UC San Diego

Pepper Canyon West Housing Project
UC San Diego Project Number: 5265

Addendum No. 9 to the Program Environmental Impact Report for the University of California, San Diego 2018 Long Range Development Plan, La Jolla Campus

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January 2022

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Acronyms and Abbreviations

2018 LRDP	Long Range Development Plan for the University of California, San Diego, La Jolla Campus
2018 LRDP EIR	Long Range Development Plan for the University of California, San Diego, La Jolla Campus Environmental Impact Report
AB	Assembly Bill
APE	Area of Potential Effect
APZ	Aircraft Potential Zones
BMP	best management practice
CBC	California Building Code
CEQA	California Environmental Quality Act
CFM	Campus Fire Marshal
CNEL	community noise equivalent level
CPM	Capital Program Management
CRHR	California Register of Historic Places
D&IB	Design & Innovation Building
dBA	A-weighted decibel
dB	decibel
DIMC	Designing for Industrialized Methods
DRB	Design Review Board
EH&S	Environmental Health and Safety
EIR	Environmental Impact Report
FDC	Fire Department Connections
GHG	greenhouse gas
GSF	gross square feet
HVAC	heating, ventilation, and air conditioning
I-5	Interstate 5
KVP	Key Vantage Point
LEED	Leadership in Energy and Environmental Design
L_{EQ}	time averaged noise levels
LID	low impact development
LOS	level of service
LRT	light rail transit
MBI	Michael Baker International
MEC	munitions and explosives of concern
MIP	Master Infrastructure Plan
MM	Mitigation Measure
MMRP	Mitigation Monitoring and Reporting Program
mph	miles per hour
MSCP	Multiple Species Conservation Plan
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Planning

NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSLU	noise-sensitive land use
OPR	Governor's Office of Planning and Research
OSP	Open Space Preserve
PDZ	Perimeter Development Zone
PLWTP	Point Loma Wastewater Treatment Plant
RAQS	Regional Air Quality Strategy
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SB	Senate Bill
SDFD	San Diego Fire Department
SHB	shot hole borer
SIO	Scripps Institute of Oceanography
SIP	State Implementation Plan
SLF	Sacred Lands File
SME	Structural and Materials Building
STC	Sound Transmission Class
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TAC	toxic air contaminant
TCR	tribal cultural resource
TDM	transportation demand management
The Regents	The Regents of the University of California
TPA	Transit Priority Area
TPH	Total Petroleum Hydrocarbons
Trolley	San Diego Trolley
UC	University of California
UC San Diego	University of California, San Diego
VA	Veterans Affairs
VMT	vehicle miles traveled

1 Introduction

1.1 PROJECT SUMMARY

The following Project is addressed in this Addendum Checklist for consistency with the 2018 Long Range Development Plan (LRDP) for the UC San Diego La Jolla Campus and the certified Program Environmental Impact Report (EIR) assessing the environmental impacts of implementing the plan (SCH No. 2016111019).

Project name:	Pepper Canyon West Housing Project
Project location:	University of California, San Diego
Lead agency's name and address:	The Regents of the University of California 1111 Franklin Street Oakland, CA 94607
Contact person:	Lauren Lievers, Principal Environmental Planner UC San Diego Campus Planning Office
Project sponsor's name and address:	UC San Diego 9500 Gilman Drive, MC 0074 La Jolla, California 92093-0074
Location of administrative record:	UC San Diego Campus Planning Office 10280 North Torrey Pines Road, Suite 460 La Jolla, CA 92093

Previously Certified 2018 LRDP Program EIR: The 2018 LRDP is a comprehensive land use plan that guides physical development on campus to accommodate projected enrollment increases and new program initiatives. The 2018 LRDP and its EIR are available at the following locations:

- UC San Diego Campus Planning Office in Torrey Pines Center South, Suite 460, 10280 North Torrey Pines Road, La Jolla, CA.
- Online at: https://plandesignbuild.ucsd.edu/planning/lrdp/la-jolla.html#Environmental-Impact-Report

1.2 PURPOSE OF CONSISTENCY REVIEW

This document provides a project-level review of whether the Pepper Canyon West Housing Project (the "Project") is consistent with the programmed growth identified in the

2018 LRDP and within the scope of activities covered in the environmental impact evaluation in the 2018 LRDP EIR. This document will also serve as the Project's Addendum, as described in the CEQA determination below.

The 2018 LRDP is a comprehensive land use plan that guides physical development on campus to accommodate projected enrollment increases and expanded and new program initiatives (UC San Diego 2018a). The 2018 LRDP EIR was prepared in accordance with §15168 of the California Environmental Quality Act (CEQA) Guidelines and Public Resources Code §21094 and analyzed the environmental impacts of the 2018 LRDP (UC San Diego 2018b). The 2018 LRDP EIR (Volume I) analyzes full implementation of uses and physical development proposed under the 2018 LRDP and identifies measures to mitigate the significant adverse program-level and cumulative impacts associated with that growth.

This Addendum Checklist documents whether or not the site-specific development proposed by the Project is consistent with the objectives, land use plans and development and population forecasts contained in the 2018 LRDP and is covered by the 2018 LRDP EIR pursuant to §15168(c) of the State CEQA Guidelines, which states, "subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared." Pursuant to §15168(c)(4), an agency should use "…a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR." This Addendum Checklist also documents that none of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred and an addendum to the 2018 LRDP EIR may be prepared (per CEQA Guidelines Section 15164).

1.3 CEQA DETERMINATION

UC San Diego previously prepared the 2018 LRDP EIR and on the basis of this evaluation and pursuant to the State CEQA Guidelines:

☒ I find that the Project WOULD NOT have new significant effects on the environment that have not already been addressed by the 2018 LRDP EIR, no substantial changes have occurred with respect to the circumstances under which the Project will be undertaken, and no new information of substantial importance to the Project has been identified. However, minor technical changes or additions are necessary, and in accordance with §15164 of the State CEQA Guidelines, an ADDENDUM has been prepared.

☐ I find that although the Project WOULD have one or more new significant effects on the environment, there will not be a significant effect in this case because new project-specific mitigation measures have been identified that would reduce the effects to a less than significant level. In accordance with §15162 of the State CEQA Guidelines, a TIERED MITIGATED NEGATIVE DECLARATION has been prepared.

☐ I find that the Project MAY have a new significant effect on the environment that was not adequately addressed in the previous EIR or a significant effect previously examined will be substantially more severe than shown in the previous EIR, and there may not be feasible mitigation which would reduce the new significant effect to a less than significant level. In accordance with §15162 of the State CEQA Guidelines, a TIERED ENVIRONMENTAL IMPACT REPORT is required.

Lauren Lievers

Signature of Project Sponsor	December 22, 2021 Date

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2 Project Description

2.1 REGIONAL LOCATION AND SETTING

The UC San Diego La Jolla campus is located adjacent to the communities of La Jolla and University City, within the northwest portion of the City of San Diego (see Figure 2-1 of the 2018 LRDP Program EIR). UC San Diego's campus is generally composed of three distinct, but contiguous, geographical areas: the Scripps Institution of Oceanography (SIO) portion of the campus (178.7 acres), the western area of the campus (West Campus, 634.8 acres), and the eastern area of the campus (East Campus, 265.7 acres). The East and West Campuses are bisected by Interstate 5 (I-5) but are internally connected via two bridges. The La Jolla del Sol housing complex (12 acres) is located southeast of these larger geographical areas and is not contiguous to the campus. Refer to Section 2.2 of the 2018 LRDP EIR for additional description on each of the campus areas. Also included in the 2018 LRDP are the beach properties, consisting of the Audrey Geisel House and an adjacent coastal canyon and beachfront parcel (25.8 acres), and the Torrey Pines Gliderport, Torrey Pines Center and Torrey Pines Court (41.0 acres). The 2018 LRDP addresses campus properties that encompass a total of 1,158 acres in La Jolla, California (see Figure 2-2 of the 2018 LRDP EIR).

2.2 PROJECT SITE AND SETTING

The proposed Project would be located on the West Campus, which is situated between Genesee Avenue to the north, La Jolla Village Drive to the south, North Torrey Pines Road to the west, and I-5 to the east (see Figure 1, *Regional Location*, and Figure 2, *Project Vicinity*). The West Campus is the largest and most developed of the three areas of the La Jolla Campus with over 12 million gross square feet (GSF) of total building space on approximately 635 acres of land. Seven undergraduate colleges and four professional schools are located on this portion of the campus. In addition to academic instruction and research facilities, the West Campus includes the following uses: libraries, theaters, student support, administrative, sports/recreational, student housing, dining, a central utilities plant, facilities maintenance services, and parking facilities (UC San Diego 2018a).

The Project site is located within the Pepper Canyon Neighborhood on the eastern edge of West Campus (see Figure 2-6 of the 2018 LRDP Program EIR). The Project site is located on an approximately 8.6-acre site that currently houses a low density, 304-bed student housing complex, known as Camp Snoopy. The site is bound by the Visual Arts Complex, Epstein Amphitheater and Public Realm (currently in construction), and Rupertus Walk to the north; Pepper Canyon Urban Forest Open Space Preserve (OSP), Pepper Canyon East Apartments, and Matthews Apartments to the east; an existing surface parking lot and Gilman Drive to the south and the Gilman Parking Structure and Pepper Canyon Hall to the west.

The land use designation for the Project site in the 2018 LRDP is Academic Mixed-Use (which allows housing uses; 2018 LRDP page 62) with surrounding land uses including Academic Mixed-Use to the west (Gilman Parking Structure and Pepper Canyon Hall), Academic to the north and south (Visual Arts Facility, Structural and Materials Engineering Building, Design and Innovation Building and a complex of Health Sciences Buildings), and OSP (Pepper Canyon "Urban Forest") to the east (see Figure 2-3 in the 2018 LRDP; UC San Diego 2018a).

The Project site is located adjacent to the UC San Diego Central Campus Station of the San Diego Trolley (Trolley) light rail transit (LRT) system. The Trolley LRT station is located adjacent to the Project site to the east and connects to the Project site and the campus via Rupertus Walk.

2.3 PROJECT BACKGROUND

At present, UC San Diego has a large demand for on-campus housing that is attributed to both unprecedented enrollment growth (more than 13,000 students in the past decade[1]) and the affordable housing shortage in San Diego County, which has seen an 8.4 percent increase in the average rent over the past year[2]. The campus housing shortage negatively affects the student experience and challenges the University's ability to adequately serve its students.

Affordable on-campus housing aids in the recruitment and retention of students and supports their success by expanding opportunities for integration into the academic and social life of the UC San Diego campus. By living on campus, students are immersed in the University community, with easy access (via campus shuttle, bicycle or foot) to adjacent academic, research, clinical, recreation, and retail facilities– supporting the campus' Climate Action Plan.

Due to limited housing supply, rapid enrollment growth, and growing demand, the UC San Diego La Jolla campus currently cannot guarantee housing to its students. Due to the high demand for on-campus housing, in the 2021-2022 academic year, the campus was only able to offer housing to students using the following priority order:

1. Scholars in programs that provide four years of housing guarantee or mandate living on campus as a condition of their offer
2. New incoming first-year and transfer students, and returning second-year students who remained in on-campus housing for the previous academic year
3. Remaining second-year students (using a lottery system)
4. Remaining third- and fourth-year students (historically, only a very small amount from this priority group are accommodated)

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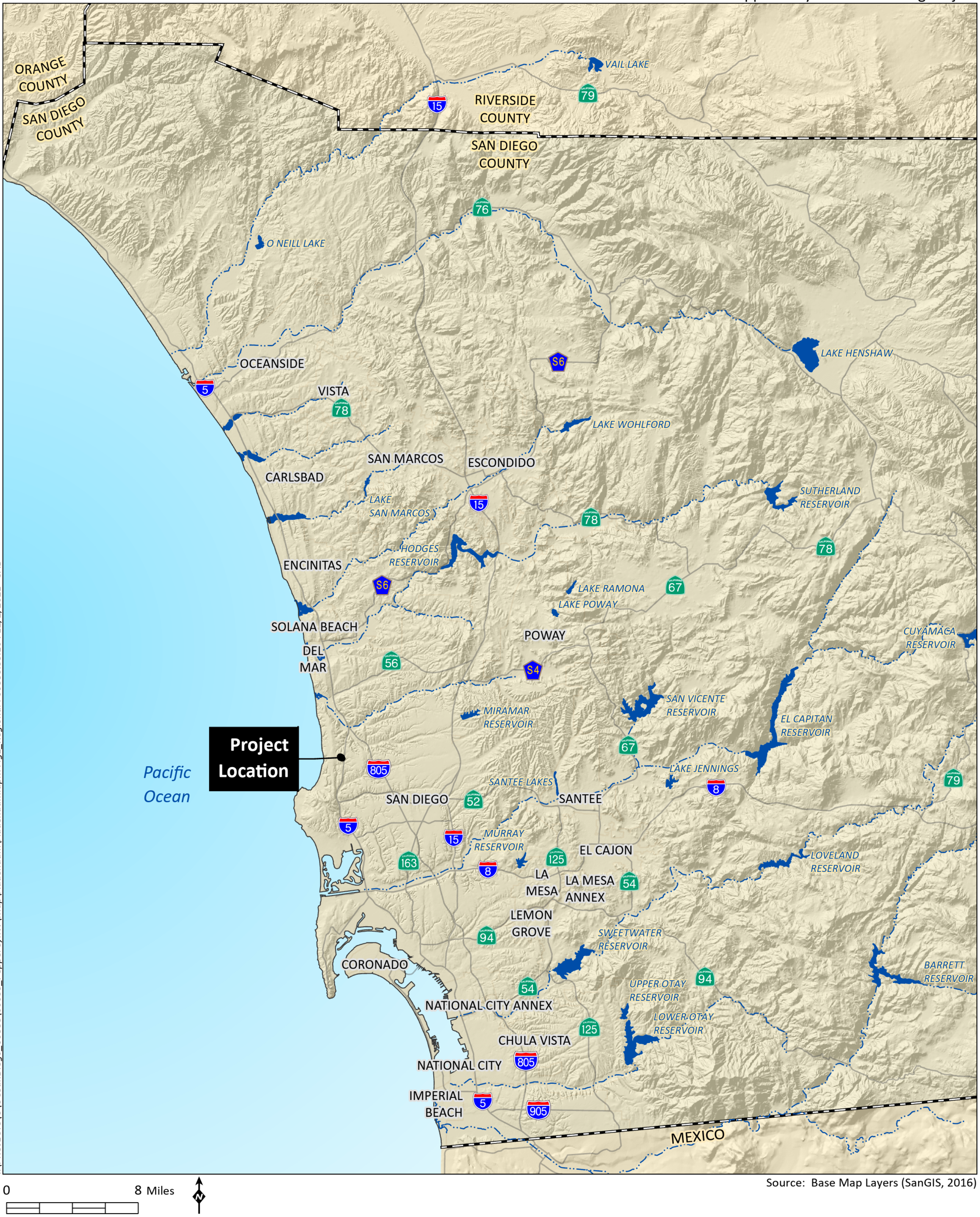

Source: Base Map Layers (SanGIS, 2016)

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Regional Location

Figure 1

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Source: Aerial (NearMap, 2019)

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Project Vicinity

Figure 2

Students find themselves in competition with the general public for rental housing in the immediate area surrounding campus, which is one of the most expensive areas to live in San Diego County. These students face a tremendous challenge when trying to secure affordable off-campus housing, often resorting to overcrowded living conditions and/or securing housing that is a significant distance from campus. Since UC San Diego can offer campus housing at significantly lower rental rates than private market housing in the surrounding neighborhoods, demand for on-campus housing is substantially higher than the number of students the campus can accommodate in on-campus housing.

In addition to documented waitlists for student housing, the results of an August 2018 UC San Diego student survey indicated a majority of students were somewhat or very interested in on-campus housing: 60 percent of juniors and 50 percent of seniors would want to live on campus if housing were available. Part of the attraction of University-owned housing is the community setting that is provided by living on campus, adjacent to the academic, research, clinical, and recreation facilities within walking distance of most on-campus housing. By living on campus, students are able to get around campus without a car – by foot, bicycle, and campus shuttles.

With the recent increases in undergraduate enrollment, the existing colleges are at or over capacity which poses a significant challenge to their ability to provide a quality academic and social support environment. Hence, the 2018 LRDP anticipated the development of up to two more residential colleges and approximately 8,900 new beds over its planning horizon (2035). The 2018 LRDP also identified a goal to house up to 65 percent of students on campus (approximately 42 percent are housed today in 17,624 beds).

In May 2019, The UC Board of Regents approved establishment of Seventh College, which began enrollment of its first cohort of students in fall 2020. The Village at Torrey Pines (The Village), which originally opened in 2009 and 2011 as housing for transfer students, is now the permanent home for Seventh College administration and housing facilities. Additionally, Sixth College relocated to its permanent home at the North Torrey Pines Living and Learning Neighborhood, just prior to the start of the fall 2020 term. With the move of Sixth College from its former location, which includes the existing Pepper Canyon West “Camp Snoopy” residences, the campus has the opportunity to redevelop existing low-density and outdated housing at the center of campus to provide Pepper Canyon West as an expanded and new campus housing complex for transfer students and/or upper division undergraduate students. Redevelopment would require demolition of existing facilities (comprised of 11 one- and two-story buildings with 304 undergraduate beds) that were built in 1967.

The proposed Project is part of the overall campus redevelopment plan presented in the 2018 LRDP aimed at addressing the student housing shortage. The Project would consist of the construction of two C-shaped buildings that would provide 1,316 beds to serve the transfer students and/or upper division undergraduate student population.

2.4 PROJECT OBJECTIVES

UC San Diego has identified the following objectives for the proposed Project:

- Provide affordable on-campus housing.
- Provide housing for transfer students and upper division undergraduate students.
- Support the UC San Diego goal of housing up to 65 percent of students on campus to provide a four-year housing guarantee and support transit-oriented development as a benefit to the region.
- Foster a safe and comfortable urban residential lifestyle for transfer and upper division students that fully integrates into the academic and social life of the UC San Diego campus.
- Embrace the close proximity to the San Diego Trolley's UC San Diego Central Campus Station, creating a new active entry to the campus and a vibrant "urban" atmosphere for riders of the light rail transit.
- Integrate with the surrounding canyon landscape in the Pepper Canyon OSP and urban campus core to which it would be adjacent by providing connectivity between the buildings and all urban amenities.
- Design a housing facility that integrates with the surrounding development and open space and connects to new pedestrian and bicycle facilities that would facilitate broader connections across the campus.
- Implement Low Impact Design (LID) opportunities with respect to stormwater management, landscape, planting, and hardscape design.
- Incorporate sustainable design principles to the greatest extent feasible to achieve Leadership in Energy and Environmental Design (LEED) Silver Certification (at a minimum), thereby reducing energy consumption, conserving nonrenewable resources, and complying with the UC Sustainable Practices Policy.

These objectives are consistent with the overall objectives of the 2018 LRDP (see Section 2.3 of the 2018 LRDP Program EIR), as described in Section 3.1 of this Addendum.

2.5 PROJECT FEATURES

2.5.1 Building Program

The Project would provide student housing in two high-rise towers with connected 5-story mid-rise buildings. The buildings would provide a total of 1,316 new beds (1,297 undergraduate student beds, 13 beds for resident student advisors, and 3 two-bedroom units for residential professional staff) for a total of approximately 580,500 GSF. This includes 572,500 GSF residential and approximately 8,000 GSF of campus-serving retail space at ground level. Apartments would be constructed in the proposed mix shown in Table 2-1.

Public realm improvements would also be provided as part of the Project. The West Rim Walk would provide a multi-use pathway roughly parallel to Pepper Canyon to the east. This would provide a primary connection to the Project from Gilman Drive and East Campus to the University Center Urban Core. Similarly, the construction of a 'living or residential street' called a Woonerf would be incorporated into the Project's western edge. A Woonerf would accommodate pedestrians, bicycles, and minimal access for periodic low-speed vehicular use. The Woonerf would provide north-south pedestrian and bicycle access and would provide direct access to the Project's residential buildings and courtyards. Secondary pathways and sidewalks would provide access within the Project itself and rustic trails would lead away from the residences across Pepper Canyon toward the existing Pepper Canyon East Apartments and Matthews Apartments. Gilman Park would be constructed at the Project's southeastern corner. The park would provide lawn space and seating at the southern edge of Pepper Canyon.

The Project would also construct landscape, hardscape, and open space improvements along the northern and western edges of the Project, integrating with the existing facilities as well as the future redevelopment opportunities in the Pepper Canyon Neighborhood portion of West Campus. The Project site would be located adjacent to the recently completed UC San Diego Central Campus Station of the Trolley LRT line, Epstein Amphitheatre and Public Realm (currently in construction), and Design & Innovation Building (D&IB), as well as the Visual Arts Facility, Pepper Canyon Hall, and the Gilman Parking Structure. The Project's hardscape and landscape improvements include connections to Rupertus Walk to the north, which serves as the primary pedestrian and bicycle corridor connecting the UC San Diego Central Campus Station to the University Center Urban Core, Library Walk and Ridge Walk. The Woonerf would provide additional connections to the west, via Russell Walk.

The areas in this Project component are described in more detail in Sections 2.5.2, Building Design, and 2.5.4, Landscape/Hardscape Improvements – Pepper Canyon West Student Housing.

Table 2-1
Proposed Unit Mix

Unit Type	Number of Units	Number of Beds
6-Bedroom	117	702
8-Bedroom	76	608
Subtotal Student Beds		**1,310**
2-Bedroom for Professional Resident Staff	3	6
Total Beds	**-**	**1,316**

2.5.2 Building Design

The proposed Project would be notable for its two high rise residential towers rising above the adjacent Pepper Canyon and the Trolley's UC San Diego Central Campus Station. The residential component of the Project would include a North Building and a South Building, each with a 5-story residential podium and connected residential tower. Figure 3, *Site Plan*, and Figures 4a-c, *Project Renderings*, show the proposed site plan and visualizations of the Project buildings and surroundings. Figures 5a-c, *Floor Plans*, show the interior layout of each building podium and tower.

