------------|------|------------------|------|------|-------|------------|------|------|------|----------------|------|--------------------|-------|----------------|----------------------|----------------|----------|
| epth  | Qc               | Fs           | Ratio        | Unit Wt.   | at Midpt       |       |              |              |      | Corrected        | d    | S Su | scept | Dens       |      | Н    |      | Sand           |      |                    | EQ    | M=7.5          | Safety               | Probab.        | Strain   |
| feet) | (tsf)            | (tsf)        | %            | (pcf)      | p'o (tsf)      | rd    | F            | n            | Co   | Qc1n             | lc   | 8 (0 | or 1) | Dr (%)     | Kc   | (m)  | KH   | Qc1n           | Ko   | CRR75              | CRR   | CSR            | Factor               | P <sub>t</sub> | (%)      |
| 2,96  | 177,02           | 1.56         | 0.88         | 110        | 0.713          | 0.973 | 0.88         | 0.50         | 1.22 | 203 18           | 1,65 |      | 1     | 100        | 1_00 | 2.75 | 1.00 | 204.1          | 1.00 | Infin.             | 0.000 | 0.314          | Non-Lig.             |                | 0.00     |
| 3,12  | 188.21           | 1.70         | 0.90         | 110        | 0.722          | 0.973 | 0.90         | 0.50         | 1.21 | 214.55           | 1.64 |      | 1     | 100        | 1,00 | 2,80 | 1.00 | 215.4          | 1.00 | Infin.             | 0.000 | 0.314          | Non-Liq.             |                | 0.00     |
| 3,29  | 199.52           | 1.82         | 0.91         | 110        | 0.731          | 0,972 | 0.92         | 0.50         | 1 20 | 226.07           | 1,63 |      | 1     | 100        | 1.00 | 2.85 | 1.00 | 226 9          | 1.00 | Infin.             | 0.000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 3.45  | 206.33           | 1.96         | 0.95         | 110        | 0.740          | 0,972 | 0.95         | 0.50         | 1.20 | 232 38           | 1,63 |      | 1     | 100        | 1_00 | 2.90 | 1.00 | 233.2          | 1.00 | Infin.             | 0.000 | 0.314          | Non-Liq.             | Non-Lig.       | 0.00     |
| 3.62  | 209,22           | 1.92         | 0.92         | 110        | 0.749          | 0.972 | 0.92         | 0.50         | 1.19 | 234.21           | 1.62 |      | 1     | 100        | 1.00 | 2,95 | 1.00 | 235.1          | 1.00 | Infin.             | 0.000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 78    | 216.92           | 2.11         | 0.97         | 110        | 0.758          | 0.971 | 0.98         | 0.50         | 1.18 | 241.40           | 1,63 |      | 1     | 100        | 1.00 | 3,00 | 1:00 |                | 1.00 | infin.             | 0.000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 94    | 220,68           | 1.88         | 0.85         | 110        | 0.767          | 0.971 | 0.85         | 0.50         | 1.17 | 244 14           | 1,58 |      | 1     | 100        | 1.00 |      | 1.00 | 245.1          |      | Infin.             | 0.000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 11    | 225.50           | 2.72         | 1.21         | 110        | 0.776          | 0.971 | 1.21         | 0.51         | 1,17 | 249.15           | 1,69 |      | 1     | 100        | 1.03 |      | 1.00 | 257.6          |      |                    | 0,000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 27    | 226.97           | 2.77         | 1.22         | 110        | 0,785          | 0.970 | 1.22         | 0.52         | 1.17 | 249 35           | 1.69 |      | 1     | 100        | 1.03 | 3_15 |      | 258.3          |      |                    | 0.000 | 0.314          | Non-Liq.             | Non-Liq.       | 0.00     |
| 44    | 260.76           | 3.44         | 1.32         | 110        | 0.794          | 0.970 | 1.32         | 0.51         | 1.16 | 284.70           | 1,68 |      | 1     | 100        | 1,03 | 3.20 | 1.00 | 293.3          |      |                    | 0,000 | 0.313          | Non-Liq.             |                | 0.00     |
|       | 273.34           | 5.44         | 1.99         | 110        | 0.803          | 0.970 | 2.00         | 0.55         | 1.16 | 300.02           | 1,82 |      | 1     | 100        | 1.12 | 3,25 |      | 336.8          |      |                    | 0,000 | 0.313          | Non-Liq.             |                | 0.00     |
| .76   | 293.55<br>441.40 | 5.65<br>7.59 | 1.92<br>1.72 | 110        | 0.812          | 0.969 | 1.93         | 0.54         | 1.15 | 319.57           | 1.79 |      | 1     | 100        | 1,10 | 3,30 | 1.00 | 352.3          |      | Infin              | 0,000 | 0,313          | Non-Liq.             |                | 0.00     |
| .93   | 347.82           | 7.59         | 2.09         | 110<br>110 | 0.821<br>0.830 | 0.969 | 1.72<br>2.09 | 0.51         | 1.14 | 473.40           | 1.66 |      | 1     | 100        | 1.01 | 3,35 |      |                | 1.00 | Infin.             | 0.000 | 0.313          | Non-Liq.             |                | 0.00     |
| 26    | 302.88           | 7.25         | 2.60         | 110        | 0.839          | 0.968 | 2.61         | 0.54<br>0.58 | 1.14 | 374.13<br>326.31 | 1.78 |      | 1     | 100<br>100 | 1.09 | 3,40 | 1.00 |                | 1.00 | Infin <sub>e</sub> | 0.000 | 0.313          | Non-Liq.             |                | 0.00     |
|       | 275.99           | 6.43         | 2.33         | 110        | 0.848          | 0.968 | 2.34         | 0.57         | 1.13 | 295.07           | 1.88 |      | 1     |            | 1.18 |      | 1.00 | 387.9          |      | Infin <sub>©</sub> | 0.000 | 0.313          | Non-Liq.             |                | 0.00     |
|       | 376.75           | 5.16         | 1.37         | 110        | 0.857          | 0.967 | 1.37         | 0.50         | 1.13 | 394.73           | 1.61 |      | 1     | 100<br>100 | 1.17 |      | 1.00 | 346.0          |      | Infin              | 0,000 | 0.313          | Non-Liq.             |                | 0.00     |
|       | 321.62           | 5.68         | 1.76         | 110        | 0.866          | 0.967 | 1.77         | 0.53         | 1.11 | 337.17           | 1.74 |      | 1     | 100        | 1.00 | 3.60 | 1.00 | 396.2<br>361.3 |      | Infin<br>Infin     | 0.000 | 0.313          | Non-Liq.             |                | 0.00     |
| 91    | 321.75           | 3.28         | 1.02         | 110        | 0.875          | 0.967 | 1.02         | 0.50         | 1.10 | 333.46           | 1.55 |      | 1     | 100        | 1.00 | 3.65 |      | 334.7          |      | Infin.             | 0.000 | 0.313<br>0.312 | Non-Liq.             |                | 0.00     |
|       | 344.32           | 3.11         | 0.90         | 110        | 0.884          | 0.966 | 0.90         | 0.50         | 1.09 | 355.08           | 1.49 |      | 1     | 100        | 1.00 | 3.70 |      | 356.4          | 1111 | Infin.             | 0.000 | 0.312          | Non-Liq.             | 2.0            | 0.00     |
|       | 348.92           | 2.94         | 0.84         | 110        | 0.893          | 0.966 | 0.84         | 0.50         | 1.09 | 358.01           | 1.47 |      | 1     |            | 1.00 |      | 1.00 | 359.3          |      | Infin.             | 0.000 | 0.312          | Non-Liq.             |                | 0.00     |
|       | 351.59           | 2.77         | 0.79         | 110        | 0.902          | 0.966 | 0.79         | 0.50         | 1.08 | 358.94           | 1.44 |      | 1     |            | 1.00 | 3.80 |      | 360.3          |      | Infin_             | 0.000 | 0.312          | Non-Liq.<br>Non-Liq. |                | 0.00     |
| 57    | 366.52           | 2.53         | 0.69         | 110        | 0.911          | 0.965 | 0.69         | 0.50         | 1.08 | 372.35           | 1.39 |      | 1     | 100        | 1.00 | 3.85 |      | 373.7          |      | Infin.             | 0.000 | 0.312          | Non-Liq.             |                | 0.00     |
|       | 381.08           | 3.05         | 0.80         | 110        | 0.920          | 0.965 | 0.80         | 0.50         | 1.07 | 385.27           | 1.43 |      | 1     |            | 1.00 |      | 1.00 | 386.7          |      |                    | 0.000 | 0.312          | Non-Liq.             |                | 0.00     |
| 90    | 413.82           | 3.60         | 0.87         | 110        | 0.929          | 0.965 | 0.87         | 0.50         | 1.07 | 416.40           | 1.44 |      | 9     |            | 1.00 |      | 1.00 | 418.0          |      |                    | 0.000 | 0.312          | Non-Lig.             |                | 0.00     |
| 06    | 452.15           | 4.24         | 0.94         | 110        | 0.938          | 0.964 | 0.94         | 0.50         | 1.06 |                  | 1.44 |      | 1     |            | 1.00 |      | 1.00 | 454.6          |      |                    | 0.000 | 0.312          | Non-Lig.             |                | 0.00     |
| 22    | 427.40           | 3.95         | 0.92         | 110        | 0.947          | 0.964 | 0.93         | 0.50         | 1.06 | 425.97           | 1.45 |      | 1     |            | 1.00 |      | 1.00 |                | 1.00 |                    | 0.000 | 0.311          | Non-Liq.             |                | 0.00     |
| 39    | 404.51           | 3.69         | 0.91         | 110        | 0.956          | 0.963 | 0.91         | 0.50         | 1.05 | 401.19           | 1.46 |      | 1     |            | 1,00 |      | 1.00 | 402.7          |      |                    | 0.000 | 0.311          | Non-Liq.             |                | 0.00     |
| 55    | 425.81           | 4.21         | 0.99         | 110        | 0.965          | 0,963 | 0.99         | 0.50         | 1.05 | 420,37           | 1.48 |      | 1     |            | 1,00 |      | 1.00 | 421.9          |      | Infin              |       | 0.311          | Non-Lig.             |                | 0.00     |
| 72    | 438,64           | 4.22         | 0.96         | 110        | 0,974          | 0.963 | 0.96         | 0.50         | 1.04 | 431,05           | 1.47 |      | 1     | 100        | 1.00 | 4.20 | 1.00 | 432.7          |      |                    | 0.000 | 0.311          | Non-Lig.             |                | 0.00     |
| 88    | 461.57           | 3.57         | 0.77         | 110        | 0.983          | 0.962 | 0.78         | 0.50         | 1.04 | 451,54           | 1,38 |      | 1     | 100        | 1,00 | 4.25 | 1.00 |                | 1.00 |                    | 0.000 | 0.311          | Non-Lig.             |                | 0.00     |
| 04    | 498,99           | 4.53         | 0.91         | 110        | 0.992          | 0.962 | 0.91         | 0.50         | 1.03 | 485,99           | 1.42 |      | 1     | 100        | 1.00 | 4.30 | 1.00 | 487.8          | 1.00 | Infin              | 0.000 | 0.311          | Non-Lig.             |                | 0.00     |
| 21    | 579.29           | 5.58         | 0.96         | 110        | 1,001          | 0.962 | 0.96         | 0.50         | 1.03 | 561,80           | 1.40 |      | 1     | 100        | 1.00 | 4.35 | 1.00 | 563.9          | 1_00 | Infin.             | 0.000 | 0.311          | Non-Liq.             |                | 0.00     |
|       | 590,35           | 3.67         | 0.62         | 110        | 1,010          | 0.961 | 0.62         | 0.50         | 1.02 | 569,97           | 1.24 |      | 1     | 100        | 1.00 | 4.40 | 1.00 | 572.1          | 1.00 | Infin.             | 0.000 | 0.311          | Non-Liq.             |                | 0.00     |
|       | 576.43           | 4.80         | 0.83         | 110        |                | 0.961 | 0.83         | 0.50         | 1.02 | 554,03           | 1,35 |      | 1     | 100        | 1.00 | 4.45 | 1.00 | 556.1          | 1.00 | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq.       | 0.00     |
|       | 606.56           | 5.65         | 0.93         | 110        |                | 0.960 | 0.93         | 0.50         | 1.01 |                  | 1,38 |      | 1     | 100        | 1.00 | 4.50 | 1.00 | 582.6          | 1.00 | Infin_             | 0.000 | 0.310          | Non-Liq.             | Non-Liq.       | 0.00     |
|       | 565.11           | 6.10         | 1.08         | 110        |                | 0 960 | 1.08         | 0.50         | 1.01 |                  | 1.46 |      | 05    |            | 1,00 |      | 1.00 | 540.4          | 1.00 | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq        | 0.00     |
|       | 544.74           | 8.59         | 1.58         | 110        |                | 0.960 | 1.58         | 0.50         | 1.01 |                  | 1.61 |      |       |            | 1.00 | 4.60 | 1.00 |                | 1.00 | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq.       | 0.00     |
|       | 567.96           |              | 1.14         | 110        |                | 0.959 | 1.14         | 0.50         | 1.00 |                  | 1.48 |      |       |            | 1.00 |      | 1.00 |                | 1.00 | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq        | 0.00     |
|       | 526.36           |              | 1.22         | 110        |                | 0.959 | 1.22         | 0.50         | 1.00 |                  | 1.52 |      |       |            | 1,00 |      | 1.00 |                | 1.00 | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq        | 0.00     |
|       | 450.76           |              | 1.02         | 110        |                | 0.958 | 1.02         | 0.50         | 0.99 |                  | 1.49 |      |       |            | 1.00 |      | 1,00 | 423 5          |      | Infin.             | 0.000 | 0.310          | Non-Liq.             | Non-Liq        | 0.00     |
|       | 418.45           | 3.90         | 0.93         | 110        |                | 0.958 | 0.94         |              | 0.99 |                  | 1.48 |      |       |            | 1.00 |      |      | 391.4          |      |                    | 0.000 | 0.310          | Non-Liq.             |                | 0.00     |
|       | 376.34           |              | 1.02         | 110        |                |       | 1.02         |              | 0.98 |                  | 1.54 |      |       |            | 1,00 |      |      |                | 0.99 |                    | 0.000 | 0.309          | Non-Liq.             |                | 0.00     |
| 01    | 355.23           | 3.87         | 1.09         | 110        | 1,101          | 0.957 | 1.09         | 0.50         | 0.98 | 328,16           | 1.58 |      | 1     | 100        | 1,00 | 4.90 | 1.00 | 329.4          | 0.98 | Infin.             | 0.000 | 0.309          | Non-Liq.             | Non-Lig.       | 0.00     |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L. Stringer, GE, Earth Systems Southwest

