

ATTACHMENT 1

AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

TROJAN STORAGE FACILITY AIR QUALITY & GREENHOUSE GAS ASSESSMENT

Campbell, CA

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Introduction

The purpose of this report is to address the air quality impacts and to compute the greenhouse gas (GHG) emissions associated with the Trojan Storage Facility located at 680 and 700 East McGlincy Lane (Parcels 3 & 4) in Campbell, California. The air quality impacts and GHG emissions would be associated with demolition of the existing uses at the site, construction of the new buildings and infrastructure, and operation of the project.

Additionally, the project's construction would be the primary source of toxic air contaminant (TAC) and fine particulate matter (PM_{2.5}) emissions that could lead to community risk impacts, or in other words, increase health risks at sensitive receptors. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).

Project Description

The project would demolish the existing storage site and construct a three-story self-storage facility with a one-level basement on a 2.1-acre site. The facility would provide 1,164 storage units and 50 parking spaces. There will also be a 650 square foot (sf) residence on the second floor of the facility for the on-site manager. The entire building would total 157,467-sf.

Setting

The project is located in Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM₁₀), and fine particulate matter (PM_{2.5}).

Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_x). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM₁₀) and fine particulate matter where particles have a diameter of 2.5 micrometers or less (PM_{2.5}). Elevated concentrations of PM₁₀ and PM_{2.5} are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

Regulatory Agencies

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.¹ The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the CARB (a part of the California Environmental Protection Agency [EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.² The detailed community risk modeling methodology used in this assessment is contained in *Attachment 1*.

City of Campbell General Plan

The City of Campbell's General Plan includes goals, policies, and strategies to improve air quality and meet the State and National ambient air quality standards. The following goals, policies, and actions are applicable to the proposed project:

¹ Available online: <http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>. Accessed: November 21, 2014.

² Bay Area Air Quality Management District. 2017. *BAAQMD CEQA Air Quality Guidelines*. May.

Goal CNR-11: Work toward improving air quality and meeting all federal and State ambient air quality standards

Policy CNR-11.2: Effects of Development on Air Quality: Use the City's development review process and the California Environmental Quality Act to evaluate and mitigate the local and cumulative effects of new development on air quality

Strategy CNR-11.2d: *Construction Dust Control:* Require dust control measures, including those included in the Santa Clara Valley Non-Point Pollution Control Program, during construction.

Strategy CNR-11.2e: *Buffering or Mitigation Requirements:* Require adequate buffering or other mitigation of all potential air pollutant sources, including commercial and industrial emissions.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. The closest sensitive receptors to the project site are residences adjacent to the southern project boundary. There are additional residences at farther distances from the project site.

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA and these significance thresholds were contained in the District's 2011 *CEQA Air Quality Guidelines*. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA. The thresholds were challenged through a series of court challenges and were mostly upheld. BAAQMD updated the *CEQA Air Quality Guidelines* in 2017 to include the latest significance thresholds that were used in this analysis are summarized in Table 1.

Table 1. Air Quality Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO _x	54	54	10
PM ₁₀	82 (Exhaust)	82	15
PM _{2.5}	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	Single Sources Within 1,000-foot Zone of Influence	Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)	
Excess Cancer Risk	>10.0 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual PM _{2.5}	>0.3 µg/m ³	>0.8 µg/m ³	
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions		Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) and adjusted to 2.6 metric tons per capita (for 2030)*	
<p>Note: ROG = reactive organic gases, NO_x = nitrogen oxides, PM₁₀ = coarse particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, PM_{2.5} = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.</p> <p>*BAAQMD does not have a recommended post-2020 GHG threshold.</p>			

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan?

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin (SFBAAB). BAAQMD, with assistance from the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), has prepared and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.³ The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHGs.

The BAAQMD, with assistance from ABAG and MTC, has prepared and implemented the Clean Air Plan to meet the applicable laws, regulations, and programs. The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHG. The project proposed land use is consistent with the City of Campbell General Plan designation for this site.

The 2017 Clean Air Plan includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The most recent clean air plan is the *2017 Clean Air Plan* that was adopted by BAAQMD in April 2017. The proposed project would not conflict with the latest Clean Air planning efforts since 1) the project would have emissions below the BAAQMD thresholds (see Impact 2), 2) the project would be considered urban infill, 3) the project would be located near employment centers, and 4) the project would be located near transit with regional connections.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The Bay Area is considered a non-attainment area for ground-level ozone and PM_{2.5} under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM₁₀ under the California Clean Air Act, but not the federal act. The area has attained both State and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM₁₀, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_x), PM₁₀, and PM_{2.5} and apply to both construction period and operational period impacts.

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from construction and operation of the site assuming full build-out of the project. The

³ Bay Area Air Quality Management District (BAAQMD), 2017. *Final 2017 Clean Air Plan*.

project land use types and size, and anticipated construction schedule were input to CalEEMod. The model output from CalEEMod is included as *Attachment 2*.

Construction Period Emissions

CalEEMod provides annual emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction schedule was based on information provided by the project applicant, but the equipment list was based on CalEEMod defaults for a project of this type and size.

The following proposed project land uses were inputted into CalEEMod: 157,467-sf entered as “General Light Industry” and 50 spaces entered as “Parking Lot” on a 2.1-acre site. In addition, 40,000-sf of building demolition was entered into the model.

The construction schedule assumed that the project would be built out over a period of approximately 10 months, beginning in June 2019. There were an estimated 220 construction workdays. Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 2 shows average daily construction emissions of ROG, NO_x, PM₁₀ exhaust, and PM_{2.5} exhaust during construction of the project. As indicated in Table 2, predicted construction period emissions would not exceed the BAAQMD significance thresholds.

Table 2. Construction Period Emissions

Scenario	ROG	NO _x	PM ₁₀ Exhaust	PM _{2.5} Exhaust
Total construction emissions (tons)	1.1 tons	1.9 tons	0.1 tons	0.1 tons
Average daily emissions (pounds)¹	10 lbs./day	17.3 lbs./day	0.9 lbs./day	0.9 lbs./day
<i>BAAQMD Thresholds (pounds per day)</i>	<i>54 lbs./day</i>	<i>54 lbs./day</i>	<i>82 lbs./day</i>	<i>54 lbs./day</i>
Exceed Threshold?	No	No	No	No

Notes: ¹Assumes 220 workdays.

Additionally, construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM₁₀ and PM_{2.5}. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. *Mitigation Measure AQ-1 would implement BAAQMD-recommended best management practices.*

Mitigation Measure AQ-1: Include measures to control dust and exhaust during construction.

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures

recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less-than-significant level. Additional measures are identified to reduce construction equipment exhaust emissions. The contractor shall implement the following best management practices that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Effectiveness of Mitigation Measure AQ-1

The measures included above would be consistent with BAAQMD-recommended basic control measures for reducing fugitive particulate matter that are contained in the BAAQMD CEQA Air Quality Guidelines.

Operational Period Emissions

Operational air emissions from the project would be generated primarily from autos driven by future customers. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build-out.

Land Uses

The project land uses were input to CalEEMod, as described above for the construction period modeling.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest the project could possibly be constructed and begin operating would be 2021. Emissions associated with build-out later than 2021 would be lower.

Trip Generation Rates

CalEEMod allows the user to enter specific vehicle trip generation rates, which were input to the model using the daily trip generation rate provided in the project trip generation table. Usually, the Saturday and Sunday trip rates were assumed to be the weekday rate adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips. However, for self-storage facilities the weekend trip rate is equal to the weekday trip rate. Therefore, the weekday project trip generation value provided was applied to both the Saturday and Sunday trip rate.

The project applicant provided project trip generation values for the general light industry facility.⁴ The weekday trip rate used for the project was 8.63, which was based on 207 trips divided by 24 hours, and this rate was used for all seven days. The trip length used was 3.1 miles, which is a one-way weighted average distance based on Trojan customer trip length. CalEEMod assumes commercial trips (i.e. a customer traveling to a commercial site) as one-way trips. *Attachment 2* includes the weighted average distance table based on Trojan customer trip length.

⁴ ITE 8th Edition Trip Generation Manual, "Mini Warehouse" trip generation rate is 1.65 trips per 1,000 square feet of net rentable area. Trojan proposed net rentable square feet would be 125,000 square feet. The total trips then would be 207 trips divided by 24 hours, which equals 8.36 daily trips.

Energy

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. Indirect emissions from electricity were computed in CalEEMod. The model has a default rate of 641.3 pounds of CO₂ per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. The rate was adjusted to account for PG&E's projected 2020 CO₂ intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO₂ per megawatt of electricity delivered.⁵

Other Inputs

Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project. Water/wastewater use were changed to 100% aerobic conditions to represent wastewater treatment plant conditions.

Mitigation

Water-efficient irrigation systems and low-flow water use were also applied. Note that the project will include solar panels on the roof, but it is unknown at this moment how much energy would be derived from the solar panels. Therefore, on-site renewable energy was not applied to the model.

Existing Uses

The existing land use on the project site included 40,000-sf entered as "General Light Industry". A CalEEMod model for the existing land use was run for years 2021 and 2023.

As shown in Table 3, operational emissions would not exceed the BAAQMD significance thresholds. This would be considered a *less-than-significant* impact.

Table 3. Operational Emissions

Scenario	ROG	NO _x	PM ₁₀	PM _{2.5}
2021 Project Operational Emissions (tons/year)	1.0 tons	1.2 tons	0.6 tons	0.2 tons
2021 Existing Operational Emissions (tons/years)	0.2 tons	0.3 tons	0.2 tons	0.1 tons
Net Emissions	0.8 tons	0.9 tons	0.4 tons	0.1 tons
BAAQMD Thresholds (tons /year)	10 tons	10 tons	15 tons	10 tons
Exceed Threshold?	No	No	No	No
2021 Project Operational Emissions (lbs/day) ¹	4.4 lbs.	4.9 lbs.	2.2 lbs.	0.5 lbs.
BAAQMD Thresholds (pounds/day)	54 lbs.	54 lbs.	82 lbs.	54 lbs.
Exceed Threshold?	No	No	No	No

Notes: ¹ Assumes 365-day operation.

⁵ Pacific Gas & Electric, 2015. *Greenhouse Gas Emission Factors: Guidance for PG&E Customers*. November.

Impact 3: Expose sensitive receptors to substantial pollutant concentrations?

Operational Community Health Risk Impacts

Operation of the project is not expected to cause any localized emissions that could expose sensitive receptors to unhealthy air pollutant levels. When operating, the project would generate automobile traffic; however, these emissions are anticipated to result in fairly low impacts in terms of TAC or PM_{2.5} exposure. No stationary sources of TACs, such as diesel-powered emergency generators, are proposed as part of the project. Therefore, operational sources of TAC or PM_{2.5} would not be substantial and were not further evaluated.

Construction Community Health Risk Impacts

Project Construction Activity

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust are known as a TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to PM_{2.5}. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects of sensitive receptors at these nearby residences from construction emissions of DPM and PM_{2.5}.⁶ Dispersion modeling was conducted to predict the off-site concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod model provided total annual PM₁₀ exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.0913 tons (183 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive PM_{2.5} dust emissions were calculated by CalEEMod as 0.02361 tons (47 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and PM_{2.5} concentrations at sensitive receptors (residences) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.⁷ The modeling utilized two area sources to represent the on-site construction emissions, one for exhaust emissions and one

⁶ DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

⁷ Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0*. May.

for fugitive dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive PM_{2.5} emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area source. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Construction emissions were modeled as occurring daily between 8 a.m. to 4 p.m. per the project applicant's construction schedule.

The modeling used a five-year data set (2006-2010) of hourly meteorological data from the San José Airport meteorological site that was prepared for use with the AERMOD model by BAAQMD. Annual DPM and PM_{2.5} concentrations from construction activities during the 2020-2021 period were calculated using the model. DPM and PM_{2.5} concentrations were calculated at nearby sensitive receptors. Receptor heights of 1.5 meters (5 feet) and 4.5 meters (15 feet) were used to represent the breathing heights of residents in nearby single-family residences and apartments.

Community Risk Impacts

Figure 1 shows the locations where the maximum-modeled DPM and PM_{2.5} concentrations occurred. The maximum concentrations occurred at a single-family residence (1.5 meters) immediately south of the project site. The maximum increased cancer risk at the location of the maximally exposed individual (MEI) was calculated using the BAAQMD recommended methods and the maximum annual modeled DPM concentration. The cancer risk calculations are based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. BAAQMD-recommended exposure parameters were used for the cancer risk calculations, as described in *Attachment 1*. Infant and adult exposures were assumed to occur at all residences through the entire construction period. *Attachment 3* includes the construction emission calculations and source information used in the modeling and the cancer risk calculations.

Results of this assessment indicated that the maximum excess residential cancer risks would be greater than the BAAQMD significance threshold of 10 in one million and the maximum PM_{2.5} concentrations would exceed the BAAQMD significance threshold of 0.3 µg/m³. *Implementation of Mitigation Measures AQ-2 would reduce this impact to a level of less-than-significant* as seen in Table 4, which summarizes the maximum cancer risks, PM_{2.5} concentrations, and health hazard indexes for project related construction activities affecting the residential MEI. Note that Table 4 is presented after the Cumulative Impacts section.

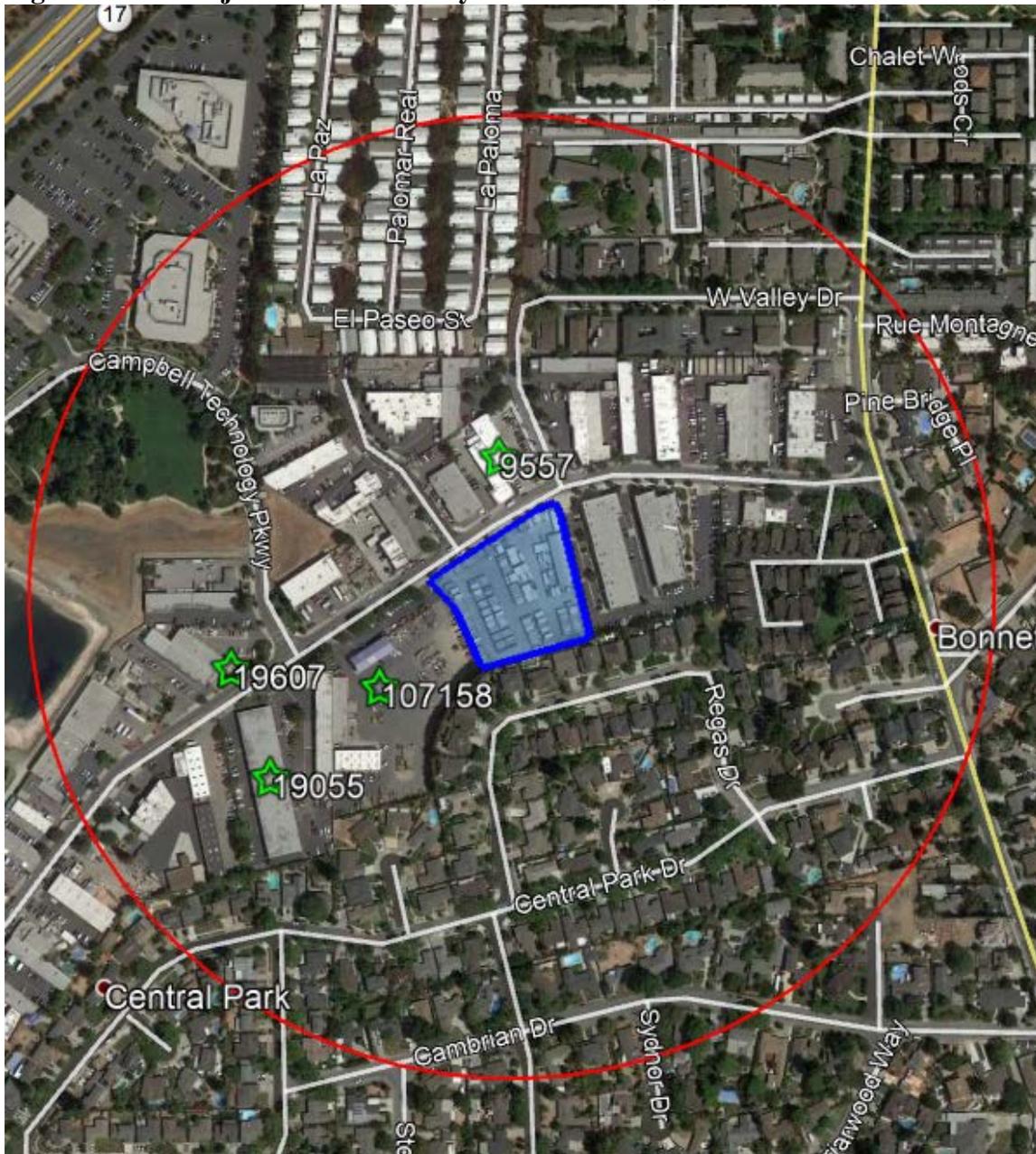
Figure 1. Project Construction Site and Locations of Off-Site Sensitive Receptors and TAC Impacts



Cumulative Impact on Construction MEI

Cumulative community risk impacts were addressed through an evaluation of TAC sources located within 1,000 feet of the construction MEI. These sources could include freeways or highways, busy surface streets, and stationary sources identified by BAAQMD. A review of the project area indicates that most nearby streets are assumed to have less than 10,000 vehicles per day. A review of BAAQMD’s stationary source Google Earth map tool identified four stationary sources with the potential to affect the construction MEI. Figure 2 shows the sources affecting the project site, nearby cumulative sources affecting the construction MEI. Community risk impacts from these sources upon the construction MEI are reported in Table 4. Details of the modeling and community risk calculations are included in *Attachment 4*.

Figure 2. Project Site and Nearby TAC and PM_{2.5} Sources



Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Risk & Hazard Analysis Tool*. This mapping tool uses Google Earth and identified the location of seven stationary sources and their estimated risk and hazard impacts. A Stationary Source Information Form (SSIF) containing the four identified sources was prepared and submitted to BAAQMD. They provided updated risk levels, emissions and adjustments to account for new OEHHA guidance⁸. The agency identified Plants #19055 and #9557 as spray booths that are not adjusted for distance. Plant #9557 was identified as a coating operation with low risk values that are calculated as zero, so this stationary source was not

⁸ Correspondence with Areana Flores, BAAQMD, November 21, 2018.

considered within the cumulative impact analysis. The remaining Plant #107158 was identified as a gas dispensing facility and adjusted with the BAAQMD's *Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)*. Concentration levels and community risk impacts from these sources upon the project are reported in Table 4.

Summary of Construction Health Risk Impacts

Table 4 reports both the project and cumulative community risk impacts. Without mitigation, the project would have a *significant* impact with respect to community risk caused by project construction activities, since the maximum cancer risk and PM_{2.5} concentration exceed the single-source thresholds of 10.0 per million for cancer risk and 0.3 µg/m³ for PM_{2.5}, respectively. As shown in Table 4, the combined annual cancer risk, PM_{2.5} concentration and Hazard risk values, which includes unmitigated and mitigated, would not exceed the cumulative threshold.

Table 4. Impacts from Combined Sources at Construction MEI

Source	Maximum Cancer Risk (per million)	PM _{2.5} concentration (µg/m ³)	Hazard Index
Project Construction	Unmitigated	65.9 (infant)	0.62
	Mitigated	7.5 (infant)	0.11
BAAQMD Single-Source Threshold	>10.0	>0.3	>1.0
Significant?			
Unmitigated	Yes	Yes	No
Mitigated	No	No	No
Plant #107158 (Gas Dispensing Facility) at 420 feet	<0.1	-	<0.01
Plant #9055 (Spray Booth)	-	-	<0.01
Plant #19607 (Spray Booth)	-	-	<0.01
<i>Combined Sources</i>	<i>Unmitigated</i>	66.0 (infant)	0.62
	<i>Mitigated</i>	7.6 (infant)	0.11
BAAQMD Cumulative Source Threshold	>100	>0.8	>10.0
Significant?			
Unmitigated	No	No	No
Mitigated	No	No	No

Mitigation Measure AQ-2: Selection of equipment during construction to minimize emissions. Such equipment selection would include the following:

The project shall develop a plan demonstrating that the off-road equipment used on-site to construct the project would achieve a fleet-wide average 85-percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following:

1. All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA NO_x and particulate matter emissions standards for Tier 3 engines and this equipment shall include

CARB-certified Level 3 Diesel Particulate Filters⁹ or equivalent. Equipment that meets U.S. EPA Tier 4 interim standards or use of equipment that is electrically powered or uses non-diesel fuels would meet this requirement.

Effectiveness of Mitigation AQ-2

With mitigation, the computed maximum increased lifetime residential cancer risk from construction, assuming infant exposure, would be 7.5 in one million or less, the maximum annual PM_{2.5} concentration would be 0.11 µg/m³, and the Hazard Index would be 0.01. As a result, impacts would be reduced to *less than significant* with respect to community risk caused by construction activities.

Impact 4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Emissions of air pollutants or TACs are addressed under impacts 2 and 3. Emission of greenhouse gases are addressed separately. In terms of odor emissions, the proposed project would construct a storage facility that is categorized as a general light industry land use. The proposed project does not fall under any of the land uses BAAQMD identified within their odor screening table of the *CEQA Air Quality Guidelines*. Therefore, odors that could cause complaints from the general public and affect a substantial number of people are not expected.

⁹ See <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

Greenhouse Gases

Setting

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO₂) and water vapor but there are also several others, most importantly methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO₂ and N₂O are byproducts of fossil fuel combustion.
- N₂O is associated with agricultural operations such as fertilization of crops.
- CH₄ is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO₂ being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO₂ equivalents (CO₂e).

An expanding body of scientific research supports the theory that global climate change is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

Recent Regulatory Actions

Assembly Bill 32 (AB 32), California Global Warming Solutions Act (2006)

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

Senate Bill 375, California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

SB 350 Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

Executive Order EO-B-30-15 (2015) and SB 32 GHG Reduction Targets

In April 2015, Governor Brown signed Executive Order which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed SB 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017*

Climate Change Scoping Plan. While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State’s emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings (note that new
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities
- Greatly increase the number of electric vehicles on the road and reduce oil demand in half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce “super pollutants” by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons CO_{2e} per capita (statewide) by 2030 and no more than 2 metric tons CO_{2e} per capita by 2050. The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

Significance Thresholds

The BAAQMD’s CEQA Air Quality Guidelines recommended a GHG threshold of 1,100 metric tons or 4.6 metric tons (MT) per capita. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur in 2020. Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a bright-line threshold of 660 MT CO_{2e}/year based on the GHG reduction goals of EO B-30-15. The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold.

Impact 1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

GHG emissions associated with development of the proposed project would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal.

Emissions for the proposed project are discussed below and were analyzed using the methodology recommended in the BAAQMD CEQA Air Quality Guidelines.

CalEEMod Modeling

CalEEMod was used to predict GHG emissions from operation of the site assuming full build-out of the project. The project land use types and size and other project-specific information were input to the model, as described above in the operational period emissions section. CalEEMod output is included in *Attachment 2*.

Construction Emissions

GHG emissions associated with construction were computed to be 277 MT of CO_{2e} for the total construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable. Best management practices assumed to be incorporated into construction of the proposed project include but are not limited to: using local building materials of at least 10 percent and recycling or reusing at least 50 percent of construction waste or demolition materials.

Operational Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate daily emissions associated with operation of the fully-developed site under the proposed project. As shown in Table 5, annual net emissions resulting from operation of the proposed project are predicted to be 765 MT of CO_{2e} for the year 2021 and 638 MT of CO_{2e} for the year 2030. The 2030 net emissions do not exceed the 2030 bright-line threshold of 660 MT CO_{2e}/year. Therefore, the project would have a *less-than-significant* impact regarding GHG emissions.

Table 5. Annual Project GHG Emissions (CO_{2e}) in Metric Tons

Source Category	Existing Land Use in 2021	Proposed Project in 2021	Proposed Project in 2030
Area	<1	<1	<1
Energy Consumption	100	396	396
Mobile	231	590	463
Solid Waste Generation	25	98	98
Water Usage	12	48	48
Total (MT CO _{2e} /year)	368	1,133	1,006
Net Emissions		765	638
Significance Threshold			660 MT CO_{2e}/year
<i>Significant?</i>			<i>No</i>

Impact 2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codifies the State of California's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, CARB, California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business-as-usual (BAU) emissions projected in 2020 back down to 1990 levels. BAU is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. It required CARB and other state agencies to develop and adopt regulations and other initiatives reducing GHGs by 2012.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO₂e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, in light of the economic downturn, to 545 MMT of CO₂e. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO₂e. Thus, an estimated reduction of 80 MMT of CO₂e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB 197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. For example, proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures and water-efficient irrigation systems.

Supporting Documentation

Attachment 1 is the methodology used to compute community risk impacts, including the methods to compute lifetime cancer risk from exposure to project emissions.

Attachment 2 includes the CalEEMod output for project construction TAC emissions and GHG emissions. Also included are any modeling assumptions, like the Trojan Weighted Average Distance Table.

Attachment 3 is the construction health risk assessment. AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 4 includes the screening community risk calculations from sources affecting the construction MEI.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.¹⁰ These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.¹¹ This HRA used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.¹² Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

¹⁰ OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

¹¹ CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

¹² BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity that would have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

$$\text{Cancer Risk (per million)} = \text{CPF} \times \text{Inhalation Dose} \times \text{ASF} \times \text{ED/AT} \times \text{FAH} \times 10^6$$

Where:

CPF = Cancer potency factor (mg/kg-day)⁻¹

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

$$\text{Inhalation Dose} = C_{\text{air}} \times \text{DBR} \times A \times (\text{EF}/365) \times 10^{-6}$$

Where:

C_{air} = concentration in air (µg/m³)

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10⁻⁶ = Conversion factor

The health risk parameters used in this evaluation are summarized as follows:

Parameter	Exposure Type →	Infant		Child		Adult
	Age Range →	3 rd Trimester	0<2	2 < 9	2 < 16	16 - 30
DPM Cancer Potency Factor (mg/kg-day) ⁻¹		1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	631	572	261
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults.

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

Annual PM_{2.5} Concentrations

While not a TAC, fine particulate matter (PM_{2.5}) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for PM_{2.5} (project level and cumulative) are in terms of an increase in the annual average concentration. When considering PM_{2.5} impacts, the contribution from all sources of PM_{2.5} emissions should be included. For projects with potential impacts from nearby local roadways, the PM_{2.5} impacts should include those from vehicle exhaust emissions, PM_{2.5} generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 2: CalEEMod Modeling Output and Trojan Weighted Average Distance Table

Trojan Weighted Average Distance Table

Cumulative % Customers	% customers	Distance one-way in Miles
2.5%	2.5%	0.5
7.5%	5.0%	1
12.5%	5.0%	1.5
22.5%	10.0%	2
42.5%	20.0%	2.5
62.5%	20.0%	3
72.5%	10.0%	3.5
82.5%	10.0%	4
92.5%	10.0%	4.5
97.5%	5.0%	5
100.0%	2.5%	10
Weighted Avg. Distance:		3.1

18-209 Trojan Storage Campbell AQ - Santa Clara County, Annual

**18-209 Trojan Storage Campbell AQ
Santa Clara County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	157.47	1000sqft	2.10	157,467.00	0
Parking Lot	50.00	Space	0.00	20,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - PG&E 2020 rate 290
- Land Use - Plans 11-12-18: 157,467-sqft for building, 50 parking spaces all on 2.1 acre site
- Construction Phase - Construction Schedule provided
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment - default equipment used
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment -

Off-road Equipment - default trenching equipment

Trips and VMT -

Demolition - 40,000 square feet of of building demo provided in construction data sheet

Grading - no grading information

Vehicle Trips - trip gen: 207 trips/24hrs = 8.63 across all the days, 3.1 trip lengths

Energy Use -

Water And Wastewater - assume 100% aerobic

Energy Mitigation -

Water Mitigation - Low-flow sinks, toilets, water-efficient irrigation systems

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	43.00
tblConstructionPhase	NumDays	220.00	133.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	6.00	11.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	157,470.00	157,467.00
tblLandUse	LotAcreage	3.62	2.10
tblLandUse	LotAcreage	0.45	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	CC_TL	7.30	3.10
tblVehicleTrips	CNW_TL	7.30	3.10
tblVehicleTrips	CW_TL	9.50	3.10
tblVehicleTrips	ST_TR	1.32	8.63
tblVehicleTrips	SU_TR	0.68	8.63
tblVehicleTrips	WD_TR	6.97	8.63
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00

tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2075	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2978	240.2978	0.0379	0.0000	241.2450
2020	0.8528	0.2159	0.2116	4.0000e-004	7.5300e-003	0.0113	0.0189	2.0300e-003	0.0108	0.0129	0.0000	35.1683	35.1683	5.7700e-003	0.0000	35.3127
Maximum	0.8528	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2978	240.2978	0.0379	0.0000	241.2450

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2075	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2976	240.2976	0.0379	0.0000	241.2448
2020	0.8528	0.2159	0.2116	4.0000e-004	7.5300e-003	0.0113	0.0189	2.0300e-003	0.0108	0.0129	0.0000	35.1683	35.1683	5.7700e-003	0.0000	35.3127
Maximum	0.8528	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2976	240.2976	0.0379	0.0000	241.2448

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2019	8-31-2019	0.7906	0.7906
2	9-1-2019	11-30-2019	0.8373	0.8373
3	12-1-2019	2-29-2020	1.0759	1.0759
4	3-1-2020	5-31-2020	0.2898	0.2898
		Highest	1.0759	1.0759

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	393.6864	393.6864	0.0215	7.6200e-003	396.4943
Mobile	0.2777	0.9896	2.3874	6.4300e-003	0.5323	5.9500e-003	0.5382	0.1425	5.5500e-003	0.1480	0.0000	589.0580	589.0580	0.0253	0.0000	589.6895
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	12.8837	25.9192	38.8028	0.0469	0.0286	48.4853
Total	0.9991	1.1932	2.5604	7.6500e-003	0.5323	0.0214	0.5537	0.1425	0.0210	0.1635	52.5197	1,008.6673	1,061.1869	2.4361	0.0362	1,132.8696

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	391.2629	391.2629	0.0212	7.5700e-003	394.0498
Mobile	0.2777	0.9896	2.3874	6.4300e-003	0.5323	5.9500e-003	0.5382	0.1425	5.5500e-003	0.1480	0.0000	589.0580	589.0580	0.0253	0.0000	589.6895
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	10.8738	21.8758	32.7496	0.0396	0.0241	40.9216
Total	0.9991	1.1932	2.5604	7.6500e-003	0.5323	0.0214	0.5537	0.1425	0.0210	0.1635	50.5098	1,002.2004	1,052.7102	2.4285	0.0317	1,122.8614

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83	0.64	0.80	0.31	12.44	0.88

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2019	6/10/2019	5	6	
2	Site Preparation	Site Preparation	6/10/2019	6/15/2019	5	5	
3	Grading	Grading	6/15/2019	7/1/2019	5	11	
4	Trenching	Trenching	7/1/2019	7/15/2019	5	11	
5	Building Construction	Building Construction	7/15/2019	1/15/2020	5	133	
6	Architectural Coating	Architectural Coating	1/15/2020	3/15/2020	5	43	
7	Paving	Paving	3/15/2020	3/30/2020	5	11	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 236,201; Non-Residential Outdoor: 78,734; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Trenching	Excavators	1	7.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	182.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Worker	1.4000e-004	1.1000e-004	1.0900e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2738	0.2738	1.0000e-005	0.0000	0.2740
Total	9.7000e-004	0.0284	6.6900e-003	7.0000e-005	1.8500e-003	1.1000e-004	1.9600e-003	5.0000e-004	1.0000e-004	6.1000e-004	0.0000	7.2867	7.2867	3.4000e-004	0.0000	7.2951

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8900e-003	0.0680	0.0447	7.0000e-005		3.8600e-003	3.8600e-003		3.6100e-003	3.6100e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657
Total	6.8900e-003	0.0680	0.0447	7.0000e-005	0.0197	3.8600e-003	0.0236	2.9800e-003	3.6100e-003	6.5900e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.3000e-004	0.0283	5.6000e-003	7.0000e-005	1.5400e-003	1.1000e-004	1.6500e-003	4.2000e-004	1.0000e-004	5.3000e-004	0.0000	7.0129	7.0129	3.3000e-004	0.0000	7.0211
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.1000e-004	1.0900e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2738	0.2738	1.0000e-005	0.0000	0.2740
Total	9.7000e-004	0.0284	6.6900e-003	7.0000e-005	1.8500e-003	1.1000e-004	1.9600e-003	5.0000e-004	1.0000e-004	6.1000e-004	0.0000	7.2867	7.2867	3.4000e-004	0.0000	7.2951

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	4.3900e-003	0.0539	0.0298	6.0000e-005	3.9800e-003	2.1300e-003	6.1100e-003	4.3000e-004	1.9600e-003	2.3900e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405
Total	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	4.3900e-003	0.0539	0.0298	6.0000e-005	3.9800e-003	2.1300e-003	6.1100e-003	4.3000e-004	1.9600e-003	2.3900e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405
Total	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0185	0.0000	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1251	0.0558	1.1000e-004		5.9000e-003	5.9000e-003		5.4300e-003	5.4300e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654
Total	0.0112	0.1251	0.0558	1.1000e-004	0.0360	5.9000e-003	0.0419	0.0185	5.4300e-003	0.0240	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864
Total	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0185	0.0000	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1251	0.0558	1.1000e-004		5.9000e-003	5.9000e-003		5.4300e-003	5.4300e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654
Total	0.0112	0.1251	0.0558	1.1000e-004	0.0360	5.9000e-003	0.0419	0.0185	5.4300e-003	0.0240	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864
Total	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864

3.5 Trenching - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932

Total	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932
Total	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156
Total	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.6700e-003	0.2234	0.0600	4.9000e-004	0.0116	1.6100e-003	0.0132	3.3600e-003	1.5400e-003	4.9000e-003	0.0000	46.5339	46.5339	2.3100e-003	0.0000	46.5916
Worker	0.0166	0.0124	0.1278	3.6000e-004	0.0363	2.4000e-004	0.0365	9.6500e-003	2.2000e-004	9.8700e-003	0.0000	32.1203	32.1203	8.7000e-004	0.0000	32.1422
Total	0.0253	0.2358	0.1878	8.5000e-004	0.0479	1.8500e-003	0.0498	0.0130	1.7600e-003	0.0148	0.0000	78.6542	78.6542	3.1800e-003	0.0000	78.7338

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154
Total	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.6700e-003	0.2234	0.0600	4.9000e-004	0.0116	1.6100e-003	0.0132	3.3600e-003	1.5400e-003	4.9000e-003	0.0000	46.5339	46.5339	2.3100e-003	0.0000	46.5916
Worker	0.0166	0.0124	0.1278	3.6000e-004	0.0363	2.4000e-004	0.0365	9.6500e-003	2.2000e-004	9.8700e-003	0.0000	32.1203	32.1203	8.7000e-004	0.0000	32.1422
Total	0.0253	0.2358	0.1878	8.5000e-004	0.0479	1.8500e-003	0.0498	0.0130	1.7600e-003	0.0148	0.0000	78.6542	78.6542	3.1800e-003	0.0000	78.7338

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0182	4.8400e-003	4.0000e-005	1.0500e-003	9.0000e-005	1.1400e-003	3.0000e-004	9.0000e-005	3.9000e-004	0.0000	4.1700	4.1700	1.9000e-004	0.0000	4.1748
Worker	1.3700e-003	9.8000e-004	0.0103	3.0000e-005	3.2700e-003	2.0000e-005	3.2900e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.8056	2.8056	7.0000e-005	0.0000	2.8073
Total	2.0000e-003	0.0191	0.0152	7.0000e-005	4.3200e-003	1.1000e-004	4.4300e-003	1.1700e-003	1.1000e-004	1.2800e-003	0.0000	6.9756	6.9756	2.6000e-004	0.0000	6.9821

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
	Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0182	4.8400e-003	4.0000e-005	1.0500e-003	9.0000e-005	1.1400e-003	3.0000e-004	9.0000e-005	3.9000e-004	0.0000	4.1700	4.1700	1.9000e-004	0.0000	4.1748
Worker	1.3700e-003	9.8000e-004	0.0103	3.0000e-005	3.2700e-003	2.0000e-005	3.2900e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.8056	2.8056	7.0000e-005	0.0000	2.8073
Total	2.0000e-003	0.0191	0.0152	7.0000e-005	4.3200e-003	1.1000e-004	4.4300e-003	1.1700e-003	1.1000e-004	1.2800e-003	0.0000	6.9756	6.9756	2.6000e-004	0.0000	6.9821

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

Category	tons/yr										MT/yr					
	Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8305	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Unmitigated Construction Off-Site

Category	tons/yr										MT/yr					
	Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948

Total	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8305	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948
Total	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948

3.8 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615
Total	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615
Total	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2777	0.9896	2.3874	6.4300e-003	0.5323	5.9500e-003	0.5382	0.1425	5.5500e-003	0.1480	0.0000	589.0580	589.0580	0.0253	0.0000	589.6895

Unmitigated	0.2777	0.9896	2.3874	6.4300e-003	0.5323	5.9500e-003	0.5382	0.1425	5.5500e-003	0.1480	0.0000	589.0580	589.0580	0.0253	0.0000	589.6895
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4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,358.97	1,358.97	1,358.97	1,431,433	1,431,433
Parking Lot	0.00	0.00	0.00		
Total	1,358.97	1,358.97	1,358.97	1,431,433	1,431,433

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	3.10	3.10	3.10	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.607897	0.037434	0.184004	0.107261	0.014919	0.004991	0.012447	0.020659	0.002115	0.001554	0.005334	0.000623	0.000761
Parking Lot	0.607897	0.037434	0.184004	0.107261	0.014919	0.004991	0.012447	0.020659	0.002115	0.001554	0.005334	0.000623	0.000761

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr									MT/yr							
	Electricity Mitigated						0.0000	0.0000			0.0000	0.0000	0.0000	169.5908	169.5908	0.0170	3.5100e-003
Electricity Unmitigated						0.0000	0.0000			0.0000	0.0000	0.0000	172.0142	172.0142	0.0172	3.5600e-003	173.5048
NaturalGas Mitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155			0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
NaturalGas Unmitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155			0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.30068e+006	171.0934	0.0171	3.5400e-003	172.5761
Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		172.0142	0.0172	3.5600e-003	173.5048

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.28225e+006	168.6700	0.0169	3.4900e-003	170.1316
Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		169.5907	0.0170	3.5100e-003	171.0603

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Unmitigated	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Total	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	tons/yr								MT/yr							
	Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Landscaping	1.8000e-004	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Total	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

7.0 Water Detail

7.1 Mitigation Measures Water

- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	32.7496	0.0396	0.0241	40.9216
Unmitigated	38.8028	0.0469	0.0286	48.4853

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	36.4149 / 0	38.8028	0.0469	0.0286	48.4853
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		38.8028	0.0469	0.0286	48.4853

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	30.7342 / 0	32.7496	0.0396	0.0241	40.9216
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		32.7496	0.0396	0.0241	40.9216

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			

Mitigated	39.6360	2.3424	0.0000	98.1966
Unmitigated	39.6360	2.3424	0.0000	98.1966

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

18-209 Trojan Storage Existing Use - Santa Clara County, Annual

**18-209 Trojan Storage Existing Use
Santa Clara County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	40.00	1000sqft	2.10	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	290	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - PG&E 2020 rate 290
- Land Use - Existing general light industry
- Construction Phase - No construction for existing site
- Off-road Equipment - no equipment for existing land use
- Grading -
- Vehicle Trips - no trip generation for existing site
- Water And Wastewater - assume 100% aerobic

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	3.00	1.00

tblConstructionPhase	PhaseEndDate	7/3/2019	7/1/2019
tblGrading	AcresOfGrading	0.00	1.50
tblLandUse	LotAcreage	0.92	2.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	WorkerTripNumber	0.00	8.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	8.3000e-004	0.0000	8.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281
Maximum	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	8.3000e-004	0.0000	8.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	8.3000e-004	0.0000	8.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281
Maximum	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	8.3000e-004	0.0000	8.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2019	8-31-2019	0.0001	0.0001
		Highest	0.0001	0.0001

2.2 Overall Operational Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004
Energy	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	99.7709	99.7709	5.4300e-003	1.9300e-003	100.4821
Mobile	0.0573	0.2523	0.7330	2.5200e-003	0.2286	2.1500e-003	0.2308	0.0612	2.0100e-003	0.0632	0.0000	230.4942	230.4942	7.7000e-003	0.0000	230.6867
Waste						0.0000	0.0000		0.0000	0.0000	10.0684	0.0000	10.0684	0.5950	0.0000	24.9439
Water						0.0000	0.0000		0.0000	0.0000	3.2727	6.5839	9.8566	0.0119	7.2500e-003	12.3161
Total	0.2401	0.3040	0.7769	2.8300e-003	0.2286	6.0800e-003	0.2347	0.0612	5.9400e-003	0.0671	13.3410	336.8497	350.1907	0.6201	9.1800e-003	368.4296

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004
Energy	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	99.7709	99.7709	5.4300e-003	1.9300e-003	100.4821
Mobile	0.0573	0.2523	0.7330	2.5200e-003	0.2286	2.1500e-003	0.2308	0.0612	2.0100e-003	0.0632	0.0000	230.4942	230.4942	7.7000e-003	0.0000	230.6867
Waste						0.0000	0.0000		0.0000	0.0000	10.0684	0.0000	10.0684	0.5950	0.0000	24.9439
Water						0.0000	0.0000		0.0000	0.0000	3.2727	6.5839	9.8566	0.0119	7.2500e-003	12.3161
Total	0.2401	0.3040	0.7769	2.8300e-003	0.2286	6.0800e-003	0.2347	0.0612	5.9400e-003	0.0671	13.3410	336.8497	350.1907	0.6201	9.1800e-003	368.4296

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/29/2019	7/1/2019	5	1	

Acres of Grading (Site Preparation Phase): 1.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Site Preparation	Scrapers	0	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.0000e-004	0.0000	8.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	8.0000e-004	0.0000	8.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Unmitigated Construction Off-Site

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281
Total	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0281	0.0281	0.0000	0.0000	0.0281

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0573	0.2523	0.7330	2.5200e-003	0.2286	2.1500e-003	0.2308	0.0612	2.0100e-003	0.0632	0.0000	230.4942	230.4942	7.7000e-003	0.0000	230.6867
Unmitigated	0.0573	0.2523	0.7330	2.5200e-003	0.2286	2.1500e-003	0.2308	0.0612	2.0100e-003	0.0632	0.0000	230.4942	230.4942	7.7000e-003	0.0000	230.6867

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	278.80	52.80	27.20	614,766	614,766
Total	278.80	52.80	27.20	614,766	614,766

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.607897	0.037434	0.184004	0.107261	0.014919	0.004991	0.012447	0.020659	0.002115	0.001554	0.005334	0.000623	0.000761

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	43.4614	43.4614	4.3500e-003	9.0000e-004	43.8380
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	43.4614	43.4614	4.3500e-003	9.0000e-004	43.8380
NaturalGas Mitigated	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441
NaturalGas Unmitigated	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.0552e+06	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441

Total		5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441
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Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.0552e+006	5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441
Total		5.6900e-003	0.0517	0.0435	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003	0.0000	56.3095	56.3095	1.0800e-003	1.0300e-003	56.6441

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	330400	43.4614	4.3500e-003	9.0000e-004	43.8380
Total		43.4614	4.3500e-003	9.0000e-004	43.8380

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	330400	43.4614	4.3500e-003	9.0000e-004	43.8380
Total		43.4614	4.3500e-003	9.0000e-004	43.8380

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004
Unmitigated	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	tons/yr								MT/yr							
	Architectural Coating	0.0209					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1562					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004
Total	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr								MT/yr							
Architectural Coating	0.0209					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1562					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004
Total	0.1771	0.0000	3.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.1000e-004	7.1000e-004	0.0000	0.0000	7.6000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			

Mitigated	9.8566	0.0119	7.2500e-003	12.3161
Unmitigated	9.8566	0.0119	7.2500e-003	12.3161

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.25 / 0	9.8566	0.0119	7.2500e-003	12.3161
Total		9.8566	0.0119	7.2500e-003	12.3161

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	9.25 / 0	9.8566	0.0119	7.2500e-003	12.3161
Total		9.8566	0.0119	7.2500e-003	12.3161

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	10.0684	0.5950	0.0000	24.9439
Unmitigated	10.0684	0.5950	0.0000	24.9439

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	49.6	10.0684	0.5950	0.0000	24.9439
Total		10.0684	0.5950	0.0000	24.9439

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
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Land Use	tons	MT/yr			
General Light Industry	49.6	10.0684	0.5950	0.0000	24.9439
Total		10.0684	0.5950	0.0000	24.9439

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

18-209 Trojan Storage Campbell AQ 2030 - Santa Clara County, Annual

18-209 Trojan Storage Campbell AQ 2030
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	157.47	1000sqft	2.10	157,467.00	0
Parking Lot	50.00	Space	0.00	20,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	290	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - PG&E 2020 rate 290
- Land Use - Plans 11-12-18: 157,467-sqft for building, 50 parking spaces all on 2.1 acre site
- Construction Phase - Construction Schedule provided
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment - default equipment used
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment -

Off-road Equipment - default trenching equipment

Trips and VMT -

Demolition - 40,000 square feet of of building demo provided in construction data sheet

Grading - no grading information

Vehicle Trips - trip gen: 207 trips/24hrs = 8.63 across all the days, 3.1 trip lengths

Energy Use -

Water And Wastewater - assume 100% aerobic

Energy Mitigation -

Water Mitigation - Low-flow sinks, toilets, water-efficient irrigation systems

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	43.00
tblConstructionPhase	NumDays	220.00	133.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	6.00	11.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	157,470.00	157,467.00
tblLandUse	LotAcreage	3.62	2.10
tblLandUse	LotAcreage	0.45	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	CC_TL	7.30	3.10
tblVehicleTrips	CNW_TL	7.30	3.10
tblVehicleTrips	CW_TL	9.50	3.10
tblVehicleTrips	ST_TR	1.32	8.63
tblVehicleTrips	SU_TR	0.68	8.63
tblVehicleTrips	WD_TR	6.97	8.63
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00

tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2075	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2978	240.2978	0.0379	0.0000	241.2450
2020	0.8528	0.2159	0.2116	4.0000e-004	7.5300e-003	0.0113	0.0189	2.0300e-003	0.0108	0.0129	0.0000	35.1683	35.1683	5.7700e-003	0.0000	35.3127
Maximum	0.8528	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2978	240.2978	0.0379	0.0000	241.2450

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2075	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2976	240.2976	0.0379	0.0000	241.2448
2020	0.8528	0.2159	0.2116	4.0000e-004	7.5300e-003	0.0113	0.0189	2.0300e-003	0.0108	0.0129	0.0000	35.1683	35.1683	5.7700e-003	0.0000	35.3127
Maximum	0.8528	1.6891	1.2849	2.7400e-003	0.1103	0.0817	0.1920	0.0357	0.0779	0.1135	0.0000	240.2976	240.2976	0.0379	0.0000	241.2448

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2019	8-31-2019	0.7906	0.7906
2	9-1-2019	11-30-2019	0.8373	0.8373
3	12-1-2019	2-29-2020	1.0759	1.0759
4	3-1-2020	5-31-2020	0.2898	0.2898
		Highest	1.0759	1.0759

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	393.6864	393.6864	0.0215	7.6200e-003	396.4943
Mobile	0.1632	0.6793	1.3742	5.0100e-003	0.5322	3.6500e-003	0.5358	0.1424	3.3900e-003	0.1458	0.0000	462.1870	462.1870	0.0156	0.0000	462.5763
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	12.8837	25.9192	38.8028	0.0469	0.0286	48.4853
Total	0.8846	0.8830	1.5472	6.2300e-003	0.5322	0.0191	0.5513	0.1424	0.0189	0.1613	52.5197	881.7963	934.3159	2.4264	0.0362	1,005.7564

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	391.2629	391.2629	0.0212	7.5700e-003	394.0498
Mobile	0.1632	0.6793	1.3742	5.0100e-003	0.5322	3.6500e-003	0.5358	0.1424	3.3900e-003	0.1458	0.0000	462.1870	462.1870	0.0156	0.0000	462.5763
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	10.8738	21.8758	32.7496	0.0396	0.0241	40.9216
Total	0.8846	0.8830	1.5472	6.2300e-003	0.5322	0.0191	0.5513	0.1424	0.0189	0.1613	50.5098	875.3294	925.8392	2.4188	0.0317	995.7482

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83	0.73	0.91	0.31	12.44	1.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2019	6/10/2019	5	6	
2	Site Preparation	Site Preparation	6/10/2019	6/15/2019	5	5	
3	Grading	Grading	6/15/2019	7/1/2019	5	11	
4	Trenching	Trenching	7/1/2019	7/15/2019	5	11	
5	Building Construction	Building Construction	7/15/2019	1/15/2020	5	133	
6	Architectural Coating	Architectural Coating	1/15/2020	3/15/2020	5	43	
7	Paving	Paving	3/15/2020	3/30/2020	5	11	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 236,201; Non-Residential Outdoor: 78,734; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Trenching	Excavators	1	7.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	182.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Worker	1.4000e-004	1.1000e-004	1.0900e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2738	0.2738	1.0000e-005	0.0000	0.2740
Total	9.7000e-004	0.0284	6.6900e-003	7.0000e-005	1.8500e-003	1.1000e-004	1.9600e-003	5.0000e-004	1.0000e-004	6.1000e-004	0.0000	7.2867	7.2867	3.4000e-004	0.0000	7.2951

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8900e-003	0.0680	0.0447	7.0000e-005		3.8600e-003	3.8600e-003		3.6100e-003	3.6100e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657
Total	6.8900e-003	0.0680	0.0447	7.0000e-005	0.0197	3.8600e-003	0.0236	2.9800e-003	3.6100e-003	6.5900e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.3000e-004	0.0283	5.6000e-003	7.0000e-005	1.5400e-003	1.1000e-004	1.6500e-003	4.2000e-004	1.0000e-004	5.3000e-004	0.0000	7.0129	7.0129	3.3000e-004	0.0000	7.0211
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.1000e-004	1.0900e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2738	0.2738	1.0000e-005	0.0000	0.2740
Total	9.7000e-004	0.0284	6.6900e-003	7.0000e-005	1.8500e-003	1.1000e-004	1.9600e-003	5.0000e-004	1.0000e-004	6.1000e-004	0.0000	7.2867	7.2867	3.4000e-004	0.0000	7.2951

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	4.3900e-003	0.0539	0.0298	6.0000e-005	3.9800e-003	2.1300e-003	6.1100e-003	4.3000e-004	1.9600e-003	2.3900e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405
Total	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	4.3900e-003	0.0539	0.0298	6.0000e-005	3.9800e-003	2.1300e-003	6.1100e-003	4.3000e-004	1.9600e-003	2.3900e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405
Total	7.0000e-005	5.0000e-005	5.6000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1404	0.1404	0.0000	0.0000	0.1405

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0185	0.0000	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1251	0.0558	1.1000e-004		5.9000e-003	5.9000e-003		5.4300e-003	5.4300e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654
Total	0.0112	0.1251	0.0558	1.1000e-004	0.0360	5.9000e-003	0.0419	0.0185	5.4300e-003	0.0240	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864
Total	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0185	0.0000	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1251	0.0558	1.1000e-004		5.9000e-003	5.9000e-003		5.4300e-003	5.4300e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654
Total	0.0112	0.1251	0.0558	1.1000e-004	0.0360	5.9000e-003	0.0419	0.0185	5.4300e-003	0.0240	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864
Total	2.0000e-004	1.5000e-004	1.5400e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3862	0.3862	1.0000e-005	0.0000	0.3864

3.5 Trenching - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932

Total	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932
Total	1.0000e-004	7.0000e-005	7.7000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1931	0.1931	1.0000e-005	0.0000	0.1932

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156
Total	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.6700e-003	0.2234	0.0600	4.9000e-004	0.0116	1.6100e-003	0.0132	3.3600e-003	1.5400e-003	4.9000e-003	0.0000	46.5339	46.5339	2.3100e-003	0.0000	46.5916
Worker	0.0166	0.0124	0.1278	3.6000e-004	0.0363	2.4000e-004	0.0365	9.6500e-003	2.2000e-004	9.8700e-003	0.0000	32.1203	32.1203	8.7000e-004	0.0000	32.1422
Total	0.0253	0.2358	0.1878	8.5000e-004	0.0479	1.8500e-003	0.0498	0.0130	1.7600e-003	0.0148	0.0000	78.6542	78.6542	3.1800e-003	0.0000	78.7338