North Building

The North Building would be a C-shaped structure located on the northern half of the Project site at Rupertus Walk near the Trolley's UC San Diego Central Campus Station, which would be the primary transit connection to West Campus. Starting at the northeast corner by Rupertus Walk, the building would rise 5-stories above ground level stepping up with the existing elevation before intersecting with a 22-story, approximately 232-foot, tower south of the North Courtyard. A large opening would be provided at ground level along the building's western edge, providing access to the North Courtyard which is formed by the empty space within the C-shape of the building's layout. The North Building would be set back approximately 135 feet from the nearest portion of the Trolley guideway.

Residences would be located within both the podium and the tower portion of the building. Residences would be provided views of the Pepper Canyon OSP to the east, University Center Urban Core to the west, the South Building to the south, and the Epstein Amphitheater to the north. Three outdoor rooftop terraces would be provided on the podium portion of the building. Rooftop equipment would include exhaust fans and an elevator machine room at the top of the tower. Retail space would be provided at the base of the tower due to its proximity and ground floor access to Rupertus Walk, Woonerf, and the West Rim Walk. Apartments would be located in both the podium and tower. Each bedroom would be single-occupancy (one bed per room). Rather than including a traditional dining hall in the complex, individual apartment units would have kitchens.

Source: CLARK Perkins&Will OJB, 2021

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Site Plan

Figure 3

Source: CLARK Perkins&Will OJB, 2021

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Project Rendering - View Looking West from Pepper Plaza

Figure 4a

Source: CLARK Perkins&Will OJB, 2021

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Project Rendering - View Northwest from Above Gilman Drive

Figure 4b

Source: CLARK Perkins&Will OJB, 2021

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Project Rendering - View Looking South from the Structural and Materials Engineering Building

Figure 4c

FLOOR PLAN
GROUND LEVEL

- ENTRANCE
- FITNESS CENTER
- GAME ROOM AND SOCIAL KITCHEN
- LAUNDRY
- BOH SUPPORT
- WELCOME LOUNGE
- CO-WORKING AND WELLNESS ENGAGEMENT
- ADRL AND CAPS SUITES
- ADRL UNIT

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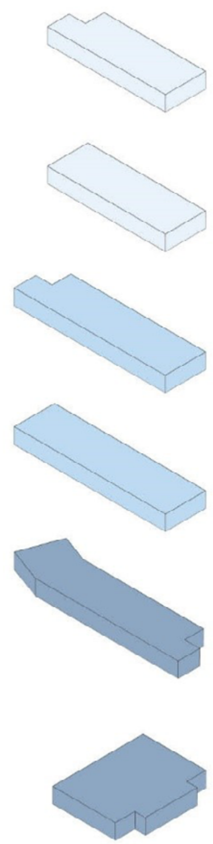
Source: CLARK Perkins&Will OJB, 2021

FLOOR PLAN
SECOND LEVEL



UNIT 6.1 - 6 BR/ 3 BA (NOTCHED)

UNIT 6.2 - 6 BR/ 3 BA (RECTANGULAR)

UNIT 8.1 - 8 BR/ 4 BA (NOTCHED)

UNIT 8.2 - 8 BR/ 4 BA (RECTANGULAR)

UNIT 8.3 - 8 BR/ 4 BA (ANGLED)

UNIT 8.4 - 8 BR/ 4 BA (BAY WINDOW)

6 BR/3 BA UNIT

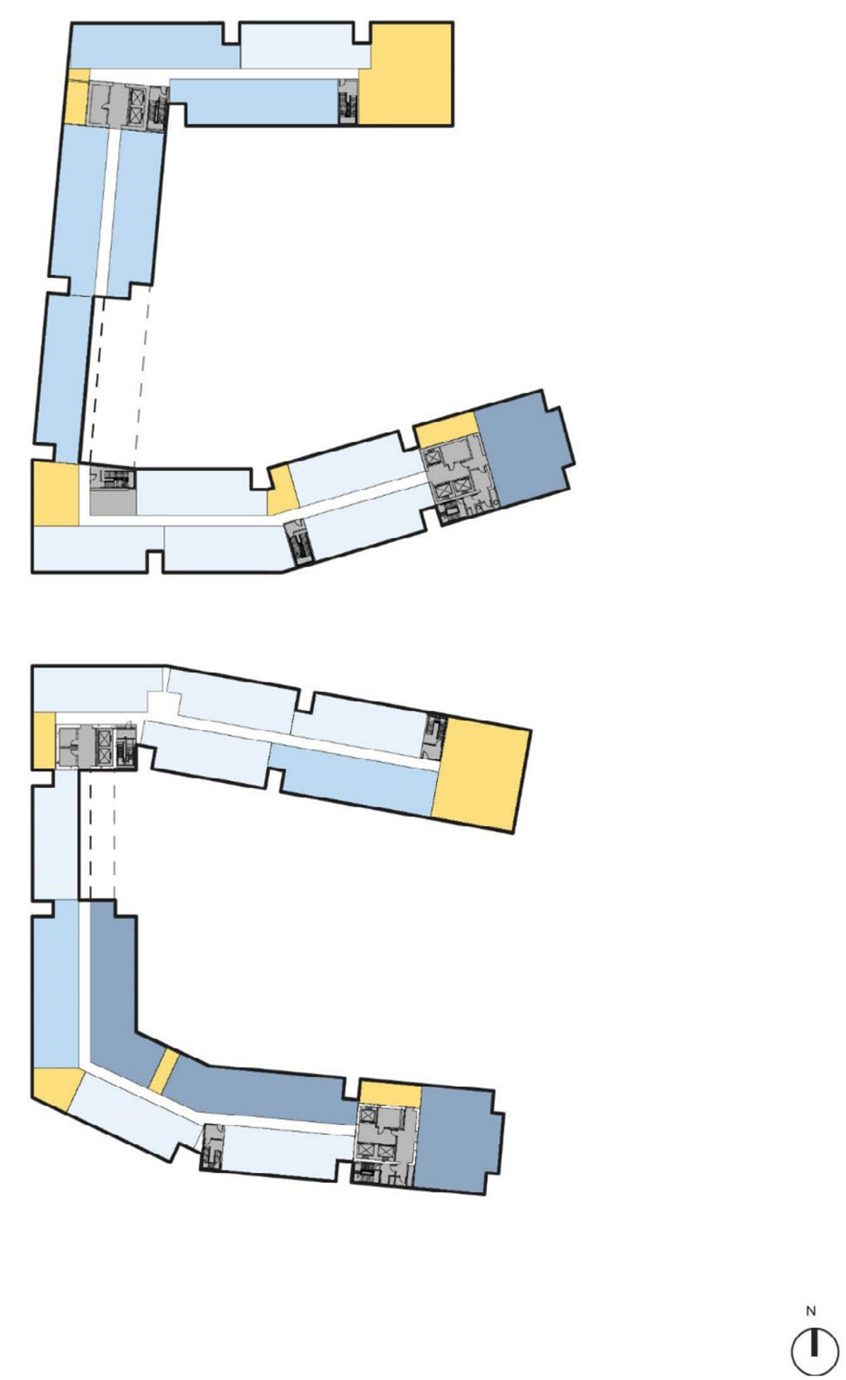
8 BR/4 BA UNIT

8 BR A/B/4 BA UNIT

COMMONS

TERRACE

BOH SUPPORT



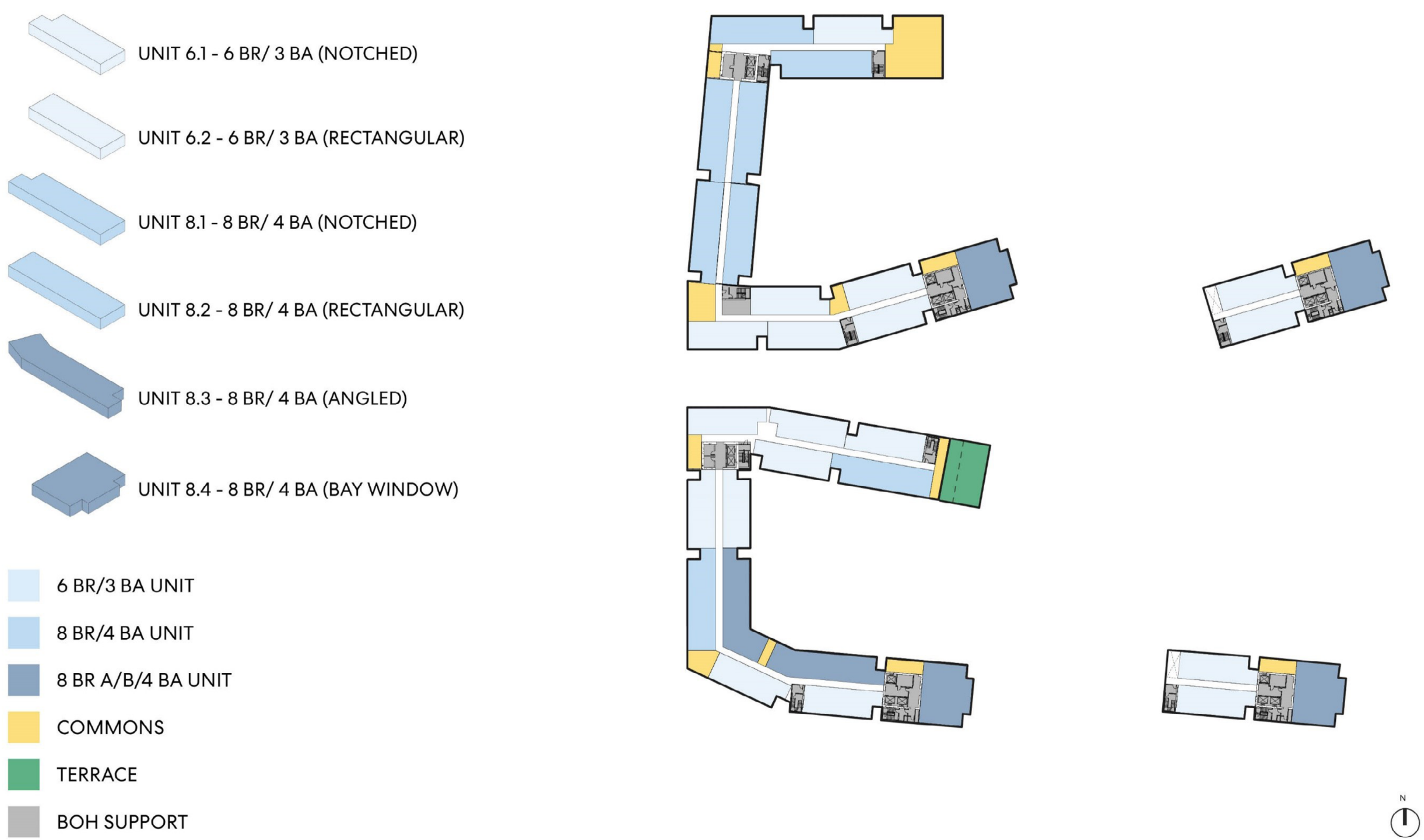
Source: CLARK Perkins&Will OJB, 2021

Floor Plan - Second Level

Figure 5b

FLOOR PLAN
THIRD LEVEL

TYPICAL TOWER



Source: CLARK Perkins&Will OJB, 2021

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Floor Plan - Third Level and Tower

Figure 5c

The buildings would be clad in a curtain wall unitized glazing system with a series of vertical opaque panels and sun-shading overlays that would allow for maximization of vision glazing without excessive solar heat gain. Colored glass panels in hues consistent with the surrounding landscape would be arranged across the façade. Window assemblies with Sound Transmission Class (STC) ratings of 28 through 37 would be required for the façades of habitable rooms exposed to excessive outside noise levels to reduce indoor noise.

South Building

The South Building would be located in the southern half of the Project site at Gilman Drive and Villa La Jolla Drive, which is one of the major entrance points to the Campus. Like the North Building, the South building would rise five stories above ground level stepping up with the existing elevation before intersecting with a 23-story, approximately 238-foot, tower south of the South Courtyard. A large opening would be provided at ground level along the building's western edge, providing access to the South Courtyard which is formed by the empty space within the C-shape of the building's layout. The South Building would be setback from Gilman Drive by approximately 60-feet.

Residences would be located within both the podium and the tower portion of the building and would provide views of the Pepper Canyon OSP to the east, University Center Urban Core to the west, the Veterans Affairs (VA) Medical Center and La Jolla to the south, and the North Building to the north. Similar to the North Building, three rooftop terraces would be provided on the podium portion of the building. Rooftop equipment would include exhaust fans and an elevator machine room at the top of the tower. Apartment units would consist of single-occupancy (one bed per room) bedrooms with a kitchen. Design elements such as glazing, colors, and shading would be similar to the North Building. Similarly, STC-rated building materials would be used to reduce indoor noise levels.

Views of the Buildings

Direct views of the Project buildings would be visible from surrounding facilities such as the Structural and Materials Engineering (SME) Building, the Gilman Parking Structure, the D&IB, the Epstein Amphitheater, the Visual Arts and Pepper Canyon Hall. Direct views of the Project buildings would be visible from off-campus locations including the VA Medical Center to the south and I-5 to the east. Additionally, direct views would be provided from Gilman Drive to the south and the elevated tracks of the San Diego Trolley LRT to the east.

2.5.3 Utility and Service System Improvements

Domestic and Fire Water Infrastructure

Existing Conditions

The existing Pepper Canyon West site is currently served by a network of existing water lines that provide both domestic and fire water service. This internally looped system has an 8-inch connection to the 12-inch line in Gilman Drive, and an 8-inch connection to Rupertus Lane. All existing structures within the existing Pepper Canyon West Student Housing area are served from this looped system. A second looped system is located near the Pepper Canyon Hall. This system has a 12-inch water line (north of the Gilman Parking Structure) and connects to the 8-inch water line in Rupertus Lane. This system primarily serves the Pepper Canyon Hall.

Proposed Domestic and Fire Water

The proposed Project would require demolition of approximately 95 percent of the existing water infrastructure within the Project site. Based on the limits of demolition, UC San Diego may require a phasing plan during construction. Three new connections would be required to support the proposed Project. These connections include:

- The northwest corner of the Project on Rupertus Lane
- Near the intersection of Villa La Jolla Drive and Gilman Drive
- The northeast corner of Gilman Parking Structure at Russell Walk

A fourth connection would be provided within Rupertus Lane via a connection to the Epstein Amphitheater. The proposed Project would include a combined domestic and fire water system similar to the existing looped system that currently serves the site. Based on initial meetings with the UC San Diego Fire Marshal, the following criteria would be met for the fire water system:

- Fire hydrant spacing at a minimum of 300 feet
- Two Fire Department Connections (FDC) per building: FDC shall be within 25 feet of proposed fire hydrants and 40 feet away from the building being served
- Two Automatic Fire Hose Connections per building: with 200-foot hose pulls

Reclaimed Water Infrastructure

Existing Conditions

An existing 12-inch reclaimed water line loop runs through the existing Pepper Canyon West Student Housing site. The 12-inch line connects to the reclaimed water system in Gilman Drive and continues north, parallel to the existing Gilman Parking Structure. Once the line reaches Russell Way, the system travels directly east through the Pepper Canyon West Student Housing site and continues east through the OSP. The existing reclaimed water line is part of the larger infrastructure system that serves the overall campus. This system would remain operational during construction activities. In order to avoid interruption of service, a detailed phasing plan would be coordinated with UC San Diego during the Construction Phase.

Proposed Reclaimed Water Infrastructure

The proposed Project would require partial demolition of the existing reclaimed water infrastructure and two new connections to the existing system. The design intent (to the extent possible) is to protect the existing reclaimed water line within the future Woonerf alignment. The proposed new reclaimed water line would connect to the existing line near Russell Way. From the connection point, the proposed line would meander between the proposed buildings and connect to the existing line at the edge of the OSP.

Sanitary Sewer Infrastructure

Existing Conditions

The Project site is currently served from a single main sewer line located within the OSP. The main point of connection that serves the site is located at the southeast corner of the site. This existing 12-inch sewer line flows easterly and ultimately connects to the 15-inch sewer line within the canyon bottom that flows along Gilman Drive. A second point of connection (lateral) that serves the site is located east of Camp Snoopy Resident Hall 705 and flows directly into the canyon system via a 10-inch sewer. Similar to the main existing sewer line, this line ultimately connects to the 15-inch sewer line located within the canyon that flows along Gilman Drive.

In addition to the two points of connection that currently serve the site, an existing 12-inch sewer main is located within the canyon. This main extends north past Rupertus Lane to an existing 8-foot diameter precast sewer manhole. This would provide future service to the North Building.

Proposed Sanitary Sewer

The Project site would require demolition of the existing sewer infrastructure within the Project limits and would install three new connections the existing sewer system. Based on the expanded footprint of the proposed Project site, the proposed North Building would require partial demolition of an existing 12-inch sewer line located near Rupertus Lane. The proposed new sewer line and connection point would reroute the existing 12-inch to the east to avoid the building footprint.

Portions of the North Tower and portions of the South Building would be served via a proposed 10-inch sewer. This sewer would connect to an existing manhole located near existing Campus Snoopy Resident Hall 705.

Based on the footprint of the proposed housing site, the proposed South Building would require a new connection to the existing 10-inch sewer line that currently flows under Gilman Drive. This existing system does not currently service the housing site but conveys existing flows from the west. The connection would not require construction within Gilman Drive. At this level of Schematic Design, the proposed sewer connection point would not reroute the existing 10-inch to the south to avoid the potential building footprint envelope.

Other Utilities

During site demolition, portions of the existing electrical conduit, telecom conduit, gas line, streetlight conduit, transformer, fire water appurtenances, light poles and irrigation lines would be removed. Mechanical and electrical systems for the proposed Project would be housed on the first floor of the north and south building and would contain electrical equipment, telecommunications systems, central lighting inverters and controls, fire detection and alarm systems, and security systems, as required.

Electrical power would be supplied to the proposed Project via the existing UC San Diego power grid, which provides 100 percent clean energy via the UC Regents Energy Services Unit Direct Access Program. Based on review of the Master Utility Plan (MUP) prepared for the 2018 LRDP there is sufficient capacity within the existing utility systems to support the proposed Project buildings. No major utility upgrades would be required for the proposed Project.

California Building Code requires emergency generators in high-rise buildings and buildings with occupied floors located more than 75 feet above the lowest level of fire department vehicle access. Emergency generators at the two buildings would provide backup power for all life safety equipment, security, telecommunication, egress lighting, and all other safety and security monitoring systems. These emergency generators would meet engine standards of Tier 3 as rated by the U.S. Environmental Protection Agency and would be equipped with diesel particulate filters. They would only be operated during power outage situations and for maintenance testing purposes.

Fire Protection

A fire system, fire alarms, and fire access plan has been prepared in accordance with the City of San Diego Fire Safety Code for the proposed Project. The UC San Diego Campus Fire Marshal (CFM) has reviewed the design plans to ensure that the proposed Project would provide continued adequate emergency access at all times during construction and operation of the proposed facility and would comply with the City of San Diego Fire Department (SDFD) policies.

Fire access would be provided in the Woonerf, from Gilman Drive to Rupertus Walk. Access would be controlled by removable bollards per University standards. There would be an integrated standpipe connection in the Central Courtyard and at two locations on the east side of the buildings. Ladder access would be provided in each of the Courtyards and on the Woonerf. The CFM was consulted for design, materiality, width and locations of fire access and lanes, and per the CFM's direction, the first floor perimeter of North Building and South Building were designed to be within 150 feet of the approved Fire Department Access Road along the Woonerf. The access road would have an unobstructed width of approximately 26 feet at all points and would provide access to all fire water storage tanks and generators provided on the Project site.

2.5.4 Landscape/Hardscape Improvements

Courtyard Areas

The proposed Project would include the development of three primary courtyard areas, two for each building and a connecting space between the two buildings. All landscape improvements in the courtyard areas would be focused on native and/or drought-tolerant species and supplemented by suitable climate adaptive, non-invasive, ornamental species.

North Courtyard

The North Courtyard would be a semi-public zone opening east to Pepper Plaza and the Pepper Canyon OSP. The North Courtyard would be oriented towards the Trolley's UC San Diego Central Campus Station to the east and would have a visual connection to the transportation hub around the station and the future D&IB beyond. Community space would be maximized by extending the indoor public spaces outdoors. Following this pattern, outdoor study areas and patios would be located adjacent to corresponding indoor spaces. The North Courtyard may contain a multi-use/outdoor wellness lawn that would provide space to study or host informal gatherings. The courtyard would contain a variety of seating options and botanical interest areas that would enhance the gateway experience. Part of the canyon landscape planting pattern would continue into the courtyard to some extent to create a gradual transition and visual connection between the North Courtyard and the Pepper Canyon OSP.

Canyon Connector

The Canyon Connector would be positioned between the North Building and the South Building. The connector would provide the primary opening to the Woonerf to the west and would connect to the West Rim Walk (described below) and development east of Pepper Canyon via an opening between the North and South Buildings. The Canyon Connector would also be the central space for residents and building workers to access the trash room, utility vaults, and transformer rooms. In addition, this area would include access to private entrances and patios. Botanical interest planting areas would frame the Canyon Connecter and private residential units would have privacy screening via plantings, berms, elevation changes or a combination of those.

South Courtyard

The South Courtyard would be a residential hub and would be primarily for residents. The courtyard would open east to the Pepper Canyon OSP; however, this courtyard would be more private in nature due to its location away from Rupertus Walk, Pepper Plaza and other developments to the north. The courtyard would be accessible via an opening in the podium, to provide pedestrian and visual connections to the Woonerf. Access would be provided to the West Rim Walk via meandering pathways.