|                      | J                          | lob No:                | 301953<br>8/14/20    | 3-001<br>)18      | chool No.              | 8                       |                      | Met                  | thods:               | Liquefac<br>Post-liqu<br>Dry San | uefactio             | on S | Settlemer         | nt Ana         | lysis fr             | om Tok               | kimatsu          | ı & See                 | d (198               | 7)                         | & Wride)       | )                       |                                  |           | Total<br>Liquefied<br>Thickness<br>(feet) |
|----------------------|----------------------------|------------------------|----------------------|-------------------|------------------------|-------------------------|----------------------|----------------------|----------------------|----------------------------------|----------------------|------|-------------------|----------------|----------------------|----------------------|------------------|-------------------------|----------------------|----------------------------|----------------|-------------------------|----------------------------------|-----------|---|
| EARTH                | IQUAKE                     |                        |                      | 7.5               | 1                      |                         |                      |                      |                      | (M=7.5):<br>and Qc1n             |                      |      |                   | o'o)*rd        | /MSF                 | SF =                 | CRR <sub>7</sub> | <sub>.5</sub> *Κσ/C     | SR                   |                            |                |                         |                                  | Probab    | 0.0                                       |
|                      |                            | PGA, g:                |                      | 0.50              |                        | Ur                      | nit Weig             | ht of ur             | nsatura              | ted soils:                       | 110                  | pci  | f                 |                | Us                   | e Tokir              | natsu (          | & Seed                  | (0) or               | Ishihara                   |                | mine (1):<br>uired SF:  | 0<br>1,50                        | Avg<br>0% | Induced<br>Subsidence                     |
| C                    | GV<br>Design GV            | VT, feet:<br>VT, feet: | 20.0<br>20.0         |                   |                        |                         | Unit W               | eight of             | satura               | ted soils:<br>ble soils:         | 110                  | pct  | f                 | Limi           | ting Ic              | for K <sub>H</sub>   | 2.0              |                         |                      |                            | uefiable       | Layers:<br>Layers:      | 0.00                             | Max<br>0% | (inches)<br>0.1                           |
| Layer                |                            | Friction<br>Fs         | Friction<br>Ratio    |                   | Eff.Stress<br>at Midpt | ;                       |                      |                      |                      | Corrected                        | d                    | 0    | Liquef<br>Suscept |                |                      | н                    |                  | Clean                   |                      |                            | EQ             | Induced<br>M=7.5        | Liquefac.<br>Safety              | Probab    | Volumetric<br>Strain                      |
| (feet)<br>0.16       | (tsf)                      | (tsf)                  | %<br>0.21            | (pcf)             | p'o (tsf)<br>0,009     | rd<br>1,000             | F<br>0.21            | n<br>0.76            | C <sub>Q</sub>       | Qc1n<br>10.74                    | lc<br>2.50           |      | (0 or 1)          |                | K <sub>c</sub>       | (m)                  | K <sub>H</sub>   | Qc1n                    | Κσ<br>1.00           | CRR <sub>75</sub>          |                | CSR<br>0.323            | Factor<br>Non-Liq.               | PL        | (%)<br>0.00                               |
| 0.33                 | 14.12<br>16.59             | 0.04                   | 0.28                 | 110<br>110        | 0.018<br>0.027         | 1.000                   | 0.28                 | 0.67<br>0.69         | 1.70<br>1.70         | 22.66<br>26.61                   | 2.22                 |      | 1                 | 15<br>22       | 1.00                 |                      | 1.00             | 22.7<br>48.7            | 1.00                 | 0.069                      | 0.069          | 0.323                   | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00                                      |
| 0.66<br>0.82         | 21 13<br>29 41             | 0.18                   | 0.84                 | 110<br>110        | 0.036                  | 1.000                   | 0.84                 | 0.68                 | 1.70                 | 33.89<br>47.18                   | 2.25                 |      | 1                 | 32<br>46       | 1.81                 |                      | 1.00             | 61 3<br>75 1            | 1.00                 | 0.101                      | 0.101          | 0.323                   | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00                                      |
| 0.98<br>1.15         | 35,60<br>34,08             | 0.35                   | 0.99                 | 110<br>110        | 0.054                  | 1.000                   | 0.99                 | 0,64<br>0,65         | 1.70<br>1.70         | 57.12<br>54.66                   | 2.10                 |      | 1                 | 54<br>52       | 1.46<br>1.51         |                      | 1.00             | 83.2<br>82.3            | 1.00                 | 0.134                      | 0.134          | 0.323                   | Non-Liq.                         | Non-Liq   | 0.00<br>0.00                              |
| 1,31<br>1,48         | 34.08<br>30.11             | 0.35                   | 1.03<br>1.11         | 110<br>110        | 0.072<br>0.081         | 0.999                   | 1.04<br>1.11         | 0.65<br>0.66         | 1.70<br>1.70         | 54.64<br>48.25                   | 2.13                 |      | 1                 | 52<br>47       | 1.51<br>1.64         |                      | 1.00             | 82.3<br>79.2            | 1.00                 | 0.132                      | 0.132<br>0.126 | 0.323                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 1.64<br>1.80         | 28.15<br>29.07             | 0.27<br>0.35           | 0.96<br>1.20         | 110<br>110        | 0.090                  | 0.998                   | 0.96<br>1.20         | 0.66<br>0.67         | 1.70<br>1.70         | 45.09<br>46.55                   | 2.18                 |      | 1                 | 44<br>45       | 1.62<br>1.72         |                      | 1.00             | 72.8<br>80.2            | 1.00                 | 0.116<br>0.128             | 0.116<br>0.128 | 0.323<br>0.323          | Non-Liq.                         | Non-Liq   | 0.00                                      |
| 1.97<br>2.13         | 26 19<br>20 41             | 0.39                   | 1.47<br>2.07         | 110<br>110        | 0.108<br>0.117         | 0.998<br>0.997          | 1.48<br>2.08         | 0.70<br>0.75         | 1.70<br>1.70         | 41.91<br>32.61                   | 2.31<br>2.49         |      | 1                 | 41<br>30       | 1,99<br>2,72         |                      | 1.00             | 83.4<br>88.5            | 1.00                 | 0.134<br>0.145             | 0.134<br>0.145 | 0.322                   | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00<br>0.00                              |
| 2.30<br>2.46         | 15.45<br>12.62             | 0.44                   | 2.83<br>2.95         | 110<br>110        | 0 126<br>0 135         | 0,997<br>0,996          | 2.85<br>2.98         | 0.81<br>0.83         | 1.70<br>1.70         | 24 62<br>20 06                   | 2.67<br>2.75         |      | 0                 |                |                      |                      |                  |                         | 1.00<br>1.00         |                            |                | 0.322                   | Non-Liq.<br>Non-Liq.             | Non-Liq   | 0.00<br>0.00                              |
| 2.62<br>2.79         | 13.50<br>20.18             | 0.27<br>0.31           | 2.01<br>1.56         | 110<br>110        | 0.153                  | 0.996<br>0.996          | 2.04<br>1.57         | 0.80<br>0.73         | 1.70<br>1.70         | 21.46<br>32.18                   | 2.63<br>2.42         |      | 0                 | 30             | 2,39                 |                      | 1,00             | 77.0                    | 1.00<br>1.00         | 0,123                      | 0.123          | 0.322<br>0.322          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00                              |
| 2.95                 | 25.28<br>31.76             | 0.31                   | 1.23                 | 110<br>110        | 0.171                  | 0.995<br>0.995          | 1,23<br>1,13         | 0.69<br>0.66         | 1.70<br>1.70         | 40.36<br>50.76                   | 2 28<br>2 18         |      | 1                 | 39<br>49       | 1.88<br>1.61         |                      | 1,00<br>1,00     | 76.0<br>81.6            |                      | 0.121<br>0.131             | 0 121<br>0 131 | 0.322<br>0.322          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 3.28                 | 35.56<br>40.16             | 0.38                   | 1.08                 | 110<br>110        |                        | 0.994<br>0.994          | 1.09<br>0.98         | 0.65                 | 1.70<br>1.70         | 56.85<br>64.22                   | 2.13                 |      | 1                 | 53<br>58       | 1,50<br>1,38         |                      | 1.00<br>1.00     | 85.5<br>88.8            | 1.00                 | 0.138<br>0.145             | 0.138<br>0.145 | 0.321<br>0.321          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 3.61                 | 45.45<br>52.79             | 0.46                   | 1.00                 | 110<br>110        | 0.208                  | 0.994                   | 1.01<br>0.97         | 0.61                 | 1.70                 | 72.71<br>84.49                   | 2.02                 |      | 1                 | 64<br>70       | 1.33                 |                      |                  |                         |                      | 0.164<br>0.235             | 0.164<br>0.235 | 0.321<br>0.321          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 3.94<br>4.10<br>4.27 | 58.72<br>64.33<br>69.66    | 0.56<br>0.60<br>0.83   | 0.95<br>0.94<br>1.19 | 110<br>110<br>110 | 0.226                  | 0.993                   | 0.95                 | 0.58                 | 1.70                 | 94.00<br>103.00                  | 1.92                 |      | 1                 | 74<br>78       | 1.20                 | 0.75                 | 1.12             | 135.7                   | 1.00                 | 0.271                      | 0.271          | 0.321                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 4.43                 | 74.65<br>78.74             | 1.28                   | 1.71                 | 110<br>110        | 0.244                  | 0.992<br>0.992<br>0.991 | 1.19<br>1.72<br>2.69 | 0.59<br>0.61<br>0.65 | 1.70<br>1.70<br>1.70 | 111.55<br>119.56<br>126.11       | 1.93<br>2.01<br>2.14 |      | 1                 | 81<br>84<br>86 | 1.21<br>1.32<br>1.54 |                      | 1.00             | 157,6                   | 1.00                 | 0.406<br>0.444             | 0.406          | 0.321                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 4.76<br>4.92         | 95.41<br>90.35             | 2.01                   | 2.11                 | 110<br>110        | 0.262                  | 0.991                   | 2.12                 | 0.61<br>0.58         | 1.70<br>1.70         | 152.88<br>144.74                 | 2.01                 |      | i                 | 94<br>92       | 1.34                 |                      | 1.00             | 200.9                   | 1.00<br>1.00<br>1.00 | Infin.<br>Infin.<br>Infin. | 0.000          | 0.320<br>0.320<br>0.320 | Non-Liq.                         | Non-Liq   | 0.00                                      |
| 5.09<br>5.25         | 73.79<br>64.99             | 0.57                   | 0.78                 | 110<br>110        | 0.280                  | 0.990                   | 0.78                 | 0.54<br>0.54         | 1.70                 | 118.12<br>103.96                 | 1.79                 |      | į                 | 84<br>78       | 1.10                 | 1.05                 | 1,00             | 130.0                   | 1.00                 | 0.285                      | 0.285          | 0.320                   | Non-Liq.<br>Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00<br>0.00                      |
| 5.41<br>5.58         | 60 11<br>57 62             | 0.48                   | 0.80                 | 110<br>110        | 0.298                  | 0.989                   | 0.81<br>1.24         | 0.57                 | 1,70<br>1,70         | 96.11<br>92.09                   | 1.87                 |      | 1                 | 75<br>73       | 1.16                 | 1.15                 | 1.00             | 111.7                   | 1.00                 | 0.210                      | 0.210          | 0 320                   | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                                      |
| 5.74<br>5.91         | 60,32<br>59.79             | 0.70<br>0.67           | 1.16<br>1.11         | 110<br>110        |                        | 0.989<br>0.988          | 1.16<br>1.12         | 0.60<br>0.60         | 1.70<br>1.70         | 96.42<br>95.55                   | 1.97<br>1.96         |      | 1                 | 75<br>75       | 1.26<br>1.25         |                      | 1.00             | 121.7<br>119.7          | 1,00                 | 0,247<br>0,239             | 0.247<br>0.239 | 0.320<br>0.319          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 6.07<br>6.23         | 56,99<br>64.88             | 0.42<br>0.50           | 0.74<br>0.77         | 110<br>110        |                        | 0.988<br>0.988          | 0.75<br>0.77         | 0.57<br>0.56         | 1.70<br>1.70         | 91.04<br>103.70                  | 1.86<br>1.83         |      | 1                 | 73<br>78       | 1.16<br>1.13         |                      |                  |                         | 1.00<br>1.00         | 0,190<br>0,230             | 0.190          | 0.319<br>0.319          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 6.40<br>6.56         | 81.28<br>88.72             | 0.52<br>0.58           | 0.64<br>0.65         | 110<br>110        | 0.361                  | 0.987<br>0.987          | 0.64<br>0.66         | 0.51                 | 1.70<br>1.70         | 130.04<br>141.98                 | 1.70<br>1.68         |      | 1                 | 88<br>91       | 1.04<br>1.02         |                      |                  | 135,6<br>145,7          |                      | 0.312<br>0.368             | 0.312<br>0.368 | 0.319<br>0.319          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00                              |
| 6.73<br>6.89         | 90.02<br>95.98             | 0.70                   | 0.78<br>0.78         | 110<br>110        | 0.379                  | 0.986<br>0.986          | 0.78                 | 0.52<br>0.52         | 1.70<br>1.70         | 144.05<br>153.61                 | 1.72<br>1.70         |      | 1                 | 92<br>95       |                      | 1,60                 | 1.00             | 160.1                   |                      | 0,406<br>Infin             | 0.406<br>0.000 | 0.319<br>0.319          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00                              |
| 7.05<br>7.22         | 106.17                     | 0.82                   | 0.77                 | 110<br>110        | 0.397                  | 0.986                   | 0.77<br>0.72         | 0.50                 | 1,63                 | 185.20                           | 1.67<br>1.62         |      | 1                 |                | 1.00                 | 1.70                 | 1.00             | 170.1<br>185.9          | 1.00                 | Infin.                     | 0.000          | 0.319<br>0.318          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 7.38<br>7.55         | 147 55<br>167 64<br>167 64 | 0.97<br>1.10           | 0.66<br>0.66<br>0.66 | 110<br>110        | 0.415                  | 0.985                   | 0.66                 | 0.50                 | 1.60                 | 224.51<br>252.36                 | 1.53                 |      | 1                 | 100            | 1.00                 |                      | 1.00             | 253,3                   | 1.00                 | Infin.                     | 0.000          | 0.318                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 7.71<br>7.87<br>8.04 | 175.94<br>183.17           | 1.10<br>1.23<br>1.23   | 0.70                 | 110<br>110<br>110 | 0.433                  | 0.984<br>0.984<br>0.984 | 0.66<br>0.70<br>0.67 | 0,50                 | 1,58<br>1,56<br>1,55 | 259 28                           | 1.49<br>1.50<br>1.48 |      | 1                 | 100            | 1.00                 | 1.90                 | 1.00             | 260.3                   | 1.00<br>1.00<br>1.00 | Infin.<br>Infin.<br>Infin. | 0.000          | 0.318                   | Non-Liq.                         | Non-Liq   | 0.00                                      |
| 8.20<br>8.37         | 189.37<br>193.49           | 0.94                   | 0.50                 | 110<br>110        | 0.451                  | 0.983                   | 0.50<br>0.64         | 0,50                 | 1.53                 | 273.46                           | 1.38<br>1.45         |      | 1                 | 100            | 1.00                 |                      | 1.00             | 274.5<br>277.7          | 1.00                 | Infin.                     | 0.000<br>0.000 | 0.318<br>0.318<br>0.318 | Non-Liq.<br>Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00<br>0.00                      |
| 8.53<br>8.69         | 194.51<br>195.90           | 1,46<br>1,50           | 0.75<br>0.77         | 110<br>110        | 0.469                  | 0 982<br>0 982          | 0.75<br>0.77         | 0.50                 | 1,50                 | 275,42                           | 1.51<br>1.51         |      | 1                 | 100            | 1.00                 |                      | 1.00             |                         | 1.00                 | Infin.                     | 0.000          | 0.318                   | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                                      |
| 8,86<br>9.02         | 199.53<br>202.65           | 1.67<br>1.56           | 0.84<br>0.77         | 110<br>110        | 0.487                  | 0.982<br>0.981          | 0.84<br>0.77         | 0.50                 | 1.47                 | 277,23                           | 1.54<br>1.51         |      | 1                 | 100            | 1,00                 | 2.20                 | 1.00             | 278.3<br>280.0          | 1.00                 | Infin.                     | 0.000          | 0.317                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 9.19<br>9.35         | 204.68<br>192.88           | 1.62<br>1.56           | 0.79<br>0.81         | 110<br>110        |                        | 0.981<br>0.981          | 0.80<br>0.81         |                      |                      |                                  | 1.52<br>1.54         |      |                   |                | 1.00                 | 2.30                 |                  | 280.3<br>261.8          |                      | Infin.                     | 0.000          | 0.317<br>0.317          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 9.51<br>9.68         | 173.28<br>160.53           | 1.31                   | 0.75<br>0.70         | 110<br>110        | 0.532                  | 0.980<br>0.980          | 0.76<br>0.70         |                      |                      |                                  | 1.56<br>1.56         |      |                   |                |                      | 2.40<br>2.45         |                  | 233.0<br>214.0          |                      | Infin.<br>Infin.           | 0.000          | 0.317<br>0.317          | Non-Liq.<br>Non-Liq.             | 2.0       | 0.00<br>0.00                              |
|                      | 160.48<br>167.93           | 0.98                   | 0.61<br>0.57         | 110<br>110        | 0.550                  | 0.980<br>0.979          | 0.61<br>0.57         | 0.50                 | 1.39                 | 219.35                           | 1.53<br>1.49         |      | 1                 | 100            | 1.00                 | 2.55                 | 1.00             | 220.2                   |                      | Infin.<br>Infin.           | 0.000          | 0.317<br>0.316          | Non-Liq.<br>Non-Liq.             |           | 0.00<br>0.00                              |
| 10.33                | 179.44<br>196.39           | 1.12                   | 0.62                 | 110<br>110        | 0,568                  | 0.979                   | 0.62<br>0.75         | 0.50                 | 1,36                 | 252.52                           | 1.50<br>1.53         |      | 1                 | 100            | 1.00                 | 2.65                 | 1.00             | 233.4<br>253.5          | 1.00                 | Infin.<br>Infin.           | 0.000          | 0.316<br>0.316          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |
| 10,66                | 212.87                     | 1.68                   | 0.79                 | 110<br>110        | 0.586                  | 978                     | 0.79                 | 0.50                 | 1.34                 | 276.76                           | 1.52<br>1.52         |      | 1                 | 100            | 1:00                 | 2.70                 | 1.00             | 277.8                   | 1.00                 | Infin.                     | 0.000          | 0.316<br>0.316          | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 10,99                | 219.09<br>218.78<br>227.29 | 1.46<br>1.57<br>1.90   | 0.67<br>0.72<br>0.84 | 110<br>110<br>110 | 0.604                  | 0.978<br>0.977<br>0.977 | 0.67<br>0.72<br>0.84 | 0.50                 | 1,32                 | 272,81                           | 1.47                 |      | 1                 | 100            | 1.00                 | 2.85                 | 1.00             | 276.3<br>273.8          | 1.00                 |                            | 0.000          | 0.316                   | Non-Liq.                         | Non-Liq.  | 0.00                                      |
| 11.32                | 240 17<br>222 62           | 1.90<br>1.92<br>1.81   | 0.80<br>0.81         | 110<br>110<br>110 | 0.623                  | 977<br>0.977<br>0.976   | 0.80<br>0.82         | 0.50                 | 1,30                 | 295.17                           | 1.53<br>1.50<br>1.53 |      | 1                 | 100            | 1.00                 | 2.90<br>2.95<br>3.00 | 1.00             | 282.4<br>296.3<br>272.6 | 1.00                 | Infin<br>Infin<br>Infin    | 0.000<br>0.000 | 0,316<br>0,316<br>0,315 | Non-Liq.<br>Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00                                      |
| 11.65                | 216 62<br>220 47           | 2.13                   | 0.98                 | 110<br>110<br>110 | 0.641                  | 976                     | 0.82<br>0.98<br>1.01 | 0.50                 | 1,29                 | 262.35                           | 1.61<br>1.61         |      | 1                 | 100            | 1.00                 | 3.00<br>3.05<br>3.10 | 1.00             | 272.6<br>263.3<br>266.1 | 1.00                 | Infin<br>Infin             | 0.000          | 0.315<br>0.315<br>0.315 | Non-Liq.<br>Non-Liq.<br>Non-Liq. | Non-Liq.  | 0.00<br>0.00<br>0.00                      |
| 11.98                | 211.90<br>218.21           | 2.36                   | 1.11                 | 110<br>110        | 0.659                  |                         | 1.12                 | 0.50                 | 1.27                 | 253.63                           | 1.66<br>1.61         |      | 1                 | 100            | 1.01                 | 3.15<br>3.20         | 1.00             | 256.5<br>259.8          | 1.00                 | Infin.                     | 0.000          | 0.315<br>0.315          | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00                                      |
| 12.30<br>12.47       | 217.25<br>227.19           | 1.71<br>1.31           | 0.79<br>0.58         | 110<br>110        | 0,677 (<br>0,686 (     | 0.974<br>0.974          | 0.79<br>0.58         | 0.50<br>0.50         | 1,25                 | 255,96                           | 1,54<br>1,43         |      | 1                 | 100            | 1.00                 | 3.25<br>3.30         | 1.00             | 256.9<br>266.9          | 1.00                 | Infin.                     | 0.000          | 0.315<br>0.315          | Non-Liq.                         | Non-Liq   | 0.00                                      |
|                      | 246.00<br>271.55           | 1.35                   | 0.55<br>0.81         | 110<br>110        |                        |                         |                      |                      |                      |                                  | 1.40<br>1.49         |      |                   |                |                      | 3.35<br>3.40         |                  | 287.2<br>315.1          |                      |                            |                | 0.315                   | Non-Liq.<br>Non-Liq.             | Non-Liq.  | 0.00<br>0.00                              |