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154
Total	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.6700e-003	0.2234	0.0600	4.9000e-004	0.0116	1.6100e-003	0.0132	3.3600e-003	1.5400e-003	4.9000e-003	0.0000	46.5339	46.5339	2.3100e-003	0.0000	46.5916
Worker	0.0166	0.0124	0.1278	3.6000e-004	0.0363	2.4000e-004	0.0365	9.6500e-003	2.2000e-004	9.8700e-003	0.0000	32.1203	32.1203	8.7000e-004	0.0000	32.1422
Total	0.0253	0.2358	0.1878	8.5000e-004	0.0479	1.8500e-003	0.0498	0.0130	1.7600e-003	0.0148	0.0000	78.6542	78.6542	3.1800e-003	0.0000	78.7338

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0182	4.8400e-003	4.0000e-005	1.0500e-003	9.0000e-005	1.1400e-003	3.0000e-004	9.0000e-005	3.9000e-004	0.0000	4.1700	4.1700	1.9000e-004	0.0000	4.1748
Worker	1.3700e-003	9.8000e-004	0.0103	3.0000e-005	3.2700e-003	2.0000e-005	3.2900e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.8056	2.8056	7.0000e-005	0.0000	2.8073
Total	2.0000e-003	0.0191	0.0152	7.0000e-005	4.3200e-003	1.1000e-004	4.4300e-003	1.1700e-003	1.1000e-004	1.2800e-003	0.0000	6.9756	6.9756	2.6000e-004	0.0000	6.9821

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
	Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0182	4.8400e-003	4.0000e-005	1.0500e-003	9.0000e-005	1.1400e-003	3.0000e-004	9.0000e-005	3.9000e-004	0.0000	4.1700	4.1700	1.9000e-004	0.0000	4.1748
Worker	1.3700e-003	9.8000e-004	0.0103	3.0000e-005	3.2700e-003	2.0000e-005	3.2900e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.8056	2.8056	7.0000e-005	0.0000	2.8073
Total	2.0000e-003	0.0191	0.0152	7.0000e-005	4.3200e-003	1.1000e-004	4.4300e-003	1.1700e-003	1.1000e-004	1.2800e-003	0.0000	6.9756	6.9756	2.6000e-004	0.0000	6.9821

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8305	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948

Total	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8305	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948
Total	1.0700e-003	7.7000e-004	8.0700e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.1935	2.1935	5.0000e-005	0.0000	2.1948

3.8 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615
Total	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615
Total	2.7000e-004	2.0000e-004	2.0600e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5611	0.5611	1.0000e-005	0.0000	0.5615

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1632	0.6793	1.3742	5.0100e-003	0.5322	3.6500e-003	0.5358	0.1424	3.3900e-003	0.1458	0.0000	462.1870	462.1870	0.0156	0.0000	462.5763

Unmitigated	0.1632	0.6793	1.3742	5.0100e-003	0.5322	3.6500e-003	0.5358	0.1424	3.3900e-003	0.1458	0.0000	462.1870	462.1870	0.0156	0.0000	462.5763
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4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,358.97	1,358.97	1,358.97	1,431,433	1,431,433
Parking Lot	0.00	0.00	0.00		
Total	1,358.97	1,358.97	1,358.97	1,431,433	1,431,433

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	3.10	3.10	3.10	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Parking Lot	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr									MT/yr							
	Electricity Mitigated						0.0000	0.0000			0.0000	0.0000	0.0000	169.5908	169.5908	0.0170	3.5100e-003
Electricity Unmitigated						0.0000	0.0000			0.0000	0.0000	0.0000	172.0142	172.0142	0.0172	3.5600e-003	173.5048
NaturalGas Mitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155			0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
NaturalGas Unmitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155			0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.30068e+006	171.0934	0.0171	3.5400e-003	172.5761
Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		172.0142	0.0172	3.5600e-003	173.5048

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.28225e+006	168.6700	0.0169	3.4900e-003	170.1316
Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		169.5907	0.0170	3.5100e-003	171.0603

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Unmitigated	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.7000e-004	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Total	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	tons/yr								MT/yr							
	Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Landscaping	1.7000e-004	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Total	0.6990	2.0000e-005	1.9000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

7.0 Water Detail

7.1 Mitigation Measures Water

- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	32.7496	0.0396	0.0241	40.9216
Unmitigated	38.8028	0.0469	0.0286	48.4853

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	36.4149 / 0	38.8028	0.0469	0.0286	48.4853
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		38.8028	0.0469	0.0286	48.4853

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	30.7342 / 0	32.7496	0.0396	0.0241	40.9216
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		32.7496	0.0396	0.0241	40.9216

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			

Mitigated	39.6360	2.3424	0.0000	98.1966
Unmitigated	39.6360	2.3424	0.0000	98.1966

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

18-209 Trojan Storage Campbell TAC - Santa Clara County, Annual

18-209 Trojan Storage Campbell TAC
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	157.47	1000sqft	2.10	157,467.00	0
Parking Lot	50.00	Space	0.00	20,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	290	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - PG&E 2020 rate 290
- Land Use - Plans 11-12-18: 157,467-sqft for building, 50 parking spaces all on 2.1 acre site
- Construction Phase - Construction Schedule provided
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment - default equipment used
- Off-road Equipment -
- Off-road Equipment -
- Off-road Equipment -

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	43.00
tblConstructionPhase	NumDays	220.00	133.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	6.00	11.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	3.00	5.00

tblLandUse	LandUseSquareFeet	157,470.00	157,467.00
tblLandUse	LotAcreage	3.62	2.10
tblLandUse	LotAcreage	0.45	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblVehicleTrips	ST_TR	1.32	1.63
tblVehicleTrips	SU_TR	0.68	0.84
tblVehicleTrips	WD_TR	6.97	8.63
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AnaerobicandFacultativeLagoonsPerce nt	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPerce nt	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1907	1.5617	1.1599	2.0200e-003	0.0649	0.0801	0.1451	0.0234	0.0764	0.0997	0.0000	172.9597	172.9597	0.0362	0.0000	173.8647
2020	0.8506	0.2069	0.1946	3.2000e-004	7.6000e-004	0.0112	0.0120	2.1000e-004	0.0107	0.0109	0.0000	27.3833	27.3833	5.6000e-003	0.0000	27.5233
Maximum	0.8506	1.5617	1.1599	2.0200e-003	0.0649	0.0801	0.1451	0.0234	0.0764	0.0997	0.0000	172.9597	172.9597	0.0362	0.0000	173.8647

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0604	1.1103	1.1895	2.0200e-003	0.0321	8.9300e-003	0.0410	6.3700e-003	8.9100e-003	0.0153	0.0000	172.9595	172.9595	0.0362	0.0000	173.8645
2020	0.8340	0.1639	0.2038	3.2000e-004	7.6000e-004	1.4400e-003	2.2000e-003	2.1000e-004	1.4400e-003	1.6500e-003	0.0000	27.3833	27.3833	5.6000e-003	0.0000	27.5233
Maximum	0.8340	1.1103	1.1895	2.0200e-003	0.0321	8.9300e-003	0.0410	6.3700e-003	8.9100e-003	0.0153	0.0000	172.9595	172.9595	0.0362	0.0000	173.8645

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	14.11	27.96	-2.87	0.00	50.00	88.65	72.48	72.09	88.12	84.69	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2019	8-31-2019	0.7345	0.4545
2	9-1-2019	11-30-2019	0.7703	0.5386
3	12-1-2019	2-29-2020	1.0418	0.9256
4	3-1-2020	5-31-2020	0.2890	0.2665
		Highest	1.0418	0.9256

2.2 Overall Operational Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	393.6864	393.6864	0.0215	7.6200e-003	396.4943
Mobile	0.2793	1.2295	3.5726	0.0123	1.1141	0.0105	1.1246	0.2982	9.8200e-003	0.3081	0.0000	1,123.3514	1,123.3514	0.0375	0.0000	1,124.2895
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	12.8837	25.9192	38.8028	0.0469	0.0286	48.4853
Total	1.0007	1.4331	3.7456	0.0135	1.1141	0.0260	1.1401	0.2982	0.0253	0.3236	52.5197	1,542.9607	1,595.4804	2.4483	0.0362	1,667.4696

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Energy	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	393.6864	393.6864	0.0215	7.6200e-003	396.4943
Mobile	0.2793	1.2295	3.5726	0.0123	1.1141	0.0105	1.1246	0.2982	9.8200e-003	0.3081	0.0000	1,123.3514	1,123.3514	0.0375	0.0000	1,124.2895
Waste						0.0000	0.0000		0.0000	0.0000	39.6360	0.0000	39.6360	2.3424	0.0000	98.1966
Water						0.0000	0.0000		0.0000	0.0000	12.8837	25.9192	38.8028	0.0469	0.0286	48.4853
Total	1.0007	1.4331	3.7456	0.0135	1.1141	0.0260	1.1401	0.2982	0.0253	0.3236	52.5197	1,542.9607	1,595.4804	2.4483	0.0362	1,667.4696

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2019	6/10/2019	5	6	
2	Site Preparation	Site Preparation	6/10/2019	6/15/2019	5	5	
3	Grading	Grading	6/15/2019	7/1/2019	5	11	
4	Trenching	Trenching	7/1/2019	7/15/2019	5	11	
5	Building Construction	Building Construction	7/15/2019	1/15/2020	5	133	
6	Architectural Coating	Architectural Coating	1/15/2020	3/15/2020	5	43	
7	Paving	Paving	3/15/2020	3/30/2020	5	11	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 236,201; Non-Residential Outdoor: 78,734; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Trenching	Excavators	1	7.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	182.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	75.00	29.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	15.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0197	0.0000	0.0197	2.9800e-003	0.0000	2.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8900e-003	0.0680	0.0447	7.0000e-005		3.8600e-003	3.8600e-003		3.6100e-003	3.6100e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657
Total	6.8900e-003	0.0680	0.0447	7.0000e-005	0.0197	3.8600e-003	0.0236	2.9800e-003	3.6100e-003	6.5900e-003	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	9.7500e-003	1.6300e-003	1.0000e-005	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	1.1789	1.1789	1.4000e-004	0.0000	1.1824
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	2.0000e-005	2.9000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0327	0.0327	0.0000	0.0000	0.0328
Total	2.7000e-004	9.7700e-003	1.9200e-003	1.0000e-005	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	1.2116	1.2116	1.4000e-004	0.0000	1.2151

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.8600e-003	0.0000	8.8600e-003	6.7000e-004	0.0000	6.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6900e-003	0.0363	0.0463	7.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657
Total	1.6900e-003	0.0363	0.0463	7.0000e-005	8.8600e-003	3.2000e-004	9.1800e-003	6.7000e-004	3.2000e-004	9.9000e-004	0.0000	6.4248	6.4248	1.6400e-003	0.0000	6.4657

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
	Hauling	2.2000e-004	9.7500e-003	1.6300e-003	1.0000e-005	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	1.1789	1.1789	1.4000e-004	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	2.0000e-005	2.9000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0327	0.0327	0.0000	0.0000	0.0328
Total	2.7000e-004	9.7700e-003	1.9200e-003	1.0000e-005	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	1.2116	1.2116	1.4000e-004	0.0000	1.2151

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	4.3900e-003	0.0539	0.0298	6.0000e-005	3.9800e-003	2.1300e-003	6.1100e-003	4.3000e-004	1.9600e-003	2.3900e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168

Total	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.7900e-003	0.0000	1.7900e-003	1.0000e-004	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0297	0.0341	6.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	1.5000e-003	0.0297	0.0341	6.0000e-005	1.7900e-003	1.9000e-004	1.9800e-003	1.0000e-004	1.9000e-004	2.9000e-004	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168
Total	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0185	0.0000	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1251	0.0558	1.1000e-004	5.9000e-003	5.9000e-003	5.4300e-003	5.4300e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654		
Total	0.0112	0.1251	0.0558	1.1000e-004	0.0360	5.9000e-003	0.0419	0.0185	5.4300e-003	0.0240	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	3.0000e-005	4.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0461	0.0461	0.0000	0.0000	0.0462
Total	7.0000e-005	3.0000e-005	4.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0461	0.0461	0.0000	0.0000	0.0462

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0162	0.0000	0.0162	4.1700e-003	0.0000	4.1700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7700e-003	0.0562	0.0668	1.1000e-004		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654
Total	2.7700e-003	0.0562	0.0668	1.1000e-004	0.0162	4.0000e-004	0.0166	4.1700e-003	4.0000e-004	4.5700e-003	0.0000	10.1849	10.1849	3.2200e-003	0.0000	10.2654

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	3.0000e-005	4.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0461	0.0461	0.0000	0.0000	0.0462
Total	7.0000e-005	3.0000e-005	4.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0461	0.0461	0.0000	0.0000	0.0462

3.5 Trenching - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	2.3800e-003	0.0242	0.0268	4.0000e-005		1.3700e-003	1.3700e-003		1.2600e-003	1.2600e-003	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231
Total	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8000e-004	0.0202	0.0301	4.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024
Total	9.8000e-004	0.0202	0.0301	4.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	3.5742	3.5742	1.1300e-003	0.0000	3.6024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231
Total	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156
Total	0.1560	1.1535	0.9305	1.5300e-003		0.0665	0.0665		0.0637	0.0637	0.0000	127.9501	127.9501	0.0266	0.0000	128.6156

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8500e-003	0.1245	0.0359	1.5000e-004	1.6300e-003	3.0000e-004	1.9400e-003	4.8000e-004	2.9000e-004	7.7000e-004	0.0000	14.1871	14.1871	1.5200e-003	0.0000	14.2253
Worker	5.6100e-003	2.6600e-003	0.0338	4.0000e-005	3.4000e-003	5.0000e-005	3.4500e-003	9.1000e-004	4.0000e-005	9.5000e-004	0.0000	3.8376	3.8376	1.9000e-004	0.0000	3.8423

Total	9.4600e-003	0.1272	0.0697	1.9000e-004	5.0300e-003	3.5000e-004	5.3900e-003	1.3900e-003	3.3000e-004	1.7200e-003	0.0000	18.0248	18.0248	1.7100e-003	0.0000	18.0675
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0436	0.8310	0.9399	1.5300e-003		7.4800e-003	7.4800e-003		7.4800e-003	7.4800e-003	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154
Total	0.0436	0.8310	0.9399	1.5300e-003		7.4800e-003	7.4800e-003		7.4800e-003	7.4800e-003	0.0000	127.9500	127.9500	0.0266	0.0000	128.6154

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8500e-003	0.1245	0.0359	1.5000e-004	1.6300e-003	3.0000e-004	1.9400e-003	4.8000e-004	2.9000e-004	7.7000e-004	0.0000	14.1871	14.1871	1.5200e-003	0.0000	14.2253
Worker	5.6100e-003	2.6600e-003	0.0338	4.0000e-005	3.4000e-003	5.0000e-005	3.4500e-003	9.1000e-004	4.0000e-005	9.5000e-004	0.0000	3.8376	3.8376	1.9000e-004	0.0000	3.8423
Total	9.4600e-003	0.1272	0.0697	1.9000e-004	5.0300e-003	3.5000e-004	5.3900e-003	1.3900e-003	3.3000e-004	1.7200e-003	0.0000	18.0248	18.0248	1.7100e-003	0.0000	18.0675

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	0.0126	0.0959	0.0819	1.4000e-004		5.2200e-003	5.2200e-003		5.0000e-003	5.0000e-003	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-004	0.0107	2.9600e-003	1.0000e-005	1.5000e-004	2.0000e-005	1.6000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	1.2804	1.2804	1.2000e-004	0.0000	1.2836
Worker	4.6000e-004	2.1000e-004	2.7000e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.3355	0.3355	1.0000e-005	0.0000	0.3358
Total	7.6000e-004	0.0109	5.6600e-003	1.0000e-005	4.6000e-004	2.0000e-005	4.7000e-004	1.2000e-004	2.0000e-005	1.5000e-004	0.0000	1.6159	1.6159	1.3000e-004	0.0000	1.6194

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	3.9300e-003	0.0749	0.0847	1.4000e-004		6.7000e-004	6.7000e-004		6.7000e-004	6.7000e-004	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784
Total	3.9300e-003	0.0749	0.0847	1.4000e-004		6.7000e-004	6.7000e-004		6.7000e-004	6.7000e-004	0.0000	11.4204	11.4204	2.3200e-003	0.0000	11.4784

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-004	0.0107	2.9600e-003	1.0000e-005	1.5000e-004	2.0000e-005	1.6000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	1.2804	1.2804	1.2000e-004	0.0000	1.2836
Worker	4.6000e-004	2.1000e-004	2.7000e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.3355	0.3355	1.0000e-005	0.0000	0.3358
Total	7.6000e-004	0.0109	5.6600e-003	1.0000e-005	4.6000e-004	2.0000e-005	4.7000e-004	1.2000e-004	2.0000e-005	1.5000e-004	0.0000	1.6159	1.6159	1.3000e-004	0.0000	1.6194

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8305	0.0362	0.0394	6.0000e-005		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	1.6000e-004	2.1100e-003	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	7.0000e-005	0.0000	0.2623	0.2623	1.0000e-005	0.0000	0.2625
Total	3.6000e-004	1.6000e-004	2.1100e-003	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	7.0000e-005	0.0000	0.2623	0.2623	1.0000e-005	0.0000	0.2625

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8253					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2800e-003	0.0292	0.0394	6.0000e-005		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001
Total	0.8266	0.0292	0.0394	6.0000e-005		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	5.4895	5.4895	4.3000e-004	0.0000	5.5001

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	1.6000e-004	2.1100e-003	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	7.0000e-005	0.0000	0.2623	0.2623	1.0000e-005	0.0000	0.2625
Total	3.6000e-004	1.6000e-004	2.1100e-003	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	7.0000e-005	0.0000	0.2623	0.2623	1.0000e-005	0.0000	0.2625

3.8 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3500e-003	0.0637	0.0649	1.0000e-004		3.6100e-003	3.6100e-003		3.3300e-003	3.3300e-003	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	4.0000e-005	5.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0671	0.0671	0.0000	0.0000	0.0672

Total	9.0000e-005	4.0000e-005	5.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0671	0.0671	0.0000	0.0000	0.0672
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3100e-003	0.0487	0.0714	1.0000e-004		4.4000e-004	4.4000e-004		4.4000e-004	4.4000e-004	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.3100e-003	0.0487	0.0714	1.0000e-004		4.4000e-004	4.4000e-004		4.4000e-004	4.4000e-004	0.0000	8.5282	8.5282	2.7000e-003	0.0000	8.5957

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	4.0000e-005	5.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0671	0.0671	0.0000	0.0000	0.0672
Total	9.0000e-005	4.0000e-005	5.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0671	0.0671	0.0000	0.0000	0.0672

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2793	1.2295	3.5726	0.0123	1.1141	0.0105	1.1246	0.2982	9.8200e-003	0.3081	0.0000	1,123.3514	1,123.3514	0.0375	0.0000	1,124.2895
Unmitigated	0.2793	1.2295	3.5726	0.0123	1.1141	0.0105	1.1246	0.2982	9.8200e-003	0.3081	0.0000	1,123.3514	1,123.3514	0.0375	0.0000	1,124.2895

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,358.97	256.68	132.27	2,996,161	2,996,161
Parking Lot	0.00	0.00	0.00		
Total	1,358.97	256.68	132.27	2,996,161	2,996,161

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.607897	0.037434	0.184004	0.107261	0.014919	0.004991	0.012447	0.020659	0.002115	0.001554	0.005334	0.000623	0.000761
Parking Lot	0.607897	0.037434	0.184004	0.107261	0.014919	0.004991	0.012447	0.020659	0.002115	0.001554	0.005334	0.000623	0.000761

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	172.0142	172.0142	0.0172	3.5600e-003	173.5048
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	172.0142	172.0142	0.0172	3.5600e-003	173.5048
NaturalGas Mitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
NaturalGas Unmitigated	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.15398e+006	0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0224	0.2036	0.1711	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	221.6722	221.6722	4.2500e-003	4.0600e-003	222.9895

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.30068e+006	171.0934	0.0171	3.5400e-003	172.5761
Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		172.0142	0.0172	3.5600e-003	173.5048

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.30068e+006	171.0934	0.0171	3.5400e-003	172.5761

Parking Lot	7000	0.9208	9.0000e-005	2.0000e-005	0.9288
Total		172.0142	0.0172	3.5600e-003	173.5048

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
Unmitigated	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003

Total	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003
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Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating	0.0825					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6163					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003	
Total	0.6990	2.0000e-005	1.9100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.7100e-003	3.7100e-003	1.0000e-005	0.0000	3.9500e-003	

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	38.8028	0.0469	0.0286	48.4853
Unmitigated	38.8028	0.0469	0.0286	48.4853

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	36.4149 / 0	38.8028	0.0469	0.0286	48.4853
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		38.8028	0.0469	0.0286	48.4853

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	36.4149 / 0	38.8028	0.0469	0.0286	48.4853
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		38.8028	0.0469	0.0286	48.4853

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	39.6360	2.3424	0.0000	98.1966
Unmitigated	39.6360	2.3424	0.0000	98.1966

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	195.26	39.6360	2.3424	0.0000	98.1966

Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		39.6360	2.3424	0.0000	98.1966

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Attachment 3: Construction Health Risk Calculations

Trojan Storage Facility, Campbell, CA

DPM Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions			Modeled Area (m ²)	DPM Emission Rate (g/s/m ²)
				(lb/yr)	(lb/hr)	(g/s)		
2019-2020	Construction	0.0913	CON_DPM	182.6	0.06253	7.88E-03	7,848	1.00E-06

Construction Hours

hr/day =	8	(8am - 4pm)
days/yr =	365	
hours/year =	2920	

PM2.5 Fugitive Dust Emissions for Modeling

Construction Year	Activity	Area Source	Area (ton/year)	PM2.5 Emissions			Modeled Area (m ²)	PM2.5 Emission Rate (g/s/m ²)
				(lb/yr)	(lb/hr)	(g/s)		
2019-2020	Construction	CON_FUG	0.02361	47.2	0.01617	2.04E-03	7,848	2.60E-07

Construction Hours

hr/day =	8	(8am - 4pm)
days/yr =	365	
hours/year =	2920	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions			Modeled Area (m ²)	DPM Emission Rate (g/s/m ²)
				(lb/yr)	(lb/hr)	(g/s)		
2019-2020	Construction	0.010370	CON_DPM	20.7	0.00710	8.95E-04	7,848	1.14E-07

Construction Hours

hr/day =	8	(8am - 4pm)
days/yr =	365	
hours/year =	2920	

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction Year	Activity	Area Source	Area (ton/year)	PM2.5 Emissions			Modeled Area (m ²)	PM2.5 Emission Rate (g/s/m ²)
				(lb/yr)	(lb/hr)	(g/s)		
2019-2020	Construction	CON_FUG	0.00658	13.2	0.00451	5.68E-04	7,848	7.24E-08

Construction Hours

hr/day =	8	(8am - 4pm)
days/yr =	365	
hours/year =	2920	

Trojan Storage Facility, Campbell, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Unmitigated

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu\text{g}/\text{m}^3$)
	Exhaust PM10/DPM ($\mu\text{g}/\text{m}^3$)	Fugitive PM2.5 ($\mu\text{g}/\text{m}^3$)	Infant/Child	Adult		
	2019-2020	0.4010	0.2176	65.9	1.2	0.080

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu\text{g}/\text{m}^3$)
	Exhaust PM10/DPM ($\mu\text{g}/\text{m}^3$)	Fugitive PM2.5 ($\mu\text{g}/\text{m}^3$)	Infant/Child	Adult		
	2019-2020	0.0457	0.0605	7.5	0.1	0.009

**Trojan Storage Facility, Campbell, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height**

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor (mg/kg-day)⁻¹
 ASF = Age sensitivity factor for specified age group
 ED = Exposure duration (years)
 AT = Averaging time for lifetime cancer risk (years)
 FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10⁻⁶

Where: C_{air} = concentration in air (µg/m³)
 DBR = daily breathing rate (L/kg body weight-day)
 A = Inhalation absorption factor
 EF = Exposure frequency (days/year)
 10⁻⁶ = Conversion factor

Values

Age --> Parameter	Infant/Child				Adult
	3rd Trimester	0 - 2	2 - 9	2 - 16	16 - 30
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk (per million)	Adult - Exposure Information		Adult Cancer Risk (per million)	Maximum			
			DPM Conc (ug/m3)			Age Sensitivity Factor	Modeled		Age Sensitivity Factor	Fugitive PM2.5	Total PM2.5	
			Year	Annual			Year					Annual
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2019-2020	0.4010	10	65.86	2019-2020	0.4010	1	1.15		
2	1	1 - 2			10	0.00			1	0.00		
3	1	2 - 3			3	0.00			1	0.00		
4	1	3 - 4			3	0.00			1	0.00		
5	1	4 - 5			3	0.00			1	0.00		
6	1	5 - 6			3	0.00			1	0.00		
7	1	6 - 7			3	0.00			1	0.00		
8	1	7 - 8			3	0.00			1	0.00		
9	1	8 - 9			3	0.00			1	0.00		
10	1	9 - 10			3	0.00			1	0.00		
11	1	10 - 11			3	0.00			1	0.00		
12	1	11 - 12			3	0.00			1	0.00		
13	1	12 - 13			3	0.00			1	0.00		
14	1	13 - 14			3	0.00			1	0.00		
15	1	14 - 15			3	0.00			1	0.00		
16	1	15 - 16			3	0.00			1	0.00		
17	1	16-17			1	0.00			1	0.00		
18	1	17-18			1	0.00			1	0.00		
19	1	18-19			1	0.00			1	0.00		
20	1	19-20			1	0.00			1	0.00		
21	1	20-21			1	0.00			1	0.00		
22	1	21-22			1	0.00			1	0.00		
23	1	22-23			1	0.00			1	0.00		
24	1	23-24			1	0.00			1	0.00		
25	1	24-25			1	0.00			1	0.00		
26	1	25-26			1	0.00			1	0.00		
27	1	26-27			1	0.00			1	0.00		
28	1	27-28			1	0.00			1	0.00		
29	1	28-29			1	0.00			1	0.00		
30	1	29-30			1	0.00			1	0.00		
Total Increased Cancer Risk						65.9				1.15		

* Third trimester of pregnancy

**Trojan Storage Facility, Campbell, CA- Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height**

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor (mg/kg-day)⁻¹
 ASF = Age sensitivity factor for specified age group
 ED = Exposure duration (years)
 AT = Averaging time for lifetime cancer risk (years)
 FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10⁻⁶

Where: C_{air} = concentration in air (µg/m³)
 DBR = daily breathing rate (L/kg body weight-day)
 A = Inhalation absorption factor
 EF = Exposure frequency (days/year)
 10⁻⁶ = Conversion factor

Values

Age --> Parameter	Infant/Child				Adult
	3rd Trimester	0 - 2	2 - 9	2 - 16	16 - 30
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information			Infant/Child Cancer Risk (per million)	Adult - Exposure Information			Adult Cancer Risk (per million)	Maximum	
			DPM Conc (ug/m3)		Age Sensitivity Factor		Modeled		Age Sensitivity Factor		Fugitive PM2.5	Total PM2.5
			Year	Annual			Year	Annual				
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2019-2020	0.0457	10	7.51	2019-2020	0.0457	1	0.13	0.0605	0.1062
2	1	1 - 2			10	0.00			1	0.00		
3	1	2 - 3			3	0.00			1	0.00		
4	1	3 - 4			3	0.00			1	0.00		
5	1	4 - 5			3	0.00			1	0.00		
6	1	5 - 6			3	0.00			1	0.00		
7	1	6 - 7			3	0.00			1	0.00		
8	1	7 - 8			3	0.00			1	0.00		
9	1	8 - 9			3	0.00			1	0.00		
10	1	9 - 10			3	0.00			1	0.00		
11	1	10 - 11			3	0.00			1	0.00		
12	1	11 - 12			3	0.00			1	0.00		
13	1	12 - 13			3	0.00			1	0.00		
14	1	13 - 14			3	0.00			1	0.00		
15	1	14 - 15			3	0.00			1	0.00		
16	1	15 - 16			3	0.00			1	0.00		
17	1	16-17			1	0.00			1	0.00		
18	1	17-18			1	0.00			1	0.00		
19	1	18-19			1	0.00			1	0.00		
20	1	19-20			1	0.00			1	0.00		
21	1	20-21			1	0.00			1	0.00		
22	1	21-22			1	0.00			1	0.00		
23	1	22-23			1	0.00			1	0.00		
24	1	23-24			1	0.00			1	0.00		
25	1	24-25			1	0.00			1	0.00		
26	1	25-26			1	0.00			1	0.00		
27	1	26-27			1	0.00			1	0.00		
28	1	27-28			1	0.00			1	0.00		
29	1	28-29			1	0.00			1	0.00		
30	1	29-30			1	0.00			1	0.00		
Total Increased Cancer Risk						7.5				0.13		

* Third trimester of pregnancy

**Trojan Storage Facility, Campbell, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height**

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor (mg/kg-day)⁻¹
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10⁻⁶

Where: C_{air} = concentration in air (µg/m³)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10⁻⁶ = Conversion factor

Values

Age --> Parameter	Infant/Child				Adult
	3rd Trimester	0 - 2	2 - 9	2 - 16	16 - 30
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk (per million)	Adult - Exposure Information		Adult Cancer Risk (per million)	Maximum		
			DPM Conc (ug/m3)			Age Sensitivity Factor	Modeled		Fugitive PM2.5	Total PM2.5	
			Year	Annual			DPM Conc (ug/m3)				Annual
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	
1	1	0 - 1	2019	0.0148	10	2.44	2019	0.0148	1	0.04	
2	1	1 - 2	2020		10	0.00	2020		1	0.00	
3	1	2 - 3	2021		3	0.00	2021		1	0.00	
4	1	3 - 4	2022		3	0.00	2022		1	0.00	
5	1	4 - 5	2023		3	0.00	2023		1	0.00	
6	1	5 - 6	2024		3	0.00	2024		1	0.00	
7	1	6 - 7	2025		3	0.00	2025		1	0.00	
8	1	7 - 8	2026		3	0.00	2026		1	0.00	
9	1	8 - 9	2027		3	0.00	2027		1	0.00	
10	1	9 - 10	2028		3	0.00	2028		1	0.00	
11	1	10 - 11	2029		3	0.00	2029		1	0.00	
12	1	11 - 12	2030		3	0.00	2030		1	0.00	
13	1	12 - 13	2031		3	0.00	2031		1	0.00	
14	1	13 - 14	2032		3	0.00	2032		1	0.00	
15	1	14 - 15	2033		3	0.00	2033		1	0.00	
16	1	15 - 16	2034		3	0.00	2034		1	0.00	
17	1	16-17	2035		1	0.00	2035		1	0.00	
18	1	17-18	2036		1	0.00	2036		1	0.00	
19	1	18-19	2037		1	0.00	2037		1	0.00	
20	1	19-20	2038		1	0.00	2038		1	0.00	
21	1	20-21	2039		1	0.00	2039		1	0.00	
22	1	21-22	2040		1	0.00	2040		1	0.00	
23	1	22-23	2041		1	0.00	2041		1	0.00	
24	1	23-24	2042		1	0.00	2042		1	0.00	
25	1	24-25	2043		1	0.00	2043		1	0.00	
26	1	25-26	2044		1	0.00	2044		1	0.00	
27	1	26-27	2045		1	0.00	2045		1	0.00	
28	1	27-28	2046		1	0.00	2046		1	0.00	
29	1	28-29	2047		1	0.00	2047		1	0.00	
30	1	29-30	2048		1	0.00	2048		1	0.00	
Total Increased Cancer Risk						2.4					0.04

* Third trimester of pregnancy

Attachment 4: Screening Community Risk Calculations



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables,

[Click here for guidance on conducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.](#)

[Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.](#)

Table A: Requester Contact Information

Date of Request	11/20/2018
Contact Name	Mimi McNamara
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-040 X111 mimcnamara@illingworthrodkin.com
Email	
Project Name	Trojan Storage Campbell
Address	680 & 700 East McGlinchy Lane
City	Campbell
County	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.)	Light Industrial: Storage units
Project Size (# of units or building square feet)	157,467-sf

Comments: Please review and confirm if Plant #9557 has any risk concentrations. Thank you!

For Air District assistance, the following steps must be completed:

- Complete all the contact and project information requested in **Table A**. Incomplete forms will not be processed. Please include a project site map.
- Download and install the free program Google Earth, <http://www.google.com/earth/download/ge/>, and then download the county specific Google Earth stationary source application files from the District's website, <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx>. The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.
- Find the project site in Google Earth by inputting the site's address in the Google Earth search box.
- Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.
- List the stationary source information in **Table B** section only.
- Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.
- Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Areana Flores at 415-749-4616, or aflores@baaqmd.gov

Table B: Google Earth data

Distance from Receptor (feet) or MEI ¹	Facility Name	Address	Plant No.	Cancer Risk ²	Hazard Risk ²	PM _{2.5} ²	Source No. ⁷	Type of Source ⁸	Fuel Code ⁵	Status/Comments
TBD	The Ultimate Kitchen Finish Inc	520 E McGlinchy Ln, #14	19055		0.0012		S1	Spray Booth		
TBD	West Valley Construction Company, Inc	580 E McGlinchy Ln	107158	0.1936755	0.0010		S1	Gas Dispensing Facility		Use GDF multiplier
TBD	All Perfect Finish	555 E McGlinchy Ln, #C	19607		0.0001		S1	Spray Booth		
TBD	Modern Bench Operations Collision	665 McGlinchy Lane	9557				S2	Coating Operation		Emissions data attached

Footnotes:

- Maximally exposed individual
- These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
- Each plant may have multiple permits and sources.
- Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
- Fuel codes: 98 = diesel, 189 = Natural Gas.
- If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
- The date that the HRSA was completed.
- Engineer who completed the HRSA. For District purposes only.
- All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
- The HRSA "Chronic Health" number represents the Hazard Index.
- Further information about common sources:
 - Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
 - The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard
 - BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
 - Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but
 - Gas stations can be adjusted using BAAQMD's Gas Station Distance Multiplier worksheet.
 - Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
 - This spray booth is considered to be insignificant.

Date last updated:



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

[Click here for guidance on conducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.](#)

[Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.](#)

Table A: Requester Contact Information

Date of Request	11/20/2018
Contact Name	Mimi McNamara
Affiliation	illingworth & Rodkin, Inc.
Phone	707-794-040 X111
Email	mmcnamara@illingworthrodkin.com
Project Name	Trojan Storage Campbell
Address	680 & 700 East McGlincy Lane
City	Campbell
County	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.)	Light industrial: Storage units
Project Size (# of units or building square feet)	157,467-sf
Comments:	Please review and confirm if Plant #9557 has any risk concentrations. Thank you!

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in **Table A**. Incomplete forms will not be processed. Please include a project site map.
2. Download and install the free program Google Earth, <http://www.google.com/earth/download/ge/>, and then download the county specific Google Earth stationary source application files from the District's website, <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx>. The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.
3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.
4. Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.
5. List the stationary source information in **Table B** section only.
6. Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRS) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRS values are presented, these values have already been modeled and cannot be adjusted further.
7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Areana Flores at 415-749-4616, or aflores@baaqmd.gov

Table B: Google Earth data

Distance from Receptor (feet) or MEI ¹	Facility Name	Address	Plant No.	Cancer Risk ²	Hazard Risk ²	PM _{2.5} ²	Source No. ³	Type of Source ⁴	Fuel Code ⁵	Status/Comments	Construction MEI				
											Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5	
No Distance Adjustment	The Ultimate Kitchen Finish Inc	520 E McGlincy Ln, #14	19055		0.0012		S1	Spray Booth						0.0012	
No Distance Adjustment	All Perfect Finish	555 E McGlincy Ln, #C	19607		0.0001		S1	Spray Booth						0.0001	
No Distance Adjustment	West Valley Construction Company, Inc	580 E McGlincy Ln	107158	0.1936755	0.0010		S1	Gas Dispensing Facility		Use GDF multiplier	0.058		0.01	0.0001	
No Distance Adjustment	Modern Bench Operations Collision Repair Center	665 McGlincey Lane	9557				S2	Coating Operation		Emissions data attached					Risk impacts calculated to be zero

Footnotes:

1. Maximally exposed individual
2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRS) was completed for the source, the application number will be listed here.
7. The date that the HRS was completed.
8. Engineer who completed the HRS. For District purposes only.
9. All HRS completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRS "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
 - a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
 - b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic
 - c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
 - d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period.
 - e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Multiplier worksheet.
 - f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
 - g. This spray booth is considered to be insignificant.

Date last updated:

How to Use the Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)

This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions (GDF's).

1. Obtain the GDF cancer risk and/or chronic hazard index from the District's Stationary Source Screening Analysis tool for facilities where the Plant No. is preceded with a 'G'. If the distance to the nearest receptor is less than 20 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk and/or chronic hazard index estimate.

2. Determine the shortest distance from the GDF to the nearest receptor.

3. In the table below, enter the cancer risk and/or chronic hazard index found in step 1 for the GDF in the row which aligns with the shortest distance from each GDF to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 300 meters, use the multiplier 0.015. The resulting product is the adjusted cancer risk in a million or the adjusted chronic hazard index for the GDF.

Note: These distance adjustment multipliers may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for gasoline dispensing facilities. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

Distance meters	Distance feet	Distance adjustment multiplier	Enter Cancer Risk	Adjusted Cancer Risk	Enter Chronic Hazard Index	Adjusted Chronic Hazard Index
20	66	1.000		0		0
25	82	0.728		0		0
30	98	0.559		0		0
35	115	0.445		0		0
40	131	0.365		0		0
45	148	0.305		0		0
50	164	0.260		0		0
55	180	0.225		0		0
60	197	0.197		0		0
65	213	0.174		0		0
70	230	0.155		0		0
75	246	0.139		0		0
80	262	0.126		0		0
85	279	0.114		0		0
90	295	0.104		0		0
95	312	0.096		0		0
100	328	0.088		0		0
105	344	0.082		0		0
110	361	0.076		0		0
115	377	0.071		0		0
120	394	0.066		0		0
125	410	0.062		0		0
130	426	0.058		0		0
135	443	0.055		0		0
140	459	0.052		0		0
145	476	0.049		0		0
150	492	0.046		0		0
155	508	0.044		0		0
160	525	0.042		0		0
165	541	0.040		0		0
170	558	0.038		0		0
175	574	0.036		0		0
180	590	0.034		0		0
185	607	0.033		0		0
190	623	0.031		0		0
195	640	0.030		0		0
200	656	0.029		0		0
205	672	0.028		0		0
210	689	0.027		0		0
215	705	0.026		0		0
220	722	0.025		0		0
225	738	0.024		0		0
230	754	0.023		0		0
235	771	0.022		0		0
240	787	0.022		0		0
245	804	0.021		0		0
250	820	0.020		0		0
255	836	0.020		0		0
260	853	0.019		0		0
265	869	0.018		0		0
270	886	0.018		0		0
275	902	0.017		0		0
280	918	0.017		0		0
285	935	0.016		0		0
290	951	0.016		0		0
295	968	0.015		0		0
300	984	0.015		0		0

How to Use the Distance Adjustment Multiplier Tool for Diesel Internal Combustion (IC) Engines

This distance multiplier tool refines the screening values for cancer risk and PM2.5 concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

1. Obtain the facility diesel IC engine(s) cancer risk and/or PM2.5 concentration from the District's Stationary Source Screening Analysis tool only for facilities where the source is listed as "generator." If the distance to the nearest receptor is less than 25 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk, chronic hazard index or PM2.5 estimates.
2. Determine the shortest distance from each diesel IC engine to the nearest receptor. Select the shortest distance to receptor found.
3. In the table below, enter the cancer risk and/or PM2.5 concentration found in step 1 for the diesel IC engine in the row which aligns with the shortest distance from each diesel IC engine to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 280 meters, use the multiplier 0.04. The resulting product is the adjusted cancer risk in a million or the adjusted PM2.5 concentration for the diesel IC engine

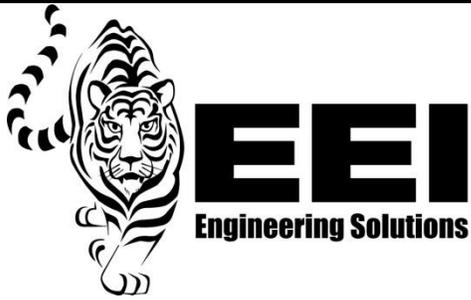
Note: This distance adjustment multiplier may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for diesel IC engines. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

Note: This distance adjustment multiplier may also be used to adjust the screening values for chronic hazard index found in the District's Stationary Source Screening Analysis Tool for facilities with only diesel IC engines.

Distance (meters)	Distance (feet)	Distance Adjustment Multiplier	Enter Cancer Risk Estimate	Adjusted Cancer Risk Estimate	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
25	82	0.85		0		0
30	98.4	0.73		0		0
35	115	0.64		0		0
40	131	0.58		0		0
50	164	0.5		0		0
60	197	0.41		0		0
70	230	0.31		0		0
80	262	0.28		0		0
90	295	0.25		0		0
100	328	0.22		0		0
110	361	0.18		0		0
120	394	0.16		0		0
130	426	0.15		0		0
140	459	0.14		0		0
150	492	0.12		0		0
160	525	0.1		0		0
180	590	0.09		0		0
200	656	0.08		0		0
220	722	0.07		0		0
240	787	0.06		0		0
260	853	0.05		0		0
280	918	0.04		0		0

ATTACHMENT 2

GEOTECHNICAL EVALUATION



GEOTECHNICAL EVALUATION

**Proposed Trojan Storage Facility
680 & 700 East McGlincy Lane
APNs: 412-35-040 & 412-35-039
Campbell, California**

EEI Project AAA-72811.4

August 24, 2018

GEOTECHNICAL EVALUATION

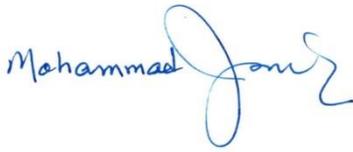
Prepared for:

Mr. Brett Henry
CEO
Trojan Storage
1732 Aviation Blvd, Suite 217
Redondo Beach, CA 90278

Project Site Location:

680 & 700 East McGlincy Lane
APNs: 412-35-040 & 412-35-039
Campbell, California

Prepared by:



Mohammad Joolazadeh
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CEG 2225 (exp. 6/30/19)
Senior Project Geologist



EI
2195 Faraday Avenue, Suite K
Carlsbad, California 92008-7207

EI Project AAA-72811.4

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- Figure 2 – Aerial Site Map
- Figure 3 – Field Exploration Map

APPENDICES

- Appendix A – Soil Classification Chart, Boring and CPT Logs
- Appendix B – Laboratory Test Data
- Appendix C – Earthwork and Grading Guidelines

Distribution: (2) Addressee (one via an electronic copy and one hard copy)

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Geotechnical Evaluation is to provide geotechnical information to Trojan Storage (“Client”) regarding the subject property in the City of Campbell, Santa Clara County, California. EEI understands that Client is considering redeveloping the subject property and requires a Geotechnical Evaluation for the proposed project.

The information gathered in this Geotechnical Evaluation is intended to provide the Client with an understanding of the physical conditions of site-specific subsurface soils, groundwater, and the regional geologic setting which could affect the cost or design of the proposed development. (Site Location Map-**Figure 1**, Aerial Site Map-**Figure 2**).

This Geotechnical Evaluation has been conducted in general accordance with the accepted geotechnical engineering principles and in general conformance with the approved proposal and cost estimate for the project by EEI, dated May 22, 2018.

EEI conducted an onsite field exploration on two separate days that included drilling and sampling of four (4) CPT soundings (CPT-1 through CPT-4 on June 27, 2018) and five (5) geotechnical borings (B-1 through B-5 on July 20, 2018) for the proposed development at the subject property. This Geotechnical Evaluation has been prepared for the sole use of Trojan Storage. Other parties, without the express written consent of EEI and the Client should not rely upon this Geotechnical Evaluation.

1.2 Project Description

Based on the referenced conceptual site plan and our communications with the Client, it is our understanding that construction of a new storage facility is being considered on the subject property.

The current proposed improvements are expected to include the construction of two new three story with full subterranean basement storage buildings. Buildings A & B, as noted on the Preliminary Site Plan, will be three-story with full subterranean basement with the approximate total building areas of 77,000, and 63,400 square feet, respectively. The proposed development will also include exterior hardscape, parking and drive areas, underground utilities and other associated improvements also assumed to be part of the project.

1.3 Scope of Services

The scope of our services included:

- A review of readily available data pertinent to the subject property, including published and unpublished geologic reports/maps, and soils data for the area (**References**).
- Conducting a geotechnical reconnaissance of the subject property and nearby vicinity.
- Coordination with Underground Service Alert (USA) and a private utility locator to identify the presence of underground utilities for clearance of proposed boring and CPT sounding locations.

- Drilling and logging of five (5) small diameter exploratory borings in readily accessible areas of the subject property to a maximum depth of approximately 40 feet below the ground surface (bgs).
- Advancement of four (4) CPT soundings across the subject property to a maximum depth of approximately 38 feet bgs and preparation of detailed CPT logs.
- An evaluation of seismicity and geologic hazards to include an evaluation of faulting, shaking, ground rupture and liquefaction potentials.
- Completion of laboratory testing program of representative earth materials encountered onsite to determine their pertinent soils engineering properties, including corrosion potential (**Appendix B**).
- The preparation of this report which presents our preliminary findings, conclusions, and recommendations.

2.0 BACKGROUND

2.1 Subject Property Description

Based on information provided by the Client including the preliminary site plan, photos and review of GoogleEarth™ (2018) satellite imagery and street views, the subject property is located on the south side of East McGlincy Lane at the intersection of Forman Drive in the City of Campbell, California. The subject property is currently occupied by Instant Storage Service which is a container rental and sales facility. The subject property comprises approximately 2.1 acres, most of which is occupied by numerous storage containers. In addition, an approximately 2,000 square-foot one-story building exists on the subject property. The existing ground surface is relatively flat and appears to be a gravel/unimproved surface between the existing buildings and storage containers. Vehicle/property access is provided through a gated entry driveway from East McGlincy Lane. Existing commercial properties are located to the east and west of the subject property with existing residential development located to the south.

The subject property is identified by Assessor's Parcel Numbers (APN's) 412-35-040 (Parcel 3 – Building A) and 412-35-039 (Parcel 4 - Building B). The immediately adjacent properties include single-family residential dwellings to the south, a commercial property to the east and an industrial lot to the west.

The center of the subject property is approximately situated at 37.2783° north latitude and 121.9386° west longitude (Google Earth™, 2018).

2.2 Previous Geotechnical Reports by Others

A geotechnical investigation for the subject property was completed by Alliance Environmental & Soil Engineering (AES) in 2005. As part of their geotechnical investigation, seven (7) exploratory borings (designated B-1 through B-7) were advanced to depths ranging from 15 to 45 feet below the existing ground surface (bgs) at the subject property. Our current geotechnical evaluation, generally agree with

the subsurface conditions encountered and the results of the laboratory analyses as described in the referenced AES report.

2.3 Topography

The subject property is located on the United States Geological Survey (USGS) San Jose West, California 7.5 Minute Quadrangle map (USGS, 2015). The map indicates the elevation of the subject property is approximately 203 to 206 feet above mean sea level (amsl). The subject property is essentially level, with surface drainage flowing gently to the northeast.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 Field Exploration

Field work for our Geotechnical Evaluation was conducted on June 27, 2018 and July 20, 2018. A total of five (5) hollow stem auger geotechnical borings (July 20, 2018) and four (4) CPT soundings (June 27, 2018) were advanced at the subject property. Boring and CPT depths were approximately 19 to 40 feet below ground surface (bgs) and were logged under the supervision of a Certified Engineering Geologist at EEI. The approximate locations of the borings are shown on the Field Exploration Map - **Figure 3**.

Exploratory Borings - A truck mounted hollow stem auger (HSA) drill rig was used to advance the exploratory borings, designated B-1 through B-5 to depths ranging from 19 to 40 feet bgs. Blow count values were determined utilizing a 140 pound hammer, falling 30-inches onto a Modified California split-tube sampler. The blows per 6-inch increment required to advance the 18-inch long Modified California split-tube samplers was measured at various depth intervals (varying between 2 to 5 feet), or at changes in lithology, recorded on the boring logs, and are presented in **Appendix A**-Soil Classification Chart and Boring Logs. Energy-corrected SPT N_{60} values are also presented on the borings logs.

Relatively “undisturbed” samples were collected in a 2.42-inch (inside diameter) California Modified split-tube sampler for visual examination and laboratory testing. The soils were classified in accordance with the Unified Soil Classification System (ASTM, 2015). Representative bulk samples were also collected for appropriate laboratory testing.

CPT Soundings - The CPT soundings (CPT-1 through CPT-4) were performed by Middle Earth Geo Testing Inc., under the supervision of a representative of EEI. CPT testing was conducted in general accordance with ASTM Test Method D3441. The CPT procedure includes pushing an electronic cone penetrometer, which records data including tip resistance, sleeve friction and dynamic pore pressure as it is advanced. A 2.5-Ton CPT rig equipped with a 15 square centimeter cone was used to conduct the CPT soundings. The four (4) CPTs were pushed to depths of approximately 28 to 38 feet bgs to refusal due to high tip pressure and rod flex within the dense and gravelly alluvial deposits. CPT data are presented in **Appendix A**.

3.2 Laboratory Testing

Selected samples obtained from our borings were tested to evaluate pertinent soil classification and engineering properties and enable development of geotechnical conclusions and recommendations. The laboratory tests consisted of:

- Moisture Content and Dry Density
- Atterberg Limits
- Shear Strength
- Fines Content
- Corrosivity

The results of the laboratory tests, and brief explanations of test procedures, are presented in **Appendix B**. It should be understood that the results provided in **Appendix B** are based upon pre-development conditions. Verification testing is recommended at the conclusion of grading on samples collected at or near finish grade.

4.0 SUBSURFACE CONDITIONS

4.1 Geologic Setting

Review of the available references indicates that the area of study is located within the Coast Ranges geomorphic province of Northern California. The Coast Ranges Geomorphic Province is characterized by a series of northwest-trending mountain ranges and intervening valleys that align sub-parallel with the San Andreas Fault System. This province is bounded on the east by the Great Valley province, on the south by the Transverse Ranges province and on the west by the Pacific Ocean and offshore Continental Borderland. The Coast Ranges are comprised of thick Mesozoic-age and Cenozoic –age sedimentary units. The depression containing the San Francisco Bay separates the northern Coast Ranges from the southern Coast Ranges. The Coast Ranges are characterized as parallel mountain ranges and valleys displaced by strike-slip earthquake faults which include the nearby Hayward and San Andreas Fault systems. The subject site location is situated directly south of the San Francisco Bay structural basin.

Regional geologic maps (California Geological Survey - CGS) indicate the property is underlain by Quaternary-age Holocene alluvium. The subject property is not indicated to be within an Alquist-Priolo Earthquake Fault Zone according to mapping of the San Jose West 7.5-minute quadrangle by CGS. Based on mapping by CGS, the subject property is located within a liquefaction zone. Also, based on a review of the ABAG website's liquefaction susceptibility maps, the property is located within a zone of moderate to very high susceptibility for liquefaction potential.

Our review of geological literature that is pertinent to the site (CDMG, 2002) indicates that the area of study is underlain by Holocene alluvial fan levee deposits (Qh1) consisting of mixed gravel, sand, silt and clay.

Regional geologic maps of the subject property and vicinity (Dibblee, 2007) indicate the area of the subject property is underlain by Holocene age younger alluvial deposits (map unit Qa.2).

4.2 Subsurface Conditions

The materials encountered in our exploratory borings and CPT soundings consisted of undocumented artificial fill and native alluvial deposits. A brief description of the subsurface conditions is provided in the following section. Detailed descriptions of the subsurface conditions are provided on the boring and CPT logs included in **Appendix A**.

Undocumented Fill consisted of dry to slightly moist gravel base coarse surface ranging from 1 to 2 feet in thickness at the ground surface. According to the property owner, the base coarse material has periodically been placed by a bobcat excavator to level low or rutted areas within the drive areas across the site. This material was encountered at the surface at all five boring locations and probably exists within all of the drive areas.

