GEOTECHNICAL ENGINEERING REPORT
for
DONNER LAKE EMERGENCY OUTLET CLEANOUT PROJECT
Truckee/Nevada County, California

Prepared for:
Truckee Meadows Water Authority
1355 Capital Boulevard
Reno, Nevada 89502

Prepared by:
Holdrege & Kull
10775 Pioneer Trail, Suite 213
Truckee, California 96161

Project No. 42361.00
October 4, 2017

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

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Truckee Meadows Water Authority
1355 Capital Boulevard
Reno, Nevada 89502

Attention: Bill Hauck

Reference: ***Donner Lake Emergency Outlet Cleanout Project***
Truckee/Nevada County, California

Subject: ***Geotechnical Engineering Report***

This report presents the results of our geotechnical engineering investigation for the proposed Donner Lake Emergency Outlet Cleanout Project located at the east end of Donner Lake in Donner Memorial State Park in Truckee/Nevada County, California. The project will involve constructing temporary coffer dams to dewater the channel and excavating or dredging soil material to deepen and widen the outflow channel. The planned project extends out into Donner Lake to daylight the channel at elevation of 5,924 feet above mean sea level (MSL). Material removal will occur along approximately 1,800 feet of channel to the planned elevation of 5,924 feet (MSL). The excavated or dredged material may be transported by a conveyor belt or via trucks to the former Cold Stream Teichert Aggregates gravel quarry located near the project site. Appurtenant construction may include a material dewatering area and temporary access roads. The purpose of our services was to explore and evaluate subsurface conditions within the channel to develop geotechnical engineering recommendations for reuse of excavated material as engineered fill and estimates of groundwater flow rates during project construction.

We encountered granular soil within the channel area during our subsurface exploration. However, very soft, highly organic, soil was encountered in the west end of the channel in Donner Lake to the maximum depth explored. These conditions will likely hamper equipment maneuverability and sediment removal and/or the approach to site grading at the lake. This material will likely be unstable for the support of water bladder

coffer dams. Excavation equipment may be limited to tracked vehicles in portions of the site and haul roads may require temporary stabilization during construction. Specific recommendations concerning the geotechnical aspects of project design and construction are presented in the following report.

The recommendations provided in this report are based on our subsurface exploration, review of regional geologic maps, engineering analyses, and our experience in the project area. We recommend retaining our firm to provide construction monitoring services during earthwork to observe subsurface conditions encountered with respect to our recommendations provided in this report. As plans develop, we should be consulted concerning the need for additional services.

Please contact us if you have any questions regarding this report or if we can be of additional service.

Sincerely,

HOLDREGE & KULL

Prepared By:

Austin L. Metz
Staff Engineer

Reviewed By:

John K. Hudson, P.E., C.E.G.
Principal

10/04/2017

copies: Electronic copy to Bill Hauck, TMWA
Roy Johnson, Brown & Caldwell
Kate Gross Gray, Stantec
Lasandra Edwards, Brown & Caldwell

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1. INTRODUCTION

This report presents the results of our geotechnical engineering investigation for the Donner Lake Emergency Outlet Cleanout Project located at the east end of Donner Lake in Donner Memorial State Park in Truckee/Nevada County, California. We performed our investigation in general accordance with our September 11, 2017 proposal for the project. A copy of the proposal is included as Appendix A of this report. For your review, Appendix B contains a document prepared by the Geoprofessional Business Association entitled *Important Information About This Geotechnical-Engineering Report.* This document summarizes the general limitations, responsibilities, and use of geotechnical engineering reports.

1.1 Purpose

The purpose of our investigation was to explore and evaluate the subsurface conditions at the project site, and to provide our geotechnical engineering recommendations for project design and construction.

Our findings are based on our subsurface exploration, laboratory test results, and our experience in the project area. We recommend retaining our firm to provide construction monitoring services during earthwork to observe subsurface conditions encountered with respect to our recommendations.

1.2 Scope of Services

To prepare this report we performed the following scope of services:

- We performed a site reconnaissance, literature review, and subsurface exploration involving hand augured borings and Dynamic Cone Penetrometer tests within and adjacent to the lake channel.

- We logged the subsurface conditions encountered and collected bulk soil samples for classification and laboratory testing.

- We performed laboratory tests on selected soil samples obtained during our subsurface investigation to evaluate material properties.

- We contracted with a state-certified laboratory to perform petroleum hydrocarbon and metal analyses of selected sediment samples for off-site disposal.

- Based on our subsurface exploration and the results of our laboratory testing, we performed engineering analyses to develop geotechnical engineering recommendations for project design and construction.

1.3 Site Description

The project site consists of an outflow channel at the east end of Donner Lake that is owned and operated by the Truckee Meadows Water Authority (TMWA). Donner Lake is located in the northeastern Sierra Nevada Mountain Range, south of Interstate 80, and west of Downtown Truckee, Nevada County, California. The approximate location of the project area is presented as Figure1, Site Vicinity Map.

Lake levels are controlled through a concrete dam located at the east end of the subject lake and channel. The surface water is operated as a reservoir down to an elevation of 5,924 feet above mean sea level (MSL, 1929 datum). We understand that in the past the outlet channel and Donner Creek were dredged to lower the outlet and develop the reservoir. The site topography is relative level and gently sloping. We expect that the channel is at or near the natural outlet stream for Donner Lake. Typical vegetation consists of conifer trees and riparian vegetation away from the channel. There is a relatively thick cover of aquatic plants in the clam water areas of the lake and channel.

The project area is generally bounded by Donner Memorial State Park to the north, east and south, and Donner Lake to the west. According to the 1992 edition of the Truckee, California 7.5-minute quadrangle map published by the U.S. Geological Survey; the subject site comprises a portion of Section 18, Township 17 north, and Range 16 east.

1.4 Proposed Improvements

Information about the proposed project was obtained from our site visits, conversations with the project team, and improvement plans prepared by Brown and Caldwell, dated September 21, 2017. The project will involve construction of temporary coffer dams and sumps to dewater the channel and excavating or dredging soil material to deepen and widen the outflow. Soil removal will occur along approximately 1,800 feet of channel to an elevation of 5,924 feet MSL (1929 datum). Dredge depths are anticipated to be typically on the order of 6 to 7 feet and are not expected to exceed about 10 feet. The dredge material may be transported by a conveyor belt or by trucks to the former Cold Stream Teichert Aggregates gravel quarry located approximately 2,500 east of the

project area or to the Teichert Martis Valley Plant. Appurtenant construction may include a stream water bypass system, material dewatering area and temporary access roads.

2. LITERATURE REVIEW

We reviewed available geologic and soil literature in our files to evaluate geologic and anticipated subsurface conditions at the site.

2.1 Site Geology

To help evaluate geologic conditions at the site, we reviewed the following literature and maps:

- *Geologic Map of Part of Eastern Placer County, Northern Sierra Nevada, California,* by David S. Harwood et al, California Geological Survey, 2014.
- *Geologic Map of the North Lake Tahoe-Donner Pass Region, Northern Sierra Nevada, California*, by Arthur Gibbs Sylvester et al, California Geological Survey, 2012.
- *Geologic Map of the Lake Tahoe Basin, California and Nevada*, by G.J. Saucedo, California Geological Survey, 2005.
- *Pleistocene History of the Truckee Area, North of Lake Tahoe, California*, by Peter W. Birkeland, Stanford University Ph.D. Thesis, 1962.

The geologic maps referenced above show the project area to be underlain by Quaternary aged glacial till deposits of the Tioga glacial advance. Donner Lake is a classic alpine glacial valley where glaciers deposited lateral, terminal and recessional moraines. Over geologic time the moraines have dammed the valley, forming Donner Lake. Several terminal and recessional moraines cross the valley in low, broad arch-shaped mounds. The moraines are made up of glacial till deposits that consist of silt, sand, gravel, cobbles, and boulders. Based on our site reconnaissance mapping, the majority of the project site is underlain by stream alluvial and lake deposits (lacustrine deposits), as shown on Figure 2, Geologic Map. The alluvial and lacustrine deposits consist predominately of fine sand and gravel. However, the channel appears to have been deflected to the north by a recessional moraine at approximate Station 12+50. Cobbles and boulders are present downstream (up station) of about Station 11+50.

Outward of the channel in the lake where the water velocity is very low, finer grained sediment is deposited. The fine sediment has been deposited down station from approximately Station 5+50. Finally, artificial fill is present along much of the channel and near-shore areas of the lake from the previous dredging that was performed. This material was placed along the shore nearly 100 years ago or more. There are full grown trees on the fill soil; however, topsoil has not developed on the surface. Although the presence of the historic fill material is interesting, it is generally outside of the project boundaries.

2.2 Regional Faulting

The project is located in a potentially active seismic area. To evaluate the location of mapped faults relative to the project site, we reviewed the following maps:

- *Fault Activity Map of California;* by Charles W. Jennings and William A. Bryant, California Geological Survey, 2010.

- *Geologic Map of the Chico Quadrangle, California,* by G.J. Saucedo and D.L. Wagner, California Division of Mines and Geology, 1992.

The potential risk of fault rupture is based on the concept of recency and recurrence. The more recently a particular fault has ruptured, the more likely it will rupture again. The California State Mining and Geology Board define an “active fault” as one that has had surface displacement within the past 11,000 years (Holocene). Potentially active faults are defined as those that have ruptured between 11,000 and 1.6 million years

before the present (Quaternary). Faults are generally considered inactive if there is no evidence of displacement during the Quaternary.

The referenced geologic maps show several active and potentially active faults located near the project site, including the Dog Valley Fault (active, approximately 2.4 miles northwest), the Tahoe Sierra Frontal Fault Zone (potentially active, approximately 3 miles west); a group of unnamed faults southeast of Truckee (active and potentially active, approximately 3 to 4 miles southeast), the Polaris Fault (active, approximately 6 miles east), the West Tahoe Fault (active, approximately 17 miles southeast), and the North Tahoe Fault (active, approximately 14.5 miles southeast). Earthquakes associated with these faults may cause strong ground shaking at the project site.

2.3 Potential Seismic Hazards

The primary hazards associated with earthquake faults include strong ground motion and surface rupture. No faults are mapped as crossing or trending towards the site; therefore, the potential for surface rupture is considered low. Earthquakes centered on regional faults in the area, such as the West Tahoe Fault, would likely result in higher ground motion at the site than earthquakes centered on smaller faults that are mapped closer to the site.
Seismic hazards include liquefaction, lateral spreading, and seismically induced slope instability. These potential hazards are discussed below.

2.3.1 Soil Liquefaction

Liquefaction is a phenomenon where loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup. Cyclic loading, such as that caused by an earthquake, typically causes an increase in pore water pressure and subsequent liquefaction. Based on the results of our subsurface investigation, near-surface soil at the site consists of loose to medium dense silty sand (SM) with cobbles and boulders. Although we did not perform an in-depth liquefaction analysis, this soil profile has a relatively moderate to high potential for liquefaction. In the event of a large earthquake, the channel may deform and loose the capacity to transport water.

2.3.2 Lateral Spreading

Lateral spreading is the lateral movement of soil resulting from liquefaction of subadjacent materials. Since we anticipate that there is at least a moderate potential for

liquefaction of soil at the site, the potential for lateral spreading to occur is also considered moderate.

2.3.3 Slope Instability

Slope instability includes landslides, debris flows, and rockfall. No landslides, debris flows or rockfall hazards were observed in the project area. Due to the gentle topography of the site and general surrounding area the potential for slope instability is considered low. Again, in the event of a large earthquake, seismically induced slope instability of channel slopes is possible.

2.3.4 Tsunami Hazards

Tsunamis are large waves produced by an underwater earthquake or landslide. Seiches are the secondary wave oscillations of water in an enclosed or semi-enclosed basin after a tsunami. Both tsunamis and seiches can damage structures through the direct impact of waves or through flooding generated by water running up on the shoreline of the basin. We reviewed a paper titled *"The potential hazard from tsunami and seiche waves generated by future large earthquakes within the Lake Tahoe Basin, California-Nevada",* by Ichinose, G.A., et al, Nevada Seismological Laboratory, University of Nevada, Reno, March 8, 1999. The paper concludes that depending on the magnitude and location of an earthquake occurring within the Lake Tahoe basin, tidal and/or seiche waves ranging in height from about 3 to 10 meters could develop on Lake Tahoe. Donner Lake is an enclosed basin of water and the project involves work within a channel at the lake. No active faults are mapped as trending through the lake. Therefore, the potential for tsunamis in the event of a large earthquake centered in the Truckee area is considered low. Donner Lake is an enclosed body of water, therefore, the potential for seiche induced waves, or inundation may be possible due to a large earthquake event centered in the Truckee area. It should be noted that the recurrence interval of earthquakes centered on faults within the Truckee and Lake Tahoe Basins are on the order of several hundred to thousands of years.

3. SUBSURFACE EXPLORATION

We performed our subsurface exploration to characterize typical subsurface conditions at the site.

3.1 Field Exploration

The site investigation consisted of sediment sampling within Donner Lake by skin diving and manually scooping up material for collection of underwater samples out of the lake. Sample and test sites were located using a hand held GPS. The samples were sealed in 6-inch by 12-inch cylinders and returned to our laboratory for testing. We combined this method with dynamic cone penetrometer (DCP) tests performed on shore or from a barge over water. The DCP tests were performed using a Triggs Wildcat Cone Penetrometer. The DCP is a portable hand-operated device that consists of a 1-inch diameter steel rod driven into the ground with a 35 pound slide hammer falling approximately 15 inches per blow. The blows required to drive the cone 10 centimeters are recorded, and the incremental blow counts provide a vertical profile of the relative density of the subject soil. The approximate location of our borings and DCP test locations are shown on Figure 3, Boring, DCP and Sample Location Plan. Boring and DCP logs are included in Appendix C. Photographs collected during our surface reconnaissance and field exploration are included in Appendix D.

The sediment material encountered in the lake near Station 0+00 consisted of fine-grained silty sand (SM) soil with a high organic content to the maximum depth explored of approximately 5,917 MSL (1988 datum). The DCP test in this material typically penetrated under the weight of the rod and hammer with zero blows. We expect that the highly organic sediment is a wedge shaped deposit that pinches out toward shore and the channel. This material will likely be unstable and may require removal prior to placement of coffer dams and establishing access for construction vehicles. Loose to medium dense, coarse-grained soil was encountered below these softer sediments in the area of DCP–5 and DCP-6.

We also performed hand-excavated and augured borings at several locations along the channel to help characterize anticipated dredge materials. These hand borings typically extended to about 5 feet below the ground surface. Where possible, borings were performed at different elevations to essentially stack the soil profile. Soil samples were sealed in plastic bags and returned to our laboratory for testing. DCP and boring elevations are referenced by the elevation of the lake water and reference to the USGS website for lake elevation. The project plans dated September 21, 2017, are based on

the 1988 datum. Elevations shown on the logs are referenced to the 1929 datum. We understand that the 1929 datum is approximately 4 feet lower than the 1988 datum.

Subsurface conditions encountered within the channel area consisted of stratified fine sand and gravel with some layers of highly organic soil. Individual logs and pieces of wood are relatively common within the sediments. However, we estimate that the total organic material is well under 3 percent by dry weight of the planned dredge material. Due to the near-surface aquatic vegetation and wood debris in the sediment, stripping and separation of wood pieces and highly organic soil will be needed if the dredge material will be used for structural fill.

3.2 Laboratory Test Results

3.2.1 Engineering Tests

H&K performed material laboratory tests to help characterize soil conditions at the site in accordance with American Society for Testing and Materials (ASTM) procedures. Tests were performed on representative samples collected to evaluate the grain size distribution, plasticity of the soil (Atterberg indices), and organic content. Laboratory test results are summarized in Table 3.2.1 and presented in Appendix E.

Table 3.2.1 – Laboratory Test Data – Engineering Properties

Sample Number	Depth Range (ft)	USCS Classification	Percent Passing No. 200 Sieve	Liquid Limit	Plastic Limit	Organic Content (%)
020-B,C	0 – 1.0	Silty Sand (SM)	28	NP	NP	11.5
350-B	0 – 1.0	Silty Sand (SM)	--	--	--	10.1
550-B,C	0 – 1.0	Poorly Graded Sand (SP)	2	-	-	1.4
1-1	1.0 – 1.5	Poorly Graded Sand (SP)	5	--	--	--
1-2	3.5 – 4.0	Silty Sand (SM)	45	--	--	--
1-3	5.0 – 5.5	Silty Sand (SM)	18	--	--	--
2-1	1.0 – 1.5	Poorly Graded Sand with Gravel (SP)	2	--	--	--
2-3	4.0 – 4.5	Silty Sand (SM)	16	--	--	--
2-4	4.5 – 5.0	Silt with Sand (ML)	77	--	--	--
3-1	1.5 – 2.0	Poorly Graded Sand with Silt (SP-SM)	7	--	--	--
3-2	3.5 – 4.0	Silty Sand (SM)	19	--	--	--
4-1	0 – 0.5	Silty Sand with Gravel (SM)	18	--	--	--
4-2	1.5 – 2.0	Poorly Graded Sand with Silt and Gravel (SP-SM)	6	--	--	--

8-4	6.5 – 7.0	Silty Sand (SM)	15	--	--	--

3.2.2 Analytical Tests

In accordance with Teichert acceptance criteria for soil disposal, four soil samples (020-A, 170-A, 350-A, and 550-A) were collected from the bottom of the channel for chemical analyses. Samples 020-A, 170-A and 350-A were collected at a depth of approximately 10 feet below the water surface near Stations 0+20, 1+70, and 3+50, respectively. Sample 550-A was collected at a depth approximately 4 feet below the water surface near Station 5+50. The samples were collected by using disposable plastic scoops that were inserted into canisters and transferred directly to laboratory-supplied glass jars. The jars were then sealed, labeled, and stored in a chilled, thermally insulated container for transport to the analytical laboratory under chain-of-custody documentation. Sample locations are shown on Figure 2, Boring, DCP, and Sample Location Plan.

Soil samples were transported to Alpha Analytical, Inc. (Alpha), a state-certified laboratory located in Sparks, Nevada for following chemical analyses:

- Total Petroleum Hydrocarbons as Diesel (TPH-d) using EPA Test Method 8015;
- Total Petroleum Hydrocarbons as Motor Oil (TPH-mo) using EPA Test Method 8015; and,
- Title 22 (CAM) 17 metals using EPA Test Method 6020.

The following additional analyses were completed by California Laboratory Services, a state-certified laboratory located in Rancho Cordova, California:

- Oil and grease (O&G) by EPA n-Hexane Extraction Method (HEM) 1664A.

The TPH-d, TPH-mo, and O&G analyses were tested with a silica gel cleanup due to anticipated organic contents. No obvious soil staining or odors were observed in the four soil samples collected for chemical analyses. No TPH-d, TPH-mo, or O&G were reported in samples 350-A and 550-A at or above their respective laboratory reporting limits. No O&G was reported in soil samples 020-A, 170-A, 350-A, and 550-A at or above the laboratory detection limit of 50 mg/kg. TPH-d was reported at concentrations of 15 mg/kg and 7.6 mg/kg in samples 020-A and 170-A, respectively. TPH-mo was reported at concentrations of 7.6 mg/kg and 12 mg/kg in samples 020-A and 170-A, respectively. The TPH-d and TPH-mo reported in samples 020-A and 170-A are well below the Teichert acceptance criteria of 1,000 mg/kg.

Metal concentrations reported in soil samples 020-A, 170-A, 350-A, and 550-A do not exceed the Teichert acceptance criteria for the respective metals.

The following Table 3.2.2 presents a summary of the analytical results for TPH and metals reported in soil samples 020-A, 170-A, 350-A, and 550-A. The analytical laboratory test reports and chain-of-custody documentation are included in Appendix E.

Table 3.2.2 – Laboratory Test Data – Chemical Properties

Constituent	Sample Number 020-A	Sample Number 170-A	Sample Number 350-A	Sample Number 550-A	Teichert Threshold Value (mg/kg)
Petroleum Hydrocarbons					
TPH-d (sgc)	15	7.6	<5.0	<5.0	1,000
TPH-mo (sgc)	38	12	<10	<10	1,000
O&G (HEM and sgc)	<50	<50	<50	<50	NA
Metals					
Beryllium	<1.0	<1.0	<1.0	<1.0	16
Vanadium	9.4	5.1	9.8	56	530
Chromium	2.5	1.7	2.4	3.9	2,500
Cobalt	1.1	<1.0	1.3	5.1	660
Nickel	<2.0	<2.0	<2.0	2.5	1,600
Copper	3.6	2.7	3.3	5.9	2,500
Zinc	<20	<20	<20	21	5,000
Arsenic	<1.0	<1.0	<1.0	15	16
Selenium	<2.0	<2.0	<2.0	<2.0	100
Molybdenum	<1.0	<1.0	<1.0	<1.0	380
Silver	<1.0	<1.0	<1.0	<1.0	380
Cadmium	<1.0	<1.0	<1.0	<1.0	1.7
Antimony	<1.0	<1.0	<1.0	<1.0	30
Barium	26	19	30	63	5,200
Mercury	<0.5	<0.5	<0.5	<0.5	18
Thallium	<1.0	<1.0	<1.0	<1.0	5
Lead	6.0	<1.0	2.7	1.8	75

LEGEND

TPH-d	Total petroleum hydrocarbons as diesel
TPH-mo	Total petroleum hydrocarbons as motor oil
O&G	Oil and grease
HEM	n-Hexane Extraction Method
sgc	Silica gel cleanup
mg/kg	Concentration in milligrams per kilogram
<	Less than the laboratory reporting limit
NA	Not applicable

Concentrations in bold exceed acceptance criteria

4. SLOPE STABILITY ANALYSES

To evaluate the anticipated performance of the proposed channel slopes, we performed slope stability analyses for both a static and rapid draw-down conditions.

4.1 Slope Stability Analysis Method

The project involves 1 horizontal to 1 vertical (1[H]:1[V]) slope inclinations within the channel area and 2(H):1(V) out in the lake. Existing slope conditions in the channel are approximately 2(H):1(V), as shown in Photo #9 in Appendix D. Global static and seismic slope stability analyses were performed using *Slide Version 7.0*™ by *Rocscience*™ utilizing the Simplified Bishop method. The factor of safety (FOS) against slope failure was calculated using the automatic grid search method to locate the critical failure surface. The Simplified Bishop method uses the method of slices and limit equilibrium theory to evaluate the FOS against slope failure.