Woonerf

The Project includes the development of a Woonerf along the western boundary of the Project site between Gilman Drive and Rupertus Walk. The 41,727-square-foot Woonerf would function as the proposed Project's front street to the west. The concept of a 'Woonerf' can generally be described as a 'living or residential street'. It is primarily a 'people' space that would accommodate pedestrians, bicycles, and minimal access for periodic vehicle use. Priority would be given to pedestrian and bicycle use but would allow low-speed vehicle access for fire, emergency, delivery, service and move-in/move-out traffic. Vehicular access to the Woonerf would be controlled by removable bollards per University standards to restrict vehicular traffic to defined hours per day. This would also limit the size of service vehicles accessing this space.

West Rim Walk

West Rim Walk would be a 10-foot-wide paved asphalt multi-use pathway developed along the western edge of the canyon. The walkway would run along the eastside of the Project's Student Housing West buildings and would be the main pedestrian connector between Rupertus Walk and Gilman Drive. The colors and finishes to be installed on the Rim Walk would be natural and would blend with the rustic canyon landscape.

Gilman Park

Gilman Park would be a passive-use open space near the intersection of Gilman Drive and Pepper Canyon Drive. Located beneath the elevated Trolley LRT line, Gilman Park would provide seating, vegetation, and an open grass lawn. Appropriate setbacks from the Trolley guideway to the tops of trees planted in Gilman Park would be maintained to provide clearances.

Intra-Project Circulation and Safety

Project improvements would include the exterior hardscape areas immediately adjacent to the Project's North Building. Both buildings would have two ground-level openings which would provide access between the Woonerf and the courtyards. Building entries would incorporate lighting, signage, and security features according to UC San Diego standards. The Project would provide at least the minimum number of bike racks per LEED requirements throughout the Project site. Outdoor bike racks for approximately 200 spaces would be provided throughout the Project. Bike racks would be located along the Woonerf and in the passageway connectors between the Project's courtyards. Thus, the proposed Project would allow for a total of approximately 200 bikes to be parked on site.

This proposed Project would be a transit-oriented development, as it is located within a five-minute walk of the Gilman Transit Hub and a short distance to the San Diego Trolley's UC San Diego Central Campus Station. Because of these multiple transit connections and its proximity adjacent to the existing Gilman Parking Structure, the Project does not include parking. The University also operates Triton Transit, a robust shuttle transit system for traversing the campus. The nearest Triton Transit shuttle stops to the Project are at Gilman Transit Hub to the southwest along Gilman Drive and Central Campus Station, located north of the Trolley's UC San Diego Central Campus Station.

A mail and package storage room within the North Building would be accessible from the Woonerf. Delivery trucks would stop at the turnaround in Russell Lane and would deliver mail and packages via handcart.

Main vehicular entry points to campus would be along Villa La Jolla Drive and Gilman Drive from the west.

Central trash collection access and major deliveries would be dropped off in the loading zone along Gilman Drive. Trash from individual building chutes will be moved to a central trash location.

Safety lighting would be provided on pathways within the Project, including the Woonerf and West Rim Walk. Safety lighting would be compliant with the UC San Diego Outdoor Lighting Policy. Signage would also be provided throughout the Project for internal wayfinding and to nearby campus amenities and destinations.

2.5.5 Project Construction

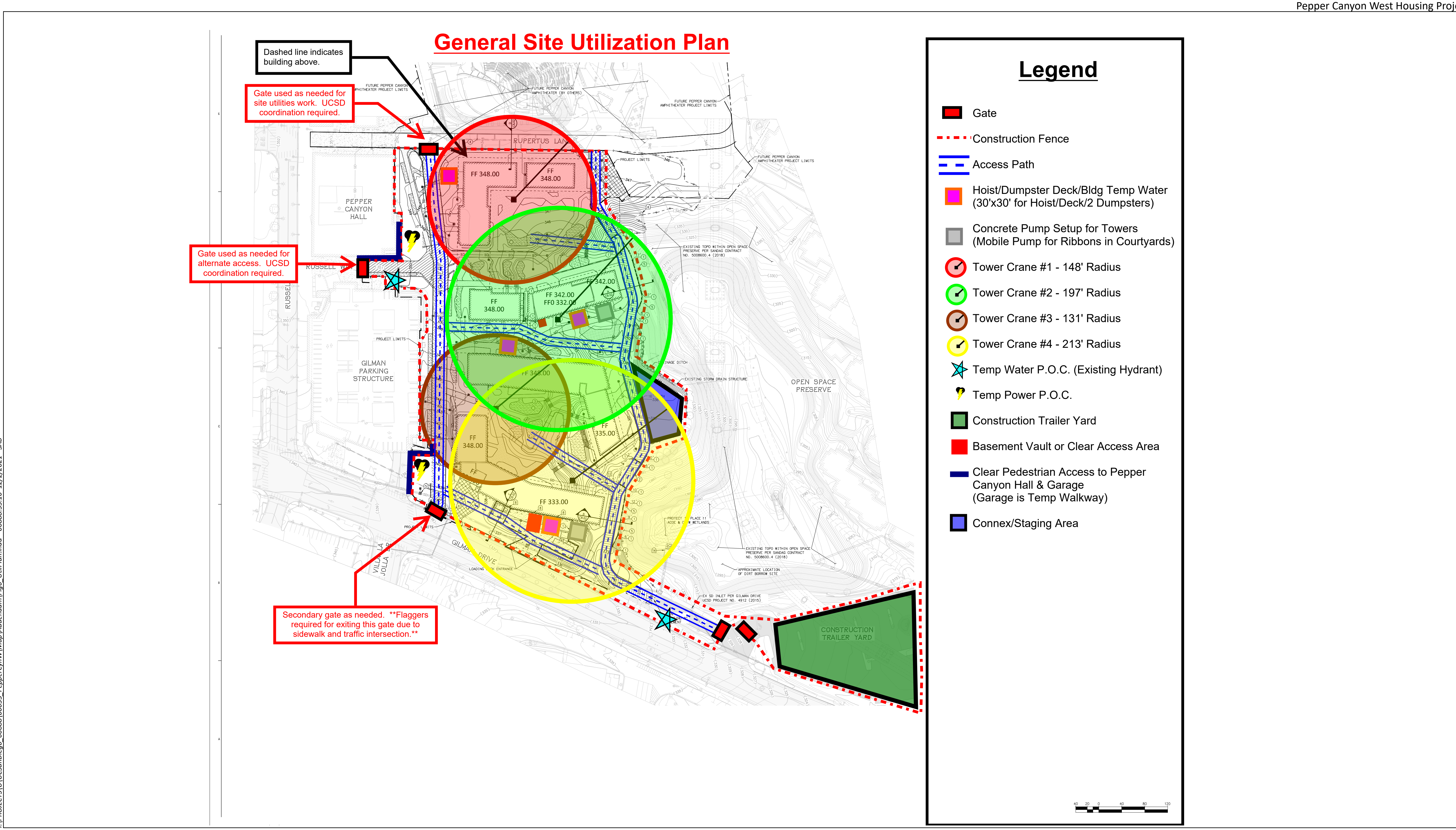
The approximately 8.6-acre Project site is an infill location including redevelopment of an existing low-density site within the interior to the campus (removing 11 one- and two-story buildings). Construction activities are anticipated to begin in mid-June 2022 and be complete by August 2024 for the start of the fall academic term. Construction of the Project is anticipated to take up to 26 months. Construction activities would occur Monday through Saturday, between the hours of 7:00 a.m. and 7:00 p.m. Limited nighttime construction may occur in order to eliminate daytime conflicts or other necessary reasons, with approval from the appropriate campus stakeholders. For public safety reasons, during the 26-month construction period, the public would not have access to the Project site or any area within the Project's construction limits. The construction staging area would be located at the southeastern corner of the Project, at the site where Gilman Park would ultimately be constructed. Some off-site construction staging and/or personnel parking may be utilized, as needed. A construction management plan would outline how the site would be accessed and managed during the construction period, including the notifications and signage to be employed. A traffic control plan would be developed and implemented during construction to ensure ingress and egress from the Project site would not interfere with traffic flows and emergency access along Gilman Drive.

Figure 6, *Site Utilization Plan*, depicts the construction limits, the anticipated area for construction staging area locations, anticipated options for site ingress and egress, the location of tower cranes, and other construction logistics. Contractor trailers would be located immediately south of the Project site (refer to Figure 6) in the construction staging area. This approximately 4-acre area would be dedicated as a construction zone associated with the proposed Project. Following the completion of construction activities, this area would be hardscaped or otherwise improved.

Demolition

Site preparation would begin with demolition of the existing residential buildings and facilities, followed by site grading and construction as described in the subsections below. As a conservative scenario, this document assumes that construction would not occur in phases and all components would be constructed concurrently.

As part of the Project, the existing site buildings, landscape, and hardscape would be demolished to accommodate construction of the new Project components. The demolition plan would include removal of approximately 55,000 GSF of building space. These buildings include eight existing two-story residential halls and three one-story service buildings (Buildings 703, 704, 705, 706, 707, 708, 709, 710, and three facilities buildings). Demolition of adjacent stairs, patio, and retaining walls would be required. The existing residential buildings were built in the 1960's and currently provide undergraduate student housing to approximately 304 students.



Source: CLARK Perkins&Will OJB, 2021
Site Utilization Plan Date: December 2021

HELIX Environmental Planning

Site Utilization Plan

Figure 6

Demolition activities would also include the removal of the 100-space parking lot P406 located on the southern portion of the Project site.

All hardscape, trees and ornamental landscaping would be removed to allow for the redevelopment of the Project site. Demolition activities are anticipated to take approximately two months.

Grading Plan

The existing Project site is situated on a relatively flat pad that gently slopes and drains to the southeast, toward the existing canyon.

To the extent possible, the proposed grading for the Project site would coordinate and incorporate the following edge limits and conditions:

- South Edge: Maintain the grading elevations and impact limits to the northern edge of the existing Gilman Drive sidewalk.
- West Edge: Maintain the existing grading elevations adjacent to the Gilman Parking Structure and Pepper Canyon Hall.
- North Edge: The northerly limits of grading would end at the southerly pavement edge for Rupertus Walk.
- East Edge: The Pepper Canyon OSP and western canyon rim would generally serve as the Project's easterly edge condition. Two rustic trails would traverse the canyon to connect to the nearby East Rim Trail and maintenance access road at the bottom of the Canyon. The trails would follow the existing topography of the site.

The proposed Project has been designed to minimize the amount of imported material required during grading. Although import is required, quantities have been refined to consider the following:

- Geotechnical recommendations for over-excavation, shrinkage and bulking (Ninyo & Moore 2018).
- Geotechnical recommendations for compaction and edge conditions of the OSP.
- Quantities for geotechnical key slopes and retaining walls
- Quantities associated with structural footings, utility trenches, and demolition

Grading for the housing site would include cut-and-fill activities, with a total cut of approximately 9,000 cubic yards of dirt and the fill of approximately 24,000 cubic yards. Thus, approximately 15,000 cubic yards of dirt would be imported to the Project site via haul trucks. Work would be performed through drilling, dewatering, excavation, and compaction. Equipment is anticipated to involve the following equipment: drilling riggers, excavators, compaction equipment, scrapers, and loaders. Site excavation and grading are anticipated to take up to two months.

Other Construction Methods

The proposed buildings would be constructed using Designing for Industrialized Methods of Construction (DIMC). This construction method allows portions of the building to be prefabricated off site and transported to the Project site to be maneuvered into position within a slipform core of the building. This method would ensure an efficient construction process by allowing for the just-in-time delivery of prefabricated components to the Project site. In addition, the initial groundwork and structure construction could occur simultaneously with the manufacture of off-site pods and precast/ prefabricated structures, which would reduce the overall time needed for construction. Upon arrival to the Project site, the modules would be craned off the truck and lifted and locked into place. After a few stories are erected, the façade would be delivered and installed using mast climbing work platforms, while the rest of the modules are placed. The roof of the building would later be installed, and finally the external works of the building would be completed. Off-site construction would reduce the requirements for large staging areas associated with more traditional construction methods and would improve the on-site construction logistics by allowing for fewer deliveries and trades on site.

Due to the current road layout, it is anticipated that access to the construction site would be primarily from the south off Gilman Drive, leading to potentially large numbers of deliveries in the area. Due to the size of vehicles able to transport oversized Project elements to the site, there would be restrictions on time of travel. Travel would generally be restricted for wide loads over 10 feet between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m.

Construction will take place in phases including the following:

- Abatement and Demolition
- Grading and Site Utilities
- Installation of Foundations
- Construction of Structures
- Exterior Finishes
- Landscape/Hardscape

Full site preparation and construction is anticipated to take up to 26 months, with approximately 4 months of site preparation and 22 months of construction.

A Geotechnical Evaluation was prepared for the proposed Project by Ninyo and Moore in September 2018 and an addendum to the report was prepared in January 2020 (see Appendix A, Geotechnical Evaluation). As described in the Section 2.5.6, Project Construction, the proposed Project has been designed to comply with the geotechnical recommendations in the report.

The proposed Project would also comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activity (General Permit). Division II of the guidelines also requires stormwater best management practices (BMPs) to be implemented in accordance with UC San Diego's NDPES Phase II Small MS4 General Permit (2013 0001-DWQ) and/or Storm Water Management Program. As part of the General Permit, campus construction projects managed by outside contractors and disturbing more than one acre must implement Storm Water Pollution Prevention Plans (SWPPPs), which specify BMPs to reduce the contribution of sediments, spilled and leaked liquids from construction equipment, and other construction-related pollutants to stormwater runoff.

2.5.6 Sustainability Features

The UC Sustainable Practices Policy covers nine areas of sustainable practices: green building, clean energy, climate protection, sustainable transportation, sustainable operations, recycling and waste management, environmentally preferable purchasing, sustainable foodservices, and sustainable water systems. The UC Sustainable Practices Policy establishes guidelines and includes climate change goals for the campus.

The proposed Project would embody UC San Diego's commitment to sustainable design, sustainable construction practices, and sustainable living. The Project would meet a minimum rating of LEED Silver with a goal of meeting the requirements for LEED Gold. Sustainable strategies have been organized around six primary focus areas:

1. **Location and Transportation**: The Project's proximity to the new Pepper Canyon LRT Station and the Gilman Transit Hub, and the exclusion of parking from the Project program would encourage the use of transit. The Project's location near the center of campus also encourages pedestrian and bicycle transportation modes. As such, building occupants are not likely to utilize single-occupancy vehicles. The inclusion of amenities such as on-site retail and bike storage would further decrease reliance on fossil fuel-burning vehicles.

2. **Site and Landscape**: The Project would have a robust landscape program, with the provision of two large housing courtyards. These zones would be landscaped with native and adapted plant species that would be low-water use.

3. **Water**: Indoor water use would be reduced through low-flow fixtures in kitchens and bathrooms. Outdoor water use would be reduced through the selection of

native and adapted plant species. In addition, where irrigation is required, water would be provided via the campus recycled water loop.

4. **Energy**: Energy use for mechanical cooling would be greatly reduced by the provision of natural ventilation at all living units and student lounges and the use of operable windows for ventilation and exterior sunshades. Energy use for lighting would be reduced by the optimization of daylight at all occupied areas, except for outdoor safety lighting which would be the minimum necessary for nighttime safety. A rigorous commissioning process would ensure that all building systems are operating at their maximum efficiency. The Project would also obtain electricity from clean sources.

5. **Materials**: Interior and exterior materials would be carefully evaluated for their health, their durability, and their maintenance requirements and selected through a life-cycle decision-making process. Recycled materials and materials from regional sources would be utilized where possible.

6. **Construction Methods**: Off-site methods of construction would be utilized for some building components to decrease construction waste and provide a quieter, safer, less-congested Project site. Demolition materials would be recycled in accordance with UC San Diego policies.

2.5.7 Planned and Pending Surrounding Development

The proposed Project is located within an area of UC San Diego that is under active construction associated with the Epstein Amphitheater and Public Realm Improvements and related capital improvement projects.

Pepper Canyon Ancillary Site Work

Pepper Canyon, designated as the Urban Forest category of the campus Open Space Preserve, was disturbed during construction of the Trolley extension and UC San Diego Central Campus Station. The Pepper Canyon Ancillary Site Work project, which was approved in May 2021 and is currently under construction, aims to restore much of the canyon including landscape and hardscape improvements. The scope of work includes construction of a Regional Storm Water Quality Basin sized to accommodate and treat storm water flows from surrounding existing and planned development. The project scope also includes construction of the East Rim Multimodal Path. The project is anticipated to be completed by mid-2022

Epstein Amphitheater & Public Realm Improvements

The Epstein Amphitheater and Public Realm Improvements Project would be composed of the Amphitheater, the surrounding public realm, D&IB landscaping, public art, and a fieldhouse replacement at Warren Field. This project is currently under construction and is located just to the north of the proposed Project site across Rupertus Walk. The project will complete the surrounding public area improvements instigated by the completed UC San Diego Central Campus Station. Construction is under way and is anticipated to be completed in summer 2022, at which point the Pepper Canyon West Project is anticipated to begin its construction.

Triton Pavilion for Student Resources and Community Engagement Project

The proposed Triton Pavilion for Student Resources and Community Engagement (Triton Pavilion) Project would redevelop two adjacent low-density parcels at the center of campus, with a new multipurpose building space that creates a campus “downtown” feel. This project would construct multiple buildings, which will be consistent with the pedestrian-scaled, urban context of the neighborhood, and would preserve view corridors for the campus’ most iconic building – the Geisel Library – which is located north of the project site. The two parcels included in the project are bisected by Myers Drive, which is approximately three blocks west of the Project site (see Figure 2). Myers Drive would also be improved to create a drop-off area for ride-share and visitor tour vehicles at the center hub of the campus, and to facilitate pedestrian circulation.

This project would house student support and other community programs and services and create an arrival destination at the center of campus for students, prospective students, faculty, staff, alumni, and visitors. The project would include space for a variety of campus programs and services that possess compatible elements, including student health and wellness, alumni and community engagement, international programs, campus support space, and retail space. The project was briefly placed on hold at the start of the COVID-19 pandemic and was then resumed. It remains in the preliminary plans phase and full project approval is not anticipated until sometime in late 2022. Environmental review for the project is currently underway.

La Jolla Innovation Center

The La Jolla Innovation Center project is a public-private partnership project located on UC San Diego property and designed and constructed by a private developer. The project is currently under construction on a site near the edge of the La Jolla campus at the intersection of La Jolla Village Drive and Villa La Jolla Drive. The project is being built to house several UC San Diego Health and UC San Diego Extension programs that are currently located in several seismically non-compliant buildings. The project is being built to serve students, patients, and the larger community with classrooms, meeting space, offices, a ground-floor café, and on-site parking. The project is anticipated to be completed in fall 2023.

Spinal Cord Injury and Community Living Center

The Spinal Cord Injury and Community Living Center is a new four-story building located at the VA Medical Center campus. The project would provide medical care to treat veterans with spinal cord injuries and disorders. The project is currently under construction and will provide 50 private spinal cord injury inpatient rooms, 32 Community Living Center beds, and outpatient and therapy clinics. The project also includes upgrades to the VA Medical Center's existing central utility plant and construction of a new 916-vehicle parking structure. The project is anticipated to be completed by in 2024.

2.6 PROJECT APPROVAL/SCHEDULE

The Pepper Canyon West Housing Project is anticipated to be constructed and occupied by fall 2024. As a public agency principally responsible for approving or carrying out the Project, the University of California is considered the Lead Agency under CEQA. The Addendum for this Project would be considered by The Regents or their delegate and the Project may be approved at The Regents (or their delegate's) discretion, and only if The Regents (or their delegate) determine that such approval complies with CEQA.

3 Consistency with 2018 LRDP

To determine whether the Project is covered by the 2018 LRDP and 2018 LRDP EIR, the following questions must be answered:

- Are the objectives of the Project consistent with the objectives adopted for the 2018 LRDP?
- Are the changes to campus population associated with the Project included within the scope of the 2018 LRDP's population projections?
- Is the proposed location of the Project in an area designated for this type of use in the 2018 LRDP?
- Is the Project included in the amount of the development projected in the 2018 LRDP?
- Are the Project activities within the scope of the environmental analysis in the 2018 LRDP EIR?
- Have the conditions described in State CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR occurred?

Sections 3.1 through 3.4 document the Project's consistency with the objectives, population projections, land use designations, and development projections contained in the 2018 LRDP.

Section 4 contains a detailed examination of environmental topics with the potential for significant impacts addressed in the 2018 LRDP EIR and documents whether or not the Project is consistent with and within the scope of the environmental impact analysis of the 2018 LRDP EIR.

3.1 2018 LRDP OBJECTIVES

Key objectives of the 2018 LRDP, as outlined in the plan, include: accommodate projected growth by expanding both academic and non-academic programs in support of the UC mission; establish two new undergraduate colleges; locate buildings in accordance with the established character, scale and design; co-locate and strengthen campus programs; activate and enliven the campus through mixed-use and transit-oriented development; redevelop the University Center into a town center; house approximately 65 percent of eligible students; provide faculty/staff affordable housing options; expand and enhance facilities for UC Health; expand multi-modal connections and trip reduction programs; implement sustainable development practices; and be responsible stewards for the campus open space systems.

The Project would support the following 2018 LRDP objectives:

Accommodating Projected Growth. The Project would provide 572,500 GSF of space for student housing and 8,000 GSF of campus-serving retail at ground level. As described below in Section 3.2, the 2018 LRDP anticipates an increase in total campus population. This increased population would require additional on-campus housing, which the Project provides. Furthermore, the Project would provide retail and passive recreation space near Central Campus to serve students, staff, faculty, and visitors to the campus arriving from the adjacent UC San Diego Central Campus Station of the Trolley LRT system.

Mixed-use and Transit-oriented Development. The Project would support a dense, mixed-use development adjacent to the Trolley's UC San Diego Central Campus Station. It would therefore encourage the use of regional transit networks and reduce the need for automobile commuting for residents and staff. Ground-level campus-serving retail would be provided for ease of use for both the Project's residents and visitors to the West Campus. The Project would also be located between two major Triton Transit shuttle stops: Gilman Transit Center and Central Campus Station. Through the Project's Woonerf and West Rim Walk connectors, the Project would have quick access to East Campus and the rest of West Campus via the nearby Triton Transit shuttle stops.