| _ayer | Tip              | Friction | Friction | Total      | Eff_Stres      | S     |              |      |      |                  |              | ф  | Liquef.            | Rel        |      |      |      | Clean          |      |        |       | Induced        | Liquefac.            |          | Volumetri    |
|-------|------------------|----------|----------|------------|----------------|-------|--------------|------|------|------------------|--------------|----|--------------------|------------|------|------|------|----------------|------|--------|-------|----------------|----------------------|----------|--------------|
| epth  | Qc               | Fs       | Ratio    | Unit Wt.   | at Midpt,      |       |              |      |      | Corrected        | 4            | 90 | Liquef.<br>Suscept | Dens.      |      | Н    |      | Sand           |      |        | EQ    | M=7.5          | Safety               | Probab.  | Strain       |
| feet) | (tsf)            | (tsf)    | %        | (pcf)      | p'o (tsf)      | rd    | F            | n    | Ca   | Qc1n             | Ic           | õ  | (0 or 1)           | Dr (%)     | Kc   | (m)  | KH   | Qc1n           | Κσ   | CRR75  | CRR   | CSR            | Factor               | P,       | (%)          |
| 2.96  | 298,70           | 2.19     | 0.73     | 110        | 0,713          | 0.973 | 0.74         | 0.50 | 1.22 | 343 15           | 1,43         |    | 1                  | 100        | 1.00 | 3.45 | 1.00 | 344.4          | 1,00 | Infin. | 0.000 | 0.314          | Non-Liq.             | Non-Lig  | 0.00         |
| 3 12  | 297.19           | 2.53     | 0.85     | 110        | 0,722          | 0.973 | 0.85         | 0.50 | 1.21 | 339,26           | 1,49         |    | 1                  | 100        | 1.00 | 3.50 | 1.00 | 340.5          | 1_00 | Infin. | 0.000 | 0.314          | Non-Lig.             |          | 0.00         |
| 3 29  | 297,26           | 2.68     | 0.90     | 110        | 0,731          | 0_972 | 0,90         | 0.50 | 1.20 | 337,23           | 1,51         |    | 1                  | 100        | 1.00 | 3.55 | 1.00 | 338.5          | 1_00 | Infin, | 0.000 | 0,314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3 45  | 299.77           | 2.66     | 0.89     | 110        | 0.740          | 0,972 | 0.89         | 0.50 | 1.20 | 337,99           | 1,50         |    | 1                  | 100        | 1.00 | 3.60 | 1.00 | 339.3          | 1.00 | Infin  | 0,000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.62  | 299,47           | 2.65     | 0.88     | 110        | 0.749          | 0.972 | 0.89         | 0.50 | 1.19 | 335,60           | 1,50         |    | 1                  | 100        | 1.00 | 3.65 | 1.00 | 336.9          | 1.00 | Infin. | 0,000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 3.78  | 293,58           | 3.11     | 1.06     | 110        | 0,758          | 0.971 | 1.06         | 0.50 | 1.18 | 327 01           | 1,57         |    | 1                  | 100        | 1.00 | 3.70 | 1.00 | 328.2          |      |        | 0,000 | 0.314          | Non-Liq,             | Non-Liq. | 0.00         |
| 3.94  | 298.13           | 3.07     | 1.03     | 110        | 0,767          | 0.971 | 1.03         | 0.50 | 1.17 | 330,12           | 1,56         |    | 1                  | 100        | 1.00 |      | 1.00 | 331.4          |      |        | 0.000 | 0.314          | Non-Liq.             | Non-Liq. | 0.00         |
| 4.11  | 301.85           | 3.04     | 1.01     | 110        | 0.776          | 0.971 | 1,01         | 0.50 | 1.17 | 332.29           | 1,55         |    | 1                  | 100        | 1.00 | 3.80 | 1.00 | 333.5          |      | Infin, | 0,000 | 0.314          | Non-Liq.             |          | 0.00         |
| 4.27  | 298.45           | 3.68     | 1.23     | 110        | 0.785          | 0.970 | 1,24         | 0.50 | 1.16 | 326,64           | 1,62         |    | 1                  | 100        | 1.00 |      | 1,00 |                | 1,00 | Infin. | 0,000 | 0.314          | Non-Liq.             |          | 0.00         |
| 4.44  | 300.98           | 2.74     | 0.91     | 110        | 0.794          | 0,970 | 0,91         | 0.50 | 1.15 | 327_53           | 1,52         |    | 1                  | 100        | 1.00 | 3.90 | 1.00 |                | 1.00 | Infin. | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
|       | 315.50<br>313.59 | 2.80     | 0.89     | 110<br>110 | 0.803          | 0.970 | 0.89         | 0.50 | 1.15 | 341.43           | 1.50         |    | 1                  | 100        | 1.00 | 3.95 |      | 342.7          |      | Infin, | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
| 4.76  | 322.37           | 3.47     | 1.08     | 110        | 0,812<br>0.821 | 0.969 | 0.97         | 0.50 | 1.14 | 337,45           | 1.53         |    | 1                  | 100        | 1.00 | 4.00 | 1.00 | 338.7          |      | Infin. | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
| 5.09  | 336.14           | 3.51     | 1.04     | 110        | 0.830          | 0.969 | 1.08<br>1.05 | 0.50 | 1.14 | 345.00<br>357.81 | 1.56<br>1.54 |    | 1                  | 100        | 1.00 |      | 1.00 | 346.3          |      | Infin. | 0,000 | 0.313          | Non-Liq.             |          | 0.00         |
| 5.26  | 323.66           | 3.11     | 0.96     | 110        | 0.839          | 0.968 | 0.96         | 0.50 | 1.13 | 342.62           | 1.54         |    | 1                  | 100<br>100 | 1.00 |      | 1.00 |                | 1.00 | Infin_ | 0.000 | 0.313          | Non-Liq.             |          | 0.00         |
|       | 317.94           | 3.08     | 0.97     | 110        | 0.848          | 0.968 | 0.97         | 0.50 | 1.12 | 334.75           | 1.53         |    | 1                  | 100        | 1.00 | 4.15 |      | 343.9          |      | Infin  | 0.000 | 0.313          | Non-Liq.             |          | 0.00         |
| 5.58  | 320.07           | 3.08     | 0.96     | 110        | 0.857          | 0.967 | 0.96         | 0.50 | 1.12 | 335.21           | 1.53         |    | 1                  | 100        | 1.00 |      | 1.00 | 336.0          | 65   | Infin  | 0.000 | 0.313          | Non-Liq.             |          | 0.00         |
|       | 310.52           | 2.97     | 0.96     | 110        | 0.866          | 0.967 | 0.96         | 0.50 | 1.11 | 323.47           | 1.54         |    | 1                  | 100        | 1.00 | 4.25 | 1.00 | 336.5<br>324.7 |      | infin. | 0.000 | 0.313          | Non-Liq.             | 7.5      | 0.00         |
|       | 314.10           | 3.02     | 0.96     | 110        | 0.875          | 0.967 | 0.96         | 0.50 | 1.10 | 325.51           | 1.54         |    | 1                  | 100        | 1.00 | 4.35 |      | 324.7          |      | Infin. | 0.000 | 0.313<br>0.312 | Non-Liq.             |          | 0.00         |
|       | 315,60           | 2.97     | 0.94     | 110        | 0.884          | 0.966 | 0.94         | 0.50 | 1.09 |                  | 1.53         |    | 1                  | 100        | 1.00 | 4.40 |      |                | 1.00 | Infin  | 0.000 | 0.312          | Non-Liq.<br>Non-Liq. |          | 0.00<br>0.00 |
|       | 327.26           | 2.77     | 0.85     | 110        | 0.893          | 0.966 | 0.85         | 0.50 | 1.09 |                  | 1.49         |    | â                  | 100        | 1.00 |      | 1.00 |                | 1.00 | Infin: | 0,000 | 0.312          | Non-Liq.             | ,        | 0.00         |
|       | 328.11           | 2.94     | 0.89     | 110        | 0.902          | 0.966 | 0.90         | 0.50 | 1.08 |                  | 1.51         |    | 4                  | 100        | 1.00 | 4.50 |      | 336.2          |      | Infin  | 0.000 | 0.312          | Non-Liq.             | ,-       | 0.00         |
|       | 357.30           | 2.93     | 0.82     | 110        | 0.911          | 0.965 | 0.82         | 0.50 | 1.08 |                  | 1.45         |    | 4                  | 100        | 1.00 | 4.55 |      | 364.3          |      |        | 0,000 | 0.312          | Non-Liq.             |          | 0.00         |
|       | 379.84           | 3.02     | 0.80     | 110        | 0.920          | 0.965 | 0.80         | 0.50 | 1.07 |                  | 1.43         |    | 4                  | 100        | 1.00 | 4.60 |      |                | 1.00 | Infin  | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 5.90  | 393,42           | 4.35     | 1.11     | 110        | 0.929          | 0.965 | 1.11         | 0.50 | 1.07 | 395.83           | 1.54         |    | 1                  | 100        | 1.00 |      | 1.00 |                | 1.00 |        | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 7_06  | 393.65           | 3.67     | 0.93     | 110        | 0.938          | 0.964 | 0.93         | 0.50 | 1.06 | 394.14           | 1.48         |    | 1                  |            | 1.00 | 4.70 |      |                | 1.00 | Infin. | 0.000 | 0.312          | Non-Liq.             |          | 0.00         |
| 22    | 403.88           | 3.66     | 0.91     | 110        | 0.947          | 0.964 | 0.91         | 0.50 | 1.06 | 402.47           | 1.46         |    | 1                  | 100        | 1.00 |      | 1.00 |                | 1.00 |        | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| 7.39  | 384.75           | 3.06     | 0.80     | 110        | 0.956          | 0.963 | 0.80         | 0.50 | 1.05 | 381,54           | 1.43         |    | 1                  | 100        | 1.00 |      | 1.00 |                | 1.00 |        | 0.000 | 0.311          | Non-Lig.             |          | 0.00         |
| .55   | 418.46           | 2.70     | 0.64     | 110        | 0,965          | 0.963 | 0.65         | 0.50 | 1.05 | 413,10           | 1.34         |    | 1                  | 100        | 1.00 | 4.85 | 1.00 | 414.6          | 1.00 |        | 0.000 | 0.311          | Non-Lig.             |          | 0.00         |
| 7.72  | 426.59           | 3.76     | 0.88     | 110        | 0.974          | 0.963 | 0.88         | 0.50 | 1.04 | 419.18           | 1.44         |    | 1                  | 100        | 1.00 | 4.90 | 1.00 | 420.8          | 1.00 |        | 0.000 | 0.311          | Non-Lig.             |          | 0.00         |
| .88   | 438.49           | 4.30     | 0.98     | 110        | 0.983          | 0.962 | 0.98         | 0.50 | 1.04 | 428,91           | 1_47         |    | 1                  | 100        | 1.00 | 4.95 | 1.00 | 430.5          | 1.00 | Infin. | 0.000 | 0.311          | Non-Liq.             |          | 0.00         |
| .04   | 459.63           | 3.50     | 0.76     | 110        | 0.992          | 0.962 | 0.76         | 0.50 | 1.03 | 447.58           | 1.37         |    | 1                  | 100        | 1.00 | 5.00 | 1.00 | 449.3          | 1.00 | Infin. | 0.000 | 0.311          | Non-Lig.             |          | 0.00         |
|       | 446.70           | 3.76     | 0.84     | 110        | 1,001          | 0.962 | 0_84         | 0.50 | 1.03 | 432.99           | 1.42         |    | 1                  | 100        | 1.00 | 5.05 | 1.00 | 434.6          | 1_00 | Infin. | 0.000 | 0.311          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 433,53           | 3.52     | 0.81     | 110        | 1.010          | 0.961 | 0.81         | 0.50 | 1.02 | 418,31           | 1.41         |    | 1                  | 100        | 1.00 | 5.10 | 1.00 | 419.9          | 1.00 | Infin. | 0_000 | 0.311          | Non-Liq.             | Non-Lig. | 0.00         |
|       | 420,70           | 4.05     | 0.96     | 110        |                | 0.961 | 0.96         | 0.50 | 1.02 |                  | 1.48         |    | 1                  | 100        | 1.00 | 5.15 | 1.00 | 405.6          | 1.00 | Infin. | 0.000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 427,38           | 4.04     | 0.95     | 110        |                | 0.960 | 0.95         |      | 1.01 | 408.71           | 1.47         |    | 1                  | 100        | 1.00 | 5.20 | 1.00 | 410.2          | 1.00 | Infin. | 0.000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 433.11           | 4.37     | 1.01     | 110        |                | 0.960 | 1,01         |      | 1.01 |                  | 1.49         |    | 1                  |            | 1.00 |      | 1.00 |                | 1_00 | Infin. | 0.000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 406.01           | 4.03     | 0.99     | 110        |                | 0.960 | 0.99         |      | 1.01 |                  | 1.51         |    | 1                  |            |      | 5.20 |      | 386.3          |      |        | 0.000 | 0.310          | Non-Liq.             | Non-Liq  | 0.00         |
|       | 382.11           | 4.15     | 1.09     | 110        |                | 0.959 | 1.09         |      | 1.00 |                  | 1,55         |    | 1                  |            | 1.00 |      | 1.00 | 361.9          |      | Infin. | 0,000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 381.05           | 4.09     | 1.07     | 110        |                | 0,959 | 1.08         |      | 1.00 |                  | 1,55         |    | 1                  |            |      |      | 1.00 | 359.4          |      | Infin: | 0.000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 379.85           | 4.12     | 1.08     | 110        |                | 0,958 | 1,09         |      | 0.99 |                  | 1.56         |    | 1                  |            |      |      | 1.00 | 356.7          |      |        | 0,000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 382.89           | 4.14     | 1.08     | 110        |                | 0.958 | 1,08         |      | 0.99 |                  | 1,55         |    | 1                  |            |      |      | 1.00 | 358.1          |      |        | 0.000 | 0.310          | Non-Liq.             | Non-Liq. | 0.00         |
|       | 384.60           | 3.97     | 1.03     | 110        |                | 0.957 | 1.04         |      | 0.98 |                  | 1,54         |    | 1                  |            |      |      | 1.00 | 358.2          |      |        | 0.000 | 0.309          | Non-Liq.             | Non-Liq. | 0.00         |
| 1.01  | 377.72           | 4.35     | 1.15     | 110        | 1.101          | 0.957 | 1.16         | 0.50 | 0.98 | 349,00           | 1,58         |    | 1                  | 100        | 1.00 | 5.20 | 1.00 | 350.3          | 0.98 | Infin. | 0.000 | 0.309          | Non-Lig.             | Non-Lia  | 0.00         |