The FOS is calculated as the ratio of the resisting forces (provided by friction and cohesion) to the driving forces of the slice being analyzed. The analysis software performs analyses of all potential failure surfaces, identifies the critical failure surface, and reports this as the surface with the lowest FOS. Required factors of safety were selected based on typical factors of safety desired for permanent slopes and our engineering judgement. For static conditions a factor of safety of 1.5 or greater was used. For temporary loads, such as seismic or rapid draw down conditions, a minimum factor of safety of 1.1 was used.

The cross sections modeled were selected as the critical sections related to slope stability, at Section 4 on the project plans with an approximate 10 foot cut slope height at a 1H:1V slope.

The cut slope material was modeled to consist of silty Sand (SM) with low cohesion. Unit weights of materials were assumed based on typical unit weights for the corresponding soil types. The safety factors computed for the proposed 1H:1V channel slopes without the groundwater table present (Figure 4) and for a rapid drawdown of the lake level with the groundwater table present (Figure 4A) are 1.89 and 1.15, respectively. Based on the results of these analyses, it is our opinion that the proposed 1H:1V channel slopes will be relatively stable under short term conditions. However, the slopes will probably deteriorate during drawdown of the lake level and/or during seismic loading conditions and continued maintenance (dredging) of the channel will be

necessary in subsequent years. Photo #9 in Appendix D shows evidence of piping in the existing channel from the recent rapid drawdown.

4.2 Site Hydrogeology and Groundwater Flow

The geology of the site can be summarized as consisting of unconsolidated alluvial/lacustrine and glacial deposits. The alluvial/lacustrine deposits in the project area consist of silt, sand and gravel that extend considerably deeper than the anticipated dewatering influence and have a relatively high permeability. The alluvial and lacustrine deposits are expected to extend beyond the channel limits. Groundwater throughout the site area generally flows in a general west to east direction and mimics topography and the flow of Donner Creek. Groundwater will essentially be at the elevation of Donner Lake water surface with the exception of short periods of time during rapid lake draw down or prolonged rain storms.

Based upon our initial findings of the very soft, highly organic silty sand soil within the lake area, we expect that it is impractical to use bladder dams on this soil. We understand that the planned coffer dam will be placed at approximate Station 3+75, resulting in approximately 200 feet of coffer dam between the lake and the channel. We have modeled the near-surface soil to have a greater permeability than the soil below a depth of approximately 2 feet. Using a permeability rate of $1x10^{-2}$ cm/sec for the top 2 feet and $1x10^{-4}$ cm/sec for below 2 feet for the soil encountered during our subsurface investigation, with an 8-foot wide bladder dam and a 5-foot head loss; we estimate seepage water of 20 to 160 gallons per minute (gpm) will seep under each 100 feet of coffer dam at the west end of the planned dredging project. The total flow for approximately 200 feet of coffer dam at this location will be on the order of 40 to 320 gpm. There will likely be additional seepage within the western channel area. If water is not drawn down below the planned depth of excavation, this could lead to a quick condition within the near surface sand soil, resulting in unstable soil at the ground surface. Unstable soil can affect the stability of the coffer dams and equipment maneuverability.

5. CONCLUSIONS

The following conclusions are based on our field observations, subsurface exploration, laboratory test results, engineering analysis, and our experience in the project area.

1. Soil generated from the dredging or removal process will vary significantly in grain size based on the source location within the lake or in the channel. Fine-grained soil types with relatively high organic content make up the near-surface soil in the western portion of the of the project area, which has a lower energy depositional environment. Granular soil types, predominately sand and gravel comprise the eastern portion of the project area, where the depositional environment had higher energy. With the exception of near-surface aquatic vegetation (Photos #1, 3, 4, and 8) and wood debris, buried logs and occasional high organic content lenses of sediments; the soil dredged from the channel (up from approximate Station 5+50) should be suitable for reuse as engineered structural fill. The soft highly organic soil out in the lake will not be suitable for reuse as engineered fill. The organic soil will likely be suitable for landscaping or restoration use. We anticipate the highly organic soil will lose significant volume when dewatered.

2. Granular soil encountered along the channel and over a majority of the project site should provide moderate bearing support for construction equipment. However, near-surface groundwater will likely result in unstable soil conditions within the channel bottom or along haul routes. Low ground pressure equipment or other methods may be necessary for transport of material out of the channel area. Soft to very soft organic soil encountered in the western portion of the project area will provide low bearing support of construction equipment. These soil types will likely inhibit the maneuverability of construction equipment.

3. Temporary dewatering of the construction area will require the use of coffer dams and likely construction sumps and removing water with pumps. To maintain stability of the excavation, groundwater should be drawn down below the lowest point of the excavation. If groundwater is not drawn down below the bottom of the excavation, this could lead to a quick condition and very unstable soil at or near the bottom of the excavation. Based on the subsurface conditions encountered, a 5-foot head loss, and an 8-foot wide bladder dam, we estimate flow rates at the western end of the dredge area of 40 to 320 gpm. Less volume of water is expected from the channel area of the project. However, the channel will require dewatering during construction.

4. The planned 1(H):1(V) slope configurations up to approximately 6 feet high appear to be stable for both the static and rapid draw-down conditions. However, we expect that the slopes will deteriorate over time from wave erosion and soil piping due to groundwater seepage. We expect that this will be more of a maintenance concern that may require future dredging to maintain the proposed channel geometry.

6. RECOMMENDATIONS

The following sections present our recommendations for site clearing and grubbing, reuse of the material for engineered structural fill, temporary excavations, and construction dewatering.

6.1 Earthwork

6.1.1 Clearing and Grubbing

Selective grading may be necessary to segregate granular soil from highly organic soil. Material that will be used for engineered structural fill should be cleared of vegetation and other deleterious materials. The existing aquatic vegetation and surface deposits of organic debris should be stripped and disposed of separately from material that will be used for structural fill. We anticipate that this material may be used in landscape areas and restoration projects. Again, near-surface soil dredged from areas west of approximately Station 5+50 has a high organic matter content and is not suitable for reuse as structural fill.

The dredged material from the channel area will be suitable for re-use as engineered fill provided the highly organic soil and wood debris is segregated or mixed with coarse-grained soil prior to placement as fill. Structural fill should consist of predominantly granular dredged soil that is nearly free of organic debris, with liquid limit of less than 40, a plasticity index less than 15, 100 percent passing the 8-inch sieve, and less than 30 percent passing the No. 200 sieve. The majority of the material encountered during our subsurface exploration in the channel area meets these recommendations for structural fill. However, some of the planned dredge soil has greater than 30 percent passing the No. 200 sieve and does not meet the recommendations stated above for structural fill. We expect that this material will be blended with the sandy soil that that makes up the bulk of the material and the total mix will be suitable for structural fill.

It is very likely that at least much of the dredged soil will be above optimum moisture content when excavated. Depending on drying conditions and when the material is used for fill, suitable compaction results may be difficult to obtain without processing the soil (e.g., disking during favorable weather, covering stockpiles during periods of precipitation, etc.). These conditions could hamper equipment maneuverability and efforts to compact fill materials to the recommended compaction criteria. Fill material may require drying to facilitate placement and compaction.

6.1.4 Cut/Fill Slope Grading

Permanent cut slopes within undisturbed native soil at the subject site should be stable at inclinations up to 1H:1V (horizontal to vertical) from a global slope stability standpoint. However, we expect that the slopes will deteriorate over time from wave erosion and soil piping due to groundwater seepage. We expect that this will be more of a maintenance concern that may require future dredging.

The upper two to three feet of cut slopes should be rounded into the existing terrain above the slope to remove loose material and produce a contoured transition from cut face to natural ground. Scaling to remove unstable cobbles and boulders may be necessary.

6.3 Construction Dewatering

The following recommendations are preliminary and are not based on groundwater pumping tests or detailed excavation flow analysis.

We anticipate that dewatering of excavations can be performed using coffer dams and by constructing sumps to depths below the excavation and removing water with pumps. To maintain stability of the excavation, groundwater should be drawn down below the lowest point of the excavation. However, we understand that this may not be acceptable to pump groundwater below 5,924 feet MSL. If groundwater is not drawn down below the bottom of the excavation, this could lead to a quick condition and very unstable soil at or near the bottom of the excavation.

Based on the subsurface conditions encountered, a 5-foot head loss, and an 8-foot wide bladder dam, we estimate flow rates at the western end of the dredge area of 40 to 320 gpm. Less volume of water is expected from the channel area of the project. However, the channel will require dewatering during construction.

6.4 Plan Review and Construction Monitoring

Construction monitoring includes review of plans and specifications and observation of onsite activities during construction as described below. We should review final grading plans prior to construction to evaluate whether our recommendations have been implemented and to provide additional and/or modified recommendations, if necessary. We also recommend that our firm be retained to provide construction monitoring and testing services during site grading, material sorting, and export to observe subsurface conditions with respect to our engineering recommendations.

7. LIMITATIONS

Our professional services were performed consistent with generally accepted geotechnical engineering principles and practices employed in the site area at the time the report was prepared. No warranty, express or implied, is intended.

Our services were performed consistent with our agreement with our client. We are not responsible for the impacts of changes in environmental standards, practices, or regulations subsequent to performance of our services. We do not warrant the accuracy of information supplied by others or the use of segregated portions of this report. This report is solely for the use of our client. Reliance on this report by a third party is at the risk of that party.

If changes are made to the nature or design of the project as described in this report, then the conclusions and recommendations presented in the report should be reviewed by H&K to assess the relevancy of our conclusions and recommendations. Additional field work and laboratory tests may be required to revise our recommendations. Costs to review project changes and perform additional field work and laboratory testing necessary to modify our recommendations are beyond the scope of services provided for this report. Additional work will be performed only after receipt of an approved scope of services, budget, and written authorization to proceed.

Analyses, conclusions, and recommendations presented in this report are based on site conditions as they existed at the time we performed our subsurface exploration. We assumed that subsurface soil conditions encountered at the locations of our subsurface explorations are generally representative of subsurface conditions across the project site. Actual subsurface conditions at locations between and beyond our explorations may differ. If subsurface conditions encountered during construction are different than those described in this report, we should be notified so that we can review and modify our recommendations as needed. Our scope of services did not include evaluating the project site for the presence of hazardous materials or petroleum products.

The elevation or depth to groundwater and soil moisture conditions underlying the project site may differ with time and location. The project site map shows approximate exploration locations as determined by pacing distances from identifiable site features. Therefore, exploration locations should not be relied upon as being exact.
The findings of this report are valid as of the present date. Changes in the conditions of the property can occur with the passage of time. These changes may be due to natural processes or human activity, at the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from

legislation or a broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

8. REFERENCES

California Division of Mines and Geology. (1992). *Geologic Map of the Chico Quadrangle.* By G.J. Saucedo and D.L. Wagner. Print.

California Geological Survey. (2012). *Geologic Map of North Lake Tahoe-Donner Pass Region, Northern Sierra Nevada, California.* By Arthur Gibbs Sylvester et al. Print.

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Ichinose, G.A., et al. (1999). *The potential hazard from tsunami and seiche waves generated by future large earthquakes within the Lake Tahoe Basin, California-Nevada*. Nevada Seismological Laboratory, University of Nevada, Reno, March 8, 1999.

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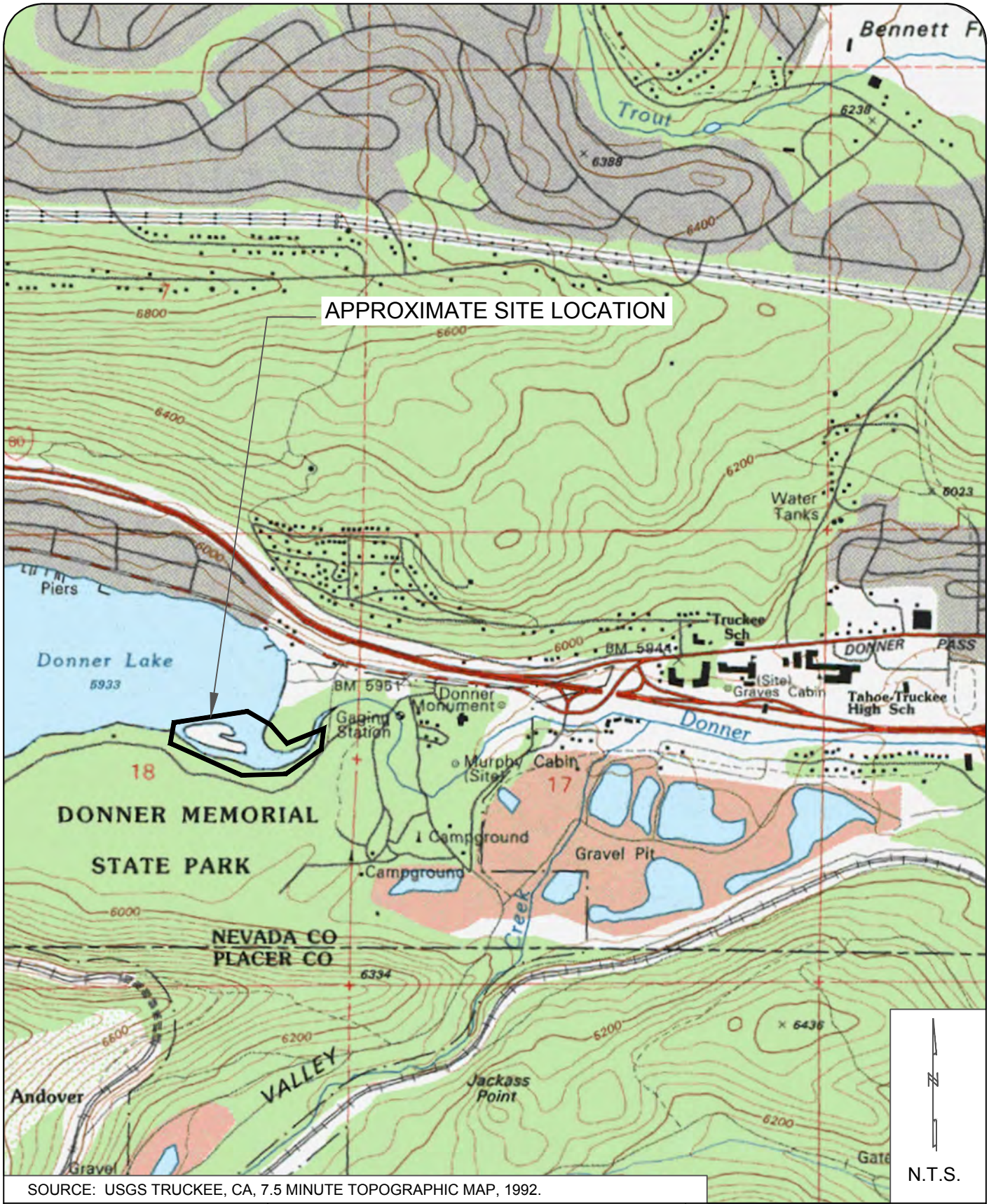
FIGURES



SOURCE: USGS TRUCKEE, CA, 7.5 MINUTE TOPOGRAPHIC MAP, 1992.

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
10775 PIONEER TRAIL
SUITE 213
TRUCKEE, CA 96161
(530) 587-5156

SITE VICINITY MAP

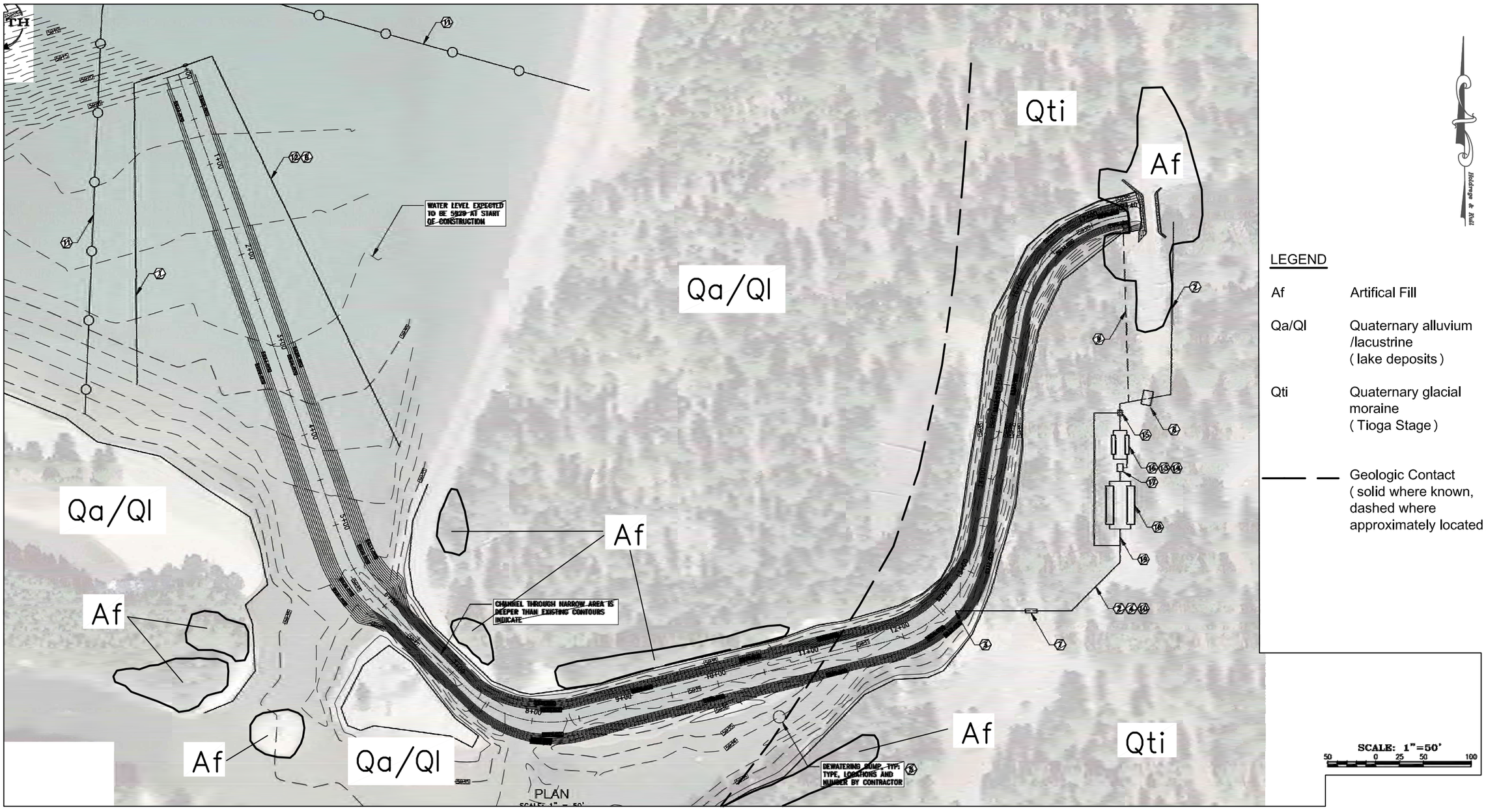
DONNER LAKE OUTFLOW

NEVADA COUNTY, CALIFORNIA

PROJECT NO.: 42361.00

DATE: OCTOBER 2017

FIGURE NO.: 1



LEGEND

Af	Artifical Fill
Qa/Ql	Quaternary alluvium /lacustrine (lake deposits)
Qti	Quaternary glacial moraine (Tioga Stage)
———	Geologic Contact (solid where known, dashed where approximately located)

BASE FROM PIPING AND UTILITY PLAN, PREPARED BY TMWA, 09/21/17.

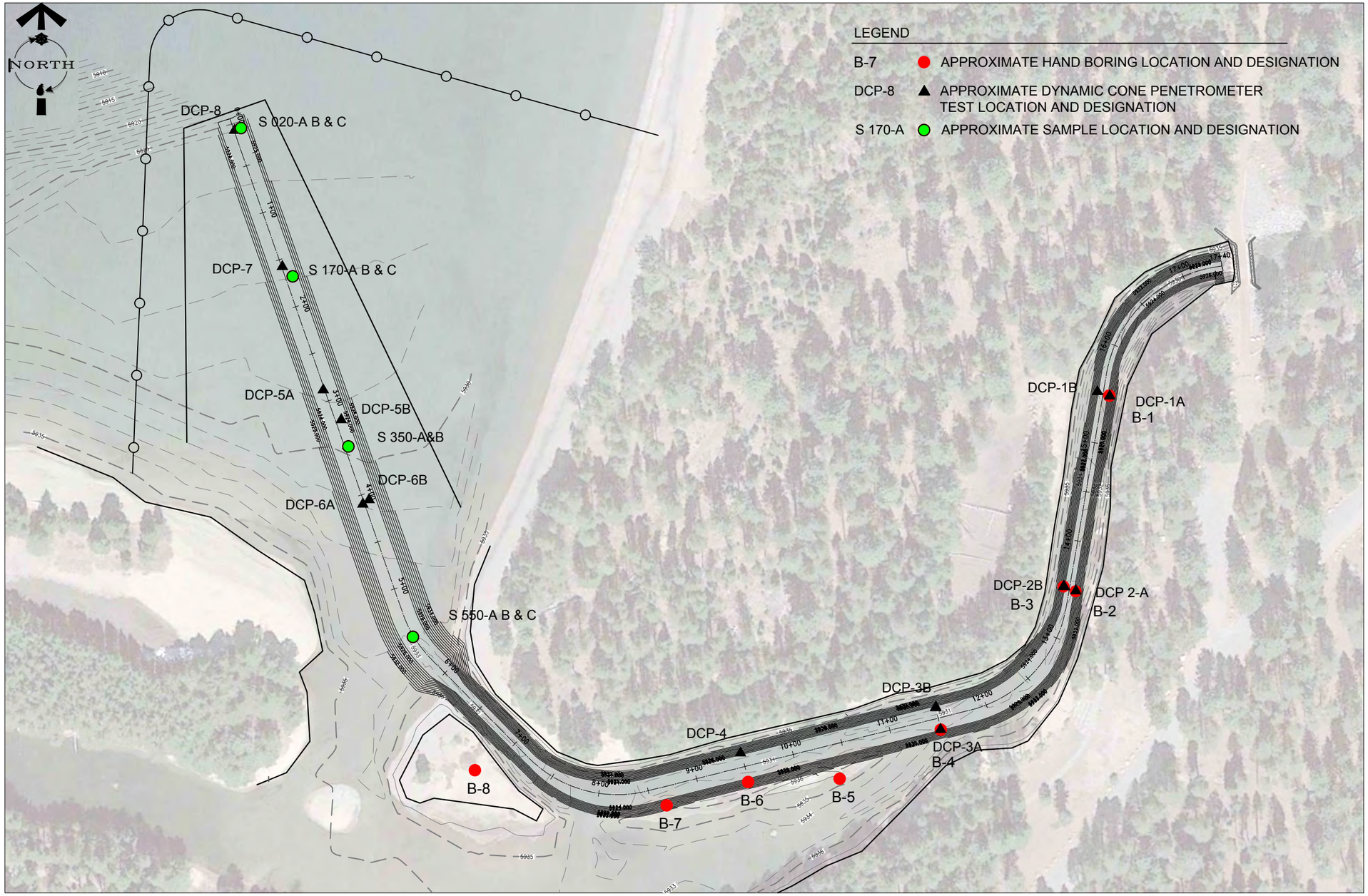
HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
10775 PIONEER TRAIL, SUITE 213
TRUCKEE, CA 96161
(530) 587-5156 FAX 587-5196

GEOLOGIC MAP

DONNER LAKE OUTFLOW

NEVADA COUNTY, CALIFORNIA

DRAWN BY: PJR	CHECKED BY: JKH
PROJECT NO.: 42361.00	
DATE: OCTOBER 2017	
FIGURE NO.: 2	



MODIFIED SITE PLAN FROM TRUCKEE MEADOWS WATER AUTHORITY, DATED SEPTEMBER 21, 2017 NOT TO SCALE.