Alluvial Deposits were encountered underlying the existing undocumented fill. The alluvial deposits extended to the maximum explored depth of 40 feet bgs. The alluvial materials generally consisted of light brown to brown, orange brown or gray brown, slightly moist to very moist, medium dense to dense silty sandy gravel, clayey sandy gravel and gravelly silty sand with thin interbeds of silty clay. The alluvial deposits were found to have a low to moderate expansion potential. Detailed boring and CPT logs are presented in **Appendix A**.

4.3 Groundwater

Based on our review of available data from the Geotracker website, the historic high groundwater depth in this area appears to be between 30 to 40 feet below the existing ground surface. According to the CGS seismic hazard zone report for the San Jose West 7.5 minute quad, highest historic groundwater is indicated to be approximately 30 feet bgs. Groundwater was not encountered in any of our exploratory borings or CPT soundings. It should be noted that variations in groundwater may result from fluctuations in the ground surface topography, subsurface stratification, rainfall, irrigation, and other factors that may not have been evident at the time of our subsurface exploration.

5.0 GEOLOGIC HAZARDS

5.1 California Building Code Seismic Design Parameters

EEI utilized seismic design criteria provided in Tables 3.3(1) and 3.3(2) in Section 1613A3.3 of the CBC (2016) and ASCE 7-10. Final selection of the appropriate seismic design coefficients should be made by the structural consultant based on the local laws and ordinances, expected building response, and desired level of conservatism. The site coefficients and adjusted maximum considered earthquake spectral response accelerations in accordance with the 2016 California Building Code are presented in **Table 1**.

Table 1 2016 CBC Seismic Parameters and Peak Ground Acceleration	
Parameter	Value
Site Coordinates	Latitude 37.2783 ° Longitude -121.9386°
Mapped Spectral Acceleration Value at Short Period: S_s	1.688g
Mapped Spectral Acceleration Value at 1-Second Period: S₁	0.604g
Site Classification	D
Short Period Site Coefficient: F_a	1.000
1-Second Period Site Coefficient: F_v	1.500
Design Spectral Response Acceleration at Short Periods: S_{DS}	1.126g
Design Spectral Response Acceleration at 1-Second Period: S_{D1}	0.604g
Peak Ground Acceleration adjusted for Site Class Effects: PGA_M	0.644g

5.2 Faulting and Surface Rupture

The portion of Northern California that includes the subject property is considered to be seismically active. Due to the proximity of the property area to several nearby active faults, strong ground shaking could occur at the property as a result of an earthquake on any one of the faults. The closest active faults to the subject property are the Monta Vista – Shannon fault located approximately 2.6 miles south of the site and the northern segment of the San Andreas Fault Zone, located approximately 11.9 miles southwest of the subject property. Our review indicates that there are no known active faults crossing the property (Jennings and Bryant, 2010) and the property is not within a State of California Earthquake Fault Zone (Hart and Bryant, 1997). It is our opinion, therefore, that the likelihood of surface fault rupture at the property is low.

5.3 Landslides and Slope Stability

The subject property and surrounding areas are generally flat. The potential for landslides or slope instabilities to occur at the site is considered negligible.

5.4 Expansive Soil

Based on the laboratory testing results, the subsurface materials at the site are considered to have a low to moderate expansion potential.

5.5 Liquefaction

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid; potentially resulting in large total and differential ground surface settlements as well as possible lateral spreading during an earthquake. Seismically induced settlement can occur in response to liquefaction of saturated loose granular soils, as well as the reorientation of soil particles during strong shaking of loose, unsaturated sands.

EEI reviewed readily available and relevant maps and publications regarding liquefaction potential at the subject property. Based on mapping of the San Jose West 7.5 minute quad (CGS), the property is located within a liquefaction zone (2002).

However, due to the presence of generally well consolidated soils which underlie the site, and absence of shallow groundwater conditions, the potential for liquefaction at the site is considered to be low.

5.6 Tsunamis, Flooding and Seiches

The subject property is not located within a Tsunami Evacuation Area or FEMA Flood Zone; therefore, damage due to tsunamis and flooding is considered low.

EEI reviewed the Federal Emergency Management Agency (FEMA) Flood Hazard Map online (2018) to determine if the subject property was located within an area designated as a Flood Hazard Zone. According to the information reviewed on the Flood Insurance Rate Map (FIRM), Map Panel No. 06085C0239H (effective May 18, 2009), the subject property is located within an “Area of Minimum Flood Hazard” which is defined as an area outside of the Special Flood Hazard Areas (SFHA) and are higher than the elevation of the 0.2 percent annual flood chance.

Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or reservoirs. The subject property is not located immediately adjacent to any lakes or confined bodies of water; therefore, the potential for a seiche to affect the property is considered low.

6.0 CONCLUSIONS

Based on our field exploration, laboratory testing and engineering and geologic analysis, it is our opinion that the subject property is suitable for the proposed development from a geotechnical engineering and geologic viewpoint. However, there are existing geotechnical conditions associated with the property that will warrant mitigation and/or consideration during planning stages. If site plans and/or the proposed building locations are revised, additional field studies may be warranted to address proposed site-specific conditions. As a result, EEI is providing the following conclusions:

- A total of five exploratory HSA borings and four CPT soundings were advanced within the subject property during this evaluation. The borings and CPTs were advanced to depths ranging from 19 to 40 feet bgs. The site is underlain by undocumented fill and Quaternary age alluvial deposits. Groundwater was not encountered in any of our exploratory borings or CPT soundings at the time our investigation.
- Undocumented fills exist throughout the drive areas of the subject property which have been placed as a leveling base coarse material and range from 1 to 2 feet in thickness as encountered in our borings. Deeper areas of fill were not encountered during our subsurface exploration but may exist on portions of the subject property that were not a part of our subsurface exploration.
- The alluvial deposits encountered in our exploratory borings at the subject property are considered to be low expansive in nature and somewhat compressible; and extend beyond the maximum depth explored of 40 feet bgs.
- The subject property is located within an area of northern California recognized as having a number of active and potentially-active faults located nearby. Our review indicates that there are no known active faults mapped as crossing the property and the property is not located within an Earthquake Fault Zone.
- Based on EEI's evaluation, earth materials underlying the site of the proposed development are not considered susceptible to liquefaction or significant amounts of seismic settlement.
- Based on our review of pertinent regional geologic maps and reports, as well as our field exploration, and preliminary geologic and engineering analysis completed to date, the development of the site appears to be feasible from a geotechnical engineering viewpoint provided the recommendations presented herein are incorporated into the design and construction phase of the project.

7.0 RECOMMENDATIONS

The preliminary recommendations presented herein should be incorporated into the planning and design phases of development. Guidelines for site preparation, earthwork, and onsite improvements are provided in the following sections.

7.1 General

Grading should conform to the guidelines presented in the 2016 California Building Code (CBC, 2016), as well as the requirements of the City of Campbell and Santa Clara County. Additionally, general Earthwork and Grading Guidelines are provided herein as **Appendix C**.

During earthwork construction, removals and reprocessing of soft or unsuitable fill materials, as well as general grading procedures of the contractor should be observed and the fill placed should be tested by representatives of the Geotechnical Engineer, EEI. If any unusual or unexpected conditions are exposed in the field, they should be reviewed by the Geotechnical Engineer and if warranted, modified and/or additional recommendations will be offered. Specific guidelines and comments pertinent to the planned development are provided herein.

The recommendations presented herein have been completed using the preliminary information provided to us regarding site development. EEI should be provided with grading and foundation plans once they are available so that we can determine if the recommendations provided in this report remain applicable.

7.2 Site Preparation and Grading

Debris and other deleterious material, such as organic soils, tree root balls and/or environmentally impacted earth materials (if any) should be removed from the subject property prior to the start of grading. Areas to receive fill should be properly scarified and/or benched in accordance with current industry standards of practice and guidelines specified in the CBC (2016) and the requirements of the local jurisdiction.

Abandoned trenches should be properly backfilled and tested. If unanticipated subsurface improvements (vaults, tanks, tunnels, utility lines, septic systems, wells, utilities, etc.) are encountered during earthwork construction, the Geotechnical Engineer should be informed and appropriate remedial recommendations would then be provided.

7.3 Remedial Earthwork

The following recommendations apply for both on-grade and basement building options. The area of site preparation should extend at least five feet beyond any proposed improvements (e.g., building foot print, appurtenant structures, sidewalks, walkways, pavement areas, etc.). Areas to be graded should be cleared of all the existing fill soils to the depths indicated below. Vegetation, upper soils containing roots, remnants of past construction, and other unsuitable material should also be removed.

For on-grade, single story buildings, the existing fill and/or potentially compressible shallow natural deposits should be over-excavated to a depth of 5 feet below existing ground surface, or minimum 2 feet below lowest proposed foundation levels (whichever is deeper). It is assumed that the proposed finished building pad grades will be approximately the same as the existing ground elevations, and at least 5 feet of properly compacted engineered fill will be placed to achieve the required grades.

For 3-Story Building with Basement the over-excavation should extend to 10 feet below existing grade. It is assumed that bottom of the proposed foundation levels will be approximately 8 feet below existing grade. A minimum of 2 feet of properly compacted engineered fill should be placed beneath the proposed foundation system.

After removal of the surficial soils and observation of the excavation bottoms, the over-excavated areas should be scarified to a minimum depth of 8-inches, moisture conditioned as needed to achieve at least two percent above optimum moisture content and re-compacted to at least 90 percent of the maximum dry density (based on ASTM D1557). The over-excavated areas should then be backfilled with onsite and/or imported soils that are placed and compacted as recommended herein until design finish grades are reached. If localized areas of relatively loose soil prevent proper compaction, over-excavation and re-compaction will be necessary.

When excavations deeper than five feet are made, temporary construction slopes should be no steeper than 1:1 (horizontal to vertical). Temporary construction slopes, sheeting and bracing should be provided by the contractor, as necessary, to protect workers in the excavation. Where excavations undermine existing improvements, temporary structural support should be provided to reduce risk of damage resulting from undercutting. Permanent cut and fill slopes should not be constructed steeper than 2:1.

The on-site soils are generally suitable for use as compacted fill and backfill. Import fill soils (if planned), should conform to the specifications presented in Section 7.3.1 of this report. Backfill around footings and in utility trenches within building and paved areas should conform to the same material and compaction requirements as for fill.

Reprocessing of the upper 24-inches of subgrade in pavement areas is also recommended.

7.3.1 Import Fill Material

The import fill material should meet the following criteria:

- No particle larger than six inches in largest dimension.
- Free of all perishable material.
- Plasticity index of 12 or less and liquid limit of 40 or less.
- Expansion Index (EI) of 20 or less (ASTM D-4829).

The earthwork contractor should ensure that all proposed fill materials are approved by the Geotechnical Engineer prior to use. Representative soil samples should be made available for testing at least ten working days prior to hauling to the property to allow for laboratory tests.

7.4 Shrinkage and Bulking

Several factors will impact earthwork balancing on the subject property, including shrinkage, bulking, subsidence, trench spoils from utilities and footing excavations, and final pavement section thickness as well as the accuracy of topography. Shrinkage, bulking and subsidence are primarily dependent upon the degree of compactive effort achieved during construction. Shrinkage, bulking and subsidence should be considered by the project civil engineer relative to final site balancing. It is recommended that the site development be planned to include an area that could be raised or lowered to accommodate final site balancing.

7.5 Temporary Site Excavations

It is anticipated that excavations in the onsite materials can be achieved with conventional earthwork equipment in good working order.

Temporary excavations within the onsite materials (considered to be a Type B soil per OSHA guidelines) should be stable at 1H:1V inclinations for short durations during construction, and where cuts do not exceed 20 feet in height. Some sloughing of surface soils should be anticipated. Temporary excavations 5 feet deep or less can be made vertically.

The faces of temporary slopes should be inspected daily by the contractor's Competent Person before personnel are allowed to enter the excavation. Any zones of potential instability, sloughing or raveling should be brought to the attention of the Engineer and corrective action implemented before personnel begin working in the excavation.

Excavated soils should not be stockpiled behind temporary excavations within a distance equal to the depth of the excavation. EEI should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of slopes to prevent runoff water from entering the excavation and eroding the slope faces.

8.0 FOUNDATION RECOMMENDATIONS

8.1 General

The foundation recommendations provided herein are based on the proposed commercial development information provided by the Client. EEI should be provided with grading and foundation plans once they are available so that we can determine if the recommendations provided in this report remain applicable. Recommendations by the project's design-structural engineer or architect may exceed the following minimum recommendations. However; if analyses by the structural engineer result in less critical details than are provided herein as minimums, the minimums presented herein should be adopted.

8.1.1 Shallow Foundation

Support the structures on an interconnected continuous foundation system bottomed in properly compacted fill materials. The depth of properly compacted fill should extend at least two feet below the bottom of the foundation system.

Allowable design parameters for foundations are as follows:

- Minimum depth for interior and exterior footing..... 2 feet
(Measured from lowest adjacent soil grade)
- Minimum footing width1.5 feet
- No isolated footing is allowed
- Allowable bearing capacity (pounds per square foot), (FS \geq 3)
 - Sustained loads 2,000 psf
 - Transient loads (1/3 allowable increase for wind and seismic) 2,650 psf

- Resistance to lateral loads
 - Passive soil resistance (pounds per cubic foot)..... 200 psf
 - Coefficient of sliding friction 0.40

Footings can be designed to resist lateral loads by using a combination of sliding friction and passive resistance. The coefficient of friction should be applied to dead load forces only. Passive resistance should be reduced by one third and the upper one foot of passive resistance should be neglected where the soil is not confined by the slabs or pavement.

For the properly constructed foundations in accordance with the foregoing criteria, total static post-construction settlement from the anticipated structural loads is estimated to be on the order of 1 inch. Differential settlement on the order of ½ of total settlement should be anticipated.

8.1.2 Mat Foundation

As an alternative a mat foundation system may be utilized for the support of the proposed structures. When properly designed and constructed, a structural mat foundation system can be expected to support high structural loads and provide relatively uniform settlement across a structure, while being able to “bridge” over localized areas of settlement. A 6-inch thick cushion of Class II Aggregate Baserock should be placed on the prepared subgrade, beneath the mat slab.

Allowable design parameters for the mat foundations are as follows:

- Minimum embedment depth from lowest adjacent soil grade2 feet
- Modulus of Subgrade Reaction.....125 pci
(this value is based on a unit square foot area and must be adjusted for large mats)
- Allowable bearing capacity (pounds per square foot), (FS ≥ 3)
 - a. Sustained loads1,500 psf
 - b. Transient loads2,000 psf
(1/3 allowable increase for wind and seismic)
- Resistance to lateral loads
 - a. Passive soil resistance (pounds per cubic foot).....200 pcf
 - b. Coefficient of sliding friction.....0.40

Lateral resistance for the mat foundation may be calculated by using a combination of sliding friction and passive resistance. The coefficient of friction should be applied to dead load forces only. Passive resistance should be reduced by one third and the upper one foot of passive resistance should be neglected where the soil is not confined by the slabs or pavement.

For the properly constructed foundations in accordance with the foregoing criteria, total static post-construction settlement from the anticipated structural loads is estimated to be on the order of 1 inch. Differential settlement on the order of ½ of total settlement should be anticipated.

8.2 Conventional Retaining Walls

8.2.1 Foundations

The recommendations provided in the foundation section of this report are also applicable to conventional retaining walls.

8.2.2 Lateral Earth Pressures

The active earth pressure for the design of unrestrained earth retaining structures with level backfills can be taken as equivalent to the pressure of a fluid weighing 40 pcf. The at-rest earth pressure for the design of restrained earth retaining structures (such as basement walls or re-entrant corners) with level backfills can be taken as equivalent to the pressure of a fluid weighing 60 pcf. The above values assume a granular and drained backfill condition. If expansive soils are used to backfill the proposed walls, increased active and at-rest earth pressures will need to be utilized for retaining wall design, and can be provided upon request. An additional 20 pcf should be added to these values for walls with a 2:1 (H: V) sloping backfill. Appropriate allowances should also be made for anticipated surcharge loading. Appropriate factors of safety should be incorporated into the design.

8.2.3 Seismic Earth Pressure

If required, the seismic earth pressures can be taken as equivalent to the pressure of a fluid weighing 25 pcf. This value is for level backfill conditions and do not include a factor of safety. Appropriate factors of safety should be incorporated into the design. This pressure is in addition to the un-factored static lateral earth pressures.

8.2.4 Retaining Wall Drainage

Retaining walls should be designed to resist hydrostatic pressures or be provided with a backdrain to reduce the accumulation of hydrostatic pressures. Backdrains may consist of a 2-foot wide zone of $\frac{3}{4}$ -inch crushed rock. The backdrain should be separated from the adjacent soils using a non-woven filter fabric, such as Mirafi 140N or equivalent. A perforated pipe (Schedule 40 PVC) should be installed at the base of the backdrain and sloped to discharge to a suitable storm drain facility. As an alternative, a geocomposite drainage system such as Miradrain 6000 or equivalent placed behind the wall and connected to a suitable storm drain facility can be used.

The project architect should provide waterproofing specifications and details.

8.2.5 Retaining Wall Backfill

Granular backfill should be utilized to provide free-draining conditions to prevent buildup of hydrostatic pressure in the backfill. Backfill materials should conform to the specifications presented in Section 7.3.1 of this report. Import fill materials should be approved by the soils engineer prior to placement. Wall backfill should be compacted by mechanical methods to at least 90 percent of the maximum dry density as determined by ASTM D 1557.

8.3 Footing Setbacks

Footings adjacent to unlined drainage swales or underground utilities (if any) should be deepened to a minimum of 6-inches below the invert of the adjacent unlined swale or utilities. This distance is measured from the footing face at the bearing elevation. Footings for structures adjacent to retaining walls should be deepened so as to extend below a 1:1 projection from the heel of the wall. Alternatively, walls may be designed to accommodate structural loads from buildings or appurtenances.

8.4 Interior Slabs-on-Grade

The subgrade beneath the slab-on-grade floors should be compacted by rolling with a smooth-wheeled rubber tired, or vibratory roller to produce a uniformly dense, non-yielding surface. The project Structural Engineer should design the interior concrete slab-on-grade floor. For design of the slab, project structural engineer could utilize acceptable design methods by California Building Code (CBC) such as Wire Reinforcement Institute (WRI) design method. For WRI method a minimum of site soil Plasticity Index (PI) and site soil Expansion Index (EI) of 20 percent and 50 respectively should be utilized. However; as a minimum it is recommended that a 5-inch thick slab, reinforced with No. 4 bars located at 12-inches on center, both ways, be constructed. A layer of free draining, clean ¾-inch crushed rock, at least 6-inches thick should be placed below the slab.

A moisture vapor retarder/barrier should be placed beneath slabs where moisture sensitive floor coverings will be installed. Typically, plastic is used as a vapor retardant. If plastic is used, a minimum 15-mil is recommended. The plastic should comply with ASTM E1745. Plastic installation should comply with ASTM E1643.

Current construction practice typically includes placement of a 2-inch thick sand cushion between the bottom of the concrete slab and the moisture vapor retarder/barrier. This cushion can provide some protection to the vapor retarder/barrier during construction, and may assist in reducing the potential for edge curling in the slab during curing. However, the sand layer also provides a source of moisture vapor to the underside of the slab that can increase the time required to reduce moisture vapor emissions to limits acceptable for the type of floor covering placed on top of the slab. The slab can be placed directly on the vapor retarder/barrier. The floor covering manufacturer should be contacted to determine the volume of moisture vapor allowable and any treatment needed to reduce moisture vapor emissions to acceptable limits for the particular type of floor covering installed. The project team should determine the appropriate treatment for the specific application.

8.5 Exterior Slabs-on-Grade (Hardscape)

It is recommended that a minimum 5-inch thick slab reinforced with No.4 bars located at 18-inches on center, both ways, be constructed. At the exterior edges of the flatwork, a thickened edge is recommended. The thickened edges should be a minimum of 8-inches deep and 6-inches wide and reinforced with two No.4 bars at top and bottom.

Slabs should be provided with weakened plane joints. Joints should be placed in accordance with the American Concrete Institute (ACI) guidelines. Proper control joints should be provided to reduce the potential for damage resulting from shrinkage. Subgrade materials should not be allowed to desiccate between grading and the construction of the concrete slabs. The floor slab subgrade should be thoroughly and uniformly moistened prior to placing concrete.

All dedicated exterior flatwork should conform to standards provided by the governing agency including section composition, supporting material thickness and any requirements for reinforcing steel. Concrete mix proportions and construction techniques, including the addition of water and improper curing, can adversely affect the finished quality of the concrete and result in cracking and spalling of the slab. We recommend that all placement and curing be performed in accordance with procedures outlined by the American Concrete Institute and/or Portland Cement Association. Special consideration should be given to concrete placed and cured during hot or cold weather conditions.

8.6 Corrosivity

A representative sample of the onsite soils was tested to provide a preliminary indication of the corrosion potential of the onsite soils. The test results are presented in **Appendix B**. A brief discussion of the corrosion test results is provided in the following section.

- The sample tested had a soluble sulfate concentration of 68 mg/kg, which indicates the sample has a low sulfate corrosion potential relative to concrete.

It should be noted that soluble sulfate in the irrigation water supply, and/or the use of fertilizer may cause the sulfate content in the surficial soils to increase with time. This may result in a higher sulfate exposure than that indicated by the test results reported herein. Studies have shown that the use of improved cements in the concrete, and a low water-cement ratio will improve the resistance of the concrete to sulfate exposure. The concrete should utilize at least type II cement with maximum 0.5 water/cement ratio in accordance with California building Code (CBC) Standard 1904.3.1. Concrete mix design, materials, placement, curing, and finishing should be in conformance with the standard specifications for public works construction “Greenbook”, and American Concrete Institute (ACI) specifications.

- The sample tested had a chloride concentration of approximately 10 mg/kg, which indicates the sample has a negligible chloride corrosion potential relative to metal.
- The sample tested had a minimum resistivity of 3,400 ohm-cm, which indicates the sample is moderately corrosive to ferrous metals.
- The sample tested had a pH of 8.5, which indicates the sample is moderately basic.

Additional testing should be performed after grading to evaluate the as-graded corrosion potential of the onsite soils. We are not corrosion engineers. A corrosion consultant should be retained to provide corrosion control recommendations if deemed necessary.

9.0 PRELIMINARY PAVEMENT DESIGN RECOMMENDATIONS

Deleterious material, excessively wet or dry pockets, concentrated zones of oversized rock fragments, and any other unsuitable yielding materials encountered during grading should be removed. Once compacted fill soils are brought to the proposed pavement subgrade elevations, the subgrade should be proof-rolled in order to check for a uniform firm and unyielding surface. Representatives of the project Geotechnical Engineer should observe all grading and fill placement.

Reprocessing of the upper 24-inches of subgrade in pavement areas is recommended. Subgrade soils should be scarified; moisture conditioned to at least two percent above optimum moisture content and compacted to at least 95 percent of the laboratory standard (ASTM D1557). If loose or yielding materials are encountered during subgrade preparation, evaluation should be performed by EEI. Aggregate base materials should be properly prepared (i.e., processed and moisture conditioned) and compacted to at least 95 percent of the maximum dry density as determined by ASTM D1557. Aggregate base materials should conform to Caltrans specifications for Class 2 aggregate base.

All pavement section changes should be properly transitioned. Although not anticipated, if adverse conditions are encountered during the preparation of subgrade materials, special construction methods may need to be employed. A representative of the project Geotechnical Engineer should be present for the preparation of subgrade and aggregate base.

For design purposes we have assumed a Traffic Index (TI) of 5.0 for the parking stalls and a Traffic Index (TI) of 6.0 for drive areas and entrance apron at the subject property. This assumed TI should be verified as necessary by the Civil Engineer or Traffic Engineer. Based on the results of our laboratory testing of representative samples of the upper soils, we have utilized an R-Value of 20 for the pavement subgrade during our calculations of pavement structural sections.

TABLE 2 Preliminary Pavement Design Recommendations		
Traffic Index (TI) / Intended Use	Pavement Surface	Aggregate Base Material ⁽¹⁾
5	3.0-inches Asphalt Concrete	9.0-inches
6	3.0-inches Asphalt Concrete	11.0-inches
Concrete Pavement Section	6.0-inches Portland Cement Concrete	6.0-inches
(1) R-Value of 78 for Caltrans Class 2 aggregate base		

The recommended pavement sections provided in **Table 2** are intended as a minimum guideline. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. If the actual traffic index (TI) increases beyond our assumed values, increased maintenance and repair could be required for the pavement section. Final pavement design should be verified by testing of soils exposed at subgrade after grading has been completed. Thicker pavement sections could result if R-Value testing indicates lower values.

10.0 DEVELOPMENT RECOMMENDATIONS

10.1 Landscape Maintenance and Planting

Soils encountered at the site have been identified as being highly expansive in nature. As such, these soils are susceptible to volume changes with variations in their moisture content. These soils will expand (swell) upon the introduction of water and shrink upon drying. The forces associated with these volume changes can have significant negative impacts (in the form of differential movement) on foundations, and other site improvements. Foundation design recommendations presented in this report are intended to minimize the potential adverse effects of these highly expansive soils on the

proposed improvements. However; such foundation systems are not intended to offset the forces (and associated movements) related to the expansive soils, but are to help soften their effects on the proposed improvements.

Provisions should be incorporated into design and construction of the site improvements to account for the highly expansive nature of the site soils. Site maintenance and landscaping should be conducted in consideration of the expansive soil characteristics. Of primary importance is minimizing the moisture variation around and below the foundation systems and lot improvements. Such design and construction provisions should include but not limited to:

- Establishing and maintaining positive drainage away from all foundations, walkways, and other hardscape improvements. Providing roof gutters on all structures with downspouts installed to carry roof runoff directly into drains away from structures.
- Avoid construction of planters adjacent to structural improvements. Alternatively; planter sides/bottoms can be sealed with an impermeable membrane and drained away from the improvements via sub-drains into approved disposal area.
- Sealing and maintaining construction /control joints within concrete slabs and walkways to reduce the potential for moisture infiltration into subgrade soils.
- Utilizing landscaping schemes with vegetation that requires minimal watering. Alternatively; watering can be done in a uniform manner as equally as possible on all sides of the foundation, keeping the soil moist but not allowing the soil to become saturated.
- Avoiding the placement of trees closer to the proposed structures less than a distance of one-half the mature height of the tree.

10.2 Site Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled over slopes. Runoff should be channeled away from slopes and structures and not allowed to pond and/or seep uncontrolled into the ground. Pad drainage should be directed toward an acceptable outlet. Consideration should be given to eliminating open bottom planters directly adjacent to proposed structures for a minimum distance of 10 feet. As an alternative, closed-bottom type planters could be utilized, with a properly designed drain outlet placed in the bottom of the planter.

Final surface grades around structures should be designed to collect and direct surface water away from structures and toward appropriate drainage facilities. The ground around the structure should be graded so that surface water flows rapidly away from the structure without ponding. In general, we recommend that the ground adjacent to the structure slope away at a gradient of at least 2 percent.

Densely vegetated areas where runoff can be impaired should have a minimum gradient of at least 5 percent within the first 5 feet from the structure. Roof gutters with downspouts that discharge directly into a closed drainage system are recommended on structures. Drainage patterns established at the time of fine grading should be maintained throughout the life of the proposed structures.

10.3 Setbacks from Storm Water Disposal Systems

We recommend that storm water disposal systems be situated at least three times their depth, or a minimum of 15 feet (whichever is greater), from the outside bottom edge of structural foundations. Structural foundations include (but are not limited to) buildings, loading docks, retaining walls, and screen walls. The invert of storm water infiltration should be outside a 1:1 (H: V) plane projected from the bottom of adjacent foundations.

Storm water disposal systems should be checked and maintained on regular intervals. Storm water devices including bio-swales that are located closer than 10 feet from any foundations/footings should be lined with an impermeable membrane to reduce the potential for saturation of foundation soils. Foundations may also need to be deepened.

Storm water infiltration should not be located near utility lines where the introduction of storm water could cause damage to utilities or settlement of trench backfill.

10.4 Additional Site Improvements

Recommendations for additional grading can be provided upon request. If in the future, additional property improvements are planned for the subject property, recommendations concerning the design and construction of improvements would be provided upon request.

10.5 Utility Trench Backfill

Fill around the pipe should be placed in accordance with details shown on the drawings, and should be placed in layers not to exceed 8-inches loose (unless otherwise approved by the Geotechnical Engineer) and compacted to at least 90 percent of the maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor). The Geotechnical Engineer should approve all backfill material.

Select material should be used when called for on the drawings, or when recommended by the Geotechnical Engineer. Care should be taken during backfill and compaction operations to maintain alignment and prevent damage to the joints. The backfill should be kept free from oversized material, chunks of highly plastic clay, or other unsuitable or deleterious material. Backfill soils should be non-expansive, non-corrosive, and compatible with native earth materials. Backfill materials and testing should be in accordance with the CBC (2016), and the requirements of the local governing jurisdiction.

Pipe backfill areas should be graded and maintained in such a condition that erosion or saturation will not damage the pipe bedding or backfill. Flooding trench backfill is not recommended. Heavy equipment should not be operated over any pipe until it has been properly backfilled with a minimum of 2 to 3 feet of cover. The utility trench should be systematically backfilled to allow maximum time for natural settlement. Backfill should not occur over porous, wet, or spongy subgrade surfaces. Should these conditions exist, the areas should be removed, replaced and recompacted.

11.0 PLAN REVIEW

Once detailed grading and foundation plans are available, they should be submitted to EEI for review and comment, to reduce the potential for discrepancies between plans and recommendations presented herein. If conditions are found to differ substantially from those stated, appropriate recommendations will be provided. Additional field studies may be warranted.

12.0 LIMITATIONS

This Geotechnical Evaluation has been conducted in accordance with generally accepted geotechnical engineering principles and practices. Findings provided herein have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time. This report has been prepared for the sole use of Urban Housing (Client), within a reasonable time from its authorization.

Subject property conditions, land use (both onsite and offsite), or other factors may change as a result of manmade influences, and additional work may be required with the passage of time.

This Geotechnical Evaluation should not be relied upon by other parties without the express written consent of EEI and the Client; therefore, any use or reliance upon this Geotechnical Evaluation by a party other than the Client should be solely at the risk of such third party and without legal recourse against EEI, its employees, officers, or directors, regardless of whether the action in which recovery of damages is brought or based upon contract, tort, statute, or otherwise. The Client has the responsibility to see that all parties to the project, including the designer, contractor, subcontractor, and building official, etc. are aware of this report in its complete form. This report contains information that may be used in the preparation of contract specifications; however, the report is not designed as a specification document, and may not contain sufficient information for use without additional assessment. EEI assumes no responsibility or liability for work or testing performed by others. In addition, this report may be subject to review by the controlling authorities.

13.0 REFERENCES

Alliance Environmental and Soil Engineering (AES), 2005, “Proposed Commercial Development, 700 East McGlinchy Lane, Campbell, California, Geotechnical Investigation” File No. 05-574-S, dated April 21, 2005.

American Society of Civil Engineers (ASCE), 2010, Minimum Design Loads for Buildings and Other Structures, ASCE Document ASCE/SEI 7-10.

American Society for Testing and Materials (ASTM), 2015, Annual Book of ASTM Standards, Volume 04.08, Construction: Soil and Rock (I), Standards D 420 - D 5876.

California Building Code (CBC), 2016, California Code of Regulations, Title 24, Part 2, Volume 2 of 2, California Building Standards Commission, Based on 2015 International Building Code; 2016 California Historical Building Code, Title 24, Part 8; and 2016 California Existing Building Code, Title 24, Part 10, based on the 2015 International Building Code, effective January 1, 2017.

California Department of Transportation (Caltrans), 1974, Highway Design Manual, dated October 1, 1974.

California Division of Mines and Geology (CDMG), 2002, Seismic Hazard Zones Map for the San Jose West 7.5 Minute Quadrangle, Official Map – Released February 7, 2002, Scale: 1”=24,000.

California Division of Mines and Geology (CDMG), 2002, Seismic Hazard Zone Report for the San Jose West 7.5 Minute Quadrangle, Santa Clara County, California, Seismic Hazard Zone Report 058.

California Geological Survey (CGS), 2002, California Geomorphic Provinces Note 36, Electronic Copy, Revised December 2002.

Dibblee, T.W. and Minch, J.A., 2007, Geologic Map of the Cupertino and San Jose West Quadrangles, Santa Clara and Santa Cruz Counties, California: Dibblee Geological Foundation Map DF-351, scale 1:24,000.

Federal Emergency Management Agency (FEMA), 2009, Flood Insurance Rate Map 06085C0239H, Santa Clara County, California, effective May 18, 2009.

GeoTracker Website, 2018, State Water Resources Control Board GeoTracker Website, website address <<http://geotracker.waterboards.ca.gov/>>, accessed July 2018.

Google Earth®, 2018, Version 7.3.2

Hart, E.W., and Bryant, W.A. (Hart and Bryant), 1997, Fault-Rupture Hazard Zones in California: California Department of Conservation, Division of Mines and Geology, Special Publication 42.

Ishihara, K. 1995, Effects of At – Depth Liquefaction on Embedded Foundations During Earthquakes, Proceedings of the Tenth Asian Regional Conference on Soil Mechanics and Foundation Engineering, August 29 through September 2, Beijing, China, Vol. 2, pp. 16-25.

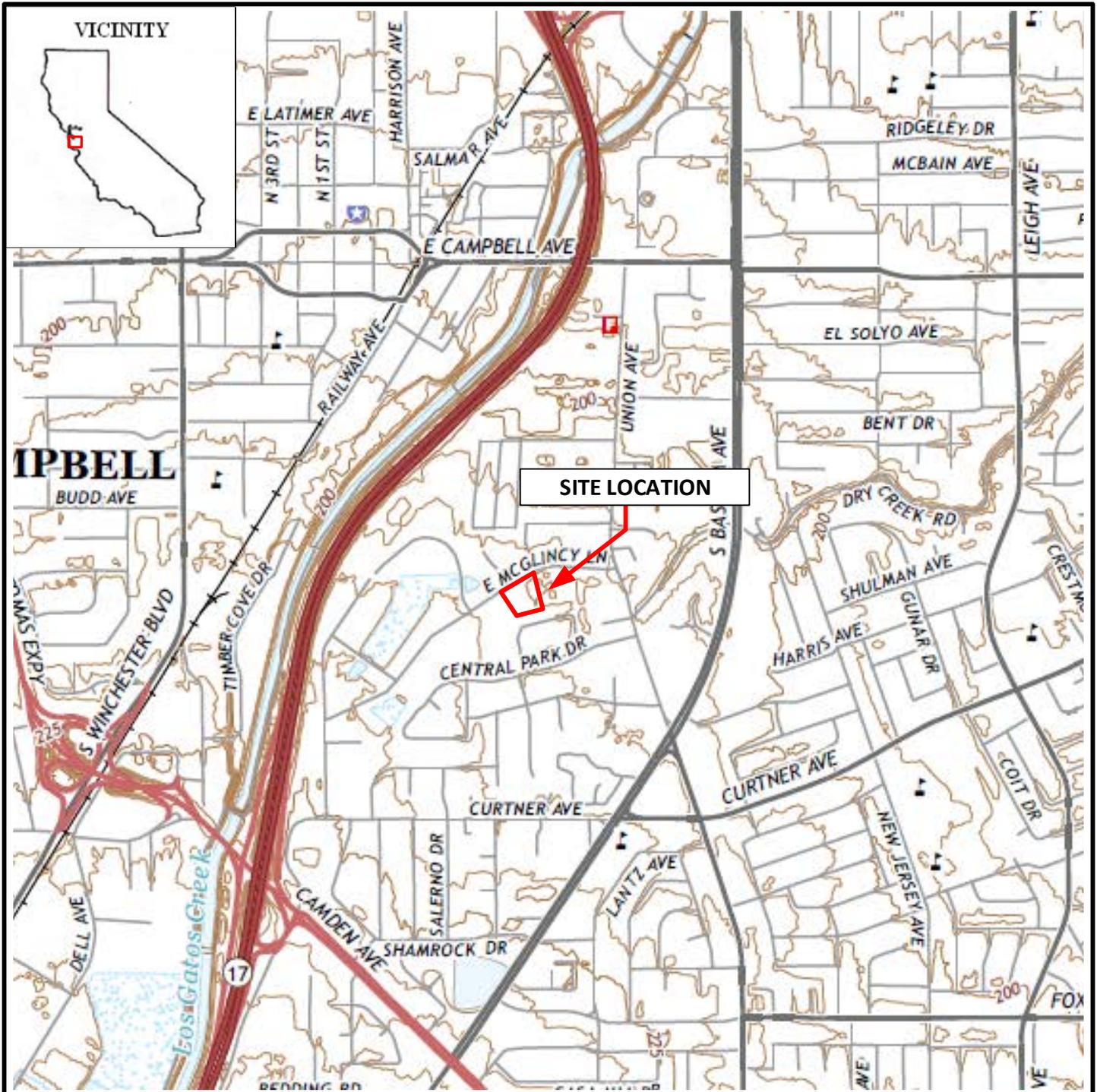
Jordan Architects, Inc., 2018, Preliminary Site Plan, Brett Henry, Trojan Storage, Campbell, CA, 4 sheets, dated April 13, 2018.

Jennings, C.W., and Bryant, W.A., (Jennings and Bryant) 2010, Fault Activity Map of California and Adjacent Areas: California Geologic Survey, Map Sheet No. 6, scale 1:750,000.

United States Geological Survey (USGS), 2015, 7.5 Minute Topographic Map, San Jose West, California Quadrangle, scale 1:24,000.

United States Geological Survey (USGS), 2008, 2008 National Seismic Hazard Maps – Online Fault Database Search, web address < <http://earthquake.usgs.gov/hazards/products/conterminous/>>, accessed July 2018.

FIGURES



Map Source: USGS, San Jose West, California 7.5 Minute Quadrangle map (USGS, 2015)

LEGEND



Scale: 1" = 1,400'



Note: All Locations Are Approximate

SITE LOCATION MAP

TROJAN STORAGE

Proposed Commercial Development

APNs: 412-35-040 & 412-35-039

680 & 700 McGlincy Lane

City of Campbell, County of Santa Clara, CA

EI Project AAA-72811.4

Created August 2018



FIGURE 1



Source: Google Earth, 2018; Image Date: May 9, 2018

LEGEND



Scale: 1" = 120'



Note: All Locations Are Approximate

AERIAL SITE MAP

TROJAN STORAGE

Proposed Commercial Development

APNs: 412-35-040 & 412-35-039

680 & 700 McGlincy Lane

City of Campbell, County of Santa Clara, CA

EI Project AAA-72811.4

Created August 2018



FIGURE 2

**APPENDIX A
SOIL CLASSIFICATION CHART AND BORING LOGS**

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS GREATER THAN 50% OF COARSE FRACTION PASSING NO. 4 SEIVE	CLEAN GRAVELS (LESS THAN 5% PASSING #200 Sieve)		GW	WELL-GRADED GRAVELS, GRAVEL- SAND MIXTURES
		GRAVELS WITH FINES (GREATER THAN 12% PASSING #200 Sieve)		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH FINES (GREATER THAN 12% PASSING #200 Sieve)		GM	SILTY-GRAVELS, GRAVEL-SAND-SILT MIXTURES
	SAND AND SANDY SOILS GREATER THAN 50% OF COARSE FRACTION PASSING NO. 4 SEIVE	CLEAN SANDS (LESS THAN 5% PASSING #200 Sieve)		SW	WELL-GRADED SANDS, GRAVELLY-SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (GREATER THAN 12% PASSING #200 Sieve)		SP	POORLY-GRADED SANDS, GRAVELLY-SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (GREATER THAN 12% PASSING #200 Sieve)		SM	SILTY-SANDS
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS Low Plasticity (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS	
			OL	ORGANIC SILTS AND ORGANIC CLAYS WITH LOW PLASTICITY	
	SILTS AND CLAYS High Plasticity (LIQUID LIMIT GREATER THAN 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR VOCANIC ASH	
			CH	INORGANIC CLAYS WITH HIGH PLASTICITY	
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	

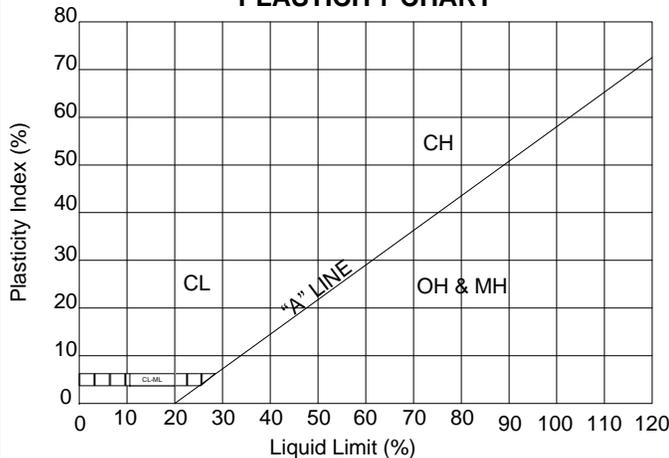
SAMPLER TYPES

	SPT		Rock Core
	Modified California (2.5" I.D.)		Shelby Tube
	Bulk		Water Level

OTHER TESTS

ATT – Atterberg Limit (Plasticity Index)	RV – R-Value
CD – Consolidated Drained Triaxial	SA – Sieve Analysis
CON – Consolidation	-#200 - Percent Passing #200 Sieve
COR – Corrosivity	TV – Torvane Shear
DS – Direct Shear	UU – Unconsolidated Undrained Triaxial
EI – Expansion Index	
MAX – Maximum Density	

PLASTICITY CHART



PENETRATION RESISTANCE

(Recorded As Blows/Foot)

SAND & GRAVEL		SILT & CLAY		
Relative Density	Blows/Foot* N ₆₀	Consistency	Blows/Foot* N ₆₀	Strength-(KSF)
Very Loose	0-4	Very Soft	0 - 2	0 - 0.5
Loose	4-10	Soft	2 - 4	0.5 - 1.0
Medium Dense	10-30	Medium Stiff	4 - 8	1.0 - 2.0
Dense	30-50	Stiff	8 - 15	2.0 - 4.0
Very Dense	Over 50	Very Stiff	15 - 30	4.0 - 8.0
		Hard	Over 30	Over 8.0

* Number of blows of 140LB hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split barrel sampler the last 12 inches of an 18-inch drive (ASTM-1586 Standard Penetration Test)

** Undrained shear strength in kips/sq. ft. As determined by laboratory testing or approximated by the standard penetration test, pocket penetrometer, torvane, or visual observation



CLIENT Trojan Storage	PROJECT NAME Proposed Commercial Development
PROJECT NUMBER AAA-72811.4	PROJECT LOCATION 700 E. McGlincy Ln., Campbell CA
DATE STARTED 7/20/18 COMPLETED 7/20/18	GROUND ELEVATION _____ BORING DIAMETER 6"
EQUIPMENT / RIG Truck Mounted CME-55	HAMMER EFFICIENCY (%) 60
METHOD 6.0" Hollow Stem Auger 140 lb Auto Hammer	SPT CORRECTION 1.00 CAL CORRECTION 0.55
LOGGED BY CCC CHECKED BY _____	GROUNDWATER DEPTH (ft) Not Encountered
NOTES _____	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS
0		UNIMPROVED GRAVEL SURFACE	GP									
1		1' thick gravel surface										
2		ALLUVIUM										
3		@ 1' SILTY SANDY GRAVEL, light brown, slightly moist, medium dense, medium to coarse-grained sand, fine to medium gravel, slightly oxidized, trace clay	GM	MC BULK	25 29 27	31		2	117			DS
4												
6		@ 6' GRAVELLY SILTY SAND, light brown mottled, slightly moist, medium dense, fine to coarse-grained sand, 20 - 30% fine to medium gravel, trace clay		SPT	9 9 7	16					4.4	#200
7												
9		@ 9' thin layers of brown silt, increase in clay, very moist		MC	7 9 10	10		4	108			
10			SM									
14				SPT	12 14 16	30						
15												
19		@ 18.5' CLAYEY SANDY GRAVEL, light brown mottled, very moist, dense, slight plasticity, medium to coarse-grained sand, oxidation, fine to coarse gravel up to 3" in diameter		MC	28 50 for 3"			8	101			
20												
24		@ 23.5' light orangish-gray to light grayish-brown, less clay		SPT	40 41 42	83					11.2	#200
25			GC									
29				MC	50 for 5"			8	103			
30												
34				SPT	34 50							

GEOTECH LOG - COLUMNS AAA-72811.4.GPJ GINT STD US LAB.GDT 8/21/18

(Continued Next Page)



CLIENT Trojan Storage **PROJECT NAME** Proposed Commercial Development

PROJECT NUMBER AAA-72811.4 **PROJECT LOCATION** 700 E. McGlincy Ln., Campbell CA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS
35		@ 18.5' CLAYEY SANDY GRAVEL, light brown mottled, very moist, dense, slight plasticity, medium to coarse-grained sand, oxidation, fine to coarse gravel up to 3" in diameter (<i>continued</i>)	GC	SPT	42 50 for 5"							
36												
37												
38												
39												
40	<p>Total depth: 40' No groundwater encountered Backfilled with native soils</p>											



CLIENT Trojan Storage	PROJECT NAME Proposed Commercial Development
PROJECT NUMBER AAA-72811.4	PROJECT LOCATION 700 E. McGlincy Ln., Campbell CA
DATE STARTED 7/20/18 COMPLETED 7/20/18	GROUND ELEVATION _____ BORING DIAMETER 6"
EQUIPMENT / RIG Truck Mounted CME-55	HAMMER EFFICIENCY (%) 60
METHOD 6.0" Hollow Stem Auger 140 lb Auto Hammer	SPT CORRECTION 1.00 CAL CORRECTION 0.55
LOGGED BY CCC CHECKED BY _____	GROUNDWATER DEPTH (ft) Not Encountered
NOTES _____	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS	
0		UNIMPROVED GRAVEL SURFACE 1.5' thick gravel surface	GP										
1		ALLUVIUM @ 1.5' SILTY SANDY GRAVEL, light brown, slightly moist, medium dense, medium to coarse-grained sand, fine to medium <2" diameter subangular-subrounded gravel, slightly oxidized, trace clay @ 3' No recovery	GM	NR	23 16 14	17							
2				SPT	11 30 34	64							
3				MC	31 29 25	30	3	119					
4													
5													
6		@ 13.5' GRAVELLY SILTY SAND, light brown mottled, moist, medium dense, fine to coarse-grained sand, fine to medium gravel, trace clay	SM	SPT	11 14 16	30							
7													
8													
9		@ 18.5' SILTY SANDY GRAVEL, gray-brown mottled, moist, dense, medium to coarse sand, fine to medium gravel, trace clay	GM	MC	50 for 6"			5	115				
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													

Total depth: 19'
No groundwater encountered
Backfilled with native soils

GEOTECH LOG - COLUMNS AAA-72811.4.GPJ GINT STD US LAB.GDT 8/21/18



CLIENT <u>Trojan Storage</u>	PROJECT NAME <u>Proposed Commercial Development</u>
PROJECT NUMBER <u>AAA-72811.4</u>	PROJECT LOCATION <u>700 E. McGlincy Ln., Campbell CA</u>
DATE STARTED <u>7/20/18</u> COMPLETED <u>7/20/18</u>	GROUND ELEVATION _____ BORING DIAMETER <u>6"</u>
EQUIPMENT / RIG <u>Truck Mounted CME-55</u>	HAMMER EFFICIENCY (%) <u>60</u>
METHOD <u>6.0" Hollow Stem Auger 140 lb Auto Hammer</u>	SPT CORRECTION <u>1.00</u> CAL CORRECTION <u>0.55</u>
LOGGED BY <u>CCC</u> CHECKED BY _____	GROUNDWATER DEPTH (ft) <u>Not Encountered</u>
NOTES _____	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS
0		UNIMPROVED GRAVEL SURFACE 1.5' thick gravel surface	GP									
1		ALLUVIUM @ 1.5' SILTY SANDY GRAVEL, brown mottled, slightly moist, loose to medium dense, medium to coarse-grained sand, fine to medium <2" diameter subangular-subrounded gravel, slightly oxidized, trace clay @ 5' Generally fine to coarse sand, mainly fine <1" gravel @ 13.5' Becomes dark gray-brown, increased gravel fraction, fine to medium gravel, medium to coarse sand, trace clay @ 18.5' CLAYEY SANDY GRAVEL, brown to gray-brown mottled, moist, dense, medium to coarse sand, slight plasticity, fine to coarse gravel, oxidation										
2			MC	34 49 21	39	9	104					
3			SPT	8 12 16	28							
4												
5			MC	5 5 4	5	6	102					
6												
7												
8												
9												
10												
11												
12												
13												
14		SPT	25 26 36	62								
15												
16												
17												
18												
19												

Total depth: 19.5'
No groundwater encountered
Backfilled with native soils

GEOTECH LOG - COLUMNS AAA-72811.4.GPJ GINT STD US LAB.GDT 8/21/18



CLIENT <u>Trojan Storage</u>	PROJECT NAME <u>Proposed Commercial Development</u>
PROJECT NUMBER <u>AAA-72811.4</u>	PROJECT LOCATION <u>700 E. McGlincy Ln., Campbell CA</u>
DATE STARTED <u>7/20/18</u> COMPLETED <u>7/20/18</u>	GROUND ELEVATION _____ BORING DIAMETER <u>6"</u>
EQUIPMENT / RIG <u>Truck Mounted CME-55</u>	HAMMER EFFICIENCY (%) <u>60</u>
METHOD <u>6.0" Hollow Stem Auger 140 lb Auto Hammer</u>	SPT CORRECTION <u>1.00</u> CAL CORRECTION <u>0.55</u>
LOGGED BY <u>CCC</u> CHECKED BY _____	GROUNDWATER DEPTH (ft) <u>Not Encountered</u>
NOTES _____	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS
0		UNIMPROVED GRAVEL SURFACE										
1		2' thick gravel surface	GP									
2		ALLUVIUM @ 2' SILTY SANDY GRAVEL, grayish-brown, slightly moist, loose to dense, medium to coarse-grained sand, fine to medium <1.5" diameter subangular-subrounded gravel, slightly oxidized		MC BULK	41	31		3	110			
3	34											
4	23											
5												
6												
7		@ 9' gravel to 3" diameter, minor clay	GM	MC	14	28		4	115			
8	24											
9	26											
10				MC	23	28		4	123			
11	25											
12	26											
13				SPT	16	69						
14	28											
15	41											
16				SPT	50 for 6"							
17												
18												
19		@ 18.5' moist to very moist, with increase in clay										