# CPT-LIQUEFY.XLS - A SPREADSHEET FOR EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL USING CPT DATA Developed 2003 by Shelton L, Stringer, GE, Earth Systems Southwest

|                | P                | roject:              | Oxnaro            | d High Sc    | hool No.           | 8              |              | Met          | thods:       | Liquefac             | tion Ar      | naly     | sis usin | g 1998     | NCEE           | R wor              | kshop            | method               | s (Rob       | ertson 8           | & Wride        | )                    |                      |                           | Total                  |
|----------------|------------------|----------------------|-------------------|--------------|--------------------|----------------|--------------|--------------|--------------|----------------------|--------------|----------|----------|------------|----------------|--------------------|------------------|----------------------|--------------|--------------------|----------------|----------------------|----------------------|---------------------------|------------------------|
|                | J                | ob No:<br>Date:      | 301953<br>8/14/20 |              |                    |                |              |              |              | Post-liqu<br>Dry San |              |          |          |            | -              |                    |                  |                      |              |                    |                |                      |                      |                           | Liquefled<br>Thickness |
| EARTH          | Sou              | inding:              | CPT-7             |              | Plot:              | 7              |              |              | 4 000        | -                    |              |          |          |            |                |                    |                  | .02, 70              |              | 140                |                |                      |                      |                           | (feet)                 |
| LAKI           |                  | gnitude:             | 6.77              | 7.5          |                    |                |              |              |              | (M=7.5):<br>and Qc1n |              |          |          | p 0) 10    | rivior         | SF =               | CRR <sub>7</sub> | , <sub>5</sub> *Κσ/C | SR           |                    |                |                      |                      | Probab                    | 0.0<br>Total           |
|                | W                | PGA, g:              | 0.65<br>1.30      | 0.50         |                    | Un             | it Maia      | ht of ur     | neatura      | ted soils:           | 110          | рс       |          |            | Us             | e Toki             | matsu            | & Seed               | (0) or       | Ishihara           |                | mine (1):            | 0                    | Avg                       | Induced                |
|                |                  | /T, feet:            | 20.0              |              | İ                  |                | Unit We      | eight of     | satura       | ted soils:           | 110          | pc       |          |            |                |                    |                  | J                    | Min SF       | of Liqu            |                | uired SF:<br>Layers: | 1,50                 | 0%<br>Max                 | Subsidence<br>(inches) |
| Layer          | esign GV<br>Tip  | T, feet:<br>Friction | 20.0<br>Friction  | Total        | Eff.Stres          |                | Limiting     | lc for l     | liquefia     | ble soils:           | 2.60         | d        | Liquef.  |            | iting Ic       | for K <sub>H</sub> | 2.0              | Clean                | _            | of Liqu            | uefiable       | Layers:              | 0.00<br>Liquefac.    | 0%                        | 0.2<br>Volumetric      |
| Depth          | Qc               | Fs                   | Ratio             | Unit Wt      | at Midpt           |                | - 22         |              |              | Corrected            |              | - 5      | Suscept  | Dens       |                | H                  | 3311             | Sand                 |              | The second         | EQ             | M=7.5                | Safety               | Probab.                   | Strain                 |
| (feet)<br>0,16 | (tsf)<br>7,32    | (tsf)<br>0.09        | 1.28              | (pcf)<br>110 | p'o (tsf)<br>0.009 | 1.000          | 1.29         | 0.83         | 1.70         | Qc1n<br>11.75        | 1c<br>2.74   | <u>Ó</u> | (0 or 1) | Dr (%)     | K <sub>c</sub> | (m)                | Кн               | Qc1n                 | Kσ           | CRR <sub>7,5</sub> | CRR            | 0.323                | Factor<br>Non-Liq.   | P <sub>L</sub><br>Non-Lia | 0.00                   |
| 0.33           | 12,26<br>14,26   | 0.12<br>0.15         | 1.00              | 110<br>110   | 0,018<br>0,027     | 1,000          | 1.00<br>1.03 | 0.76<br>0.74 | 1.70<br>1.70 | 19.67<br>22.87       | 2.50<br>2.44 |          | 1        | 9<br>16    | 2.75<br>2.50   |                    | 1,00             | 54.0<br>57.1         | 1.00         | 0.095<br>0.097     | 0,095<br>0,097 | 0.323<br>0.323       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                   |
| 0.66           | 13,52            | 0.15                 | 1.09              | 110          | 0.036              | 1,000          | 1.10         | 0.75         | 1.70         | 21,67                | 2.48         |          | 1        | 13         | 2,66           |                    | 1.00             | 57.7                 | 1.00         | 0.098              | 0.098          | 0.323                | Non-Liq.             | Non-Liq                   | 0.00                   |
| 0.98           | 11,35<br>9,04    | 0.14                 | 1.22              | 110<br>110   | 0,045<br>0,054     | 1.000          | 1.22<br>1.34 | 0.78<br>0.81 | 1.70<br>1.70 | 18.16<br>14.44       | 2.57<br>2.67 |          | 0        | 6          | 3,14           |                    | 1,00             | 57.0                 | 1.00<br>1.00 | 0.097              | 0.097          | 0.323<br>0.323       | Non-Liq.<br>Non-Liq. |                           | 0.00                   |
| 1.15<br>1.31   | 7.13<br>7.13     | 0.08                 | 1.07<br>1.07      | 110<br>110   | 0,063<br>0,072     | 0.999          | 1.08<br>1.08 | 0.82<br>0.82 | 1,70<br>1,70 | 11.36<br>11.34       | 2.72         |          | 0        |            |                |                    |                  |                      | 1.00         |                    |                | 0.323                | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 1.48<br>1.64   | 6.14<br>6.75     | 0.08                 | 1.27<br>2.01      | 110<br>110   | 0.081              | 0.999          | 1.29<br>2.04 | 0.85<br>0.87 | 1.70<br>1.70 | 9.74<br>10.70        | 2.82         |          | 0        |            |                |                    |                  |                      | 1.00         |                    |                | 0.323                | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00           |
| 1,80<br>1,97   | 12.03<br>26.83   | 0.25<br>0.46         | 2.04              | 110<br>110   | 0.099              | 0.998          | 2,05         | 0.81         | 1.70         | 19 17<br>42 94       | 2.67         |          | 0        | 40         | 0.40           |                    | 4.00             | 00.0                 | 1.00         | 0.440              | 0.140          | 0,323                | Non-Liq.             | Non-Liq                   | 0.00                   |
| 2.13           | 27.70            | 0.58                 | 2.10              | 110          | 0.117              | 0.997          | 2.11         | 0.72         | 1.70<br>1.70 | 44.32                | 2,39         |          | 1        | 42<br>43   | 2,10<br>2,27   |                    | 1.00             | 90,0<br>100,6        | 1.00<br>1.00 | 0.148<br>0.175     | 0.148<br>0.175 | 0.322<br>0.322       | Non-Liq.<br>Non-Liq. |                           | 0.00                   |
| 2,30<br>2,46   | 30.71<br>35.14   | 0.62                 | 2.02<br>1.69      | 110<br>110   | 0.126<br>0.135     | 0.997<br>0.996 | 2.02<br>1.70 | 0.71<br>0.68 | 1.70<br>1.70 | 49.14<br>56.25       | 2.34         |          | 1        | 47<br>53   | 2.10<br>1.80   |                    | 1.00             | 103.0<br>101.0       | 1.00         | 0.182<br>0.176     | 0.182<br>0.176 | 0.322                | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 2.62           | 34.66<br>30.29   | 0.52<br>0.43         | 1.49<br>1.42      | 110<br>110   | 0.144<br>0.153     | 0,996<br>0,996 | 1.49<br>1.43 | 0.67<br>0.68 | 1.70<br>1.70 | 55.46<br>48.42       | 2.22         |          | 1        | 52<br>47   | 1.71<br>1.81   |                    | 1.00             | 95.1<br>87.5         | 1.00         | 0.160<br>0.142     | 0.160<br>0.142 | 0.322                | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 2.95<br>3.12   | 25.72<br>22.47   | 0.37<br>0.33         | 1.42              | 110<br>110   | 0.162<br>0.171     | 0.995          | 1.43<br>1.50 | 0.70<br>0.72 | 1.70<br>1.70 | 41.07<br>35.83       | 2.31<br>2.37 |          | 1        | 40<br>34   | 1.98<br>2.19   |                    | 1,00             | 81.4<br>78.6         |              | 0.130<br>0.125     | 0.130<br>0.125 | 0.322<br>0.322       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00                   |
| 3.28<br>3.44   | 20.80<br>20.45   | 0.31                 | 1.47<br>1.47      | 110<br>110   | 0.180<br>0.189     | 0.994          | 1.48         | 0.73<br>0.73 | 1.70<br>1.70 | 33.13<br>32.55       | 2.40         |          | 1        | 31         | 2.29           |                    | 1.00             | 76.0                 | 1_00         | 0.121              | 0.121          | 0.321                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 3.61           | 20.73            | 0.30                 | 1.45              | 110          | 0.198              | 0.994          | 1.47         | 0.73         | 1.70         | 32.99                | 2.39         |          | 1        | 30<br>31   | 2,32<br>2,29   |                    | 1.00<br>1.00     | 75.4<br>75.5         | 1.00<br>1.00 | 0.120<br>0.120     | 0.120<br>0.120 | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 3.77<br>3.94   | 19.90<br>17.21   | 0.31<br>0.35         | 1.58<br>2.05      | 110<br>110   | 0.208<br>0.217     | 0.993          | 1.59<br>2.08 | 0.74<br>0.77 | 1.70<br>1.70 | 31.64<br>27.31       | 2.43         |          | 1        | 29<br>23   | 2,44<br>3,03   |                    | 1.00             | 77.1<br>82.8         | 1.00         | 0.123<br>0.133     | 0.123<br>0.133 | 0.321<br>0.321       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 4.10<br>4.27   | 11.84<br>7.47    | 0.37                 | 3.08              | 110<br>110   | 0.226<br>0.235     | 0.993<br>0.992 | 3.14<br>4.38 | 0.85<br>0.92 | 1.70<br>1.70 | 18.66<br>11.63       | 2.79<br>3.04 |          | 0        |            |                |                    |                  |                      | 1.00         |                    |                | 0.321                | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 4.43<br>4.59   | 7.87<br>13.03    | 0.27<br>0.25         | 3.41              | 110<br>110   | 0.244              | 0.992          | 3.51<br>1.93 | 0.90         | 1.70<br>1.70 | 12.25<br>20.53       | 2.96<br>2.63 |          | 0        |            |                |                    |                  |                      | 1.00         |                    |                | 0.321<br>0.320       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 4.76<br>4.92   | 17.56<br>25.00   | 0.20                 | 1.13              | 110<br>110   | 0.262              | 0.991<br>0.991 | 1.15         | 0.73         | 1.70         | 27 80<br>39 74       | 2.40         |          | 1        | 24         | 2,30           |                    | 1.00             | 63.9                 | 1,00         |                    | 0.104          | 0.320                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 5.09           | 28.21            | 0.27                 | 0.97              | 110          | 0.280              | 0,990          | 0.98         | 0.66         | 1.70         | 44.88                | 2.18         |          | 1        | 39<br>44   | 1.75<br>1.63   |                    | 1.00             | 69.6<br>73.1         | 1.00         |                    | 0.111<br>0.116 | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 5.25<br>5.41   | 26.74<br>27.54   | 0.32                 | 1.19<br>1.20      | 110<br>110   | 0.298              | 0.990<br>0.989 | 1.20<br>1.21 | 0.68<br>0.68 | 1.70<br>1.70 | 42,50<br>43,77       | 2.25         |          | 1        | 41<br>43   | 1.81<br>1.79   |                    | 1.00<br>1.00     | 76.9<br>78.2         | 1.00<br>1.00 | 0.122<br>0.124     | 0 122<br>0 124 | 0.320<br>0.320       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 5.58<br>5.74   | 30.42<br>35.07   | 0.33                 | 1.08<br>0.95      | 110<br>110   |                    | 0.989<br>0.989 | 1.10<br>0.96 | 0.66<br>0.64 | 1.70<br>1.70 | 48.39<br>55.84       | 2.18         |          | 1        | 47<br>53   | 1.63<br>1.46   |                    | 1.00             | 78.9<br>81.3         | 1.00         | 0.126<br>0.130     | 0.126<br>0.130 | 0.320                | Non-Liq.<br>Non-Liq. |                           | 0.00                   |
| 5.91<br>6.07   | 42.76<br>59.96   | 0.43                 | 0.99              | 110<br>110   |                    | 0.988          | 1.00         | 0.62<br>0.59 | 1.70<br>1.70 | 68.19<br>95.81       | 2.04<br>1.93 |          | 1        | 61<br>75   | 1.36<br>1.22   | 1.00               | 1.00             | 92.6<br>116.9        | 1.00         | 0.154<br>0.228     | 0.154<br>0.228 | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 6.23<br>6.40   | 82.48<br>98.15   | 0.78                 | 0.94              | 110<br>110   | 0.343              | 0.988<br>0.987 | 0.94<br>0.91 | 0.55<br>0.53 | 1.70<br>1.70 | 131.98               | 1.80<br>1.74 |          | 1        | 88<br>96   | 1.11           | 1.05               | 1.00             | 146.8                | 1.00         | 0.374<br>Infin.    | 0.374          | 0.319                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 6.56<br>6.73   | 106.99<br>112.07 | 1.01                 | 0.94              | 110<br>110   | 0.361              | 0.987<br>0.986 | 0.95         | 0.52<br>0.52 | 1.70         | 171.33               | 1.72         |          | i        | 99         | 1.05           | 1.15               | 1.00             | 180.9                | 1.00         | Infin.             | 0.000          | 0.319                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 6.89           | 112,25           | 1.18                 | 1.05              | 110          | 0.379              | 0.986          | 1.05         | 0.53         | 1.70         | 179.76               | 1.72<br>1.74 |          | i        | 100        |                | 1.25               | 1.00             | 191.9                | 1.00         | Infin.<br>Infin.   | 0.000          | 0.319<br>0.319       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 7.22           | 111.68<br>113.57 | 1.25<br>1.36         | 1.12<br>1.19      | 110<br>110   |                    | 0.986<br>0.985 | 1.13<br>1.20 | 0.54<br>0.54 | 1.70<br>1.70 | 178.82<br>181.71     | 1.76<br>1.78 |          | 1        | 100<br>100 | 1.08<br>1.09   | 1.30<br>1.35       |                  | 193.6<br>198.6       | 1.00         | Infin.<br>Infin.   | 0.000          | 0.319<br>0.318       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 7.38<br>7.55   | 110.25<br>100.97 | 1.39<br>1.35         | 1.26              | 110<br>110   |                    | 0.985<br>0.985 | 1.27<br>1.34 |              | 1.69<br>1.69 |                      | 1.80<br>1.85 |          | 1        | 100<br>97  |                | 1.40<br>1.45       |                  |                      | 1.00         | Infin.<br>Infin.   | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 7 71<br>7 87   | 100.97<br>95.77  | 1.35<br>1.34         | 1.34              | 110<br>110   |                    | 0.984<br>0.984 | 1.34<br>1.40 |              | 1.67<br>1.67 |                      | 1.85<br>1.88 |          | 1        | 96<br>94   |                | 1.50<br>1.55       |                  | 183.0<br>176.7       | 1.00         | Infin.<br>Infin.   | 0.000          | 0.318<br>0.318       | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00           |
| 8.04<br>8.20   | 92.93<br>90.79   | 1.31<br>1.03         | 1.41<br>1.14      | 110<br>110   | 0.442              | 0.984          | 1.42<br>1.14 | 0.58         | 1.65<br>1.61 | 144.62               | 1.90<br>1.85 |          | 1        | 92<br>90   | 1,19           | 1.60               | 1.00             | 172.1<br>157.8       | 1.00         | Infin<br>0.446     | 0.000          | 0.318<br>0.318       | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 8,37           | 87.38            | 1.00                 | 1.14              | 110          | 0.460              | 0.983          | 1.15         | 0.57         | 1.60         | 131.65               | 1.86         |          | 1        | 88         | 1.15           | 1.70               | 1.00             | 152.6                | 1.00         | 0.410              | 0.410          | 0,318                | Non-Liq.             | Non-Liq.                  | 0.00<br>0.00           |
| 8.53<br>8.69   | 82.47<br>86.06   | 0.96                 | 1.17              | 110<br>110   | 0.478              | 0.982          | 1.18<br>1.17 | 0.57         | 1.60<br>1.57 | 127.32               | 1.89<br>1.88 |          | 1        | 86<br>87   | 1.17           | 1.75<br>1.80       | 1.00             | 146.1<br>149.3       | 1.00         | 0,390              | 0.370<br>0.390 | 0.318<br>0.317       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 8.86<br>9.02   | 93.45<br>102.02  | 1.08<br>1.14         | 1.15<br>1.12      | 110<br>110   |                    |                | 1.16<br>1.13 |              | 1.55<br>1.52 |                      | 1.85<br>1.82 |          | 1        | 90<br>93   |                | 1.85<br>1.90       |                  | 156.8<br>164.7       |              |                    | 0.439<br>0.000 | 0.317<br>0.317       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 9.19<br>9.35   | 107.28<br>109.34 | 1.17<br>1.18         | 1.09              | 110<br>110   |                    |                | 1.10         |              | 1.50<br>1.48 |                      | 1.80<br>1.80 |          | 1        | 94<br>94   |                | 1.95               |                  | 168.7<br>169.1       |              |                    | 0.000          | 0.317<br>0.317       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
| 9.51           | 111.98<br>118.26 | 1.16<br>1.20         | 1.04              | 110<br>110   | 0.523              | 0.980          | 1.04<br>1.02 | 0.54         | 1.47<br>1.45 | 154.35               | 1.78<br>1.76 |          | 1        | 95<br>97   | 1.09           | 2.05               | 1.00             | 169.5<br>174.2       | 1.00         | Infin.             | 0.000          | 0.317                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 9.84           | 127.36<br>137.13 | 1.25                 | 0.98<br>0.97      | 110          | 0.541              | 0.980          | 0.99         | 0.53         | 1.42         | 170.74               | 1.73         |          | î        | 99         | 1.06           | 2.15               | 1.00             | 181.7                | 1.00         | Infin              | 0.000          | 0.317                | Non-Liq.             | Non-Liq.                  | 0.00<br>0.00           |
| 10.17          | 144,79           | 1.41                 | 0.98              | 110<br>110   | 0.559              | 0.979          | 0.98         | 0.52         | 1.41         | 189,61               | 1.71<br>1.70 |          | 1        | 100<br>100 | 1.04           | 2.20<br>2.25       | 1.00             | 190.2<br>197.4       | 1.00         | Infin.             | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 10.50          | 155,29<br>160,35 | 1.57<br>1.65         | 1.01              | 110<br>110   | 0.577              | 0.978          |              |              | 1.38<br>1.37 |                      | 1.69<br>1.69 |          | 1        | 100<br>100 |                |                    |                  | 208.8<br>213.4       |              |                    | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
|                | 162.80<br>163.62 | 1.74<br>1.48         | 1.07<br>0.90      | 110<br>110   |                    |                |              |              | 1.36<br>1.34 |                      | 1.70<br>1.65 |          | 1        | 100<br>100 |                | 2.40<br>2.45       |                  | 216.7<br>207.4       |              |                    | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
|                | 165.03<br>165.44 | 1.59<br>1.62         | 0.96              | 110<br>110   |                    |                |              |              | 1.33<br>1.32 |                      | 1.67<br>1.68 |          | 1        | 100<br>100 |                | 2.50<br>2.55       | 1.00             | 210.8                |              | Infin              | 0.000          | 0.316<br>0.316       | Non-Liq.<br>Non-Liq. | Non-Liq.                  | 0.00<br>0.00           |
| 11.32          | 170.54<br>193.35 | 1 67<br>1 66         | 0.98              | 110<br>110   | 0.623              | 0.977          | 0.98         | 0.51         | 1,31         | 210.31               | 1.67<br>1.59 |          | 1        | 100        | 1.02           | 2.60               | 1.00             | 214.5                | 1.00         | Infin.             | 0.000          | 0.316                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 11.65          | 234.30           | 1.88                 | 0.80              | 110          | 0.641              | 976            | 0.81         | 0.50         | 1.29         | 283.83               | 1.52         |          | 1        | 100        | 1.00           | 2.65               | 1.00             |                      | 1.00         | Infin              | 0.000          | 0,315                | Non-Liq.             | Non-Liq.                  | 0.00                   |
| 11.98          | 311.45<br>345.03 | 2.01                 | 0.58              | 110<br>110   | 0.659              | 0.975          | 0.58         | 0.50         | 1.27         | 412.54               | 1.33<br>1.30 |          | 1        | 100        | 1.00           | 2.80               | 1.00             |                      | 1.00         | Infin.             | 0.000          | 0,315<br>0,315       | Non-Liq.<br>Non-Liq. | Non-Liq                   | 0.00<br>0.00           |
| 12.30          | 350.57<br>323.89 | 2.01                 | 0.57<br>0.63      | 110<br>110   | 0.677              | 0.974          | 0.63         | 0.50         | 1.25         | 381.99               | 1.30<br>1.35 |          | 1        | 100<br>100 | 1_00           | 2.85<br>2.90       | 1.00             | 417.9<br>383.4       | 1.00         |                    | 0.000          | 0.315<br>0.315       | Non-Liq.<br>Non-Liq. |                           | 0.00<br>0.00           |
|                | 284.79<br>272.50 | 2.15                 | 0.75<br>0.79      | 110<br>110   |                    |                |              |              |              |                      | 1.45<br>1.48 |          | 1        | 100<br>100 |                | 2.95<br>3.00       |                  | 334.8<br>318.2       |              |                    | 0.000          | 0.315<br>0.315       | Non-Liq.<br>Non-Liq. |                           | 0.00                   |
|                | 284.55           | 2.13                 | 0.75              | 110          |                    |                |              | 0.50         |              | 328.95               |              |          | 1        |            | 1.00           |                    |                  | 330.2                |              | Infin.             |                | 0 315                | Non-Liq.             |                           | 0.00                   |