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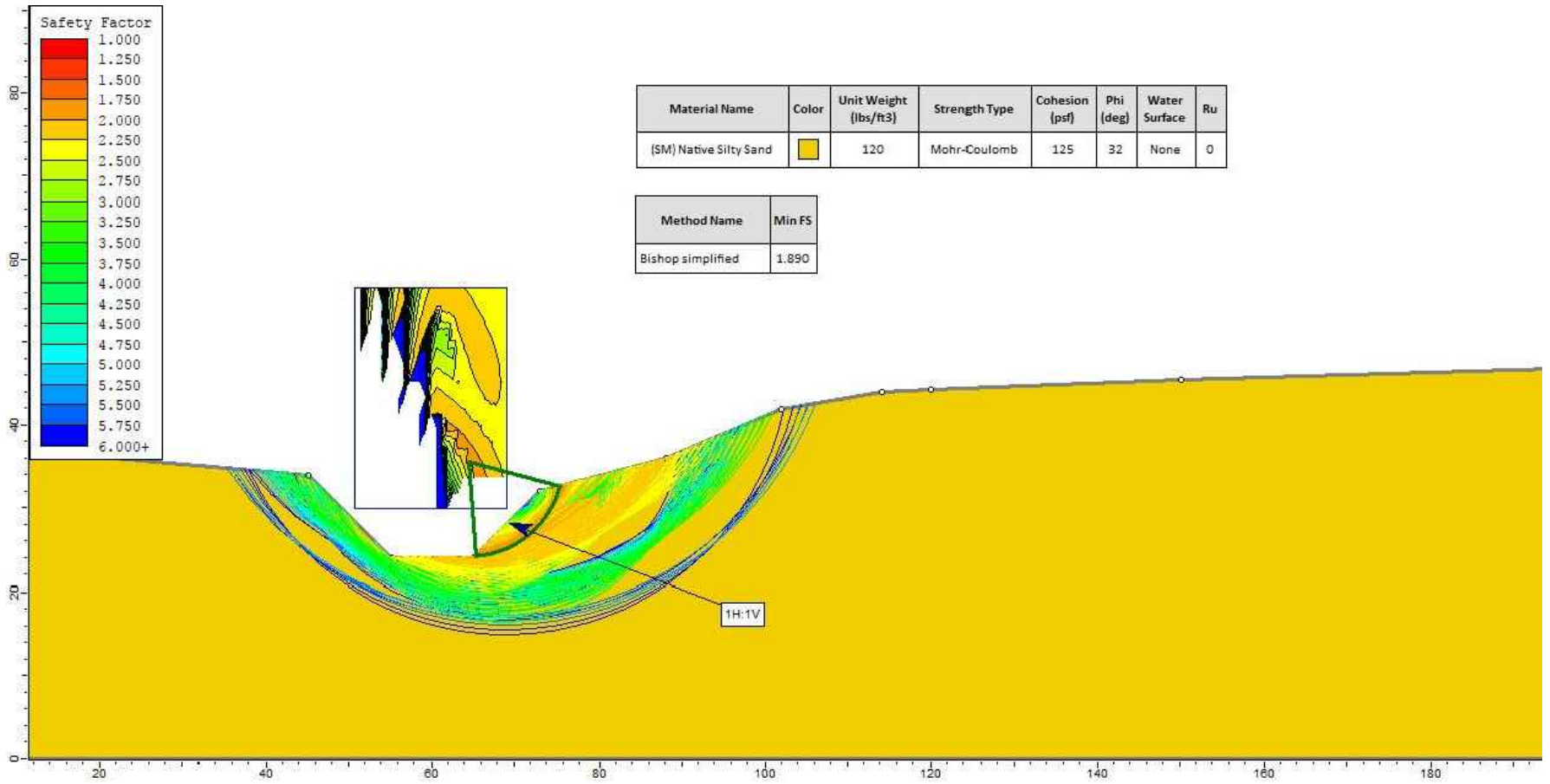
SUITE 213
TRUCKEE, CA 96161
(530) 587-5156

BORING, DCP, AND SAMPLE LOCATION PLAN
DONNER LAKE OUTFLOW
NEVADA COUNTY, CALIFORNIA

PROJECT NO.: 42361.00

DATE: OCTOBER 2017

FIGURE NO.: 3



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
(SM) Native Silty Sand		120	Mohr-Coulomb	125	32	None	0

Method Name	Min FS
Bishop simplified	1.890

Notes: 1. The slope stability analysis was performed using the computer program SLIDE7.0 developed by Rocscience, Inc.
2. The local groundwater table was assumed to not be present for this slope stability analysis.

HORIZONTAL = VERTICAL SCALE

20 Feet 0 40 80

1 Inch 0

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
An NV5 Company
10775 Pioneer Trail, Suite 213
Truckee, California, 96161
PH: 530-587-5156 FX: 530-587-5196

SLOPE STABILITY CROSS-SECTION
NO GROUNDWATER TABLE

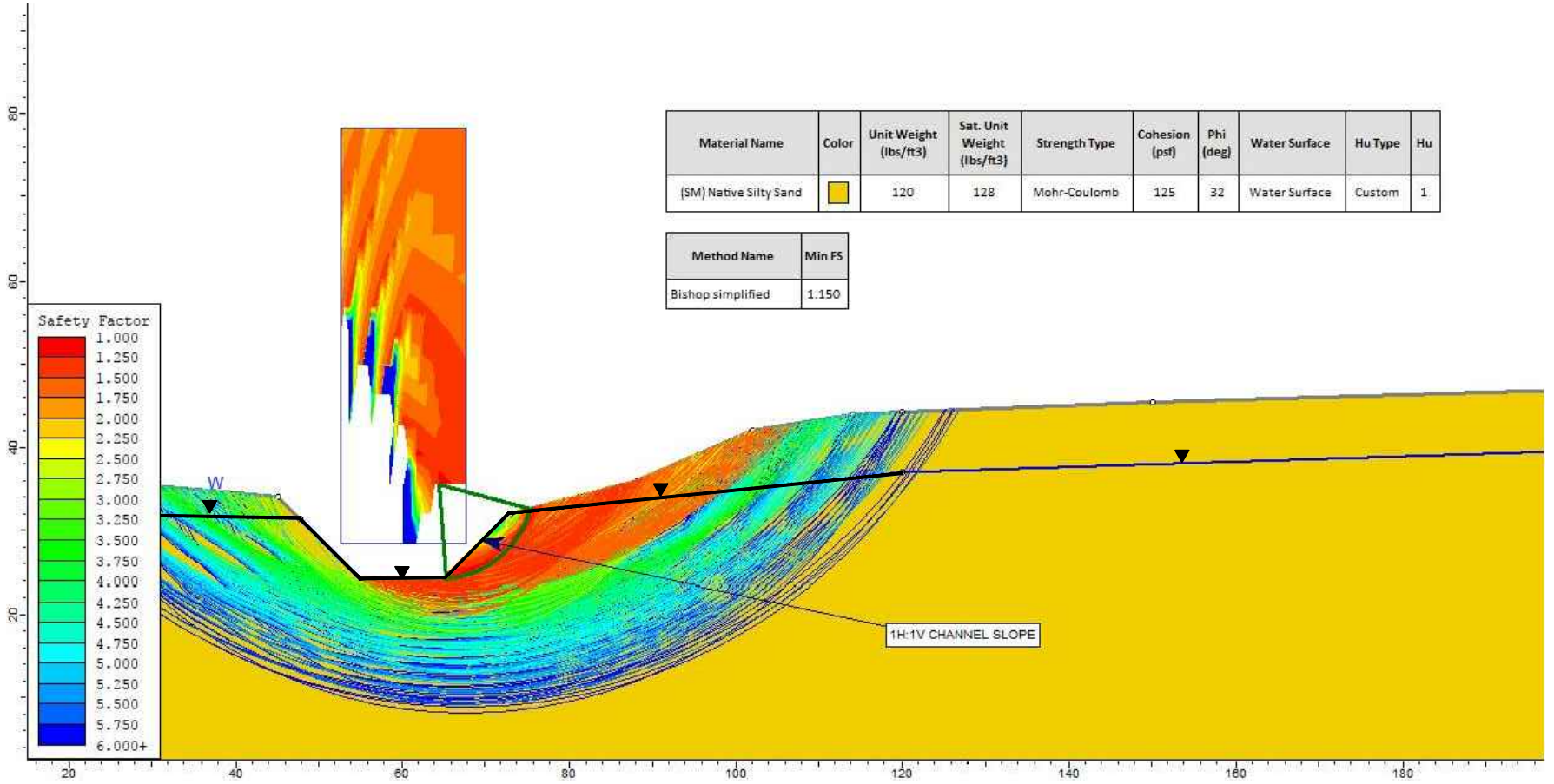
Donner Lake Outlet Channel Cleanout Project
Donner Lake
Truckee, California

DRAWN BY:	DMO
CHECKED BY:	JKH
PROJ. NO.:	125717-0042361.00
DATE:	10-02-17

FIGURE NO.: 4

42361_17-1002_Fig-4.dwg

Full Scale When Printed On 8.5x11 Sheet



Notes: 1. The slope stability analysis was performed using the computer program SLIDE7.0 developed by Rocscience, Inc.
2. The local groundwater table was assumed to have been rapidly drawn down to the bottom of the outlet channel for this slope stability analysis.

HORIZONTAL = VERTICAL SCALE

20 Feet 0 40 80

1 Inch 0

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CONSULTING ENGINEERS • GEOLOGISTS
An NV5 Company
10775 Pioneer Trail, Suite 213
Truckee, California, 96161
PH: 530-587-5156 FX: 530-587-5196

SLOPE STABILITY CROSS-SECTION
RAPID DRAW-DOWN OF GROUNDWATER TABLE

Donner Lake Outlet Channel Cleanout Project
Donner Lake
Truckee, California

DRAWN BY:	DMO
CHECKED BY:	JKH
PROJ. NO.:	125717-0042361.00
DATE:	10-02-17

FIGURE NO.: 4A

42361_17-1002_Fig-4A.dwg

Full Scale When Printed On 8.5x11 Sheet

APPENDIX A PROPOSAL

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

Proposal No. PT17254
September 11, 2017 (Revision 1)

Truckee Meadows Water Authority
1355 Capital Blvd.
Reno, NV 89502

Attention: Bill Hauck

Reference: ***Donner Lake Outflow Into Donner Creek***
Nevada County, California

Subject: ***Proposal for Geotechnical Engineering Services***

This letter presents our proposal to prepare a geotechnical engineering report for the proposed Donner Lake Outflow Emergency Dredging project in Donner State Park, Truckee/Nevada County, California. The purpose of our services will be to explore and characterize subsurface conditions at the project site to develop geotechnical engineering recommendations for reuse of dredged material as engineered fill and estimates of groundwater flow rates during project construction. We will provide value engineering and site specific design recommendations to help reduce construction costs for your project. We have a reputation for responsive, innovative, yet practical approaches to geotechnical problems. Included in this proposal are a brief summary of our understanding of the project, the scope of services we can provide, and an estimate of our fees.

PROJECT DESCRIPTION

This proposal is based on conversations with Roy Johnson from Brown and Caldwell; review of a Topographic Survey and Proposed Grading Plan, prepared by US Geomatics, dated May 15, 2017; and our understanding of the proposed project. We anticipate that the proposed project will involve constructing temporary coffer dams to dewater the channel and excavating or dredging soil material to deepen and widen the outflow in approximately 1,800 feet of channel to an elevation of 5,924 feet above mean sea level (MSL). Dredge depths are anticipated to be typically on the order of 6 to 7 feet, and are not expected to exceed about 10 feet. The dredged material may be transported by a conveyor belt to the former Cold Stream Teichert Aggregates gravel quarry, located near the project site. Appurtenant construction may include a material dewatering area and temporary access roads. Site access is currently provided within Donner State Park on the south side of the channel. Vehicle access on the north side of the channel is not very feasible at this time.

ANTICIPATED CONDITIONS

In preparation of this proposal, we completed a site visit, discussed the project with Roy Johnson of Brown and Caldwell, and reviewed geologic maps regarding subsurface conditions in the project vicinity. Based on this information and our experience in the site area, we anticipate that subsurface soil conditions will consist of silty sand soil overlying glacial till. The glacial till consists of silt, sand, and cobbles to large boulders.

We anticipate that groundwater outside of the channel will be at the approximate level of Donner Lake. We anticipate that the site can be accessed by truck-mounted equipment.

SCOPE OF SERVICES

Review of Available Literature

Prior to our subsurface exploration, we will review regional geologic maps. Our field exploration locations will be selected based on site access and the anticipated project layout. In addition, we will prepare a brief work plan to be submitted to State Parks and we will make the site for USA.

Field Exploration

We propose to explore the subsurface conditions within and immediately adjacent to the channel using a combination of Dynamic Cone Penetrometer (DCP) tests, collecting soil samples by hand within the channel, and excavating 2 to 3 back hoe excavated test pits adjacent to the channel to depths up to approximately 10 feet below the existing ground surface or refusal. We plan on performing three DCP tests at 6 to 9 sections along the channel. The test pits will be excavated using a track-mounted mini-excavator. The test pits will be visually logged by a field representative who will obtain bulk soil samples for classification and laboratory testing. Upon completion, the test pits will be backfilled with excavated soil.

Laboratory Testing

The purpose of laboratory testing is to evaluate the physical and engineering properties of the soil samples collected in the field. We anticipate the laboratory testing program will consist of tests for soil classification (gradation, plasticity, and organic content).

In accordance with Teichert acceptance criteria for soil disposal at there property, we will collect composite stockpile samples for analytical testing. At this time, we anticipate a total of four composite samples will be needed. The composite soil sample will be transported to a state-certified laboratory and tested for the following constituents on a standard 10 day turn-around-time:

- Title 22 (CAM) 17 metals using EPA Test Method 6020 or equivalent.

At this time, we do not anticipate additional analyses will be needed for petroleum hydrocarbons, volatile organic compounds (VOCs), or semi-volatile organic compounds (SVOCs) due to the origin of the dredged soil. If additional analyses are requested by Teichert for acceptance at their facility, we will provide you with a cost estimate to complete this service.

Analysis and Report

Based on the results of our field exploration and laboratory testing, we will provide our opinions and recommendations regarding the following:

- General characterization of the material that will be encountered within the channel at the project site, with emphasis on how the conditions are expected to affect the proposed construction and to help a contractor evaluate the type of equipment that can be used while excavating;
- Estimation of soil permeability to be used for dewatering rates and inflow under planned coffer dams;
- An estimate of organic content and a general discussion of reuse of dredged soil as structural fill and/or other uses;
- Analytical evaluation of dredge spoils to help evaluate acceptance at an off-site disposal facility;
- Recommendations for temporary excavations, and construction dewatering; and,
- Evaluation of the stability of the planned permanent trapezoidal channel slopes.

We will present our opinions and recommendations in a written report complete with a DCP and test pit location plan, the results of our DCP tests, logs of our test pits, and laboratory test results.

SCHEDULE AND FEES

At the present time, we can begin our subsurface exploration within one week of your authorization to proceed. We anticipate the DCP tests will require approximately one week from you authorization to complete. We will provide the DCP results and slope and channel bottom stability information within 3 weeks of your authorization. If weather, access, or site conditions restrict our field operations, we may need to revise our scope of services and fee estimate. We anticipate submitting a draft written report within four weeks after your authorization and a final written report within one week of receiving TMWA's comments. If requested, we can provide preliminary verbal information with respect to our anticipated conclusions and recommendations prior to completion of our final report.

We propose our services be compensated on a time and expense basis in accordance with our 2017 Fee Schedule. For the above-described scope of services, we estimate our fees to be [redacted]

LIMITATIONS

Prior to initiating our subsurface exploration, all site utilities and utility easements must be accurately located in the field, on a scaled map, or both. This information must be made available to Holdrege & Kull by the client before beginning our subsurface exploration. Our fee is not adequate to compensate for both the performance of the services and the assumption of risk of damage to such structures. Holdrege & Kull will not accept responsibility for damage to existing utilities not accurately located in the manner described above. Services rendered by Holdrege & Kull to repair them will be billed at cost.

Holdrege & Kull will perform its services in a manner consistent with the standard of care and skill ordinarily exercised by members of the profession practicing under similar conditions in the geographic vicinity and at the time the services will be performed. No warranty or guarantee, express or implied, is part of the services offered by this proposal.

CLOSING

Enclosed with this proposal is our firm's Agreement for Geotechnical Engineering Services. Please sign and return one copy of the attached Agreement for Geotechnical Engineering Services to our attention if this proposal meets with your approval. This proposal is deemed to be incorporated into and made part of the Agreement for Geotechnical Engineering Services.

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If you have any questions or need additional information, please contact the undersigned.

Sincerely,

Holdrege & Kull

Pamela J. Raynak, P.G.
Senior Geologist

John K. Hudson, P.E., C.E.G.
Principal

Attachment: 2017 Fee Schedule
Agreement for Geotechnical Engineering Services

cc: Roy Johnson, Brown and Caldwell

APPENDIX B ***IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT***
(Included with permission of the GBA, Copyright 2016)

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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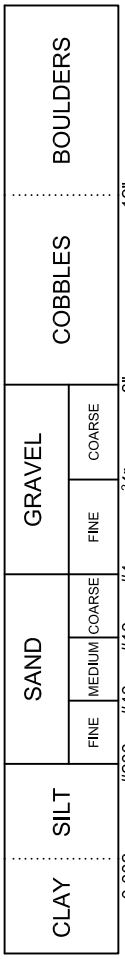
APPENDIX C BORING AND DCP LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

COARSE GRAINED SOIL More than 50% of the soil is retained on the No. 200 sieve	GRAVEL More than 50% coarse fraction is larger than the No. 4 sieve size	Clean Gravel with less than 5% fines*	GW		WELL GRADED GRAVEL, GRAVEL SAND MIXTURES
			GP		POORLY GRADED GRAVEL, GRAVEL SAND MIXTURES
		Gravel with more than 12% fines*	GM		SILTY GRAVEL, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVEL, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
	SAND More than 50% coarse fraction is smaller than the No. 4 sieve size	Clean Sand with less than 5% fines*	SW		WELL GRADED SAND, GRAVELY SAND
			SP		POORLY GRADED SAND, GRAVELY SAND
		Sand with more than 12% fines*	SM		SILTY SAND, POORLY GRADED SAND-SILT MIXTURE
			SC		CLAYEY SAND, POORLY GRADED SAND-SILT MIXTURE
FINE GRAINED SOIL More than 50% of the soil passes the No. 200 sieve	SILT AND CLAY Liquid limit less than 50		ML		INORGANIC SILT & VERY FINE SAND, ROCK FLOUR, SILTY OR CLAYEY FINE SAND, OR CLAYEY SILT WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAY, SANDY CLAY, SILTY CLAY, LEAN CLAY
			OL		ORGANIC CLAY AND ORGANIC SILTY CLAY OF LOW PLASTICITY
	SILT AND CLAY Liquid limit greater than 50		MH		INORGANIC SILT, MIMCACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT
			CH		INORGANIC CLAY OF HIGH PLASTICITY, FAT CLAY
			OH		ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILT
HIGHLY ORGANIC SOIL			Pt		PEAT AND OTHER HIGHLY ORGANIC SOIL
ROCK			RX		ROCK



* Hybrid classifications are used when the fines content is between 5% and 12% (e.g, SP-SM, GP-GM, SW-SC, GW-GC, etc.)

SAMPLE DESIGNATION

- CALIFORNIA SAMPLER (3" OUTSIDE DIAMETER)
- MODIFIED CALIFORNIA SAMPLER (2-1/2" OUTSIDE DIAMETER)
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2" OUTSIDE DIAMETER)
- BULK OR CLASSIFICATION SAMPLE
- ROCK CORE BARREL (3.5" OUTSIDE DIAMETER)

KEY TO SYMBOLS

▽	OBSERVED GROUNDWATER
▼	STABILIZED GROUNDWATER LEVEL
LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX
Gs	SPECIFIC GRAVITY
PERM	PERMEABILITY
CONSOL	CONSOLIDATION
SA	SIEVE ANALYSIS
-200	PERCENT PASSING NO. 200 SIEVE

NON-COHESIVE (GRANULAR) SOIL

RELATIVE DENSITY	SPT BLOWS PER FOOT (N)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	51 +

BLOW COUNTS

BLOW COUNTS REPRESENT THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER EVERY 6 INCHES OF AN 18-INCH DRIVE OR FRACTION INDICATED. BLOW COUNTS PRESENTED ON LOGS HAVE NOT BEEN ADJUSTED.