Total depth: 19'
No groundwater encountered
Backfilled with native soils



CLIENT Trojan Storage **PROJECT NAME** Proposed Commercial Development

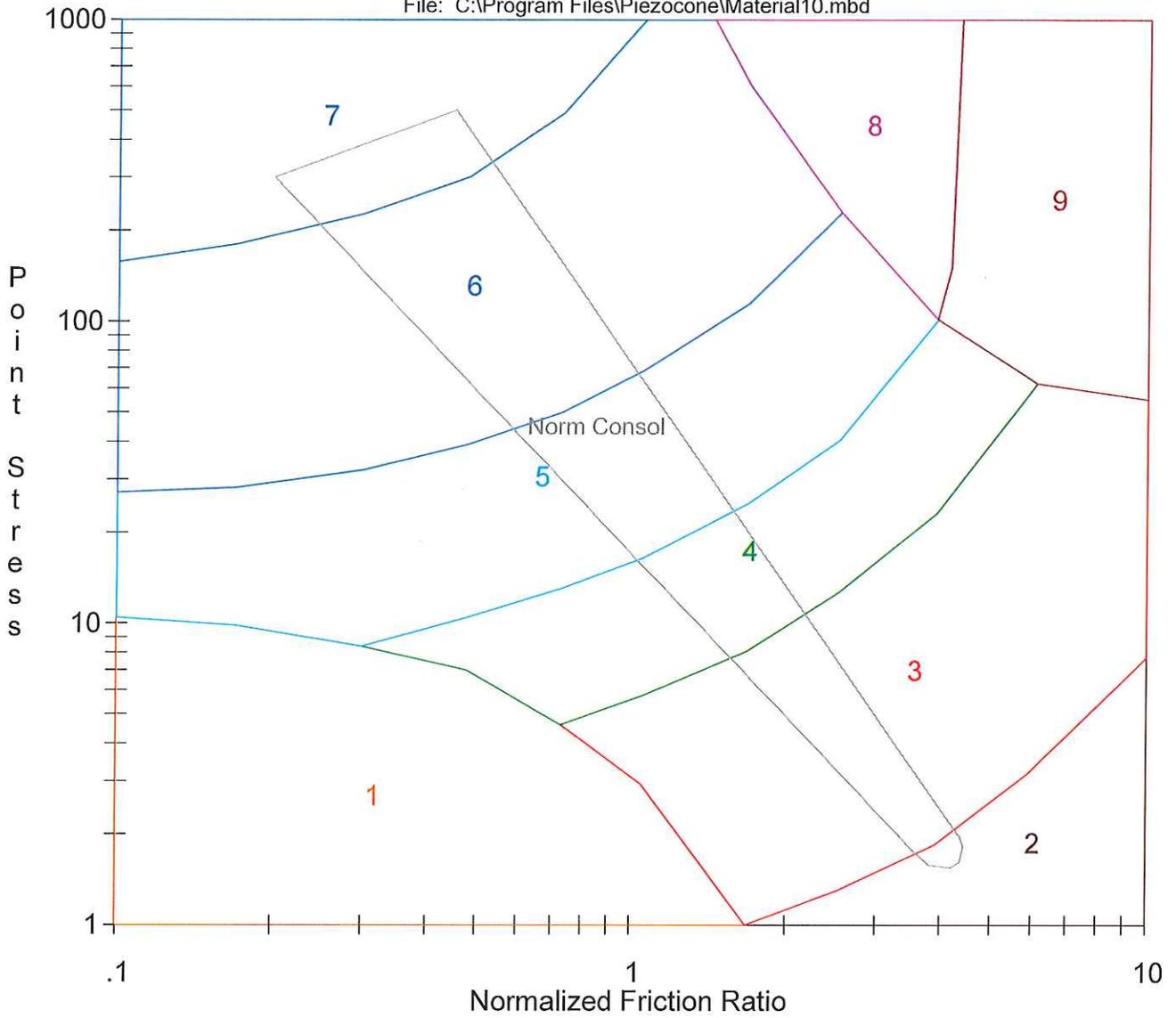
PROJECT NUMBER AAA-72811.4 **PROJECT LOCATION** 700 E. McGlincy Ln., Campbell CA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	USCS SYMBOL	SAMPLE TYPE	PENETRATION RESISTANCE (blows/6-inches)	SPT N60	POCKET PEN (tsf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS (PI,LL)	FINES CONTENT (%)	OTHER TESTS
35		@ 24' CLAYEY SANDY GRAVEL with interbedded light brown SILTY CLAY (continued)	GC-CL									
36												
37												
38												
39		@ 38.5' CLAYEY SANDY GRAVEL, brown mottled, moist to very moist, dense, medium to coarse-grained sand, fine to medium gravel; refusal at 39.5'	GC	<input checked="" type="checkbox"/> SPT	48 50 for 3"							

Total depth; refusal: 39.5'
 No groundwater encountered
 Backfilled with native soils

Material Behavior Type Zones

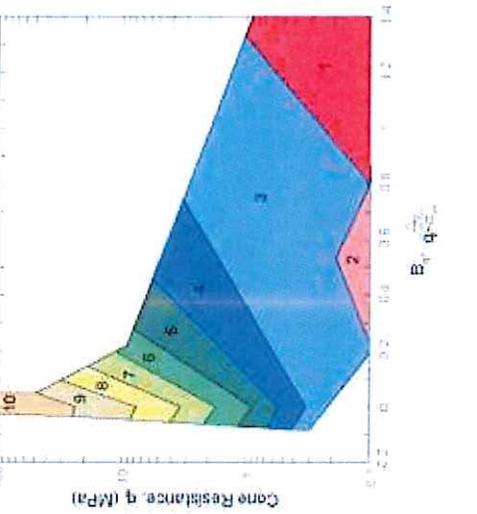
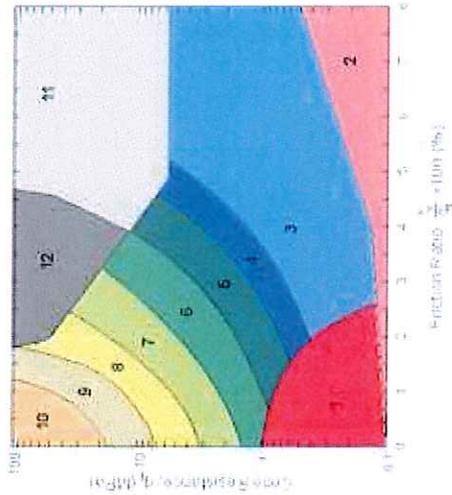
File: C:\Program Files\Piezocone\Material10.mbd



1. sensitive fine SOIL
2. Organic SOILS - Peats
3. silty CLAY to CLAY
4. clayy SILT to silty CLAY
5. silty SAND to sandy SILT
6. clean SAND to silty SAND
7. grvly SAND to dense SAND
8. stiff SAND to clay SAND
9. very stiff fine SOIL

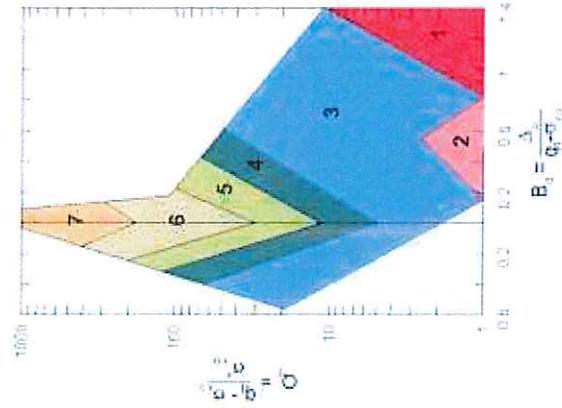
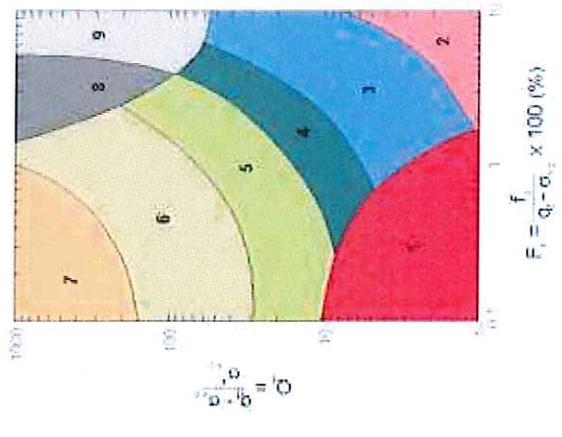
CPT Soil Behavior Type Legend

Robertson et al. 1986



- Soil Behavior Type**
- 1 Sensitive, Fine Grained
 - 2 Organic Material
 - 3 Clay
 - 4 Silty Clay to Clay
 - 5 Clayey Silt to Silty Clay
 - 6 Sandy Silt to Clayey Silt
 - 7 Silty Sand to Sandy Silt
 - 8 Sand to Silty Sand
 - 9 Sand
 - 10 Gravelly Sand to Sand
 - 11 Very Stiff Fine Grained*
 - 12 Sand to Clayey Sand*
- *Overconsolidated or Cemented

Robertson et al. 1990



- Soil Behavior Type**
- 1 Sensitive, Fine Grained
 - 2 Organic Soils-Peats
 - 3 Clays, Clay to Silty Clay
 - 4 Silt Mixtures; Clayey Silt to Silty Clay
 - 5 Sand Mixtures; Silty Sand to Sandy Silt
 - 6 Sands; Clean Sands to Silty Sands
 - 7 Gravelly Sand to Sand
 - 8 Very Stiff Sand to Clayey Sand*
 - 9 Very Stiff Fine Grained*
- *Overconsolidated or Cemented

Trojan Storage

Project ID: EEIE Engineering S olutions
 Data File: SDF(0 14).cpt
 CPT Date: 6/27/ 2018 9 :58:13 AM
 GW Duration: 50 ft
 Sound ing ID: CPT -1
 Project No: AAA -7281 1.4
 Core/R ig: DDG1 418

Depth ft	qc PS tsf	qc1n PS	q1nc PS	qt PS	Slv Stss tsf	pore prss (psi)	Frct Ratio %	Mat Typ Zon	Material Behavior Description	Unit Wght pcf	Qc N	SPT R-N 60%	SPT R-N1 60%	SPT IcN1 60%	SPT Den %	Rel Den %	Ftn Ang deg	Und Shr	OCR -	Fin Ic %	Ic SBT	Nk -
0.33	725.2	1163.1	1163.1	725.3	3.3	4	0.5		7 grvly SAND to dense SAND	130	6	100	100	100	95	48	-	-	-	5	0.96	16
0.49	213.1	341.8	404.4	213.1	5.7	0.1	2.7		8 stiff SAND to clay SAND	115	1	100	100	64	-	-	14.1	9.9	-	10	1.89	16
0.66	661.2	1060.4	1060.4	661.2	7.8	0.2	1.2		6 clean SAND to silty SAND	125	5	100	100	100	95	48	-	-	-	5	1.37	16
0.82	573.5	919.8	919.8	573.5	8.8	0.7	1.5		8 stiff SAND to clay SAND	115	1	100	100	100	-	-	38	9.9	-	5	1.49	16
0.98	481.9	772.9	772.9	482	9	4.5	1.9		8 stiff SAND to clay SAND	115	1	100	100	100	-	-	31.9	9.9	-	5	1.6	16
1.15	412.6	661.8	660	412.6	8	-0.1	1.9		8 stiff SAND to clay SAND	115	1	100	100	100	-	-	27.3	9.9	-	5	1.64	16
1.31	371.5	595.8	595.8	371.5	6.2	0.3	1.7		6 clean SAND to silty SAND	125	5	100	74	100	95	48	-	-	-	5	1.6	16
1.48	302.9	485.8	501.9	302.9	5.8	0.4	1.9		6 clean SAND to silty SAND	125	5	97	61	85	95	48	-	-	-	6	1.69	16
1.64	261.2	418.9	418.9	261.2	3.5	2.7	1.3		6 clean SAND to silty SAND	125	5	84	52	71	95	48	-	-	-	5	1.59	16
1.8	222.9	357.4	357.4	222.9	2.7	0.8	1.2		6 clean SAND to silty SAND	125	5	71	45	61	95	48	-	-	-	5	1.6	16
1.97	168	269.5	284.9	168.2	2.4	7.1	1.5		6 clean SAND to silty SAND	125	5	54	34	48	95	48	-	-	-	7	1.73	16
2.13	152.2	244.1	290.1	152.3	3.3	1.3	2.2		6 clean SAND to silty SAND	125	5	49	30	46	95	48	-	-	-	10	1.9	16
2.3	208.6	334.5	371.1	208.6	4.3	0.8	2.1		6 clean SAND to silty SAND	125	5	67	42	61	95	48	-	-	-	8	1.8	16
2.46	265.7	426.2	426.2	265.9	3.8	6.1	1.4		6 clean SAND to silty SAND	125	5	85	53	73	95	48	-	-	-	5	1.61	16
2.62	276.6	443.6	443.6	276.6	2.6	1.5	0.9		6 clean SAND to silty SAND	125	5	89	55	72	95	48	-	-	-	5	1.44	16
2.79	283.9	455.3	455.3	283.9	2.1	1.8	0.7		6 clean SAND to silty SAND	125	5	91	57	72	95	48	-	-	-	5	1.36	16
2.95	296.4	475.4	475.4	296.5	2.3	3.5	0.8		6 clean SAND to silty SAND	125	5	95	59	75	95	48	-	-	-	5	1.36	16
3.12	304	487.5	487.5	304	1.7	2	0.6		7 grvly SAND to dense SAND	130	6	81	51	74	95	48	-	-	-	5	1.25	16
3.28	303.2	486.2	486.2	303.2	1.6	2.8	0.5		7 grvly SAND to dense SAND	130	6	81	51	74	95	48	-	-	-	5	1.22	16
3.45	278.5	446.6	446.6	278.5	2.6	2.2	0.9		6 clean SAND to silty SAND	125	5	89	56	72	95	48	-	-	-	5	1.44	16
3.61	312.1	500.5	500.5	312.1	2.9	0.7	0.9		6 clean SAND to silty SAND	125	5	100	62	80	95	48	-	-	-	5	1.42	16
3.77	280.2	449.5	449.5	280.3	2.6	0.6	0.9		6 clean SAND to silty SAND	125	5	90	56	73	95	48	-	-	-	5	1.44	16
3.94	230.5	369.6	369.6	230.5	2.6	0.8	1.1		6 clean SAND to silty SAND	125	5	74	46	62	95	48	-	-	-	5	1.57	16
4.1	206.3	330.9	330.9	206.3	1.2	1.1	0.6		6 clean SAND to silty SAND	125	5	66	41	52	95	48	-	-	-	5	1.38	16
4.27	188.1	301.6	301.6	188.1	1.3	0.9	0.7		6 clean SAND to silty SAND	125	5	60	38	49	95	48	-	-	-	5	1.46	16
4.43	166.8	267.4	275.1	166.8	2.1	2.5	1.3		6 clean SAND to silty SAND	125	5	53	33	47	95	48	-	-	-	6	1.69	16
4.59	140	224.5	224.5	140	1.2	0.7	0.9		6 clean SAND to silty SAND	125	5	45	28	38	94	48	-	-	-	5	1.61	16
4.76	117.2	188	195.2	117.2	1.1	0.7	1		6 clean SAND to silty SAND	125	5	38	23	33	88	47	-	-	-	6	1.7	16
4.92	89.4	143.3	151.3	89.4	0.7	0.8	0.8		6 clean SAND to silty SAND	125	5	29	18	25	79	46	-	-	-	7	1.73	16
5.09	73.7	118.2	134.3	73.7	0.7	0.8	0.9		6 clean SAND to silty SAND	125	5	24	15	22	73	45	-	-	-	9	1.84	16
5.25	69.8	111.9	131.4	69.8	0.7	0.9	1		6 clean SAND to silty SAND	125	5	22	14	21	71	44	-	-	-	10	1.88	16

5.41	61.3	98.3	114.2	61.3	0.5	0.8	0.8	0.8	6 clean SAND to silty SAND	125	5	20	12	18	66	44	-	10	1.87	16	
5.58	59.3	95.1	108.5	59.3	0.4	0.1	0.7	0.7	6 clean SAND to silty SAND	125	5	19	12	18	65	43	-	9	1.84	16	
5.74	58.3	93.5	104.2	58.3	0.4	0.5	0.6	0.6	6 clean SAND to silty SAND	125	5	19	12	17	65	43	-	8	1.81	16	
5.91	56.5	90.6	100.2	56.5	0.3	0.6	0.6	0.6	6 clean SAND to silty SAND	125	5	18	11	17	64	43	-	8	1.8	16	
6.07	50.7	80.3	92.8	50.7	0.3	0.3	0.6	0.6	6 clean SAND to silty SAND	125	5	16	10	15	60	42	-	10	1.86	16	
6.23	47.1	73.5	88.7	47.1	0.3	0.5	0.7	0.7	6 clean SAND to silty SAND	125	5	15	9	14	57	42	-	11	1.92	16	
6.4	41.7	64.2	78.2	41.7	0.2	0.2	0.6	0.6	6 clean SAND to silty SAND	125	5	13	8	12	52	41	-	11	1.93	16	
6.56	42.1	64.1	78.4	42.1	0.2	0.2	0.6	0.6	6 clean SAND to silty SAND	125	5	13	8	12	52	41	-	11	1.93	16	
6.73	43.4	65.2	78.5	43.4	0.2	0	0.5	0.5	6 clean SAND to silty SAND	125	5	13	9	12	53	41	-	11	1.91	16	
6.89	38.8	57.6	78.4	38.8	0.3	0.2	0.8	0.8	6 clean SAND to silty SAND	125	5	12	8	11	49	40	-	14	2.04	16	
7.05	31.9	46.8	101.5	31.9	0.6	0.1	2	2	5 silty SAND to sandy SILT	120	4	12	8	11	42	39	-	25	2.36	16	
7.22	27.2	39.4	108.1	27.2	0.7	-0.1	2.6	2.6	4 clay SILT to silty CLAY	115	2	20	14	10	-	-	1.9	9.9	30	2.49	15
7.38	22.8	32.7	103.7	22.8	0.6	0.5	2.8	2.8	4 clay SILT to silty CLAY	115	2	16	11	8	-	-	1.6	9.9	34	2.57	15
7.55	11.1	17.8	-	11.1	0.5	-0.3	4.7	4.7	3 silty CLAY to CLAY	115	1.5	12	7	5	-	-	0.8	7.5	54	2.93	15
7.71	7.3	11.7	-	7.3	0.3	0.4	4.7	4.7	3 silty CLAY to CLAY	115	1.5	8	5	4	-	-	0.5	4.7	64	3.08	15
7.87	6.6	10.5	-	6.6	0.2	1.5	3.8	3.8	3 silty CLAY to CLAY	115	1.5	7	4	3	-	-	0.4	4.1	63	3.06	15
8.04	16.1	25.8	-	16.1	0.8	2.7	4.9	4.9	3 silty CLAY to CLAY	115	1.5	17	11	7	-	-	1.1	9.9	47	2.82	15
8.2	61.4	84	174.8	61.5	2.1	1.5	3.4	3.4	5 silty SAND to sandy SILT	120	4	21	15	19	61	42	-	24	2.34	16	
8.37	115.8	156.8	188.1	115.8	1.8	-0.5	1.6	1.6	6 clean SAND to silty SAND	125	5	31	23	30	82	45	-	11	1.91	16	
8.53	112.5	150.9	158.4	112.5	0.9	0.3	0.8	0.8	6 clean SAND to silty SAND	125	5	30	23	27	81	44	-	6	1.72	16	
8.69	120.4	159.8	162.9	120.3	0.9	-0.3	0.7	0.7	6 clean SAND to silty SAND	125	5	32	24	28	82	45	-	6	1.67	16	
8.86	119.7	157.4	168.9	119.7	1.1	-0.5	1	1	6 clean SAND to silty SAND	125	5	31	24	28	82	44	-	7	1.75	16	
9.02	110	143.3	165.7	110	1.4	-0.4	1.3	1.3	6 clean SAND to silty SAND	125	5	29	22	27	79	44	-	10	1.86	16	
9.19	114.3	147.5	155.1	114.3	0.9	-0.8	0.8	0.8	6 clean SAND to silty SAND	125	5	30	23	26	80	44	-	7	1.72	16	
9.35	103.5	132.4	165.2	103.5	1.6	-0.6	1.6	1.6	6 clean SAND to silty SAND	125	5	26	21	26	76	44	-	12	1.96	16	
9.51	94.8	120.2	135.3	94.8	0.9	-0.3	0.9	0.9	6 clean SAND to silty SAND	125	5	24	19	22	73	43	-	9	1.83	16	
9.68	83.2	104.6	111.7	83.2	0.5	-0.9	0.6	0.6	6 clean SAND to silty SAND	125	5	21	17	19	68	42	-	7	1.74	16	
9.84	66.1	82.4	95.4	66.1	0.4	-1	0.6	0.6	6 clean SAND to silty SAND	125	5	16	13	15	61	41	-	10	1.86	16	
10.01	68.3	84.4	180.9	68.3	2.4	-0.2	3.6	3.6	4 clay SILT to silty CLAY	115	2	42	34	19	-	-	4.8	9.9	25	2.36	15
10.17	60.5	74.2	177.6	60.4	2.3	-0.6	3.9	3.9	4 clay SILT to silty CLAY	115	2	37	30	17	-	-	4.2	9.9	27	2.42	15
10.34	67.3	82	181.7	67.3	2.5	-0.5	3.7	3.7	4 clay SILT to silty CLAY	115	2	41	34	19	-	-	4.7	9.9	25	2.38	15
10.5	82.5	99.7	177.1	82.5	2.4	-0.6	2.9	2.9	5 silty SAND to sandy SILT	120	4	25	21	22	67	42	-	20	2.24	16	
10.66	107.6	129.1	183.2	107.6	2.4	-0.7	2.2	2.2	5 silty SAND to sandy SILT	120	4	32	27	26	75	43	-	15	2.08	16	
10.83	115.9	138	177.3	115.9	2.1	-0.5	1.8	1.8	6 clean SAND to silty SAND	125	5	28	23	27	78	43	-	13	1.99	16	
10.99	102.7	121.4	142.6	102.7	1.2	-0.5	1.1	1.1	6 clean SAND to silty SAND	125	5	24	21	23	73	43	-	10	1.89	16	
11.16	125.7	147.4	165.2	125.7	1.4	-0.6	1.1	1.1	6 clean SAND to silty SAND	125	5	29	25	27	80	44	-	9	1.82	16	
11.32	129.9	151.3	166.2	129.9	1.3	0.3	1	1	6 clean SAND to silty SAND	125	5	30	26	27	81	44	-	8	1.79	16	
11.48	142.8	165.1	193.1	142.8	2.1	-0.2	1.5	1.5	6 clean SAND to silty SAND	125	5	33	29	31	84	44	-	10	1.88	16	
11.65	179.8	206.4	230.3	179.9	2.7	0.3	1.5	1.5	6 clean SAND to silty SAND	125	5	41	36	38	91	45	-	8	1.81	16	
11.81	227	258.7	264.7	227	2.7	-0.5	1.2	1.2	6 clean SAND to silty SAND	125	5	52	45	45	95	46	-	6	1.68	16	
11.98	243.6	275.6	275.6	243.7	2.6	5.4	1.1	1.1	6 clean SAND to silty SAND	125	5	55	49	47	95	46	-	5	1.62	16	
12.14	284.9	320.1	344.1	284.9	5	3.2	1.8	1.8	6 clean SAND to silty SAND	125	5	64	57	57	95	47	-	7	1.75	16	
12.3	302.4	337.5	340.6	302.6	4.2	8.2	1.4	1.4	6 clean SAND to silty SAND	125	5	67	60	59	95	47	-	5	1.66	16	

12.47	299.3	331.8	348	299.5	4.8	8.6	1.6	6 clean SAND to silty SAND	125	5	66	60	59	95	47	-	-	6	1.72	16
12.63	279.4	307.7	384.4	279.5	8.3	1.5	3	8 stiff SAND to clay SAND	115	1	100	100	59	-	-	18.5	9.9	12	1.96	16
12.8	418.2	457.7	457.7	418.2	6.4	-0.2	1.5	6 clean SAND to silty SAND	125	5	92	84	78	95	48	-	-	5	1.62	16
12.96	405.6	441	450.9	405.6	7	1.8	1.7	6 clean SAND to silty SAND	125	5	88	81	77	95	48	-	-	6	1.68	16
13.12	254.5	275	300.1	254.5	4.3	1.1	1.7	6 clean SAND to silty SAND	125	5	55	51	50	95	46	-	-	8	1.78	16
13.29	263.6	283.1	299.6	263.7	4	5	1.5	6 clean SAND to silty SAND	125	5	57	53	50	95	46	-	-	7	1.73	16
13.45	226.4	241.6	286	226.5	4.8	4.4	2.1	6 clean SAND to silty SAND	125	5	48	45	46	95	45	-	-	10	1.89	16
13.62	196.5	208.4	264.2	196.6	4.7	2.8	2.4	5 silty SAND to sandy SILT	120	4	52	49	41	91	45	-	-	12	1.97	16
13.78	201.9	212.9	264	202	4.6	2.9	2.3	6 clean SAND to silty SAND	125	5	43	40	41	92	45	-	-	12	1.95	16
13.94	205.5	215.4	261.1	205.7	4.4	9	2.1	6 clean SAND to silty SAND	125	5	43	41	41	92	45	-	-	11	1.92	16
14.11	253.7	264.3	274.7	253.8	3.3	6.8	1.3	6 clean SAND to silty SAND	125	5	53	51	47	95	46	-	-	6	1.7	16
14.27	284.3	294.5	297.2	284.5	3.6	7.4	1.3	6 clean SAND to silty SAND	125	5	59	57	51	95	46	-	-	5	1.66	16
14.44	272.1	280.3	303.8	272.4	4.5	11.4	1.7	6 clean SAND to silty SAND	125	5	56	54	51	95	46	-	-	7	1.77	16
14.6	260.1	266.3	267.8	260.1	3	2	1.1	6 clean SAND to silty SAND	125	5	53	52	46	95	46	-	-	5	1.65	16
14.76	267.5	272.3	274.6	267.6	3.2	4.4	1.2	6 clean SAND to silty SAND	125	5	54	53	47	95	46	-	-	5	1.66	16
14.93	256.8	260	272.5	256.9	3.5	6	1.4	6 clean SAND to silty SAND	125	5	52	51	46	95	46	-	-	6	1.72	16
15.09	265.4	267.3	283.4	265.5	3.9	2.8	1.5	6 clean SAND to silty SAND	125	5	53	53	48	95	46	-	-	7	1.73	16
15.26	239.7	240	240	239.7	2.4	4	1	6 clean SAND to silty SAND	125	5	48	48	41	95	45	-	-	5	1.63	16
15.42	227.8	226.8	246.9	227.9	3.3	6.9	1.4	6 clean SAND to silty SAND	125	5	45	46	41	94	45	-	-	8	1.77	16
15.58	240.8	238.6	248.3	241	2.9	7.1	1.2	6 clean SAND to silty SAND	125	5	48	48	42	95	45	-	-	6	1.72	16
15.75	238.7	235.2	270	238.7	4.4	1.6	1.9	6 clean SAND to silty SAND	125	5	47	48	44	95	45	-	-	9	1.85	16
15.91	254.5	249.4	289.6	254.6	5.2	8.2	2	6 clean SAND to silty SAND	125	5	50	51	47	95	45	-	-	10	1.87	16
16.08	260.1	253.6	297.7	260.1	5.6	3.5	2.1	6 clean SAND to silty SAND	125	5	51	52	48	95	45	-	-	10	1.88	16
16.24	228.7	221.9	269.1	229	5	12.1	2.2	6 clean SAND to silty SAND	125	5	44	46	42	93	45	-	-	11	1.92	16
16.4	252.6	243.8	288.2	252.7	5.4	2.9	2.1	6 clean SAND to silty SAND	125	5	49	51	46	95	45	-	-	10	1.89	16
16.57	226	217	266.1	226	5	2.6	2.2	6 clean SAND to silty SAND	125	5	43	45	42	93	45	-	-	11	1.94	16
16.73	259.3	247.8	297.4	259.5	5.9	5.7	2.3	6 clean SAND to silty SAND	125	5	50	52	47	95	45	-	-	11	1.91	16
16.9	246.5	234.4	302	246.6	6.7	4.3	2.7	8 stiff SAND to clay SAND	115	1	100	100	46	-	-	16.3	9.9	13	1.99	16
17.06	228.6	216.4	306.4	228.6	7.5	1.4	3.3	8 stiff SAND to clay SAND	115	1	100	100	44	-	-	15.1	9.9	15	2.08	16
17.23	173.5	163.5	285.3	173.7	7.2	9.6	4.2	9 very stiff fine SOIL	120	2	82	87	35	83	43	-	-	20	2.23	30
17.39	203.8	191.2	272.7	204	6.3	12.3	3.1	8 stiff SAND to clay SAND	115	1	100	100	39	-	-	13.4	9.9	15	2.08	16
17.55	200.4	187.1	258.4	200.4	5.6	4.4	2.8	5 silty SAND to sandy SILT	120	4	47	50	38	88	44	-	-	15	2.06	16
17.72	179.8	167.1	246.8	179.9	5.4	5.6	3	5 silty SAND to sandy SILT	120	4	42	45	34	84	43	-	-	16	2.11	16
17.88	230.5	213.4	263.3	230.7	5.2	9.4	2.3	6 clean SAND to silty SAND	125	5	43	46	41	92	44	-	-	12	1.94	16
18.05	252.4	232.5	285.3	252.5	5.9	3.4	2.4	6 clean SAND to silty SAND	125	5	47	50	45	95	45	-	-	11	1.94	16
18.21	207.8	190.6	276	207.9	6.6	1.8	3.2	8 stiff SAND to clay SAND	115	1	100	100	39	-	-	13.7	9.9	16	2.1	16
18.37	189.4	173	256.9	189.5	5.9	4.3	3.2	5 silty SAND to sandy SILT	120	4	43	47	36	85	43	-	-	16	2.12	16
18.54	181.6	165.1	263	181.7	6.4	6.8	3.5	8 stiff SAND to clay SAND	115	1	100	100	35	-	-	12	9.9	18	2.17	16
18.7	219.4	198.7	264	219.6	5.8	8	2.7	5 silty SAND to sandy SILT	120	4	50	55	39	90	44	-	-	14	2.02	16
18.87	259.8	234.3	308.3	259.9	7.5	4.7	2.9	8 stiff SAND to clay SAND	115	1	100	100	46	-	-	17.1	9.9	13	2.01	16
19.03	291.4	261.7	294.2	291.5	5.4	3.4	1.9	6 clean SAND to silty SAND	125	5	52	58	48	95	45	-	-	9	1.82	16
19.19	311.4	278.5	313.4	311.5	6	2.2	1.9	6 clean SAND to silty SAND	125	5	56	62	51	95	45	-	-	9	1.83	16
19.36	315.3	280.7	338.6	315.4	7.9	3.8	2.5	8 stiff SAND to clay SAND	115	1	100	100	53	-	-	20.8	9.9	11	1.92	16

19.52	464.7	412.1	443.2	465	9.5	12.2	2.1	6 clean SAND to silty SAND	125	5	82	93	74	95	47	-	7	1.76	16	
19.69	393.9	347.9	419.5	394.4	11.2	22.3	2.9	8 stiff SAND to clay SAND	115	1	100	100	66	-	-	26	9.9	11	1.92	16
19.85	319.2	280.8	363.7	319.6	9.9	20.1	3.1	8 stiff SAND to clay SAND	115	1	100	100	55	-	-	21.1	9.9	13	2	16
20.01	335.1	293.6	341.7	335.3	7.7	11.8	2.3	6 clean SAND to silty SAND	125	5	59	67	55	95	45	-	-	10	1.87	16
20.18	282.3	246.4	285.5	282.4	5.6	0.6	2	6 clean SAND to silty SAND	125	5	49	56	46	95	45	-	-	10	1.87	16
20.34	270	234.6	269.2	270.4	5	20.4	1.9	6 clean SAND to silty SAND	125	5	47	54	44	95	44	-	-	9	1.85	16
20.51	268.5	232.4	263	268.7	4.7	11.5	1.7	6 clean SAND to silty SAND	125	5	46	54	43	95	44	-	-	9	1.83	16
20.67	279.5	240.9	270.2	279.6	4.8	5.3	1.7	6 clean SAND to silty SAND	125	5	48	56	44	95	44	-	-	9	1.82	16
20.83	327.7	281.3	294.8	327.7	4.7	0.9	1.4	6 clean SAND to silty SAND	125	5	56	66	50	95	45	-	-	6	1.71	16
21	348.4	297.9	319.4	348.4	5.7	0.3	1.7	6 clean SAND to silty SAND	125	5	60	70	53	95	45	-	-	7	1.75	16
21.16	335.5	285.8	288.1	335.5	4.1	-0.1	1.2	6 clean SAND to silty SAND	125	5	57	67	50	95	45	-	-	5	1.66	16
21.33	302	256.2	277.5	302	4.7	0.6	1.6	6 clean SAND to silty SAND	125	5	51	60	46	95	45	-	-	7	1.77	16
21.49	277.8	234.8	262.4	277.9	4.6	1.9	1.7	6 clean SAND to silty SAND	125	5	47	56	43	95	44	-	-	8	1.81	16
21.65	270.7	227.9	262.9	270.8	5	4.6	1.9	6 clean SAND to silty SAND	125	5	46	54	42	94	44	-	-	9	1.86	16
21.82	234.3	196.5	235.2	234.4	4.4	5.6	1.9	6 clean SAND to silty SAND	125	5	39	47	37	89	43	-	-	11	1.91	16
21.98	219.1	183	230.7	219.4	4.7	15.2	2.1	6 clean SAND to silty SAND	125	5	37	44	36	87	43	-	-	12	1.97	16
22.15	197.8	164.6	221.2	198	4.7	12.5	2.4	5 silty SAND to sandy SILT	120	4	41	49	33	83	42	-	-	14	2.03	16
22.31	169.9	140.9	211.6	170.3	4.7	23.3	2.8	5 silty SAND to sandy SILT	120	4	35	42	29	78	42	-	-	17	2.13	16
22.47	165	136.3	202.6	165.3	4.3	14.7	2.6	5 silty SAND to sandy SILT	120	4	34	41	28	77	41	-	-	16	2.12	16
22.64	191	157.3	191.6	191.1	3.2	5	1.7	6 clean SAND to silty SAND	125	5	31	38	30	82	42	-	-	11	1.93	16
22.8	229.1	188	218.3	229.2	3.7	5.1	1.6	6 clean SAND to silty SAND	125	5	38	46	35	88	43	-	-	10	1.87	16
22.97	267.6	218.7	237.8	267.7	3.7	6.6	1.4	6 clean SAND to silty SAND	125	5	44	54	39	93	44	-	-	8	1.77	16
23.13	284.6	231.8	242.2	284.7	3.4	7.4	1.2	6 clean SAND to silty SAND	125	5	46	57	41	95	44	-	-	6	1.71	16
23.3	233.1	189.2	198.6	233.2	2.4	2.7	1	6 clean SAND to silty SAND	125	5	38	47	34	88	43	-	-	6	1.72	16
23.46	190.3	153.9	190.9	190.3	3.3	-0.1	1.8	6 clean SAND to silty SAND	125	5	31	38	30	81	42	-	-	12	1.95	16
23.62	174.9	140.9	228.7	174.9	5.7	0	3.3	5 silty SAND to sandy SILT	120	4	35	44	30	78	41	-	-	18	2.18	16
23.79	185.2	148.8	241.6	185.3	6.3	0.3	3.4	5 silty SAND to sandy SILT	120	4	37	46	31	80	42	-	-	18	2.18	16
23.95	212	169.6	250.5	212	6.5	1.2	3.1	5 silty SAND to sandy SILT	120	4	42	53	35	84	42	-	-	16	2.11	16
24.12	251.4	200.6	235.8	251.5	4.5	4.1	1.8	6 clean SAND to silty SAND	125	5	40	50	38	90	43	-	-	10	1.89	16
24.28	236.1	187.7	228.1	236.2	4.6	4.5	1.9	6 clean SAND to silty SAND	125	5	38	47	36	88	43	-	-	11	1.93	16
24.44	240.7	190.7	244.4	241	5.6	13.3	2.3	5 silty SAND to sandy SILT	120	4	48	60	37	88	43	-	-	13	1.99	16
24.61	304.5	240.4	279.2	304.9	6	21.7	2	6 clean SAND to silty SAND	125	5	48	61	45	95	44	-	-	10	1.87	16
24.77	345.7	272.1	292.4	346.2	5.4	24.3	1.6	6 clean SAND to silty SAND	125	5	54	69	49	95	45	-	-	7	1.75	16
24.94	321.8	252.4	293.5	322.3	6.6	23	2.1	6 clean SAND to silty SAND	125	5	50	64	47	95	44	-	-	10	1.87	16
25.1	354.1	276.8	288.7	354.2	4.9	7.5	1.4	6 clean SAND to silty SAND	125	5	55	71	49	95	45	-	-	6	1.71	16
25.26	328.2	255.7	294.1	328.3	6.5	6.6	2	6 clean SAND to silty SAND	125	5	51	66	48	95	44	-	-	9	1.86	16
25.43	313.4	243.4	278	313.6	5.9	8.3	1.9	6 clean SAND to silty SAND	125	5	49	63	45	95	44	-	-	9	1.85	16
25.59	329.9	255.4	314.8	330	8.4	4.7	2.5	8 stiff SAND to clay SAND	115	1	100	100	49	-	-	21.8	9.9	11	1.94	16
25.76	339.6	262.1	319.8	339.9	8.5	13.1	2.5	8 stiff SAND to clay SAND	115	1	100	100	50	-	-	22.4	9.9	11	1.93	16
25.92	345.2	265.6	293	345.4	5.9	7.5	1.7	6 clean SAND to silty SAND	125	5	53	69	48	95	44	-	-	8	1.8	16
26.08	261.9	200.9	230.9	261.9	4.3	0.9	1.7	6 clean SAND to silty SAND	125	5	40	52	37	90	43	-	-	9	1.86	16
26.25	277.6	212.2	253.2	277.7	5.5	4.4	2	6 clean SAND to silty SAND	125	5	42	56	40	92	43	-	-	10	1.9	16
26.41	372.5	283.9	300.6	372.5	5.6	4.2	1.5	6 clean SAND to silty SAND	125	5	57	74	51	95	45	-	-	7	1.73	16

26.58	504.9	383.6	383.6	504.9	7.2	3.9	1.4	6 clean SAND to silty SAND	125	5	77	100	66	95	46	-	5	1.64	16	
26.74	404.7	306.5	331.4	404.8	7.1	5.7	1.8	6 clean SAND to silty SAND	125	5	61	81	55	95	45	-	7	1.76	16	
26.9	318.5	240.5	278	318.7	6.2	6.6	2	6 clean SAND to silty SAND	125	5	48	64	45	95	44	-	10	1.86	16	
27.07	145.5	109.5	185.1	145.5	4.1	1.6	2.9	5 silty SAND to sandy SILT	120	4	27	36	23	70	40	-	19	2.21	16	
27.23	79	47.2	-	79.1	3.7	4.2	4.8	4 clay SILT to silty CLAY	115	2	24	39	12	-	-	5.5	9.9	37	2.62	15
27.4	55.4	32.9	-	55.7	3.4	15.8	6.3	3 silty CLAY to CLAY	115	1.5	22	37	9	-	-	3.8	9.9	47	2.82	15
27.56	71.3	42.1	-	71.8	3.9	26.3	5.6	3 silty CLAY to CLAY	115	1.5	28	48	11	-	-	4.9	9.9	41	2.71	15
27.72	107.4	79.9	175	107.8	3.7	24	3.5	4 clay SILT to silty CLAY	115	2	40	54	18	-	-	7.5	9.9	25	2.37	15
27.89	118.8	88.2	185.8	119.1	4.2	15.9	3.6	4 clay SILT to silty CLAY	115	2	44	59	20	-	-	8.3	9.9	24	2.35	15
28.05	108.2	80.1	200	108.4	4.7	7.8	4.5	4 clay SILT to silty CLAY	115	2	40	54	19	-	-	7.5	9.9	28	2.44	15

* I ndica tes th e par amete r was calculated using th
T he pa ramete rs li sted above were determined usi
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Mi ddle Eart h Ge o Tes ting

Trojan Storage

Project ID: EEI E ring S oluti ons
 Data File: SDF(0 18).cpt
 CPT Date: 6/27/ 2018 1 2:09:05 12:00 PM
 GW Duration: 50 ft

Sounding ID: CPT -2
 Project No: AAA -7281 1.4
 Core/Rig: DDG1 418

Depth ft	qc PS	qc1h PS	q1ncs PS	qt PS	Silv tsf	Stss tsf	pore press (psi)	Frct Ratio %	Mat Typ Zon	Material Behavior Description	Unit Wght pcf	Qc N	SPT		SPT		Rel Den %	Ftn Ang deg	Und Shr	OCR %	Fin lc	Nk SBT	Indx
													R-N1 60%	R-N 60%	SPT 60%	SPT 60%							
0.33	585.1	938.3	938.3	938.3	585.1	6.1	3	1	6	clean SAND to silty SAND	125	5	100	100	100	95	48	-	5	1.34	16		
0.49	735.4	1179.5	1179.5	735.6	7.9	6.2	1.1	1.1	6	clean SAND to silty SAND	125	5	100	100	100	95	48	-	5	1.31	16		
0.66	795.7	1276.1	1276.1	795.9	7.5	11.7	0.9	0.9	7	grvly SAND to dense SAND	130	6	100	100	100	95	48	-	5	1.25	16		
0.82	736.3	1180.9	1180.9	736.7	7.2	18.1	1	1	7	grvly SAND to dense SAND	130	6	100	100	100	95	48	-	5	1.28	16		
0.98	612.4	982.2	982.2	612.7	6	13.9	1	1	7	grvly SAND to dense SAND	130	6	100	100	100	95	48	-	5	1.3	16		
1.15	532.2	853.5	853.5	532.4	4.4	12.9	0.8	0.8	7	grvly SAND to dense SAND	130	6	100	89	100	95	48	-	5	1.26	16		
1.31	483.4	775.2	775.2	483.6	2.6	11.7	0.5	0.5	7	grvly SAND to dense SAND	130	6	100	81	100	95	48	-	5	1.11	16		
1.48	466.3	747.8	747.8	466.5	3.3	11.9	0.7	0.7	7	grvly SAND to dense SAND	130	6	100	78	100	95	48	-	5	1.23	16		
1.64	470.4	754.4	754.4	470.6	4.3	11.3	0.9	0.9	6	clean SAND to silty SAND	125	5	100	94	100	95	48	-	5	1.32	16		
1.8	489.1	784.5	784.5	489.4	3.7	11.3	0.8	0.8	7	grvly SAND to dense SAND	130	6	100	82	100	95	48	-	5	1.24	16		
1.97	441.4	707.9	707.9	441.6	4.9	11.2	1.1	1.1	6	clean SAND to silty SAND	125	5	100	88	100	95	48	-	5	1.41	16		
2.13	416	667.1	667.1	416.2	4.3	11.5	1	1	6	clean SAND to silty SAND	125	5	100	83	100	95	48	-	5	1.4	16		
2.3	351.9	564.4	564.4	352.1	3.7	11.3	1.1	1.1	6	clean SAND to silty SAND	125	5	100	70	91	95	48	-	5	1.44	16		
2.46	324.6	520.5	520.5	324.8	2.8	13.5	0.9	0.9	6	clean SAND to silty SAND	125	5	100	65	82	95	48	-	5	1.38	16		
2.62	328.6	527	527	328.8	2.7	10.3	0.8	0.8	6	clean SAND to silty SAND	125	5	100	66	83	95	48	-	5	1.36	16		
2.79	312.9	501.9	501.9	313.1	2.5	10.5	0.8	0.8	6	clean SAND to silty SAND	125	5	100	63	79	95	48	-	5	1.36	16		
2.95	321.2	515.2	515.2	321.4	1.7	10	0.5	0.5	7	grvly SAND to dense SAND	130	6	86	54	78	95	48	-	5	1.21	16		
3.12	331.5	531.7	531.7	331.7	3.8	9.4	1.1	1.1	6	clean SAND to silty SAND	125	5	100	66	87	95	48	-	5	1.48	16		
3.28	389.4	624.5	624.5	389.6	4.1	12.4	1	1	6	clean SAND to silty SAND	125	5	100	78	100	95	48	-	5	1.41	16		
3.45	447	716.8	716.8	447.2	4.7	13.3	1.1	1.1	6	clean SAND to silty SAND	125	5	100	89	100	95	48	-	5	1.39	16		
3.61	452.9	726.4	726.4	453.2	5.9	17.1	1.3	1.3	6	clean SAND to silty SAND	125	5	100	91	100	95	48	-	5	1.47	16		
3.77	439.9	705.5	705.5	440.2	6.1	17.6	1.4	1.4	6	clean SAND to silty SAND	125	5	100	88	100	95	48	-	5	1.5	16		
3.94	462.5	741.7	741.7	462.8	6.4	15.8	1.4	1.4	6	clean SAND to silty SAND	125	5	100	92	100	95	48	-	5	1.49	16		
4.1	439.7	705.2	705.2	440	5.3	15.7	1.2	1.2	6	clean SAND to silty SAND	125	5	100	88	100	95	48	-	5	1.44	16		
4.27	436.5	700.1	700.1	436.9	5.1	17.6	1.2	1.2	6	clean SAND to silty SAND	125	5	100	87	100	95	48	-	5	1.43	16		
4.43	418	670.4	670.4	418.3	4.2	14.7	1	1	6	clean SAND to silty SAND	125	5	100	84	100	95	48	-	5	1.39	16		
4.59	414.9	665.4	665.4	415.2	4.2	15.8	1	1	6	clean SAND to silty SAND	125	5	100	83	100	95	48	-	5	1.39	16		
4.76	409.9	657.4	657.4	410.3	4	17	1	1	6	clean SAND to silty SAND	125	5	100	82	100	95	48	-	5	1.37	16		
4.92	419.7	673.2	673.2	420.2	4.1	21.8	1	1	6	clean SAND to silty SAND	125	5	100	84	100	95	48	-	5	1.37	16		
5.09	422.3	677.2	677.2	422.7	3.4	22.3	0.8	0.8	7	grvly SAND to dense SAND	130	6	100	70	100	95	48	-	5	1.3	16		
5.25	461.8	740.6	740.6	462.3	3.9	24.7	0.9	0.9	7	grvly SAND to dense SAND	130	6	100	77	100	95	48	-	5	1.3	16		
5.41	399.9	641.4	641.4	400.2	5.3	15	1.3	1.3	6	clean SAND to silty SAND	125	5	100	80	100	95	48	-	5	1.5	16		

5.58	363.4	582.8	582.8	582.8	363.6	4.1	10.8	1.1	6 clean SAND to silty SAND	125	5	100	73	95	95	48	-	-	5	1.46	16
5.74	330.4	530	530	330.7	330.7	3.8	12	1.2	6 clean SAND to silty SAND	125	5	100	66	87	95	48	-	-	5	1.49	16
5.91	313.4	498.8	498.8	313.6	313.6	2.3	11.3	0.7	6 clean SAND to silty SAND	125	5	100	63	78	95	48	-	-	5	1.33	16
6.07	273.2	428.9	428.9	273.3	273.3	1.9	8.8	0.7	6 clean SAND to silty SAND	125	5	86	55	67	95	48	-	-	5	1.35	16
6.23	246.5	382	382	246.7	246.7	2.7	8	1.1	6 clean SAND to silty SAND	125	5	76	49	64	95	48	-	-	5	1.55	16
6.4	211	322.8	322.8	211.1	211.1	2.2	7.8	1	6 clean SAND to silty SAND	125	5	65	42	54	95	48	-	-	5	1.56	16
6.56	199.3	301	301	199.4	199.4	2.4	6.5	1.2	6 clean SAND to silty SAND	125	5	60	40	52	95	48	-	-	5	1.63	16
6.73	163.7	244.2	247	163.8	163.8	1.8	4.7	1.1	6 clean SAND to silty SAND	125	5	49	33	42	95	47	-	-	5	1.66	16
6.89	145.2	214.1	214.1	145.3	145.3	1.2	4.5	0.9	6 clean SAND to silty SAND	125	5	43	29	37	92	46	-	-	5	1.62	16
7.05	125.7	183.2	189.9	125.8	125.8	1.2	4.6	0.9	6 clean SAND to silty SAND	125	5	37	25	32	87	46	-	-	6	1.7	16
7.22	99.5	143.3	195.1	99.6	99.6	2.2	4.5	2.2	5 silty SAND to sandy SILT	120	4	36	25	29	79	44	-	-	14	2.04	16
7.38	76.9	109.6	206.1	76.9	76.9	2.7	2.8	3.6	5 silty SAND to sandy SILT	120	4	27	19	24	70	43	-	-	22	2.28	16
7.55	75.9	107.1	207.4	76	76	2.8	2.2	3.7	5 silty SAND to sandy SILT	120	4	27	19	24	69	43	-	-	22	2.3	16
7.71	152.9	213.5	257.1	153	153	3.2	2.9	2.1	6 clean SAND to silty SAND	125	5	43	31	41	92	46	-	-	11	1.92	16
7.87	102.8	142.1	237.2	102.9	102.9	3.6	3.8	3.5	5 silty SAND to sandy SILT	120	4	36	26	30	79	44	-	-	19	2.2	16
8.04	154.5	211.4	222.7	154.6	154.6	1.8	3.9	1.2	6 clean SAND to silty SAND	125	5	42	31	38	92	46	-	-	7	1.72	16
8.2	203.8	276.1	301.1	204	204	3.4	5.6	1.7	6 clean SAND to silty SAND	125	5	55	41	50	95	47	-	-	8	1.78	16
8.37	232.5	311.7	340.2	232.6	232.6	4.3	6.6	1.8	6 clean SAND to silty SAND	125	5	62	46	56	95	48	-	-	8	1.78	16
8.53	268.1	356.1	356.1	268.1	268.1	3.4	2.3	1.3	6 clean SAND to silty SAND	125	5	71	54	61	95	48	-	-	5	1.61	16
8.69	251.4	330.8	330.8	251.5	251.5	3.3	4.3	1.3	6 clean SAND to silty SAND	125	5	66	50	57	95	48	-	-	5	1.64	16
8.86	252.8	329.5	329.5	252.8	252.8	2.1	4	0.8	6 clean SAND to silty SAND	125	5	66	51	54	95	48	-	-	5	1.49	16
9.02	254	328.1	328.1	254.1	254.1	1.6	4.8	0.6	6 clean SAND to silty SAND	125	5	66	51	52	95	48	-	-	5	1.39	16
9.19	207.2	265.2	280.3	207.3	207.3	2.9	3.9	1.4	6 clean SAND to silty SAND	125	5	53	41	47	95	47	-	-	7	1.73	16
9.35	201.8	256	272.4	201.8	201.8	2.9	3.2	1.4	6 clean SAND to silty SAND	125	5	51	40	46	95	47	-	-	7	1.74	16
9.51	184.2	231.7	231.8	184.2	184.2	1.8	2.8	1	6 clean SAND to silty SAND	125	5	46	37	40	95	46	-	-	5	1.65	16
9.68	147.2	183.6	237.6	147.2	147.2	3.4	2.6	2.3	5 silty SAND to sandy SILT	120	4	46	37	36	87	45	-	-	13	2	16
9.84	186.7	231	313.1	186.8	186.8	5.8	2.6	3.1	8 stiff SAND to clayey SAND	115	1	100	100	46	-	-	12.3	9.9	14	2.04	16
10.01	263.8	323.9	366.7	263.9	263.9	5.8	2.9	2.2	6 clean SAND to silty SAND	125	5	65	53	60	95	47	-	-	9	1.83	16
10.17	273.7	333.3	414	273.7	273.7	8.4	2.9	3.1	8 stiff SAND to clayey SAND	115	1	100	100	64	-	-	18.1	9.9	12	1.95	16
10.34	270.8	327.4	368.1	270.9	270.9	5.8	3.9	2.2	6 clean SAND to silty SAND	125	5	65	54	60	95	47	-	-	9	1.82	16
10.5	350.8	420.8	422.2	350.9	350.9	5.5	4.7	1.6	6 clean SAND to silty SAND	125	5	84	70	73	95	48	-	-	5	1.65	16
10.66	350.1	416.7	416.7	350.2	350.2	4.7	4.4	1.4	6 clean SAND to silty SAND	125	5	83	70	71	95	48	-	-	5	1.6	16
10.83	426.7	504	504	426.9	426.9	4.3	7.7	1	6 clean SAND to silty SAND	125	5	100	85	82	95	48	-	-	5	1.45	16
10.99	459	538.1	538.1	459.1	459.1	6.9	7.7	1.5	6 clean SAND to silty SAND	125	5	100	92	91	95	48	-	-	5	1.58	16
11.16	505.9	588.7	588.7	506.1	506.1	2.5	10.7	0.5	7 grvly SAND to dense SAND	130	6	98	84	87	95	48	-	-	5	1.15	16
11.32	509.2	588.1	588.1	509.4	509.4	2.2	11	0.4	7 grvly SAND to dense SAND	130	6	98	85	86	95	48	-	-	5	1.11	16
11.48	454.7	521.1	521.1	454.9	454.9	1.8	9.5	0.4	7 grvly SAND to dense SAND	130	6	87	76	76	95	48	-	-	5	1.11	16
11.65	374.3	425.9	425.9	374.5	374.5	2.5	5.9	0.7	6 clean SAND to silty SAND	125	5	85	75	67	95	48	-	-	5	1.34	16
11.81	317.2	358.4	358.4	317.3	317.3	2.5	6.2	0.8	6 clean SAND to silty SAND	125	5	72	63	58	95	47	-	-	5	1.44	16
11.98	289.1	324.3	324.3	289.1	289.1	2.6	4.2	0.9	6 clean SAND to silty SAND	125	5	65	58	54	95	47	-	-	5	1.52	16
12.14	233.6	260.3	260.3	233.7	233.7	2.4	4.6	1	6 clean SAND to silty SAND	125	5	52	47	45	95	46	-	-	5	1.62	16
12.3	227.4	251.7	273	227.5	227.5	3.5	5.3	1.5	6 clean SAND to silty SAND	125	5	50	45	45	95	46	-	-	7	1.77	16
12.47	220.7	242.7	276.9	220.8	220.8	4.1	5.7	1.9	6 clean SAND to silty SAND	125	5	49	44	45	95	46	-	-	9	1.85	16
12.63	234.5	256.3	285	234.7	234.7	4.1	6.2	1.7	6 clean SAND to silty SAND	125	5	51	47	47	95	46	-	-	8	1.81	16