| Layer  | Tip              | Friction     | Friction | Total      | Eff Stres      | S     |              |      |      |                |      | de    | Liquef.  | Rel    |      |      |      | Clean |              |                     |       | Induced | Liquefac.            |                | Volumetr |
|--------|------------------|--------------|----------|------------|----------------|-------|--------------|------|------|----------------|------|-------|----------|--------|------|------|------|-------|--------------|---------------------|-------|---------|----------------------|----------------|----------|
| Depth  | Qc               | Fs           | Ratio    | Unit Wt.   | at Midpt       |       |              |      |      | Corrected      | t    | S. S. | Suscept  | Dens   |      | Н    |      | Sand  |              |                     | EQ    | M=7.5   | Safety               | Probab         | Strain   |
| (feet) | (tsf)            | (tsf)        | %        | (pcf)      | p'o (tsf)      | rd    | F            | n    | Co   | Qc1n           | lc   | ò     | (0 or 1) | Dr (%) | Kc   | (m)  | KH   | Qc1n  | Κσ           | CRR75               | CRR   | CSR     | Factor               | P <sub>i</sub> | (%)      |
| 2,96   | 288.27           | 2.12         | 0.73     | 110        | 0.713          | 0.973 | 0.74         | 0.50 | 1.22 | 331,14         | 1.44 | т     | 1        | 100    | 1.00 | 3.10 | 1.00 | 332.4 | 1,00         | Infin               | 0.000 | 0.314   | Non-Lig.             | Non-Lia        | 0.00     |
| 3.12   | 289.02           | 2.14         | 0.74     | 110        | 0.722          | 0.973 | 0.74         | 0.50 | 1.21 | 329,91         | 1.45 |       | 1        | 100    | 1.00 | 3,15 | 1.00 | 331.1 | 1,00         | Infin.              | 0.000 | 0.314   | Non-Lig.             |                | 0.00     |
| 3.29   | 293.05           | 2.33         | 0.80     | 110        | 0.731          | 0.972 | 0.80         | 0.50 | 1.20 | 332,44         | 1,47 |       | 1        | 100    | 1.00 | 3.15 | 1.00 | 333.7 | 1.00         | Infin.              | 0.000 | 0.314   | Non-Liq.             |                | 0.00     |
| 3.45   | 289.11           | 2.34         | 0.81     | 110        | 0.740          | 0.972 | 0.81         | 0.50 | 1.20 | 325,94         | 1.48 |       | 1        | 100    | 1,00 | 3,15 | 1.00 | 327.2 | 1.00         | Infin.              | 0.000 | 0.314   | Non-Lig.             |                | 0.00     |
| 3.62   | 286.16           | 2.38         | 0.83     | 110        | 0.749          | 0.972 | 0.83         | 0.50 | 1.19 | 320 65         | 1.49 |       | 1        | 100    | 1.00 | 3,15 | 1.00 | 321,8 | 1.00         | Infin.              | 0,000 | 0.314   | Non-Liq.             | Non-Liq.       | 0.00     |
| 3.78   | 285.79           | 2.45         | 0.86     | 110        | 0.758          | 0.971 | 0.86         | 0.50 | 1.18 | 318.31         | 1.51 |       | -1       | 100    | 1,00 | 3.15 | 1.00 | 319.5 | 1.00         | Infin.              | 0,000 | 0.314   | Non-Liq.             | Non-Liq.       | 0.00     |
| 3.94   | 290,46           | 3.11         | 1.07     | 110        | 0,767          | 0.971 | 1.07         | 0.50 | 1.17 | 321.61         | 1.58 |       | 10       | 100    | 1.00 | 3 15 | 1.00 | 322.8 | 1.00         | Infin.              | 0.000 | 0.314   | Non-Liq.             | Non-Liq.       | 0.00     |
| 4.11   | 293,63           | 3.14         | 1.07     | 110        | 0.776          | 0,971 | 1.07         | 0.50 | 1.17 | 323 22         | 1,58 |       | 1        | 100    | 1.00 | 3.15 | 1.00 | 324.4 | 1.00         | Infin.              | 0.000 | 0_314   | Non-Liq.             | Non-Liq.       | 0.00     |
| 1.27   | 305.18           | 2.93         | 0.96     | 110        | 0.785          | 0.970 | 0.96         | 0.50 | 1.16 | 334,02         | 1,53 |       | 1        | 100    | 1.00 | 3.15 | 1.00 | 335.3 |              | Infin.              | 0,000 | 0.314   | Non-Liq.             | Non-Liq_       | 0.00     |
| 4.44   | 274.68           | 2.47         | 0.90     | 110        | 0,794          | 0,970 | 0.90         | 0.50 | 1.15 | 298.83         | 1.54 |       | 1        | 100    | 1,00 |      | 1.00 | 299_9 |              | Infin.              | 0.000 | 0.313   | Non-Liq.             | Non-Liq        | 0.00     |
| 4.60   | 264,68           | 1.89         | 0.71     | 110        | 0,803          | 0,970 | 0.72         | 0.50 | 1.15 | 286,29         | 1,48 |       | 1        | 100    | 1,00 |      | 1.00 | 287_4 |              | Infin.              | 0,000 | 0.313   | Non-Liq.             | Non-Liq.       | 0.00     |
|        | 260,78           | 1.87         | 0.72     | 110        | 0,812          | 0.969 | 0.72         | 0.50 | 1.14 | 280,48         | 1,48 |       | 1        | 100    | 1.00 | 3,15 | 1.00 | 281.5 |              | Infin.              | 0,000 | 0.313   | Non-Liq.             |                | 0.00     |
| 1.93   | 254.73<br>243.62 | 1.85         | 0.73     | 110        | 0,821          | 0.969 | 0.73         | 0.50 | 1.14 | 272,43         | 1,50 |       | 1        | 100    | 1.00 | 3.15 | 1.00 | 273.4 |              | Infin.              | 0,000 | 0.313   | Non-Liq.             |                | 0.00     |
|        | 243 62           | 1.72         | 0.71     | 110        | 0,830          | 0.969 | 0.71         | 0.50 | 1.13 | 259,08         | 1,50 |       | 1        | 100    | 1.00 |      | 1.00 |       | 1,00         |                     | 0.000 | 0.313   | Non-Liq.             |                | 0.00     |
| 5.26   |                  | 1.73         | 0.70     | 110        | 0.839          | 0.968 | 0.70         | 0.50 | 1.12 | 262,22         | 1,50 |       | 1        | 100    | 1.00 |      | 1.00 | 263_2 |              |                     | 0.000 | 0.313   | Non-Liq.             |                | 0.00     |
| 5.42   | 243.67<br>240.87 | 1.34<br>1.85 | 0.55     | 110        | 0.848          | 0.968 | 0.55         | 0.50 | 1.12 | 256,34         | 1.43 |       | 1        | 100    | 1.00 | 3.15 | 1.00 |       | 1,00         | Infin.              | 0.000 | 0.313   | Non-Liq.             |                | 0.00     |
| .75    | 227.67           | 1.80         | 0.77     | 110        | 0.857          | 0.967 | 0.77         | 0.50 | 1.11 | 252,04         | 1,54 |       | 1        | 100    | 1.00 | 3.15 | 1.00 |       | 1,00         | Infin.              | 0.000 | 0.313   | Non-Liq.             |                | 0.00     |
|        | 215.03           | 1.51         | 0.79     | 110<br>110 | 0.866<br>0.875 | 0.967 | 0.79         | 0.50 | 1.11 | 236,93         | 1.57 |       | 1        | 100    | 1.00 |      | 1.00 |       | 1.00         | Infin <sub>ii</sub> | 0.000 | 0,313   | Non-Liq.             |                | 0.00     |
|        | 169.50           | 0.84         | 0.50     |            |                | 0.967 | 0.71         | 0.50 | 1.10 | 222.56         | 1.55 |       | 1        | 100    | 1.00 | 3.15 |      | 223.4 |              |                     | 0.000 | 0.312   | Non-Liq.             |                | 0.00     |
|        | 113.63           | 0.84         | 0.30     | 110<br>110 | 0,884<br>0.893 | 0.966 | 0.50<br>0.72 | 0.50 | 1.09 | 174,33         | 1.53 |       | 1        | 100    | 1.00 |      | 1,00 |       | 1.00         | Infin               | 0.000 | 0.312   | Non-Liq.             |                | 0.00     |
| 40     | 74.42            | 0.94         | 1.26     | 110        | 0.902          | 0.966 | 1.28         | 0.54 | 1.10 | 116,73         | 1.77 |       | 1        | 83     |      | 3.15 |      |       | 1,00         |                     | 0,271 | 0.312   | Non-Liq.             |                | 0.00     |
| 5.57   | 41.55            | 1.04         | 2.51     | 110        | 0.902          | 0.965 | 2.57         |      | 1.11 | 76,80<br>42,93 | 2.07 |       | 1        | 66     | 1.40 |      | 1,00 | 107.3 | 1,00         |                     | 0,195 | 0.312   | Non-Liq.             |                | 0.00     |
| 73     | 20,49            | 1.00         | 4.87     | 110        | 0.920          | 0.965 | 5.10         |      | 1.12 | 20.90          | 2.40 |       | 1        | 42     | 2.56 |      | 1.00 | 109.7 |              | 0.203               | 0.203 | 0.312   | Non-Liq.             |                | 0.00     |
| 90     | 17.66            | 0.87         | 4.92     | 110        | 0,929          | 0.965 | 5.19         | 0.89 | 1.13 | 17.75          | 2.95 |       | 0        |        |      |      |      |       | 1.00         |                     |       | 0.312   | Non-Liq.             |                | 0.00     |
| .06    | 17.13            | 0.80         | 4.64     | 110        | 0,938          | 0.964 | 4.91         |      | 1.11 | 17.03          | 2.94 |       | 0        |        |      |      |      |       | 1,00<br>1,00 |                     |       | 0.312   | Non-Liq.             |                | 0.00     |
| 22     | 45.69            | 0.87         | 1.91     | 110        | 0.947          | 0.964 | 1.95         | 0.71 | 1.08 | 45.77          | 2.36 |       | 1        | 44     | 2.14 |      | 1.00 | 98.1  | 1.00         | 0.160               | 0.460 | 0.312   | Non-Liq.             |                | 0.00     |
| 39     | 85.88            | 0.98         | 1.14     | 110        | 0.956          | 0.963 | 1.15         |      | 1.06 | 85.36          | 2.00 |       | 1        |        | 1.30 |      | 1.00 |       | 1.00         |                     | 0.168 | 0.311   | Non-Liq.             |                | 0.00     |
|        | 131.32           | 1.21         | 0.92     | 110        | 0.965          | 0.963 | 0.93         |      | 1.05 | 129.57         | 1.80 |       | 1        | 88     | 1.11 | 1.00 | 1.00 |       | 1.00         |                     | 0.360 | 0.311   | Non-Liq.             |                | 0.00     |
|        | 175.08           | 1.51         | 0.86     | 110        | 0.974          | 0.963 | 0.87         |      | 1.04 | 171.70         | 1.69 |       | 4        | 99     | 1.03 |      | 1.00 | 178.1 |              |                     | 0.000 | 0.311   | Non-Liq.             |                | 0.00     |
|        | 212.23           | 1.86         | 0.88     | 110        |                | 0.962 | 0.88         | 0.50 | 1.04 |                | 1.64 |       | 1        |        |      |      | 1.00 |       | 1.00         |                     | 0.000 | 0.311   | Non-Liq.<br>Non-Liq. | 100            | 0.00     |
|        | 246.62           | 1.63         | 0.66     | 110        |                | 0.962 | 0.66         |      | 1.03 |                | 1.51 |       | 4        |        |      |      | 1.00 |       | 1.00         |                     | 0.000 | 0.311   | Non-Liq.             |                | 0.00     |
|        | 274.39           | 2.22         | 0.81     | 110        |                | 0.962 | 0.81         |      | 1.03 | 265.59         | 1.54 |       | 4        |        |      |      | 1.00 |       | 1.00         |                     | 0.000 | 0.311   | Non-Liq.             |                | 0.00     |
| 37     | 300.69           | 2.46         | 0.82     | 110        |                | 0.961 | 0.82         |      | 1.02 |                | 1.52 |       | 4        |        | 1.0  |      | 1.00 |       | 1.00         |                     | 0.000 | 0.311   | Non-Liq.             |                | 0.00     |
| 54     | 310.01           | 2.49         | 0.80     | 110        | 6.5            | 0.961 | 0.81         |      | 1.02 |                | 1.50 |       | 1        |        |      |      | 1.00 |       | 1.00         |                     | 0.000 | 0.310   | Non-Lig.             |                | 0.00     |
| .70    | 331,14           | 2.83         | 0.85     | 110        | 1.029          | 0.960 | 0.86         |      | 1.01 |                | 1.51 |       | 1        |        |      |      |      |       | 1.00         |                     | 0.000 | 0.310   | Non-Lig.             |                | 0.00     |
| .86    | 350.78           | 3.15         | 0.90     | 110        | 1.038          | 0.960 | 0.90         | 0.50 | 1.01 |                | 1.51 |       | 1        |        |      |      | 1.00 |       | 1.00         |                     | 0.000 | 0.310   | Non-Lig.             |                | 0.00     |
| 03     | 364.85           | 3.25         | 0.89     | 110        | 1.047          | 0.960 | 0.89         |      | 1.01 |                | 1.50 |       | 1        |        |      |      | 1.00 | 347.0 |              |                     | 0.000 | 0.310   | Non-Liq.             |                | 0.00     |
| 19     | 366.79           | 3.32         | 0.91     | 110        |                | 0.959 | 0.91         |      | 1.00 |                | 1.50 |       | 4        | 100    |      |      | 1.00 | 347.4 |              |                     | 0.000 | 0.310   | Non-Liq.             |                | 0.00     |
| 36     | 364.13           | 3.25         | 0.89     | 110        |                | 0.959 | 0.89         |      | 1.00 |                | 1.50 |       | 1        |        |      |      | 1.00 | 343.4 |              |                     | 0.000 | 0.310   | Non-Liq.             |                | 0.00     |
| 52     | 351.02           | 3.25         | 0.92     | 110        |                | 0.958 | 0.93         |      | 0.99 |                | 1.52 |       | 1        |        | 500  |      | 1.00 | 329.6 |              |                     | 0.000 | 0.310   | Non-Liq.             |                | 0.00     |
| 69     | 348.92           | 2.58         | 0.74     | 110        |                | 0 958 | 0.74         |      | 0.99 |                | 1.45 |       | 1        |        |      |      | 1.00 | 326.2 |              |                     | 0.000 | 0.310   | Non-Liq.             |                | 0.00     |
| .85    | 359.19           | 3.47         | 0.97     | 110        |                | 0.957 | 0.97         |      | 0.98 |                | 1.53 |       | 1        |        |      |      | 1.00 | 334.4 |              |                     | 0.000 | 0.309   | Non-Liq.             |                | 0.00     |
| .01    | 376.67           | 4.05         | 1.08     | 110        | 1.101          | 0.957 | 1.08         |      | 0.98 |                | 1.56 |       | 4        |        | 1.00 |      |      | 349.3 |              |                     | 0.000 | 0.309   | Non-Liq.             |                | 0.00     |