COHESIVE (CLAYEY) SOIL

COMPARATIVE CONSISTENCY	SPT BLOWS PER FOOT (N)	UNCONFINED COMPRESSIVE STRENGTH (TSF)
VERY SOFT	0 - 2	0 - 0.25
SOFT	3 - 4	0.25 - 0.50
MEDIUM STIFF	5 - 8	0.50 - 1.00
STIFF	9 - 15	1.00 - 2.00
VERY STIFF	16 - 30	2.00 - 4.00
HARD	31 +	4.00 +

SOIL CONTACTS

- _____ SOLID - WELL-DEFINED CHANGE
- ---------- DASHED - GRADATIONAL OR APPROXIMATE CHANGE

MOISTURE CONTENT

CLASSIFICATION	DESCRIPTION
DRY	FREE OF MOISTURE, DUSTY, DRY TO THE TOUCH
SLIGHTLY MOIST	BELOW THE SOIL'S OPTIMUM MOISTURE CONTENT, BUT NOT DRY
MOIST	NEAR THE SOIL'S OPTIMUM MOISTURE CONTENT
VERY MOIST	ABOVE THE SOIL'S OPTIMUM MOISTURE CONTENT, BUT NOT WET
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

CEMENTATION

CLASSIFICATION	DESCRIPTION
WEAK	CRUMBLES OR BREAKS WITH HANDLING OR SLIGHT FINGER PRESSURE
MODERATE	CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE
STRONG	WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE

MINOR CONSTITUENT QUANTITIES

QUALIFIER	DESCRIPTION
TRACE	PARTICLES ARE PRESENT, BUT ESTIMATED TO BE LESS THAN 5%
SOME	5 to 12%
WITH	12 to 30%

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
10775 PIONEER TRAIL
SUITE 213
TRUCKEE, CA 96161
(530) 587-5156

SOIL CLASSIFICATION KEY
DONNER LAKE OUTFLOW
NEVADA COUNTY, CALIFORNIA

PROJECT NO.: 42361.00
DATE: OCTOBER 2017
FIGURE NO.: NA

BORING B-1

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5932.6	9/25/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	J. HUDSON	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	3'	YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
1-1		5	1		SP	GRAYISH BROWN POORLY GRADED SAND (SP); MOIST, LOOSE, FINE GRAINED, MOTTLED ORANGE BROWN - GRADES WITH LESS FINES, WEAKLY CEMENTED KNODUES, EST 15% FINES, 4" COBBLE, BECOMES WET, SILTY
			2			
			3			
1-2		45	4		SM	LIGHT YELLOWISH BROWN SILTY SAND (SM); WET, LOOSE, VERY FINE SAND
						DARK GRAY SILTY SAND (SM); WET, LOOSE, COARSE/ SAND MOTTLED BLACK AND ORANGE BROWN, TRACE COARSE GRAVEL SUBROUNDED TO ROUNDED
1-3		18	5			TERMINATED AT 5.5'
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-2

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5931.6	9/25/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	J. HUDSON	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	2'	YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					SP	DARK GRAYISH BROWN POORLY GRADED SAND WITH GRAVEL (SP); MOIST, LOOSE, FINE TO COARSE SAND AND GRAVEL
2-1		2	1			
			2			
2-2			3			
					SM	LIGHT OLIVE BROWN SILTY SAND (SM); WET, LOOSE, FINE SAND, ESTIMATE 10% FINES
2-3		16	4			MOTTLED ORANGE BROWN, GRAY, BROWN, GRADES WITH INCREASING FINES, WEAKLY CEMENTED KNODULES
2-4		77			ML	DARK GRAY SILT WITH SAND (ML); WET, MEDIUM STIFF TO STIFF, VERY FINE SAND
			5			TERMINATED AT 5'
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-3

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5931	9/22/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	A. METZ	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. VILLARREAL	BULK	3/4'	YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
			1		SM	GRAYISH BROWN SILTY SAND (SM); WET, LOOSE, FINE TO MEDIUM SAND, 15% FINES
3-1		7	2		SP-SM	DARK GRAYISH BROWN POORLY GRADED SAND WITH SILT (SP-SM); WET, LOOSE, FINE TO MEDIUM SAND, EST. 5% FINES.
			3			REDDISH BROWN WELL-GRADED GRAVEL (GW); WET, LOOSE, ESTIMATED 35% FINE GRAVEL, 55% FINE TO COARSE SAND, 10% FINES
3-2		19	4			DARK GRAY SILTY SAND (SM); WET, MEDIUM DENSE, FINE TO MEDIUM SAND, EST. 5% FINES INCREASING WITH DEPTH
			5			TERMINATED AT 5'
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-4

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5931.5	9/25/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	J. HUDSON	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	2'	YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
4-1		18	0		SM	VERY DARK GRAY SILTY SAND WITH GRAVEL (SM); MOIST, MEDIUM DENSE, FINE SAND, CHUNK OF WOOD (FILL)
			1		SP-SM	DARK GRAYISH BROWN POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM); MOIST, LOOSE TO MEDIUM DENSE, FINE TO COARSE SAND AND GRAVEL
4-2		6	2			
			3			REFUSAL AT 3.5'
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-5

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5932	09/30/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	J. HUDSON	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	3.5'	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
			1		SM	YELLOWISH BROWN SILTY SAND (SM); MOIST, LOOSE, FINE TO COARSE SAND, SOME FINE TO COARSE GRAVEL, TRACE COBBLES GRADES TO FINE SAND AT 1 FOOT
5-1			2		ML	BROWN SANDY SILT (ML); MOIST, SOFT, VERY FINE SAND, NON-PLASTIC, HIGH ORGANIC CONTENT
			3		SP	YELLOWISH BROWN TO GRAY POORLY GRADED SAND (SP); MOIST TO WET, LOOSE TO MEDIUM DENSE, FINE TO MEDIUM SAND, POCKETS OF ORGANIC MATTER
			4			
			5		GP	GRAY POORLY GRADED GRAVEL WITH SAND (GP); WET, DENSE, FINE TO COARSE SAND AND GRAVEL
			6			TERMINATED AT 4.5 '
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-6

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5930	9/26/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	A. METZ	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
A. METZ	BULK	9"	YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					SM	GRAY SILTY SAND (SM); MOIST, LOOSE, VERY FINE TO FINE, $\frac{1}{4}$" LAYERS OF ORGANIC MATTER, EST. 10% FINES, 18"+ BOULDER AT 3" DEPTH
6-1			1		SP	YELLOWISH BROWN POORLY GRADED SAND (SP); MOIST, LOOSE TO MEDIUM DENSE, FINE TO MEDIUM SAND, LAYERS OF PARTIALLY BURNT WOOD
			2		SM	GRAY SILTY SAND (SM) WET, LOOSE TO MEDIUM DENSE, LASTIC, EST. 40% FINES TRANSITIONING TO <15% @ 24 INCHES, SOME SUBANGULAR GRAVEL
6-2			3			
			4		SW-SM	GRADES TO WELL-GRADED SAND WITH GRAVEL AND SILT (SW-SM); WET, MEDIUM DENSE, MEDIUM TO COARSE SAND, EST. 10% FINES, 65% SAND 25% GRAVEL
6-3			5			
			6			TERMINATED AT 5.5'
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-7

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5929.5	09/30/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	J. HUDSON	HAND/ AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	0.5'	YES @ 3'

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					GP	GRAY POORLY GRADED GRAVEL WITH SAND (GP); MOIST, LOOSE, FINE TO COARSE SAND AND GRAVEL
7.1			1		SM	GRAY SILTY SAND (SM); WET, LOOSE, VERY FINE SAND, NON-PLASTIC FINES
			2			
			3			
			4			TERMINATED AT 3.5 '
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

BORING B-8

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42361.00	DONNER LAKE OUTFLOW	5934.8	9/26/2017	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
H&K	A. METZ & J. HUDSON	TRENCH / AUGER

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
J. HUDSON	BULK	5'	AUGER - YES

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					GP	GRAY POORLY GRADED GRAVEL WITH SAND (GP); LOOSE, MOIST, FINE TO MEDIUM SAND, FINE TO COARSE GRAVEL, SUBANGULAR.
8-1			1			
8-2			2		SM-OL	DARK BROWN SANDY SILT (SM-OL) STIFF TO VERY STIFF, LOW PLASTICITY, HIGH ORGANIC, TRACE FINE GRAVEL
					SM	ORANGE BROWN SILTY SAND (SM); MOIST, LOOSE TO MEDIUM DENSE, FINE SAND, BECOMES GRAY BROWN, FINE TO MEDIUM GRAINED, LESS SILT
8-3			3			
			4			
			5		SP-SM	GRAYISH BROWN POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM); WET, LOOSE TO MEDIUM DENSE, FINE TO MEDIUM SAND, COARSE GRAVEL
			6			GRAY SILTY SAND (SM); WET, LOOSE, FINE TO MEDIUM SAND
8-4		15	7			
			8			TERMINATED AT 8'
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-19-2017
DATE COMPLETED: 09-19-2017

HOLE #: DCP - 1A
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 15+50

SURFACE ELEVATION: 5930
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
- 1 ft	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 2 ft	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
-	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
- 3 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 1 m	17	75.5	••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
-	13	50.2	•••••••••••••	14	MEDIUM DENSE	STIFF
- 4 ft	15	57.9	•••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	19	73.3	••••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
-	21	81.1	•••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
- 5 ft	18	69.5	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	17	65.6	•••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	20	77.2	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 6 ft	24	92.6	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	26	100.4	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 2 m	16	61.8	•••••••••••••••	17	MEDIUM DENSE	VERY STIFF
- 7 ft	15	51.3	•••••••••••••	14	MEDIUM DENSE	STIFF
-	19	65.0	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	28	95.8	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 8 ft	29	99.2	••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	26	88.9	••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	32	109.4	•••••••••••••••••••••••••••••	25+	DENSE	HARD
- 9 ft	32	109.4	•••••••••••••••••••••••••••••	25+	DENSE	HARD
-	28	95.8	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	31	106.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 3 m 10 ft	29	99.2	••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	34	104.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	24	73.4	••••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
-	32	97.9	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 11 ft	34	104.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	31	94.9	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	36	110.2	•••••••••••••••••••••••••••	25+	DENSE	HARD
- 12 ft	37	113.2	••••••••••••••••••••••••••••	25+	DENSE	HARD
-	35	107.1	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	31	94.9	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 4 m 13 ft	34	104.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF

HOLE #: DCP - 1A

WILDCAT DYNAMIC CONE LOG

PROJECT: Donner Lake Outflow

PROJECT NUMBER: 42361.00

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	34	94.2	••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	30	83.1	••••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
- 14 ft	31	85.9	••••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
-	32	88.6	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	30	83.1	••••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
- 15 ft	34	94.2	••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	39	108.0	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	40	110.8	•••••••••••••••••••••••••••	25+	DENSE	HARD
- 16 ft	49	135.7	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 5 m	49	135.7	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-						
- 17 ft						
-						
-						
- 18 ft						
-						
-						
- 19 ft						
-						
- 6 m						
- 20 ft						
-						
-						
- 21 ft						
-						
-						
- 22 ft						
-						
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- 7 m 23 ft						
-						
-						
- 24 ft						
-						
-						
- 25 ft						
-						
-						
- 26 ft						
- 8 m						
-						
- 27 ft						
-						
-						
- 28 ft						
-						
-						
- 29 ft						
-						
- 9 m						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-20-2017
DATE COMPLETED: 09-20-2017

HOLE #: DCP - 1B
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 15+50

SURFACE ELEVATION: 5931.8
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 1 ft	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
- 2 ft	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 3 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 1 m	13	57.7	•••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	10	38.6	••••••••••	11	MEDIUM DENSE	STIFF
- 4 ft	10	38.6	••••••••••	11	MEDIUM DENSE	STIFF
-	10	38.6	••••••••••	11	MEDIUM DENSE	STIFF
-	13	50.2	••••••••••••••	14	MEDIUM DENSE	STIFF
- 5 ft	12	46.3	•••••••••••••	13	MEDIUM DENSE	STIFF
-	15	57.9	•••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	23	88.8	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
- 6 ft	23	88.8	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	20	77.2	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 2 m	22	84.9	•••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
- 7 ft	30	102.6	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	100	342.0	••	25+	VERY DENSE	HARD
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-20-2017
DATE COMPLETED: 09-20-2017

HOLE #: DCP - 2A
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 13+50

SURFACE ELEVATION: 5931.3
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
- 1 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
- 2 ft	10	44.4	•••••••••••	12	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••	13	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••	13	MEDIUM DENSE	STIFF
- 3 ft	10	44.4	•••••••••••	12	MEDIUM DENSE	STIFF
- 1 m	11	48.8	••••••••••••	13	MEDIUM DENSE	STIFF
-	15	57.9	••••••••••••••	16	MEDIUM DENSE	VERY STIFF
- 4 ft	17	65.6	•••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	23	88.8	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	32	123.5	••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 5 ft	33	127.4	•••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	32	123.5	••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	33	127.4	•••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 6 ft	27	104.2	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	24	92.6	•••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 2 m	20	77.2	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 7 ft	16	54.7	••••••••••••••	15	MEDIUM DENSE	STIFF
-	22	75.2	••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
-	26	88.9	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
- 8 ft	35	119.7	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	39	133.4	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	61	208.6	••	25+	VERY DENSE	HARD
- 9 ft	80	273.6	••	25+	VERY DENSE	HARD
-	82	280.4	••	25+	VERY DENSE	HARD
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-21-2017
DATE COMPLETED: 09-21-2017

HOLE #: DCP - 2B
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 13+50

SURFACE ELEVATION: 5930.2
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 2 ft	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
- 3 ft	13	57.7	••••••••••••••••	16	MEDIUM DENSE	VERY STIFF
- 1 m	15	66.6	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	20	77.2	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 4 ft	23	88.8	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	29	111.9	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	25	96.5	•••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 5 ft	27	104.2	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	29	111.9	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	27	104.2	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 6 ft	17	65.6	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	28	108.1	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 2 m	27	104.2	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 7 ft	36	123.1	••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	37	126.5	•••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	40	136.8	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 8 ft	37	126.5	•••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	30	102.6	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	31	106.0	•••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 9 ft	30	102.6	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	28	95.8	•••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	29	99.2	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 3 m 10 ft	34	116.3	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-20-2017
DATE COMPLETED: 09-20-2017

HOLE #: DCP - 3A
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 11+50

SURFACE ELEVATION: 5930.6
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
- 1 ft	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
- 2 ft	2	8.9	••	2	VERY LOOSE	SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	9	40.0	•••••••••••	11	MEDIUM DENSE	STIFF
- 3 ft	15	66.6	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
- 1 m	24	106.6	•••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	26	100.4	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 4 ft	19	73.3	••••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
-	21	81.1	•••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
-	17	65.6	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
- 5 ft	17	65.6	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	17	65.6	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	23	88.8	•••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
- 6 ft	26	100.4	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	28	108.1	•••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 2 m	22	84.9	•••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
- 7 ft	30	102.6	•••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	31	106.0	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	32	109.4	•••••••••••••••••••••••••••••	25+	DENSE	HARD
- 8 ft	70	239.4	••	25+	VERY DENSE	HARD
-	55	188.1	••	25+	VERY DENSE	HARD
-	46	157.3	••	25+	DENSE	HARD
- 9 ft	37	126.5	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	38	130.0	•••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	42	143.6	•••••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 3 m 10 ft	34	116.3	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	29	88.7	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	29	88.7	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	31	94.9	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 11 ft	39	119.3	•••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	50	153.0	••	25+	DENSE	HARD
-	60	183.6	••	25+	VERY DENSE	HARD
- 12 ft	52	159.1	••	25+	DENSE	HARD
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-22-2017
DATE COMPLETED: 09-22-2017

HOLE #: DCP - 3B
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 11+50

SURFACE ELEVATION: 5930.0
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 1 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
-	3	13.3	•••	3	VERY LOOSE	SOFT
- 2 ft	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	13	57.7	••••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
- 3 ft	17	75.5	••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
- 1 m	18	79.9	••••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	22	84.9	••••••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
- 4 ft	22	84.9	••••••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
-	23	88.8	•••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	25	96.5	•••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 5 ft	30	115.8	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	36	139.0	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	38	146.7	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 6 ft	40	154.4	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	37	142.8	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 2 m	35	135.1	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 7 ft	44	150.5	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	42	143.6	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	42	143.6	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 8 ft	48	164.2	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	50	171.0	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-22-2017
DATE COMPLETED: 09-22-2017

HOLE #: DCP - 4
CREW: ALM + JAV
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 9+50

SURFACE ELEVATION: 5930.0
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
- 1 ft	2	8.9	••	2	VERY LOOSE	SOFT
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 2 ft	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••	13	MEDIUM DENSE	STIFF
-	12	53.3	••••••••••••	15	MEDIUM DENSE	STIFF
- 3 ft	18	79.9	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 1 m	16	71.0	••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
-	17	65.6	•••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
- 4 ft	17	65.6	•••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	18	69.5	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	16	61.8	••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
- 5 ft	17	65.6	•••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	19	73.3	•••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
-	20	77.2	•••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 6 ft	21	81.1	••••••••••••••••••••••	23	MEDIUM DENSE	VERY STIFF
-	22	84.9	••••••••••••••••••••••	24	MEDIUM DENSE	VERY STIFF
- 2 m	20	77.2	•••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 7 ft	20	68.4	•••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	31	106.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	32	109.4	••••••••••••••••••••••••••	25+	DENSE	HARD
- 8 ft	31	106.0	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	36	123.1	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	32	109.4	••••••••••••••••••••••••••	25+	DENSE	HARD
- 9 ft	43	147.1	••	25+	DENSE	HARD
-	47	160.7	••	25+	DENSE	HARD
-	35	119.7	••••••••••••••••••••••••••••	25+	DENSE	HARD
- 3 m 10 ft	32	109.4	••••••••••••••••••••••••••	25+	DENSE	HARD
-	25	76.5	•••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
-	35	107.1	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	42	128.5	••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 11 ft	35	107.1	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	50	153.0	••	25+	DENSE	HARD
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name: Holdrege & Kull
Company Street #: 10775 Pioneer Trail, Ste. 213
Company City, State, Zip: Truckee, California 96161

PROJECT NUMBER: 42361.00
DATE STARTED: 09-23-2017
DATE COMPLETED: 09-23-2017

HOLE #: DCP - 5A
CREW: ALM
PROJECT: Donner Lake Outflow
ADDRESS: Donner Lake Outflow
LOCATION: Sta 2+80

SURFACE ELEVATION: 5924.6
WATER ON COMPLETION: Yes
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 5 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
- 6 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 m	1	3.9	•	1	VERY LOOSE	VERY SOFT
- 7 ft	1	3.4		0	VERY LOOSE	VERY SOFT
-	1	3.4		0	VERY LOOSE	VERY SOFT
-	1	3.4		0	VERY LOOSE	VERY SOFT
- 8 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 9 ft	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	3	10.3	••	2	VERY LOOSE	SOFT
- 3 m 10 ft	3	10.3	••	2	VERY LOOSE	SOFT
-	3	9.2	••	2	VERY LOOSE	SOFT
-	3	9.2	••	2	VERY LOOSE	SOFT
-	3	9.2	••	2	VERY LOOSE	SOFT
- 11 ft	4	12.2	•••	3	VERY LOOSE	SOFT
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name	Holdrege & Kull
Company Street #	10775 Pioneer Trail, Ste. 213
Company City, State, Zip	Truckee, California 96161

PROJECT NUMBER:	42361.00
DATE STARTED:	09-23-2017
DATE COMPLETED:	09-23-2017

HOLE #:	DCP - 5B
CREW:	ALM
PROJECT:	Donner Lake Outflow
ADDRESS:	Donner Lake Outflow
LOCATION:	Sta 3+25

SURFACE ELEVATION:	5924 (Mud Line)
WATER ON COMPLETION:	Terminated due to dri
HAMMER WEIGHT:	35 lbs.
CONE AREA:	10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	1	4.4	•	1	VERY LOOSE	VERY SOFT
-	2	8.9	••	2	VERY LOOSE	SOFT
- 1 ft	3	13.3	•••	3	VERY LOOSE	SOFT
-	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
- 2 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name	Holdrege & Kull		
Company Street #	10775 Pioneer Trail, Ste. 213	PROJECT NUMBER:	42361.00
Company City, State, Zip	Truckee, California 96161	DATE STARTED:	09-27-2017
		DATE COMPLETED:	09-27-2017
HOLE #:	DCP - 6A		
CREW:	ALM	SURFACE ELEVATION:	5925.6 (Mud Line)
PROJECT:	Donner Lake Outflow	WATER ON COMPLETION:	Yes
ADDRESS:	Donner Lake Outflow	HAMMER WEIGHT:	35 lbs.
LOCATION:	Sta 4+10	CONE AREA:	10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	2	8.9	••	2	VERY LOOSE	SOFT
-	16	71.0	••••••••••••••••••	20	MEDIUM DENSE	VERY STIFF
- 1 ft	22	97.7	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	14	62.2	••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
-	18	79.9	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
- 2 ft	23	102.1	••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	15	66.6	••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	36	159.8	••	25+	DENSE	HARD
- 3 ft	30	133.2	••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 1 m	32	142.1	••	25+	DENSE	HARD
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name	Holdrege & Kull		
Company Street #	10775 Pioneer Trail, Ste. 213	PROJECT NUMBER:	42361.00
Company City, State, Zip	Truckee, California 96161	DATE STARTED:	09-27-2017
		DATE COMPLETED:	09-23-2017
HOLE #:	DCP - 6B		
CREW:	ALM	SURFACE ELEVATION:	5925.6 (Mud Line)
PROJECT:	Donner Lake Outflow	WATER ON COMPLETION:	Yes
ADDRESS:	Donner Lake Outflow	HAMMER WEIGHT:	35 lbs.
LOCATION:	Sta 4+10	CONE AREA:	10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	2	8.9	••	2	VERY LOOSE	SOFT
-	24	106.6	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	38	168.7	••	25+	DENSE	HARD
- 2 ft	38	168.7	••	25+	DENSE	HARD
-	38	168.7	••	25+	DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name	Holdrege & Kull		
Company Street #	10775 Pioneer Trail, Ste. 213	PROJECT NUMBER:	42361.00
Company City, State, Zip	Truckee, CA 96161	DATE STARTED:	09-23-2017
		DATE COMPLETED:	09-23-2017
HOLE #:	DCP - 7		
CREW:	ALM	SURFACE ELEVATION:	5922.4
PROJECT:	Donner Lake Outflow	WATER ON COMPLETION:	Yes
ADDRESS:	Donner Lake Outflow	HAMMER WEIGHT:	35 lbs.
LOCATION:	Sta 1+55	CONE AREA:	10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 5 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 6 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 m	0	0.0		0	VERY LOOSE	VERY SOFT
- 7 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 8 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 9 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
-	2	6.8	•	1	VERY LOOSE	VERY SOFT
- 3 m 10 ft	5	17.1	••••	4	VERY LOOSE	SOFT
-	3	9.2	••	2	VERY LOOSE	SOFT
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Company Name	Holdrege & Kull		
Company Street #	10775 Pioneer Trail, Ste. 213	PROJECT NUMBER:	42361.00
Company City, State, Zip	Truckee, CA 96161	DATE STARTED:	09-23-2017
		DATE COMPLETED:	09-23-2017
HOLE #:	DCP - 8		
CREW:	ALM	SURFACE ELEVATION:	5920.3 (Mud Line)
PROJECT:	Donner Lake Outflow	WATER ON COMPLETION:	Yes
ADDRESS:	Donner Lake Outflow	HAMMER WEIGHT:	35 lbs.
LOCATION:	Sta 0+20	CONE AREA:	10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 3 ft	0	0.0		0	VERY LOOSE	VERY SOFT
- 1 m	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 4 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 5 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 6 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-	0	0.0		0	VERY LOOSE	VERY SOFT
- 2 m	0	0.0		0	VERY LOOSE	VERY SOFT
- 7 ft	0	0.0		0	VERY LOOSE	VERY SOFT
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

APPENDIX D PHOTOGRAPHS

Photo #1: Channel geometry, station 16+25 looking south. Note the organic matter growing at the base of the channel.