12.8	237.9	258.2	292.1	238	4.5	6.2	1.9	6 clean SAND to silty SAND	125	5	52	48	48	95	46	-	-	9	1.83	16
12.96	218.1	235.3	267.8	218.2	3.9	4.3	1.8	6 clean SAND to silty SAND	125	5	47	44	44	95	45	-	-	9	1.84	16
13.12	222	237.9	255.9	222.1	3.1	6	1.4	6 clean SAND to silty SAND	125	5	48	44	43	95	45	-	-	7	1.76	16
13.29	202.6	215.8	253.4	202.7	3.9	5.1	1.9	6 clean SAND to silty SAND	125	5	43	41	41	92	45	-	-	10	1.88	16
13.45	235.4	249.2	274	235.5	3.8	5.2	1.6	6 clean SAND to silty SAND	125	5	50	47	45	95	46	-	-	8	1.79	16
13.62	306.1	322.1	322.1	306.2	3.8	6.6	1.3	6 clean SAND to silty SAND	125	5	64	61	55	95	47	-	-	5	1.63	16
13.78	343.2	359	362.1	343.3	5	6.8	1.5	6 clean SAND to silty SAND	125	5	72	69	62	95	47	-	-	5	1.66	16
13.94	397.2	413	427.7	397.4	7	9.7	1.8	6 clean SAND to silty SAND	125	5	83	79	73	95	48	-	-	6	1.7	16
14.11	459.2	474.7	474.7	459.4	6.9	11.6	1.5	6 clean SAND to silty SAND	125	5	95	92	81	95	48	-	-	5	1.61	16
14.27	495.7	509.6	509.6	495.9	6.2	10.9	1.3	6 clean SAND to silty SAND	125	5	100	99	85	95	48	-	-	5	1.52	16
14.44	369.2	377.4	377.4	369.4	4.1	8.2	1.1	6 clean SAND to silty SAND	125	5	75	74	63	95	47	-	-	5	1.55	16
14.6	313.8	319	353.4	314	6.2	6.4	2	6 clean SAND to silty SAND	125	5	64	63	58	95	47	-	-	8	1.8	16
14.76	318.8	322.2	353.5	319	6.1	7	1.9	6 clean SAND to silty SAND	125	5	64	64	58	95	47	-	-	8	1.79	16
14.93	263.3	264.7	295.2	263.4	4.7	5.6	1.8	6 clean SAND to silty SAND	125	5	53	53	48	95	46	-	-	8	1.81	16
15.09	228.2	228.1	238.6	228.3	2.7	3.3	1.2	6 clean SAND to silty SAND	125	5	46	46	40	94	45	-	-	6	1.71	16
15.26	194	192.8	231.4	194	3.7	3.8	1.9	6 clean SAND to silty SAND	125	5	39	39	37	89	44	-	-	11	1.91	16
15.42	202.2	200	229.8	202.3	3.3	3.8	1.7	6 clean SAND to silty SAND	125	5	40	40	37	90	44	-	-	9	1.86	16
15.58	136.7	134.5	181.6	136.8	2.8	2.5	2	5 silty SAND to sandy SILT	120	4	34	34	27	77	42	-	-	14	2.04	16
15.75	103.8	101.6	172.1	103.8	2.8	2.6	2.7	5 silty SAND to sandy SILT	120	4	25	26	22	68	41	-	-	19	2.21	16
15.91	75.3	73.3	170	75.3	2.7	2.9	3.6	4 clayey SILT to silty CLAY	115	2	37	38	17	-	-	5.3	9.9	26	2.4	15
16.08	69.4	67.2	179.1	69.4	2.9	2.7	4.3	4 clayey SILT to silty CLAY	115	2	34	35	16	-	-	4.8	9.9	30	2.48	15
16.24	113	109	195.6	113	3.6	2.1	3.2	5 silty SAND to sandy SILT	120	4	27	28	24	70	41	-	-	21	2.25	16
16.4	106.3	102	180.1	106.3	3.1	1.8	3	5 silty SAND to sandy SILT	120	4	26	27	22	68	41	-	-	20	2.24	16
16.57	144.3	137.9	206.1	144.3	3.9	2.9	2.7	5 silty SAND to sandy SILT	120	4	34	36	28	78	42	-	-	16	2.12	16
16.73	152.4	144.9	203.4	152.5	3.6	3.4	2.4	5 silty SAND to sandy SILT	120	4	36	38	29	79	42	-	-	15	2.07	16
16.9	163	154.3	210.1	163	3.8	3.3	2.3	5 silty SAND to sandy SILT	120	4	39	41	31	81	43	-	-	14	2.04	16
17.06	148.6	140	219.5	148.6	4.5	2.4	3	5 silty SAND to sandy SILT	120	4	35	37	29	78	42	-	-	18	2.16	16
17.23	193.8	181.8	235.1	193.9	4.5	3	2.3	5 silty SAND to sandy SILT	120	4	45	48	36	87	44	-	-	13	1.99	16
17.39	225.8	210.9	275.8	225.9	6	3.4	2.7	5 silty SAND to sandy SILT	120	4	53	56	41	92	44	-	-	13	2.01	16
17.55	215	199.8	263.2	215.1	5.6	2.9	2.6	5 silty SAND to sandy SILT	120	4	50	54	39	90	44	-	-	13	2.01	16
17.72	213.7	197.7	265.3	213.8	5.8	2.9	2.7	5 silty SAND to sandy SILT	120	4	49	53	39	90	44	-	-	14	2.03	16
17.88	201	185.1	273	201.1	6.5	4.7	3.3	8 stiff SAND to clayey SAND	115	1	100	100	38	-	-	13.2	9.9	16	2.11	16
18.05	224.4	205.9	283.6	224.5	6.7	3.2	3	8 stiff SAND to clayey SAND	115	1	100	100	41	-	-	14.8	9.9	14	2.05	16
18.21	268.7	245.4	300.5	268.8	6.5	4.5	2.4	6 clean SAND to silty SAND	125	5	49	54	47	95	45	-	-	11	1.94	16
18.37	361.5	328.8	358.4	361.6	6.8	5.7	1.9	6 clean SAND to silty SAND	125	5	66	72	59	95	46	-	-	8	1.78	16
18.54	423.2	383.1	405.7	423.3	7.8	7.4	1.8	6 clean SAND to silty SAND	125	5	77	85	68	95	47	-	-	7	1.73	16
18.7	389.6	351.2	397.8	389.8	9	5.7	2.3	8 stiff SAND to clayey SAND	115	1	100	100	65	-	-	25.7	9.9	9	1.83	16
18.87	354	317.8	357.2	354.2	7.4	5.6	2.1	6 clean SAND to silty SAND	125	5	64	71	58	95	46	-	-	9	1.82	16
19.03	429.1	383.5	405.4	429.3	7.8	7.9	1.8	6 clean SAND to silty SAND	125	5	77	86	68	95	47	-	-	7	1.73	16
19.19	433.3	385.6	443.3	433.4	11.1	8.6	2.6	8 stiff SAND to clayey SAND	115	1	100	100	72	-	-	28.6	9.9	9	1.86	16
19.36	484.2	429.2	441.4	484.4	8.5	8.9	1.7	6 clean SAND to silty SAND	125	5	86	97	75	95	47	-	-	6	1.69	16
19.52	430.8	380.2	412.2	431	8.7	8.2	2	6 clean SAND to silty SAND	125	5	76	86	69	95	47	-	-	7	1.77	16
19.69	321.2	282.3	307.2	321.4	5.4	7.5	1.7	6 clean SAND to silty SAND	125	5	56	64	51	95	45	-	-	8	1.77	16
19.85	278.5	243.7	295.2	278.6	6.5	5.1	2.3	6 clean SAND to silty SAND	125	5	49	56	46	95	45	-	-	11	1.92	16

20.01	232.3	202.5	303.1	232.4	8.3	5.8	3.6	8 stiff SAND to clayey SAND	115	1	100	100	42	-	-	15.3	9.9	16	2.12	16
20.18	319.2	277.2	336.5	319.3	8.1	6.1	2.6	8 stiff SAND to clayey SAND	115	1	100	100	53	-	-	21.1	9.9	11	1.93	16
20.34	294	254.3	321.8	294.2	8	6.8	2.7	8 stiff SAND to clayey SAND	115	1	100	100	49	-	-	19.4	9.9	12	1.97	16
20.51	399.4	344.3	369.1	399.6	7.3	7.6	1.8	6 clean SAND to silty SAND	125	5	69	80	62	95	46	-	-	7	1.75	16
20.67	366.8	314.9	343.5	366.9	6.8	6	1.9	6 clean SAND to silty SAND	125	5	63	73	57	95	46	-	-	8	1.78	16
20.83	338.4	289.3	289.3	338.6	3.8	6.7	1.1	6 clean SAND to silty SAND	125	5	58	68	50	95	45	-	-	5	1.62	16
21	335.5	285.7	285.7	335.7	3.3	6.9	1	6 clean SAND to silty SAND	125	5	57	67	48	95	45	-	-	5	1.59	16
21.16	351.5	298.2	298.2	351.6	3.9	6.9	1.1	6 clean SAND to silty SAND	125	5	60	70	51	95	45	-	-	5	1.61	16
21.33	336.5	284.3	318.5	336.6	6.5	6.1	1.9	6 clean SAND to silty SAND	125	5	57	67	52	95	45	-	-	9	1.82	16
21.49	271.7	228.7	289.4	271.8	6.9	5.1	2.6	5 silty SAND to sandy SILT	120	4	57	68	44	94	44	-	-	12	1.97	16
21.65	251.9	211.2	294.8	252	7.9	5.3	3.1	8 stiff SAND to clayey SAND	115	1	100	100	43	-	-	16.6	9.9	15	2.07	16
21.82	298	249	312.1	298.2	7.8	7	2.6	8 stiff SAND to clayey SAND	115	1	100	100	48	-	-	19.7	9.9	12	1.96	16
21.98	378.6	315.3	355.9	378.8	8.1	9.4	2.1	6 clean SAND to silty SAND	125	5	63	76	58	95	46	-	-	9	1.83	16
22.15	429.3	356.1	368	429.5	6.8	10.1	1.6	6 clean SAND to silty SAND	125	5	71	86	63	95	46	-	-	6	1.69	16
22.31	506.7	418.8	450.9	507	10.5	15.7	2.1	6 clean SAND to silty SAND	125	5	84	100	75	95	47	-	-	7	1.76	16
22.47	433.4	356.9	382.1	433.6	8	10.6	1.9	6 clean SAND to silty SAND	125	5	71	87	64	95	46	-	-	7	1.75	16
22.64	515.1	422.7	422.7	515.4	7.3	15	1.4	6 clean SAND to silty SAND	125	5	85	100	72	95	47	-	-	5	1.61	16
22.8	180.4	147.5	215.7	180.5	4.8	6.3	2.7	5 silty SAND to sandy SILT	120	4	37	45	30	80	42	-	-	16	2.1	16
22.97	192.1	156.5	192.9	192.2	3.3	6.8	1.8	6 clean SAND to silty SAND	125	5	31	38	30	82	42	-	-	11	1.94	16
23.13	243.1	197.3	234.5	243.2	4.5	7.1	1.9	6 clean SAND to silty SAND	125	5	39	49	37	89	43	-	-	10	1.9	16
23.3	234	189.2	214.9	234	3.5	4.4	1.5	6 clean SAND to silty SAND	125	5	38	47	35	88	43	-	-	9	1.84	16
23.46	294.8	237.6	255.4	294.9	4.1	5.9	1.4	6 clean SAND to silty SAND	125	5	48	59	43	95	44	-	-	7	1.75	16
23.62	265.6	213.3	232.1	265.7	3.6	5.7	1.4	6 clean SAND to silty SAND	125	5	43	53	39	92	44	-	-	8	1.77	16
23.79	298	238.5	288.8	298.1	6.8	5.3	2.3	6 clean SAND to silty SAND	125	5	48	60	45	95	44	-	-	11	1.92	16
23.95	322.8	257.4	299	322.9	6.7	6.3	2.1	6 clean SAND to silty SAND	125	5	51	65	48	95	44	-	-	10	1.87	16
24.12	344.1	273.5	289.2	344.2	5	6.6	1.5	6 clean SAND to silty SAND	125	5	55	69	49	95	45	-	-	7	1.73	16
24.28	293.5	232.5	271.1	293.6	5.7	5	2	6 clean SAND to silty SAND	125	5	46	59	44	95	44	-	-	10	1.87	16
24.44	324.5	256.2	287.5	324.6	5.8	6.1	1.8	6 clean SAND to silty SAND	125	5	51	65	47	95	44	-	-	9	1.82	16
24.61	378	297.4	323.4	378.2	6.6	6.2	1.8	6 clean SAND to silty SAND	125	5	59	76	54	95	45	-	-	8	1.77	16
24.77	337.1	264.3	291.7	337.2	5.8	5.8	1.7	6 clean SAND to silty SAND	125	5	53	67	48	95	44	-	-	8	1.8	16
24.94	305.2	238.6	284.6	305.4	6.6	6.1	2.2	6 clean SAND to silty SAND	125	5	48	61	45	95	44	-	-	11	1.9	16
25.1	288.8	225	262.7	289	5.5	5.7	1.9	6 clean SAND to silty SAND	125	5	45	58	42	94	44	-	-	10	1.88	16
25.26	289.9	225.1	256.4	290.1	5	6.8	1.8	6 clean SAND to silty SAND	125	5	45	58	42	94	44	-	-	9	1.84	16
25.43	242.1	187.4	206.6	242.3	3.1	6.7	1.3	6 clean SAND to silty SAND	125	5	37	48	34	88	43	-	-	8	1.79	16
25.59	215.4	166.1	184.7	215.5	2.6	6.1	1.2	6 clean SAND to silty SAND	125	5	33	43	30	84	42	-	-	8	1.81	16
25.76	205.9	158.3	185.5	206	3	5.9	1.5	6 clean SAND to silty SAND	125	5	32	41	30	82	42	-	-	10	1.88	16
25.92	164.9	126.4	179	165	3.6	5.2	2.2	5 silty SAND to sandy SILT	120	4	32	41	26	75	41	-	-	15	2.08	16
26.08	124.8	95.4	151	124.9	2.7	4.9	2.2	5 silty SAND to sandy SILT	120	4	24	31	20	65	39	-	-	18	2.16	16
26.25	59.1	45	130.8	59.2	1.9	4.7	3.3	4 clayey SILT to silty CLAY	115	2	23	30	11	-	-	4.1	9.9	32	2.53	15
26.41	35.3	21.6	-	35.4	0.9	4.8	2.7	4 clayey SILT to silty CLAY	115	2	11	18	6	-	-	2.4	6.8	41	2.72	15
26.58	34.2	20.8	-	34.3	1.1	5.3	3.5	3 silty CLAY to CLAY	115	1.5	14	23	6	-	-	2.3	6.5	46	2.8	15
26.74	34.8	21	-	34.9	1.3	5.4	3.9	3 silty CLAY to CLAY	115	1.5	14	23	6	-	-	2.3	6.6	47	2.82	15
26.9	44.1	26.5	-	44.5	1.4	21.9	3.3	4 clayey SILT to silty CLAY	115	2	13	22	7	-	-	3	8.4	40	2.7	15
27.07	41.5	24.8	-	43	1.8	75.1	4.6	3 silty CLAY to CLAY	115	1.5	17	28	7	-	-	2.8	7.9	47	2.82	15

27.23	42.4	25.2	43.9	2.5	75.7	6.2	3 silty CLAY to CLAY	115	1.5	17	28	8	-	-	2.9	8	52	2.9	15
27.4	55.2	32.6	56.7	4	77.7	7.4	3 silty CLAY to CLAY	115	1.5	22	37	10	-	-	3.8	9.9	50	2.87	15
27.56	148.5	110.6	201.6	4.9	42.2	3.4	5 silty SAND to sandy SILT	120	4	28	37	24	70	40	-	-	21	2.26	16
27.72	179.1	133	223.4	5.9	8.5	3.3	5 silty SAND to sandy SILT	120	4	33	45	28	76	41	-	-	19	2.21	16
27.89	205.5	152.2	256.4	7.6	7.2	3.7	8 stiff SAND to clayey SAND	115	1	100	100	32	-	-	13.5	9.9	19	2.21	16
28.05	313.7	231.6	294.2	8.1	8.8	2.6	8 stiff SAND to clayey SAND	115	1	100	100	45	-	-	20.7	9.9	12	1.98	16
28.22	389.6	286.9	326.7	8.1	10	2.1	6 clean SAND to silty SAND	125	5	57	78	53	95	45	-	-	9	1.84	16
28.38	422.3	310.1	334.7	7.4	10.6	1.8	6 clean SAND to silty SAND	125	5	62	84	56	95	45	-	-	7	1.76	16
28.54	448.6	328.4	346.5	7.4	11.3	1.6	6 clean SAND to silty SAND	125	5	66	90	58	95	45	-	-	7	1.73	16
28.71	455.8	332.7	364.7	8.9	12	2	6 clean SAND to silty SAND	125	5	67	91	60	95	45	-	-	8	1.79	16
28.87	431.5	314.1	364.1	10.1	12.4	2.4	8 stiff SAND to clayey SAND	115	1	100	100	59	-	-	28.5	9.9	10	1.87	16
29.04	414.6	301	345.8	9.2	13.2	2.2	6 clean SAND to silty SAND	125	5	60	83	56	95	45	-	-	9	1.85	16
29.2	405.2	293.3	312.2	6.4	12.8	1.6	6 clean SAND to silty SAND	125	5	59	81	52	95	45	-	-	7	1.74	16
29.36	383.6	276.9	319.5	8.2	12.5	2.1	6 clean SAND to silty SAND	125	5	55	77	52	95	44	-	-	9	1.86	16
29.53	400.3	288.1	335.8	9.1	13.1	2.3	6 clean SAND to silty SAND	125	5	58	80	54	95	44	-	-	10	1.87	16
29.69	395.1	283.6	345.3	10.3	13	2.6	8 stiff SAND to clayey SAND	115	1	100	100	54	-	-	26.1	9.9	11	1.93	16
29.86	344.1	246.3	318.9	9.8	14.1	2.9	8 stiff SAND to clayey SAND	115	1	100	100	48	-	-	22.7	9.9	13	2	16
30.02	303.6	216.8	271.4	7.2	15.5	2.4	6 clean SAND to silty SAND	125	5	43	61	42	93	43	-	-	12	1.96	16
30.19	307.3	218.8	251.3	5.4	15.3	1.8	6 clean SAND to silty SAND	125	5	44	61	41	93	43	-	-	9	1.85	16
30.35	343.5	243.9	277.8	6.3	15.1	1.9	6 clean SAND to silty SAND	125	5	49	69	45	95	44	-	-	9	1.84	16
30.51	360.5	255.3	285.2	6.4	15.6	1.8	6 clean SAND to silty SAND	125	5	51	72	47	95	44	-	-	8	1.81	16
30.68	345.1	243.8	278.6	6.5	14.3	1.9	6 clean SAND to silty SAND	125	5	49	69	45	95	44	-	-	9	1.85	16
30.84	280.8	197.8	233.8	5.1	13.1	1.8	6 clean SAND to silty SAND	125	5	40	56	37	90	43	-	-	10	1.89	16
31.01	275.6	193.6	230.5	5.1	13.6	1.8	6 clean SAND to silty SAND	125	5	39	55	37	89	42	-	-	10	1.9	16
31.17	292.9	205.2	261.4	7	13.3	2.4	5 silty SAND to sandy SILT	120	4	51	73	40	91	43	-	-	12	1.98	16
31.33	414.1	289.4	319.9	7.6	14.9	1.9	6 clean SAND to silty SAND	125	5	58	83	53	95	44	-	-	8	1.8	16
31.5	373.4	260.3	338.1	11.1	14	3	8 stiff SAND to clayey SAND	115	1	100	100	51	-	-	24.6	9.9	13	2	16
31.66	378.9	263.5	323.4	9.7	13.1	2.6	8 stiff SAND to clayey SAND	115	1	100	100	51	-	-	25	9.9	11	1.94	16
31.83	381	264.3	299.6	7.3	11.4	1.9	6 clean SAND to silty SAND	125	5	53	76	49	95	44	-	-	9	1.84	16
31.99	314.6	217.7	250.9	5.6	10.3	1.8	6 clean SAND to silty SAND	125	5	44	63	41	93	43	-	-	9	1.86	16
32.15	283.7	195.7	232.9	5.2	10.1	1.9	6 clean SAND to silty SAND	125	5	39	57	37	89	42	-	-	10	1.9	16
32.32	281.3	193.6	230.9	5.2	10.1	1.9	6 clean SAND to silty SAND	125	5	39	56	37	89	42	-	-	10	1.9	16
32.48	280.5	192.6	210.3	3.5	10.8	1.3	6 clean SAND to silty SAND	125	5	39	56	35	89	42	-	-	8	1.78	16
32.65	352.1	241.1	253.1	4.5	11.7	1.3	6 clean SAND to silty SAND	125	5	48	70	43	95	43	-	-	6	1.72	16
32.81	441.8	301.8	301.8	4.5	14.3	1	6 clean SAND to silty SAND	125	5	60	88	51	95	44	-	-	5	1.58	16
32.97	464.2	316.2	316.2	5.4	12.7	1.2	6 clean SAND to silty SAND	125	5	63	93	54	95	45	-	-	5	1.61	16
33.14	340.1	231.1	253.6	5.1	8.1	1.5	6 clean SAND to silty SAND	125	5	46	68	42	95	43	-	-	8	1.79	16
33.3	314	212.9	261.6	6.9	7.9	2.2	6 clean SAND to silty SAND	125	5	43	63	41	92	43	-	-	11	1.94	16
33.47	320.8	216.9	272.5	7.7	9	2.4	6 clean SAND to silty SAND	125	5	43	64	42	93	43	-	-	12	1.96	16
33.63	342.2	230.8	266.5	6.4	10.1	1.9	6 clean SAND to silty SAND	125	5	46	68	43	95	43	-	-	9	1.86	16
33.79	327.1	220.1	243.6	4.9	10.1	1.5	6 clean SAND to silty SAND	125	5	44	65	40	93	43	-	-	8	1.8	16
33.96	289.4	194.2	212.3	3.7	9.2	1.3	6 clean SAND to silty SAND	125	5	39	58	35	89	42	-	-	8	1.78	16
34.12	265	177.4	192.1	3	8.5	1.1	6 clean SAND to silty SAND	125	5	35	53	32	86	42	-	-	7	1.77	16
34.29	228.8	152.8	173.5	2.8	8	1.2	6 clean SAND to silty SAND	125	5	31	46	28	81	41	-	-	9	1.84	16

34.45	202.9	135.2	167.5	203.1	3.1	7.9	1.6	6 clean SAND to silty SAND	125	5	27	41	26	77	40	-	-	12	1.95	16
34.61	246	163.5	185.7	246.1	3.2	8.1	1.3	6 clean SAND to silty SAND	125	5	33	49	30	83	41	-	-	9	1.84	16
34.78	279.7	185.5	206.8	279.9	3.8	8.9	1.4	6 clean SAND to silty SAND	125	5	37	56	34	87	42	-	-	8	1.81	16
34.94	303.7	200.9	252.2	303.8	6.9	9.2	2.3	6 clean SAND to silty SAND	125	5	40	61	39	90	42	-	-	12	1.96	16
35.11	301.3	198.8	267.5	301.4	8.2	9	2.7	5 silty SAND to sandy SILT	120	4	50	75	40	90	42	-	-	14	2.03	16
35.27	290.5	191.3	274.6	290.7	9	8.8	3.1	8 stiff SAND to clayey SAND	115	1	100	100	39	-	-	19.1	9.9	15	2.09	16
35.43	288.7	189.7	230.1	288.9	5.6	9	1.9	6 clean SAND to silty SAND	125	5	38	58	36	88	42	-	-	11	1.92	16
35.6	292.2	191.5	233	292.3	5.7	9.7	2	6 clean SAND to silty SAND	125	5	38	58	37	88	42	-	-	11	1.93	16
35.76	358.3	234.3	280.8	358.5	7.8	10.8	2.2	6 clean SAND to silty SAND	125	5	47	72	44	95	43	-	-	11	1.91	16
35.93	563.5	367.7	401.5	563.9	11.5	19.9	2	6 clean SAND to silty SAND	125	5	74	100	67	95	45	-	-	8	1.78	16
36.09	611.8	398.3	398.3	612.1	8.1	11.3	1.3	6 clean SAND to silty SAND	125	5	80	100	68	95	46	-	-	5	1.6	16
36.26	429.6	279	323.7	429.8	9.4	9.4	2.2	6 clean SAND to silty SAND	125	5	56	86	52	95	44	-	-	10	1.87	16
36.42	393.5	255	290	393.6	7.5	8.7	1.9	6 clean SAND to silty SAND	125	5	51	79	47	95	43	-	-	9	1.84	16
36.58	373.4	241.4	269.4	373.5	6.3	8.6	1.7	6 clean SAND to silty SAND	125	5	48	75	44	95	43	-	-	8	1.81	16
36.75	302.9	195.4	234.7	303.1	5.8	10.1	1.9	6 clean SAND to silty SAND	125	5	39	61	37	89	42	-	-	11	1.91	16
36.91	269	173.1	204.5	269.2	4.4	10.5	1.6	6 clean SAND to silty SAND	125	5	35	54	33	85	41	-	-	10	1.89	16
37.08	265.7	170.6	202.8	265.9	4.4	10.1	1.7	6 clean SAND to silty SAND	125	5	34	53	32	85	41	-	-	10	1.9	16
37.24	230.3	147.6	178.1	230.5	3.5	9.9	1.5	6 clean SAND to silty SAND	125	5	30	46	28	80	41	-	-	11	1.92	16
37.4	248.7	159	188.7	248.9	3.8	9.8	1.5	6 clean SAND to silty SAND	125	5	32	50	30	82	41	-	-	10	1.9	16
37.57	239.1	152.5	183.4	239.3	3.7	10	1.6	6 clean SAND to silty SAND	125	5	31	48	29	81	41	-	-	11	1.91	16
37.73	251.6	160.2	191.4	251.8	4	9.9	1.6	6 clean SAND to silty SAND	125	5	32	50	30	83	41	-	-	11	1.91	16
37.9	225.4	143.2	211.5	225.6	6	10	2.7	5 silty SAND to sandy SILT	120	4	36	56	29	79	40	-	-	16	2.11	16
38.06	231.4	146.6	207.1	231.6	5.6	10	2.5	5 silty SAND to sandy SILT	120	4	37	58	30	80	40	-	-	15	2.08	16
38.22	357.4	226	249.6	357.6	5.4	11.4	1.5	6 clean SAND to silty SAND	125	5	45	71	41	94	43	-	-	8	1.8	16
38.39	372.9	235.3	235.3	373.1	3.3	10.6	0.9	6 clean SAND to silty SAND	125	5	47	75	40	95	43	-	-	5	1.61	16

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Trojan Storage

Project ID: EEIE engineer S oluti ons
 Data File: SDF(0 17).cpt
 CPT Date: 6/27/ 2018 1 1:31:03 1:00 AM
 GW Duration: 50 ft

Sound ing ID: CPT -3
 Project No: AAA -7281 1.4
 Core/Rig: DDG1 418

Depth ft	qc PS tsf	qc1n PS	q1ncs PS	qt PS	Slv Stss tsf	pore prss (psi)	Frct Ratio %	Mat Typ Zon	Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N1 60%	SPT R-N 60%	SPT IcN1 60%	SPT Den %	Rel Ftn Ang deg	Und Shr	OCR	Fin Ic	SBT	Indx
0.33	189.2	303.4	303.4	189.2	1.2	0.7	0.6	6	clean SAND to silty SAND	125	5	61	38	49	95	48	-	-	5	1.43	16
0.49	242.8	389.5	389.5	242.9	2.4	1.4	1	6	clean SAND to silty SAND	125	5	78	49	64	95	48	-	-	5	1.5	16
0.66	255	408.9	408.9	255	3.4	1.6	1.3	6	clean SAND to silty SAND	125	5	82	51	70	95	48	-	-	5	1.6	16
0.82	208.5	334.4	338.6	208.6	2.9	2.2	1.4	6	clean SAND to silty SAND	125	5	67	42	58	95	48	-	-	5	1.66	16
0.98	203.5	326.4	341.2	203.6	3.2	2.7	1.6	6	clean SAND to silty SAND	125	5	65	41	58	95	48	-	-	6	1.71	16
1.15	192.6	308.9	339.7	192.7	3.7	5.2	1.9	6	clean SAND to silty SAND	125	5	62	39	56	95	48	-	-	8	1.79	16
1.31	174.1	279.3	318.1	174.2	3.6	2.9	2	6	clean SAND to silty SAND	125	5	56	35	52	95	48	-	-	9	1.84	16
1.48	137	219.8	281.7	137.1	3.6	4.3	2.6	5	silty SAND to sandy SILT	120	4	55	34	43	93	48	-	-	13	1.99	16
1.64	108	173.2	249.8	108.1	3.2	4	3	5	silty SAND to sandy SILT	120	4	43	27	35	85	48	-	-	16	2.09	16
1.8	99.3	159.2	234.6	99.4	2.9	4.4	2.9	5	silty SAND to sandy SILT	120	4	40	25	33	82	48	-	-	16	2.11	16
1.97	96.8	155.2	240.5	96.8	3.1	4.1	3.2	5	silty SAND to sandy SILT	120	4	39	24	32	82	48	-	-	17	2.15	16
2.13	125.1	200.6	257.5	125.2	3.1	5.2	2.4	5	silty SAND to sandy SILT	120	4	50	31	39	90	48	-	-	13	1.99	16
2.3	139.6	223.8	260.9	139.7	2.7	4.8	1.9	6	clean SAND to silty SAND	125	5	45	28	42	94	48	-	-	10	1.87	16
2.46	126.2	202.4	249	126.3	2.7	5.4	2.2	6	clean SAND to silty SAND	125	5	40	25	39	90	48	-	-	11	1.94	16
2.62	98.7	158.2	225.6	98.7	2.7	4.3	2.7	6	clean SAND to silty SAND	120	4	40	25	32	82	48	-	-	15	2.08	16
2.79	70.3	112.8	189.9	70.4	2.1	3.7	3	5	silty SAND to sandy SILT	120	4	28	18	24	71	47	-	-	19	2.21	16
2.95	49	78.6	202.6	49.1	2.3	3.9	4.7	4	clay SILT to silty CLAY	115	2	39	25	19	-	-	3.5	9.9	29	2.46	15
3.12	43.6	69.9	-	43.6	3.1	4	7.2	9	very stiff fine SOIL	120	2	35	22	18	55	45	-	-	37	2.64	30
3.28	106.9	171.4	252.5	107	3.3	3.2	3.1	5	silty SAND to sandy SILT	120	4	43	27	35	85	48	-	-	16	2.11	16
3.45	61.1	98	235.4	61.2	3	1.9	5	9	very stiff fine SOIL	120	2	49	31	23	66	46	-	-	27	2.42	30
3.61	56.7	91	212.7	56.8	2.5	3.1	4.5	4	clay SILT to silty CLAY	115	2	45	28	21	-	-	4	9.9	27	2.41	15
3.77	45.2	72.5	192.3	45.3	2.1	3.4	4.6	4	clay SILT to silty CLAY	115	2	36	23	17	-	-	3.2	9.9	30	2.48	15
3.94	35.4	56.8	175.8	35.5	1.7	2.8	4.8	4	clay SILT to silty CLAY	115	2	28	18	14	-	-	2.5	9.9	33	2.56	15
4.1	26.3	42.3	-	26.4	1.9	3.1	7.1	3	silty CLAY to CLAY	115	1.5	28	18	12	-	-	1.8	9.9	45	2.78	15
4.27	62.1	99.6	177.9	62.2	1.8	4.3	3	5	silty SAND to sandy SILT	120	4	25	16	22	67	45	-	-	21	2.25	16
4.43	91.9	147.4	178.8	92	1.4	3.7	1.6	6	clean SAND to silty SAND	125	5	29	18	28	80	47	-	-	11	1.92	16
4.59	81.3	130.4	174.1	81.4	1.6	3.6	1.9	5	silty SAND to sandy SILT	120	4	33	20	26	76	46	-	-	14	2.03	16
4.76	61.5	98.6	151.7	61.5	1.3	3.1	2.1	5	silty SAND to sandy SILT	120	4	25	15	20	67	44	-	-	17	2.14	16
4.92	46.1	73.9	140.7	46.1	1.2	2.4	2.6	5	silty SAND to sandy SILT	120	4	18	12	16	57	43	-	-	22	2.29	16
5.09	22.2	35.6	-	22.3	0.9	2.2	4.3	4	clay SILT to silty CLAY	115	2	18	11	9	-	-	1.5	9.9	39	2.67	15
5.25	19	30.4	-	19	0.9	1.6	4.6	3	silty CLAY to CLAY	115	1.5	20	13	8	-	-	1.3	9.9	43	2.74	15

5.41	19.8	31.7	-	19.8	1	1.6	5	3 silty CLAY to CLAY	115	1.5	21	13	9	-	1.4	9.9	43	2.75	15
5.58	29.9	47.9	140.9	29.9	1.1	2.1	3.7	4 clay SILT to silty CLAY	115	2	24	15	12	-	2.1	9.9	32	2.53	15
5.74	27.7	44.5	139.5	27.8	1.1	2.3	3.8	4 clay SILT to silty CLAY	115	2	22	14	11	-	1.9	9.9	34	2.57	15
5.91	22.2	35.6	-	22.3	0.7	1.6	3.4	4 clay SILT to silty CLAY	115	2	18	11	9	-	1.5	9.9	35	2.6	15
6.07	19.2	30.8	-	19.2	0.9	1.5	5	3 silty CLAY to CLAY	115	1.5	21	13	9	-	1.3	9.9	44	2.77	15
6.23	24.9	39.6	123.3	24.9	0.8	1.4	3.3	4 clay SILT to silty CLAY	115	2	20	12	10	-	1.7	9.9	34	2.56	15
6.4	22.7	35.6	111.3	22.7	0.7	1.1	3	4 clay SILT to silty CLAY	115	2	18	11	9	-	1.6	9.9	34	2.57	15
6.56	10.8	17.3	-	10.8	0.6	1.2	6.1	3 silty CLAY to CLAY	115	1.5	12	7	6	-	0.7	8.7	59	3.01	15
6.73	16.9	27.1	-	16.9	0.6	1.2	3.5	4 clay SILT to silty CLAY	115	2	14	8	7	-	1.2	9.9	41	2.71	15
6.89	41.3	62.5	96.9	41.3	0.5	1.1	1.3	5 silty SAND to sandy SILT	120	4	16	10	13	52	41	-	17	2.15	16
7.05	65.5	98.1	118.2	65.5	0.6	1.4	1	6 clean SAND to silty SAND	125	5	20	13	19	66	43	-	11	1.92	16
7.22	79.8	118	146.5	79.8	1.1	1.1	1.4	6 clean SAND to silty SAND	125	5	24	16	23	72	44	-	12	1.95	16
7.38	85.3	124.8	167.4	85.4	1.6	0.8	1.9	5 silty SAND to sandy SILT	120	4	31	21	25	74	44	-	14	2.03	16
7.55	92.3	133.5	165.5	92.3	1.4	1.2	1.5	6 clean SAND to silty SAND	125	5	27	18	26	77	44	-	12	1.95	16
7.71	82.1	117.3	138.6	82.1	0.9	1	1.1	6 clean SAND to silty SAND	125	5	23	16	22	72	43	-	10	1.89	16
7.87	69.8	98.7	116.4	69.8	0.6	1	0.9	6 clean SAND to silty SAND	125	5	20	14	19	67	43	-	10	1.89	16
8.04	62.4	87.2	106.6	62.4	0.6	1	0.9	6 clean SAND to silty SAND	125	5	17	12	17	62	42	-	11	1.93	16
8.2	63.3	87.6	106.4	63.3	0.6	0.9	0.9	6 clean SAND to silty SAND	125	5	18	13	17	63	42	-	11	1.93	16
8.37	57.8	79.2	88.3	57.8	0.3	0.9	0.5	6 clean SAND to silty SAND	125	5	16	12	14	59	41	-	8	1.81	16
8.53	53.3	72.3	88.1	53.3	0.4	1	0.7	6 clean SAND to silty SAND	125	5	14	11	14	56	41	-	11	1.93	16
8.69	52.2	70.1	84.1	52.2	0.3	0.9	0.6	6 clean SAND to silty SAND	125	5	14	10	13	55	40	-	11	1.91	16
8.86	55.3	73.6	90.7	55.3	0.4	0.6	0.7	6 clean SAND to silty SAND	125	5	15	11	14	57	41	-	11	1.94	16
9.02	59.9	78.9	109.4	59.9	0.8	0.7	1.3	5 silty SAND to sandy SILT	120	4	20	15	16	59	41	-	15	2.06	16
9.19	72.1	94.1	119	72.1	0.8	0.6	1.1	6 clean SAND to silty SAND	125	5	19	14	18	65	42	-	12	1.97	16
9.35	70.9	91.7	124.2	70.9	1	0.6	1.4	5 silty SAND to sandy SILT	120	4	23	18	18	64	42	-	14	2.04	16
9.51	66.6	85.4	109.1	66.6	0.7	1.2	1.1	6 clean SAND to silty SAND	125	5	17	13	17	62	41	-	12	1.98	16
9.68	63.8	81.1	100	63.8	0.5	0.9	0.9	6 clean SAND to silty SAND	125	5	16	13	16	60	41	-	11	1.94	16
9.84	57.1	72	98.8	57.2	0.6	0.9	1.1	5 silty SAND to sandy SILT	120	4	18	14	14	56	40	-	14	2.05	16
10.01	49.2	61.5	86.2	49.2	0.5	0.9	1	5 silty SAND to sandy SILT	120	4	15	12	12	51	39	-	15	2.07	16
10.17	47.9	59.4	84.8	47.9	0.5	0.8	1	5 silty SAND to sandy SILT	120	4	15	12	12	50	39	-	15	2.09	16
10.34	44.2	54.3	73.4	44.2	0.3	1	0.7	6 clean SAND to silty SAND	125	5	11	9	11	47	39	-	14	2.04	16
10.5	41.3	50.4	75.8	41.3	0.4	0.7	0.9	5 silty SAND to sandy SILT	120	4	13	10	10	44	38	-	17	2.13	16
10.66	42.4	51.4	86.5	42.4	0.5	0.8	1.3	5 silty SAND to sandy SILT	120	4	13	11	11	45	38	-	19	2.21	16
10.83	47.2	56.7	122.2	47.2	1.1	0.6	2.5	5 silty SAND to sandy SILT	120	4	14	12	13	48	39	-	25	2.36	16
10.99	55.8	66.6	114	55.8	1	0.9	1.8	5 silty SAND to sandy SILT	120	4	17	14	14	54	40	-	20	2.22	16
11.16	72.4	85.7	165.7	72.4	2.2	0.8	3	5 silty SAND to sandy SILT	120	4	21	18	19	62	41	-	22	2.3	16
11.32	125.1	147	178.3	125.1	1.9	2.2	1.6	6 clean SAND to silty SAND	125	5	29	25	28	80	44	-	11	1.92	16
11.48	174.9	204.1	233.5	174.9	2.9	1.9	1.7	6 clean SAND to silty SAND	125	5	41	35	38	91	45	-	9	1.85	16
11.65	194.2	224.9	224.9	194.2	1.2	1.3	0.6	6 clean SAND to silty SAND	125	5	45	39	37	94	46	-	5	1.52	16
11.81	183	210.4	210.4	183	1.5	1.6	0.8	6 clean SAND to silty SAND	125	5	42	37	36	92	45	-	5	1.61	16
11.98	186.4	212.8	212.8	186.5	1.6	2.4	0.9	6 clean SAND to silty SAND	125	5	43	37	36	92	45	-	5	1.62	16
12.14	181.6	205.9	210.7	181.7	1.8	2.1	1	6 clean SAND to silty SAND	125	5	41	36	36	91	45	-	6	1.68	16
12.3	209.5	235.8	235.8	209.5	1.5	2	0.7	6 clean SAND to silty SAND	125	5	47	42	39	95	46	-	5	1.54	16

12.47	189.8	212.2	212.2	189.9	1.6	2.3	0.9	6 clean SAND to silty SAND	125	5	42	38	36	92	45	-	-	5	1.63	16
12.63	167.6	186.1	196.3	167.6	1.7	3.3	1	6 clean SAND to silty SAND	125	5	37	34	33	88	44	-	-	7	1.73	16
12.8	148.2	163.5	205.7	148.2	2.9	2.1	2	6 clean SAND to silty SAND	125	5	33	30	32	83	44	-	-	12	1.97	16
12.96	155.5	170.4	193.1	155.5	2.1	3.2	1.4	6 clean SAND to silty SAND	125	5	34	31	31	85	44	-	-	9	1.83	16
13.12	162.8	177.3	195.4	162.8	2	3.4	1.2	6 clean SAND to silty SAND	125	5	35	33	32	86	44	-	-	8	1.79	16
13.29	150.6	163	179.5	150.7	1.7	2.9	1.1	6 clean SAND to silty SAND	125	5	33	30	30	83	44	-	-	8	1.79	16
13.45	147.3	158.3	160.3	147.3	1	2.5	0.7	6 clean SAND to silty SAND	125	5	32	29	28	82	44	-	-	5	1.66	16
13.62	99.2	106	132.4	99.3	1.2	2.8	1.3	6 clean SAND to silty SAND	125	5	21	20	20	69	41	-	-	12	1.96	16
13.78	69.6	73.9	121.6	69.7	1.3	5.1	1.9	5 silty SAND to sandy SILT	120	4	18	17	16	57	40	-	-	19	2.19	16
13.94	48.3	51	113.9	48.3	1.1	2.3	2.4	5 silty SAND to sandy SILT	120	4	13	12	12	45	37	-	-	26	2.38	16
14.11	22	25.7	-	22.1	0.8	1.9	3.9	4 clay SILT to silty CLAY	115	2	13	11	7	-	-	1.5	8.2	44	2.76	15
14.27	13.8	15.9	-	13.8	0.7	1.9	5.3	3 silty CLAY to CLAY	115	1.5	11	9	5	-	-	0.9	4.9	59	3.01	15
14.44	12	13.7	-	12	0.6	2	5.3	3 silty CLAY to CLAY	115	1.5	9	8	5	-	-	0.8	4.2	63	3.06	15
14.6	9.3	10.5	-	9.3	0.6	1.8	7	3 silty CLAY to CLAY	115	1.5	7	6	4	-	-	0.6	3.1	76	3.24	15
14.76	9.2	10.3	-	9.2	0.7	1.7	7.9	3 silty CLAY to CLAY	115	1.5	7	6	4	-	-	0.6	3.1	79	3.28	15
14.93	13.2	14.6	-	13.2	0.6	1.5	4.9	3 silty CLAY to CLAY	115	1.5	10	9	5	-	-	0.9	4.5	60	3.02	15
15.09	11	12	-	11	0.7	1.4	7.1	3 silty CLAY to CLAY	115	1.5	8	7	4	-	-	0.7	3.6	72	3.19	15
15.26	8.6	9.4	-	8.7	1.6	1.5	9.9	3 silty CLAY to CLAY	115	1.5	6	6	4	-	-	0.5	2.8	88	3.38	15
15.42	69.6	70.1	138.3	69.7	1.8	1.5	2.6	5 silty SAND to sandy SILT	120	4	18	17	16	55	39	-	-	23	2.31	16
15.58	132.3	132.5	167.7	132.4	2.2	1.6	1.7	6 clean SAND to silty SAND	125	5	26	26	26	76	42	-	-	12	1.97	16
15.75	147.2	146.5	165.3	147.3	1.7	3.2	1.1	6 clean SAND to silty SAND	125	5	29	29	27	80	43	-	-	9	1.83	16
15.91	141.4	140	154.8	141.4	1.4	2.9	1	6 clean SAND to silty SAND	125	5	28	28	26	78	43	-	-	8	1.8	16
16.08	119.2	117.4	147.6	119.3	1.7	3	1.4	6 clean SAND to silty SAND	125	5	23	24	23	72	42	-	-	12	1.97	16
16.24	92.6	90.8	127.7	92.7	1.4	2.4	1.6	5 silty SAND to sandy SILT	120	4	23	23	18	64	40	-	-	15	2.07	16
16.4	73.8	72	146.9	73.9	2.1	2.1	2.8	5 silty SAND to sandy SILT	120	4	18	18	16	56	39	-	-	24	2.33	16
16.57	72.9	70.7	138.9	72.9	1.9	1.4	2.6	5 silty SAND to sandy SILT	120	4	18	18	16	56	39	-	-	23	2.3	16
16.73	82.6	79.8	172.8	82.7	2.8	1.3	3.5	4 clay SILT to silty CLAY	115	2	40	41	18	-	-	5.8	9.9	25	2.36	15
16.9	119.2	114.6	184.3	119.3	3.2	2.5	2.7	5 silty SAND to sandy SILT	120	4	29	30	24	71	41	-	-	18	2.18	16
17.06	155.2	148.4	195.3	155.2	3.2	2.3	2.1	5 silty SAND to sandy SILT	120	4	37	39	29	80	43	-	-	13	2.01	16
17.23	153	145.6	195.5	153	3.3	2.9	2.1	5 silty SAND to sandy SILT	120	4	36	38	29	79	43	-	-	14	2.03	16
17.39	167.2	158.4	196.4	167.3	3	4.4	1.8	6 clean SAND to silty SAND	125	5	32	33	31	82	43	-	-	12	1.95	16
17.55	176.5	166.4	212.7	176.6	3.6	6.4	2.1	5 silty SAND to sandy SILT	120	4	42	44	32	84	43	-	-	12	1.98	16
17.72	178.1	167.1	213.9	178.2	3.7	4.9	2.1	5 silty SAND to sandy SILT	120	4	42	45	33	84	43	-	-	13	1.98	16
17.88	212.7	198.7	241.3	212.8	4.3	5.9	2	6 clean SAND to silty SAND	125	5	40	43	38	90	44	-	-	11	1.93	16
18.05	286.1	266	279.1	286.2	3.9	5.6	1.4	6 clean SAND to silty SAND	125	5	53	57	47	95	45	-	-	6	1.72	16
18.21	281.9	260.9	260.9	282	3	4.4	1.1	6 clean SAND to silty SAND	125	5	52	56	45	95	45	-	-	5	1.64	16
18.37	233.4	215	259.7	233.5	4.9	4.2	2.1	6 clean SAND to silty SAND	125	5	43	47	41	92	44	-	-	11	1.92	16
18.54	223	204.5	252.3	223.1	4.8	7.1	2.2	6 clean SAND to silty SAND	125	5	41	45	39	91	44	-	-	11	1.94	16
18.7	242.6	221.4	263.7	242.7	5	8.2	2.1	6 clean SAND to silty SAND	125	5	44	49	42	93	44	-	-	10	1.9	16
18.87	209.7	190.5	218.7	209.8	3.3	6.5	1.6	6 clean SAND to silty SAND	125	5	38	42	35	88	44	-	-	9	1.85	16
19.03	179.5	162.3	187.8	179.6	2.5	7	1.4	6 clean SAND to silty SAND	125	5	32	36	30	83	43	-	-	10	1.86	16
19.19	179.9	162	192.1	180	2.8	6.8	1.6	6 clean SAND to silty SAND	125	5	32	36	31	83	43	-	-	10	1.9	16
19.36	192.5	172.6	200.8	192.6	2.9	6.1	1.5	6 clean SAND to silty SAND	125	5	35	39	32	85	43	-	-	10	1.87	16

19.52	209.6	187.1	217.3	209.7	3.4	6.6	1.6	6 clean SAND to silty SAND	125	5	37	42	35	88	43	-	10	1.87	16
19.69	218.6	194.4	223.7	218.8	3.5	6.7	1.6	6 clean SAND to silty SAND	125	5	39	44	36	89	44	-	9	1.86	16
19.85	160	141.6	181.7	160.1	2.9	6.2	1.8	6 clean SAND to silty SAND	125	5	28	32	28	78	42	-	13	1.99	16
20.01	162.1	142.9	207.5	162.3	4.2	6.9	2.6	5 silty SAND to sandy SILT	120	4	36	41	29	79	42	-	16	2.1	16
20.18	172.3	151.2	222.8	172.4	4.8	6.3	2.8	5 silty SAND to sandy SILT	120	4	38	43	31	81	42	-	16	2.11	16
20.34	178.6	156.1	225	178.7	4.8	6.9	2.7	5 silty SAND to sandy SILT	120	4	39	45	32	82	42	-	16	2.09	16
20.51	147.5	128.4	184.3	147.6	3.4	6	2.3	5 silty SAND to sandy SILT	120	4	32	37	26	75	41	-	15	2.09	16
20.67	140	121.4	197.1	140.1	4	7.6	2.9	5 silty SAND to sandy SILT	120	4	30	35	26	73	41	-	18	2.18	16
20.83	163.4	141.1	201.8	163.5	4	9.3	2.5	5 silty SAND to sandy SILT	120	4	35	41	29	78	42	-	15	2.09	16
21	178.6	153.7	185.9	178.8	2.9	7.9	1.6	6 clean SAND to silty SAND	125	5	31	36	29	81	42	-	11	1.92	16
21.16	186	159.4	188	186.1	2.8	8.5	1.5	6 clean SAND to silty SAND	125	5	32	37	30	82	42	-	10	1.89	16
21.33	204.7	174.8	197.8	204.9	2.8	8.5	1.4	6 clean SAND to silty SAND	125	5	35	41	32	85	43	-	9	1.83	16
21.49	198.2	168.5	207.5	198.4	3.7	9.2	1.9	6 clean SAND to silty SAND	125	5	34	40	32	84	43	-	11	1.94	16
21.65	204.6	173.4	221.9	204.8	4.4	7.9	2.2	5 silty SAND to sandy SILT	120	4	43	51	34	85	43	-	13	1.98	16
21.82	196.6	165.9	228.2	196.7	5	6.5	2.5	5 silty SAND to sandy SILT	120	4	41	49	33	84	43	-	14	2.05	16
21.98	208.8	175.6	211.5	209	3.7	6.5	1.8	6 clean SAND to silty SAND	125	5	35	42	33	86	43	-	11	1.92	16
22.15	218.7	183.2	224.4	218.8	4.3	7.6	2	6 clean SAND to silty SAND	125	5	37	44	35	87	43	-	11	1.94	16
22.31	224.3	187.2	208.6	224.6	3	13.2	1.4	6 clean SAND to silty SAND	125	5	37	45	34	88	43	-	8	1.81	16
22.47	232.4	193.2	202.7	232.5	2.4	7	1	6 clean SAND to silty SAND	125	5	39	46	34	89	43	-	6	1.72	16
22.64	250.4	207.4	243.3	250.6	4.6	12.9	1.8	6 clean SAND to silty SAND	125	5	41	50	39	91	44	-	10	1.88	16
22.8	285.5	235.6	262.5	285.7	4.7	11	1.7	6 clean SAND to silty SAND	125	5	47	57	43	95	44	-	8	1.81	16
22.97	305.2	250.9	275.8	305.4	5	11.9	1.6	6 clean SAND to silty SAND	125	5	50	61	46	95	44	-	8	1.79	16
23.13	242.1	198.3	243.5	242.3	5.1	8.1	2.1	6 clean SAND to silty SAND	125	5	40	48	38	90	43	-	11	1.94	16
23.3	219.8	179.4	241.7	220	5.6	8.9	2.6	5 silty SAND to sandy SILT	120	4	45	55	36	86	43	-	14	2.03	16
23.46	216.6	176.2	254.8	216.8	6.5	9.9	3	5 silty SAND to sandy SILT	120	4	44	54	36	86	43	-	16	2.1	16
23.62	218.5	177.1	210.9	218.7	3.7	9.5	1.7	6 clean SAND to silty SAND	125	5	35	44	34	86	43	-	10	1.9	16
23.79	260.3	210.3	250.2	260.6	5.1	12.6	2	6 clean SAND to silty SAND	125	5	42	52	40	92	44	-	10	1.9	16
23.95	381.1	306.7	320.9	381.4	5.8	15.4	1.5	6 clean SAND to silty SAND	125	5	61	76	54	95	45	-	6	1.71	16
24.12	459.2	368.3	373.8	459.6	6.9	17.8	1.5	6 clean SAND to silty SAND	125	5	74	92	64	95	46	-	6	1.67	16
24.28	510.6	408.1	433.1	510.9	9.8	15.3	1.9	6 clean SAND to silty SAND	125	5	82	100	73	95	47	-	7	1.73	16
24.44	417.4	332.5	375	417.8	9.2	19.5	2.2	6 clean SAND to silty SAND	125	5	66	83	61	95	46	-	9	1.83	16
24.61	425.5	337.8	360.4	426	7.5	20.9	1.8	6 clean SAND to silty SAND	125	5	68	85	60	95	46	-	7	1.74	16
24.77	306.6	242.5	292.8	307	7	17.4	2.3	6 clean SAND to silty SAND	125	5	49	61	46	95	44	-	11	1.92	16
24.94	313.5	247.1	276.5	313.9	5.4	23.8	1.7	6 clean SAND to silty SAND	125	5	49	63	45	95	44	-	8	1.82	16
25.1	306.3	240.7	247.7	306.6	3.6	11.6	1.2	6 clean SAND to silty SAND	125	5	48	61	42	95	44	-	6	1.69	16
25.26	311.3	243.8	266.8	311.7	4.8	18.5	1.6	6 clean SAND to silty SAND	125	5	49	62	44	95	44	-	8	1.78	16
25.43	410.3	320.3	331.3	410.9	6.1	28.7	1.5	6 clean SAND to silty SAND	125	5	64	82	56	95	45	-	6	1.69	16
25.59	462.1	359.5	359.5	462.8	5.7	38.4	1.2	6 clean SAND to silty SAND	125	5	72	92	61	95	46	-	5	1.6	16
25.76	465	360.5	360.5	465.6	5	30.8	1.1	6 clean SAND to silty SAND	125	5	72	93	60	95	46	-	5	1.55	16
25.92	433.1	334.7	334.7	433.8	4.5	35.6	1	6 clean SAND to silty SAND	125	5	67	87	56	95	46	-	5	1.56	16
26.08	421	324.3	338.4	421.4	6.5	23	1.6	6 clean SAND to silty SAND	125	5	65	84	57	95	45	-	6	1.71	16
26.25	483.3	371.1	371.5	484.1	6.9	41.7	1.4	6 clean SAND to silty SAND	125	5	74	97	64	95	46	-	5	1.65	16
26.41	473.6	362.5	379.4	474.1	8	23	1.7	6 clean SAND to silty SAND	125	5	73	95	64	95	46	-	6	1.71	16