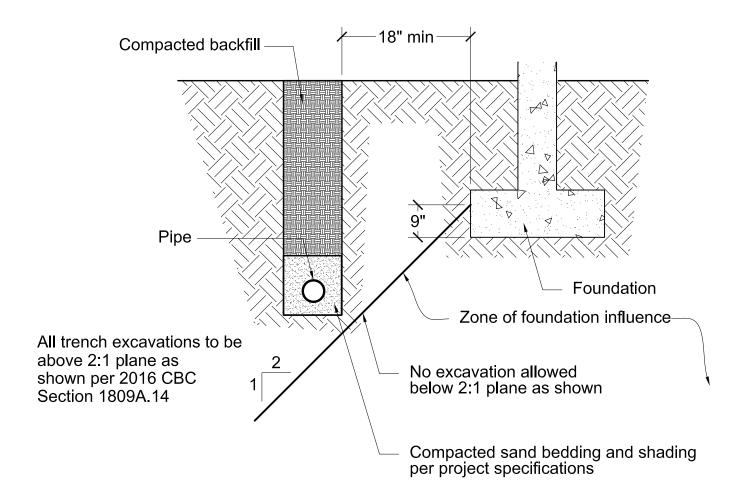
#### **APPENDIX E**

Typical Detail A: Title 24 Pipe Placed Parallel to Foundations

# TYPICAL DETAIL A TITLE 24 PIPE PLACED PARALLEL TO FOUNDATIONS

#### **OXNARD HIGH SCHOOL NO. 8**

Northeast of Camino Del Sol and North Rose Avenue Oxnard, California



#### SCHEMATIC ONLY NOT TO SCALE



2049 Preisker Lane, Suite E Santa Maria, California 93454

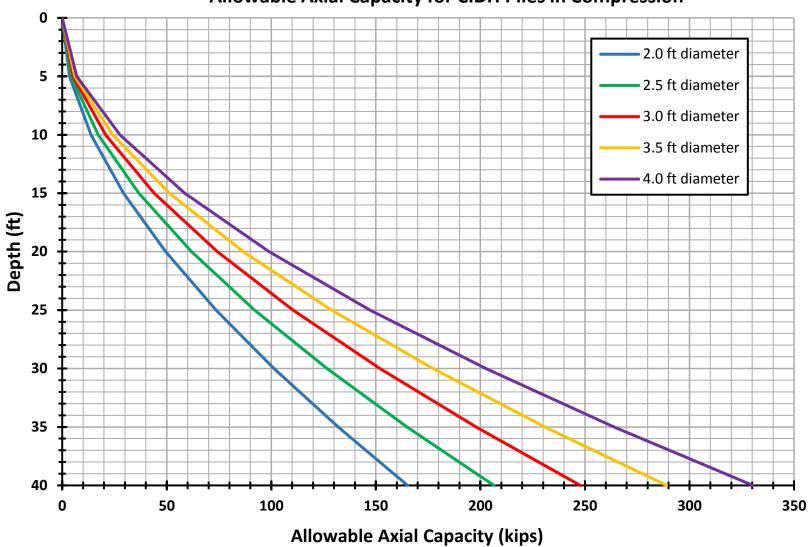
#### **APPENDIX F**

Allowable Axial Capacity for CIDH Piles in Compression Chart

Tremie Method

## **Oxnard High School No. 8**

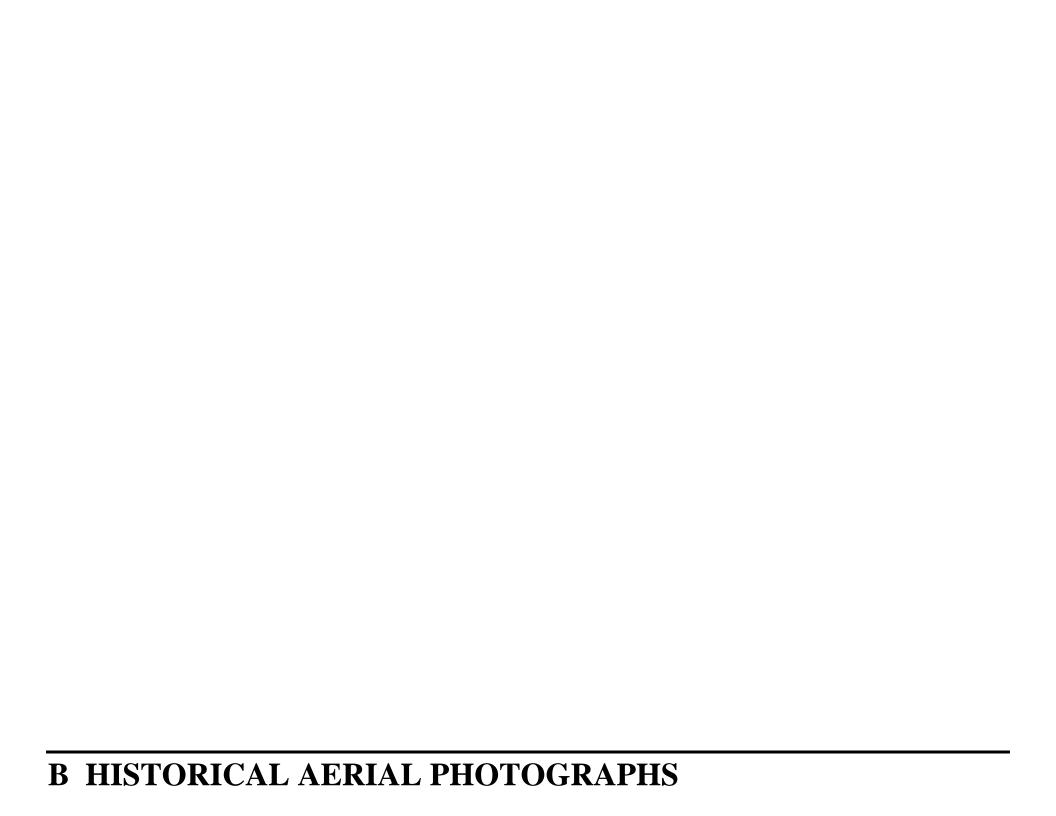
## **Allowable Axial Capacity for CIDH Piles in Compression**



# RECOMMENDED PROCEDURE FOR TREMIE-PLACED CONCRETE IN CAISSON (DRILLED SHAFT) FOUNDATION CONSTRUCTION

The following are general guidelines only, and may be subject to modification by the architect/engineer and/or geotechnical engineer.