Photo #2: Channel, water elevation at approximately 5,932 feet MSL, looking west from station 13+00.

Photo #3: View of channel from station 7+00, looking east. Note the green organic matter at the channel bend. Approximate water elevation is 5,929.83 feet MSL.

Photo #4: Channel geometry, station 9+50 looking west. Approximate water elevation is 5,929.30 feet MSL.

Photo #5: Channel geometry, station 8+10 looking northwest. Approximate water elevation is 5,929.30 feet MSL.

Photo #6: Gravel predominantly on surface of channel slope, looking southeast from station 6+50.

Photo #7: Slope cracks due to soil piping from groundwater seepage (pencil for scale).

Photo #8: Lacustrine deposits with wood debris, looking northeast from station 8+50.

Photo #9: Evidence of piping in channel slope, approximate 2(H):1(V) existing slope. Station 13+50 looking north.

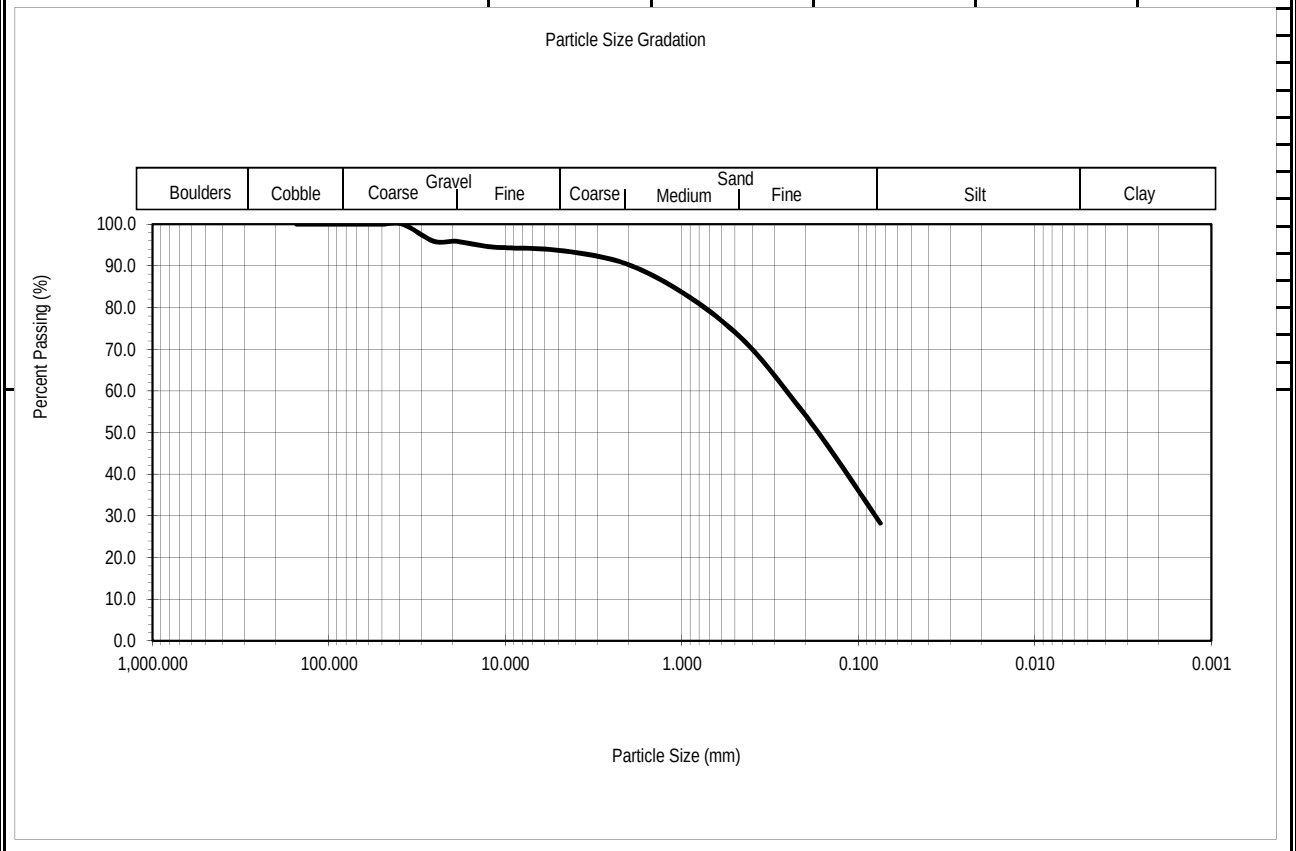
APPENDIX E LABORATORY TEST DATA

Particle Size Distribution

ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**020-C**	Boring/Trench:	**Sta. 0+20**	Depth, (ft.): **0-1**	Tested By: **SLN**
Description:	**Black (10YR 2/1) Silty Sand (SM)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	1,142.3	100.0
3 Inch	3.0000	76.2	0.00	0.0	1,142.3	100.0
2 Inch	2.0000	50.8	0.00	0.0	1,142.3	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	1,142.3	100.0
1.0 Inch	1.0000	25.4	46.70	46.7	1,095.6	95.9
3/4 Inch	0.7500	19.1	0.00	46.7	1,095.6	95.9
1/2 Inch	0.5000	12.7	14.30	61.0	1,081.3	94.7
3/8 Inch	0.3750	9.5	3.90	64.9	1,077.4	94.3
#4	0.1870	4.7500	7.50	72.4	1,069.9	93.7
#10	0.0787	2.0000	38.56	111.0	1,031.4	90.3
#20	0.0335	0.8500	97.63	208.6	933.7	81.7
#40	0.0167	0.4250	120.60	329.2	813.1	71.2
#60	0.0098	0.2500	133.73	462.9	679.4	59.5
#100	0.0059	0.1500	142.75	605.7	536.6	47.0
#200	0.0030	0.0750	214.13	819.8	322.5	28.2



HOLDREGE & KULL

(530) 478-1305 - Fax (530) 478-1019 - 792 Searls Ave.- Nevada City, CA 95959 - A California Corporation

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

Atterberg Indices

ASTM D4318

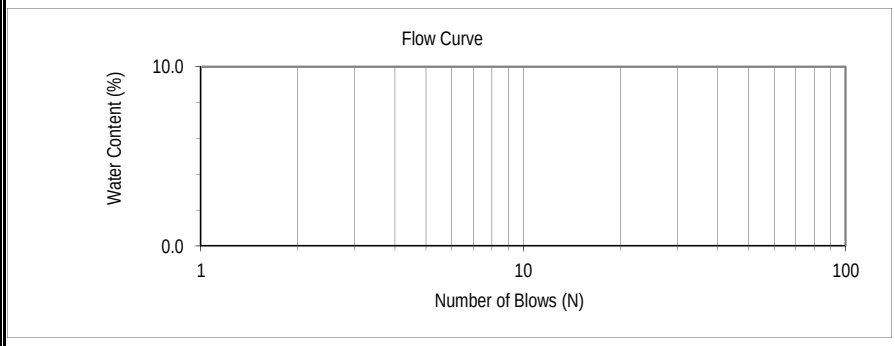
DSA File #:
DSA Appl #:

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**			Date:	**9/26/2017**
Sample No.:	**020-C**	Boring/Trench:	**Sta. 0+20**	Depth, (ft.):	**0-1**	Tested By:	**MLH**
Description:	**Black (10YR 2/1) Silty Sand (SM)**					Checked By:	**MLH**
Sample Location:						Lab. No.:	**15-17-500**

Estimated % of Sample Retained on No. 40 Sieve: 25 Sample Air Dried: yes

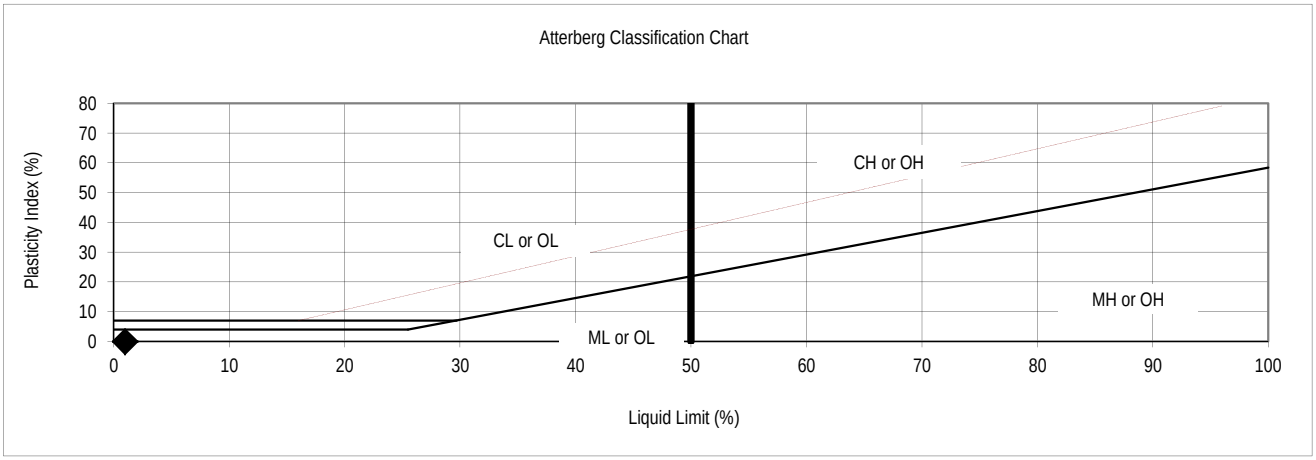
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	20	31	36			22	1	
Wt. Pan (gr)	22.26	21.19	21.63			22.01	21.88	
Wt. Wet Soil + Pan (gr)								
Wt. Dry Soil + Pan (gr)								
Wt. Water (gr)	0.00	0.00	0.00			0.00	0.00	
Wt. Dry Soil (gr)	-22.26	-21.19	-21.63			-22.01	-21.88	
Water Content (%)	0.0	0.0	0.0			0.0	0.0	
Number of Blows, N								
				LIQUID LIMIT =	NP	PLASTIC LIMIT =		NP



Plasticity Index = NP

Group Symbol = ML



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Particle Size Distribution

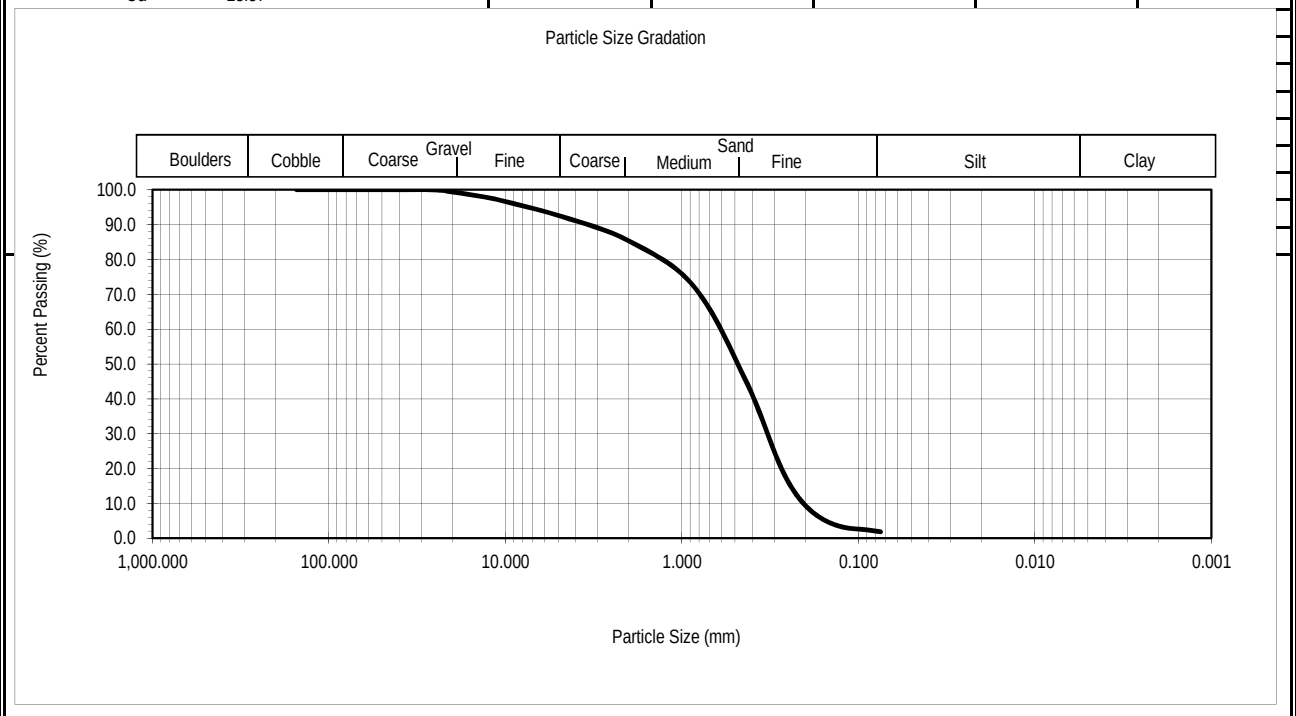
ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**550-C**	Boring/Trench:	**STA 5+50** Depth, (ft.): **0-1**	Tested By:	**SLN**
Description:	**Dark Greyish Brown (2.5Y 4/2) Poorly Graded Sand (SP)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	3,461.8	100.0
3 Inch	3.0000	76.2	0.00	0.0	3,461.8	100.0
2 Inch	2.0000	50.8	0.00	0.0	3,461.8	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	3,461.8	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	3,461.8	100.0
3/4 Inch	0.7500	19.1	27.40	27.4	3,434.4	99.2
1/2 Inch	0.5000	12.7	49.90	77.3	3,384.5	97.8
3/8 Inch	0.3750	9.5	49.10	126.4	3,335.4	96.3
#4	0.1870	4.7500	141.70	268.1	3,193.7	92.3
#10	0.0787	2.0000	239.87	508.0	2,953.8	85.3
#20	0.0335	0.8500	457.45	965.4	2,496.4	72.1
#40	0.0167	0.4250	966.91	1,932.3	1,529.5	44.2
#60	0.0098	0.2500	969.04	2,901.4	560.4	16.2
#100	0.0059	0.1500	395.89	3,297.3	164.6	4.8
#200	0.0030	0.0750	100.83	3,398.1	63.7	1.8

Cc = 0.09

Cu = 28.57



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Particle Size Distribution

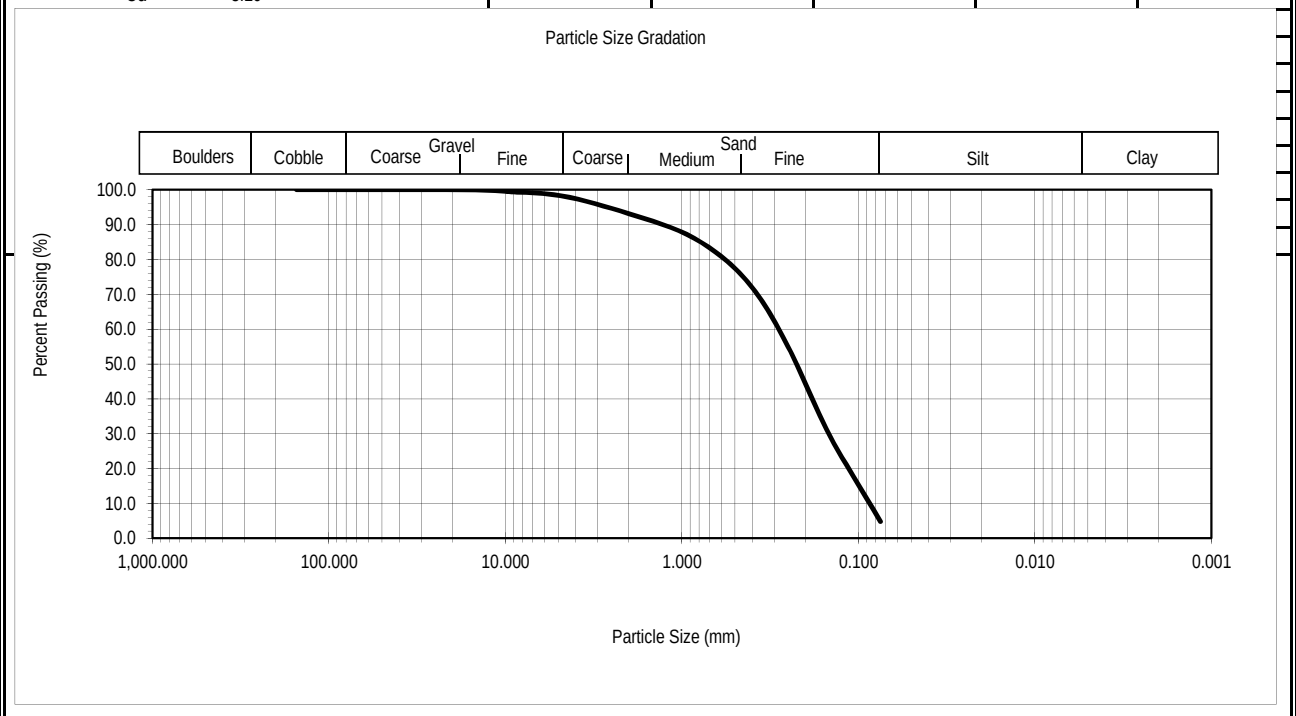
ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**1-1**	Boring/Trench:	**B-1** Depth, (ft.): **1**	Tested By:	**SLN**
Description:	**Greyish Brown (10YR 5/2) Poorly Graded Sand (SP)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	2,251.7	100.0
3 Inch	3.0000	76.2	0.00	0.0	2,251.7	100.0
2 Inch	2.0000	50.8	0.00	0.0	2,251.7	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	2,251.7	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	2,251.7	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	2,251.7	100.0
1/2 Inch	0.5000	12.7	3.30	3.3	2,248.4	99.9
3/8 Inch	0.3750	9.5	9.10	12.4	2,239.3	99.4
#4	0.1870	4.7500	28.00	40.4	2,211.3	98.2
#10	0.0787	2.0000	114.06	154.5	2,097.2	93.1
#20	0.0335	0.8500	159.21	313.7	1,938.0	86.1
#40	0.0167	0.4250	279.61	593.3	1,658.4	73.7
#60	0.0098	0.2500	420.61	1,013.9	1,237.8	55.0
#100	0.0059	0.1500	543.39	1,557.3	694.4	30.8
#200	0.0030	0.0750	586.95	2,144.2	107.4	4.8

Cc = 1.06

Cu = 3.26



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PARTICLE SIZE DISTRIBUTION TEST WORK SHEET

ASTM D1140

DSA File #:
DSA Appl #:

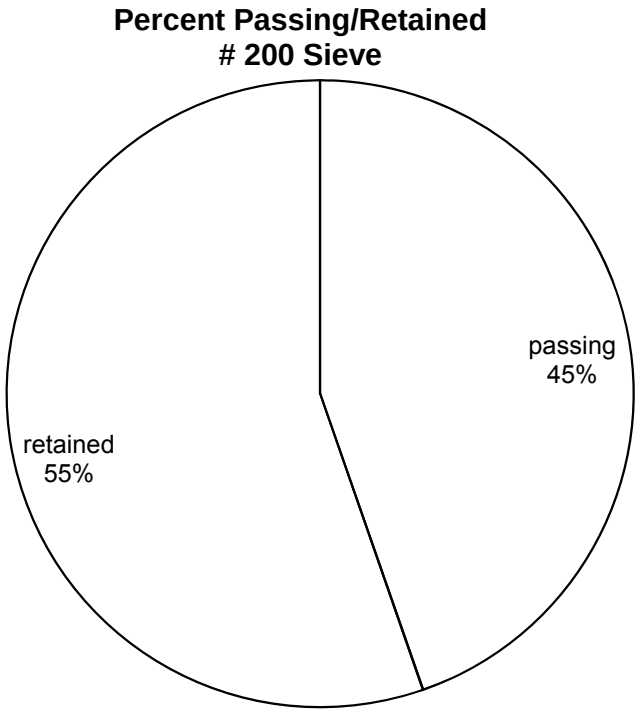
Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**			Date:	**9/26/2017**
Sample No.:	**1-2**	Boring/Trench:	**B-1**	Depth, (ft.):	**3.5**	Tested By:	**SLN**
Description:	**Light Yellowish Brown (10YR 6/4) Silty Sand (SM)**					Checked By:	**MLH**
Sample Location:						Lab. No.:	**15-17-500**

Moisture Content Data:

Pan ID	MF	
Pan Weight	50.84	(gm)
Wet Soil + Pan	152.71	(gm)
Dry Soil + Pan	151.94	(gm)
Water Weight	0.77	(gm)
Dry Soil Weight	101.10	(gm)
Moisture Content	0.8	(%)

Total Material Sample Data:

Pan ID	JDA	
Pan Weight	314.24	(gm)
Wet Soil + Pan Wt.	563.34	(gm)
Wet Weight	249.10	(gm)
Dry Weight	247.22	(gm)
Dry Wt.> #200 Sieve & Pan	451.02	(gm)
Dry Wt.> #200 Sieve	136.78	
Total Percent <#200 Sieve	44.67	(%)