26.58	302.1	230.5	272.1	302.4	6.1	12	2	6	clean SAND to silty SAND	125	5	46	60	43	95	44	-	10	1.89	16	
26.74	220.4	167.6	218.4	220.6	4.8	11.2	2.2	5	silty SAND to sandy SILT	120	4	42	55	33	84	42	-	13	2	16	
26.9	140.6	106.6	169.4	140.8	3.4	9.8	2.5	5	silty SAND to sandy SILT	120	4	27	35	22	69	40	-	18	2.17	16	
27.07	67.2	50.8	133.1	67.4	2.1	10.7	3.1	4	clay SILT to silty CLAY	115	2	25	34	12	-	-	4.6	9.9	2.47	15	
27.23	36.1	21.8	-	36.5	1.5	16.2	4.3	3	silty CLAY to CLAY	115	1.5	15	24	6	-	-	2.4	6.9	4.8	2.84	15
27.4	26.6	16	-	27.1	1.6	22.3	6.3	3	silty CLAY to CLAY	115	1.5	11	18	5	-	-	1.8	4.9	6.2	3.05	15
27.56	28.3	16.9	-	28.8	2.6	24.3	9.9	3	silty CLAY to CLAY	115	1.5	11	19	6	-	-	1.9	5.2	7.1	3.17	15
27.72	97.5	72.9	198.3	98.1	4.5	32.9	4.7	4	clay SILT to silty CLAY	115	2	36	49	18	-	-	6.8	9.9	30	2.49	15
27.89	192.7	143.7	202.7	193.2	4.6	22.9	2.4	5	silty SAND to sandy SILT	120	4	36	48	29	79	41	-	15	2.07	16	
28.05	232.3	172.7	200.4	232.7	3.5	19.8	1.5	6	clean SAND to silty SAND	125	5	35	46	32	85	42	-	10	1.87	16	
28.22	280.2	207.7	237.4	280.7	4.6	23.6	1.7	6	clean SAND to silty SAND	125	5	42	56	39	91	43	-	9	1.85	16	
28.38	351.1	259.4	275	351.5	5	22.8	1.4	6	clean SAND to silty SAND	125	5	52	70	46	95	44	-	7	1.73	16	
28.54	313.8	231.2	257.6	314.2	5.1	19.5	1.6	6	clean SAND to silty SAND	125	5	46	63	42	95	44	-	8	1.81	16	
28.71	277.3	203.7	231.8	277.6	4.4	18.1	1.6	6	clean SAND to silty SAND	125	5	41	55	38	90	43	-	9	1.84	16	
28.87	257	188.2	205.7	257.4	3.2	20.9	1.3	6	clean SAND to silty SAND	125	5	38	51	34	88	42	-	8	1.78	16	
29.04	231.6	169.1	197.8	232	3.5	22.1	1.5	6	clean SAND to silty SAND	125	5	34	46	32	84	42	-	10	1.88	16	
29.2	254.7	185.4	222.3	255.1	4.6	22.6	1.8	6	clean SAND to silty SAND	125	5	37	51	35	87	42	-	11	1.91	16	
29.36	381.3	276.9	299.8	381.8	6.2	23.3	1.6	6	clean SAND to silty SAND	125	5	55	76	50	95	44	-	7	1.77	16	
29.53	399.4	289.2	309.3	399.9	6.4	23.9	1.6	6	clean SAND to silty SAND	125	5	58	80	52	95	45	-	7	1.75	16	
29.69	422.1	304.7	321.3	422.6	6.6	24.8	1.6	6	clean SAND to silty SAND	125	5	61	84	54	95	45	-	7	1.72	16	
29.86	399.1	287.3	297.4	399.9	5.5	39.4	1.4	6	clean SAND to silty SAND	125	5	57	80	51	95	44	-	6	1.7	16	
30.02	414.6	297.7	307.5	415.4	5.8	39.6	1.4	6	clean SAND to silty SAND	125	5	60	83	52	95	45	-	6	1.69	16	
30.19	432.4	309.6	311.8	433.2	5.6	42.7	1.3	6	clean SAND to silty SAND	125	5	62	86	54	95	45	-	5	1.66	16	
30.35	380.8	271.9	284.2	381.4	5.2	28.2	1.4	6	clean SAND to silty SAND	125	5	54	76	48	95	44	-	6	1.71	16	
30.51	316.3	225.2	232	316.7	3.5	20	1.1	6	clean SAND to silty SAND	125	5	45	63	39	94	43	-	6	1.69	16	
30.68	262.4	186.3	212.9	262.7	4	15.9	1.5	6	clean SAND to silty SAND	125	5	37	52	35	88	42	-	9	1.85	16	
30.84	231.2	163.7	207.9	231.6	4.6	22.2	2	6	clean SAND to silty SAND	125	5	33	46	32	83	42	-	12	1.98	16	
31.01	279.7	197.5	220.7	280.1	4	19.1	1.4	6	clean SAND to silty SAND	125	5	40	56	36	89	43	-	8	1.81	16	
31.17	298.8	210.5	236.2	299.3	4.6	22.7	1.6	6	clean SAND to silty SAND	125	5	42	60	39	92	43	-	9	1.82	16	
31.33	261.9	183.9	239.9	262.2	6.2	17.7	2.4	5	silty SAND to sandy SILT	120	4	46	65	36	87	42	-	13	2	16	
31.5	292.1	204.7	250.3	292.4	6.2	15.7	2.1	6	clean SAND to silty SAND	125	5	41	58	39	91	43	-	11	1.93	16	
31.66	339	236.8	268.5	339.3	6	16.6	1.8	6	clean SAND to silty SAND	125	5	47	68	44	95	43	-	9	1.84	16	
31.83	386	269	274.7	386.4	4.7	21	1.2	6	clean SAND to silty SAND	125	5	54	77	47	95	44	-	6	1.68	16	
31.99	357.1	248.2	272.7	357.4	5.7	18.2	1.6	6	clean SAND to silty SAND	125	5	50	71	45	95	44	-	8	1.79	16	
32.15	281.6	195.2	246.7	282	6.4	16.7	2.3	5	silty SAND to sandy SILT	120	4	49	70	38	89	42	-	12	1.97	16	
32.32	281.9	194.9	261.8	282.2	7.6	17.3	2.7	5	silty SAND to sandy SILT	120	4	49	70	39	89	42	-	14	2.03	16	
32.48	316	218	250.1	316.5	5.5	22.5	1.8	6	clean SAND to silty SAND	125	5	44	63	41	93	43	-	9	1.85	16	
32.65	361.4	248.7	281.8	362	6.6	29.4	1.8	6	clean SAND to silty SAND	125	5	50	72	46	95	44	-	9	1.84	16	
32.81	412.6	283.1	304.8	413.2	6.7	29.9	1.6	6	clean SAND to silty SAND	125	5	57	83	51	95	44	-	7	1.76	16	
32.97	337.1	230.7	269.5	337.7	6.6	30.5	2	6	clean SAND to silty SAND	125	5	46	67	43	95	43	-	10	1.88	16	
33.14	308.4	210.5	252.3	308.9	6.2	24.1	2	6	clean SAND to silty SAND	125	5	42	62	40	92	43	-	11	1.91	16	
33.3	289.9	197.5	238.7	290.5	5.7	27.7	2	6	clean SAND to silty SAND	125	5	39	58	38	89	42	-	11	1.92	16	
33.47	288.7	196.1	234.9	289.3	5.5	26.2	1.9	6	clean SAND to silty SAND	125	5	39	58	37	89	42	-	11	1.91	16	

33.63	311	210.7	234	311.5	4.6	27.5	1.5	6	clean SAND to silty SAND	125	5	42	62	38	92	43	-	8	1.81	16
33.79	296.3	200.3	208.8	296.8	3.1	22.6	1	6	clean SAND to silty SAND	125	5	40	59	35	90	42	-	6	1.71	16
33.96	257	173.3	199.1	257.3	3.7	18.6	1.5	6	clean SAND to silty SAND	125	5	35	51	32	85	42	-	9	1.86	16
34.12	230	154.7	194	230.3	4.2	18.1	1.8	6	clean SAND to silty SAND	125	5	31	46	30	81	41	-	12	1.96	16
34.29	195.1	130.9	191.9	195.4	4.7	13.3	2.5	5	silty SAND to sandy SILT	120	4	33	49	27	76	40	-	16	2.11	16
34.45	220.7	147.7	205.2	221	5.2	13.4	2.4	5	silty SAND to sandy SILT	120	4	37	55	30	80	41	-	15	2.06	16
34.61	296.9	198.3	233.9	297.2	5.4	16.6	1.8	6	clean SAND to silty SAND	125	5	40	59	37	90	42	-	10	1.89	16
34.78	351.3	234	267.1	351.7	6.3	20.2	1.8	6	clean SAND to silty SAND	125	5	47	70	43	95	43	-	9	1.85	16
34.94	397.5	264.2	289.4	398	6.6	21.2	1.7	6	clean SAND to silty SAND	125	5	53	80	48	95	44	-	8	1.78	16
35.11	391.9	259.9	281.8	392.3	6.1	19.9	1.6	6	clean SAND to silty SAND	125	5	52	78	47	95	44	-	7	1.77	16
35.27	311.3	205.9	241.9	311.6	5.7	14.5	1.8	6	clean SAND to silty SAND	125	5	41	62	39	91	42	-	10	1.88	16
35.43	269.6	177.9	223.4	269.8	5.5	14.5	2.1	6	clean SAND to silty SAND	125	5	36	54	34	86	42	-	12	1.96	16
35.6	281.6	185.4	220.2	281.9	4.9	15.7	1.8	6	clean SAND to silty SAND	125	5	37	56	35	87	42	-	10	1.9	16
35.76	295.6	194.2	229.2	296	5.3	19.7	1.8	6	clean SAND to silty SAND	125	5	39	59	37	89	42	-	10	1.89	16
35.93	289	189.4	232.2	289.4	5.8	18.4	2	6	clean SAND to silty SAND	125	5	38	58	36	88	42	-	11	1.94	16
36.09	276.3	180.6	226.1	276.7	5.7	17.5	2.1	6	clean SAND to silty SAND	125	5	36	55	35	87	42	-	12	1.96	16
36.26	261.5	170.5	216.6	261.8	5.4	14.7	2.1	6	clean SAND to silty SAND	125	5	34	52	33	85	41	-	12	1.98	16
36.42	272	177	215.2	272.3	5	18.6	1.9	6	clean SAND to silty SAND	125	5	35	54	34	86	42	-	11	1.93	16
36.58	315	204.5	227.2	315.4	4.5	20	1.5	6	clean SAND to silty SAND	125	5	41	63	37	91	42	-	8	1.81	16
36.75	342.2	221.6	240.4	342.6	4.7	20.9	1.4	6	clean SAND to silty SAND	125	5	44	68	40	93	43	-	7	1.77	16
36.91	311.2	201.1	229.2	311.6	4.9	22.3	1.6	6	clean SAND to silty SAND	125	5	40	62	37	90	42	-	9	1.84	16
37.08	314.4	202.7	237.8	314.8	5.7	20.4	1.8	6	clean SAND to silty SAND	125	5	41	63	38	90	42	-	10	1.88	16
37.24	365.5	235.1	265.8	366	6.4	24.4	1.8	6	clean SAND to silty SAND	125	5	47	73	43	95	43	-	9	1.83	16
37.4	463.1	297.3	313.9	463.7	7.1	31.2	1.5	6	clean SAND to silty SAND	125	5	59	93	53	95	44	-	7	1.73	16
37.57	509.8	326.5	343.2	510.4	8.2	30.8	1.6	6	clean SAND to silty SAND	125	5	65	100	58	95	45	-	6	1.72	16
37.73	617.5	394.6	394.6	618.4	8.5	41.4	1.4	6	clean SAND to silty SAND	125	5	79	100	68	95	45	-	5	1.62	16
37.9	603.6	384.9	403.6	603.9	10.7	14.7	1.8	6	clean SAND to silty SAND	125	5	77	100	68	95	45	-	6	1.72	16

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Trojan Storage

Project ID: EEI Engineering Solutions
 Data File: SDF(015).cpt
 CPT Date: 6/27/2018 10:36:01 3:00 AM
 GW Duration: 50 ft

Sounding ID: CPT -4
 Project No: AAA -7281 1.4
 Core/Rig: DDG1 418

Depth ft	qc PS	qc1n PS	q1ncs PS	qt PS	Slv Stss	pore prss (psi)	Frct Ratio %	Mat Typ	Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	SPT R-N 60%	SPT R-N 60%	SPT R-N 60%	Rel Den %	Ftn Ang deg	Und Shr	OCR -	Fin lc %	Indx -
0.33	465.3	746.2	746.2	465.3	6.7	1	1.4	6	clean SAND to silty SAND	125	5	100	93	100	95	48	-	5	1.5	16	
0.49	599.6	961.6	961.6	599.7	9.7	4.4	1.6	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	39.7	9.9	5	1.51	16
0.66	615.4	987	987	615.6	10.9	10.8	1.8	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	40.8	9.9	5	1.54	16
0.82	545	874.1	874.1	545.2	9.2	8.3	1.7	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	36.1	9.9	5	1.54	16
0.98	472.7	758.1	835.3	473	14.1	16.5	3	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	31.3	9.9	8	1.79	16
1.15	449.8	721.3	808.9	450.3	14	29.8	3.1	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	29.8	9.9	9	1.82	16
1.31	578	927	945.3	578.6	13.7	29.8	2.4	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	38.3	9.9	6	1.67	16
1.48	406	651.1	700.1	406.3	10.4	16.1	2.6	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	26.9	9.9	7	1.76	16
1.64	369.2	592.2	648.7	369.4	9.8	6.7	2.6	8	stiff SAND to clay SAND	115	1	100	100	100	-	-	24.5	9.9	8	1.78	16
1.8	316.9	508.2	585.9	317	9.5	6.1	3	8	stiff SAND to clay SAND	115	1	100	100	95	-	-	21	9.9	9	1.86	16
1.97	279.7	448.6	528	280	8.5	10.5	3	8	stiff SAND to clay SAND	115	1	100	100	84	-	-	18.5	9.9	10	1.89	16
2.13	227.1	364.3	457.4	227.3	7.5	7.9	3.3	8	stiff SAND to clay SAND	115	1	100	100	71	-	-	15	9.9	12	1.96	16
2.3	218	349.7	422.4	218.2	6.3	6.6	2.9	8	stiff SAND to clay SAND	115	1	100	100	67	-	-	14.4	9.9	11	1.92	16

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Trojan Storage

Project ID: EEIE Engineering Solutions
 Data File: SDF(016).cpt
 CPT Date: 6/27/2018 10:58:02 3:00 AM
 GW Duration: 50 ft

Sound log ID: CPT-04A
 Project No: AAA-7281-1.4
 Core/Rig: DDG1-418

Depth ft	qc PS tsf	qcIn PS	q1ncs PS	qt PS	Slv Stss tsf	pore prss (psi)	Frct Ratio %	Mat Typ	Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	SPT R-N 60%	SPT R-N 60%	SPT R-N 60%	Rel Den %	Ftn Ang deg	Und Shr	OCR	Fin Ic %	Fin Ic %	Nk
0.33	1.1	0	0	1.1	2.3	0	9.9	2	Organic SOILS - Peats	100	1	0	1	1	1	-	-	0.1	9.9	95	5.64	10
0.49	5.5	8.9	-	5.5	2.6	0	9.9	3	silty CLAY to CLAY	115	1.5	6	4	4	4	-	-	0.4	9.9	86	3.36	15
0.66	57.2	91.7	206.7	57.2	2.4	0.4	4.3	4	clay SILT to silty CLAY	115	2	46	29	21	-	-	4	9.9	26	2.39	15	
0.82	36.5	58.6	-	36.5	3.7	0	9.9	9	very stiff fine SOIL	120	2	29	18	17	49	48	-	-	-	46	2.79	30
0.98	103.7	166.3	337	103.7	5.7	0.3	5.5	9	very stiff fine SOIL	120	2	83	52	37	84	48	-	-	-	23	2.32	30
1.15	211.4	339.1	418.7	211.5	6.4	0.7	3	8	stiff SAND to clayey SAND	115	1	100	100	65	-	-	14	9.9	12	1.95	16	
1.31	266.9	428	492.8	266.9	7.3	1.6	2.7	8	stiff SAND to clayey SAND	115	1	100	100	80	-	-	17.7	9.9	9	1.86	16	
1.48	293.8	471.2	529	293.8	7.7	1.6	2.6	8	stiff SAND to clayey SAND	115	1	100	100	87	-	-	19.5	9.9	9	1.82	16	
1.64	341.7	548.1	595	341.8	8.4	3.4	2.5	8	stiff SAND to clayey SAND	115	1	100	100	99	-	-	22.6	9.9	8	1.77	16	
1.8	390.4	626.2	662.4	390.5	9.2	3.8	2.4	8	stiff SAND to clayey SAND	115	1	100	100	100	-	-	25.9	9.9	7	1.73	16	
1.97	406.5	651.9	665.3	406.6	8.5	4.6	2.1	8	stiff SAND to clayey SAND	115	1	100	100	100	-	-	26.9	9.9	6	1.67	16	
2.13	348.7	559.3	599.1	348.9	8.2	6.3	2.4	8	stiff SAND to clayey SAND	115	1	100	100	100	-	-	23.1	9.9	7	1.75	16	
2.3	303.4	486.6	582	303.5	10	5.3	3.3	8	stiff SAND to clayey SAND	115	1	100	100	95	-	-	20.1	9.9	11	1.91	16	
2.46	321.5	515.6	585.4	321.6	9.1	6.5	2.8	8	stiff SAND to clayey SAND	115	1	100	100	91	-	-	21.3	9.9	9	1.84	16	
2.62	311.1	499	555.8	311.4	8.1	12.6	2.6	8	stiff SAND to clayey SAND	115	1	100	100	91	-	-	20.6	9.9	8	1.81	16	
2.79	302.9	485.7	514.8	303.1	6.4	13.9	2.1	8	stiff SAND to clayey SAND	115	1	100	100	86	-	-	20.1	9.9	7	1.73	16	
2.95	336.3	539.4	539.4	336.7	3.4	17.1	1	6	clean SAND to silty SAND	125	5	100	67	87	95	48	-	-	-	5	1.43	16
3.12	314.9	505.1	505.1	315.1	2.7	9.1	0.9	6	clean SAND to silty SAND	125	5	100	63	80	95	48	-	-	-	5	1.38	16
3.28	242.7	389.2	389.2	242.8	2.8	4.8	1.2	6	clean SAND to silty SAND	125	5	78	49	65	95	48	-	-	-	5	1.56	16
3.45	168.4	270.1	298.7	168.4	3	1.1	1.8	6	clean SAND to silty SAND	125	5	54	34	49	95	48	-	-	-	8	1.8	16
3.61	122.3	196.2	246.1	122.3	2.7	2	2.2	6	clean SAND to silty SAND	125	5	39	24	38	89	48	-	-	-	12	1.96	16
3.77	87.1	139.8	204.4	87.2	2.3	2	2.6	5	silty SAND to sandy SILT	120	4	35	22	29	78	47	-	-	-	16	2.1	16
3.94	78.3	125.6	183.2	78.4	1.8	1.3	2.4	5	silty SAND to sandy SILT	120	4	31	20	26	75	46	-	-	-	16	2.1	16
4.1	101.1	162.1	207.7	101.1	2.1	2.9	2.1	5	silty SAND to sandy SILT	120	4	41	25	32	83	47	-	-	-	13	1.99	16
4.27	183.6	294.5	308.5	183.7	2.7	5.2	1.5	6	clean SAND to silty SAND	125	5	59	37	52	95	48	-	-	-	6	1.71	16
4.43	251.2	402.9	402.9	251.3	2.4	4.7	1	6	clean SAND to silty SAND	125	5	81	50	66	95	48	-	-	-	5	1.48	16
4.59	242.9	389.6	389.6	243	2.5	5.5	1	6	clean SAND to silty SAND	125	5	78	49	64	95	48	-	-	-	5	1.51	16
4.76	237.9	381.5	381.5	238	2.1	4.9	0.9	6	clean SAND to silty SAND	125	5	76	48	62	95	48	-	-	-	5	1.47	16
4.92	251.2	402.8	402.8	251.2	2.3	3.3	0.9	6	clean SAND to silty SAND	125	5	81	50	66	95	48	-	-	-	5	1.47	16
5.09	239.8	384.6	384.6	239.9	1.8	3.7	0.7	6	clean SAND to silty SAND	125	5	77	48	61	95	48	-	-	-	5	1.41	16
5.25	240.5	385.7	385.7	240.5	2	2.2	0.8	6	clean SAND to silty SAND	125	5	77	48	63	95	48	-	-	-	5	1.45	16

5.41	231.8	371.7	371.7	231.9	2.3	2.9	1	6	clean SAND to silty SAND	125	5	74	46	61	95	48	-	5	1.51	16
5.58	260.7	418.1	418.1	260.8	2.2	2.7	0.8	6	clean SAND to silty SAND	125	5	84	52	67	95	48	-	5	1.42	16
5.74	251	402.6	402.6	251.1	2.1	2.5	0.9	6	clean SAND to silty SAND	125	5	81	50	65	95	48	-	5	1.44	16
5.91	215.6	345.8	345.8	215.7	2.5	2.2	1.2	6	clean SAND to silty SAND	125	5	69	43	59	95	48	-	5	1.59	16
6.07	196.2	314.7	314.7	196.2	2.2	1.1	1.1	6	clean SAND to silty SAND	125	5	63	39	53	95	48	-	5	1.59	16
6.23	180.2	286.9	286.9	180.2	2	0.7	1.1	6	clean SAND to silty SAND	125	5	57	36	49	95	48	-	5	1.63	16
6.4	153.8	241.6	241.6	153.8	1.2	0.9	0.8	6	clean SAND to silty SAND	125	5	48	31	41	95	47	-	5	1.57	16
6.56	134.5	208.6	234.5	134.5	2.1	0.3	1.6	6	clean SAND to silty SAND	125	5	42	27	38	91	46	-	9	1.82	16
6.73	122.5	187.5	203.1	122.5	1.5	0.8	1.2	6	clean SAND to silty SAND	125	5	38	25	34	88	46	-	7	1.77	16
6.89	109.1	164.9	189.7	109.1	1.5	0.1	1.4	6	clean SAND to silty SAND	125	5	33	22	31	83	45	-	9	1.86	16
7.05	75.6	112.8	130	75.6	0.7	-0.5	1	6	clean SAND to silty SAND	125	5	23	15	21	71	43	-	9	1.86	16
7.22	78	115	129.7	77.9	0.7	-1	0.9	6	clean SAND to silty SAND	125	5	23	16	21	72	44	-	9	1.83	16
7.38	66.5	97	116.6	66.5	0.6	-1	1	6	clean SAND to silty SAND	125	5	19	13	18	66	43	-	11	1.91	16
7.55	51.3	74	94.1	51.3	0.4	-0.9	0.9	6	clean SAND to silty SAND	125	5	15	10	14	57	41	-	12	1.98	16
7.71	43.2	61.6	92.8	43.2	0.5	-0.9	1.2	5	silty SAND to sandy SILT	120	4	15	11	13	51	40	-	17	2.13	16
7.87	38.8	54.8	88.5	38.8	0.5	-0.7	1.2	5	silty SAND to sandy SILT	120	4	14	10	12	47	39	-	18	2.18	16
8.04	39	54.4	121.8	38.9	1	-0.7	2.6	5	silty SAND to sandy SILT	120	4	14	10	13	47	39	-	26	2.38	16
8.2	49.3	68.2	123.9	49.3	1	-0.8	2.1	5	silty SAND to sandy SILT	120	4	17	12	15	54	41	-	21	2.26	16
8.37	85.7	117.3	177.1	85.7	2	-0.4	2.4	5	silty SAND to sandy SILT	120	4	29	21	24	72	43	-	17	2.13	16
8.53	231.7	314.1	343.9	231.7	4.4	1.4	1.9	6	clean SAND to silty SAND	125	5	63	46	57	95	48	-	8	1.78	16
8.69	242	324.9	328.5	242.1	3.3	0.8	1.4	6	clean SAND to silty SAND	125	5	65	48	56	95	48	-	5	1.66	16
8.86	370.4	492.3	492.3	370.4	2.4	1.2	0.6	7	grvly SAND to dense SAND	130	6	82	62	76	95	48	-	5	1.29	16
9.02	331.4	436.1	436.1	331.4	2.9	0.6	0.9	6	clean SAND to silty SAND	125	5	87	66	70	95	48	-	5	1.43	16
9.19	306.3	399.3	399.3	306.3	3.7	1.5	1.2	6	clean SAND to silty SAND	125	5	80	61	67	95	48	-	5	1.57	16
9.35	274.8	355	355	274.8	2.8	0.9	1	6	clean SAND to silty SAND	125	5	71	55	59	95	48	-	5	1.53	16
9.51	251.2	321.7	321.7	251.2	2.4	0.4	1	6	clean SAND to silty SAND	125	5	64	50	54	95	48	-	5	1.54	16
9.68	269.3	341.7	341.7	269.3	2.1	1.8	0.8	6	clean SAND to silty SAND	125	5	68	54	56	95	48	-	5	1.46	16
9.84	300	377.5	377.5	300.1	3	2.3	1	6	clean SAND to silty SAND	125	5	76	60	63	95	48	-	5	1.52	16
10.01	320.2	399.4	399.4	320.2	3.1	2.5	1	6	clean SAND to silty SAND	125	5	80	64	66	95	48	-	5	1.49	16
10.17	313.1	387.4	387.4	313.2	2.8	3.5	0.9	6	clean SAND to silty SAND	125	5	77	63	63	95	48	-	5	1.47	16
10.34	323.5	396.9	396.9	323.6	2.5	6.4	0.8	6	clean SAND to silty SAND	125	5	79	65	64	95	48	-	5	1.41	16
10.5	275.6	335.5	335.5	275.7	2.3	1.9	0.8	6	clean SAND to silty SAND	125	5	67	55	55	95	48	-	5	1.49	16
10.66	240.6	290.5	290.5	240.6	2.2	1.8	0.9	6	clean SAND to silty SAND	125	5	58	48	49	95	47	-	5	1.55	16
10.83	301.5	361.2	361.2	301.6	2.7	2.9	0.9	6	clean SAND to silty SAND	125	5	72	60	59	95	48	-	5	1.48	16
10.99	361.1	429.3	429.3	361.2	2.4	2.9	0.7	6	clean SAND to silty SAND	125	5	86	72	67	95	48	-	5	1.34	16
11.16	360	424.6	424.6	360	2.9	2.7	0.8	6	clean SAND to silty SAND	125	5	85	72	68	95	48	-	5	1.4	16
11.32	352.8	413.1	413.1	353	3.2	5.9	0.9	6	clean SAND to silty SAND	125	5	83	71	67	95	48	-	5	1.45	16
11.48	322.8	375.1	375.1	322.9	2.8	5.7	0.9	6	clean SAND to silty SAND	125	5	75	65	61	95	48	-	5	1.47	16
11.65	278.1	320.9	320.9	278.2	1.6	5.3	0.6	6	clean SAND to silty SAND	125	5	64	56	51	95	47	-	5	1.38	16
11.81	282	323	331.1	282.1	4.1	5.4	1.4	6	clean SAND to silty SAND	125	5	65	56	56	95	47	-	6	1.68	16
11.98	328.5	373.6	372.9	328.6	4.7	5.4	1.4	6	clean SAND to silty SAND	125	5	75	66	64	95	48	-	5	1.64	16
12.14	390.5	441.1	441.1	390.6	4.7	3.2	1.2	6	clean SAND to silty SAND	125	5	88	78	74	95	48	-	5	1.54	16
12.3	304.3	341.3	341.3	304.3	3.1	2.4	1	6	clean SAND to silty SAND	125	5	68	61	57	95	47	-	5	1.55	16

12.47	257.3	286.6	286.6	257.3	2.2	3.1	0.9	6 clean SAND to silty SAND	125	5	57	51	48	95	46	-	5	1.54	16	
12.63	227.8	252.1	252.1	227.9	1.9	3.8	0.8	6 clean SAND to silty SAND	125	5	50	46	42	95	46	-	5	1.56	16	
12.8	221.9	244	244	222.1	1.8	7.1	0.8	6 clean SAND to silty SAND	125	5	49	44	41	95	46	-	5	1.57	16	
12.96	238.1	260.1	260.1	238.2	2	4.9	0.8	6 clean SAND to silty SAND	125	5	52	48	44	95	46	-	5	1.55	16	
13.12	238.8	259.2	259.2	238.9	2.3	5.3	1	6 clean SAND to silty SAND	125	5	52	48	44	95	46	-	5	1.61	16	
13.29	231.2	249.3	249.3	231.3	2.3	6.3	1	6 clean SAND to silty SAND	125	5	50	46	43	95	46	-	5	1.63	16	
13.45	207.3	222.1	237.1	207.3	2.7	3.4	1.3	6 clean SAND to silty SAND	125	5	44	41	40	93	45	-	7	1.74	16	
13.62	220.1	234.4	248.8	220.3	2.9	8.4	1.3	6 clean SAND to silty SAND	125	5	47	44	42	95	45	-	7	1.73	16	
13.78	245.6	259.9	286.4	245.7	4.1	4.7	1.7	6 clean SAND to silty SAND	125	5	52	49	47	95	46	-	8	1.79	16	
13.94	232.8	245	284.5	232.9	4.7	4.1	2	6 clean SAND to silty SAND	125	5	49	47	46	95	45	-	10	1.87	16	
14.11	197.7	206.8	247.7	197.8	3.9	2.6	2	6 clean SAND to silty SAND	125	5	41	40	39	91	45	-	11	1.91	16	
14.27	144.1	149.8	222.9	144.1	4.1	1.6	2.8	5 silty SAND to sandy SILT	120	4	37	36	31	80	43	-	16	2.12	16	
14.44	144.5	149.4	212.4	144.5	3.7	2.6	2.6	5 silty SAND to sandy SILT	120	4	37	36	30	80	43	-	15	2.08	16	
14.6	180.7	185.8	240.3	180.8	4.2	2.2	2.4	5 silty SAND to sandy SILT	120	4	46	45	36	87	44	-	13	1.99	16	
14.76	160.9	164.5	190.8	160.9	2.3	1.8	1.5	6 clean SAND to silty SAND	125	5	33	32	31	83	43	-	10	1.87	16	
14.93	176.7	179.6	223.6	176.7	3.6	2.1	2	6 clean SAND to silty SAND	125	5	36	35	35	86	44	-	12	1.95	16	
15.09	196.3	198.5	230.7	196.4	3.4	5.4	1.7	6 clean SAND to silty SAND	125	5	40	39	37	90	44	-	10	1.87	16	
15.26	221.1	222.4	253.1	221.2	3.8	4.9	1.7	6 clean SAND to silty SAND	125	5	44	44	41	93	45	-	9	1.84	16	
15.42	251	251.1	281.6	251.2	4.5	8	1.8	6 clean SAND to silty SAND	125	5	50	50	46	95	45	-	9	1.82	16	
15.58	256.4	255.1	291.5	256.6	5	7.1	1.9	6 clean SAND to silty SAND	125	5	51	51	47	95	45	-	9	1.85	16	
15.75	293.8	290.6	321.9	293.9	5.5	4.6	1.9	6 clean SAND to silty SAND	125	5	58	59	53	95	46	-	8	1.8	16	
15.91	263.7	259.6	311.4	263.8	6.2	5.2	2.4	6 clean SAND to silty SAND	125	5	52	53	49	95	45	-	11	1.91	16	
16.08	276.9	271.1	331.8	277.1	7.1	9.1	2.6	8 stiff SAND to clayey SAND	115	1	100	100	52	-	-	18.3	9.9	11	1.94	16
16.24	271.1	264.1	324.9	271.4	7	15.4	2.6	8 stiff SAND to clayey SAND	115	1	100	100	51	-	-	17.9	9.9	11	1.94	16
16.4	302.5	293.3	352.9	302.6	7.8	8	2.6	8 stiff SAND to clayey SAND	115	1	100	100	56	-	-	20	9.9	11	1.91	16
16.57	262.1	253	338.4	262.3	8.3	11	3.2	8 stiff SAND to clayey SAND	115	1	100	100	50	-	-	17.3	9.9	14	2.03	16
16.73	272.6	261.9	329.1	273	7.5	17.8	2.7	8 stiff SAND to clayey SAND	115	1	100	100	51	-	-	18	9.9	12	1.96	16
16.9	290.4	277.7	321.2	290.8	6.3	22.6	2.2	6 clean SAND to silty SAND	125	5	56	58	52	95	46	-	10	1.86	16	
17.06	291.9	277.8	340.7	292.3	7.7	20.5	2.6	8 stiff SAND to clayey SAND	115	1	100	100	53	-	-	19.3	9.9	11	1.94	16
17.23	311.3	294.9	339.7	311.7	6.9	21.7	2.2	6 clean SAND to silty SAND	125	5	59	62	55	95	46	-	9	1.86	16	
17.39	459.5	433.2	436.2	459.9	7.4	19.9	1.6	6 clean SAND to silty SAND	125	5	87	92	75	95	48	-	5	1.66	16	
17.55	502	471	491.6	502.2	9.8	9.4	2	6 clean SAND to silty SAND	125	5	94	100	83	95	48	-	6	1.71	16	
17.72	416.9	389.3	429.3	417	9.2	7.5	2.2	8 stiff SAND to clayey SAND	115	1	100	100	71	-	-	27.5	9.9	8	1.79	16
17.88	277.2	257.7	294.1	277.3	5.4	7	1.9	6 clean SAND to silty SAND	125	5	52	55	48	95	45	-	9	1.85	16	
18.05	214.6	198.6	246.7	215.1	4.7	24	2.2	6 clean SAND to silty SAND	125	5	40	43	38	90	44	-	12	1.95	16	
18.21	245.5	226.1	256.9	246	4.2	28.1	1.7	6 clean SAND to silty SAND	125	5	45	49	42	94	45	-	9	1.84	16	
18.37	210.4	192.9	222.7	210.6	3.4	9.2	1.6	6 clean SAND to silty SAND	125	5	39	42	36	89	44	-	9	1.86	16	
18.54	232.3	212	233.7	232.5	3.3	12.8	1.4	6 clean SAND to silty SAND	125	5	42	46	39	92	44	-	8	1.79	16	
18.7	231.5	210.4	245.8	231.8	4.2	12.7	1.8	6 clean SAND to silty SAND	125	5	42	46	39	92	44	-	10	1.88	16	
18.87	230.9	208.9	251.9	231.2	4.7	13.4	2.1	6 clean SAND to silty SAND	125	5	42	46	40	91	44	-	11	1.92	16	
19.03	235.8	212.4	266	236.1	5.5	15.3	2.4	6 clean SAND to silty SAND	125	5	42	47	41	92	44	-	12	1.96	16	
19.19	238.2	213.6	233.1	238.5	3.3	12.6	1.4	6 clean SAND to silty SAND	125	5	43	48	39	92	44	-	8	1.78	16	
19.36	247.1	220.6	258	247.4	4.7	14.2	1.9	6 clean SAND to silty SAND	125	5	44	49	41	93	44	-	10	1.88	16	

19.52	288.2	256.2	300.5	288.5	6.2	14.4	2.2	125	5	51	58	48	95	45	-	-	-	10	1.88	16
19.69	357.9	316.8	367.3	358.3	8.5	16.5	2.4	115	1	100	100	59	-	-	23.6	9.9	9.9	10	1.87	16
19.85	315.2	277.9	338.2	315.4	8.1	7.9	2.6	115	1	100	100	53	-	-	20.8	9.9	9.9	11	1.93	16
20.01	413.5	363.2	516.9	413.7	18.5	12	4.5	120	2	100	100	74	95	46	-	-	-	15	2.08	30
20.18	568.2	497	508.5	568.6	10.5	20	1.9	125	5	99	100	87	95	48	-	-	-	6	1.68	16
20.34	540.8	471.1	507.1	541.4	12	33	2.2	115	1	100	100	85	-	-	35.7	9.9	9.9	7	1.76	16
20.51	319.9	277.6	351.2	320.2	9.2	15.5	2.9	115	1	100	100	54	-	-	21.1	9.9	9.9	12	1.97	16
20.67	342.2	295.9	325.5	342.4	6.3	10.7	1.8	125	5	59	68	54	95	45	-	-	-	8	1.79	16
20.83	413.5	356.1	380.1	413.8	7.5	14.5	1.8	125	5	71	83	64	95	46	-	-	-	7	1.74	16
21	451	386.8	389.6	451.5	6.8	26	1.5	125	5	77	90	67	95	47	-	-	-	5	1.66	16
21.16	486.7	415.8	415.8	487.2	5	26.1	1	125	5	83	97	68	95	47	-	-	-	5	1.5	16
21.33	398.1	338.7	350.3	398.7	6.1	30.7	1.5	125	5	68	80	60	95	46	-	-	-	6	1.69	16
21.49	420.7	356.6	363	421	6.3	16.7	1.5	125	5	71	84	62	95	46	-	-	-	6	1.67	16
21.65	361.9	305.5	324.7	362.3	5.8	20.6	1.6	125	5	61	72	54	95	45	-	-	-	7	1.74	16
21.82	336.6	283.1	328	338.1	7.4	74.7	2.2	125	5	57	67	53	95	45	-	-	-	10	1.87	16
21.98	403.7	338.2	356	404.3	6.7	28.6	1.7	125	5	68	81	60	95	46	-	-	-	7	1.72	16
22.15	412.8	344.5	384.2	412.9	8.8	8.2	2.1	125	5	69	83	63	95	46	-	-	-	8	1.81	16
22.31	340.6	283.2	392	340.8	12.6	11.5	3.7	115	1	100	100	57	-	-	22.5	9.9	9.9	15	2.06	16
22.47	407.3	337.5	377.9	407.6	8.8	16.5	2.2	125	5	68	81	62	95	46	-	-	-	9	1.82	16
22.64	407.8	336.7	369.9	408	8.1	12.3	2	125	5	67	82	61	95	46	-	-	-	8	1.79	16
22.8	316.4	260.2	288.1	316.7	5.4	16.9	1.7	125	5	52	63	47	95	45	-	-	-	8	1.8	16
22.97	380	311.4	320.8	380.3	5.4	14.6	1.4	125	5	62	76	55	95	45	-	-	-	6	1.69	16
23.13	510	416.4	416.4	510.3	5.8	17.1	1.1	125	5	83	100	69	95	47	-	-	-	5	1.54	16
23.3	513.8	418.1	418.1	514.2	4.6	16.3	0.9	125	5	84	100	68	95	47	-	-	-	5	1.45	16
23.46	462.5	375	375	463.1	4.5	26.7	1	125	5	75	93	62	95	46	-	-	-	5	1.5	16
23.62	418.7	338.2	338.7	418.9	5.6	12.1	1.4	125	5	68	84	58	95	46	-	-	-	5	1.65	16
23.79	327.8	263.8	264.4	328.1	3.7	14.4	1.1	125	5	53	66	46	95	45	-	-	-	5	1.65	16
23.95	306.4	245.8	246.1	306.7	3.2	13.9	1.1	125	5	49	61	42	95	44	-	-	-	5	1.65	16
24.12	373.6	298.6	298.6	373.8	4.3	12.6	1.2	125	5	60	75	51	95	45	-	-	-	5	1.63	16
24.28	286.2	228	240.8	286.4	3.6	7.5	1.3	125	5	46	57	41	94	44	-	-	-	7	1.73	16
24.44	325.3	258.2	296.3	325.4	6.5	5.8	2	125	5	52	65	48	95	44	-	-	-	9	1.85	16
24.61	290	229.5	269	290.2	5.7	9.5	2	125	5	46	58	43	94	44	-	-	-	10	1.88	16
24.77	317.7	250.5	263.8	317.9	4.2	7.9	1.3	125	5	50	64	44	95	44	-	-	-	7	1.72	16
24.94	300.3	236	274.9	300.4	5.9	5	2	125	5	47	60	44	95	44	-	-	-	10	1.87	16
25.1	313.6	245.6	298	313.7	7.3	3.5	2.4	125	5	49	63	47	95	44	-	-	-	11	1.92	16
25.26	311.9	243.5	316.8	312	9	5.5	2.9	115	1	100	100	48	-	-	20.6	9.9	9.9	13	2	16
25.43	304.2	236.7	286.2	304.3	6.9	7	2.3	125	5	47	61	45	95	44	-	-	-	11	1.92	16
25.59	307.6	238.6	283.7	307.7	6.6	9.2	2.2	125	5	48	62	45	95	44	-	-	-	10	1.9	16
25.76	373.7	288.9	298.6	373.8	5.1	7.2	1.4	125	5	58	75	51	95	45	-	-	-	6	1.69	16
25.92	432.2	333	369	432.3	8.8	6.8	2	125	5	67	86	61	95	45	-	-	-	8	1.8	16
26.08	460.8	354	384.3	461	9	6.7	2	125	5	71	92	64	95	46	-	-	-	8	1.77	16
26.25	497	380.6	416.7	497.1	10.5	4.7	2.1	125	5	76	99	69	95	46	-	-	-	8	1.78	16
26.41	407.8	311.3	325.9	407.9	6.2	4.1	1.5	125	5	62	82	55	95	45	-	-	-	6	1.71	16

26.58	370.6	282	285.6	370.8	4.6	12.2	1.2	6	clean SAND to silty SAND	125	5	56	74	49	95	45	-	5	1.66	16	
26.74	347.2	263.4	263	347.4	3.8	11.2	1.1	6	clean SAND to silty SAND	125	5	53	69	45	95	44	-	5	1.64	16	
26.9	298.6	225.8	244.9	298.9	4.2	13.2	1.4	6	clean SAND to silty SAND	125	5	45	60	41	94	44	-	7	1.77	16	
27.07	229.8	173.2	211.9	229.9	4.2	5.8	1.9	6	clean SAND to silty SAND	125	5	35	46	33	85	42	-	11	1.93	16	
27.23	119.2	89.6	164.1	119.4	3.3	12.2	2.8	5	silty SAND to sandy SILT	120	4	22	30	20	63	39	-	21	2.26	16	
27.4	63.5	47.6	124.2	63.6	1.8	5.9	2.9	4	clay SILT to silty CLAY	115	2	24	32	11	-	-	4.4	9.9	2.47	15	
27.56	52	30.8	-	52.2	1.7	10.3	3.4	4	clay SILT to silty CLAY	115	2	15	26	8	-	-	3.6	9.8	3.8	2.65	15
27.72	53.9	31.7	-	54.1	2.6	10.1	4.9	3	silty CLAY to CLAY	115	1.5	21	36	9	-	-	3.7	9.9	4.3	2.75	15
27.89	55.7	32.6	-	55.9	2.9	7	5.4	3	silty CLAY to CLAY	115	1.5	22	37	9	-	-	3.8	9.9	4.5	2.78	15
28.05	68.1	39.7	-	68.3	3.9	6.8	5.8	3	silty CLAY to CLAY	115	1.5	26	45	11	-	-	4.7	9.9	4.2	2.74	15
28.22	108	79.8	206.4	108.1	5	7.2	4.7	4	clay SILT to silty CLAY	115	2	40	54	19	-	-	7.5	9.9	2.9	2.46	15
28.38	181.4	133.7	220.1	181.6	5.8	9.5	3.2	5	silty SAND to sandy SILT	120	4	33	45	28	77	41	-	19	2.19	16	
28.54	205.6	151.1	263.1	205.8	8	9.6	3.9	8	stiff SAND to clay SAND	115	1	100	100	33	-	-	13.5	9.9	2.0	2.23	16
28.71	260	190.5	274.3	260.3	8.1	15.9	3.1	8	stiff SAND to clay SAND	115	1	100	100	39	-	-	17.1	9.9	1.6	2.09	16
28.87	296.8	216.9	287.8	297.1	8.3	13.3	2.8	8	stiff SAND to clay SAND	115	1	100	100	43	-	-	19.5	9.9	1.3	2.02	16
29.04	318.2	232	283.3	318.4	7.3	13	2.3	6	clean SAND to silty SAND	125	5	46	64	44	95	44	-	11	1.93	16	
29.2	304.7	221.5	280	305	7.6	15.7	2.5	5	silty SAND to sandy SILT	120	4	55	76	43	93	43	-	12	1.97	16	
29.36	309.6	224.4	270.1	309.9	6.6	18.3	2.2	6	clean SAND to silty SAND	125	5	45	62	43	94	43	-	11	1.92	16	
29.53	349.5	252.6	290.6	349.8	6.9	16.7	2	6	clean SAND to silty SAND	125	5	51	70	47	95	44	-	9	1.86	16	
29.69	357.6	257.8	301.5	358	7.6	18	2.1	6	clean SAND to silty SAND	125	5	52	72	48	95	44	-	10	1.88	16	
29.86	396.1	284.7	306.9	396.5	6.5	18.9	1.6	6	clean SAND to silty SAND	125	5	57	79	51	95	44	-	7	1.76	16	
30.02	423.8	303.8	336.6	424.2	8.2	21.6	1.9	6	clean SAND to silty SAND	125	5	61	85	55	95	45	-	8	1.8	16	
30.19	432.4	309.1	340.5	432.9	8.2	26.4	1.9	6	clean SAND to silty SAND	125	5	62	86	56	95	45	-	8	1.79	16	
30.35	431.9	307.9	327.3	432.5	7	27.5	1.6	6	clean SAND to silty SAND	125	5	62	86	55	95	45	-	7	1.74	16	
30.51	406	288.6	330.7	406.5	8.6	26.3	2.1	6	clean SAND to silty SAND	125	5	58	81	54	95	44	-	9	1.85	16	
30.68	425	301.3	331.7	425.8	7.9	40.3	1.9	6	clean SAND to silty SAND	125	5	60	85	55	95	45	-	8	1.79	16	

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above were determined usi
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ility for analy sis a nd de sign

Mi ddle Eart h Ge o Tes ting

LAYER Report Creation - Select the parameters and sequence that you want them in

Always enter a file extension first, even if a file won't be created

TXT 1 4 7 10 11 12 13 14 21 25 35 40 43 46 47 39

Place a U after the number to calculate the parameter using the uncorrected point stress (ie 19U)

Delete Line Cancel Save & Exit

Parameter Numbers and Associated Description

1 Layer Number	21 Relative Density	41 Stress Reduction Factor (Rd)
2 Depth to Top of Layer	22 Friction Angle	42 Volumetric Strain (%)
3 Depth to Middle of Layer	23 Undrained Shear Strength	43 Total Settlement (vol strain * thickness)
4 Depth to Bottom of Layer / Data Pt.	24 Over Consolidation Ratio	44 Dry Sand Settlement
5 Layer Thickness	25 Fines Content from Ic	45 Wet Sand Settlement
6 qc (Measured PS)	26	46 Maximum Cyclic Shear Strain (%)
7 Qn	27 D50	47 Lateral Displacement Index
8 qc1n (Normalized & Overburden Corrected)	28 Nk, Cone Factor	48 Clean sand box(1.64<Ic<2.36_FR<0.5)
9 qc1ncs (Equivalent Clean Sand)	29 Sigma' at the top of the Layer	49 EQ Zone (A, B, C)
10 Sleeve Stress	30 Sigma' at the middle of the Layer	50 Soil/Geologic Material Description
11 Pore Press	31 Sigma' at the bottom of the Layer / Data Pt.	51 Soil/Geologic Material Number
12 Friction Ratio	32 Sigma at the Top of the Layer	
13 Material Behavior Number	33 Sigma at the Middle of the Layer	
14 Soil Description	34 Sigma at the Bottom of the Layer / Data Pt.	
15 USCS Soil Description	35 Ic Material Index	55 Liquefy2 Middle Depth of Layer
16 Unit Weight	36 Cyclic Stress Ratio (CRR)	56 Liquefy2 Bottom Depth of Layer
17 Number of Points in Layer	37 Cyclic Resistance Ratio (CSR)	57 LIQ EFY 2
18 Qc to N Ratio	38 Ksigma	58 Pile Soil Num
19 Blow Count from Qc to N Ratio	39 Min. Layer Liquefaction Factor of Safety	
20	40 Layer Liquefaction Factor of Safety	

Figure 4-7 Report and Data File Creation options from the Layer Selection Screen

For all parameters, the user should check the references to understand the limitations of the parameter so that it is not used incorrectly.

Table 4-1 Description of Parameter Choices that Could be Included a Report

No.	Parameter Description
1	Layer Number. Prints the layer number for the selected layers.
2	Depth to Top of Layer. Prints the top depth for the layers.

3	Depth to Middle of Layer. Prints the depth to the middle of each layer.
4	Depth to Bottom of Layer. Prints the bottom depth for the layers.
5	Thickness. Prints the thickness of the layers.
6	Measured Point Stress (q_c)
7	Normalized and dimensionless Point Stress for classification. Prints the average normalized point stress for the layers. (Q_n)
8	Normalized and dimensionless point stress (q_{c1n})
9	Normalized and dimensionless clean sand equivalent point stress (q_{c1ncs})
10	Sleeve Stress. Prints the average sleeve stress for the layers.
11	User defined parameter contained in the data file. Usually this would be the pore pressure. Prints the average user defined parameter or pore pressure for the layers if this data was collected.
12	Friction Ratio. Prints the average friction ratio for the layers.
13	Material Behavior Number. Prints the material behavior zone number for the layer.
14	Soil Description. Prints the soil description for the layers. The CONE program will always use the normalized point stress to determine the soil description.
15	USCS Description. Prints the Unified Soil Classification System (USCS) for the layers. The CONE program will always use the normalized point stress to determine the classification.
16	Unit Weight. Prints the unit weight for the layer. The unit weights for each material type are included in the Material Behavior Data file.
17	Number of data points in the layer that were used to calculate the average values.