Redevelopment of University Center. The Project's location next to University Center and adjacent to the Trolley's UC San Diego Central Campus Station would support the continued redevelopment of University Center as a walkable and active "town center." The Project would provide multiple uses, including dense housing, ground-level retail, and passive recreation. The Project's Woonerf and West Rim Walk would provide connections between the University Center and nearby areas within West Campus.

Additional Campus Housing. The Project would directly support the goal to provide housing for 65 percent of the eligible student population. The Project would replace the aging low-density housing currently located on the site through the construction of a high-density project . The Project proposes 1,316 beds within two high-rise residential towers and would be designed to connect to nearby campus amenities.

Expand Multi-modal Connections. The Project would be located adjacent to the Trolley's UC San Diego Central Campus Station, which would allow for the reduction of automobile commuting by the Project's residents and staff. The Project would construct a Woonerf, or "living street" which would provide pedestrian, bicycle, and low-speed vehicular access through the Project site, connecting Gilman Drive and the nearby Gilman Transit Center to Rupertus Walk and the Epstein Amphitheater. The Project's West Rim Walk would provide pedestrian access adjacent to the Pepper Canyon OSP and the Project's courtyards. Both the Woonerf and West Rim Walk would provide direct multi-modal access through the Project site between Gilman Drive and the Trolley.

Sustainable Development Practices. The Project would minimize environmental impacts through sustainable development practices related to building siting and design. The Project would meet LEED Silver certification (while striving for Gold), with water and energy-reducing features. Landscaping areas would be planted with native and drought-tolerant plants to promote native species and reduce water use.

Campus Open Space Systems. The Project recognizes the importance of campus open spaces and would form a balance between the built environment of the Project's structures and the adjacent open space within Pepper Canyon. The Project would provide landscaped courtyards and the West Rim Walk to transition from the Project's high-density housing to Pepper Canyon's restored OSP.

3.2 2018 LRDP CAMPUS POPULATION

The 2018 LRDP anticipates that the total campus population would grow by 16,750 people over the 2018 LRDP planning period, resulting in a total population of 65,600 by 2035 (Table 3-1). The Project would provide beds for 1,316 residents and is anticipated to result in an incremental increase in staff population (approximately 50 people) related to residential staff, retail staff, and other employees that would directly support the Project. Staff growth associated with the program was considered and anticipated in the 2018 LRDP, and the Project would not cause an exceedance of the 21,000 total staff anticipated by the 2018 LRDP. Although the Project would lead to an increase in the number of students residing on campus, as well as staff working on the UC San Diego campus, the level of growth is consistent with 2018 LRDP population projections,

The campus population presented in this table does not represent just those physically present on campus in any given day. Rather, it represents total student enrollment and full-time-equivalent employees (e.g., "headcount"). The population figures are not adjusted to reflect the fact that not all students, faculty, and staff are on campus simultaneously on any given day due to variations in class and working/teaching schedules, vacations, sick leave, and sabbaticals. Additionally, since the onset of the COVID-19 pandemic in early 2020, a portion of the total campus population has transitioned to online learning and remote work schedules which may continue long-term. Thus, the actual on-campus population on any given weekday would be less than that presented in this table.

Table 3-1
Total Campus Population Growth Projections

Category	Fall 2015 (Baseline)[1]	Fall 2021 (Actual)[2]	Fall 2035 (Projected)[1]
Students	32,850	41,875	42,400
Faculty	1,300	1,770	2,200
Staff	14,700	18,730	21,000
Total Population	**48,850**	**62,375**	**65,600**

Sources:
[1] UC San Diego2018a.
[2] Current annual data provided by Campus Planning Office.

3.3 2018 LRDP LAND USE

The Land Use Plan of the 2018 LRDP describes functional land use categories that reflect those activities that would be predominant in any given area of campus (Figure 2-3 in the 2018 LRDP EIR). Predominant uses are the primary programs, facilities, and activities in a general geographic area. Other support or ancillary uses are allowable within any given area defined by a predominant use.

The 2018 LRDP designates the Project site as Academic Mixed Use, defined as land and structures that are for academic and administrative activities that generally serve the campus community, including student housing. The Project would redevelop approximately 8.6 acres with new student housing and associated retail and outdoor areas to accommodate 1,316 residents. This would be consistent with the Academic Mixed-Use category, as it would provide multiple uses that would serve both the Project and the campus community, and is located adjacent to the campus University Center neighborhood that includes a mix of uses and urban density. Therefore, it has been determined that the Project is consistent with the land use categories in the 2018 LRDP.

3.4 2018 LRDP DEVELOPMENT SPACE

The 2018 LRDP provides capacity for approximately 9 million GSF of additional building space for academic, clinical, housing, administrative, and service programs. This projected net increase accounts for the potential removal (demolition) of approximately 1 million GSF of buildings that are beyond their useful life and/or are located in strategic redevelopment areas. The total new campus building space is presented by geographic area on the UC San Diego La Jolla campus as shown in Table 3-2 below.

Table 3-2
Total Campus Space Projections

Campus Location	Fall 2015 (Baseline) (GSF)[1]	Fall 2021 (Actual) (GSF)	Fall 2035 (Projected) (GSF)
West Campus	11,099,000	12,360,300	16,046,000
East Campus	3,075,300	5,011,900	9,358,300
Scripps Institution of Oceanography	1,018,000	1,018,000	2,011,000
Nearby Properties	471,000	471,000	471,000
Total Space	**15,663,300**	**18,861,200**	**27,886,300**

Sources:
[1] UC San Diego 2018a

As described in Section 2.5.5, the Project would demolish all structures on the site totaling 55,000 GSF. This includes eight two-story apartment buildings and three one-story service buildings. The Project would construct 580,500 GSF of residential and retail space. Including the removal of the existing Camp Snoopy structures, the Project would increase the total space within the West Campus from 12,360,300 to approximately 12,885,800 GSF. Based on this data, it has been determined the Project would not exceed the building space projections contemplated in the 2018 LRDP and is consistent with the plan.

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4 Consistency with 2018 LRDP EIR

The evaluation contained in this consistency review was conducted in accordance with §15152 and §15183.5(a) of the State CEQA Guidelines which allow for tiered CEQA review provided the Project's effects have been addressed in a prior (or earlier) programmatic analysis. The 2018 LRDP EIR is a Program EIR that comprehensively addressed the potential environmental effects of campus growth and development due to implementation of future projects and activities proposed under the 2018 LRDP EIR. Therefore, given the consistency of the proposed Project with the 2018 LRDP, a tiered CEQA review is appropriate.

In January 2019 and following certification of the 2018 LRDP EIR, amendments and additions to Appendix G of the State CEQA Guidelines went into effect. Because the Governor's Office of Planning and Research (OPR) proposed these amendments and additions to Appendix G of the State CEQA Guidelines in 2018, UC San Diego was able to anticipate the checklist changes during the preparation of the 2018 LRDP EIR and incorporate those concepts into the certified EIR. Therefore, while the 2018 LRDP EIR reflects the Appendix G checklist questions that were in effect at the time of EIR certification, the analysis contained therein reflect the context of and appropriately address the amended Appendix G that was approved in 2019. To address the amendments directly, this Addendum Checklist reflects the current Appendix G of the CEQA Guidelines and refers to sections of the 2018 LRDP EIR where relevant analysis can be found.

4.1 EVALUATION OF PROJECT ENVIRONMENTAL IMPACTS

Checklist Explanation

On the basis of the tiering and subsequent review concepts identified in the CEQA Guidelines, the University has defined the following column headings in this Addendum Checklist. Both headings rely on the relevant analyses in the 2018 LRDP EIR:

<u>Impacts Adequately Examined in the 2018 LRDP EIR:</u> This column is checked where the potential impacts of the Project were adequately examined in the certified 2018 LRDP EIR. Where applicable, mitigation measures identified in the 2018 LRDP EIR would mitigate the impacts of the Project. All applicable mitigation measures from the 2018 LRDP are incorporated into the Project as noted in Section 5 of this Addendum Checklist. The Project is consistent with the analysis evaluated in the 2018 LRDP EIR.

<u>Impacts Not Examined in the 2018 LRDP EIR:</u> If a column is checked in this section, this indicates potential effects of the Project were not adequately evaluated in the certified 2018 LRDP EIR. However, as described in the supporting text, the potential effects of the Project could result in: a) no impact in the category; b) less-than-significant impact in the category; or c) new potentially significant impact. In the instance that a) or b) is checked, no

additional CEQA documentation would be necessary. In the instance that c) is checked, additional CEQA documentation would be necessary to further address the issue. All applicable mitigation measures (LRDP Program and/or project-specific) would be incorporated into the Project as noted in Section 5 of this Addendum Checklist.

Environmental Topics Addressed

The following environmental resources, if checked below, would be potentially affected by this Project and would involve at least one significant impact that substantially exceeds or is otherwise outside the scope of activities evaluated for potential environmental effects in the 2018 LRDP EIR, as discussed below in Sections 4.1.1 through 4.1.15 of the Addendum Checklist. Agriculture and Forestry and Mineral Resources are discussed in Section 4.1 of the 2018 LRDP EIR under *Effects Not Found to be Significant*. As noted in those discussions, no potential for significant impacts to those topics would occur due to the lack of such resources on the UC San Diego La Jolla campus. As such, those topics are not discussed in this Addendum Checklist.

If "None" is checked below, this Project is deemed entirely consistent with and covered by the environmental analysis contained in the 2018 LRDP EIR.

☐ Aesthetics	☐ Air Quality	☐ Biological Resources
☐ Cultural and Tribal Cultural Resources	☐ Energy	☐ Geology and Soils
☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials	☐ Hydrology and Water Quality
☐ Land Use and Planning	☐ Noise	☐ Population and Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities and Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance
☒ None		

4.1.1 Aesthetics

Section 3.1 of the 2018 LRDP EIR evaluates the impacts of campus growth under the 2018 LRDP on aesthetics. The 2018 LRDP EIR concludes that implementation of future projects under the plan would result in potentially significant impacts to scenic vistas, visual character or quality and light or glare (Sections 3.1.3.1 through 3.1.3.3). No potential for significant impacts to scenic resources within the viewshed of the state scenic highway is identified (Section 3.1.5). Mitigation Measures (MM) Aes-1 (scenic vistas) and Aes-2A and Aes-2B (visual character/quality) and Aes-3 (night lighting) are identified in the mitigation framework of the 2018 LRDP EIR for projects that would contribute to these impacts. Implementation of the measures would reduce the future aesthetics impacts to less than significant levels, consistent with the 2018 LRDP.

AESTHETICS	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
Would the Project…		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

a) As shown on Figure 3.1-2, Campus Visual Resources, of the 2018 LRDP EIR, the Project site is not located within a designated Visual Sensitive Zone (Scripps Institute of Oceanography [SIO]), Perimeter Development Zone (PDZ), or within view of any of the Key Vantage Points (KVPs). As described in Section 2.2, Project Site and Setting, the Project site is currently located on 8.6 acres of the existing Pepper Canyon West "Camp Snoopy" Residences and is therefore located on previously developed land. As discussed in Section 2.5.5, the existing one to two story buildings and its associated features and landscaping would be demolished to construct the Project buildings, and associated landscaping and hardscaping features. Although the visual character of the Project site would change upon completion of the Project, the Project would not have the potential for a significant impact to views because it is not located at a scenic vista location. Furthermore, it should be noted that per Senate Bill 743, a project's aesthetic impacts will not be considered significant if the project is a residential, mixed-use residential, or employment center project and is located on an infill site within a Transit Priority Area (TPA), which is defined as being within 0.5-mile of a major transit stop. Because the Project is a residential project located approximately 135 feet from the UC San Diego Central Campus Station of the Trolley LRT system, impacts associated with aesthetics are considered less than significant. Therefore, the Project would result in less than significant impacts consistent with the scenic vistas/views analysis evaluated in the 2018 LRDP EIR.

b) Implementation of the Project would not result in substantial damage to scenic resources within a state scenic highway because no such resources or roads exist on or adjacent to the UC San Diego, La Jolla campus. Therefore, the Project would result in less than significant impacts consistent with the scenic resources analysis evaluated in the 2018 LRDP EIR.

c) The Project is located within an urbanized area and would comply with the 2018 LRDP and UC San Diego design guidelines. Because the Project would comply with all applicable UC regulations governing scenic quality, the Project would not have the potential for a significant impact related to degradation of the visual character of the site and its surroundings. In addition, the Project is not near a campus visual resource, (refer to Figure 3.1.2 in the 2018 LRDP EIR). It should be noted that per Senate Bill 743, a project's aesthetic impacts will not be considered significant if the project is a residential, mixed-use residential, or employment center project and is located on an infill site within a TPA, which is defined as being within 0.5-mile of a major transit stop. Furthermore, the Project's early concept design was reviewed by the Design Review Board (DRB) in January and August 2019 to assess its consistency with the visual landscape and character of the surrounding development. Input received on the design included shadows, pedestrian pathways, landscape connections, and architectural fenestration and materials. Following a project hold due to the onset of the COVID-19 pandemic in 2020 through late 2021, final design incorporated DRB input, and will be reviewed for final design endorsement as required by 2018 LRDP MM Aes-2A. Because the Project is a residential project located adjacent to the UC San Diego Central Campus Station of the Trolley LRT system, impacts associated with aesthetics are considered less than significant. Therefore, the Project would result in less than significant impacts consistent with the visual character and quality analysis evaluated in the 2018 LRDP EIR.

d) Lighting fixtures, including safety lighting, would be provided on all pathways within the Project, including the Woonerf, West Rim Walk, and trails. As with all projects at UC San Diego, the Project has been designed to comply with the UC San Diego Design Guidelines which includes an Outdoor Lighting Policy. Compliance with these policies would require building materials that appropriately reduce glare (e.g., “clear vision” glass to minimize glare and reflectivity) as well as light fixtures that would be downcast and would minimize light pollution or spill over. Further, the Project does not include a parking garage that would result in vehicle headlights affecting nighttime views. Therefore, because the Project would not create any new source of substantial light or glare that could adversely affect daytime or nighttime views in the area, the proposed Project would result in less than significant impacts consistent with the light and glare analysis provided in the 2018 LRDP Program EIR.

4.1.2 Air Quality

Section 3.2 of the 2018 LRDP EIR addresses the air quality effects of campus growth under the 2018 LRDP and concludes that its implementation would result in potentially significant impacts from construction and operational activities that could lead to a violation of air quality standards or contribute substantially to an existing or projected air quality violation (Section 3.2.3.2). Cumulatively significant impacts were identified due to a considerable net increase in criteria pollutants in a region that is in non-attainment (Section 3.2.3.3). Potentially significant construction-related emissions would cause exposure of sensitive receptors to toxic air contaminant (TAC) emissions (Section 3.2.3.5). Less than significant impacts were identified related to consistency with the Regional Air Quality Strategy (RAQS) and State Implementation Plan (SIP) and due to carbon monoxide hot spots (Sections 3.2.3.1 and 3.2.3.4). No potential for significant odors impacts was identified (Section 3.2.5).

MM AQ-2A (fugitive dust emissions) and AQ-2B (off-road construction emissions) are required for projects that would contribute to these impacts. However, the 2018 LRDP EIR acknowledges that not all projects under the plan can feasibly implement MM AQ-2B and certain projects would contribute to significant and unavoidable impacts related to criteria pollutants and TACs.

AIR QUALITY Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state ambient air quality standard?	☒	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐

a) The 2018 LRDP incorporates development strategies identified in the San Diego Association of Governments (SANDAG) Regional Transportation Plan and Sustainable Communities Strategy by integrating land use, housing, and transportation planning, which is consistent with the goals developed by SANDAG and the University land use assumed in the Regional Air Quality Strategy (RAQS). The Project is consistent with the 2018 LRDP, as described in Section 3 of this Addendum. At the project level, the Project is consistent with these strategies.

The Project would not construct vehicular parking and would be adjacent to the UC San Diego Central Campus Station of the Trolley LRT system, which would provide access to multimodal transportation for the Project's residents. The Project would promote pedestrian and bicycle mobility by enhancing pedestrian connections and access to the site. The Project would connect to Rupertus Walk north of the Project and it would construct a Woonerf and the West Rim Walk along the Project's western and eastern edges, respectively. The Project would also include alternative transportation facilities such as bicycle racks throughout the site. In addition, the Project is located in close proximity to the Gilman Transit Center that provides access to many regional and local bus routes. Together these elements would reduce operational mobile source emissions associated with the Project. Therefore, the Project would result in less than significant impacts and is consistent with the air quality management plan analysis evaluated in the 2018 LRDP EIR.

b) Implementation of the Project would contribute to a cumulatively considerable net increase of criteria pollutants for which the region is in nonattainment under an applicable federal or state ambient air quality standard. MMs AQ-2A (fugitive dust emissions) and AQ-2B (off-road construction emissions) would be incorporated into construction specifications to minimize this impact. With these measures in place, the

Project would result in less than significant impacts. However, the feasibility of implementing MM AQ-2B is not assured. Therefore, implementation of the Project would contribute to a cumulatively considerable net increase of criteria pollutants for which the region is non-attainment. The Project is consistent with the air quality analysis evaluated in the 2018 LRDP EIR.

c) Future traffic associated with the Project would not result in or contribute to any exceedances of the 1-hour or 8-hour CO standards during the AM peak periods. Therefore, operation of the Project would not expose sensitive receptors to substantial pollutant concentrations caused by localized CO impacts. The Project would result in less than significant impacts and is consistent with the air quality analysis evaluated in the 2018 LRDP EIR.

TAC emissions would be associated with Project-related construction and operations due to diesel PM emissions from construction equipment and motor vehicles. As described in Section 3.2.3.5 of the 2018 LRDP EIR, campus growth, including the Project, would not exceed the risk threshold for on-campus residents and workers; however, the potential to exceed the thresholds for cancer risks for off-campus residents and workers and off-campus and on-campus sensitive receptors on a programmatic level would exist. Because construction of the Project, as well as traffic generated during its operations, would contribute TAC emissions, MM AQ-2B would be incorporated into construction specifications to minimize this impact. However, the feasibility of implementing MM AQ-2B is not assured and the Project would contribute to the significant and unavoidable air quality (TAC) impacts associated with implementing the 2018 LRDP, consistent with the air quality analysis evaluated in the 2018 LRDP EIR.

D) Potential sources that may emit odors during construction of the Project would include exhaust from diesel construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, odors from construction equipment would not affect a substantial amount of people. The Project would use typical construction techniques, and the odors from off-road equipment and on-road vehicles would be typical of most construction sites and temporary in nature. In addition, Project operation would not produce new substantial sources of odor or other pollutants that would adversely affect a substantial number of people. The Project would include uses associated with residential living and ground-level retail. Operational odors would therefore be related to the cooking of food within indoor spaces or at outside grills. Therefore, the Project would result in less than significant impacts and is consistent with the air quality analysis evaluated in the 2018 LRDP EIR.

4.1.3 Biological Resources

Section 3.5 of the 2018 LRDP EIR addresses the effects of campus growth under the 2018 LRDP on biological resources and concludes that its implementation would result in potentially significant impacts to sensitive biological resources, including candidate, sensitive, or special-status plant species (Section 3.3.3.1); sensitive animal species (Section 3.3.3.2); and sensitive vegetation communities (Section 3.3.3.3) and federally-protected wetlands (Section 3.3.3.4). No potential for significant impacts to wildlife corridors or linkages and conflicts with local policies or ordinances, including any adopted habitat conservation plans (Section 3.3.5) was identified.

The mitigation framework addresses all of the potentially significant impacts identified in Section 3.3.3 of the 2018 LRDP EIR. If an LRDP project would impact sensitive plants, the site would be surveyed for sensitive plants in accordance with MM Bio-1A and, if applicable, San Diego barrel cactus would be relocated in accordance with MM Bio-1B. For impacts to sensitive animal species, surveys for the species, construction noise attenuation, and agency consultation is required by MMs Bio-2A, 2B, and 2C and avian nest surveys and avoidance measures are required by MMs Bio-2D and 2E. MMs Bio-3A and 3B require project-level surveys for sensitive vegetation communities, while avoidance and compensatory mitigation is required by MMs Bio-3C and Bio-3D. Indirect construction impacts are addressed through the implementation of MMs Bio-3E and Bio-3F, and indirect operational impacts require compliance with MMs Bio-3G through Bio-3M. Implementation of these measures would reduce future project-level impacts to less than significant levels.