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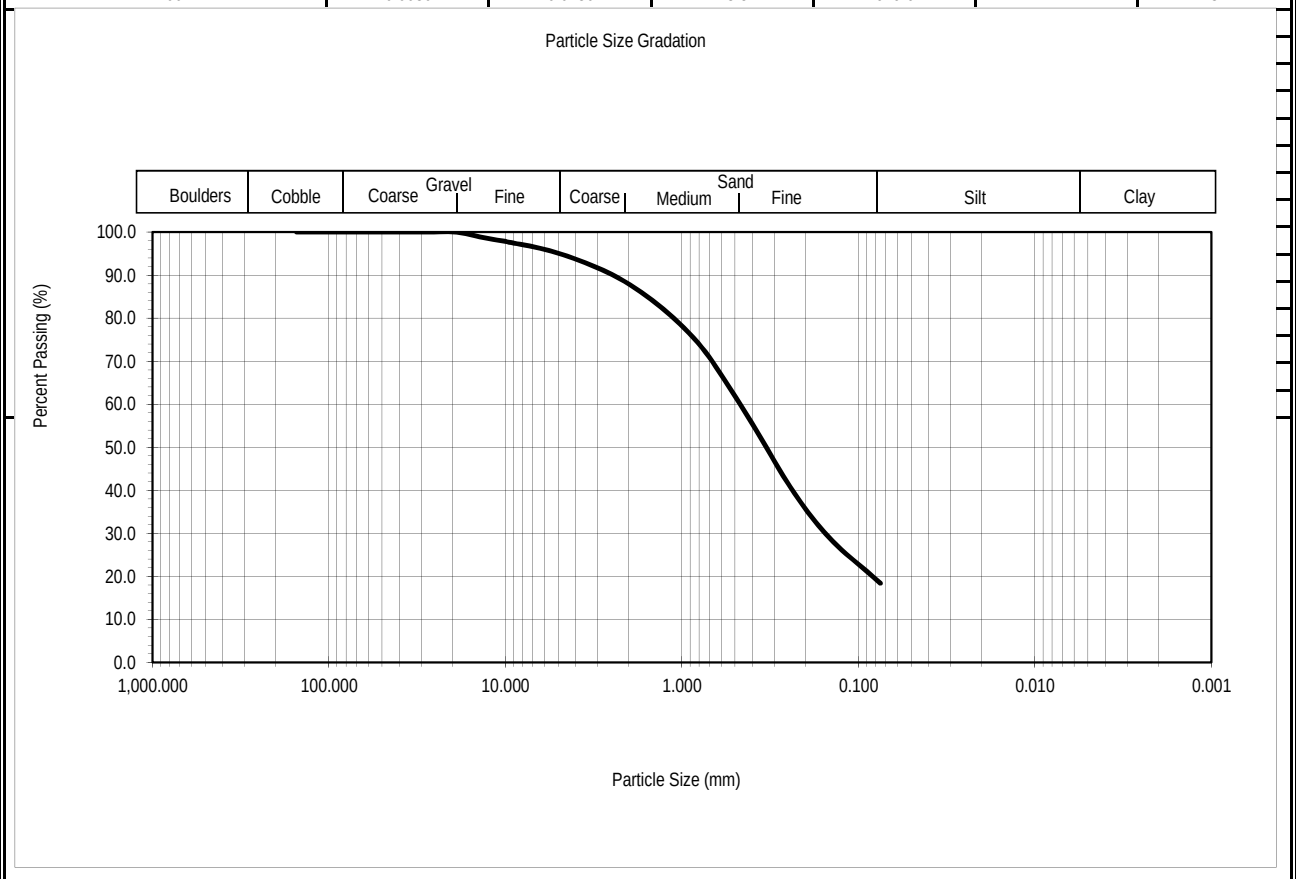
Particle Size Distribution

ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**1-3**	Boring/Trench:	**B-1** Depth, (ft.): **5**	Tested By:	**MLH/SLN**
Description:	**Dark Grey (10YR 4/1) Silty Sand (SM)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	1,163.7	100.0
3 Inch	3.0000	76.2	0.00	0.0	1,163.7	100.0
2 Inch	2.0000	50.8	0.00	0.0	1,163.7	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	1,163.7	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	1,163.7	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	1,163.7	100.0
1/2 Inch	0.5000	12.7	16.74	16.7	1,147.0	98.6
3/8 Inch	0.3750	9.5	10.50	27.2	1,136.5	97.7
#4	0.1870	4.7500	33.28	60.5	1,103.2	94.8
#10	0.0787	2.0000	79.79	140.3	1,023.4	87.9
#20	0.0335	0.8500	147.80	288.1	875.6	75.2
#40	0.0167	0.4250	209.28	497.4	666.3	57.3
#60	0.0098	0.2500	183.12	680.5	483.2	41.5
#100	0.0059	0.1500	140.61	821.1	342.6	29.4
#200	0.0030	0.0750	128.51	949.6	214.1	18.4



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Particle Size Distribution

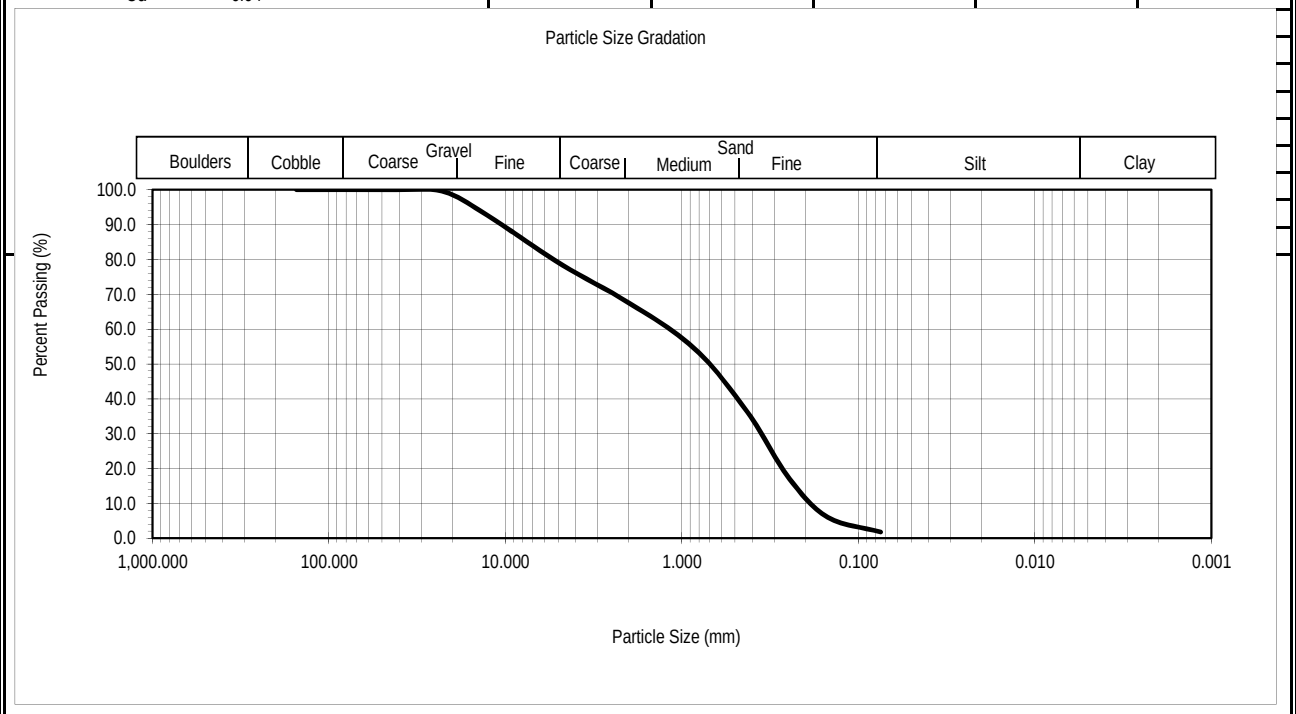
ASTM D422

Project No.:	**42361-01**	Project Name:	**1497.87**	Date:	**9/26/2017**
Sample No.:	**2-1**	Boring/Trench:	**B-2** Depth, (ft.): **1**	Tested By:	**SLN**
Description:	**Dark Greyish Brown (10YR 4/2) Poorly Graded Sand with Gravel**			Checked By:	**MLH**
Sample Location:	**(SP)**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	2,912.8	100.0
3 Inch	3.0000	76.2	0.00	0.0	2,912.8	100.0
2 Inch	2.0000	50.8	0.00	0.0	2,912.8	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	2,912.8	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	2,912.8	100.0
3/4 Inch	0.7500	19.1	55.20	55.2	2,857.6	98.1
1/2 Inch	0.5000	12.7	157.10	212.3	2,700.5	92.7
3/8 Inch	0.3750	9.5	120.90	333.2	2,579.6	88.6
#4	0.1870	4.7500	297.10	630.3	2,282.5	78.4
#10	0.0787	2.0000	315.28	945.6	1,967.3	67.5
#20	0.0335	0.8500	380.30	1,325.9	1,587.0	54.5
#40	0.0167	0.4250	533.78	1,859.7	1,053.2	36.2
#60	0.0098	0.2500	540.59	2,400.3	512.6	17.6
#100	0.0059	0.1500	334.94	2,735.2	177.6	6.1
#200	0.0030	0.0750	125.51	2,860.7	52.1	1.8

Cc = 0.58

Cu = 6.94



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ASTM D1140

DSA File #:
DSA Appl #:

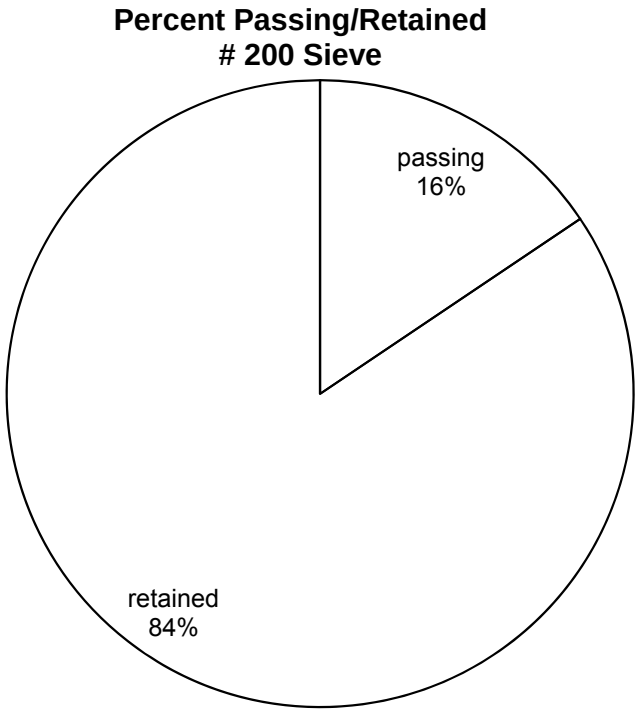
Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**			Date:	**9/26/2017**
Sample No.:	**2-3**	Boring/Trench:	**B-2**	Depth, (ft.):	**4**	Tested By:	**SLN**
Description:	**Light Olive Brown (2.5Y 5/6) Silty Sand (SM)**					Checked By:	**MLH**
Sample Location:						Lab. No.:	**15-17-500**

Moisture Content Data:

Pan ID	TD	
Pan Weight	50.49	(gm)
Wet Soil + Pan	139.64	(gm)
Dry Soil + Pan	138.92	(gm)
Water Weight	0.72	(gm)
Dry Soil Weight	88.43	(gm)
Moisture Content	0.8	(%)

Total Material Sample Data:

Pan ID	BK	
Pan Weight	319.25	(gm)
Wet Soil + Pan Wt.	605.36	(gm)
Wet Weight	286.11	(gm)
Dry Weight	283.80	(gm)
Dry Wt.> #200 Sieve & Pan	558.85	(gm)
Dry Wt.> #200 Sieve	239.60	
Total Percent <#200 Sieve	15.57	(%)



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ASTM D1140

DSA File #:
DSA Appl #:

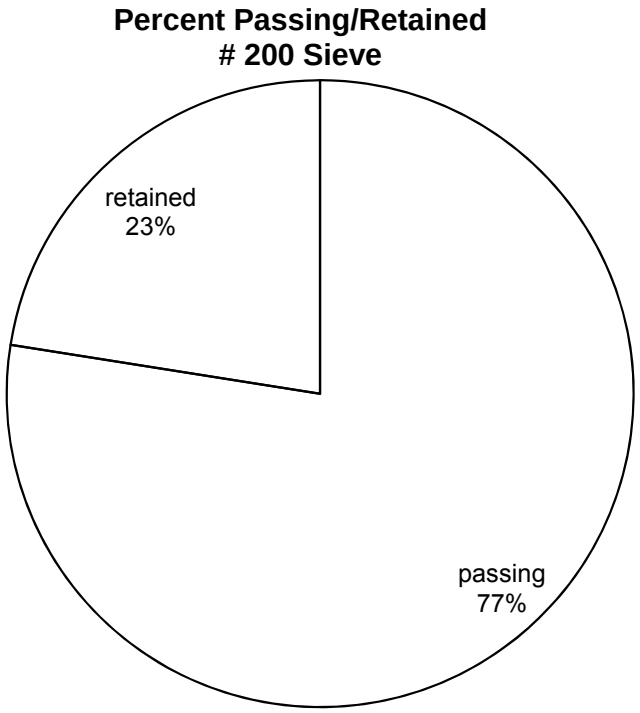
Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**			Date:	**9/26/2017**
Sample No.:	**2-4**	Boring/Trench:	**B-2**	Depth, (ft.):	**4.5**	Tested By:	**SLN**
Description:	**Dark Grey (10YR 4/1) Silt with Sand (ML)**					Checked By:	**MLH**
Sample Location:						Lab. No.:	**15-17-500**

Moisture Content Data:

Pan ID	MC	
Pan Weight	50.78	(gm)
Wet Soil + Pan	152.88	(gm)
Dry Soil + Pan	152.25	(gm)
Water Weight	0.63	(gm)
Dry Soil Weight	101.47	(gm)
Moisture Content	0.6	(%)

Total Material Sample Data:

Pan ID	E	
Pan Weight	322.47	(gm)
Wet Soil + Pan Wt.	612.39	(gm)
Wet Weight	289.92	(gm)
Dry Weight	288.13	(gm)
Dry Wt.> #200 Sieve & Pan	387.33	(gm)
Dry Wt.> #200 Sieve	64.86	
Total Percent <#200 Sieve	77.49	(%)



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Particle Size Distribution

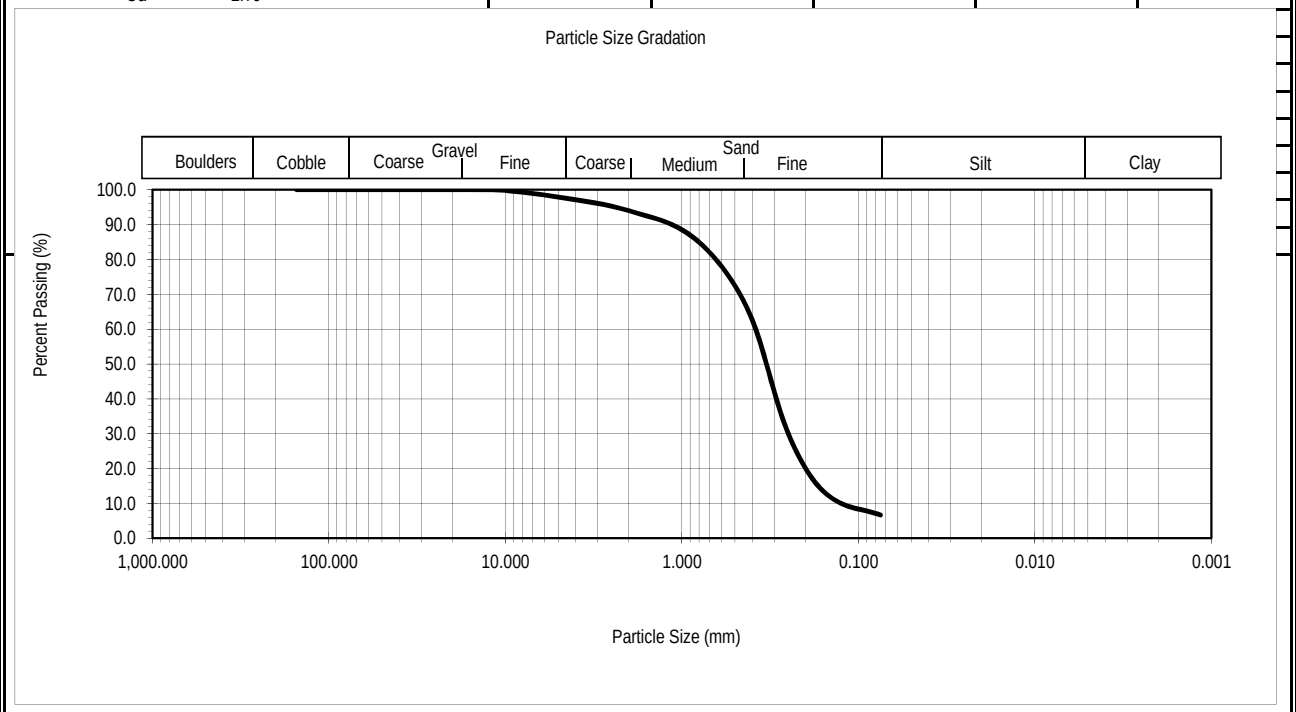
ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**3-1**	Boring/Trench:	**B-3** Depth, (ft.): **1.5-2**	Tested By:	**MLH/SLN**
Description:	**Dark Greyish Brown (10YR 4/2) Poorly Graded Sand with Silt**			Checked By:	**MLH**
Sample Location:	**(SP-SM)**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	712.0	100.0
3 Inch	3.0000	76.2	0.00	0.0	712.0	100.0
2 Inch	2.0000	50.8	0.00	0.0	712.0	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	712.0	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	712.0	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	712.0	100.0
1/2 Inch	0.5000	12.7	0.00	0.0	712.0	100.0
3/8 Inch	0.3750	9.5	2.28	2.3	709.7	99.7
#4	0.1870	4.7500	13.91	16.2	695.8	97.7
#10	0.0787	2.0000	26.70	42.9	669.1	94.0
#20	0.0335	0.8500	56.07	99.0	613.0	86.1
#40	0.0167	0.4250	144.52	243.5	468.5	65.8
#60	0.0098	0.2500	254.33	497.8	214.2	30.1
#100	0.0059	0.1500	125.50	623.3	88.7	12.5
#200	0.0030	0.0750	41.39	664.7	47.3	6.6

Cc = 1.24

Cu = 2.79



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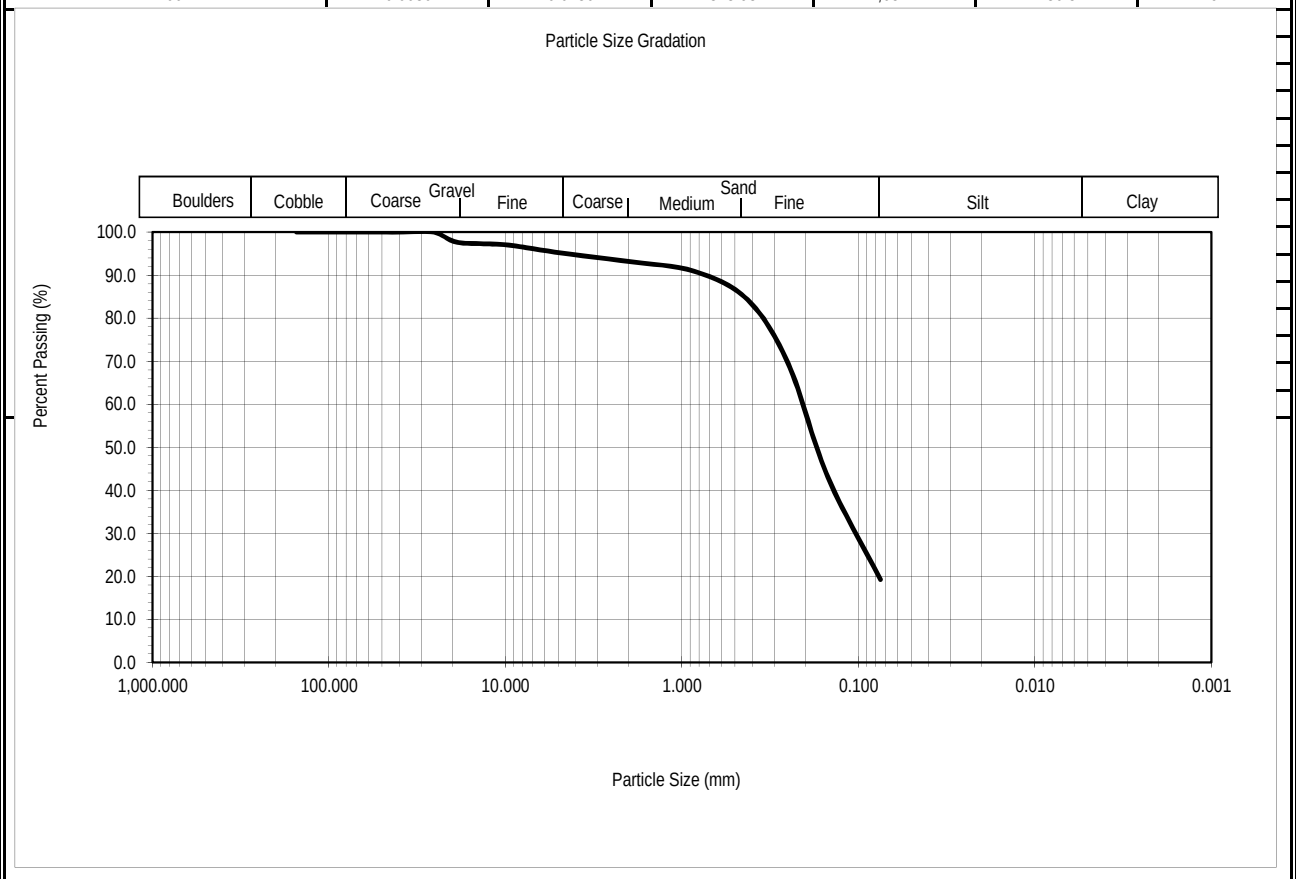
Particle Size Distribution

ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**3-2**	Boring/Trench:	**B-3**	Depth, (ft.): **3.5-4**	Tested By: **MLH/SLN**
Description:	**Dark Grey (10YR 4/1) Silty Sand (SM)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	1,301.6	100.0
3 Inch	3.0000	76.2	0.00	0.0	1,301.6	100.0
2 Inch	2.0000	50.8	0.00	0.0	1,301.6	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	1,301.6	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	1,301.6	100.0
3/4 Inch	0.7500	19.1	30.10	30.1	1,271.5	97.7
1/2 Inch	0.5000	12.7	5.40	35.5	1,266.1	97.3
3/8 Inch	0.3750	9.5	3.90	39.4	1,262.2	97.0
#4	0.1870	4.7500	24.20	63.6	1,238.0	95.1
#10	0.0787	2.0000	25.43	89.0	1,212.6	93.2
#20	0.0335	0.8500	29.38	118.4	1,183.2	90.9
#40	0.0167	0.4250	85.95	204.4	1,097.3	84.3
#60	0.0098	0.2500	192.95	397.3	904.3	69.5
#100	0.0059	0.1500	339.85	737.2	564.5	43.4
#200	0.0030	0.0750	313.98	1,051.1	250.5	19.2