18	<p>Q_c to N Ratio. Prints the corresponding Q_c to N ratio each layer. This method of blow count determination is described by Robertson and Campanella and can only be used for their classification scheme.</p>
19	<p>Blow Count from Q_c to N Ratio. Prints the blow count for each layer that was determined using the Q_c to N ratio from the material behavior zone determined for each layer in the sounding</p> $N = q_{c1n} / (q_{c1n} \text{ to } N \text{ Ratio})$ <p>An "Rat" (Ratio) in the column title indicates that the Q_c to N ratio was used for the correlation instead of from a chart as indicated below.</p>
20	Reserved
21	<p>Relative Density is calculated using the following equation (Zhang, Robertson and Brachman, 2004)</p> $D_r = -85 * 76 (\log(q_{c1N}))$
22	<p>Friction Angle. Prints the friction angle of the layer using the following equation. (Robertson, 1998)</p> $\tan(\phi') = (1/2.68) * (\log(q_c / \sigma'_{vo})) + 0.29$
23	<p>Undrained Shear Strength. Prints the undrained shear strength of the layer. This is not printed if the material is identified as a granular material. This value is determined from equation 5.5 in the work done by Robertson and Campanella (1984). The N_k factor is needed for this determination. This equation is shown below.</p> $S_u = (q_c - \sigma) / N_k$ <p>where:</p> <p><i>S_u</i> = Undrained shear strength <i>q_{c1n}</i> = Corrected point stress <i>σ_o</i> = Total overburden stress <i>N_k</i> = Cone shape factor</p>

24	<p>Over Consolidation Ratio. Prints the Over Consolidation Ratio (OCR) for the layer. By knowing the undrained shear strength that was calculated above, the overburden stress and the ratio of the normally consolidated undrained shear strength to the overburden stress, the over consolidation ratio can be calculated. The form of the equation is shown below:</p> $OCR = \left(\frac{S_u / \sigma_v}{S_u / \sigma_{v_{NC}}} \right)^{1.25}$ <p>where:</p> <p>S_u = Undrained shear strength σ_v = Effective overburden stress $S_u / \sigma_{v_{NC}}$ = Ratio for normally consolidated clays</p> <p>The ratio of the normally consolidated undrained shear strength to the overburden stress ranges from 0.16 to 0.40 with 0.33 being the most applicable for post-Pleistocene clays. See Schmertman (1978) for a more detailed discussion.</p>
25	<p>Fines content from I_c (Robertson & Wride, 1998, pg 450)</p> $FC\% = 5 \text{ if } I_c < 1.26$ $FC\% = 1.75 * I_c^{3.25} - 3.7$ $FC\% = 95 \text{ if } I_c > 3.5$
26	Reserved
27	<p>D_{50}. The D_{50} value as input by the user is printed for the layers. The units for this are in millimeters. Because this parameter is determined using the material behavior number, it already takes into account the normalized point stress effects so it will not make any difference if the $\Delta N @$ is or isn't included.</p>
28	<p>N_k. This is the cone factor that is used to determine the undrained shear strength.</p>
29	<p>Sigma = (σ') at top of Layer. This will print the effective overburden stress at the top of a soil layer.</p>
30	<p>Sigma = (σ') at middle of Layer. This will print the effective overburden stress at the middle of the soil layer.</p>

31	Sigma= (σ') at the bottom of Layer. This will print the effective overburden stress at the bottom of the soil layer.
32	Sigma Total (σ_o) at top of Layer. This will print the total overburden stress at the top of a soil layer.
33	Sigma Total (σ_o) at middle of Layer. This will print the total overburden stress at the middle of the soil layer.
34	Sigma Total (σ_o) at the bottom of Layer. This will print the total overburden stress at the bottom of the soil layer.
35	I_c material index (Youd et al. 2001, pg. 822, eq 14)
36	Cyclic Stress Ratio (CSR) (Youd et al. 2001, pg. 818, eq. 1)
37	Cyclic Resistance Ratio (CRR) (Youd et al. 2001, pg. 822, eq. 11a & 11b)
38	K_σ correction factor (Youd et al. 2001, pg. 829, fig 15)
39	Minimum Liquefaction Factor of Safety in the Layer. This takes all the Factors of Safety for each of the individual points and then determines which one is the lowest. (Youd et al., 2001, pg. 828, eq. 30)
40	Liquefaction Factor of Safety calculated using the average values from the layer (Youd et al., 2001, pg. 828, eq. 30). If the program prints an "*" then it is a soil that is not liquefiable. If it prints "N/A" then it is a soil that is liquefiable but it is above the water table so it will not liquefy.
41	Stress Reduction Factor (Youd et al., 2001, pg. 819, eq 3)
42	Volumetric Strain (ϵ) %. Zhang et al., 2002, pg. 1171, fig 3 and pg. 1180 below the water table, Pradel (1998) above the water table.

43	Settlement for the layer. (volumetric strain * height of layer). When this parameter is selected, the value that is printed in the table is calculated from the average parameters for the layer. The settlement value shown on the plots is calculated using the values for each individual data point and then summed over the sounding. The closer the layers resemble the data, the closer these values will be. If the layers differ significantly from the data points, then layer settlement value and the continuous settlement value can be significantly different.
44	Dry sand settlement (above the ground water) Pradel (1998)
45	Wet sand settlement from liquefaction (Zhang et al., 2002)
46	Maximum Cyclic Shear Strain (Zhang, Robertson and Brachman, 2004)
47	Lateral Displacement index (Zhang, Robertson and Brachman, 2004)
48	Clean sand box. Reports if a layer falls within the clean sand box reported by Robertson & Wride (1998)
49	EQ zone. Reports if a layer falls within one of the earthquake zones (A, B, or C) as reported by Robertson & Wride (1998)
50	Sand/Geologic material description. If during the layer selection process, you use the shift-right click keys, you can enter the number of the soil/geologic material description for a range of layers. This will print the soil/geologic material description on the report.
51	Sand/Geologic material number. As with the previous item, if the soil/geologic numbers were identified in the layer selection screen, this option will print the number associated with the soil/geologic description.
55	Liquefy2 Middle Depth of Layer. See Liquefy2 Users Manual
56	Liquefy2 Bottom Depth of Layer. See Liquefy2 Users Manual
	User Defined Correlations The user can define different correlations to be printed that are related to the material behavior type zones The following are user defined correlations
58	In MBD Data file when distributed. This is the flag needed for Liquefy2 to recognize whether a given layer has the potential for Liquefaction

Select Data File Parameters

If you would like a set of data printed in a data file that would be used in another program, this used this option. You select the parameters and order for each layer that you included in the data file. This is similar to the option above except that none of the header information is included in the data file. If you need other data included in the data file besides the layer data, you will need to add this information by using another Text Editor such as NotePad or Word.

Even though you have selected the parameters to be contained in the data file, if you want the data file created, you **MUST** also check the box. If this box is not checked, the file will not be created. You also can enter the name of the extension of the file that will contain the data. If you want other information included in the data file, you will need to go in with another Text Editor and add that information.

Select Parameters for Material Behavior Zone Plot

Anytime the Material Behavior Zone Plot is used, there are several overlays or data that can be selected and be shown when this is used. Some of the more common overlays are the Clean Sand Zone, the Earthquake Zones and the Normal Consolidation Zone. All of these zones can be plotted at the same time but it can become a little confusing.

The percentages can be calculated for the percent of each data point that falls within the material behavior zone. This is useful in determining how well the classification of the layer matches the various data points the comprise the layer.

VIEW

The View menu will provide the user with the following options. See Figure 4-8.

1-Layer Number
4-Depth to Bottom of Layer / Data Pt.
6- Qc (Measured PS)
7-Qn
8-QC1N (Normalized & Overburden Corrected)
9-QC1NCS (Equivalent Clean Sand)
10-Sleeve Stress
11-Pore Pressure
12-Friction Ratio
13-Material Behavior Number
14-Material Behavior Zone Description
15-USCS Soil Description
16-Unit Weight
18-Qc to N Ratio
19-SPT based on Qc to N Ratio
20-SPT based on Ic
21-Relative Density
22-Friction Angle
23-Undrained Shear Strength
24-Over Consolidation Ratio
25-Fines Content from Ic
27-D50
28-Nk, Cone Factor
35-Ic Material Index
40-Layer Liquefaction Factor of Safety
42-Volumetric Strain (%)
43-Total Settlement (vol strain *thickness)
44-Dry Sand Settlement
45-Wet Sand Settlement
46-Maximum Cyclic Shear Strain (%)
47-Lateral Displacement Index

These options are also available to be printed out in a .pdf graph it is highly recommended that there are not more than 8 graphs chosen per page.

15cm² Cone Specifications

Net Area Ratio .80

	2.5 Ton	5 Ton	20 Ton
Max Tip Force	2.5 Ton	5 Ton	20 Ton
Resolution	1.1 uV	1.1 uV	1.1 uV
Maximum Sensor Input	3.5 V	3.5 V	3.5 V
Power Requirements	12 VDC	12 VDC	12 VDC

Tip			
area	15 cm ²	15 cm ²	15 cm ²
range (kn)	22	44	225
range (lb)	5,000	10,000	50,000
range (mpa)	15	30	150
overload capacity	150%	150%	150%
accuracy	0.2%	0.2%	0.2%

Sleeve			
area	225 cm ²	225 cm ²	225 cm ²
range (kn)	45	45	45
range (lb)	10,000	10,000	10,000
range (mpa)	2	2	2
overload capacity	150%	150%	150%
accuracy	0.5%	0.5%	0.5%

Pore Pressure Transducer			
standard range (kpa)	6,900	6,900	6,900
standard range (psi)	1,000	1,000	1,000
burst pressure	200%	200%	200%
accuracy	0.5%	0.5%	0.5%

Inclinometer (Dual Axis)			
range (degrees)	15	15	15
resolution (degree)	0.1	0.1	0.1

Seismic			
standard tri-axial geophone	2g	2g	2g
true DC response			
capacity: (+/-) -			

Seismic signals are gained downhole by 1, 10, 100, or 1,000 and digitized in the DataPack

Surface Area of Friction Sleeve 225 cm²

Diameter 1.75"

Surface Area of Tip 15 cm²

Tip 60 degree



**APPENDIX B
LABORATORY TEST DATA**

LABORATORY TEST DATA

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were performed:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- **MOISTURE CONTENT and DRY DENSITY:** The in-situ moisture content and dry density of soils was determined for soil samples obtained from the borings, and were determined in general accordance with ASTM D2216 and ASTM 2937, respectively.
- **GRAIN SIZE DISTRIBUTION:** The grain size distribution was determined on selected samples in accordance with ASTM D422.
- **CORROSIVITY:** Corrosion testing of representative soil samples included sulfate potential by California Test 417, chloride potential by California Test 422, and soil minimum resistivity and pH by California Test 643. The sample was tested at the Cooper Testing Labs of Palo Alto, California.
- **ATTERBERG LIMITS:** The Atterberg limits were determined in accordance with ASTM D4318.
- **DIRECT SHEAR STRENGTH:** The direct shear strength of a representative soil sample was determined in accordance with ASTM D3080.

GRAIN SIZE DISTIBUTION - PASSING #200 SIEVE ASTM METHOD D422

Boring No.	B-1	B-1	B-5			
Depth	6'-7.5'	23.5'-25'	28.5'-30'			ft
Total Sample Weight	181.0	224.0	276.0			gm
Retained on #200 Sieve	173.0	199.0	80.0			gm
Passing #200 Sieve	8.0	25.0	196.0			gm
Fines Content	4.4	11.2	71.0			%

Boring No.						
Depth						ft
Total Sample Weight						gm
Retained on #200 Sieve						gm
Passing #200 Sieve						gm
Fines Content						%

Boring No.						
Depth						ft
Total Sample Weight						gm
Retained on #200 Sieve						gm
Passing #200 Sieve						gm
Fines Content						%



2195 Faraday Avenue, Suite K, Carlsbad, CA 92008

Client:	Trojan Storage
Project Name:	Proposed Storage Facility
Project Number:	AAA-72811.4
Date:	7/30/18
Tested by:	S.Lau
Reviewed by:	CCC

8/9/2018

Environmental Equalizer, Inc.
216 Mt. Rose Street
Reno, NV 89408
Attn: Stan Lau

OrderID: 1807902

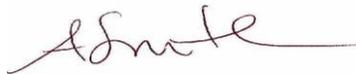
Dear: Stan Lau

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 7/27/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,



Andy Smith
QA Manager

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Western Environmental Testing Laboratory

Report Comments

Environmental Equalizer, Inc. - 1807902

Specific Report Comments

None

Report Legend

- B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank
- D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
- HT -- Sample analyzed beyond the accepted holding time
- J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
- M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
- N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
- NC -- Not calculated due to matrix interference
- QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
- QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
- S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
- SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
- U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:

A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

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Western Environmental Testing Laboratory Analytical Report

Environmental Equalizer, Inc.

216 Mt. Rose Street

Reno, NV 89408

Attn: Stan Lau

Phone: (775) 525-4660 Fax:

PO\Project: Trojan Storage / AAA-72811-4

Date Printed: 8/9/2018

OrderID: 1807902

Customer Sample ID: B-1 2-6 Feet

Collect Date/Time: 7/20/2018 10:30

WETLAB Sample ID: 1807902-001

Receive Date: 7/27/2018 13:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
<u>General Chemistry</u>							
Paste pH	SW846 9045D	8.460	pH Units	1		8/2/2018	NV00925
Resistivity	SM 2510B	3400	ohms.cm	1	1.0	8/3/2018	NV00925
<u>Anions by Ion Chromatography</u>							
Chloride	EPA 300.0	10	mg/kg	10	10	8/2/2018	NV00925
Sulfate	EPA 300.0	68	mg/kg	10	10	8/2/2018	NV00925
<u>Sample Preparation</u>							
10:1 DI Water Extraction	WL 10.0	Complete		1		7/30/2018	NV00925
Saturated Paste Preparation	CSTPM S:1.0	Complete		1		8/2/2018	NV00925

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EPA LAB ID: NV00932

Western Environmental Testing Laboratory QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18080113	Blank 1	Chloride	EPA 300.0	ND			mg/L
		Sulfate	EPA 300.0	ND			mg/L
QC18080124	Blank 1	Resistivity	SM 2510B	ND			ohms.cm

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18080072	LCS 1	Paste pH	SW846 9045D	7.060	7.00	101	ph Units
QC18080113	LCS 1	Chloride	EPA 300.0	10.2	10.0	102	mg/L
		Sulfate	EPA 300.0	25.0	25.0	100	mg/L
QC18080124	LCS 1	Resistivity	SM 2510B	1456	1412	103	ohms.cm

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18080072	Duplicate 1	Paste pH	SW846 9045D	1807902-001	8.46	8.460	pH Units	<1%
QC18080124	Duplicate 1	Resistivity	SM 2510B	1807902-001	3448	3460	ohms.cm	<1%

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result	MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18080113	MS 1	Chloride	EPA 300.0	1807905-036	ND	5.68	5.71	5	mg/L	110	111	<1
		Sulfate	EPA 300.0	1807905-036	ND	M 12.3	12.1	10	mg/L	NC	NC	NC
QC18080113	MS 2	Chloride	EPA 300.0	1808100-002	ND	5.79	5.68	5	mg/L	115	113	2
		Sulfate	EPA 300.0	1808100-002	ND	11.5	11.3	10	mg/L	114	113	2

SPARKS

475 E. Greg Street, Suite 119
Sparks, Nevada 89431
tel (775) 355-0202
fax (775) 355-0817
EPA LAB ID: NV00925 - ELAP No: 2523

ELKO

1084 Lamoille Hwy
Elko, Nevada 89801
tel (775) 777-9933
fax (775) 777-9933
EPA LAB ID: NV00926

LAS VEGAS

3230 Polaris Ave. Suite 4
Las Vegas, Nevada 89102
tel (702) 475-8899
fax (702) 622-2868
EPA LAB ID: NV00932

DIRECT SHEAR TEST (ASTM D3080)

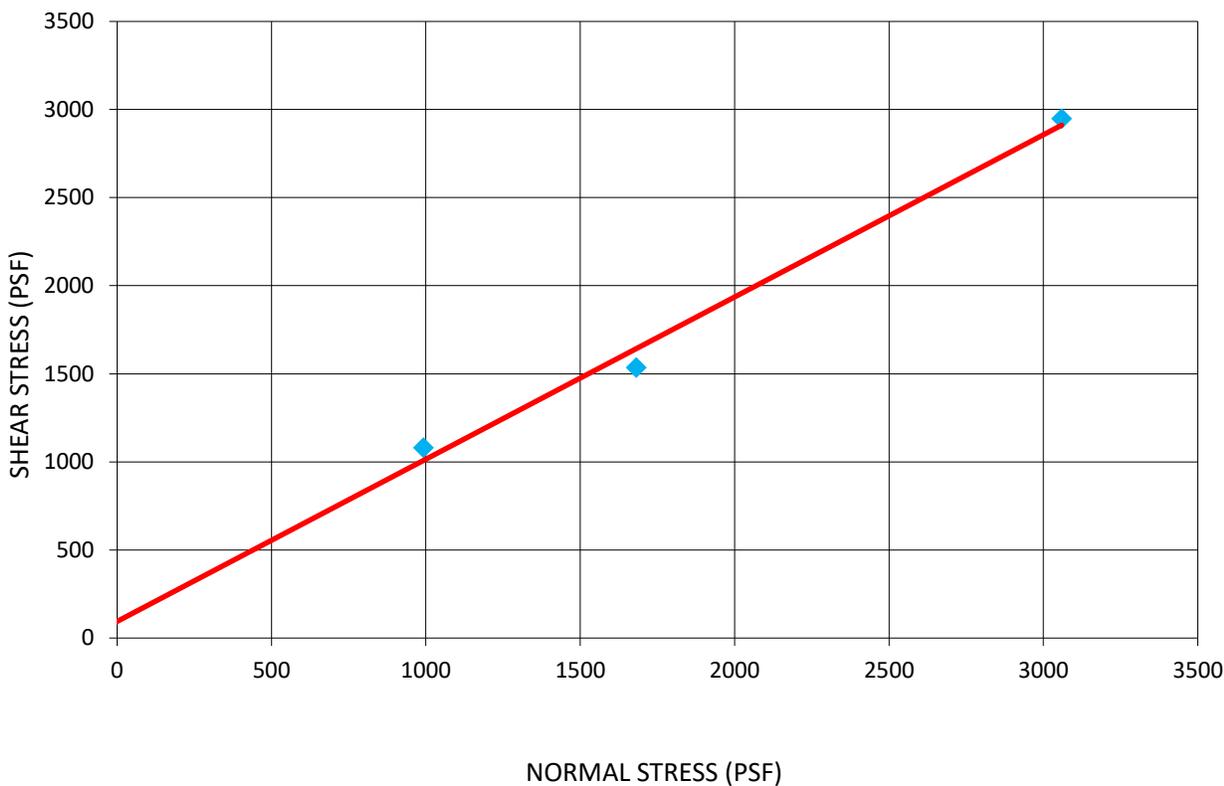
B-1 @ 3-4.5 ft.

Sample Data	
Remolded:	Natural
Remarks:	Sample inundated prior to testing
Soil Description:	Lt. Brown Silty Sandy GRAVEL (GM)

Test Results		
Average Initial Moisture =	5.3	%
Average Dry Density =	113.4	pcf
Average Final Moisture =	13.9	%

Peak Strength	$\phi = 43 \text{ deg.}$	$c = 94 \text{ psf}$
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SHEAR TEST DIAGRAM



2195 Faraday Avenue, Suite K, Carlsbad, CA 92008

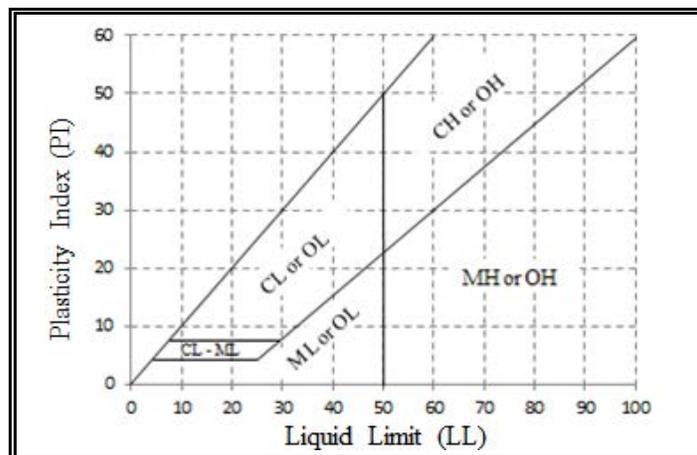
Client:	Trojan Storage
Project Name:	Proposed Storage Facility
Project No.:	AAA-72811.4
Date:	7/31/18
Boring/Sample No:	B-1
Depth/Location:	3-4.5 ft.
Soil Description:	Lt. Brown Silty Sandy GRAVEL (GM)
Tested by:	BD

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX

ASTM METHOD D 4318

Sample	B-5 @ 28.5'-30'					
	Liquid Limit			Plastic Limit		
Test Number	1	2	3	1	2	2
Container Number	P0	P14	P13	P16	P9	P40
Weight of Container (g)	4.35	4.31	4.28	4.36	4.32	7.42
Wet Weight of Soil and Container (g)	17.44	16.78	20.82	9.77	10.75	16.60
Dry Weight of Soil and Container (g)	15.24	14.60	17.80	9.43	10.37	16.03
Number of Blows	35	30	20	 	 	
Moisture Content (%)	20.2	21.2	22.3	6.7	6.3	6.6

Liquid Limit =	21.7
Plastic Limit =	6.5
Plasticity Index =	15.2
Classification:	N/P



2195 Faraday Avenue, Suite K, Carlsbad, CA 92008

Client:	Trojan Storage
Project Name:	Proposed Storage Facility
Job Number:	AAA-72811.4
Date:	7/30/18
Boring Number:	B-5
Depth:	28.5'-30'
Soil Description:	Well - Graded SAND with Silt (SM-SW)
Tested by:	S. Lau

**APPENDIX C
EARTHWORK AND GRADING GUIDELINES**



EARTHWORK AND GRADING GUIDELINES

GENERAL

These guidelines present general procedures and recommendations for earthwork and grading as required on the approved grading plans, including preparation of areas to be filled, placement of fill and installation of subdrains and excavations. The recommendations contained in the geotechnical report are applicable to each specific project, are part of the earthwork and grading guidelines and would supersede the provisions contained hereafter in the case of conflict. Observations and/or testing performed by the consultant during the course of grading may result in revised recommendations which could supersede these guidelines or the recommendations contained in the geotechnical report. Figures A through O are provided at the back of this appendix, exhibiting generalized cross sections relating to these guidelines.

The contractor is responsible for the satisfactory completion of all earthworks in accordance with provisions of the project plans and specifications. The project soil engineer and engineering geologist (geotechnical consultant) or their representatives should provide observation and testing services, and geotechnical consultation throughout the duration of the project.

EARTHWORK OBSERVATIONS AND TESTING

Geotechnical Consultant

Prior to the commencement of grading, a qualified geotechnical consultant (a soil engineer and engineering geologist) should be employed for the purpose of observing earthwork procedures and testing the fills for conformance with the recommendations of the geotechnical report, the approved grading plans, and applicable grading codes and ordinances.

The geotechnical consultant should provide testing and observation so that determination may be made that the work is being completed as specified. It is the responsibility of the contractor to assist the consultant and keep them aware of work schedules and predicted changes, so that the consultant may schedule their personnel accordingly.

All removals, prepared ground to receive fill, key excavations, and subdrains should be observed and documented by the project engineering geologist and/or soil engineer prior to placing any fill. It is the contractor's responsibility to notify the engineering geologist and soil engineer when such areas are ready for observation.

Earthwork and Grading Guidelines

Laboratory and Field Tests

Maximum dry density tests to determine the degree of compaction should be performed in accordance with American Standard Testing Materials test method ASTM designation D-1557-78. Random field compaction tests should be performed in accordance with test method ASTM designations D-1556-82, D-2937 or D-2922 & D-3017, at intervals of approximately two (2) feet of fill height per 10,000 sq. ft. or every one thousand cubic yards of fill placed. These criteria would vary depending on the soil conditions and the size of the project. The location and frequency of testing would be at the discretion of the geotechnical consultant

Contractor's Responsibility

All clearing, site preparation, and earthwork performed on the project should be conducted by the contractor, with observation by geotechnical consultants and staged approval by the appropriate governing agencies. It is the contractor's responsibility to prepare the ground surface to receive the fill to the satisfaction of the soil engineer, and to place, spread, moisture condition, mix and compact the fill in accordance with the recommendations of the soil engineer. The contractor should also remove all major deleterious material considered unsatisfactory by the soil engineer.

It is the sole responsibility of the contractor to provide adequate equipment and methods to accomplish the earthwork in accordance with applicable grading guidelines, codes or agency ordinances, and approved grading plans. Sufficient watering apparatus and compaction equipment should be provided by the contractor with due consideration for the fill material, rate of placement, and climatic conditions. If, in the opinion of the geotechnical consultant, unsatisfactory conditions such as questionable weather, excessive oversized rock, deleterious material or insufficient support equipment are resulting in a quality of work that is not acceptable, the consultant will inform the contractor, and the contractor is expected to rectify the conditions, and if necessary, stop work until conditions are satisfactory.

The contractor will properly grade all surfaces to maintain good drainage and prevent ponding of water. The contractor will take action to control surface water and to prevent erosion control measures that have been installed.

SITE PREPARATION

All vegetation including brush, trees, thick grasses, organic debris, and other deleterious material should be removed and disposed of offsite, and must be concluded prior to placing fill. Existing fill, soil, alluvium, colluvium, or rock materials determined by the soil engineer or engineering geologist as unsuitable for structural in-place support should be removed prior to fill placement. Depending upon the soil conditions, these materials may be reused as compacted fills. Any materials incorporated as part of the compacted fills should be approved by the soil engineer.

Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines, or other structures not located prior to grading are to be removed or treated in a manner recommended by the soil engineer. Soft, dry, spongy, highly fractured, or otherwise unsuitable ground extending to such a depth that surface processing cannot adequately improve the condition should be over excavated down to firm ground and approved by the soil engineer before compaction and filling operations continue. Over excavated and processed soils which have been properly mixed and moisture-conditioned should be recompacted to the minimum relative compaction as specified in these guidelines.

Earthwork and Grading Guidelines

Existing ground which is determined to be satisfactory for support of the fills should be scarified to a minimum depth of six (6) inches, or as directed by the soil engineer. After the scarified ground is brought to optimum moisture (or greater) and mixed, the materials should be compacted as specified herein. If the scarified zone is greater than 6 inches in depth, it may be necessary to remove the excess and place the material in lifts restricted to six (6) inches in compacted thickness.

Existing grind which is not satisfactory to support compacted fill should be over excavated as required in the geotechnical report or by the onsite soils engineer and/or engineering geologists. Scarification, discing, or other acceptable form of mixing should continue until the soils are broken down and free of large fragments or clods, until the working surface is reasonably uniform and free from ruts, hollows, hummocks, or other uneven features which would inhibit compaction as described above.

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical) gradient, the ground should be benched. The lowest bench, which will act as a key, should be a minimum of 12 feet wide and should be at least two (2) feet deep into competent material, approved by the soil engineer and/or engineering geologist. In fill over cut slope conditions, the recommended minimum width of the lowest bench or key is at least 15 feet with the key excavated on competent material, as designated by the Geotechnical Consultant. As a general rule, unless superseded by the Soil Engineer, the minimum width of fill keys should be approximately equal to one-half ($\frac{1}{2}$) the height of the slope.

Standard benching is typically four feet (minimum) vertically, exposing competent material. Benching may be used to remove unsuitable materials, although it is understood that the vertical height of the bench may exceed four feet. Pre stripping may be considered for removal of unsuitable materials in excess of four feet in thickness.

All areas to receive fill, including processed areas, removal areas, and toe of fill benches should be observed and approved by the soil engineer and/or engineering geologist prior to placement of fill. Fills may then be properly placed and compacted until design grades are attained.

COMPACTED FILLS

Earth materials imported or excavated on the property may be utilized as fill provided that each soil type has been accepted by the soil engineer. These materials should be free of roots, tree branches, other organic matter or other deleterious materials. All unsuitable materials should be removed from the fill as directed by the soil engineer. Soils of poor gradation, undesirable expansion potential, or substandard strength characteristics may be designated unsuitable by the consultant and may require mixing with other earth materials to serve as a satisfactory fill material.

Fill materials generated from benching operations should be dispersed throughout the fill area. Benching operations should not result in the benched material being placed only within a single equipment width away from the fill/bedrock contact.

Earthwork and Grading Guidelines

Oversized materials, defined as rock or other irreducible materials with a maximum size exceeding 12 inches in one dimension, should not be buried or placed in fills unless the location of materials and disposal methods are specifically approved by the soil engineer. Oversized material should be taken offsite or placed in accordance with recommendations of the soil engineer in areas designated as suitable for rock disposal. Oversized material should not be placed vertically within 10 feet of finish grade or horizontally within 20 feet of slope faces.

To facilitate trenching, rock should not be placed within the range of foundation excavations or future utilities unless specifically approved by the soil engineer and/or the representative developers.

If import fill material is required for grading, representative samples of the material should be analyzed in the laboratory by the soil engineer to determine its physical properties. If any material other than that previously analyzed is imported to the fill or encountered during grading, analysis of this material should be conducted by the soil engineer as soon as practical.

Fill material should be placed in areas prepared to receive fill in near-horizontal layers that should not exceed six (6) inches compacted in thickness. The soil engineer may approve thicker lifts if testing indicates the grading procedures are such that adequate compaction is being achieved. Each layer should be spread evenly and mixed to attain uniformity of material and moisture suitable for compaction.

Fill materials at moisture content less than optimum should be watered and mixed, and “wet” fill materials should be aerated by scarification, or should be mixed with drier material. Moisture conditioning and mixing of fill materials should continue until the fill materials have uniform moisture content at or above optimum moisture.

After each layer has been evenly spread, moisture-conditioned and mixed, it should be uniformly compacted to a minimum of 90 percent of maximum density as determined by ASTM test designation, D 1557-78, or as otherwise recommended by the soil engineer. Compaction equipment should be adequately sized and should be reliable to efficiently achieve the required degree of compaction.

Where tests indicate that the density of any layer of fill, or portion thereof, is below the required relative compaction or improper moisture content, the particular layer or portion will be reworked until the required density and/or moisture content has been attained. No additional fill will be placed in an area until the last placed lift of fill has been tested and found to meet the density and moisture requirements, and is approved by the soil engineer.

Compaction of slopes should be accomplished by over-building the outside edge a minimum of three (3) feet horizontally, and subsequently trimming back to the finish design slope configuration. Testing will be performed as the fill is horizontally placed to evaluate compaction as the fill core is being developed. Special efforts may be necessary to attain the specified compaction in the fill slope zone. Final slope shaping should be performed by trimming and removing loose materials with appropriate equipment. A final determination of fill slope compaction should be based on observation and/or testing of the finished slope face.

Earthwork and Grading Guidelines

If an alternative to over-building and cutting back the compacted fill slope is selected, then additional efforts should be made to achieve the required compaction in the outer 10 feet of each lift of fill by undertaking the following:

- Equipment consisting of a heavy short-shanked sheepsfoot should be used to roll (horizontal) parallel to the slopes continuously as fill is placed. The sheepsfoot roller should also be used to roll perpendicular to the slopes, and extend out over the slope to provide adequate compaction to the face slope.
- Loose fill should not be spilled out over the face of the slope as each lift is compacted. Any loose fill spilled over a previously completed slope face should be trimmed off or be subject to re-rolling.
- Field compaction tests will be made in the outer two (2) to five (5) feet of the slope at two (2) to three (3) foot vertical intervals, subsequent to compaction operations.
- After completion of the slope, the slope face should be shaped with a small dozer and then re-rolled with a sheepsfoot to achieve compaction to near the slope face. Subsequent to testing to verify compaction, the slopes should be grid-rolled to achieve adequate compaction to the slope face. Final testing should be used to confirm compaction after grid rolling.
- Where testing indicates less than adequate compaction, the contractor will be responsible to process, moisture condition, mix and recompact the slope materials as necessary to achieve compaction. Additional testing should be performed to verify compaction.
- Erosion control and drainage devices should be designed by the project civil engineer in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the soil engineer or engineering geologist.

EXCAVATIONS

Excavations and cut slopes should be observed and mapped during grading by the engineering geologist. If directed by the engineering geologist, further excavations or over-excavation and refilling of cut areas should be performed. When fills over cut slopes are to be graded, the cut portion of the slope should be observed by the engineering geologist prior to placement of the overlying fill portion of the slope. The engineering geologist should observe all cut slopes and should be notified by the contractor when cut slopes are started.

If, during the course of grading, unanticipated adverse or potentially adverse geologic conditions are encountered, the engineering geologist and soil engineer should investigate, evaluate and make recommendations to mitigate (or limit) these conditions. The need for cut slope buttressing or stabilizing should be based on as-grading evaluations by the engineering geologist, whether anticipated previously or not.

Unless otherwise specified in soil and geological reports, no cut slopes should be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies. Additionally, short-term stability of temporary cut slopes is the contractor's responsibility.

Earthwork and Grading Guidelines

Erosion control and drainage devices should be designed by the project civil engineer and should be constructed in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the soil engineer or engineering geologist.

SUBDRAIN INSTALLATION

Subdrains should be installed in accordance with the approved embedment material, alignment and details indicated by the geotechnical consultant. Subdrain locations or construction materials should not be changed or modified without approval of the geotechnical consultant. The soil engineer and/or engineering geologist may recommend and direct changes in subdrain line, grade and drain material in the field, pending exposed conditions. The location of constructed subdrains should be recorded by the project civil engineer.

COMPLETION

Consultation, observation and testing by the geotechnical consultant should be completed during grading operations in order to state an opinion that all cut and filled areas are graded in accordance with the approved project specifications.

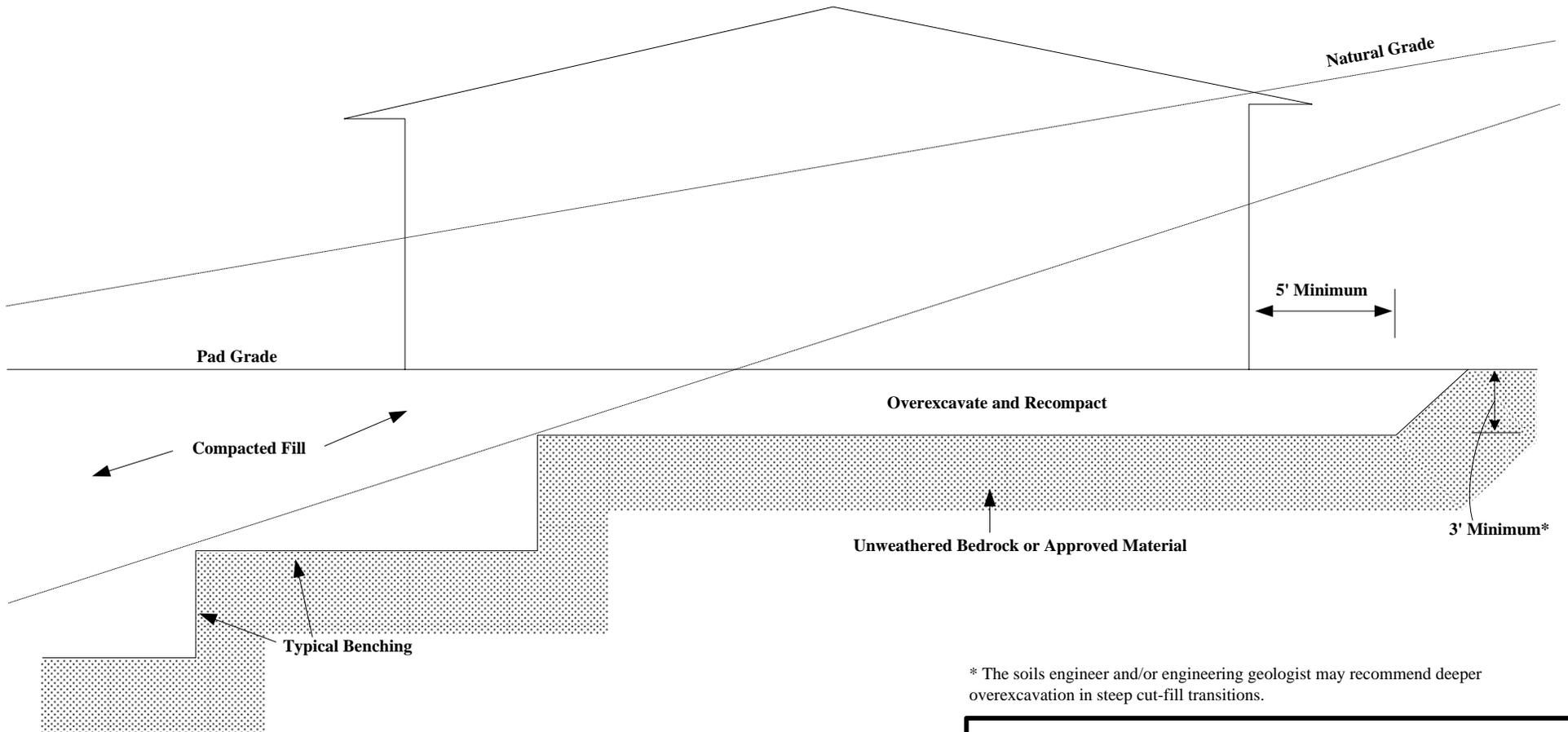
After completion of grading and after the soil engineer and engineering geologist have finished their observations, final reports should be submitted subject to review by the controlling governmental agencies. No additional grading should be undertaken without prior notification of the soil engineer and/or engineering geologist.

All finished cut and fill slopes should be protected from erosion, including but not limited to planting in accordance with the plan design specifications and/or as recommended by a landscape architect. Such protection and/or planning should be undertaken as soon as possible after completion of grading.

ATTACHMENTS

- Figure A – Transition Lot Detail Cut Lot
- Figure B – Transition Lot Detail Cut - Fill
- Figure C – Rock Disposal Pits
- Figure D – Detail for Fill Slope Toeing out on a Flat Alluviated Canyon
- Figure E – Removal Adjacent to Existing Fill
- Figure F – Daylight Cut Lot Detail
- Figure G – Skin Fill of Natural Ground
- Figure H – Typical Stabilization Buttress Fill Design
- Figure I – Stabilization Fill for Unstable Material Exposed in Portion of Cut Slope
- Figure J – Fill Over Cut Detail
- Figure K – Fill Over Natural Detail
- Figure L – Oversize Rock Disposal
- Figure M – Canyon Subdrain Detail
- Figure N – Canyon Subdrain Alternate Details
- Figure O – Typical Stabilization Buttress Subdrain Detail
- Figure P – Retaining Wall Backfill

**TRANSITION LOT DETAIL
CUT LOT – MATERIAL TYPE
TRANSITION**



* The soils engineer and/or engineering geologist may recommend deeper overexcavation in steep cut-fill transitions.

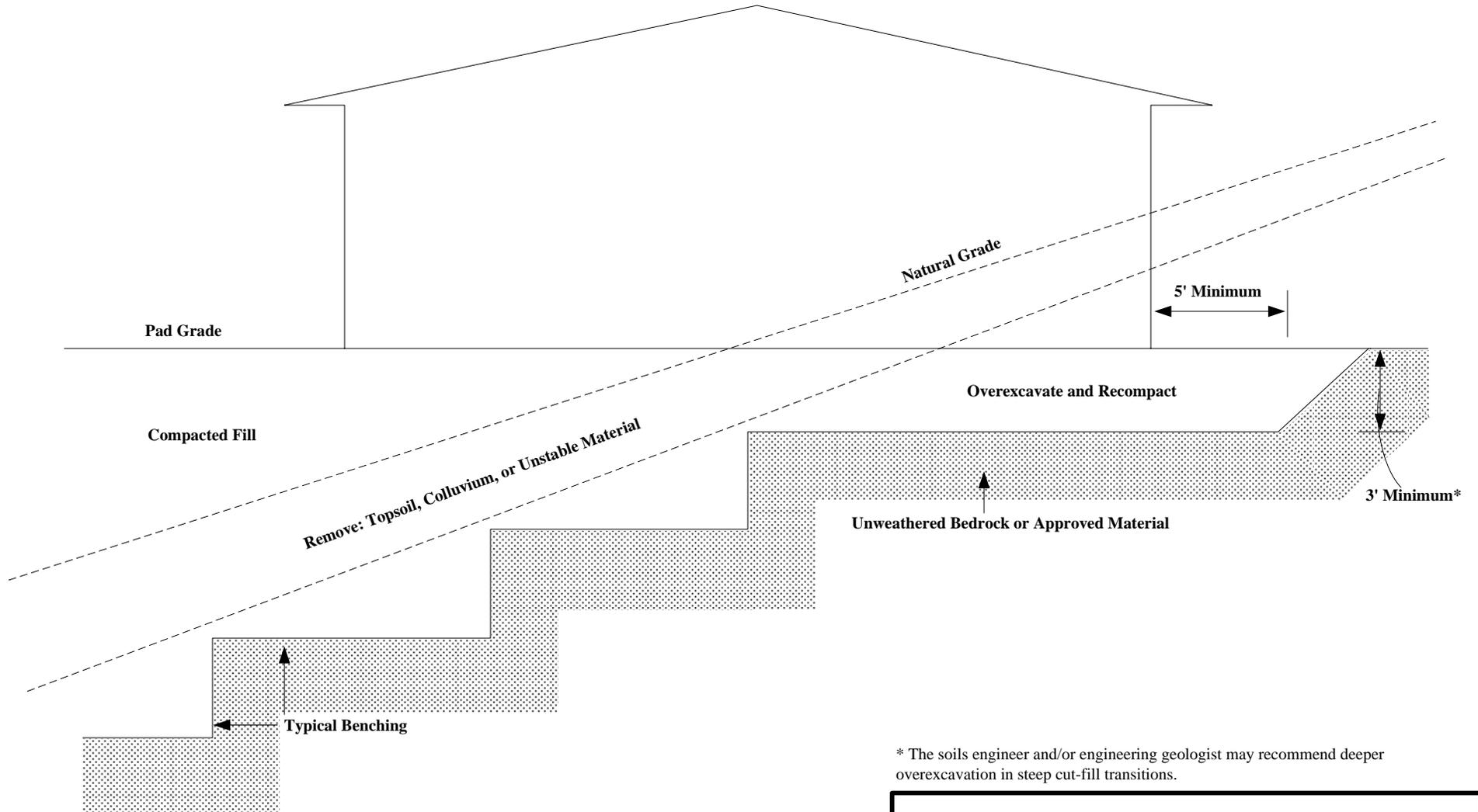
**EARTHWORK AND GRADING GUIDELINES
TRANSITION LOT DETAIL
CUT LOT – MATERIAL TYPE TRANSITION**

Note: Figure not to scale



FIGURE A

**TRANSITION LOT DETAIL
CUT – FILL – DAYLIGHT TRANSITION**



* The soils engineer and/or engineering geologist may recommend deeper overexcavation in steep cut-fill transitions.

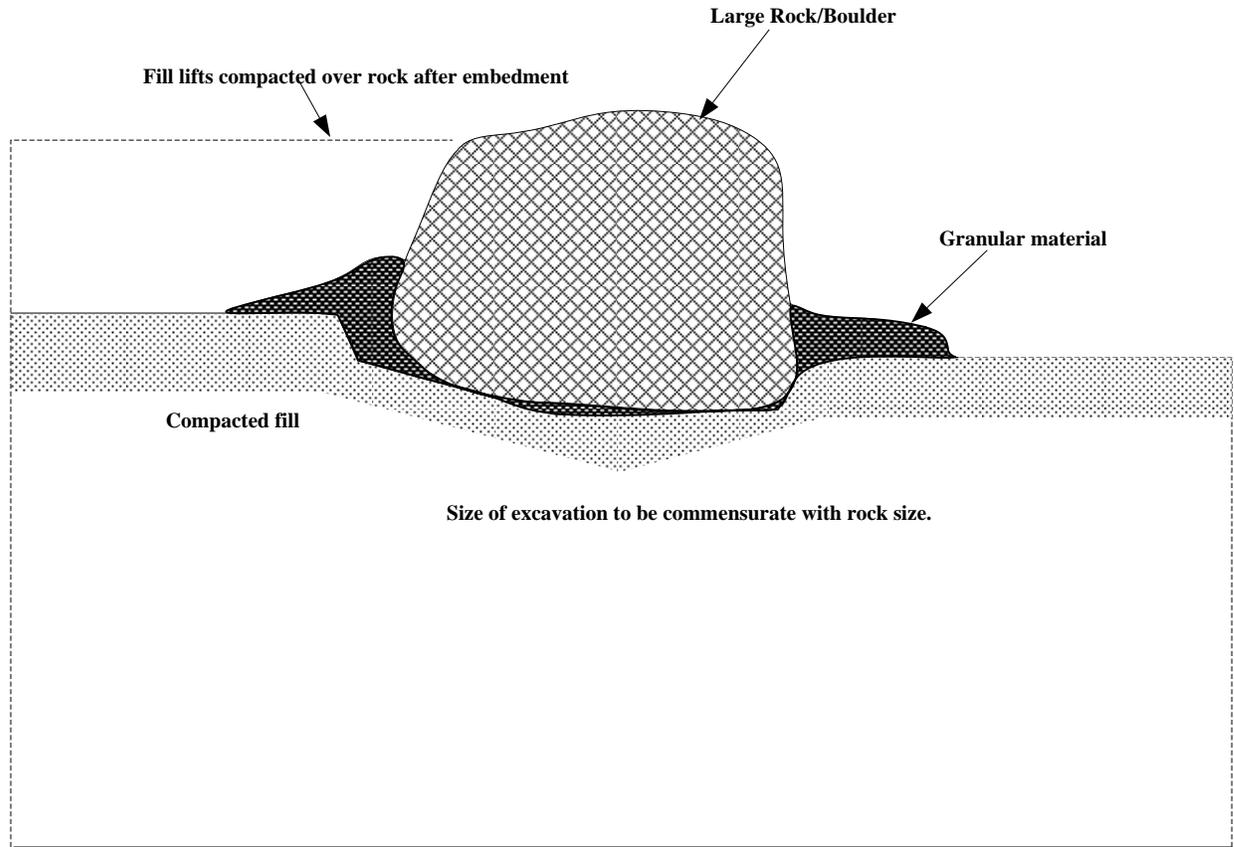
**EARTHWORK AND GRADING GUIDELINES
TRANSITION LOT DETAIL
CUT – FILL – DAYLIGHT TRANSITION**



FIGURE B

Note: Figure not to scale

ROCK DISPOSAL PITS



Note:

- (1) Large rock is defined as having a diameter larger than 3 feet in maximum size.
- (2) Pit shall be excavated into compacted fill to a depth equal to half of the rock size.
- (3) Granular soil shall be pushed into the pit and then flooded around the rock using a sheepsfoot to help with compaction.
- (4) A minimum of 3 feet of compacted fill should be laid over each pit.
- (5) Pits shall have at least 15 feet of separation between one another, horizontally.
- (6) Pits shall be placed at least 20 feet from any fill slope.
- (7) Pits shall be used only in deep fill areas.

EARTHWORK AND GRADING GUIDELINES ROCK DISPOSAL PITS



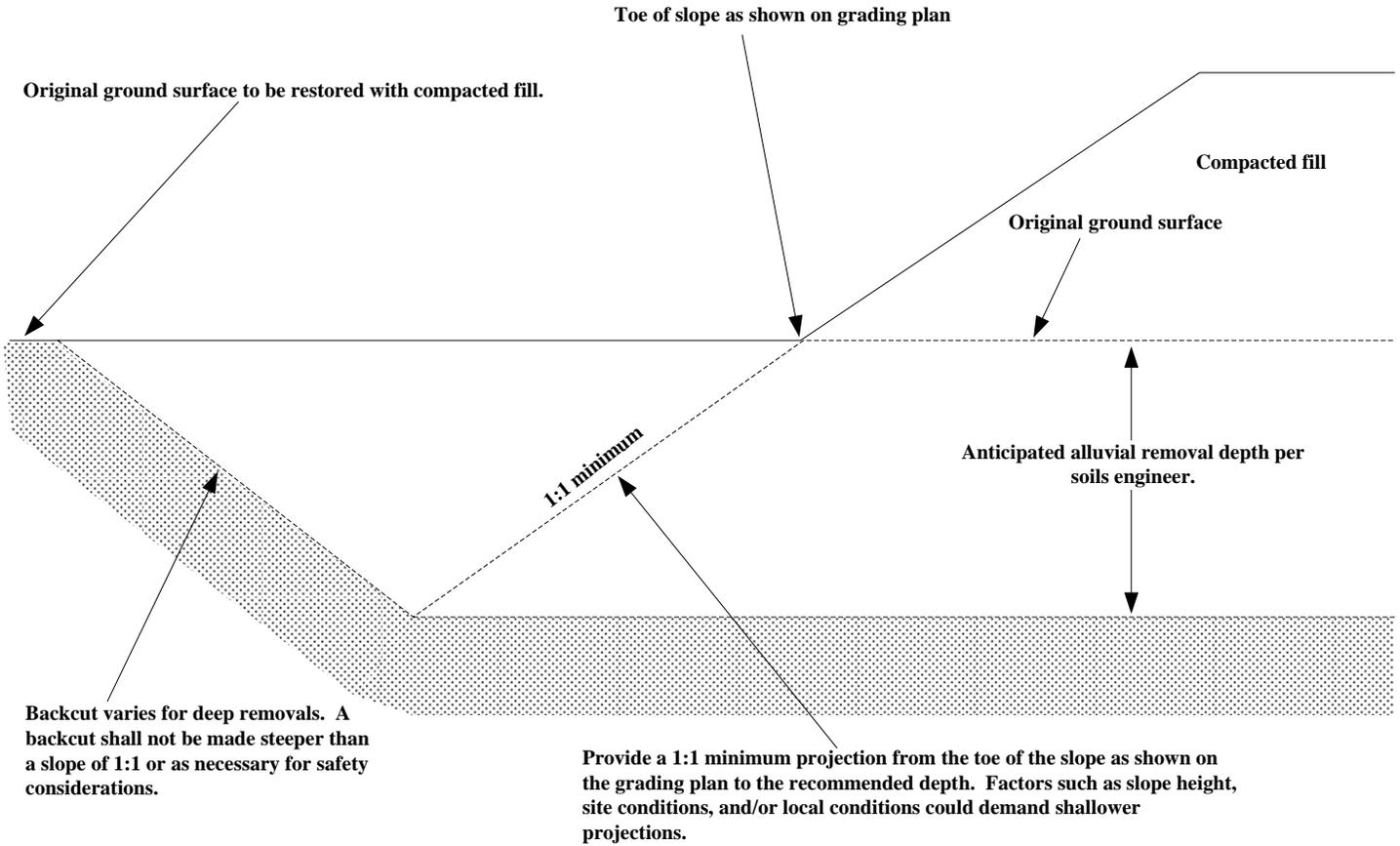
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FIGURE C

Note: Figure not to scale

**DETAIL FOR FILL SLOPE TOEING OUT ON
FLAT ALLUVIATED CANYON**



Original ground surface to be restored with compacted fill.

Toe of slope as shown on grading plan

Compacted fill

Original ground surface

1:1 minimum

Anticipated alluvial removal depth per soils engineer.

Backcut varies for deep removals. A backcut shall not be made steeper than a slope of 1:1 or as necessary for safety considerations.

Provide a 1:1 minimum projection from the toe of the slope as shown on the grading plan to the recommended depth. Factors such as slope height, site conditions, and/or local conditions could demand shallower projections.