BIOLOGICAL RESOURCES	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
Would the Project…		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☒	☐	☐	☐

BIOLOGICAL RESOURCES Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
c) Have a substantial adverse effect on state or federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

a) The 8.6-acre Project site would largely be located within an existing developed site that the 2018 LRDP EIR defines as Urban/Developed Land (refer to Figure 3.3-2 in the 2018 LRDP EIR). The Project site currently hosts multiple mature trees, which may house nesting avian species such as raptors. To reduce impacts to nesting birds during construction, 2018 LRDP EIR MMs Bio-2D and Bio-2E would be implemented. The Project would be constructed adjacent to Pepper Canyon OSP, and would provide trails extending into the canyon. The portion of Pepper Canyon OSP adjacent to the Project was identified as Eucalyptus Woodland and non-native grassland as shown on Figure 3.3-2 of the LRDP EIR. However, the construction of the Trolley's Blue Line extension (SANDAG's Mid-Coast Corridor Transit Project) has substantially altered or removed the majority of habitat within the portions of the canyon, including where the Project's trails would be located. Furthermore, nearby Diegan coastal sage scrub east and north of the Project site in Pepper Canyon has been removed by SANDAG's Mid-Coast Corridor Transit Project and from construction related to the Epstein Amphitheatre and Public Realm project. Any impacts to biological resources by the trolley construction were evaluated and mitigated for as part of those projects. Therefore, the Project site does not currently support habitat for special-status species, and the Project would not cause any significant direct impacts. However, the Project would be located adjacent to the

Pepper Canyon OSP, which contains a small, isolated wetland that has been protected from the past and ongoing adjacent development projects and would not be impacted by the proposed Project. Additionally, much of the canyon would undergo re-vegetation pursuant to its Open Space Preserve “Urban Forest” designation as part of the Pepper Canyon Ancillary Site Works project described in Section 2.5.7 and close-out of the Mid-Coast Corridor Transit Project. Therefore, 2018 LRDP MMs Bio-3E and Bio-3F would be to address potential indirect construction impacts associated with OSP vegetation communities, and MMs Bio-3G, Bio-3H, Bio-3I, Bio-3K, and Bio-3M would be required to address potential impacts during operations. Therefore, with incorporation of these measures, the Project would be consistent with the sensitive species analysis evaluated in the 2018 LRDP EIR.

b, c) The Project site is developed, as noted above under item 4.1.3 a, and does not contain any aquatic, wetland, or riparian habitat. While there is a small, isolated wetland located within Pepper Canyon OSP near the Project site, it is located outside of the Project’s construction limits and would not be affected by the Project. No significant impacts to such resources would occur and the Project is consistent with the biological resources analysis evaluated in the 2018 LRDP EIR.

d) Development of the Project, located within a previously developed area, would not preclude wildlife movement or impact wildlife corridors or linkages as none exist on the campus. Therefore, the Project is consistent with the biological resources analysis evaluated in the 2018 LRDP EIR.

e) UC San Diego is a part of the UC, a constitutionally created unit of the State of California. As a state entity, UC is not subject to municipal plans, policies, and regulations, such as County and City General Plans or local ordinances. Thus, the Project would not result in any conflicts with any local policies protecting biological resources and is consistent with the biological resources analysis evaluated in the 2018 LRDP EIR.

f) The Project would not directly or indirectly affect resources preserved by the City of San Diego as part of its Multiple Species Conservation Plan (MSCP). Therefore, no impacts are anticipated to the City’s MSCP or the NCCP Program and is consistent with the biological resources analysis evaluated in the 2018 LRDP EIR.

4.1.4 Cultural and Tribal Cultural Resources

Section 3.4 of the 2018 LRDP EIR addresses the effects of campus growth under the 2018 LRDP on archaeological and historical resources, including tribal cultural resources, and concludes that its implementation would result in potentially significant impacts due to potential alterations of historical (built environment) resources that would cause a substantial adverse change in their significance (Section 3.4.3.1); land disturbance of recorded archaeological resources and unrecorded subsurface archaeological resources

(Section 3.4.3.2); disturbance of human remains and of potential human remains in unrecorded subsurface sites (Section 3.4.3.4); and disturbance of tribal cultural resources (TCRs) (Section 3.4.3.5). Disturbance of geological formations containing paleontological (fossil) resources (Section 3.4.3.3) is discussed further in Section 4.1.6, Geology and Soils, of this Addendum.

The mitigation framework addresses all of the potentially significant impacts identified in Section 3.4.3 of the 2018 LRDP EIR. For impacts to historical resources, MM Cul-1A requires an analysis of historical resources and avoidance through compliance with the Secretary of the Interior's Standards for Rehabilitation; project redesign is required in accordance with MM Cul-1B; preparation of documentation is required by MM Cul-1C; and feasible relocation of historical resources through compliance with MM Cul-1D. Supplemental measures are also required for certain projects as described in MM Cul-1E through Cul-1G. Demolition would be considered a significant and unavoidable impact of the 2018 LRDP implementation.

The mitigation framework requires the identification of archaeological resources in the Area of Potential Effects (APE) and evaluation in accordance with MM Cul-2A; avoidance of impacted resources per MM Cul-2B; documentation and treatment is required by MM Cul-2C; unknown resources, including human remains, are treated in accordance with MM Cul-2D; and construction monitoring to comply with MM Cul-2E. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097.98 is required for inadvertent discoveries of human remains, as noted in MM Cul-2E. Implementation of these measures would reduce future project-level impacts to archaeological resources, including human remains, to less than significant levels.

If campus development would affect TCRs, UC San Diego would initiate tribal consultation and identify feasible avoidance and minimization measures in accordance with MM Cul-5A. If avoidance is not feasible, TCRs would be treated through construction monitoring in accordance with MM Cul-5B; any cultural materials would be returned to the tribe per MM Cul-5C. Implementation of these measures would reduce future project-level impacts to TCRs to less than significant levels.

CULTURAL AND TRIBAL CULTURAL RESOURCES	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
Would the Project…		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Cause a substantial adverse change in the significance of a historical resource as pursuant to §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐

CULTURAL AND TRIBAL CULTURAL RESOURCES Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
c) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐
d) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code §5020.1(k), or	☒	☐	☐	☐
2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code §5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code §5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				

a) Based on the inventory and analysis contained in the Historic Resources Report prepared for the 2018 LRDP EIR (ARG 2018), the Project site does not contain structures or facilities that are eligible for the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR), and the Project site is not located in any of the historic districts defined on campus. Therefore, the Project would not cause any changes to the significance of historic resources due to removals or demolition and is consistent with the historic resources analysis evaluated in the 2018 LRDP EIR.

b,c) Based on a review of the Project's Area of Potential Effects in accordance with MM Cul-2A and the inventory and analysis contained in the Archaeological Resources Report prepared for the 2018 LRDP EIR (AECOM 2018), two identified historic archeological resources are located in the vicinity of the Project site.

Site P-37-032491 is a historic archeological resource that is a rectangular concrete foundation possibly associated with the former Camp Matthews, a Marine Corps rifle range. The concrete pad measures 55 feet long by 31 feet wide, and walls are present along the north and west edges of the resource. The original purpose of the structure is not clear, but may be storage related. No artifacts were observed within or adjacent to the foundations. Research and field survey results indicate that this resource is more than 45 years old and possibly built in the 1950s. However, this site is not eligible or the NRHP or the CRHR because the foundation does not retain integrity of design, materials, workmanship, or feeling of when it was constructed.

Site P-37-032492/CA-SDI-20616 is a historic archeological resource that is composed of concrete culvert that is also possibly associated with the former Camp Matthews. The remains include two wood-formed concrete walls, a concrete base, a metal pipe railing, and a rubble pile of concrete chunks. The south concrete wall measures 14.5 feet long, 8 inches wide, and 82 inches tall and contains the culvert opening. The culvert opening is all concrete, measures 24 inches diameter, and has a modern plastic pipe cemented into it. The east concrete wall measures 12.5 feet long, 6 inches wide, and 65 inches tall. The concrete base joins the two walls, although it is mainly covered with the concrete rubble. The concrete rubble extends approximately 40 feet north of the culvert opening and maybe an attempt to fill the former drainage channel. No artifacts were observed on or adjacent to the site.

Neither of these resources are considered significant archaeological resources, and the Archaeological Resources Report for the 2018 LRDP (AECOM 2018) concluded no further testing was required at these locations. Because of the presence of known resources, the potential also exists for unknown resources and/or buried human remains to be encountered during Project construction. For projects located on the West Campus, MM Cul-2D requires archaeological monitoring for unknown resources within areas of natural deposition and on mesa tops in previously developed sites where prior grading activity has removed two or more feet of soil. Construction monitoring by a qualified archaeologist would be conducted as required by MM Cul-2E. If human remains are inadvertently discovered, the campus would comply with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097.98. Compliance with the 2018 LRDP EIR mitigation framework would ensure the Project would reduce its potentially significant impacts to less than significant levels and is consistent with the cultural resources analysis evaluated in the 2018 LRDP EIR.

d) Assembly Bill (AB) 52 requires that CEQA lead agencies consult with California Native American tribes that have requested such consultation, at initiation of the CEQA process, to identify and evaluate the significance of TCRs. The process for identification of TCRs on the UC San Diego campus consisted of the formal consultation process mandated by AB 52, as well as a Native American consultation and outreach program conducted for the 2018 LRDP EIR.

In January 2016, UC San Diego proactively contacted California Native American tribes traditionally and culturally affiliated with the San Diego region to solicit their interest in being notified of proposed campus development projects as part of the planning process pursuant to AB 52. UC San Diego did not receive any responses as a result of this outreach attempt. However, UC San Diego was contacted independently by the San Luis Rey Band of Mission Indians, who expressed interest in receiving formal notifications of proposed projects on campus. Accordingly, UC San Diego has been sending out formal consultation request letters to the San Luis Rey Band of Mission Indians on a project-by-project basis. Such a letter describing the 2018 LRDP and requesting a consultation was sent to the San Luis Rey Band of Mission Indians on December 9, 2016. Because no response was received within the requested 30 days, UC San Diego assumed that consultation was declined.

The 2018 LRDP EIR Notice of Preparation (NOP) dated November 3, 2016, was also sent to 13 Native American tribes and the Native American Heritage Commission (NAHC) notifying them of the preparation of the 2018 LRDP EIR and soliciting input from them regarding potential environmental issues associated with implementing the 2018 LRDP. Although an NOP response letter was received from the NAHC, no response letters were received from the notified tribes (refer to Appendix A to the 2018 LRDP EIR).

In February 2017, a Sacred Lands File (SLF) search was requested from the NAHC as part of the 2018 LRDP EIR preparation (see Appendix D to the 2018 LRDP EIR). The NAHC responded that sites had been identified within the Project area and recommended contacting the Iipay Nation of Santa Ysabel for more information. Campus representatives then contacted the tribe, which indicated there are several sites in the vicinity of UC San Diego that are considered sacred due to the known presence of human remains. Because the Project is consistent with the 2018 LRDP and is not located on or near the TCRs identified on campus through these prior consultation and communication efforts, less than significant impacts to TCRs are anticipated occur. The Project is consistent with the cultural resources analysis evaluated in the 2018 LRDP EIR. Though impacts to TCRs are not anticipated, 2018 LRDP EIR mitigation measure CUL-5B (Native American construction monitoring) will be implemented during construction of the proposed Project.

4.1.5 Energy

Since the 2018 LRDP EIR was certified, the CEQA Guidelines were amended to provide new requirements to address a project's impacts on energy. While a separate section on Energy was not included in the 2018 LRDP EIR, applicable analyses and discussion to these new CEQA Guidelines questions are located in Section 3.15, Utilities, Service Systems, and Energy (specifically Section 3.15.3.6) of the 2018 LRDP EIR as well as Section 3.6, Greenhouse Gas Emissions. These analyses are referenced below as appropriate. No mitigation related to energy was required in the 2018 LRDP EIR.

ENERGY Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	☒	☐	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

During construction, the Project would result in an increase in energy consumption through the combustion of fossil fuels in construction vehicles, worker commute vehicles, and construction equipment, and the use of electricity for temporary buildings, lighting, and other sources. The Project would also consume energy for building heating and cooling, refrigeration, lighting, electricity, and commercial equipment. New student, visitor, and faculty vehicle trips and fleet vehicle trips associated with the Project would also be a source of energy consumption. However, the Project would comply with the energy conservation strategies expressed in the UC Sustainable Practices Policy. The Project would use electricity purchased from the UC Energy Services Unit Direct Access Program (100 percent renewable). As described in Section 2, the Project would meet a minimum rating of LEED Silver, while striving for LEED Gold. Sustainable strategies to reduce energy use include the use of natural ventilation at all living units and student lounges and the use of operable windows for ventilation and exterior sunshades. Except for outdoor safety lighting, energy use for lighting would be reduced through the optimization of daylight at all occupied areas.

As noted under the VMT discussion under item 4.1.15 g of the Transportation/Traffic discussion, the campus as a whole, including the Project, would produce a VMT that would be measurably lower than the regional and City averages, thus reducing energy usage associated with vehicle trips. Additionally, the Project does not propose vehicular parking, and therefore encourages the use of alternative transportation options. The Project would not result in wasteful, inefficient, or unnecessary use of energy and is consistent with the energy analysis evaluated in the 2018 LRDP EIR.

b) Construction of the Project would implement sustainability measures identified in Section 2.5.6 of this Addendum. Conformance with the UC Sustainable Practices Policy and other UC requirements related to energy reduction and carbon-free energy use would ensure that the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project would not result in any new significant environmental effects or a substantial increase in the severity of previously identified significant effects regarding conflict with energy plan or policy.

4.1.6 Geology and Soils

Section 3.5 of the 2018 LRDP EIR addresses the geology and soils effects of campus growth under the 2018 LRDP and concludes that implementation of future projects under the plan that comply with the applicable regulations related to geologic and soils hazards and result in less than significant impacts related to exposure to seismic-related hazards (Section 3.5.3.1), soil erosion and topsoil loss associated with ground disturbance (Section 3.5.3.2); unstable geologic or soil conditions (Section 3.5.3.3), and expansive soils (Section 3.5.3.4). The analysis determined there is no potential for a significant geology or soils impact related to use of septic tanks or alternative wastewater disposal systems (Section 3.5.5).

No geology and soils mitigation is required in the 2018 LRDP EIR.

Section 3.4, Cultural and Tribal Cultural Resources, of the 2018 LRDP EIR addresses the effects of campus growth under the 2018 LRDP on paleontological resources and concludes that its implementation would result in potentially significant impacts to disturbance of geological formations containing paleontological (fossil) resources (Section 3.4.3.3). Paleontological monitoring is required in formations of high sensitivity; identification and evaluation; avoidance; documentation and treatment; and construction monitoring in accordance with Mitigation Measure Cul-3. Implementation of this measure would reduce future project-level impacts to less than significant levels.

GEOLOGY AND SOILS Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☒	☐	☐	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

a) Although the campus contains seismic hazards, implementation of the Project would not result in significant impacts because the UC San Diego campus and the surrounding area are not located within an Alquist-Priolo Earthquake Fault Zone. The Project site would not be subject to surface fault rupture but could be subject to a severe level of seismic ground shaking. In addition, portions of the campus could be subject to earthquake-induced landslides.

A geotechnical evaluation by Ninyo and Moore was prepared in September 2018 for the area including the Project site. During the July 2018 survey, 31 borings were drilled within the Project site to depths up to 51.2 feet (see Appendix A). Materials encountered consisted of fill, very old paralic deposits, and Scripps formation. Fill materials were found to depths of approximately 12.5 feet. Very old paralic deposits were found from beneath the fill materials to the depths explored. The very old paralic deposits consist of various shades of brown, gray, and yellow, moist, weakly to strongly cemented, silty to clayey sandstone and sandy siltstone. The Scripps formation were also encountered beneath the fill and to the depths explored. The Scripps formation consisted of various shades of gray and brown, moist, weakly to strongly cemented, sandy siltstone with claystone interbeds. Groundwater was not encountered in the borings. Based on referenced geologic maps, literature, topographic maps, and stereoscopic aerial photographs, no landslides or indications of deep-seated landsliding were noted underlying the Project site or in the adjacent areas of Pepper Canyon to the east.

Based on the analysis contained in the 2018 LRDP Program EIR and the results of the Project-specific geotechnical evaluation, the potential for seismic-related liquefaction at the site is considered very low due to the types of soils and depths to groundwater. The Project would comply with the California Building Code (CBC) and the UC Policy on Seismic Safety, which require independent review of structural seismic design of both new construction and remodeling projects. Project compliance with these policies would avoid any potential for seismic hazards and the Project is consistent with the geology and soils analysis evaluated in the 2018 LRDP EIR.

b) Similar to other campus development, the Project would comply with the UC San Diego Design Guidelines, which include the incorporation of LID and erosion and sediment control BMPs, and UC San Diego's Stormwater Management Program and other regulatory requirements, as needed to minimize erosion and topsoil loss. Specifically, the Project would comply with relevant NPDES permits, including the General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit) and the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (Phase II Small MS4 Permit), which require soil erosion control measures. Project compliance with these regulations during construction and operation would provide adequate protection against soil erosion during and after site construction. Therefore, the Project is consistent with the geology and soils analysis evaluated in the 2018 LRDP EIR.

c) The geotechnical evaluation conducted for the Project and adjacent Pepper Canyon site to the east determined that, while the Project site is mapped within a marginally susceptible landslide area, the potential for large-scale slope instabilities is low. As discussed previously, the Project would comply with the CBC and the University of California Seismic Safety Policy which would address unstable soil and slope conditions, if needed. Project compliance with these regulations during construction and operation would provide adequate protection against impacts. The Project is consistent with the geology and soils analysis evaluated in the 2018 LRDP EIR

d) The geotechnical evaluation conducted for the Project and adjacent Pepper Canyon site determined that soils on the Project site exhibit a low expansion index. These soils are generally considered suitable for reuse as fill, provided they meet the recommendations for fill materials as presented in the geotechnical evaluation report and UC San Diego Environment, Health & Safety (EH&S) guidelines. The Project would be required to comply with the CBC and the University of California Seismic Safety Policy. Project compliance with these regulations during construction and operation would provide adequate protection against impacts. The Project is consistent with the geology and soils analysis evaluated in the 2018 LRDP EIR.

e) UC San Diego is provided sanitary sewer service by the City of San Diego. No septic tanks or alternative wastewater systems are used or anticipated to be associated with the implementation of the 2018 LRDP, including the Project. The Project is consistent with the geology and soils analysis evaluated in the 2018 LRDP EIR.

f) Based on the mapping and analysis contained in the 2018 LRDP EIR, the Project site is located within an area of high potential for paleontological resources and would require grading of 1,000 cubic yards or more at depths of 10 feet or greater. Figure 3.4-2 of the 2018 LRDP EIR indicates that eastern portions of the Project site could potentially have "undifferentiated Eocene sedimentary deposits including Ardath Shale and Scripps Formation." Because of the potential for impacts to unique paleontological resources, construction monitoring during initial earthwork activities would be conducted in accordance with MM Cul-3. Compliance with the 2018 LRDP EIR mitigation framework would ensure that the Project would reduce its potentially significant impacts to less than significant levels and is consistent with the cultural resources analysis evaluated in the 2018 LRDP EIR.

4.1.7 Greenhouse Gas Emissions

Section 3.6 of the 2018 LRDP EIR addresses potential impacts from greenhouse gas (GHG) emissions and climate change and determines that implementation of the 2018 LRDP would generate GHG emissions that may have a potentially significant cumulative impact on the environment during construction and operation (Section 3.6.3.1) even with the implementation of GHG Reduction Actions contained in the 2018 LRDP and described in Section 3.6.3.1 of the 2018 LRDP EIR. Despite the projected increase in GHG emissions over time, the campus would not conflict with UC policies and plans adopted for the purposes of reducing GHG emissions which are consistent with GHG reduction targets contained in AB 32 and Senate Bill (SB) 32 (Section 3.6.3.2).

Implementation of programmatic measures identified in the 2018 LRDP EIR mitigation framework require the campus to decarbonize the cogeneration plant after 2032

(MM GHG-1A), to install electric charging stations across the campus (MM GHG-1B), and to conduct annual inventory updates and determine the need for and purchase of carbon credit purchases (MM GHG-1C) to reduce campus-wide contributions to cumulative GHG emissions (and related climate change impacts) to less than significance. No project-level mitigation measures are required for cumulative GHG emissions impacts.

GREENHOUSE GAS EMISSIONS Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose or reducing the emissions of greenhouse gases?	☒	☐	☐	☐

a) Construction and operation of the Project would result in GHG emissions from site preparation, construction vehicle trips, construction equipment, building energy use, water treatment/usage, solid waste disposal, and mobile sources (air and vehicle travel). However, the Project would include multiple design features that would reduce its overall contribution to campus-wide GHG emissions. These green building design features, as described in the Section 2.5.6, Sustainability Features, of this Addendum, would help achieve the Project goal of being certified, at a minimum, as a LEED Silver building and achieve building energy efficiency of 20 percent better than Title 24 energy performance standard, in accordance with the UC Sustainable Practices Policy. These design elements are reflective of UC San Diego's commitment to sustainability.

Although the Project would result in GHG emissions, through the initiatives to reduce campus-wide GHG emissions, Project emissions would be reduced or offset over time. In addition, the Project's emissions would be included in the annual GHG inventory as part of the campus' implementation of MM GHG-1C. The Project is consistent with the GHG analysis evaluated in the 2018 LRDP EIR.

b) The 2018 LRDP contains several GHG Reduction Actions focused on minimizing and reducing future GHG emissions across the campus. Implementation of those strategies would support the University's efforts in reaching the UC Sustainable Practices Policy target of climate neutrality for Scope 1 and 2 emissions by 2025 and climate neutrality for Scope 3 emissions by 2050, which are in line with the UC Carbon Neutrality Initiative and the UC San Diego Climate Action Plan. As described above in item 4.1.7 a, the Project would not conflict with UC Sustainable Practices Policy. Consistent with the overall 2018 LRDP, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose or reducing the emissions of GHGs and is consistent with the GHG analysis evaluated in the 2018 LRDP EIR.

4.1.8 Hazards and Hazardous Materials

Section 3.7 of the 2018 LRDP EIR addresses the hazards and hazardous materials effects of campus growth and determined that implementation of the 2018 LRDP would not result in a potentially significant impact related to the transport, use, and disposal of hazardous materials (Section 3.7.3.1 and 3.7.3.2); or pose a health risk to occupants of the school or the campus community (Section 3.7.3.3). The potential for significant hazards related to listed hazardous materials sites on the UC San Diego campus would exist due to the unknown potential for munitions debris or munitions and explosives of concern (MEC) associated with historical military training (Section 3.7.3.4). Aircraft operations and activities would not pose significant safety hazards (Section 3.7.3.5). Construction-related road closures or detours on the campus could impair or intervene with emergency response and result in potentially significant impacts (Section 3.7.3.6). Based on the analysis of wildfire hazards on campus, there would be less than significant potential for large-scale wildland fires (Section 3.7.3.7).