- 1. Concrete should be placed in caisson excavations by means of a tremie when the depth of water in the excavation cannot be limited to a maximum of 2 inches, or when the freefall of the concrete would result in the concrete striking the rebar or excavation walls as it falls.
- 2. The concrete should be pumped to the tremie pipe or, a hopper with a tremie pipe attached should be used. An "elephant's trunk" should not be used to place concrete under water; however, an elephant's trunk may be used to direct the fall of the concrete in dry excavations. The elephant's trunk should be of sufficient length to prevent the concrete from striking the rebar or excavation walls as it falls.
- 3. Concrete for dry excavations should be designed for, and placed at, a slump of 4 to 6 inches. Concrete to be placed below water should be designed for, and placed at, a slump of 7 to 9 inches.
- 4. The tremie pipe should consist of rigid steel pipe with tight couplings. The tremie pipe should be 4 to 6 inches in diameter and should be longer than the deepest caisson excavation.
- 5. The tremie pipe should be lowered with caution through the center of the reinforcing to within 1 foot of the bottom of the excavation; the tremie should not be allowed to penetrate into the muck on the bottom of the hole
- 6. The pump hose and tremie pipe should be "slicked" with Portland cement slurry. No clay, bentonite, or other material should be used unless approved by the architect/engineer and geotechnical engineer.
- Pumping of the concrete should begin immediately after the reinforcing and the tremie pipe have been placed in the excavation and the excavation has been inspected. The tremie pipe should not be raised until the concrete surface in the caisson excavation is at least 5 feet above the bottom of the tremie pipe. The bottom of the tremie pipe should then be kept at least 5 feet below the top of the concrete until the pour is completed.
- 8. The concrete should be pumped until all muck, laitance, and unsuitable concrete has been lifted above the top-of-caisson elevation. All muck, laitance, and unsuitable concrete should be immediately removed from the excavation.
- 9. Concrete poured at a 6-inch or greater slump should *not* be vibrated during the pour, unless directed by the architect/engineer. When vibration is required, it should *not* be started until the concrete pour is completed and the muck, laitance and unsuitable concrete have been removed. At a minimum, the upper 10 feet of the concrete should then be vibrated. Additional concrete may be added as necessary during vibration. The vibrator should not be allowed to contact the reinforcing.
- 10. During the pour, if the tremie pipe has to be removed from the concrete, (e.g., to allow removal of casing), it should be reset at the top of the concrete. The tremie should then be purged, as directed by the inspector, and then immediately lowered to at least 5 feet below the top of the concrete as the concrete is being pumped. All degraded concrete should be lifted with the continuing pour and removed from the top of the caisson.



Oxnard High School #8 1853 Camino Del Sol Oxnard, CA 93030

Inquiry Number: 5046760.9

September 12, 2017

# The EDR Aerial Photo Decade Package



#### **EDR Aerial Photo Decade Package**

#### **Client Name:**

Oxnard High School #8 1853 Camino Del Sol Oxnard, CA 93030 EDR Inquiry # 5046760.9

Tetra Tech, Inc. 5383 Hollister Avenue, Suite 130 Santa Barbara, CA 93111 Contact: Jason Dane



Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

#### Search Results:

| <u>Scale</u> | <u>Details</u>  | Source  |
|--------------|---|---|
| 1"=500'      | Flight Year: 2012   | USDA/NAIP   |
| 1"=500'      | Flight Year: 2010   | USDA/NAIP   |
| 1"=500'      | Flight Year: 2009   | USDA/NAIP   |
| 1"=500'      | Flight Year: 2005   | USDA/NAIP   |
| 1"=500'      | Acquisition Date: September 03, 1994  | USGS/DOQQ   |
| 1"=500'      | Flight Date: August 06, 1985  | USDA  |
| 1"=500'      | Flight Date: September 21, 1978   | USDA  |
| 1"=500'      | Flight Date: August 13, 1967  | USGS  |
| 1"=500'      | Flight Date: October 04, 1959   | USDA  |
| 1"=500'      | Flight Date: August 15, 1947  | USGS  |
| 1"=500'      | Flight Date: May 09, 1938   | USDA  |
| 1"=500'      | Flight Date: January 01, 1927   | USGS  |
|              | 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' 1"=500' | 1"=500' Flight Year: 2012  1"=500' Flight Year: 2010  1"=500' Flight Year: 2009  1"=500' Flight Year: 2005  1"=500' Acquisition Date: September 03, 1994  1"=500' Flight Date: August 06, 1985  1"=500' Flight Date: September 21, 1978  1"=500' Flight Date: August 13, 1967  1"=500' Flight Date: October 04, 1959  1"=500' Flight Date: August 15, 1947  1"=500' Flight Date: May 09, 1938 |

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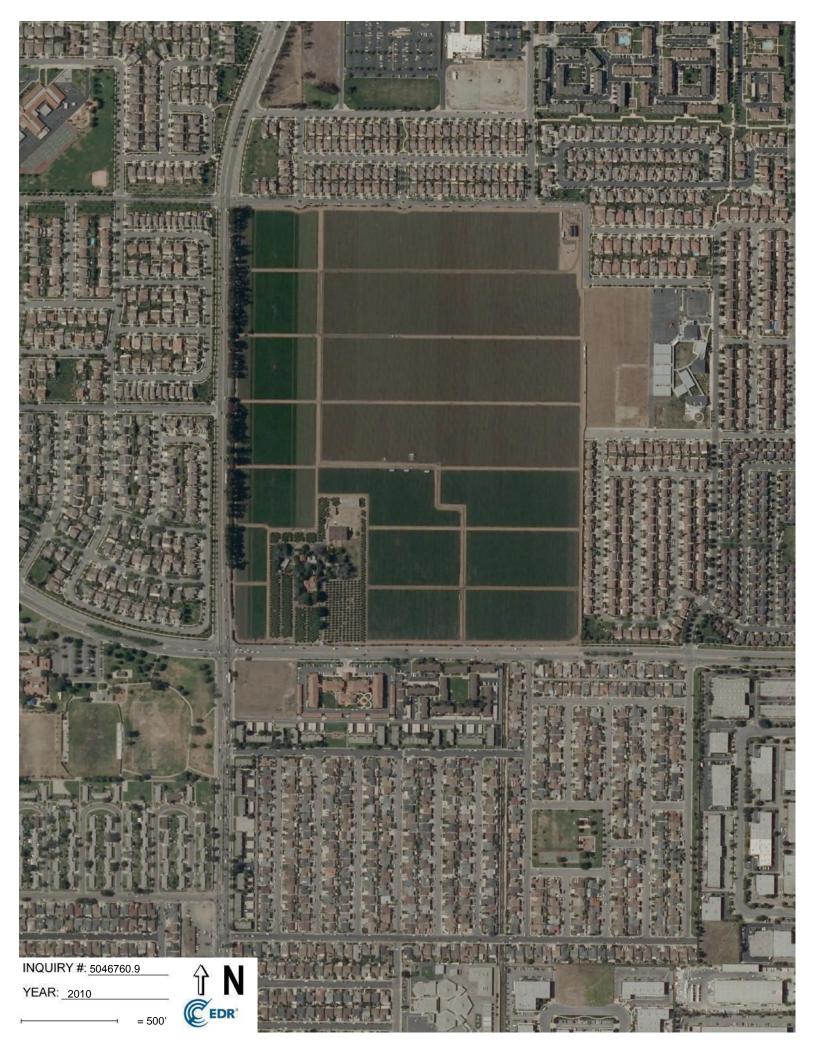
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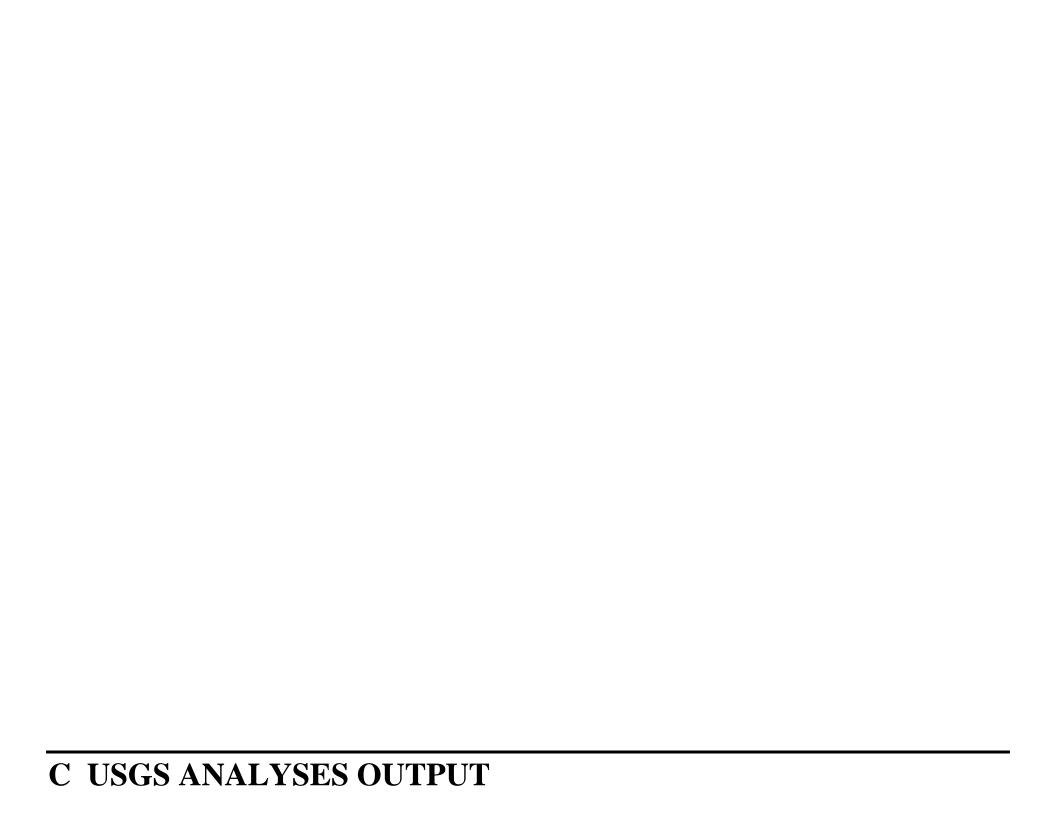












### **☑USGS** Design Maps Summary Report

#### **User-Specified Input**

Report Title High School No. 8

Wed May 16, 2018 02:09:37 UTC

Building Code Reference Document ASCE 7-10 Standard

(which utilizes USGS hazard data available in 2008)

Site Coordinates 34.2077°N, 119.1554°W

Site Soil Classification Site Class D - "Stiff Soil"

Risk Category I/II/III



#### **USGS-Provided Output**

$$S_s = 2.596 g$$

$$S_{MS} = 2.596 g$$

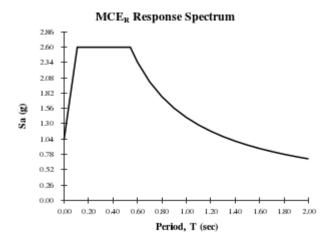
$$S_{DS} = 1.731 g$$

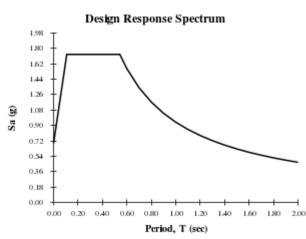
$$S_1 = 0.938 g$$

$$S_{M1} = 1.407 g$$

$$S_{D1} = 0.938 g$$

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA<sub>M</sub>,  $T_L$ ,  $C_{RS}$ , and  $C_{R1}$  values, please view the detailed report.

## Design Maps Detailed Report

ASCE 7-10 Standard (34.2077°N, 119.1554°W)

Site Class D - "Stiff Soil", Risk Category I/II/III

#### Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain  $S_s$ ) and 1.3 (to obtain  $S_1$ ). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]

 $S_s = 2.596 g$ 

From <u>Figure 22-2</u>[2]

 $S_1 = 0.938 g$ 

#### Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

| Site Class                       | <b>v</b> <sub>s</sub> | $\overline{\textit{N}}$ or $\overline{\textit{N}}_{ch}$ | -<br>Su            |  |  |
|----------------------------------|-----------------------|---|--------------------|--|--|
| A. Hard Rock                     | >5,000 ft/s           | N/A   | N/A                |  |  |
| B. Rock                          | 2,500 to 5,000 ft/s   | N/A   | N/A                |  |  |
| C. Very dense soil and soft rock | 1,200 to 2,500 ft/s   | >50   | >2,000 psf         |  |  |
| D. Stiff Soil                    | 600 to 1,200 ft/s     | 15 to 50  | 1,000 to 2,000 psf |  |  |
| E. Soft clay soil                | <600 ft/s             | <15   | <1,000 psf         |  |  |

Any profile with more than 10 ft of soil having the characteristics:

- Plasticity index PI > 20,
- Moisture content  $w \ge 40\%$ , and
- Undrained shear strength  $s_u < 500 \text{ psf}$

F. Soils requiring site response analysis in accordance with Section 21.1

See Section 20.3.1

For SI:  $1ft/s = 0.3048 \text{ m/s} 1 \text{lb/ft}^2 = 0.0479 \text{ kN/m}^2$ 

# Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake ( $MCE_R$ ) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F<sub>a</sub>

| Site Class | Mapped MCE R Spectral Response Acceleration Parameter at Short Period |              |                  |                       |                       |  |
|------------|---|--------------|------------------|-----------------------|-----------------------|--|
|            | S <sub>s</sub> ≤ 0.25   | $S_s = 0.50$ | $S_s = 0.75$     | S <sub>s</sub> = 1.00 | S <sub>s</sub> ≥ 1.25 |  |
| А          | 0.8   | 0.8          | 0.8              | 0.8                   | 0.8                   |  |
| В          | 1.0   | 1.0          | 1.0              | 1.0                   | 1.0                   |  |
| С          | 1.2   | 1.2          | 1.1              | 1.0                   | 1.0                   |  |
| D          | 1.6   | 1.4          | 1.2              | 1.1                   | 1.0                   |  |
| Е          | 2.5   | 1.7          | 1.2              | 0.9                   | 0.9                   |  |
| F          |   | See Se       | ection 11.4.7 of | ASCE 7                |                       |  |

Note: Use straight-line interpolation for intermediate values of S<sub>s</sub>

For Site Class = D and  $S_s$  = 2.596 g,  $F_a$  = 1.000

Table 11.4-2: Site Coefficient F<sub>v</sub>

| Site Class | Mapped MCE R Spectral Response Acceleration Parameter at 1-s Period |              |              |              |           |  |  |
|------------|---|--------------|--------------|--------------|-----------|--|--|
|            | S₁ ≤ 0.10   | $S_1 = 0.20$ | $S_1 = 0.30$ | $S_1 = 0.40$ | S₁ ≥ 0.50 |  |  |
| А          | 0.8   | 0.8          | 0.8          | 0.8          | 0.8       |  |  |
| В          | 1.0   | 1.0          | 1.0          | 1.0          | 1.0       |  |  |
| С          | 1.7   | 1.6          | 1.5          | 1.4          | 1.3       |  |  |
| D          | 2.4   | 2.0          | 1.8          | 1.6          | 1.5       |  |  |
| Е          | 3.5   | 3.2          | 2.8          | 2.4          | 2.4       |  |  |
| F          | See Section 11.4.7 of ASCE 7  |              |              |              |           |  |  |