**EARTHWORK AND GRADING GUIDELINES
DETAIL FOR FILL SLOPE TOEING OUT ON A FLAT
ALLUVIATED CANYON**



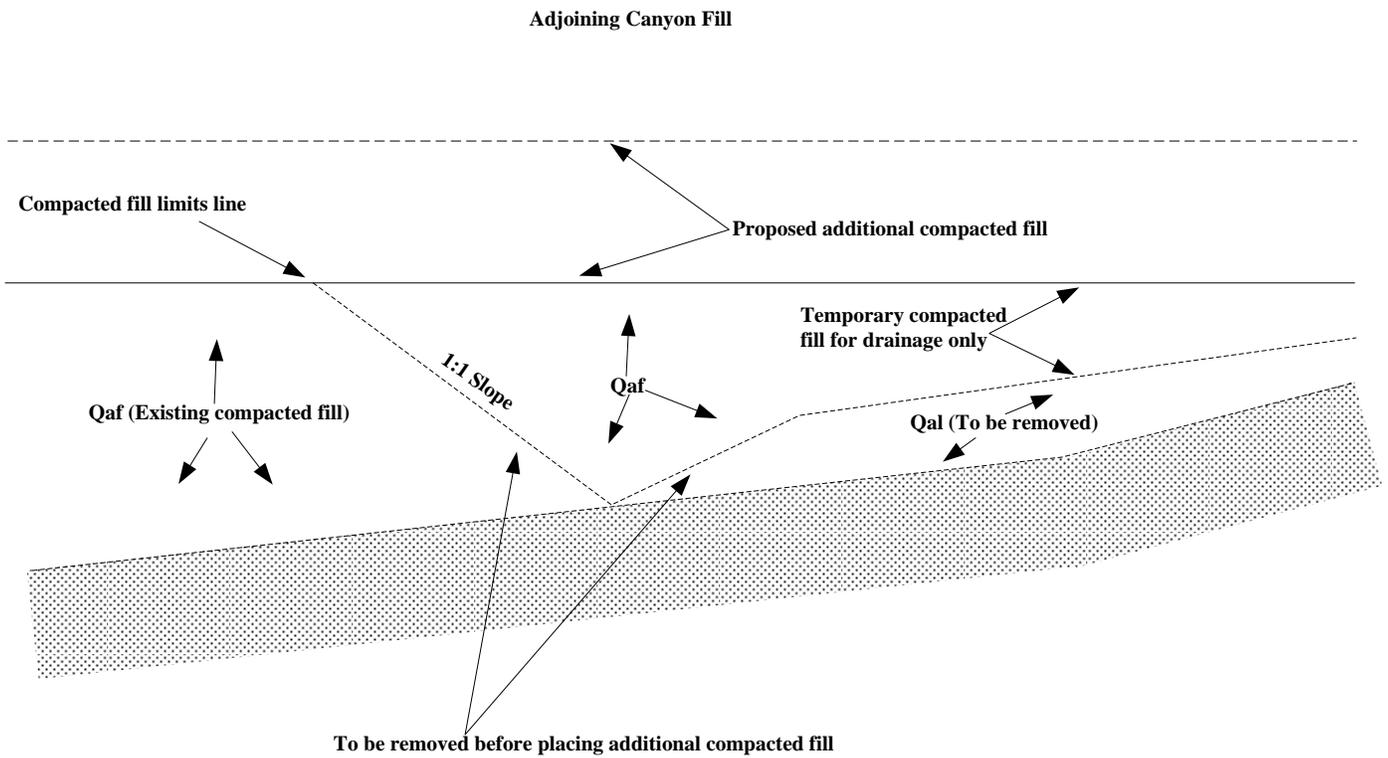
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FIGURE D

Note: Figure not to scale

REMOVAL ADJACENT TO EXISTING FILL



Legend

Qaf - Artificial Fill

Qal - Alluvium

EARTHWORK AND GRADING GUIDELINES REMOVAL ADJACENT TO EXISTING FILL



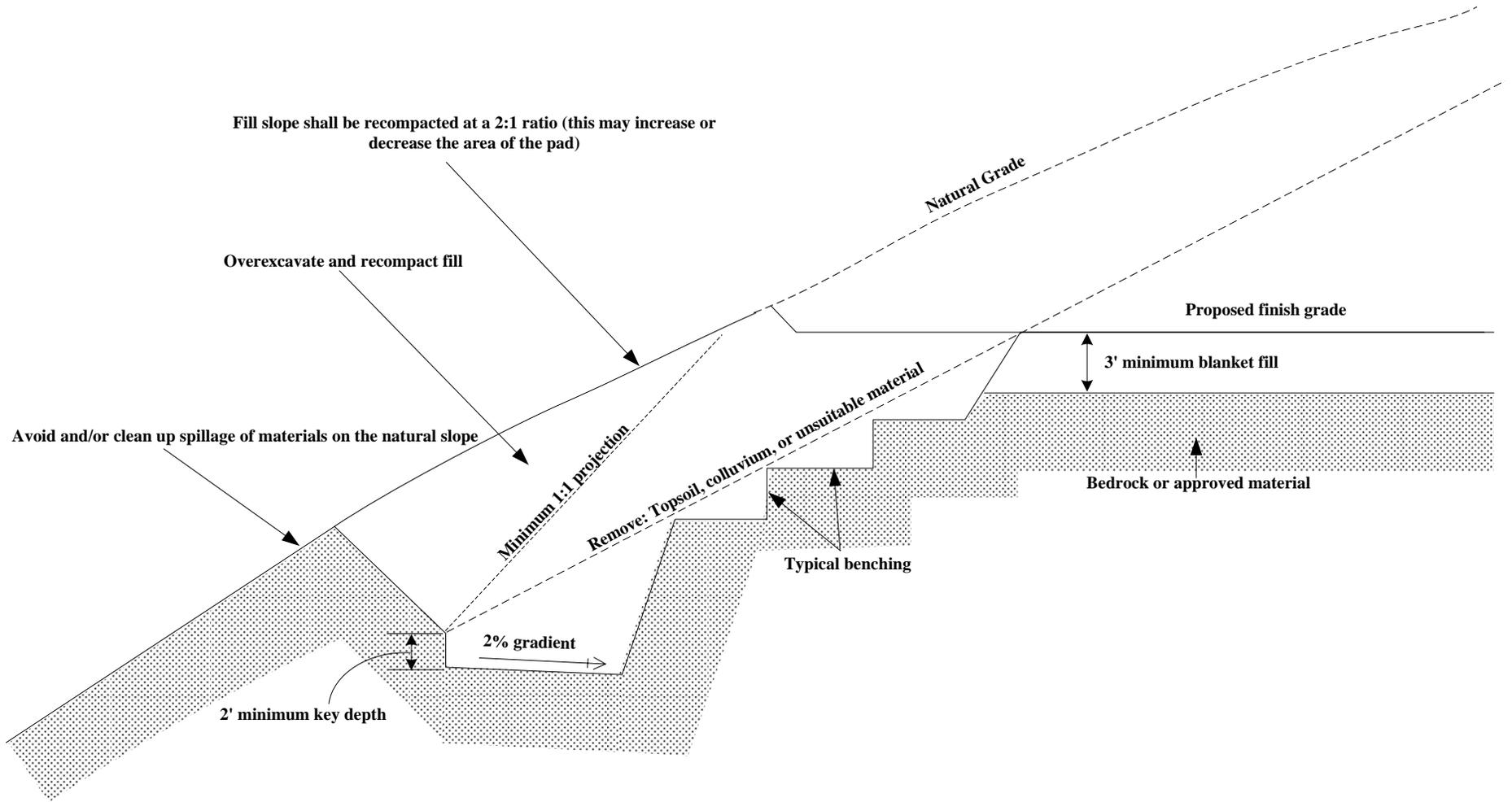
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FIGURE E

Note: Figure not to scale

DAYLIGHT CUT LOT DETAIL



- Note:
- (1) Subdrain and key width requirements shall be determined based on exposed subsurface conditions and the thickness of overburden.
 - (2) Pad overexcavation and recompaction shall be completed if determined as necessary by the soils engineer and/or engineering geologist.

EARTHWORK AND GRADING GUIDELINES DAYLIGHT CUT LOT DETAIL



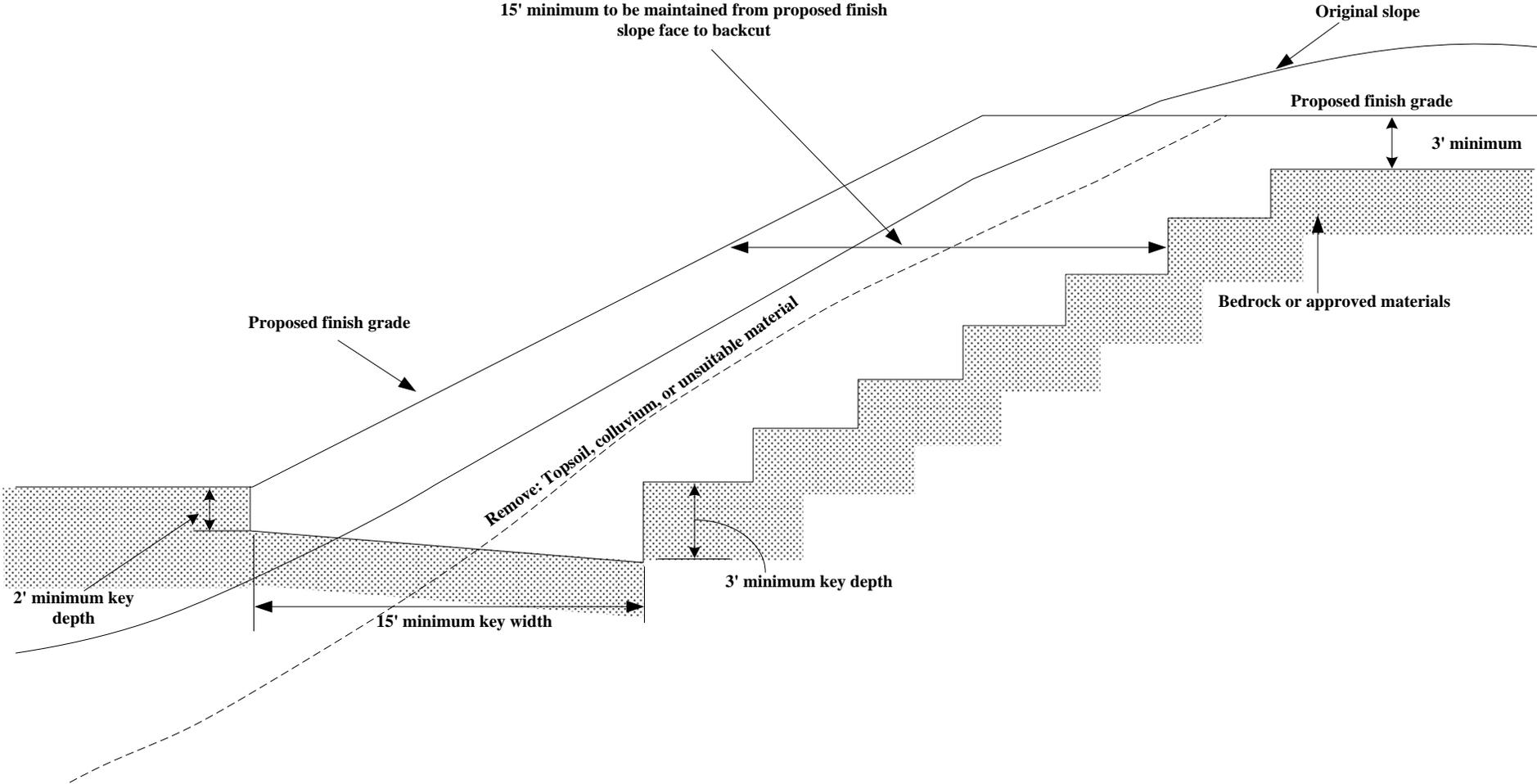
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FIGURE F

Note: Figure not to scale

SKIN FILL OF NATURAL GROUND



- Note:
- (1) The need and disposition of drains will be determined by the soils engineer and/or engineering geologist based on site conditions.
 - (2) Pad overexcavation and recompaction shall be completed if determined as necessary by the soils engineer and/or engineering geologist.

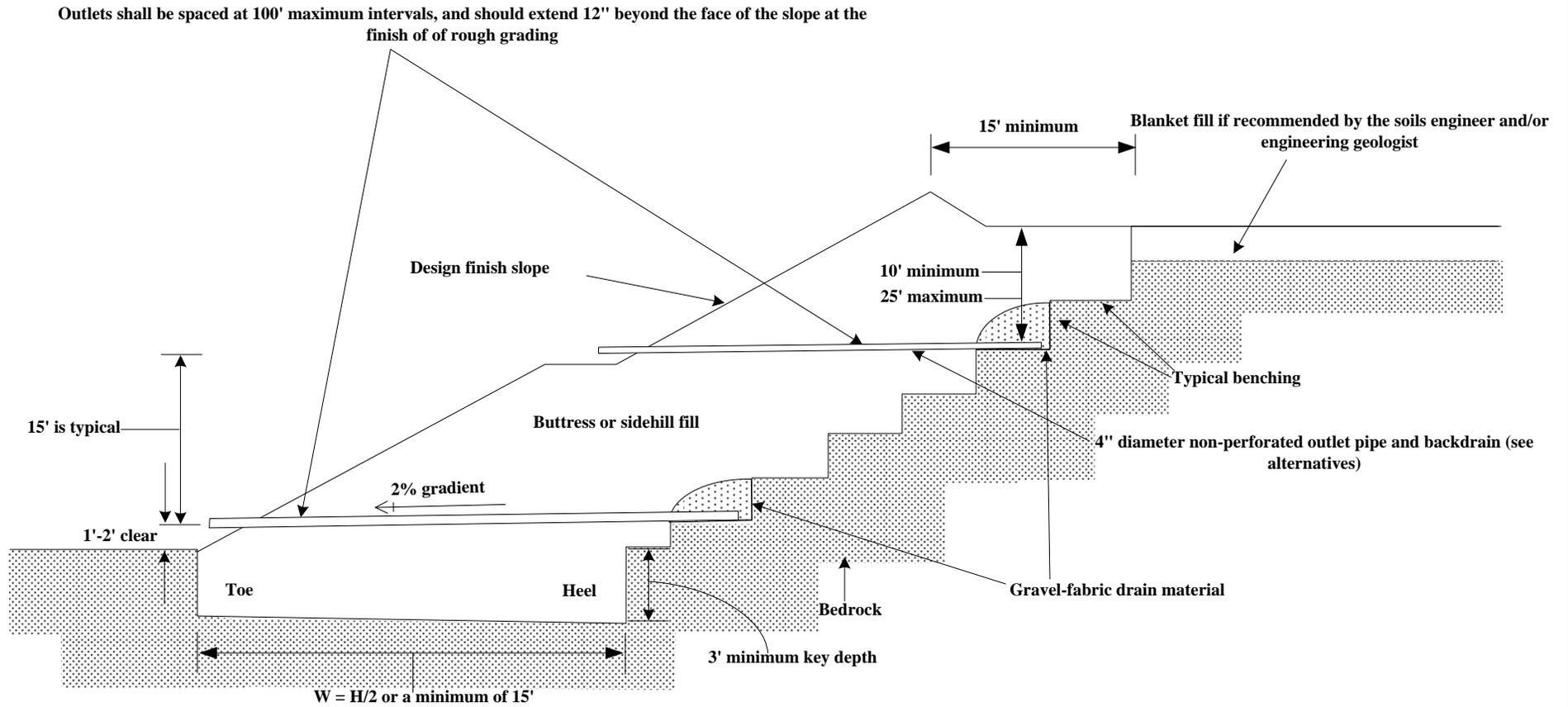
EARTHWORK AND GRADING GUIDELINES SKIN FILL OF NATURAL GROUND



FIGURE G

Note: Figure not to scale

TYPICAL STABILIZATION BUTTRESS FILL DESIGN



EARTHWORK AND GRADING GUIDELINES TYPICAL STABILIZATION BUTTRESS FILL DESIGN

Note: Figure not to scale

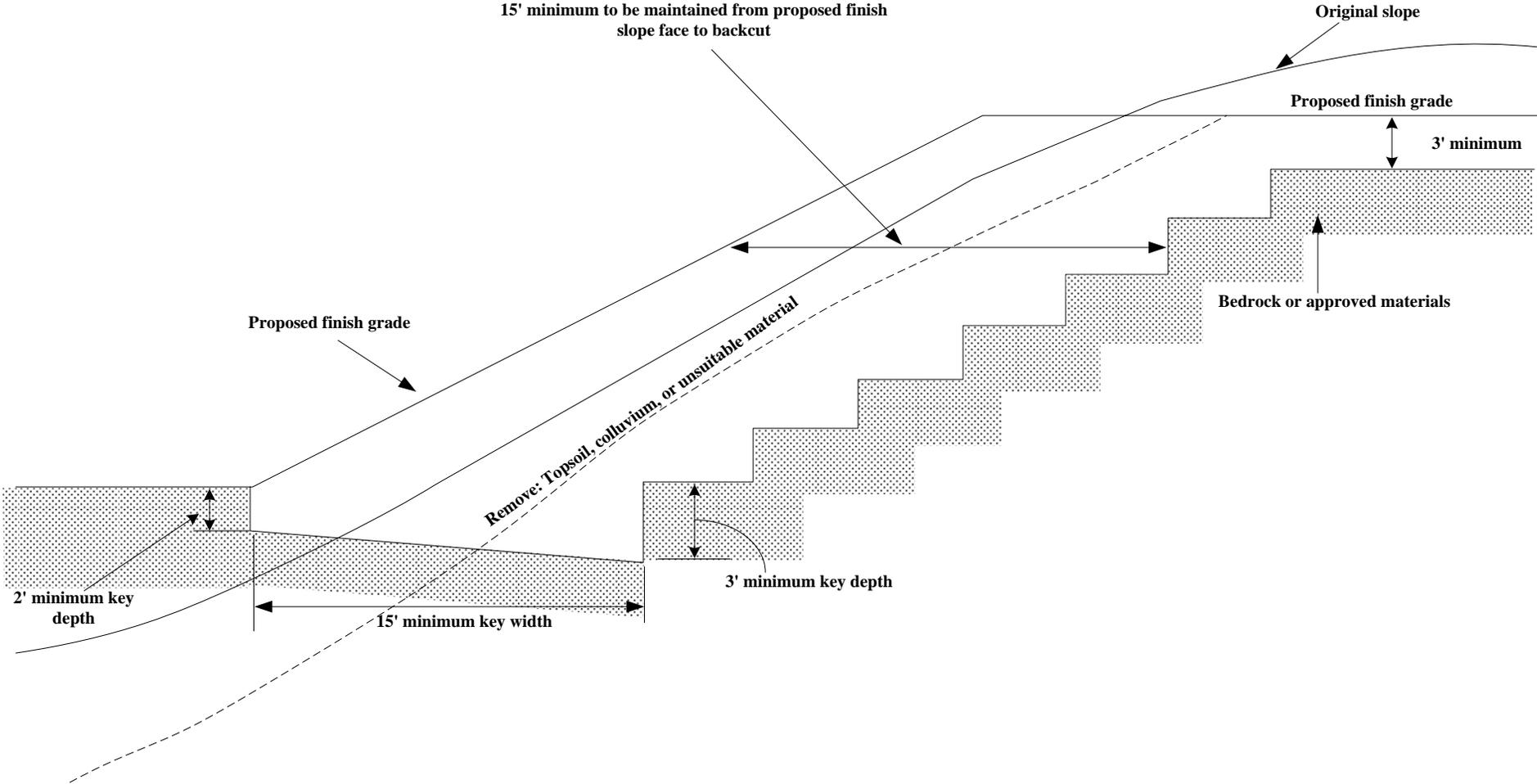


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FIGURE H

SKIN FILL OF NATURAL GROUND



- Note:
- (1) The need and disposition of drains will be determined by the soils engineer and/or engineering geologist based on site conditions.
 - (2) Pad overexcavation and recompaction shall be completed if determined as necessary by the soils engineer and/or engineering geologist.

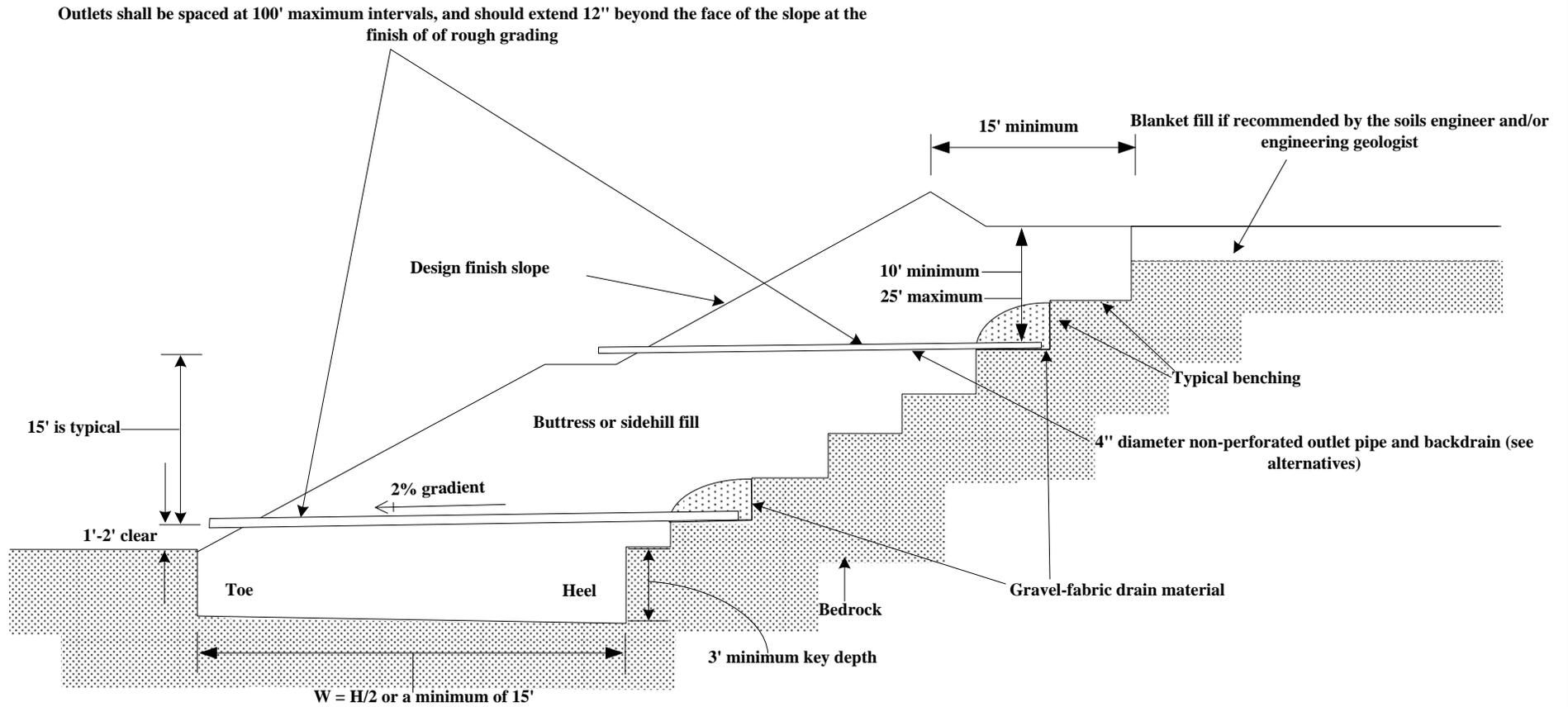
EARTHWORK AND GRADING GUIDELINES SKIN FILL OF NATURAL GROUND



FIGURE G

Note: Figure not to scale

TYPICAL STABILIZATION BUTTRESS FILL DESIGN



EARTHWORK AND GRADING GUIDELINES TYPICAL STABILIZATION BUTTRESS FILL DESIGN

Note: Figure not to scale

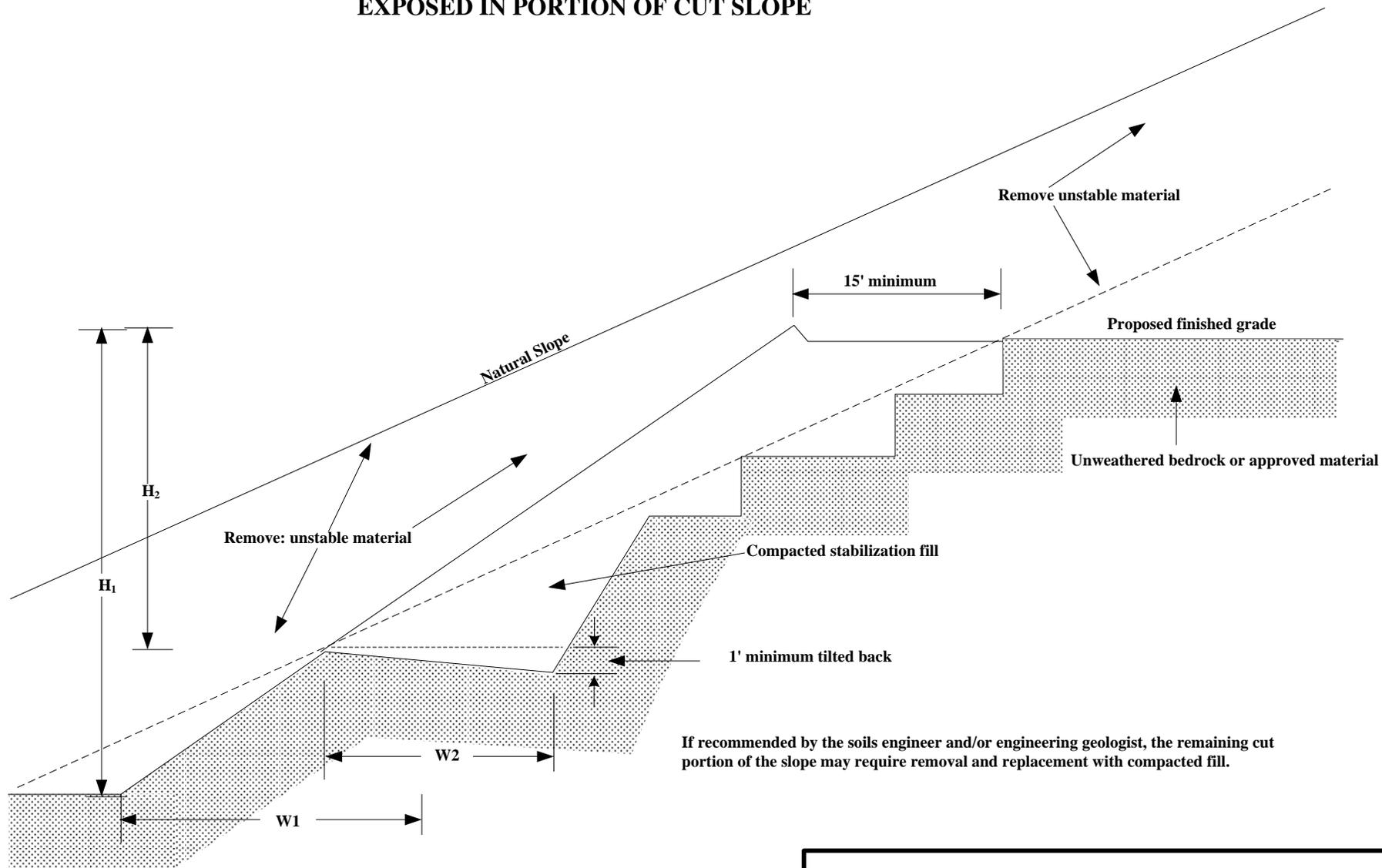


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FIGURE H

STABILIZATION FILL FOR UNSTABLE MATERIAL EXPOSED IN PORTION OF CUT SLOPE



If recommended by the soils engineer and/or engineering geologist, the remaining cut portion of the slope may require removal and replacement with compacted fill.

- Note:
- (1) Subdrains are required only if specified by the soils engineer and/or engineering geologist.
 - (2) "W" shall be the equipment width (15') for slope heights less than 25 feet. For slopes greater than 25 feet "W" shall be determined by the project soils engineer and/or the engineering geologist. "W" shall never be less than H/2.

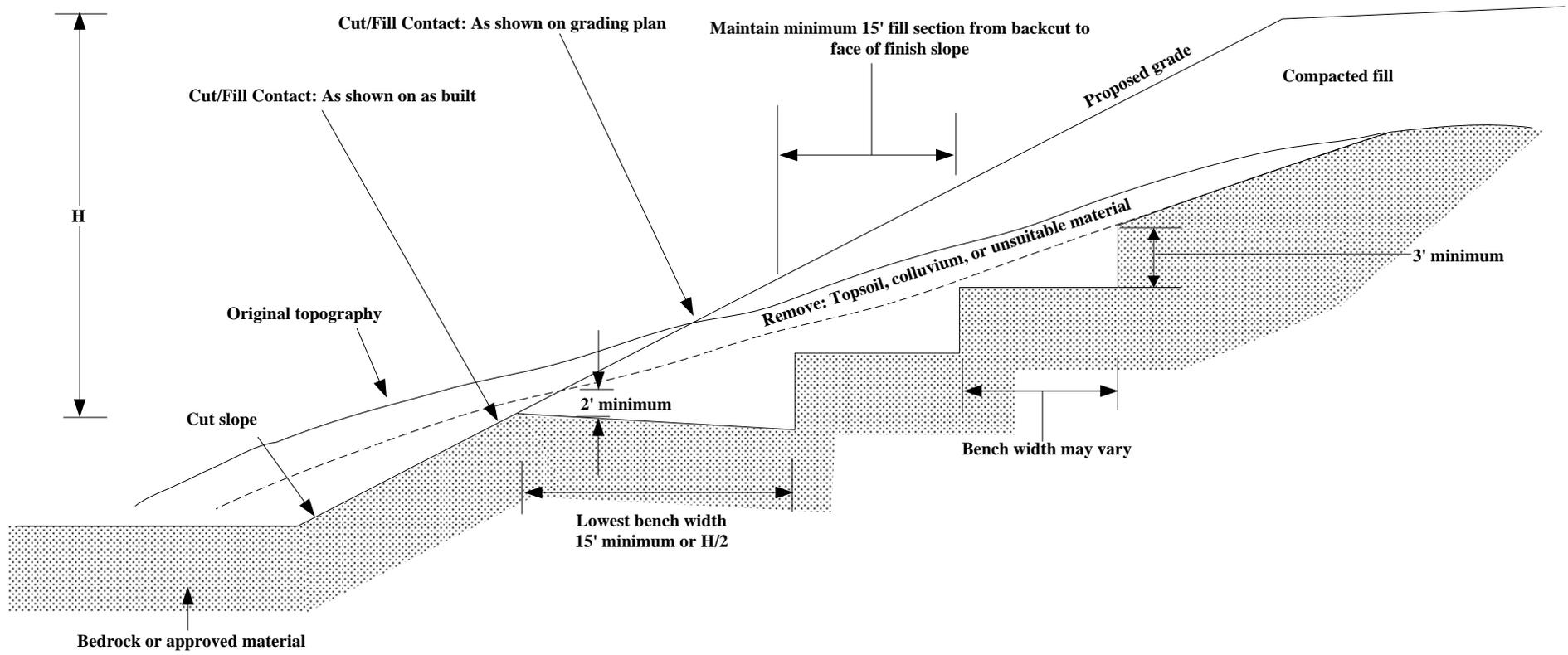
EARTHWORK AND GRADING GUIDELINES
STABILIZATION FILL FOR UNSTABLE MATERIAL
EXPOSED IN PORTION OF CUT SLOPE



FIGURE I

Note: Figure not to scale

FILL OVER CUT DETAIL



Note: The cut section shall be excavated and evaluated by the soils engineer/engineering geologist prior to constructing the fill portion.

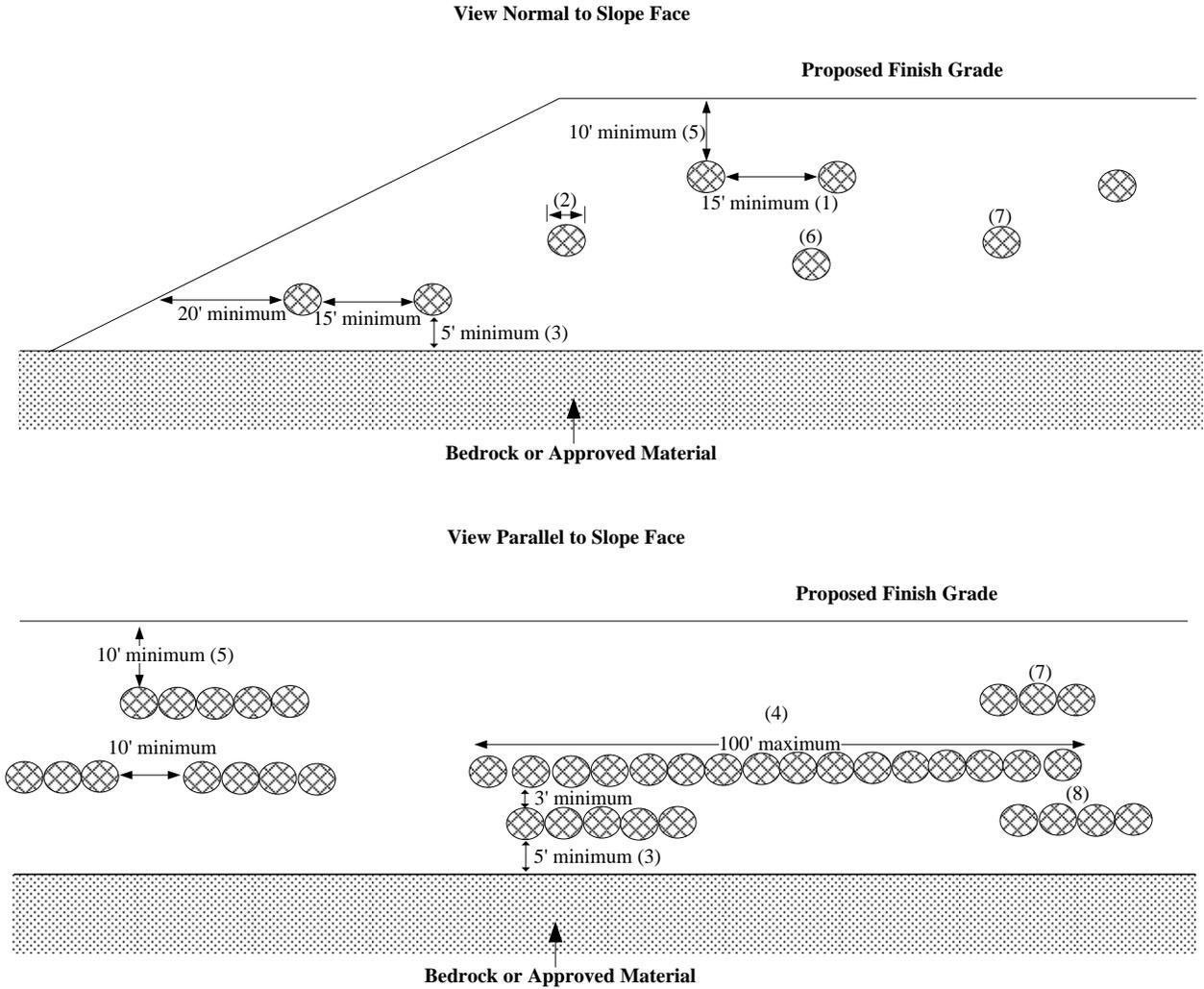
EARTHWORK AND GRADING GUIDELINES FILL OVER CUT DETAIL



FIGURE J

Note: Figure not to scale

OVERSIZE ROCK DISPOSAL



- Note:
- (1) One Equipment width or a minimum of 15 feet.
 - (2) Height and width may vary depending on rock size and type of equipment used. Length of windrow shall be no greater than 100 feet maximum.
 - (3) If approved by the soils engineer and/or engineering geologist.
 - (4) Orientation of windrows may vary but shall be as recommended by the soils engineer and/or engineering geologist. Unless recommended staggering of windrows is not necessary.
 - (5) Areas shall be cleared for utility trenches, foundations, and swimming pools.
 - (6) Voids in windrows shall be filled by flooding granular soil into place. Granular soil shall be any soil which has a unified soil classification system (Universal Building Code (UBC) 29-1). Designation of SM, SP, SW, GP, or GW.
 - (7) After fill between windrows is placed and compacted with the lift of fill covering windrow, windrow shall be proof rolled with a D-9 dozer or equivalent.
 - (8) Oversized rock is defined as larger than 12", and less than 4 feet in size.

Approximate Scale: 1" = 30'



Note: All distances are approximate

EARTHWORK AND GRADING GUIDELINES OVERSIZE ROCK DISPOSAL



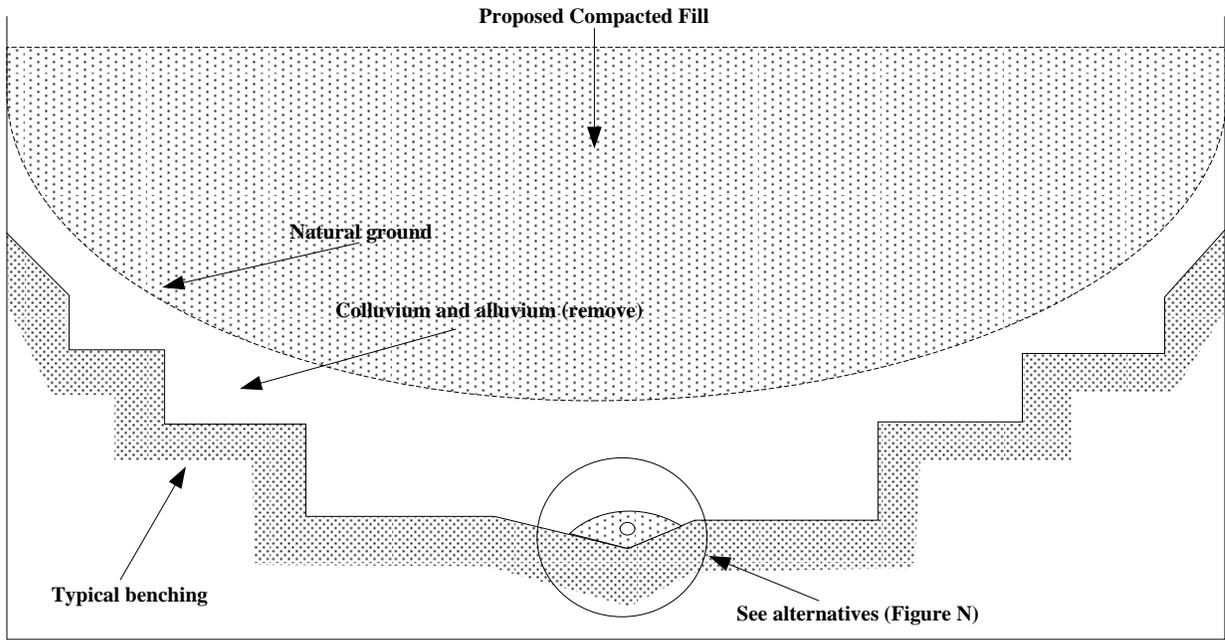
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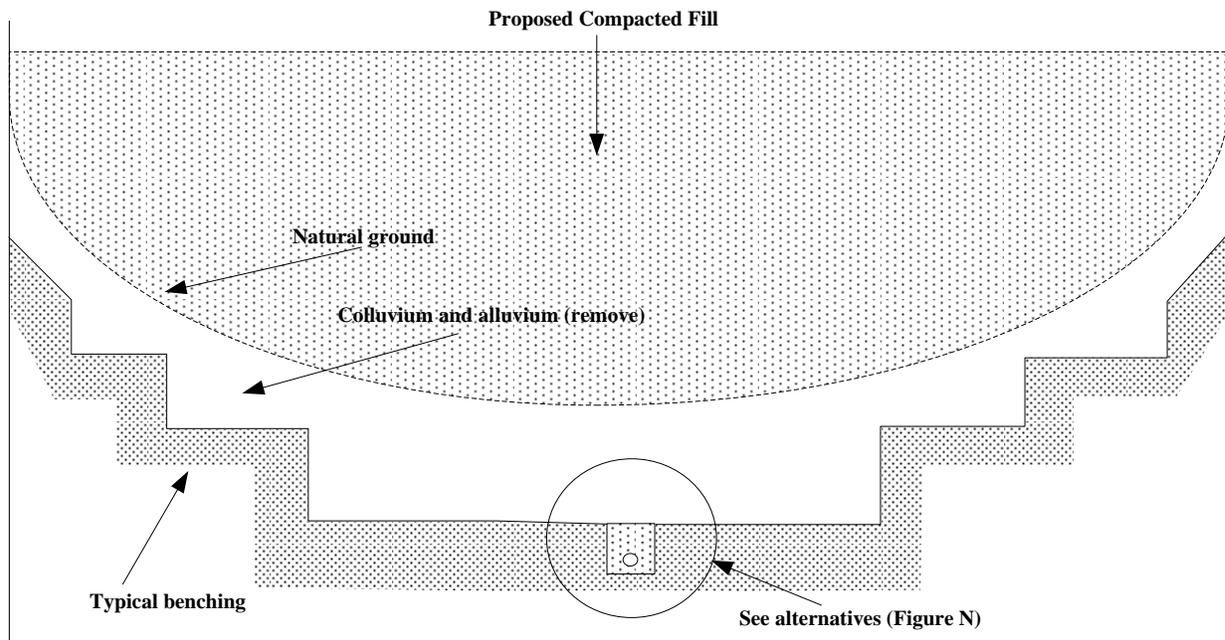
FIGURE L

CANYON SUBDRAIN DETAIL

Type A



Type B



Note: Alternatives, locations, and extent of subdrains should be determined by the soils engineer and/or engineering geologist during actual grading.

EARTHWORK AND GRADING GUIDELINES CANYON SUBDRAIN DETAIL



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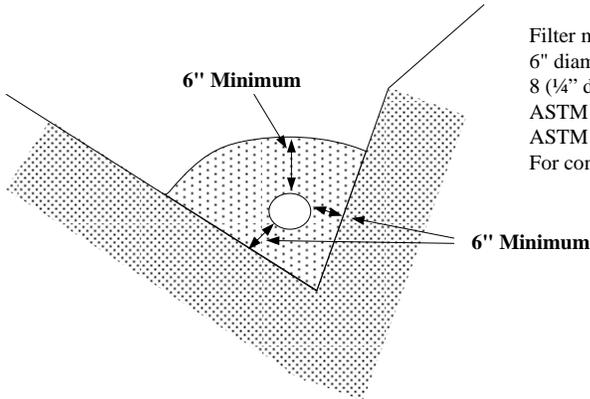
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FIGURE M

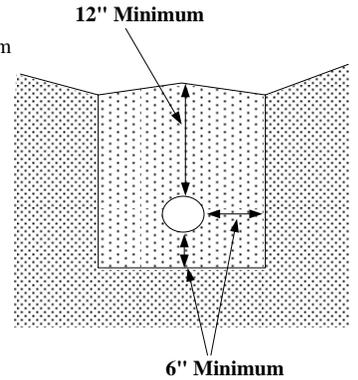
Note: Figures not to scale

CANYON SUBDRAIN ALTERNATE DETAILS

Alternate 1: Perforated Pipe and Filter Material



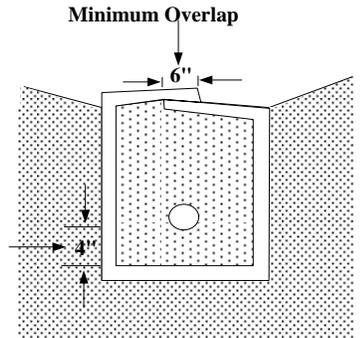
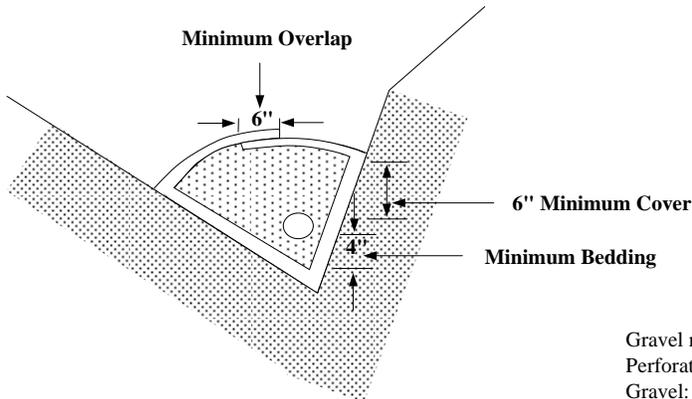
Filter material: Minimum volume of 9 feet³/linear foot.
 6" diameter ABS or PVC pipe or approved substitute with minimum 8 (1/4" diameter) perforations per linear foot in bottom half of pipe.
 ASTM D 2751, SDR 35 or ASTM D 1527, Schedule 40.
 ASTM D 3034, SDR 35 or ASTM D 1785, Schedule 40.
 For continuous run in excess of 500 feet use 8" diameter pipe.



Filter Material

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

Alternate 2: Perforated Pipe, Gravel and Filter Fabric



Gravel material 9 feet³/linear foot.
 Perforated pipe: see alternate 1.
 Gravel: Clean 3/4" rock or approved substitute.
 Filter Fabric: Mirafi 140 or approved substitute.

EARTHWORK AND GRADING GUIDELINES CANYON SUBDRAIN ALTERNATE DETAILS



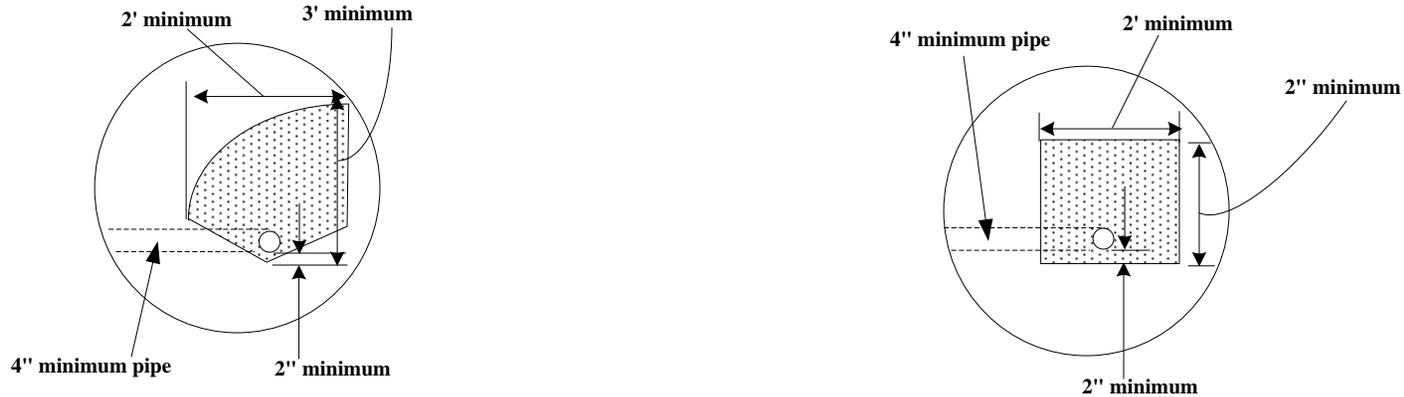
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FIGURE N

Note: Figures not to scale

TYPICAL STABILIZATION BUTTRESS SUBDRAIN DETAIL



Filter Material: Minimum of 5 ft³/linear foot of pipe or 4 ft³/linear foot of pipe when placed in square cut trench.

Alternative In Lieu Of Filter Material: Gravel may be encased in approved filter fabric. Filter fabric shall be mirafi 140 or equivalent. Filter fabric shall be lapped a minimum of 12" on all joints.

Minimum 4" Diameter Pipe: ABS-ASTM D-2751, SDR 35 or ASTM D-1527 schedule 40 PVC-ASTM D-3034, SDR 35 or ASTM D-1785 schedule 40 with a crushing strength of 1,000 pounds minimum, and a minimum of 8 uniformly spaced perforations per foot of pipe installed with perforations at bottom of pipe. Provide cap at upstream end of pipe. Slope at 2% to outlet pipe. Outlet pipe shall be connected to the subdrain pipe with tee or elbow.

- Note:
- (1) Trench for outlet pipes shall be backfilled with onsite soil.
 - (2) Backdrains and lateral drains shall be located at the elevation of every bench drain. First drain shall be located at the elevation just above the lower lot grade. Additional drains may be required at the discretion of the soils engineer and/or engineering geologist.

Filter Material – Shall be of the following specification or an approved equivalent:

Filter Material

Sieve Size	Percent Passing
1"	100
¾"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

Gravel - Shall be of the following specification or an approved equivalent:

Filter Material

Sieve Size	Percent Passing
1½"	100
No. 4	50
No. 200	8

Sand equivalent: Minimum of 50

Note: Figures not to scale

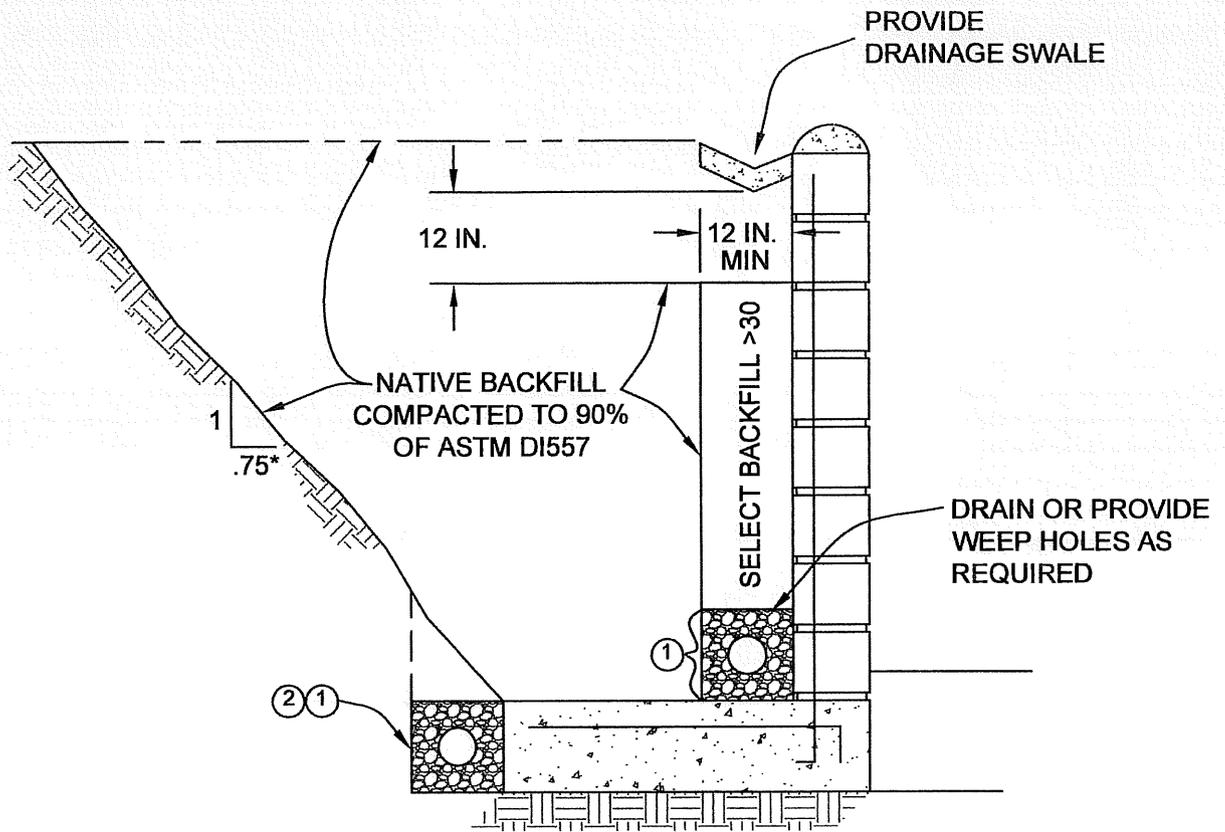
EARTHWORK AND GRADING GUIDELINES TYPICAL STABILIZATION BUTTRESS SUBDRAIN DETAIL



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FIGURE O



* OR AS REQUIRED FOR SAFETY

NOTES

- ① 4-INCH PERFORATED PVC SCHEDULE 40 OR APPROVED ALTERNATE. PLACE PERFORATION DOWN AND SURROUND WITH A MINIMUM OF 1 CUBIC FOOT PER LINEAL FOOT (1 FT. /FT.) OF 3/4 INCH ROCK OR APPROVED ALTERNATE AND WRAPPED IN FILTER FABRIC.
- ② PLACE DRAIN AS SHOWN WHERE MOISTURE MIGRATION THROUGH THE WALL IS UNDESIRABLE.

NOTE: FIGURE NOT TO SCALE

EARTHWORK & GRADING GUIDELINES

TYPICAL RETAINING WALL BACKFILL



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FIGURE P