The 2018 LRDP EIR mitigation framework requires the assessment of hazardous materials contamination on the Project site and removal or remediation if a public health risk is identified (MM Haz-4A and -4B). MM Haz-4C requires construction activities to be halted if unknown contamination is encountered and implementation of remedial activities. Implementation of these measures during project-level planning and construction would reduce potential hazards from past contamination to less than significant levels. Compliance with MM Haz-6 would require contractors to notify Campus Fire Marshal and the campus community of any required road closures to reduce emergency access/response impacts to less than significant levels.

HAZARDS AND HAZARDOUS MATERIALS Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the project area?	☒	☐	☐	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☒	☐	☐	☐

a, b) The geotechnical evaluation conducted for the Project and adjacent Pepper Canyon site stated that based on the findings of the environmental soil sampling and analysis, fill materials within the top 2 to 5 feet of soil are likely to contain lead at concentrations that would classify the soil as a California-hazardous waste. The soil would therefore require special handling and disposal. These materials, if excavated, would need to be segregated and stockpiled separately from other excavated materials, tested in accordance with the accepting landfill facility's requirements, and disposed of at a landfill permitted to receive this type of waste. In addition, the geotechnical evaluation stated that analytical testing indicated that the on-site soils at the site may contain detectable concentrations of Total Petroleum Hydrocarbons (TPH) in the diesel and motor oil range. Based on the concentrations detected, the soils may be suitable for on-site reuse; however, if materials are to be placed in the vicinity of buildings proposed for occupation, additional testing would be performed to evaluate potential vapor risks. Soils proposed for export with detectable concentration of TPH or that are odorous may require special handling.

By implementing MM Haz-4A and MM Haz-4B from the 2018 LRDP EIR, materials generated from excavations within these areas would be subject to on-site testing and evaluation in accordance with UC San Diego's EH&S Guidelines. In addition, if hazardous materials not identified in consultation with EH&S, or undocumented areas of contamination are encountered during the Project construction, work would be discontinued until appropriate health and safety procedures are implemented per the requirements of MM Haz-4C.

Approximately 15,000 cubic yards of fill would be imported to the Project site via haul trucks during Project grading. Per MM Haz-4B, to reduce the potential for importation of contaminated materials to the site, soil materials from off-site sources would be evaluated prior to their delivery to the site. The soil supplier would test and certify all soils as suitable for use in compliance with the UC San Diego's EH&S requirements.

Adherence to existing regulations and compliance with campus safety standards mandated by applicable federal, state, University, and local laws and regulations, would minimize the risks resulting from the routine transportation, use, storage, or disposal of hazardous materials or hazardous wastes and from accidental releases during Project construction. The Project is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

c) The Project would involve the use or transport of hazardous materials during construction. As discussed in Items 4.1.8 a and b above, the Project would comply with the 2018 LRDP mitigation framework, and continued compliance with UC San Diego's EH&S Guidelines. Furthermore, the campus would continue to comply with federal and state regulations pertaining to hazardous wastes and with existing campus programs, practices, and procedures that would ensure that risks associated with hazardous emissions or materials to existing or proposed primary or secondary schools located within one-quarter mile from the campus would remain less that significant through proper handling procedures, disposal practices, and/or cleanup procedures. The Project is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

d) The Project site is not located on a contaminated site pursuant to Government Code Section 65962.5 (2018 LRDP EIR Impact 3.9-2). The Project would not disturb known contamination sites associated with the former Camp Matthews training activities.

Compliance with the 2018 LRDP EIR mitigation framework would ensure the Project would reduce its potentially significant impacts to less than significant levels and is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

e) UC San Diego is not located within any Aircraft Potential Zones (APZs) for MCAS Miramar and, thus, implementation of the Project would not result in a significant aircraft safety hazard. With regard to the Torrey Pines Gliderport, its short-term use is not a safety hazard to the campus and surrounding area because the gliders do not take-off or land over UC San Diego structures. The Project is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

f) Project construction would not require the temporary closure of the existing campus roadway network and would not interfere with response times of emergency vehicles during its operation. As required by MM Haz-6, UC San Diego would require the construction contractor to notify the campus Fire Marshal and community to prevent conflicts with emergency access or evacuation routes during construction. Compliance with the 2018 LRDP EIR mitigation framework would ensure the Project would reduce its potentially significant impacts to less than significant levels and is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

g) The Project would be located adjacent to and partially within Pepper Canyon, which is classified as 'Urban Forest' of the Campus Open Space Preserve land use category. Project design features relevant to fire safety, as discussed in Section 2.5.3, would be implemented to minimize the potential for wildfire hazards. UC San Diego would continue to implement brush management around buildings that are adjacent to undeveloped areas of the campus, would equip all new on-campus academic, residential, medical, research, and support facilities with emergency fire sprinkler systems and would continue to retrofit existing buildings with fire sprinklers, in accordance with the CBC. The UC San Diego Fire Marshal would be responsible for ensuring that adequate access is maintained on campus at all times and would meet regularly with the City of San Diego Deputy Fire Chief to maintain a site plan/access plan that would adequately serve the campus. The Project would result in less than significant wildfire impacts and is consistent with the hazards and hazardous materials analysis evaluated in the 2018 LRDP EIR.

4.1.9 Hydrology and Water Quality

Section 3.8 of the 2018 LRDP EIR addresses the hydrology and water quality effects of campus growth under the 2018 LRDP and determined it would result in less than significant impacts related to the alteration of drainage patterns and potential water quality effects due to project compliance with applicable policies and regulations (i.e. UC San Diego's Design Guidelines, Sustainability Policies, Phase II Small MS4 Permit and additional

Storm Water Management Program requirements (Sections 3.8.3.1 and 3.8.3.2)). No potential for seiches exists on campus, while less than significant risk associated with tsunamis would occur (Section 3.8.3.3). No potential exists for significant impacts related to the depletion of groundwater supplies and flooding (Section 3.8.5). The following analysis is based on a Drainage Study that was prepared by Michael Baker International (MBI) on January 2020, herein included as Appendix B to this Addendum.

No mitigation is required for hydrology and water quality impacts as described in the 2018 LRDP EIR.

HYDROLOGY AND WATER QUALITY Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR No Impact	Impact Not Examined in 2018 LRDP EIR Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR Potentially Significant Impact
a) Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade surface or groundwater quality?	☒	☐	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☒	☐	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: (i)result in substantial erosion or siltation on- or off-site? (ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; (iii) create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or (iv) impede or redirect flood flows?	☒	☐	☐	☐
d) In flood hazard, tsunami, or seich zones, risk release of pollutants due to Project inundation?	☒	☐	☐	☐

HYDROLOGY AND WATER QUALITY Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☐	☐	☐

a,c) Construction of the Project would not contribute substantial loads of sediment or other pollutants to stormwater runoff due to compliance with the NPDES state-wide General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activity (General Permit). As part of the General Permit, campus construction projects managed by outside contractors and disturbing over one acre (including the Project) must implement SWPPPs, which specify BMPs to reduce the contribution of sediments, spilled and leaked liquids from construction equipment, and other construction-related pollutants to stormwater runoff. Compliance with the regulations would provide adequate protection from stormwater contamination and water quality protection from construction activities on campus.

Development of the Project would result in an overall increase in impervious surfaces and produce changes to site-specific stormwater infrastructure. During the Project's planning and design phases, it underwent review by UC San Diego Campus Planning and Capital Program Management (CPM) staff to ensure utility infrastructure would be appropriately considered.

As described in the Project's Drainage Study (see Appendix B), existing runoff at the Project site is collected by curb inlets and area drains and conveyed easterly into Pepper Canyon OSP. Following construction, the Project would continue to collect and route runoff into Pepper Canyon OSP, similar to existing conditions. Discharge would be conveyed via new area drains and storm drains. The Project would reduce the amount of peak flow at the southern portion of the site but would result in an increased peak flow at the northern portion of the site, with an overall slight increase in peak flow into Pepper Canyon OSP from the Project's developed areas as compared to existing conditions (MBI 2020). The Project's storm drains would discharge on-site runoff at the northeast and southeast corners of the Project site into Pepper Canyon OSP; however, the Project would not cause flooding downstream, nor would it hydraulically impact on-site or downstream stormwater infrastructure. As part of improvements to the adjacent Pepper Canyon OSP project, a bioretention basin would be located east of the Project site. The Project's storm water flows, along with other stormwater runoff from nearby areas, would then be discharged into this basin.

In addition, the Project would be required to comply with UC San Diego Design Guidelines and Storm Water Management Program and other regulatory requirements related to storm water runoff. Campus development, including the Project, is covered under the

Phase II Small MS4 Permit, which requires management of long-term stormwater discharges and implementation of pollution protection measures. These management practices are enforced under the campus stormwater management program and ensure long-term protection related to stormwater pollution.

Therefore, the Project would result in less than significant water quality impacts and is consistent with the hydrology/water quality analysis evaluated in the 2018 LRDP EIR.

b) No removal of groundwater is proposed, as the Project, similar to the rest of campus, would use potable and recycled water supplied by the City of San Diego Public Utilities Department via existing and future lines on UC San Diego's campus. The Project would not result in impacts to groundwater resources and is consistent with the hydrology/water quality analysis evaluated in the 2018 LRDP EIR.

d) The entire UC San Diego campus is outside of the 100-year and 500-year flood hazard areas or any County-identified flood hazard areas. In addition, the Project site is not within an area that contains risk from seiches because this phenomenon is typically associated with land-locked bodies of water. The Project is also not within SIO and therefore not at risk for inundation by tsunamis. Thus, the Project would not result in significant impacts related to potential pollutant release during floods, tsunamis, and seiches. The Project is consistent with the hydrology/water quality analysis evaluated in the 2018 LRDP EIR.

e) Construction activities could result in significant short-term water quality impacts from uncontrolled sediment and pollutants in storm water runoff that could conflict with the policies of the Basin Plan. The Project would be required to comply with the UC San Diego Design Guidelines, policies, Storm Water Management Program (SWMP) and other regulatory requirements related to storm water runoff to minimize the potential for pollutants to enter receiving waters.

Operation of the Project could result in significant long-term water quality impacts from uncontrolled pollutants in storm water runoff that could conflict with the policies of the Basin Plan. The proposed Project would integrate a number of storm water BMPs to promote on-site treatment prior to being discharged. As described in item 4.1.9 a, c, above, the Project would be covered under the Phase II Small MS4 Permit, which would require management of long-term stormwater discharge.

With the incorporation of the proposed site design, source control, and treatment control BMPs and the continued implementation of UC San Diego Design Guidelines, SWMP and other regulatory requirements, water quality impacts associated with changes in storm water runoff would be minimized and would not conflict with or obstruct implementation of the Basin Plan. In addition, the Project is not in an area governed by a sustainable groundwater management plan. Therefore, impacts would be less than significant, and the

Project is consistent with the hydrology and water quality analysis evaluated in the 2018 LRDP EIR.

4.1.10 Land Use and Planning

Section 3.9 of the 2018 LRDP EIR addresses the land use and planning effects of campus growth under the 2018 LRDP and determined that its implementation would not result in inconsistencies with applicable land use plans, policies, and regulation (Section 3.9.3.1). In addition, as noted in Section 3.9.5 of the 2018 LRDP EIR, there is no potential for significant impacts related to physically dividing an established community or conflict with a Habitat Conservation Plan or Natural Community Conservation Plan (NCCP) Program.

No mitigation is required for land use and planning impacts as described in the 2018 LRDP EIR.

LAND USE AND PLANNING	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
Would the Project…		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Physically divide an established community?	☒	☐	☐	☐
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐

a) The Project, which redevelops an existing housing site with higher density housing, does not involve any development outside of established campus properties or boundaries, and no incursion into, or division of, the surrounding residential communities would occur. As described in Section 2.5.4, the Project's Woonerf, West Rim Walk, and internal walkways and trails would provide additional connections between the Project's residential buildings and adjacent areas. Furthermore, the Woonerf and West Rim Walk would provide connectivity through the Project site for increased access between Gilman Drive and Rupertus Walk, providing multi-modal routes to the UC San Diego Central Campus Station. The Project would not result in an impact and is consistent with the land use analysis evaluated in the 2018 LRDP EIR.

b) As described in Section 3 of this Addendum, the Project is consistent with the objectives, population forecasts and building space projections in the 2018 LRDP, which is the applicable land use plan for the UC San Diego campus. The Project would not result in significant environmental impacts due to a conflict with a land use plan, policy, or regulation and is consistent with the land use analysis evaluated in the 2018 LRDP EIR.

4.1.11 Noise

Section 3.10 of the 2018 LRDP EIR addresses the noise effects of campus growth under the 2018 LRDP and concludes there is the potential for significant impacts due to noise-sensitive land uses (NSLUs) being exposed to noise levels in excess of applicable standards (Section 3.10.3.1); exposure of vibration sensitive land uses to or the generation of excessive groundborne vibration or groundborne noise levels (Section 3.10.3.2); permanent increases in ambient noise levels (Section 3.10.3.3); and temporary increases in ambient noise levels (Section 3.10.3.4). No potential for significant impacts from noise produced by a private, public or public use airport (Section 3.10.5).

The mitigation framework in the 2018 LRDP addresses these potentially significant impacts by evaluating whether screening distances can be observed to avoid the impact; requiring site-specific studies based on the type of noise source; and integrating source-specific controls into project designs to reduce noise levels at sensitive land uses as required by MM Noi-1A through Noi-1F. MM Noi-2A requires new vibration sensitive uses near the trolley to prepare a vibration mitigation program to identify controls to reduce vibration effects and the incorporation of those controls into the project designs. Certain construction projects are required to prepare and implement a construction vibration program to comply with MM Noi-2B. Implementation of these measures would reduce future project-level impacts from noise and vibration to less than significant levels.

NOISE Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Generate substantial temporary or permanent increases in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Generate excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) For a project located within the vicinity of a private airstrip or within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☒	☐	☐	☐

a) The nearest NSLUs to the Project site are Pepper Canyon Hall located adjacent to the Project to the west, the Visual Arts Facility located approximately 50 feet north of the Project across Rupertus Walk, Matthews Apartments located approximately 300 feet east of the Project across Pepper Canyon, and the VA Medical Center located approximately 300 feet south of the Project across Gilman Drive.

Temporary Noise Increases: Construction activities associated with the Project could temporarily expose NSLUs to noise levels in excess of standards due to their proximity to the Project site or use of certain construction equipment. The Project would involve construction activities that would require the use of noisy construction equipment within 150 feet of Pepper Canyon Hall and the Visual Arts Facility to the west and northwest, respectively. No pile driving would be required during Project construction. As described in Section 2.5.5., construction would typically occur between 7:00 a.m. and 7:00 p.m. from Monday to Saturday, with the potential for limited nighttime construction. The Project would therefore be required to comply with MM Noi-1F of the 2018 LRDP EIR, which requires the integration of construction noise mitigation recommendations into the contractor specifications and its implementation during construction. As described in Section 2.5.5, if nighttime construction is required to eliminate daytime conflicts or other necessary reasons, approval from the appropriate campus stakeholders would be required prior to construction work conducted during nighttime hours. Therefore, incorporation into the contractor's specifications the construction noise control measures as required by the mitigation framework in the 2018 LRDP EIR would ensure that construction-related noise impacts would be less than significant, and the Project is consistent with the noise analysis evaluated in the 2018 LRDP EIR.

Permanent Noise Increase: Implementation of the Project would potentially contribute to projected increases in traffic noise along local roadways; however, Project-related traffic would not result in a substantial noise increase because the overall change in noise levels would be less than 3 decibels (dB) which would be imperceptible to NSLUs adjacent to the roads (as shown in Table 3.10-11 in the 2018 LRDP EIR).

The Project would establish NSLUs near existing noise sources. The South Building would be located within 100 feet of Gilman Drive to the south and Gilman Parking Structure to the west. The North Building tower would be located approximately 135 feet from the Trolley's UC San Diego Central Campus Station. Because of the Project's placement of NSLUs close to the transit line, a Project-specific noise study was conducted in compliance with MM Noi-1B. The Noise Study was conducted in October 2019 by Charles M. Salter and Associates (included as Appendix C of this Addendum). The study considered the surrounding noise environment including the Trolley line and provided recommendations to ensure that noise levels within the Project's habitable rooms would be reduced to or less than the campus requirement, which is a community noise equivalent level (CNEL) average of 45 A-weighted decibels (dBA). Window assemblies with STC ratings would be required for the façades of habitable rooms in both the North and South Buildings. STC ratings of 28 through 37 were identified in the Noise Study for the structure's façades and are incorporated into the Project's design to reduce noise levels to at or below 45 dBA CNEL. Therefore, incorporation of the Project design features recommended in the site-specific acoustical study prepared in compliance with the mitigation framework in the 2018 LRDP EIR would ensure that impacts related to existing off-site noise levels impacts would be less than significant and the Project is consistent with the noise analysis evaluated in the 2018 LRDP EIR.

The Project would provide stationary noise sources in the form of heating, ventilation, and air conditioning (HVAC) units. Mitigation measure NOI-1C of the 2018 LRDP EIR requires that major HVAC systems not shielded by a noise-reducing barrier be located at least 100 feet from an existing or proposed NSLU. HVAC units for the Project would be located along the Project building's rooftops; however, no units would be located within 100 feet of nearby NSLUs. Therefore, stationary source-related noise impacts would be less than significant, and the Project is consistent with the noise analysis evaluated in the 2018 LRDP EIR.

b) The Project would construct new campus housing, which would establish a new vibration-sensitive receptor. As shown in Table 3.10-16 of the 2018 LRDP EIR, the vibration screening distances for the Trolley and campus housing is 32 feet. The Project's North Building residences would be located outside of the screening distance, or approximately 135 feet from the nearest point of the Trolley guideway and would therefore not be exposed to significant Trolley vibration.

The Project does not propose a land use that would generate substantial operational vibration, but construction of the Project would require the use of vibratory rollers for the Project building's foundations. Construction activities would therefore generate ground-borne vibration. Table 3.10-16 of the 2018 LRDP EIR provides screening distances for vibratory sources and associated vibration-sensitive receptors. If vibration sources are located within the screening distances for a given receptor, the Project may result in a significant impact.

The screening distances between campus housing and vibratory roller construction is 75 feet. Existing residences at Matthews Apartments would be located over 300 feet from Project construction and would therefore be outside the screening distance for a vibratory roller. Off-site residences would not be subjected to significant construction vibration.

The screening distances between classrooms and vibratory roller construction is 60 feet. Existing classrooms at Pepper Canyon Hall the Visual Arts Facility west and northwest of the Project site would be approximately 120 feet from the North Building footprint, and would therefore be outside the screening distance for a vibratory roller. Off-site classrooms would not be subjected to significant construction vibration, and the Project is consistent with the vibration analysis evaluated in the 2018 LRDP EIR.

c) Because there are no private airstrips within two miles of the UC San Diego campus and the campus is not located within the 60 dBA CNEL contour of any airport, including MCAS Miramar and the Medical Center heliport operations; there is no potential for significant noise impacts from aircraft operations in the Project area. Therefore, the Project is consistent with the noise analysis evaluated in the 2018 LRDP EIR.

4.1.12 Population and Housing

Section 3.11 of the 2018 LRDP EIR addresses the population and housing effects of implementing the 2018 LRDP and concludes that plan implementation would result in the direct inducement of substantial population growth in the area (Section 3.11.3.1). However, the 2018 LRDP would not result in indirect inducement of substantial population growth due to the extension of roads or other infrastructure (Section 3.11.3.1). Less than significant impacts are identified for the temporary displacement of existing on-campus housing and people (Section 3.11.3.2). No feasible mitigation is available for direct inducement of substantial population growth in the area; therefore, the population-related impacts of the campus growth are unavoidable.

POPULATION AND HOUSING Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☒	☐	☐	☐

a) The Project would provide housing for the projected increased student population by replacing the existing low-density housing at the site. The Project would replace 304 existing beds with 1,316 beds for residents for a net increase of 1,012 residents. The Project would result in an incremental increase in staff population (approximately 50 people) related to residential staff, retail staff, and other employees that would directly support the Project. While some of this staff may already be employed by the university, in some cases new employees may need to be hired to fill the Project's needs. Any staff growth associated with the program was considered and anticipated in the 2018 LRDP, and the Project would not cause an exceedance of the 21,000 total staff anticipated by the 2018 LRDP. Although the Project would lead to a slight increase in the number of students residing on campus, as well as faculty and/or staff working on the UC San Diego campus, the level of growth is consistent with 2018 LRDP population projections, as discussed in Section 3 of this Addendum.

In addition, because the Project would construct residences and associated amenities on a previously developed portion of the West Campus, no new roads would be extended into undeveloped areas as part of the Project and any utility upgrades would be sized to accommodate projected campus growth as noted in Section 2 of this Addendum. Therefore, the Project is consistent with the population and housing analysis evaluated in the 2018 LRDP EIR.

b) The Project would demolish “Camp Snoopy”, which consists of eight existing two-story apartment buildings and associated one-story service buildings. This would result in the removal of 304 beds; however, no students would be displaced, as the redevelopment would begin over the summer months after the end of the school year. In addition, the campus would stagger the opening of the new housing facilities to correspond with any temporary decreases in housing availability such that the level of on-campus housing is maintained or increased year-to-year. Therefore, less than significant impacts would occur, consistent with the population and housing analysis evaluated in the 2018 LRDP EIR.

4.1.13 Public Services

Section 3.12 of the 2018 LRDP EIR addresses the physical effects of providing public services to meet the needs of the campus growth under the 2018 LRDP and determines that less than significant environmental impacts would occur due to the need for additional fire protection facilities (Section 3.12.3.1), police protection facilities (Section 3.12.3.2), and public school facilities (Section 3.12.3.3). No mitigation is required for public services impacts as described in the 2018 LRDP EIR.

PUBLIC SERVICES Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☒	☐	☐	☐
ii) Police protection?	☒	☐	☐	☐
iii) Schools?	☒	☐	☐	☐
iv) Parks?	☒	☐	☐	☐
v) Other public facilities	☒	☐	☐	☐

a) Implementation of the Project would contribute to the overall need for new fire and police protection and school, park, and other public facilities in the University area, but not at a level that would require new facilities beyond those that exist or are already planned by the various service providers nor would any new facilities result in a significant physical impact to the environment. Therefore, the Project is consistent with the public services analysis evaluated in the 2018 LRDP EIR.