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PARTICLE SIZE DISTRIBUTION TEST WORK SHEET

ASTM D1140

DSA File #:
DSA Appl #:

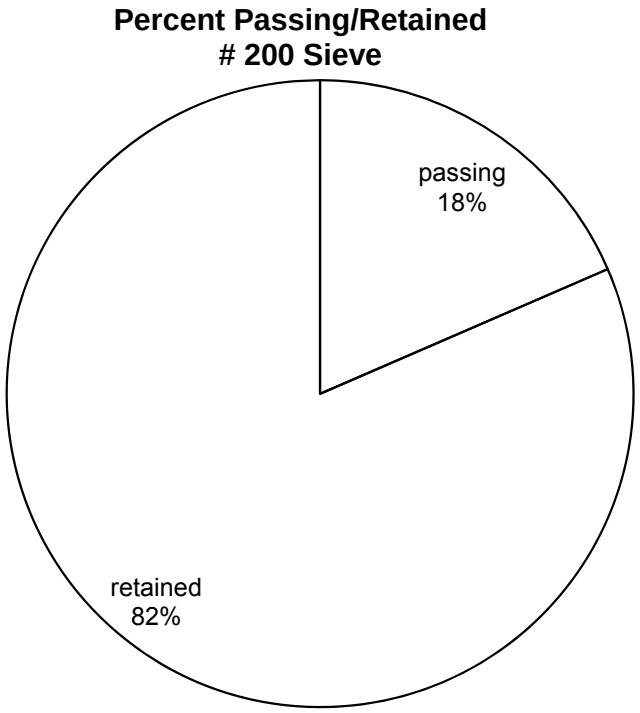
Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**			Date:	**9/26/2017**
Sample No.:	**4-1**	Boring/Trench:	**B-4**	Depth, (ft.):	**0-.5**	Tested By:	**SLN**
Description:	**Very Dark Grey (7.5YR 3/1) Silty Sand with Gravel (SM)**					Checked By:	**MLH**
Sample Location:						Lab. No.:	**15-17-500**

Moisture Content Data:

Pan ID	TG	
Pan Weight	50.64	(gm)
Wet Soil + Pan	121.94	(gm)
Dry Soil + Pan	116.60	(gm)
Water Weight	5.34	(gm)
Dry Soil Weight	65.96	(gm)
Moisture Content	8.1	(%)

Total Material Sample Data:

Pan ID	J4	
Pan Weight	227.52	(gm)
Wet Soil + Pan Wt.	429.63	(gm)
Wet Weight	202.11	(gm)
Dry Weight	186.97	(gm)
Dry Wt.> #200 Sieve & Pan	379.91	(gm)
Dry Wt.> #200 Sieve	152.39	
Total Percent <#200 Sieve	18.50	(%)



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Particle Size Distribution

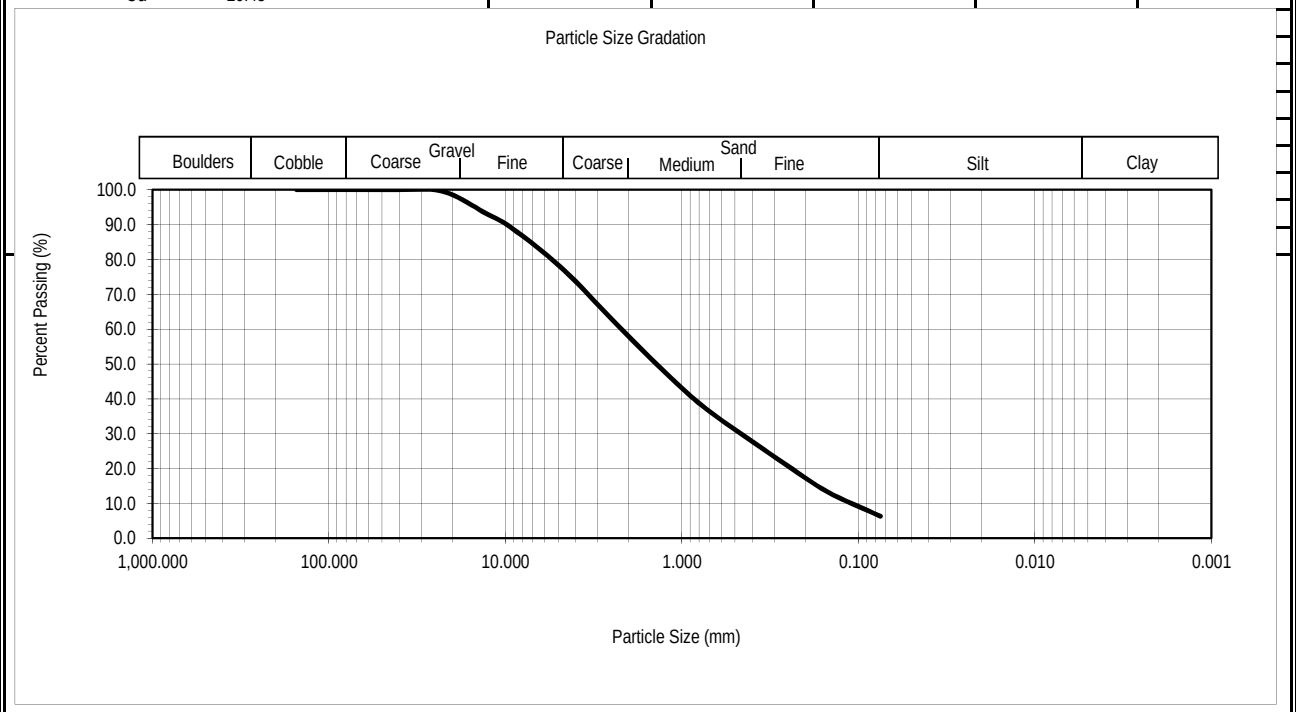
ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**4-2**	Boring/Trench:	**B-4** Depth, (ft.): **1.5**	Tested By:	**MLH/SLN**
Description:	**Dark Greyish Brown (10YR 4/2) Poorly Graded Sand with Silt and Gravel**			Checked By:	**MLH**
Sample Location:	**(SP-SM)**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	1,645.9	100.0
3 Inch	3.0000	76.2	0.00	0.0	1,645.9	100.0
2 Inch	2.0000	50.8	0.00	0.0	1,645.9	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	1,645.9	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	1,645.9	100.0
3/4 Inch	0.7500	19.1	31.60	31.6	1,614.3	98.1
1/2 Inch	0.5000	12.7	83.30	114.9	1,531.0	93.0
3/8 Inch	0.3750	9.5	57.20	172.1	1,473.8	89.5
#4	0.1870	4.7500	201.20	373.3	1,272.6	77.3
#10	0.0787	2.0000	320.34	693.6	952.3	57.9
#20	0.0335	0.8500	296.07	989.7	656.2	39.9
#40	0.0167	0.4250	183.63	1,173.3	472.6	28.7
#60	0.0098	0.2500	131.86	1,305.2	340.7	20.7
#100	0.0059	0.1500	121.34	1,426.5	219.4	13.3
#200	0.0030	0.0750	115.68	1,542.2	103.7	6.3

Cc = 0.91

Cu = 20.45



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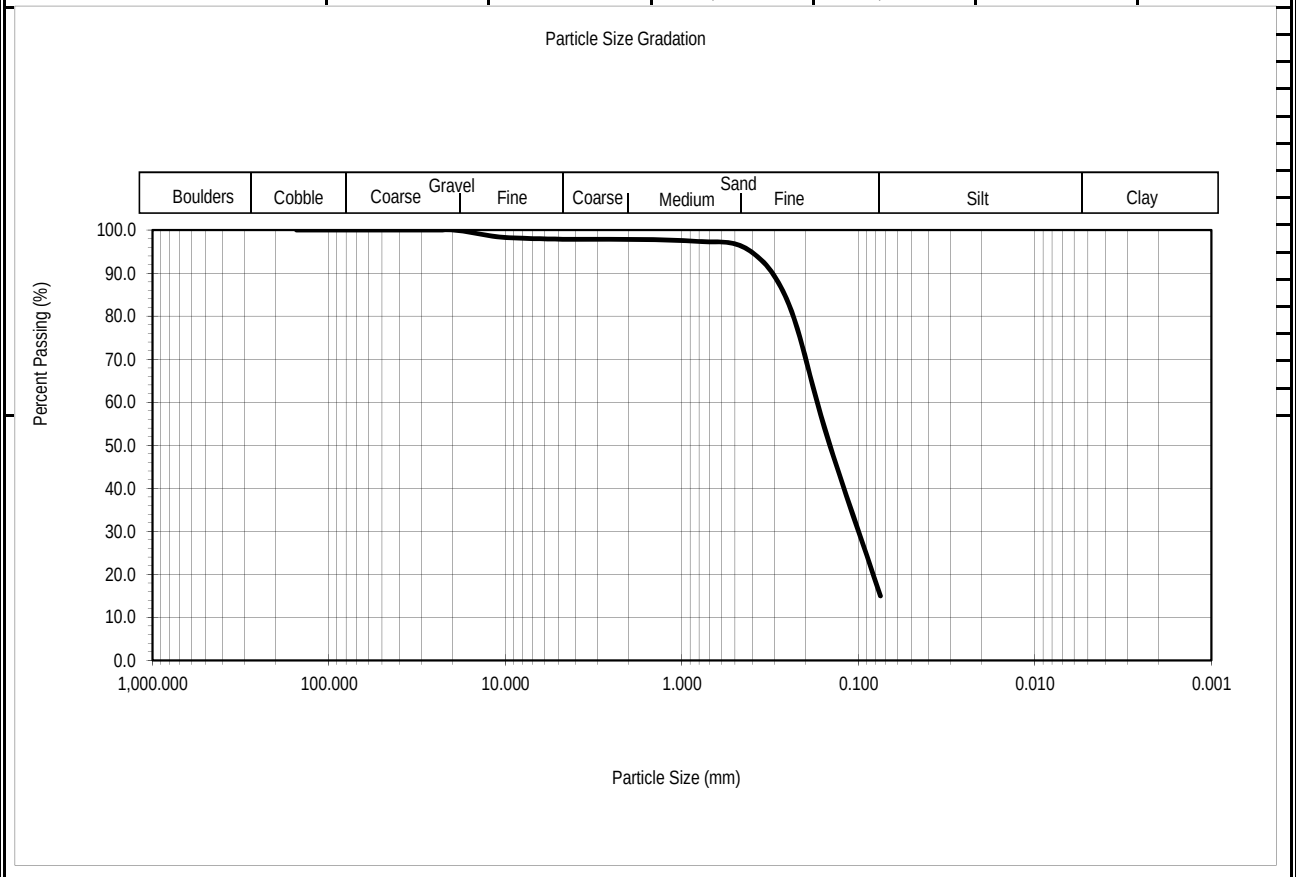
Particle Size Distribution

ASTM D422

Project No.:	**42361-01**	Project Name:	**Donner Lake Out Flow**	Date:	**9/26/2017**
Sample No.:	**8-4**	Boring/Trench:	**B-8**	Depth, (ft.): **6.5-7**	Tested By: **SLN/MLH**
Description:	**Grey (10YR 5/1) Silty Sand (SM)**			Checked By:	**MLH**
Sample Location:	**0**			Lab. No.:	**15-17-500**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	2,958.5	100.0
3 Inch	3.0000	76.2	0.00	0.0	2,958.5	100.0
2 Inch	2.0000	50.8	0.00	0.0	2,958.5	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	2,958.5	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	2,958.5	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	2,958.5	100.0
1/2 Inch	0.5000	12.7	34.90	34.9	2,923.6	98.8
3/8 Inch	0.3750	9.5	17.30	52.2	2,906.3	98.2
#4	0.1870	4.7500	9.80	62.0	2,896.5	97.9
#10	0.0787	2.0000	1.05	63.1	2,895.5	97.9
#20	0.0335	0.8500	13.67	76.7	2,881.8	97.4
#40	0.0167	0.4250	54.67	131.4	2,827.1	95.6
#60	0.0098	0.2500	366.90	498.3	2,460.2	83.2
#100	0.0059	0.1500	926.19	1,424.5	1,534.0	51.9
#200	0.0030	0.0750	1,090.20	2,514.7	443.8	15.0



HOLDREGE & KULL

(530) 478-1305 - Fax (530) 478-1019 - 792 Searls Ave.- Nevada City, CA 95959 - A California Corporation

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Organic Content
ASTM D2974

Project No.:	42361	Project Name:	Donner Lake Outflow (10' Below Water Surface)			Date:	09/26/17
Sample No.:	020-B	Boring/Trench No.:	STA 0+20	Depth (ft.)	0 - 1	Tested By:	CHB
Soil Description:		(SM) silty Sand, Lab Est.: 55% fine sand 45% silt/clay				Checked By:	
		very dark gray (5Y 3/1)				Lab. No.:	C17-191

MOISTURE CONTENT			
Tare No.			G10
Tare Weight	(grams)	Wt	766.1
Wet Soil + Tare Weight	(grams)	Ws+t	1665.7
Dry Soil + Tare Weight	(grams)	Wd+t	1005.0
Wet Soil Weight	(grams)	Ww	899.6
Dry Soil Weight	(grams)	Wds	238.9
Moisture Content	(%)	w	276.6

ORGANIC CONTENT			
Tare No.			T2
Tare Weight	(grams)	Wt	357.51
Soil + Tare Weight	(grams)	Ws+t	412.06
Ash + Tare Weight	(grams)	Wa+t	405.80
Dry Soil Weight	(grams)	Ws	54.55
Ash Weight	(grams)	Wa	48.29
Ash Content	(%)	a	88.5
Organic Content	(%)	o	11.5

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Organic Content
ASTM D2974

Project No.:	42361	Project Name:	Donner Lake Outflow (6' Below Water Surface)			Date:	09/26/17
Sample No.:	350-B	Boring/Trench No.:	STA 3+50	Depth (ft.)	0 - 1	Tested By:	CHB
Soil Description:		(SM) silty Sand, Lab Est.: 55% fine sand 45% silt/clay				Checked By:	
		very dark gray (5Y 3/1)				Lab. No.:	C17-191

MOISTURE CONTENT			
Tare No.			G2
Tare Weight	(grams)	Wt	766.2
Wet Soil + Tare Weight	(grams)	Ws+t	1781.9
Dry Soil + Tare Weight	(grams)	Wd+t	1013.8
Wet Soil Weight	(grams)	Ww	1015.7
Dry Soil Weight	(grams)	Wds	247.6
Moisture Content	(%)	w	310.2

ORGANIC CONTENT			
Tare No.			T1
Tare Weight	(grams)	Wt	356.51
Soil + Tare Weight	(grams)	Ws+t	411.69
Ash + Tare Weight	(grams)	Wa+t	406.09
Dry Soil Weight	(grams)	Ws	55.18
Ash Weight	(grams)	Wa	49.58
Ash Content	(%)	a	89.9
Organic Content	(%)	o	10.1

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Organic Content
ASTM D2974

Project No.:	42361	Project Name:	Donner Lake Outflow (4' Below Water Surface)			Date:	09/26/17
Sample No.:	550-B	Boring/Trench No.:	STA 5+50	Depth (ft.)	0 - 1	Tested By:	CHB
Soil Description:		(SM) silty Sand, lab est: 5% gravel, 80% sand, 15% silt/clay				Checked By:	
		dark yellowish brown (10YR 4/4)				Lab. No.:	C17-191

MOISTURE CONTENT			
Tare No.			G7
Tare Weight	(grams)	Wt	767.5
Wet Soil + Tare Weight	(grams)	Ws+t	2412.4
Dry Soil + Tare Weight	(grams)	Wd+t	2122.3
Wet Soil Weight	(grams)	Ww	1644.9
Dry Soil Weight	(grams)	Wds	1354.8
Moisture Content	(%)	w	21.4

ORGANIC CONTENT			
Tare No.			T2
Tare Weight	(grams)	Wt	357.51
Soil + Tare Weight	(grams)	Ws+t	434.87
Ash + Tare Weight	(grams)	Wa+t	433.78
Dry Soil Weight	(grams)	Ws	77.36
Ash Weight	(grams)	Wa	76.27
Ash Content	(%)	a	98.6
Organic Content	(%)	o	1.4

Alpha Analytical, Inc
255 Glendale Ave, #21
Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406
Website: www.alpha-analytical.com

October 02, 2017

Pam Raynak
Holdrege & Kull
10775 Pioneer Trail #213
Truckee, CA 96161
TEL: (530) 587-5156
FAX

RE: 42361.00/Donner Lake Outflow

Order No.: HOL1709214

Dear Pam Raynak:

There were no problems with the analytical events associated with this report unless noted.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Roger Scholl

Roger Scholl
Laboratory Director
255 Glendale Ave, #21
Sparks, Nevada 89431

Alpha Analytical, Inc.

(775) 355-1044 / (775) 355-0406 FAX / 1-800-283-1183
225 Glendale Ave. - Suite 21 - Sparks, Nevada 89431-5578

Analytical Report

WO#: **HOL1709214**
Report Date: **10/2/2017**

CLIENT: Holdrege & Kull
Collection Date: 9/22/2017 11:18:00 AM
Project: 42361.00/Donner Lake Outflow
Lab ID: 1709214-01
Matrix: SOIL
Client Sample ID 170-A

Analyses	Result	PQL	Qual	Units	Date Analyzed	Method
Beryllium (Be)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Vanadium (V)	5.1	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Chromium (Cr)	1.7	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cobalt (Co)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Nickel (Ni)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Copper (Cu)	2.7	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Zinc (Zn)	ND	20		mg/Kg	9/28/2017	Metals by EPA 6020
Arsenic (As)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Selenium (Se)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Molybdenum (Mo)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Silver (Ag)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cadmium (Cd)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Antimony (Sb)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Barium (Ba)	19	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Mercury (Hg)	ND	0.50		mg/Kg	9/28/2017	Metals by EPA 6020
Thallium (Tl)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Lead (Pb)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
TPH-E (DRO), Silica Gel	7.6	5.0	CL	mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
TPH-E (ORO), Silica Gel	12	10	C	mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
Surr: Nonane, Silica Gel	106	68-159		%Rec	9/29/2017	TPH-E w/SG by EPA 8015C

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225 Glendale Ave. - Suite 21 - Sparks, Nevada 89431-5578

Analytical Report

WO#: **HOL1709214**
Report Date: **10/2/2017**

CLIENT: Holdrege & Kull
Collection Date: 9/22/2017 11:21:00 AM
Project: 42361.00/Donner Lake Outflow
Lab ID: 1709214-02
Matrix: SOIL
Client Sample ID 020-A

Analyses	Result	PQL	Qual	Units	Date Analyzed	Method
Beryllium (Be)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Vanadium (V)	9.4	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Chromium (Cr)	2.5	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cobalt (Co)	1.1	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Nickel (Ni)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Copper (Cu)	3.6	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Zinc (Zn)	ND	20		mg/Kg	9/28/2017	Metals by EPA 6020
Arsenic (As)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Selenium (Se)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Molybdenum (Mo)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Silver (Ag)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cadmium (Cd)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Antimony (Sb)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Barium (Ba)	26	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Mercury (Hg)	ND	0.50		mg/Kg	9/28/2017	Metals by EPA 6020
Thallium (Tl)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Lead (Pb)	6.0	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
TPH-E (DRO), Silica Gel	15	5.0	CL	mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
TPH-E (ORO), Silica Gel	38	10	C	mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
Surr: Nonane, Silica Gel	108	68-159		%Rec	9/29/2017	TPH-E w/SG by EPA 8015C

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225 Glendale Ave. - Suite 21 - Sparks, Nevada 89431-5578

Analytical Report

WO#: **HOL1709214**
Report Date: **10/2/2017**

CLIENT: Holdrege & Kull
Collection Date: 9/22/2017 11:29:00 AM
Project: 42361.00/Donner Lake Outflow
Lab ID: 1709214-03
Matrix: SOIL
Client Sample ID 350-A

Analyses	Result	PQL	Qual	Units	Date Analyzed	Method
Beryllium (Be)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Vanadium (V)	9.8	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Chromium (Cr)	2.4	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cobalt (Co)	1.3	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Nickel (Ni)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Copper (Cu)	3.3	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Zinc (Zn)	ND	20		mg/Kg	9/28/2017	Metals by EPA 6020
Arsenic (As)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Selenium (Se)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Molybdenum (Mo)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Silver (Ag)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cadmium (Cd)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Antimony (Sb)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Barium (Ba)	30	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Mercury (Hg)	ND	0.50		mg/Kg	9/28/2017	Metals by EPA 6020
Thallium (Tl)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Lead (Pb)	2.7	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
TPH-E (DRO), Silica Gel	ND	5.0		mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
TPH-E (ORO), Silica Gel	ND	10		mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
Surr: Nonane, Silica Gel	108	68-159		%Rec	9/29/2017	TPH-E w/SG by EPA 8015C

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(775) 355-1044 / (775) 355-0406 FAX / 1-800-283-1183
225 Glendale Ave. - Suite 21 - Sparks, Nevada 89431-5578

Analytical Report

WO#: **HOL1709214**
Report Date: **10/2/2017**

CLIENT: Holdrege & Kull
Collection Date: 9/22/2017 11:32:00 AM
Project: 42361.00/Donner Lake Outflow
Lab ID: 1709214-04
Matrix: SOIL
Client Sample ID 550-A

Analyses	Result	PQL	Qual	Units	Date Analyzed	Method
Beryllium (Be)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Vanadium (V)	56	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Chromium (Cr)	3.9	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cobalt (Co)	5.1	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Nickel (Ni)	2.5	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Copper (Cu)	5.9	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Zinc (Zn)	21	20		mg/Kg	9/28/2017	Metals by EPA 6020
Arsenic (As)	15	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Selenium (Se)	ND	2.0		mg/Kg	9/28/2017	Metals by EPA 6020
Molybdenum (Mo)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Silver (Ag)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Cadmium (Cd)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Antimony (Sb)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Barium (Ba)	63	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Mercury (Hg)	ND	0.50		mg/Kg	9/28/2017	Metals by EPA 6020
Thallium (Tl)	ND	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
Lead (Pb)	1.8	1.0		mg/Kg	9/28/2017	Metals by EPA 6020
TPH-E (DRO), Silica Gel	ND	5.0		mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
TPH-E (ORO), Silica Gel	ND	10		mg/Kg	9/29/2017	TPH-E w/SG by EPA 8015C
Surr: Nonane, Silica Gel	109	68-159		%Rec	9/29/2017	TPH-E w/SG by EPA 8015C