Note: Use straight-line interpolation for intermediate values of  $S_{\scriptscriptstyle 1}$ 

For Site Class = D and  $S_{\scriptscriptstyle 1}$  = 0.938 g,  $F_{\scriptscriptstyle V}$  = 1.500

**Equation (11.4–1):** 

 $S_{MS} = F_a S_S = 1.000 \times 2.596 = 2.596 g$ 

**Equation (11.4-2):** 

 $S_{M1} = F_v S_1 = 1.500 \times 0.938 = 1.407 g$ 

Section 11.4.4 — Design Spectral Acceleration Parameters

Equation (11.4-3):

 $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 2.596 = 1.731 g$ 

**Equation (11.4-4):** 

 $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 1.407 = 0.938 g$ 

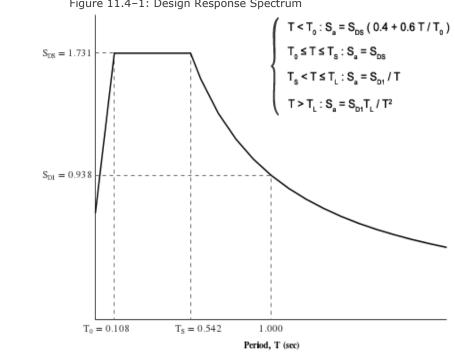
Section 11.4.5 — Design Response Spectrum

From Figure 22-12 [3]

Spectral Response Acceleration, Sa (g)

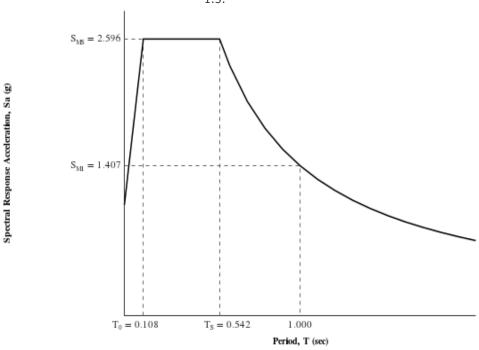
 $T_L = 8$  seconds





# Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE $_{\!\scriptscriptstyle R}\!)$ Response Spectrum

The  $MCE_R$  Response Spectrum is determined by multiplying the design response spectrum above by



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7<sup>[4]</sup>

PGA = 1.020

**Equation (11.8–1):** 

 $PGA_{M} = F_{PGA}PGA = 1.000 \times 1.020 = 1.02 g$ 

Table 11.8-1: Site Coefficient F<sub>PGA</sub>

| Site  | Mapped     | Mapped MCE Geometric Mean Peak Ground Acceleration, PGA |                          |            |               |  |  |
|-------|------------|---|--------------------------|------------|---------------|--|--|
| Class | PGA ≤ 0.10 | PGA = 0.20  | PGA = 0.30               | PGA = 0.40 | PGA ≥<br>0.50 |  |  |
| А     | 0.8        | 0.8   | 0.8                      | 0.8        | 0.8           |  |  |
| В     | 1.0        | 1.0   | 1.0                      | 1.0        | 1.0           |  |  |
| С     | 1.2        | 1.2   | 1.1                      | 1.0        | 1.0           |  |  |
| D     | 1.6        | 1.4   | 1.2                      | 1.1        | 1.0           |  |  |
| Е     | 2.5        | 1.7   | 1.2                      | 0.9        | 0.9           |  |  |
| F     |            | See Se  | ction 11.4.7 of <i>i</i> | ASCE 7     |               |  |  |

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = D and PGA = 1.020 g,  $F_{PGA}$  = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17<sup>[5]</sup>

 $C_{RS} = 0.910$ 

From Figure 22-18 [6]

 $C_{R1} = 0.909$ 

#### Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

| VALUE OF S <sub>DS</sub>    | RISK CATEGORY |     |    |  |  |  |
|-----------------------------|---------------|-----|----|--|--|--|
|                             | I or II       | III | IV |  |  |  |
| S <sub>DS</sub> < 0.167g    | А             | А   | А  |  |  |  |
| $0.167g \le S_{DS} < 0.33g$ | В             | В   | С  |  |  |  |
| $0.33g \le S_{DS} < 0.50g$  | С             | С   | D  |  |  |  |
| 0.50g ≤ S <sub>DS</sub>     | D             | D   | D  |  |  |  |

For Risk Category = I and  $S_{DS}$  = 1.731 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

| VALUE OF S <sub>D1</sub>     | RISK CATEGORY |     |    |  |  |  |
|------------------------------|---------------|-----|----|--|--|--|
|                              | I or II       | III | IV |  |  |  |
| S <sub>D1</sub> < 0.067g     | А             | А   | А  |  |  |  |
| $0.067g \le S_{D1} < 0.133g$ | В             | В   | С  |  |  |  |
| $0.133g \le S_{D1} < 0.20g$  | С             | С   | D  |  |  |  |
| 0.20g ≤ S <sub>D1</sub>      | D             | D   | D  |  |  |  |

For Risk Category = I and  $S_{D1}$  = 0.938 g, Seismic Design Category = D

Note: When  $S_1$  is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category  $\equiv$  "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = E

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

#### References

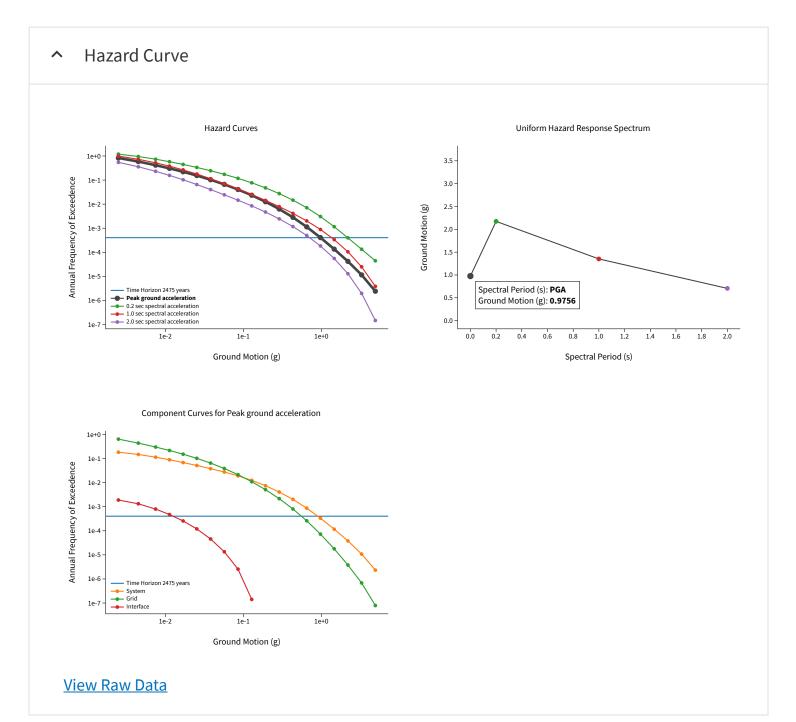
- 1. Figure 22-1:
  - https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010\_ASCE-7\_Figure\_22-1.pdf
- 2. *Figure 22-2*:
  - https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010\_ASCE-7\_Figure\_22-2.pdf
- 3. *Figure 22-12*:
  - $https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010\_ASCE-7\_Figure\_22-12.pdf$
- 4. *Figure 22-7*:
  - https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010\_ASCE-7\_Figure\_22-7.pdf
- 5. Figure 22-17:
  - https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010\_ASCE-7\_Figure\_22-17.pdf
- 6. Figure 22-18:
  - https://earthquake.usqs.gov/hazards/designmaps/downloads/pdfs/2010 ASCE-7 Figure 22-18.pdf

U.S. Geological Survey - Earthquake Hazards Program

# **Unified Hazard Tool**

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the <u>U.S. Seismic Design Maps web tools</u> (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

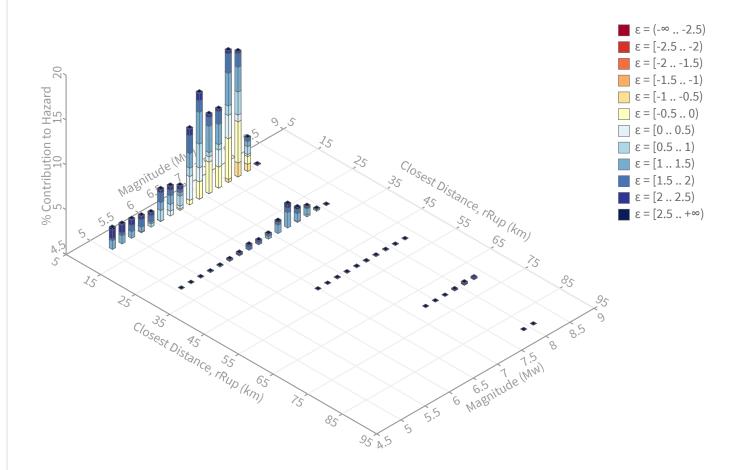
| ^ Input   |                          |
|---|--------------------------|
| Edition   | Spectral Period          |
| Dynamic: Conterminous U.S. 2014 (v4.1.                  | Peak ground acceleration |
| Latitude  | Time Horizon             |
| Decimal degrees   | Return period in years   |
| 34.2077   | 2475                     |
| Longitude   |                          |
| Decimal degrees, negative values for western longitudes |                          |
| -119.1554   |                          |
| Site Class  |                          |
| 259 m/s (Site class D)                                  |                          |



### Deaggregation

#### Component

Total



#### Summary statistics for, Deaggregation: Total

#### **Deaggregation targets**

Return period: 2475 yrs

**Exceedance rate:** 0.0004040404 yr<sup>-1</sup> **PGA ground motion:** 0.97556941 g

#### **Recovered targets**

Return period: 2817.403 yrs

**Exceedance rate:**  $0.0003549368 \text{ yr}^{-1}$ 

#### **Totals**

**Binned:** 100 % **Residual:** 0 % **Trace:** 0.11 %

#### Mean (for all sources)

r: 10.79 km m: 7.01 εο: 0.93 σ

#### Mode (largest r-m bin)

**r:** 9.19 km **m:** 7.53 **εο:** 0.57 σ

Contribution: 14.68 %

#### Mode (largest ε<sub>0</sub> bin)

**r:** 9.02 km **m:** 7.68 **εο:** -0.22 σ

Contribution: 4.59 %

#### Discretization

**r:** min = 0.0, max = 1000.0,  $\Delta$  = 20.0 km **m:** min = 4.4, max = 9.4,  $\Delta$  = 0.2

ε: min = -3.0, max = 3.0,  $\Delta$  = 0.5 σ

#### **Epsilon keys**

**ε0:** [-∞ .. -2.5)

**ε1:** [-2.5 .. -2.0)

**ε2:** [-2.0 .. -1.5)

**ε3:** [-1.5 .. -1.0)

**ε4:** [-1.0 .. -0.5)

**ε5:** [-0.5 .. 0.0)

**ε6:** [0.0 .. 0.5)

**ε7:** [0.5 .. 1.0)

**ε8:** [1.0 .. 1.5)

**ε9:** [1.5 .. 2.0)

**ε10:** [2.0 .. 2.5)

**ε11:** [2.5 .. +∞]

## **Deaggregation Contributors**

| Source Set 😝 Source                 | Туре   | r     | m    | ε <sub>0</sub> | lon       | lat      | az     | %     |
|-------------------------------------|--------|-------|------|----------------|-----------|----------|--------|-------|
| UC33brAvg_FM32                      | System |       |      |                |           |          |        | 42.71 |
| Simi-Santa Rosa [6]                 |        | 5.61  | 6.98 | 0.59           | 119.102°W | 34.222°N | 71.68  | 10.00 |
| Oak Ridge (Onshore) [0]             |        | 6.66  | 7.36 | 0.50           | 119.167°W | 34.261°N | 350.11 | 9.57  |
| Oak Ridge (Offshore) [5]            |        | 11.12 | 6.87 | 1.03           | 119.273°W | 34.240°N | 288.48 | 5.05  |
| Oak Ridge (Onshore) [1]             |        | 9.81  | 7.55 | 0.61           | 119.113°W | 34.285°N | 24.35  | 3.72  |
| Ventura-Pitas Point [3]             |        | 10.11 | 7.51 | 0.59           | 119.195°W | 34.290°N | 338.13 | 3.62  |
| Red Mountain [0]                    |        | 20.69 | 7.13 | 1.42           | 119.304°W | 34.347°N | 318.73 | 1.76  |
| Malibu Coast (Extension) alt 2 [3]  |        | 15.26 | 7.54 | 1.00           | 119.168°W | 34.070°N | 184.32 | 1.41  |
| Ventura-Pitas Point [2]             |        | 10.11 | 7.18 | 0.76           | 119.195°W | 34.290°N | 338.13 | 1.05  |
| UC33brAvg_FM31                      | System |       |      |                |           |          |        | 39.83 |
| Simi-Santa Rosa [6]                 |        | 5.61  | 7.01 | 0.59           | 119.102°W | 34.222°N | 71.68  | 10.81 |
| Oak Ridge (Onshore) [0]             |        | 6.66  | 7.43 | 0.48           | 119.167°W | 34.261°N | 350.11 | 9.71  |
| Ventura-Pitas Point [3]             |        | 10.11 | 7.58 | 0.56           | 119.195°W | 34.290°N | 338.13 | 4.28  |
| Oak Ridge (Onshore) [1]             |        | 9.81  | 7.65 | 0.58           | 119.113°W | 34.285°N | 24.35  | 3.48  |
| Red Mountain [0]                    |        | 20.69 | 7.23 | 1.36           | 119.304°W | 34.347°N | 318.73 | 1.97  |
| Ventura-Pitas Point [2]             |        | 10.11 | 6.71 | 1.00           | 119.195°W | 34.290°N | 338.13 | 1.57  |
| Channel Islands Thrust [0]          |        | 16.31 | 6.87 | 1.50           | 119.265°W | 34.044°N | 209.01 | 1.47  |
| Malibu Coast (Extension) alt 1 [5]  |        | 15.26 | 7.33 | 1.10           | 119.172°W | 34.068°N | 185.62 | 1.11  |
| UC33brAvg_FM31 (opt)                | Grid   |       |      |                |           |          |        | 8.80  |
| PointSourceFinite: -119.155, 34.248 |        | 6.56  | 5.73 | 1.36           | 119.155°W | 34.248°N | 0.00   | 1.20  |
| PointSourceFinite: -119.155, 34.248 |        | 6.56  | 5.73 | 1.36           | 119.155°W | 34.248°N | 0.00   | 1.20  |
| PointSourceFinite: -119.155, 34.257 |        | 7.21  | 5.72 | 1.43           | 119.155°W | 34.257°N | 0.00   | 1.07  |
| PointSourceFinite: -119.155, 34.257 |        | 7.21  | 5.72 | 1.43           | 119.155°W | 34.257°N | 0.00   | 1.07  |
| UC33brAvg_FM32 (opt)                | Grid   |       |      |                |           |          |        | 8.66  |
| PointSourceFinite: -119.155, 34.248 |        | 6.56  | 5.73 | 1.36           | 119.155°W | 34.248°N | 0.00   | 1.21  |
| PointSourceFinite: -119.155, 34.248 |        | 6.56  | 5.73 | 1.36           | 119.155°W | 34.248°N | 0.00   | 1.21  |
| PointSourceFinite: -119.155, 34.257 |        | 7.21  | 5.72 | 1.43           | 119.155°W | 34.257°N | 0.00   | 1.07  |
| PointSourceFinite: -119.155, 34.257 |        | 7.21  | 5.72 | 1.43           | 119.155°W | 34.257°N | 0.00   | 1.07  |