4.1.14 Recreation

Section 3.13 of the 2018 LRDP EIR addresses the environmental effects associated with modifying recreational facilities to meet the needs of campus growth under the 2018 LRDP and concludes that despite the increase in usage of on- and off-campus recreational facilities, less than significant impacts would occur (Section 3.13.3.1). Any construction and expansion of recreational facilities would be addressed through compliance with the 2018 LRDP EIR mitigation framework and less than significant impacts would occur (Section 3.13.3.2). No mitigation is required for recreation impacts as described in the 2018 LRDP EIR.

RECREATION Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

a) The increase in campus population attributable to the Project would contribute to increased demands for recreation facilities on and off campus. The 2018 LRDP anticipates the need for new recreation facilities and the campus would continue to manage and maintain its existing recreation facilities. The City of San Diego would continue to expand and maintain its off--campus recreation facilities in response to its own population growth, whose residents could include the new campus population associated with the Project. Substantial physical deterioration in recreation facilities is, therefore, not expected to occur as a result of the Project. Therefore, the Project is consistent with the public services analysis evaluated in the 2018 LRDP EIR.

b) The Project would provide passive recreation spaces in the North and South Courtyards as well as in the Canyon Connector. Passive recreation activities include study areas, patios, and a multi-use outdoor wellness lawn. The Woonerf would serve as a "living street" for pedestrians, bicycles, and minimal low-speed vehicular traffic. The West Rim Walk would provide a multi-modal pedestrian facility. Off-site campus recreational opportunities would be available to the Project's residences within a short walk or bicycle ride. The Project, including its passive recreation spaces, would be constructed on a previously developed site. Implementation of the Project would therefore not require the construction or expansion of recreational facilities but would contribute to the campus-wide need for new or expanded facilities. The environmental impacts associated with the development of new campus recreational facilities would be less than significant or would be mitigated to below a level of significance through the application of the mitigation framework in the 2018 LRDP EIR. Therefore, the Project is consistent with the recreation analysis evaluated in the 2018 LRDP EIR.

4.1.15 Transportation and Circulation

Section 3.14 of the 2018 LRDP EIR addresses the transportation and traffic effects of campus growth under the 2018 LRDP. The 2018 LRDP EIR concludes that traffic associated with plan implementation would result in cumulatively significant impacts due to exceedances of level of service (LOS) criteria in the Near-Term (Year 2025) and Long-Term (Year 2035) Scenarios for intersections, street segments, freeway mainline segments, and freeway ramp meters in the area (Section 3.14.3.1). However, implementation of the 2018 LRDP would not cause substantial additional vehicle miles travelled (VMT) to exceed the regional averages for applicable campus land uses; therefore, less than significant VMT impacts are identified (Section 3.14.3.2). In addition, implementation of the 2018 LRDP would not conflict with applicable policies, plans, or programs regarding safety or performance of public transit, bicycle, or pedestrian facilities and its impact would be less than significant (Section 3.14.3.3). There is no potential for significant impacts to air traffic patterns, conflicts with a congestion management plan, safety hazards due to a design feature or incompatible uses, or inadequate emergency access (Section 3.14.5).

The 2018 LRDP mitigation framework includes programmatic mitigation to reduce or minimize the LOS impacts of plan implementation, as described in Section 3.14.3.1 of the 2018 LRDP EIR. Specifically, the campus is implementing MM Tra-1A-OPT2 by funding and installing the needed improvements at a subset of impacted intersections, and freeway ramp meters. UC San Diego is currently working with the City of San Diego and Caltrans to obtain the appropriate agreements and permits and on track to complete the improvements by the end of 2023 or sooner. Despite these improvements, impacts would be cumulatively significant and unavoidable as described in Section 3.14.3.1 of the 2018 LRDP EIR. No project-level mitigation measures are required for cumulative traffic impacts.

On September 27, 2013, SB 743 was signed into law, which created a process to change the way that transportation impacts are analyzed under CEQA. SB 743 required the California Governor's Office of Planning and Research to amend the CEQA Guidelines to provide an alternative to LOS for evaluating transportation impacts. The transportation impact assessment updates to the CEQA Guidelines required under SB 743 were approved on December 28, 2018 and were required to be implemented statewide by July 1, 2020. Under the new (i.e., current) CEQA transportation guidelines, LOS, or vehicle delay, is no longer considered an environmental impact under CEQA; and, VMT has been adopted as the most appropriate measure of transportation impacts under CEQA. Therefore, this Addendum addresses the Project's consistency with the Program EIR's VMT analysis.

TRANSPORTATION/TRAFFIC Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Conflict with an applicable plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☒	☐	☐	☐

TRANSPORTATION/TRAFFIC Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
b) Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?	☒	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d) Result in inadequate emergency access?	☒	☐	☐	☐

a) Implementation of the Project would not conflict with applicable policies, plans, or programs regarding safety or performance of public transit, roadway, bicycle, or pedestrian facilities. The Project would provide design elements that increase the site's connectivity within the West Campus and beyond, including providing access to the Trolley's UC San Diego Central Campus Station and UC San Diego's Triton Transit shuttles and public bus service at Gilman Transit Hub. The Project's Woonerf would provide pedestrian, bicycle, and low-speed vehicular traffic connections within the campus between Gilman Drive and Rupertus Walk. Similarly, the West Rim Walk would provide pedestrian access from Gilman Drive to the Trolley station entrance. The Project would provide bicycle racks throughout the site to encourage use of the campus and local bicycle networks. Signage and safety lighting would also be provided throughout the Project and along walkways and trails for wayfinding for both residents and visitors. As noted in Section 3.14.3.2 of the 2018 LRDP EIR, UC San Diego continues to look for opportunities to close gaps in the bicycle/pedestrian network in and adjacent to campus and improve last mile connections to campus trolley stations, whenever feasible. Therefore, less than significant impacts would occur, and the Project is consistent with the transportation analysis evaluated in the 2018 LRDP EIR.

b) CEQA Guidelines section 15064.3 pertains to impacts associated with VMT. As part of the 2018 LRDP EIR, a six-tier analysis of VMT impacts was conducted in accordance with the concepts expressed in SB 743. As shown in that comprehensive analysis, the 2018 LRDP VMT per resident, VMT per employee, and VMT per capita would be measurably lower than the regional and City averages. In addition, the campus transportation demand management (TDM) program combined with its location within a TPA would lower auto dependency and VMT over time. As described above in item 4.1.15 a, the Project would provide design elements to increase connectivity within the West Campus and promote the use of existing transit options within the region. Therefore, less than significant impacts would occur, and the Project is consistent with the transportation analysis evaluated in the 2018 LRDP EIR.

c) The Project would not change the campus circulation system or off-site circulation system and would not substantially increase hazards due to design features or incompatible uses. Therefore, no impacts would occur, and the Project is consistent with the transportation analysis evaluated in the 2018 LRDP EIR.

d) Upon implementation of the Project, the campus would amend the emergency access route map, as necessary, to ensure that adequate fire protection and emergency access is maintained on campus at all times, which would be reviewed and approved by the Campus Fire Marshal. Therefore, no impacts would occur, and the Project is consistent with the transportation analysis evaluated in the 2018 LRDP EIR.

4.1.16 Utilities and Service Systems

Section 3.15 of the 2018 LRDP EIR addresses the physical effects of expanding the utility infrastructure and the energy demands associated with campus growth under the 2018 LRDP and concludes that less than significant impacts would occur related to wastewater treatment capacity (Section 3.15.3.1); new and expanded water and wastewater infrastructure (Section 3.15.3.2); new or expanded storm water drainage facilities (Section 3.15.3.3), water supply availability (Section 3.15.3.4); and compliance with statutes and regulations related to solid waste management (Section 3.15.3.5). The 2018 LRDP EIR further determines there is no potential for significant impacts related to solid waste disposal needs or the capacity of local infrastructure to impact the provision of solid waste services or impair the attainment of solid waste reduction goals. No mitigation is required for utilities, service systems or energy impacts as described in the 2018 LRDP EIR.

UTILITIES, SERVICE SYSTEMS AND ENERGY Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR: No Impact	Impact Not Examined in 2018 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2018 LRDP EIR: Potentially Significant Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐	☐	☐
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☒	☐	☐	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the providers existing commitments?	☒	☐	☐	☐
d) Generate solid waste in excess of State or local standards or the capacity of local infrastructure or negatively impact the provision of solid waste services or impair the attainment of solid waste reduction goals?	☒	☐	☐	☐
e) Comply with federal, state, and local management and reduction statues and regulations related to solid waste?	☒	☐	☐	☐

a) During the planning and design phase for the Project, UC San Diego Campus Planning and CPM) staff conducted a review of the Project's utility needs to verify that adequate infrastructure would be available to serve its domestic water, wastewater, storm water, energy, and telecommunication needs. Additionally, as part of the site evaluation process, the Campus Planner also consulted the Master Infrastructure Plan (MIP) and CPM engineers to identify any capacity constraints and determine whether system improvements would be required to support the Project.

Following the internal utility infrastructure evaluation process, improvements to utility and service systems were implemented into the proposed Project, as described in Section 2.5.3. These improvements include the demolition of the existing sewer infrastructure within the Project limits and install three new connections to the existing sewer system. Similarly, approximately 95 percent of the existing water infrastructure within the Project site would be removed to provide three new connections to support the Project's domestic and fire water needs. Additionally, the Project would connect to an existing connection within Rupertus Lane. A new reclaimed water line would connect to off-site lines at the edge of the Project at the OSP and Russell Way. New electrical and telecommunication infrastructure would be provided to service the Project site. Existing gas line infrastructure would be removed and would not be replaced within the Project site. A connection to the existing campus hot water loop would provide hot water for the Project's residences and retail. The utility infrastructure improvements required to serve the Project would be required to comply with the mitigation framework in the 2018 LRDP EIR. Therefore, less than significant impacts would occur, and the Project is consistent with the utilities and service systems analysis evaluated in the 2018 LRDP EIR.

b) Implementation of the Project would not increase potable water usage on the campus beyond levels anticipated in the City's Water Supply Assessment Report prepared for the 2018 LRDP. The Project would meet a minimum rating of LEED Silver. Sustainable strategies include using reclaimed water and providing connections to existing lines. All landscape improvements throughout the Project would focus on native and/or drought-tolerant species. Installation of low-flow fixtures in kitchens and bathrooms would reduce potable water use. Therefore, less than significant impacts would occur, and the Project is consistent with the utilities and service systems analysis evaluated in the 2018 LRDP EIR.

c) Implementation of the Project would increase the amount of on-campus building space and the on-campus residential population. Such increases would result in the generation and discharge of additional wastewater from the campus; the additional wastewater would require treatment at the Point Loma Wastewater Treatment Plant (PLWTP). However, the PLWTP would have more than adequate capacity to receive and treat wastewater from UC San Diego and existing commitments. Additionally, water conservation efforts implemented on campus, including the Project, would further reduce flow rates from the campus. Therefore, less than significant impacts would occur, and the Project is consistent with the utilities and service systems analysis evaluated in the 2018 LRDP EIR, which assumed increases in building and residential space.

d) Implementation of the 2018 LRDP would not result in inadequate capacity of solid waste facilities in the region such that construction of a new landfill or expansion of an existing landfill would be necessary. As noted below under item 4.1.16 e, the Project would minimize its waste disposal needs and assist the state and local agencies in achieving their applicable solid waste management and diversion goals. No impacts would result, and the Project is consistent with the utilities and service systems analysis evaluated in the 2018 LRDP EIR.

e) Project implementation would require demolition, clearing/grubbing, and grading activities that would produce excavated soils, green waste, asphalt/concrete, and other construction and demolition waste. Operation of the Project would contribute additional non-recyclable/non-reusable waste that would be deposited at Miramar Landfill, after accounting for waste reduction and diversion. However, the Project would comply with applicable waste reduction and diversion programs as part of the campus-wide effort to meet the UC Sustainable Practices Policy's zero waste goals. Supplementing the zero waste goal that was originally set for 2020, revisions to the Sustainable Practices Policy set waste reduction goals for each campus. Each campus will reduce per capita municipal solid waste by 25 percent by 2025, and 50 percent by 2030, compared to its year 2015-2016 baseline. UC San Diego prepares annual reports to track progress toward these goals and maintains a Zero Waste Plan to further reduce waste. Off-site construction methods would be utilized for some building components to decrease construction waste, and demolition materials would be recycled in accordance with UC San Diego policies. Furthermore, the Project would provide recycling and composting bins throughout the Project to reduce operational waste. Therefore, the Project would minimize its waste disposal needs and assist the state and local agencies in achieving their applicable solid waste management and diversion goals, resulting in less than significant impacts. The Project is consistent with the utilities and service systems analysis evaluated in the 2018 LRDP EIR.

4.1.17 Wildfire

Since the 2018 LRDP EIR was certified, the CEQA Guidelines were amended to provide new requirements to address a project's impacts on wildfire hazards. This section of this Addendum addresses those new questions, which were not explicitly addressed in the 2018 LRDP EIR. Relevant information provided in the 2018 LRDP EIR along with new project-specific information is relied upon to make new impact determinations.

WILDFIRE Would the Project…	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

a) UC San Diego has an Emergency Operations Plan that addresses planned responses instructions and procedures to various levels of human-made or natural emergency situations for all campus staff, students, and visitors. It provides information for building evacuation, emergency supplies, and related emergency contacts and information sources. Multiple emergency response regions are provided throughout the campus equipped to provide necessary supplies and trained personnel in the event of an emergency.

The Project would require construction access via Gilman Drive along the southern edge of the site; however, a construction management plan and traffic control plan would be developed and implemented to ensure there would be no obstructions to emergency operations. Consistent with the 2018 LRDP, the Project would be reviewed by the Campus Fire Marshal to ensure that adequate fire protection and emergency access is maintained on the campus at all times. As required by Mitigation Measure Haz-6, UC San Diego would require the construction contractor to notify the Campus Fire Marshal and community to prevent conflicts with emergency access or evacuation routes during construction. Implementation of Mitigation Measure Haz-6, which requires the notification of the Campus Fire Marshal and campus community at large prior to the start of construction, would reduce impacts to less than significant levels. Therefore, the Project would not result in any new significant environmental effects.

b) The Project site is located at the top of slope of a canyon landscaped with vegetation consistent with the Open Space Preserve “Urban Forest” category (to be completed by the Pepper Canyon OSP project that is currently under construction). Vegetation used for landscaping, vehicles, and small machinery could exacerbate wildfire risk and expose Project occupants to wildfire pollutants. As described in Section 2.5.3, the Project would connect to the Campus’ existing water supply through three new connections and one existing connection within Rupertus Lane. The fire water system would provide fire hydrant spacing at a minimum of 300 feet, two FDC per building, within 25 feet of proposed hydrants, and two automatic fire hose connections per building. Additionally, the Pepper Canyon landscape will be irrigated and maintained, including appropriate fuel management techniques. Trees within the canyon also must be managed so as not to exceed a maximum height limitation due to proximity to the Trolley guideway. Implementation of these fire protection measures, fuel management regulations, landscape management techniques, and compliance with associated regulations would ensure impacts to Project occupants due to wildfire pollutants under the proposed Project would be less than significant. Therefore, the Project would not result in any new significant environmental effects regarding exposure of Project occupants to pollutant concentrations from a wildfire.

c) Installation and maintenance associated with new infrastructure would be necessary for the Project. However, this would not exacerbate fire risk due to its location within the campus where fire protection measures including fuel management zones and building review by the Campus Fire Marshal. Any temporary or ongoing impacts to the environment resulting from the installation and maintenance of infrastructure is part of ongoing operations and projected future development of the campus and therefore evaluated under the 2018 LRDP EIR. Therefore, the Project would not result in any new significant environmental effects regarding installation or maintenance of associated infrastructure.

d) As described in Geology and Soils, the Project would not be at risk of landslides. The Project would be located upslope from the existing Pepper Canyon OSP and would therefore not be at risk of downslope or downstream flooding as a result of runoff, or post-fire slope instability. As described in Hydrology and Water Quality, the Project would result in a slight increase in peak flows as compared to existing conditions, however it would not significantly alter the drainage of the site or off-site drainages.

In the event that the steep slopes near the Project are burned from a wildfire, such as within the adjacent Pepper Canyon OSP, unstable soils could occur due to the lack of vegetation to anchor the hillside. UC San Diego would implement BMPs to stabilize slopes and prevent sediment movement exposure to off-site adjacent occupants. These BMPs would include the placement of fiber rolls, straw wattles, or sandbags on the affected slopes, as well as erosion control mats, to stabilize and protect the burned areas.

Therefore, the possibility of flooding or landslides as a result of running water down the slope would be greatly lessened. In addition, the Project would result in the redevelopment of a disturbed area and add additional fire protection measures, resulting in a less than significant impact. Therefore, the Project would not result in any new significant environmental effects regarding downstream or down slope flooding.

4.1.18 Mandatory Findings of Significance

	Impact Examined in 2018 LRDP EIR	Impact Not Examined in 2018 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the Project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

a) All applicable mitigation measures identified in the 2018 LRDP EIR to avoid and reduce impacts are integrated into the proposed Project and with the integration of these measures, the Project would not substantially degrade the quality of the environment.

As described in Section 4.1.3, Biological Resources, of this Addendum, the Project would not significantly affect fish or wildlife habitat or species. The site is developed and mostly devoid of sensitive biological resources, except potential nest trees for special-status birds, which would be addressed by 2018 LRDP EIR MMs Bio-2D and Bio-2E. Indirect construction impacts would be addressed through pre-construction meetings and weekly monitoring, as addressed by 2018 LRDP EIR MMs Bio-3E and 3F. Potential operational impacts would be addressed by 2018 LRDP EIR MMs Bio-3G, Bio-3H, Bio-3I, Bio-3K, and Bio-3M.

As described in Section 4.1.4, *Cultural and Tribal Cultural Resources*, no historic architectural resources were identified on the Project site and the Project site is not within an area of archaeological sensitivity. Measures integrated into the Project would avoid disturbance, disruption, or destruction of inadvertent or unknown archaeological resource discoveries, as addressed by 2018 LRDP EIR MMs Cul-2D, Cul-2E, and Cul-3. Therefore, the Project would not eliminate any examples of the major periods of California history or prehistory.

b) The 2018 LRDP EIR identified significant and unavoidable cumulative impacts to air quality (construction, operational and toxic air contaminant emissions), cultural resources (historical resources and tribal cultural resources), population and housing (physical effects of population growth), transportation/traffic (levels of service) and growth inducement (regional growth). As part of the 2018 LRDP EIR development program, the Project would contribute to significant and unavoidable impacts related to air quality, transportation/traffic, and regional growth as described in this Addendum. Measures from the 2018 LRDP EIR would work to address these impacts, specifically MMs AQ-2A, AQ-2B for air quality and MMs Cul-2D, 2E, and 3 for cultural resources. However, the Project is within the scope of campus development and population evaluated in the 2018 LRDP EIR as noted in Section 3 of this document.

These impacts were also addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2018 LRDP. No conditions have substantially changed, and no new information has become available since certification of the 2018 LRDP EIR that would substantially alter this previous analysis. No additional mitigation is available to reduce the Project's contribution to these previously identified impacts.

c) As described above, the Project would incrementally contribute to cumulative air quality (toxic air contaminants) that were identified as significant and unavoidable as well as cumulatively considerable in the 2018 LRDP EIR. The Project's construction and operation emissions are within the scope of impacts examined in the 2018 LRDP EIR. These impacts were also addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2018 LRDP.

Effects of the Project would not result in substantial adverse effects on human beings beyond those analyzed in the 2018 LRDP EIR. No conditions have changed, and no new information has become available since certification of the 2018 LRDP EIR that would alter this analysis. The Project would include 2018 LRDP EIR MMs Haz 4A, Haz-4B, Haz-4C, and

Haz-6 to address impacts related to hazardous materials and MM Noi-1F to address construction noise. No additional mitigation is available to reduce the Project's contribution these impacts. Other impacts with the potential to affect human beings were determined to be less than significant.

5 Applicable Mitigation Measures

The following mitigation measures from the certified 2018 LRDP EIR Mitigation Monitoring and Reporting Program (MMRP) would be applicable to the impacts associated with the Project. No new significant impacts or increased severity in impacts that were not analyzed in the 2018 LRDP EIR have been identified; therefore, no additional Project-specific mitigation is required.

Aesthetics

Aes-2A: Prior to Project design approval, any proposed project that would have the potential to substantially degrade the visual character of the campus shall undergo design review by the UC San Diego Design Review Board to ensure that the design is consistent with the visual landscape and/or the character of the surrounding development. The design review process shall evaluate and incorporate, where appropriate, factors including but not necessarily limited to: building mass and form, building proportion, roof profile, architectural detail and fenestration, texture, color, type and quality of building materials, and landscaping.

Air Quality

AQ-2A: Implement Measures to Control PM Emissions Generated by Construction Activities. UC San Diego shall require by contract specification that contractors implement the following measures during all phases of construction of individual projects developed under the proposed 2018 LRDP:

- Water the grading areas a minimum of twice daily to minimize fugitive dust;
- Stabilize graded areas as quickly as possible to minimize fugitive dust;
- Apply chemical stabilizer or pave the last 100 feet of internal travel path within the construction site prior to public road entry;
- Install wheel washers adjacent to a paved apron prior to vehicle entry on public roads;
- Remove any visible track-out into traveled public streets via regular street sweeping;
- Wet wash the construction access point at the end of each workday if any vehicle travel on unpaved surfaces has occurred;
- Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads;
- Cover haul trucks or maintain at least 12 inches of freeboard to reduce blow-off during hauling;

- Suspend all soil disturbance and travel on unpaved surfaces if winds exceed 25 mph;
- Cover/water onsite stockpiles of excavated material;
- Enforce a 15-mph speed limit on unpaved surfaces;
- On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce re-suspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt in dry weather;
- Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible to reduce dust generation; and
- Limit the daily grading volumes/area to extent feasible.