Alpha Analytical, Inc
255 Glendale Ave, #21
Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406
Website: www.alpha-analytical.com

QC SUMMARY REPORT

WO#: **1709214**
02-Oct-17

Client: Holdrege & Kull
Project: 42361.00/Donner Lake Outflow **TestCode:** **METALS_SO**

Sample ID **MB-2244** SampType: **MBLK** TestCode: **METALS_SO** Units: **mg/Kg**
Client ID: **PBS** Batch ID: **2244** TestNo: **E200.8**
Prep Date: **9/22/2017** RunNo: **1751** SeqNo: **43273**
Analysis Date: **9/22/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium (Be)	ND	1									
Vanadium (V)	ND	1									
Chromium (Cr)	ND	1									
Cobalt (Co)	ND	1									
Nickel (Ni)	ND	2									
Copper (Cu)	ND	2									
Zinc (Zn)	ND	20									
Arsenic (As)	ND	1									
Selenium (Se)	ND	2									
Molybdenum (Mo)	ND	1									
Silver (Ag)	ND	1									
Cadmium (Cd)	ND	1									
Antimony (Sb)	ND	1									
Barium (Ba)	ND	1									
Mercury (Hg)	ND	0.2									
Thallium (Tl)	ND	1									
Lead (Pb)	ND	1									

Sample ID **LCS-2244** SampType: **LCS** TestCode: **METALS_SO** Units: **mg/Kg**
Client ID: **LCSS** Batch ID: **2244** TestNo: **E200.8**
Prep Date: **9/22/2017** RunNo: **1751** SeqNo: **43275**
Analysis Date: **9/22/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium (Be)	28.7	1	25	0	115	79.51	120.49				
Vanadium (V)	27.4	1	25	0	110	79.51	120.49				
Chromium (Cr)	30.5	1	25	0	122	79.51	120.49				S
Cobalt (Co)	29.4	1	25	0	118	79.51	120.49				
Nickel (Ni)	25.9	2	25	0	104	79.51	120.49				
Copper (Cu)	29.4	2	25	0	118	79.51	120.49				
Zinc (Zn)	29.2	20	25	0	117	79.51	120.49				
Arsenic (As)	28.2	1	25	0	113	79.51	120.49				
Selenium (Se)	28.7	2	25	0	115	79.51	120.49				
Molybdenum (Mo)	23.9	1	25	0	95.7	79.51	120.49				
Silver (Ag)	28	1	25	0	112	79.51	120.49				
Cadmium (Cd)	27.3	1	25	0	109	79.51	120.49				
Antimony (Sb)	22.4	1	25	0	89.6	79.51	120.49				
Barium (Ba)	276	1	250	0	111	79.51	120.49				
Mercury (Hg)	0.37	0.2	0.5	0	74.1	79.51	120.49				S

Qualifiers:
B Analyte detected in the associated Method Bla
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits

Alpha Analytical, Inc
255 Glendale Ave, #21
Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406
Website: www.alpha-analytical.com

QC SUMMARY REPORT

WO#: **1709214**

02-Oct-17

Client: Holdrege & Kull

Project: 42361.00/Donner Lake Outflow **TestCode:** **METALS_SO**

Sample ID **LCS-2244** SampType: **LCS** TestCode: **METALS_SO** Units: **mg/Kg**
Client ID: **LCSS** Batch ID: **2244** TestNo: **E200.8**
Prep Date: **9/22/2017** RunNo: **1751** SeqNo: **43275**
Analysis Date: **9/22/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium (Tl)	29.1	1	25	0	116	79.51	120.49				
Lead (Pb)	29.2	1	25	0	117	79.51	120.49				

Sample ID **1709201-01AMSD** SampType: **MSD** TestCode: **METALS_SO** Units: **mg/Kg**
Client ID: **BatchQC** Batch ID: **2244** TestNo: **E200.8**
Prep Date: **9/22/2017** RunNo: **1751** SeqNo: **43277**
Analysis Date: **9/22/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium (Be)	28.4	1	25	0	114	74.51	125.49	25.1	12	20	
Vanadium (V)	98.7	1	25	63.8	140	74.51	125.49	91.6	7.5	20	S
Chromium (Cr)	49.4	1	25	19.5	120	74.51	125.49	47.3	4.3	20	
Cobalt (Co)	43.3	1	25	13.9	118	74.51	125.49	38	13	20	
Nickel (Ni)	39.7	2	25	9.79	120	74.51	125.49	35.2	12	20	
Copper (Cu)	81	2	25	54.3	107	74.51	125.49	74.1	8.9	20	
Zinc (Zn)	109	20	25	76.1	130	74.51	125.49	99.1	9.1	20	S
Arsenic (As)	36.7	1	25	9.97	107	74.51	125.49	32.8	11	20	
Selenium (Se)	26.4	2	25	0	106	74.51	125.49	24.1	9.2	20	
Molybdenum (Mo)	21.8	1	25	1.34	81.8	74.51	125.49	22.2	2.1	20	
Silver (Ag)	29.1	1	25	0	113	74.51	125.49	25.8	12	20	
Cadmium (Cd)	28.2	1	25	0	113	74.51	125.49	24.7	13	20	
Antimony (Sb)	6.03	1	25	0	24.1	74.51	125.49	15.8	90	20	RS
Barium (Ba)	500	1	250	120	152	74.51	125.49	371	30	20	RS
Mercury (Hg)	1.34	0.2	0.5	0	244	74.51	125.49	0.579	79	20	RS
Thallium (Tl)	29.9	1	25	0	119	74.51	125.49	26	14	20	
Lead (Pb)	85.8	1	25	43.4	170	74.51	125.49	67.1	25	20	RS

Sample ID **1709201-01AMS** SampType: **MS** TestCode: **METALS_SO** Units: **mg/Kg**
Client ID: **BatchQC** Batch ID: **2244** TestNo: **E200.8**
Prep Date: **9/22/2017** RunNo: **1751** SeqNo: **43276**
Analysis Date: **9/22/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium (Be)	25.1	1	25	0	100	74.51	125.49				
Vanadium (V)	91.6	1	25	63.8	111	74.51	125.49				
Chromium (Cr)	47.3	1	25	19.5	111	74.51	125.49				
Cobalt (Co)	38	1	25	13.9	96.4	74.51	125.49				
Nickel (Ni)	35.2	2	25	9.79	102	74.51	125.49				

Qualifiers:
B Analyte detected in the associated Method Bla
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits

Alpha Analytical, Inc
255 Glendale Ave, #21
Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406
Website: www.alpha-analytical.com

QC SUMMARY REPORT

WO#: **1709214**

02-Oct-17

Client: Holdrege & Kull

Project: 42361.00/Donner Lake Outflow **TestCode:** **METALS_SO**

Sample ID	**1709201-01AMS**	SampType:	**MS**	TestCode:	**METALS_SO**	Units:	**mg/Kg**
Client ID:	**BatchQC**	Batch ID:	**2244**	TestNo:	**E200.8**		
Prep Date:	**9/22/2017**	RunNo:	**1751**	SeqNo:	**43276**		
Analysis Date:	**9/22/2017**						

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper (Cu)	74.1	2	25	54.3	79.3	74.51	125.49				
Zinc (Zn)	99.1	20	25	76.1	92.1	74.51	125.49				
Arsenic (As)	32.8	1	25	9.97	91.2	74.51	125.49				
Selenium (Se)	24.1	2	25	0	96.4	74.51	125.49				
Molybdenum (Mo)	22.2	1	25	1.34	83.6	74.51	125.49				
Silver (Ag)	25.8	1	25	0	99.6	74.51	125.49				
Cadmium (Cd)	24.7	1	25	0	98.9	74.51	125.49				
Antimony (Sb)	15.8	1	25	0	63.2	74.51	125.49				S
Barium (Ba)	371	1	250	120	100	74.51	125.49				
Mercury (Hg)	0.579	0.2	0.5	0	92.5	74.51	125.49				
Thallium (Tl)	26	1	25	0	104	74.51	125.49				
Lead (Pb)	67.1	1	25	43.4	94.5	74.51	125.49				

Qualifiers:

B	Analyte detected in the associated Method Bla
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1709214**

02-Oct-17

Client: Holdrege & Kull

Project: 42361.00/Donner Lake Outflow **TestCode:** **TPH/E_SG_S**

Sample ID **MB-2284** SampType: **MBLK** TestCode: **TPH/E_SG_S** Units: **mg/Kg**
Client ID: **PBS** Batch ID: **2284SG** TestNo: **SW8015**
Prep Date: **9/28/2017** RunNo: **1816** SeqNo: **44815**
Analysis Date: **9/29/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-E (DRO), Silica Gel	ND	5									
TPH-E (ORO), Silica Gel	ND	10									
Surr: Nonane, Silica Gel	6.2		6		103	67.51	159.49				

Sample ID **LCS-2284** SampType: **LCS** TestCode: **TPH/E_SG_S** Units: **mg/Kg**
Client ID: **LCSS** Batch ID: **2284SG** TestNo: **SW8015**
Prep Date: **9/28/2017** RunNo: **1816** SeqNo: **44816**
Analysis Date: **9/29/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-E (DRO), Silica Gel	98.4	5	100	0	98.4	69.51	130.49				
Surr: Nonane, Silica Gel	6.93		6		116	67.51	159.49				

Sample ID **1709256-01AMSD** SampType: **MSD** TestCode: **TPH/E_SG_S** Units: **mg/Kg**
Client ID: **BatchQC** Batch ID: **2284SG** TestNo: **SW8015**
Prep Date: **9/28/2017** RunNo: **1816** SeqNo: **44818**
Analysis Date: **9/29/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-E (DRO), Silica Gel	106	5	100	23.1	82.5	77.51	167.49	111	5	42	
Surr: Nonane, Silica Gel	6.68		6		111	75.51	149.49	6.66	0	0	

Sample ID **1709256-01AMS** SampType: **MS** TestCode: **TPH/E_SG_S** Units: **mg/Kg**
Client ID: **BatchQC** Batch ID: **2284SG** TestNo: **SW8015**
Prep Date: **9/28/2017** RunNo: **1816** SeqNo: **44817**
Analysis Date: **9/29/2017**

Analyte	Result	PQL	SPK Value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-E (DRO), Silica Gel	111	5	100	23.1	87.9	77.51	167.49				
Surr: Nonane, Silica Gel	6.66		6		111	75.51	149.49				

Qualifiers:

B	Analyte detected in the associated Method Bla
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

October 02, 2017

CLS Work Order #: 17I1213
COC #:

Reyna Vallejo
Alpha Analytical, Inc.-Sparks
255 Glendale Ave.; Suite 21
Sparks, NV 89431

Project Name: 1709214

Enclosed are the results of analyses for samples received by the laboratory on 09/29/17 09:00. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CHAIN OF CUSTODY RECORD

*Please reference the Work Order Number on all reports and invoices.
*Also please include the dates of analysis and detection limits. Please send the report to Alpha Analytical (Sparks). Attention To Reyna Tallejo (reyna@alpha-analytical.com).

RUSH

Alpha Analytical, Inc.
255 Glendale Ave. #21 Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406

Report Due ON: ~~29-Sep-17~~ 10-2-17

Sampled by: P Raynak

171213

SUB CONTRATOR	CLS	COMPANY	CLS Labs
ADDRESS	3249 Fitzgerald Rd.		
CITY, STATE, ZIP	Rancho Cordova, CA 95742-		
PHONE	(916) 638-7301	FAX	(916) 638-4510
ACCOUNT #		EMAIL	

SPECIAL INSTRUCTIONS / COMMENTS
OG-TRPH EPA 1664 w/SGT only.

1709214

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	ANALYTICAL PARAMETERS: Other
1	HOL 1709214-01A	170-A	4OZCG-U	Soil	9/22/2017 11:18:00 AM	1	√
2	HOL 1709214-02A	020-A	4OZCG-U	Soil	9/22/2017 11:21:00 AM	1	√
3	HOL 1709214-03A	350-A	4OZCG-U	Soil	9/22/2017 11:29:00 AM	1	√
4	HOL 1709214-04A	550-A	4OZCG-U	Soil	9/22/2017 11:32:00 AM	1	√

Relinquished By	Date	Time	Received By	Date	Time	Comments:
Relinquished By	9/28/2017	4:00 PM		9/29/17	0900	2 1
	Date	Time	Received By	Date	Time	

Alpha Analytical, Inc.-Sparks	Project: 1709214	
255 Glendale Ave.; Suite 21	Project Number: [none]	**CLS Work Order #: 17I1213**
Sparks, NV 89431	Project Manager: Reyna Vallejo	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
HOL 1709214-01A ; 170-A (17I1213-01) Soil	**Sampled: 09/22/17 11:18**		**Received: 09/29/17 09:00**						
Silica Gel Treated HEM (SGT-HEM)	ND	50	mg/kg	1	1707417	09/29/17	09/29/17	EPA 1664A	
HOL 1709214-02A ; 020-A (17I1213-02) Soil	**Sampled: 09/22/17 11:21**		**Received: 09/29/17 09:00**						
Silica Gel Treated HEM (SGT-HEM)	ND	50	mg/kg	1	1707417	09/29/17	09/29/17	EPA 1664A	
HOL 1709214-03A ; 350-A (17I1213-03) Soil	**Sampled: 09/22/17 11:29**		**Received: 09/29/17 09:00**						
Silica Gel Treated HEM (SGT-HEM)	ND	50	mg/kg	1	1707417	09/29/17	09/29/17	EPA 1664A	
HOL 1709214-04A ; 550-A (17I1213-04) Soil	**Sampled: 09/22/17 11:32**		**Received: 09/29/17 09:00**						
Silica Gel Treated HEM (SGT-HEM)	ND	50	mg/kg	1	1707417	09/29/17	09/29/17	EPA 1664A	

CA SWRCB ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742 **www.californialab.com** **916-638-7301** **Fax: 916-638-4510**

Alpha Analytical, Inc.-Sparks
255 Glendale Ave.; Suite 21
Sparks, NV 89431

Project: 1709214
Project Number: [none]
Project Manager: Reyna Vallejo

CLS Work Order #: 17I1213
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1707417 - Solvent Extract										
Blank (1707417-BLK1)				Prepared & Analyzed: 09/29/17						
Silica Gel Treated HEM (SGT-HEM)	ND	50	mg/kg							
LCS (1707417-BS1)				Prepared & Analyzed: 09/29/17						
Silica Gel Treated HEM (SGT-HEM)	343	50	mg/kg	500		69	64-132			
LCS Dup (1707417-BSD1)				Prepared & Analyzed: 09/29/17						
Silica Gel Treated HEM (SGT-HEM)	328	50	mg/kg	500		66	64-132	4	34	
Matrix Spike (1707417-MS1)	Source: 17I1213-04			Prepared & Analyzed: 09/29/17						
Silica Gel Treated HEM (SGT-HEM)	323	50	mg/kg	500	ND	65	64-132			
Matrix Spike Dup (1707417-MSD1)	Source: 17I1213-04			Prepared & Analyzed: 09/29/17						
Silica Gel Treated HEM (SGT-HEM)	348	50	mg/kg	500	ND	70	64-132	7	34	

CA SWRCB ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com 916-638-7301 Fax: 916-638-4510

Alpha Analytical, Inc.-Sparks	Project: 1709214	
255 Glendale Ave.; Suite 21	Project Number: [none]	**CLS Work Order #: 17I1213**
Sparks, NV 89431	Project Manager: Reyna Vallejo	COC #:

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CA SWRCB ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742 **www.californialab.com** **916-638-7301** **Fax: 916-638-4510**

Alpha Analytical, Inc
255 Glendale Ave, #21
Sparks, Nevada 89431
TEL: (775) 355-1044 FAX: (775) 355-0406
Website: www.alpha-analytical.com

Definition Only

WO#: **1709214**

Date:

Definitions:

ND = Not Detected

C = Reported concentration includes additional compounds uncharacteristic of common fuels and lubricants.

D = Reporting Limits were increased due to high concentrations of non-target analytes.

H = Reporting Limits were increased due to the hydrocarbons present in the sample.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

K = DRO concentration may include contributions from lighter-end hydrocarbons (e.g. gasoline) that elute in the DRO range.

L = DRO concentration may include contributions from heavier-end hydrocarbons (e.g. motor oil) that elute in the DRO range.

O = Reporting Limits were increased due to sample foaming.

V = Reporting Limits were increased due to high concentrations of target analytes.

X = Reporting Limits were increased due to sample matrix interferences.

Z = DRO concentration may include contributions from lighter-end (e.g. gasoline) and heavier-end (e.g. motor oil) hydrocarbons that elute in the DRO range.

S50 = The analysis of the sample required a dilution such that the surrogate concentration was diluted below the laboratory acceptance criteria. The laboratory control sample was acceptable.

S51 = Surrogate recovery could not be determined due to the presence of co-eluting hydrocarbons.

S53 = Surrogate recovery was below laboratory acceptance limits. Probable matrix effect.

S54 = Surrogate recovery was below laboratory acceptance limits.

S55 = Surrogate recovery was above laboratory acceptance limits.

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Website: www.alpha-analytical.com

Definition Only

WO#: **1709214**

Date:

Definitions:

Report CC's Pam Raynak

CHAIN-OF-CUSTODY RECORD

AMENDED

CA RUSH

Alpha Analytical, Inc.

255 Glendale Ave, #21 *Sparks, Nevada 89431*

TEL: (775) 355-1044 *FAX: (775) 355-0406*

WorkOrder: HOL1709214
Report Due By: 29-Sep-17
EDD Required: NO

Amendment due 10-2-17

Report Attention: Pam Raynak

Client:
Holdrege & Kull
10775 Pioneer Trail #213
Truckee, CA 96161

TEL: 5305875156
FAX:
ProjectNo: 42361.00/Donner Lake Outflow

Date Received: 25-Sep-17

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests METALS_SO	OTHER	TPH/E_SG_S					Sample Remarks
HOL1709214-01	170-A	SO	9/22/2017 11:18:00 AM	1	1	4	A - CAM_17_TTLC	A - O&G w/ silica gel cleanup	A - Silica Gel (C)					
HOL1709214-02	020-A	SO	9/22/2017 11:21:00 AM	1	1	4	A - CAM_17_TTLC	A - O&G w/ silica gel cleanup	A - Silica Gel (C)					
HOL1709214-03	350-A	SO	9/22/2017 11:29:00 AM	1	1	4	A - CAM_17_TTLC	A - O&G w/ silica gel cleanup	A - Silica Gel (C)					
HOL1709214-04	550-A	SO	9/22/2017 11:32:00 AM	1	1	4	A - CAM_17_TTLC	A - O&G w/ silica gel cleanup	A - Silica Gel (C)					

Comments: Samples picked up by Alpha employee, therefore $25.00 courier fee may apply. Amended 9/28/17 11:45 to add to all samples on a 48 hr TAT, per email from Pam: TPH/E with silica gel cleanup and O&G with silica gel cleanup. O&G subbed to CLS. Due 10/2/17.KM

	Signature	Print Name	Company	Date/Time
Logged in by:	Kmurray	Kmurray	Alpha Analytical, Inc.	9/28/17 1200

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Report CC's Pam Raynak

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.

255 Glendale Ave, #21 Sparks, Nevada 89431

TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder: HOL1709214
Report Due By: 29-Sep-17
EDD Required: NO

Report Attention: Pam Raynak

Client:
Holdrege & Kull
10775 Pioneer Trail #213
Truckee, CA 96161

TEL: 5305875156
FAX:
ProjectNo: 42361.00/Donner Lake Outflow

Date Received: 25-Sep-17

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests METALS_SO							Sample Remarks
HOL1709214-01	170-A	SO	9/22/2017 11:18:00 AM	1	0	4	A - CAM_17_TTLC							
HOL1709214-02	020-A	SO	9/22/2017 11:21:00 AM	1	0	4	A - CAM_17_TTLC							
HOL1709214-03	350-A	SO	9/22/2017 11:29:00 AM	1	0	4	A - CAM_17_TTLC							
HOL1709214-04	550-A	SO	9/22/2017 11:32:00 AM	1	0	4	A - CAM_17_TTLC							

Comments: Samples picked up by Alpha employee, therefore $25.00 courier fee may apply.

	Signature	Print Name	Company	Date/Time
Logged in by:	KMurray	K Murray	Alpha Analytical, Inc.	9/25/17 1055

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic O-Other

CHAIN OF CUSTODY

4179

Billing Information:
Company: HOLDREGE & KULL
Attn: AMANDA CAUDILL
Address: 792 SEARLS AVE.
City, State, Zip: NEVADA CITY, CA 95959
Phone Number: 5304781305 Fax: 5304781312

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044 Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901
Northern NV: Elko, NV 89801 Phone: 775-388-7043
Southern NV: Las Vegas, NV 89120 Phone: 702-281-4848

Consultant/ Client Info:
Company: HOLDREGE & KULL
Address: 10775 PIONEER TR #213
City, State, Zip: TRUCKEE, CA 96161

Job and Purchase Order Info:
Job #: 42361.00
Job Name: DONNER LAKE OUTFLOW
P.O. #: 42361.00

Report Attention/Project Manager:
Name: PAM RAYNAK
Email Address: PRAYNAK@HANDK.NET
Phone #: 530 587 5156
Cell #: 530 362 0032

QC Deliverable Info:
EDD Required? Yes / (No)
EDF Required? Yes / (No)
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR (CA) KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	Analysis Requested: CAM 17 METALS	Remarks
1118	9.22.17	So	HOL1709214-01	170-A	4DAY	1-5		/	/	
1121	↓	↓	02	020-A	↓	↓		/	/	
1129			03	350-A				/	/	
1132			04	550-A				/	/	

ADDITIONAL INSTRUCTIONS:
NEED RESULTS BY FRIDAY 9.29.17

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: PSRaynak

Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:
PSRaynak	9.22.17	1156	TO H:K REFRIDGERATOR PSRaynak	9.22.17	1156
PSRaynak	9.25.17	1001		9.25.17	10:01

* Key: AQ - Aqueous AR-Air OT - Other So-Soil WA - Waste ** B - Brass L - Liter O - Orbo OT - Other P - Plastic S-Soil Jar T - Tedlar V - VOA

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

07/16