AQ-2B: Minimize Off-Road Construction Equipment Emissions. UC San Diego shall require by contract specification that the construction contractor use off-road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a project-by-project basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available or feasible for the project.

Biological Resources

Bio-2D: If Project construction is scheduled to commence during the raptor nesting season (generally January 15 through July 31), pre-construction surveys for raptor nests shall be performed by a qualified biologist within 500 feet of Project construction activities no more than seven days prior to the initiation of construction. Construction activities within 500 feet of an identified active raptor nest shall not commence during the breeding season until a qualified biologist determines that the nest is no longer active and any young birds in the area have adequately fledged and are no longer reliant on the nest. Trees with inactive nests can be removed outside the breeding season without causing an impact.

Bio-2E: No grubbing, trimming, or clearing of vegetation (including brush management) from Project sites shall occur during the general avian breeding season (February 15 through August 31). If grubbing, trimming, or clearing cannot feasibly occur outside of the general avian breeding season, a qualified biologist shall perform a pre-construction nesting bird survey no more than seven days prior to the commencement of vegetation clearing or grubbing to determine if active bird nests are present in the affected areas. Should an active migratory bird nest be located, the Project biologist shall direct vegetation clearing away from the nest until it has been determined by the Project biologist that the young have fledged, or the nest has failed. If there are no nesting birds (includes nest building or other breeding/nesting behavior) within the survey area, clearing, grubbing, and grading shall be allowed to proceed.

Bio-3E: Prior to construction, a pre-construction meeting shall be held between the Project Manager, qualified Biologist, Environmental Planner, and construction crews to ensure crews are informed of the sensitivity of habitats in the Open Space Preserve and adjacent undeveloped lands.

i. Prior to commencement of clearing or grading activities, fencing (e.g., silt fencing, orange construction fencing, and/or chain-link fencing as determined by campus planning) shall be installed around the approved limits of disturbance to prevent errant disturbance of sensitive biological resources by construction vehicles or personnel. Installation of fencing to demarcate the approved limits of disturbance shall be verified by the Project biologist prior to initiation of clearing or grading activities. All movement of construction contractors, including ingress and egress of equipment and personnel, shall be limited to designated construction zones. This fencing shall be removed upon completion of all construction activities.

ii. No temporary storage or stockpiling of construction materials shall be allowed within the Ecological Reserve or Restoration Lands, and all staging areas for equipment and materials shall be located at least 50 feet from the edge of these areas. This prohibition shall not be applied to facilities that are planned to traverse Ecological Reserve or Restoration Lands (e.g., trails and utilities). Staging areas and construction sites in proximity to the Ecological Reserve or Restoration Lands shall be kept free of trash, refuse, and other waste; no waste dirt, rubble, or trash shall be deposited in these areas.

iii. Equipment to extinguish small brush fires (e.g., from trucks or other vehicles) shall be present on site during all phases of Project construction activities, along with personnel trained in the use of such equipment. Smoking shall be prohibited in construction areas adjacent to flammable vegetation.

iv. Temporary night lighting shall not be used during construction unless determined to be absolutely necessary. If night lighting is necessary, lights shall be directed away from sensitive vegetation communities and shielded to minimize temporary lighting of the surrounding habitat.

Bio-3F: During Project construction, a biological monitor shall visit the site weekly during site preparation and rough grading activities, and monthly following completion of rough grading, until construction is completed. During site visits, the monitor shall be responsible for ensuring that the construction activities and staging areas are restricted to the approved limits of work, and protective fencing is adequately maintained. The monitor shall be responsible for ensuring that the contractor adheres to the other provisions described above. The monitor, in cooperation with the on-site construction manager, shall have the authority to halt construction activities in the event that these provisions are not met. Monitors shall submit regular reports to the UC San Diego Campus Planning Office during construction documenting the implementation of construction measures Bio-3E.

Bio-3G: The following best management practices shall be implemented for each project that would remove or install tree species on UC San Diego that may be used as host trees by shot hole borers (SHBs)

i. Trees to be planted on UC San Diego shall be obtained from a reliable source and be free of sign of SHB infestation.

ii. An education program for on-site workers responsible for tree installation shall be implemented. The program shall describe the signs of SHB infestation (e.g., sugary exudate on trunks or branches, and SHB entry/exit holes [approximately the size of the tip of a ballpoint pen]).

iii. Sign of SHB infestation shall be reported to California Department of Fish and Wildlife and UC Riverside's Eskalen Lab (www.eskalenlab.ucr.edu) by the UC San Diego Project Manager and/or the Project biologist.

iv. Trees with sign of SHB infestation shall be pruned or removed, as appropriate, and potential host materials shall be chipped to less than one inch prior to composting on site or transfer to a landfill.

v. Equipment that is used to prune or remove SHB-infected trees shall be disinfected prior to additional use.

vi. Biologists monitoring mitigation sites shall be knowledgeable regarding sign of SHB infestation.

Bio-3H: Areas selectively thinned for brush management shall be monitored by a qualified biologist for establishment of invasive plant species pursuant to the HMP.

Bio-3I: Landscaping adjacent to the Open Space Preserve shall comply with the following requirements to prevent the introduction of invasive species:

i. Appropriate landscaping shall be selected based on the vegetation communities within the portion of the Open Space Preserve adjacent to the project. In areas supporting native (or disturbed native) vegetation communities, revegetation of impacted slopes shall be with appropriate native plant materials. In particular, where the Open Space Preserve is disturbed by construction of the Campus Meander, installation of native plants such as lemonadeberry, toyon, deerweed (*Acmispon glaber*), monkey flower (*Diplacus aurantiacus*), and sages (*Salvia* spp.) are recommended to make the Open Space Preserve more impenetrable to people while reinforcing the boundaries and edges of the Campus Meander (The Harrison Studio 1997).

ii. Only non-invasive plant species shall be included in the landscape plans for projects (species not listed on the California Invasive Plant Inventory prepared by the Cal-IPC

[2006]). A qualified landscape architect and/or qualified biologist shall review landscape plant palettes prior to implementation to ensure that no invasive species are included.

iii. Any planting stock brought onto a project site adjacent to the Open Space Preserve for landscaping or habitat restoration shall be inspected to ensure it is free of pest species that could invade natural areas, including but not limited to Argentine ants and South American fire ants. Inspections of planting stock for habitat restoration shall be by a qualified biologist, and inspections of planting stock for landscaping shall be the responsibility of qualified UC San Diego Project Manager or their designated assignee. Any planting stock found to be infested with such pests shall be quarantined, treated, or disposed of according to best management practices by qualified personnel, in a manner that precludes invasions into natural habitats.

Bio-3K: The following best management practices shall be implemented by the campus along areas that interface with the Open Space Preserve to address runoff/water quality impacts from landscaping:

i. Integrated Pest Management principles (University of California Integrated Pest Management Program) shall be implemented to the extent practicable for areas in and adjacent to the Open Space Preserve for chemical pesticides, herbicides, and fertilizers. Examples of such measures may include, but are not limited to, alternative weed/pest control measures (e.g., removal by hand) and proper application techniques (e.g., conformance to manufacturer specifications and legal requirements).

ii. Irrigation for Project landscaping shall be minimized and controlled in areas in and adjacent to the Open Space Preserve through efforts such as designing irrigation systems to match landscaping water needs, using sensor devices to prevent irrigation during and after precipitation, and using automatic flow reducers/shut-off valves that are triggered by a decrease in water pressure from broken sprinkler heads or pipes.

Bio-3M: Maintenance of storm water facilities shall be conducted in a manner to minimize impacts to adjacent sensitive habitats. Maintenance will be overseen by a qualified biologist and occur outside the general bird breeding season which extends from February 15 through August 31.

Cultural and Tribal Cultural Resources

Cul-2D: Unknown Resources. For areas between recorded sites ("unknown resources") the following shall apply:

West Campus and East Campus. If the Project is proposed:

a. in an area of natural deposition and is adjacent to recorded sites, a qualified archaeologist shall monitor all grading activities.

b. on a mesa top in a previously developed site (including parking lots, utility corridors, eucalyptus grove reserve, recreation fields, ornamental landscaping) and if previously recorded sites are adjacent, the prior grading plans shall be viewed to determine if prior grading activity has removed two or more feet of soil.

   - If two or more feet of soil have been previously removed, no further work is required.
   - If not, a qualified archaeologist shall monitor grading activities during the removal of the top two to three feet of soil.

c. on a mesa top in an undeveloped area of the campus, a cultural survey shall be completed by a qualified archaeologist as part of the project-specific CEQA document (i.e., during schematic design).

   - If ground visibility is good and the survey is negative, no additional work is required.
   - If ground visibility is poor due to high grasses/brush, a CEQA mitigation measure shall be included requiring a subsequent survey after brush removal is completed to confirm survey results. If the second survey is negative, no additional work is required.

d. In all cases, if cultural resources are located during survey/monitoring activities described above, recommendations of the UC San Diego-retained qualified archaeologist shall be implemented in accordance with measures Cul-2A, Cul-2B, and Cul-2C, as described above.

e. In all cases, monitoring will cease if grading reaches underlying formational material (Lindavista [Very Old Paralic], Bay Point [Old Paralic], Scripps, Ardath Shale), regardless of how shallow or in what location it is found.

f. All monitoring shall be conducted in accordance with measure Cul-2E.

Cul-2E: Construction Monitoring.

i. Prior to beginning any work that requires monitoring:

a. a preconstruction meeting shall be held that includes the qualified archaeologist, Project Manager and/or Grading Contractor, and other appropriate personnel so the archaeologist can make comments and/or suggestions concerning the archaeological monitoring program to the Project Manager and/or Grading Contractor.

b. the qualified archaeologist shall (at that meeting or subsequently) submit to the Project Manager a copy of the site/grading plan (reduced to 11 x 17 inches) that identifies areas to be monitored as well as areas that may require delineation of grading limits.

c. the archaeologist shall also coordinate with the Project Manager on the construction schedule to identify when and where monitoring is to begin and including the start date for monitoring.

ii. The qualified archaeologist shall be present during grading/excavation as detailed in Cul-2D and shall document such activity on a standardized form. A record of activity shall be sent to the Environmental Planner and Project Manager each month.

iii. Discoveries

a. Discovery Process – In the event of a discovery, and when requested by the qualified archaeologist, or the Archaeological Principal Investigator (PI) if the archaeological monitor is not qualified as a PI, the Environmental Planner and Project Manager shall be contacted and shall divert, direct, or temporarily halt ground-disturbing activities in the area of discovery to allow for preliminary evaluation of potentially significant archaeological resources. The PI shall also immediately notify Campus Planning of such findings at the time of discovery.

b. Determination of Significance – The significance of the discovered resources shall be determined by the PI in consultation with Campus Planning and the Native American Community, as appropriate. Campus Planning must concur with the evaluation before grading activities will be allowed to resume. For archaeological resources considered significant by the PI, a Research Design and Data Recovery Program shall be prepared, approved by Campus Planning, and carried out to mitigate impacts before ground-disturbing activities in the area of discovery will be allowed to resume.

iv. If human remains are discovered, work shall halt in that area and the procedures detailed in the California Health and Safety Code (Section 7050.5) and the California PRC (Section 5097.98) and will be followed.

v. Notification of Completion – The qualified archaeologist shall notify Campus Planning, as appropriate, in writing of the end date of monitoring.

vi. Handling and Curation of Significant Artifacts and Letter of Acceptance

a. The qualified archaeologist shall ensure that all significant cultural remains collected are cleaned, catalogued, and permanently curated with an appropriate institution; that a letter of acceptance from the curation institution has been submitted to Campus Planning; that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.

b. Curation of artifacts associated with the survey, testing, and/or data recovery for this Project shall be completed in consultation with Campus Planning and the Native American representative, as applicable.

vii. Final Results Reports (Monitoring and Research Design and Data Recovery Program) – Prior to completion of the project, two copies of the Final Results Report (even if no significant resources were found) and/or evaluation report, if applicable, which describe the results, analysis, and conclusions of the archaeological monitoring program (with appropriate graphics) shall be submitted to Campus Planning for approval. For significant archaeological resources encountered during monitoring, the Research Design and Data Recovery Program shall be included as part of the Final Results Report.

viii. Recording Sites with State of California Department of Park and Recreation – The qualified archaeologist shall record (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) any significant or potentially significant resources encountered during the Archaeological Monitoring Program and submit such forms to the SCIC with the Final Results Report.

Cul-3: Construction Monitoring. Grading and excavation equating to 1,000 cubic yards or more at depths of 10 feet or greater within highly sensitive geologic formations (i.e., Ardath Shale, Scripps Formation, and Old Paralic Deposits) shall require monitoring by a qualified paleontologist, including the following measures:

i. Prior to beginning any work that requires paleontological monitoring:

a. a preconstruction meeting shall be held that includes the qualified paleontologist, Construction Manager and/or Grading Contractor, and other appropriate personnel so the qualified paleontologist can make comments and/or suggestions concerning the monitoring program to the Construction Manager and/or Grading Contractor.

b. the qualified paleontologist shall (at that meeting or subsequently) submit to the Project Manager a copy of the site/grading plan (reduced to 11 x 17 inches) that identifies areas to be monitored as well as areas that may require delineation of grading limits.

c. the qualified paleontologist shall also coordinate with the Project Manager on the construction schedule to identify when and where monitoring is to begin and to specify the start date for monitoring.

ii. The qualified paleontologist shall document monitoring activity on a standardized form. A record of daily activity shall be sent to Campus Planning and the Project Manager each month.

iii. The qualified paleontologist shall be present initially during all earth-moving activities. After 50 percent of the excavations are complete within the unit, if no significant fossils have been recovered, the level of monitoring may be reduced or suspended entirely at the qualified paleontologist's discretion and in consultation with Campus Planning. These deposits may be included in those identified as Undifferentiated Tertiary Sedimentary deposits in Figure 3.5-1.

iv. Discoveries

a. Discovery Process – In the event of a discovery, and when requested by the qualified paleontologist, the Project Manager shall be contacted and shall divert, direct, or temporarily halt ground-disturbing activities in the area of discovery to allow for preliminary evaluation of potentially significant paleontological resources. The paleontologist shall also immediately notify Campus Planning of such findings at the time of discovery.

b. Determination of Significance – The significance of the discovered resources shall be determined by the paleontologist in consultation with the Project Manager and Campus Planning, who must concur with the evaluation before grading activities will be allowed to resume.

c. Documentation and Treatment of Finds – Based on the scientific value and/or uniqueness of the find, the qualified paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If treatment and salvage are required, recommendations shall be consistent with Society of Vertebrate Paleontology 2010 guidelines and currently accepted scientific practice. Work in the affected area may resume once the fossil has been assessed and/or salvaged and a paleontological monitor is present.

v. Notification of Completion – The paleontologist shall notify Campus Planning in writing of the end date of monitoring.

vi. Handling and Curation of Significant Paleontological Specimens and Letter of Acceptance – The paleontologist shall ensure that all significant fossils collected are appropriately prepared and permanently curated with an appropriate institution, and that a letter of acceptance from the curation institution has been submitted to Campus Planning.

vii. Final Results Reports (Monitoring and Research Design and Recovery Program) – Prior to completion of the project, two copies of the Final Results Report (even if no significant resources were found) and/or evaluation report, if applicable, which describe the results, analysis, and conclusions of the Paleontological Monitoring Program (with appropriate graphics) shall be submitted to Campus Planning for approval.

CUL-5B: Monitoring. Activities with the potential to cause a substantial adverse change to the significance of a TCR shall be monitored by a Native American tribal representative. Where the TCR is also considered a historical resource under CEQA, monitoring by a qualified archaeologist may also be required.

i. Prior to any work that requires monitoring:

   a. UC San Diego shall enter into a Tribal Monitoring Agreement with the tribe. This agreement will specify procedures for the proper treatment of any tribal cultural resources and/or Native American human remains discovered during the monitoring. The agreement will also specify the roles and authorities of the Native American monitors and other participants.
   b. A preconstruction meeting shall be held that includes the tribal representative, archaeologist, Construction Manager and/or Grading Contractor, and other appropriate personnel so the tribal representative can make comments and/or suggestions concerning the Archaeological Monitoring Program to the Construction Manager and/or Grading Contractor.

ii. Discoveries

   a. Discovery Process – In the event of a discovery, the tribal representative, in consultation with the Construction Project Manager, may divert, direct, or temporarily halt ground-disturbing activities in the area of discovery to allow for preliminary evaluation of potentially significant tribal cultural resources. The tribal representative shall also immediately notify Campus Planning of such findings at the time of discovery.

   b. Determination of Significance – The significance of the discovered resources shall be determined by the tribal representative in consultation with Campus Planning and the Native American Community, as appropriate. Campus Planning must concur with the evaluation before grading activities will be allowed to resume.

c. If human remains are discovered, work shall halt in that area and the procedures detailed in the California Health and Safety Code (Section 7050.5) and the California PRC (Section 5097.98) and will be followed.

Hazards and Hazardous Materials

Haz-4A: During Project planning, EH&S shall be consulted in order to identify if any past contamination, USTs, ASTs, or other contamination could potentially occur in areas to be impacted. EH&S will consider the cases on file at the County of San Diego Department of Environmental Health (DEH) and information on historical uses in the area to be impacted such as old maps and photos. If EH&S determines that there is limited potential for contamination to occur on site, no additional mitigation is necessary. If it is determined that contamination has potential to exist on a project site, Mitigation Measure Haz-4B shall be implemented.

Haz-4B: If contamination exists on a proposed project site and if it poses a risk to human health or the environment, actions shall be taken prior to any construction, pursuant to applicable regulations, to remove or otherwise remediate the contamination through appropriate measures such as natural attenuation, active remediation, and engineering controls. Assessment and remediation activities shall incorporate the following conditions:

i. All assessment and remediation activities shall be conducted in accordance with a work plan that is approved by the regulatory agency having oversight of the activities.

ii. It may be necessary to excavate existing soil within the Project site, or to bring fill soils into the site from off-site locations. At sites that have been identified as being contaminated or where soil contamination is suspected, appropriate sampling and classification are required prior to disposal of excavated soil. Contaminated soil shall be properly disposed of at an approved off-site facility. Fill soils also shall be sampled to ensure that imported soil parameters are within acceptable levels.

iii. Caution shall be taken during excavation activities near existing groundwater monitoring wells, so that they are not damaged. Existing groundwater monitoring wells may have to be abandoned and reinstalled if they are located in an area that is undergoing redevelopment.

Haz-4C: In the event that USTs, not identified in consultation with EH&S, or undocumented areas of contamination are encountered during construction or redevelopment activities, work shall be discontinued until appropriate health and safety procedures are implemented. Either the County of San Diego DEH or the San Diego Regional Water Quality Control Board (RWQCB), depending on the nature of the contamination, must be notified regarding the contamination. Each agency and program within the respective agency has its own mechanism for initiating an investigation. The appropriate program (e.g., the DEH

Local Oversight Program for tank release cases, the County of San Diego DEH Voluntary Assistance Program for non-tank release cases, the RWQCB for non-tank cases involving groundwater contamination) will be selected based on the nature of the contamination identified. The contamination remediation and removal activities will be conducted in accordance with pertinent regulatory guidelines, under the oversight of the appropriate regulatory agency.

Haz-6: In the event that the construction of a project requires a lane or roadway closure on campus, prior to construction the contractor and/or Project Manager shall ensure that the UC San Diego Fire Marshal and campus community at large are notified. If determined necessary by the UC San Diego Fire Marshal, local emergency services will be notified by the Fire Marshal of the closure.

Noise

Noi-1F: If Project construction activities resulting from implementation of the 2018 LRDP are proposed less than 150 feet of NSLU, or may involve the use of vibratory or impact-type pile drivers, impact-type equipment (including but not limited to: clam shovels, hydra break rams, hoe rams, and jackhammers), concrete saws, pavement scarifiers, sand blasters, or vibrating hoppers, mitigation shall be integrated into the Project's construction specifications to minimize temporary noise caused by construction activities to less than significant levels:

i. Require the construction contractor to work with proper administrative controls on equipment operation periods so as not to exceed a 12-hour average sound level of 75 dBA L_{EQ} at any NSLU between 7:00 a.m. and 7:00 p.m. Monday through Saturday.

ii. Outfit construction equipment with properly maintained, manufacturer-approved or recommended sound abatement means on air intakes, combustion exhausts, heat dissipation vents, and the interior surfaces of engine hoods and power train enclosures.

iii. Locate (to the extent practical) steady-state, continuously operating stationary construction equipment such as generators, pumps, and air compressors at least 150 feet from nearby NSLUs. If this screening distance cannot be achieved in the field, consider deployment of temporary noise walls or acoustical blankets/curtains that would block direct sound paths between the operating equipment and the receptor(s) of concern.

iv. Position (to the extent practical) construction laydown and vehicle staging areas as far from NSLUs as feasible.

v. Inform, whenever possible and preferably with at least two weeks of advanced notice, all neighboring NSLUs expected to be exposed to elevated noise levels that a construction project would commence.

vi. Where NSLU are expected to be less than 100 feet away, schedule anticipated loud construction activities, which could involve impact-type equipment and processes such as pile driving, jackhammering, pavement breaking, compactors, etc., to not coincide with any finals week of classes and recognized holidays. Adjust hours or days of the construction activity to occur before or after these noise-sensitive periods of the UC San Diego academic year.

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6 References

The primary sources of information for this project-level Addendum are the 2018 LRDP and its Program EIR, including all relevant technical studies and references noted in those documents, which are incorporated by reference herein. Additional Project-specific information has been added to supplement the information in those primary references.

AECOM. 2018. Archaeological Resources Report for the 2018 UC San Diego Long Range Development Plan. July.

ARG. 2018. UC San Diego 2018 Long Range Development Plan Historic Resources Survey Report. October.

Charles M. Salter Associates, Inc. 2019. UC San Diego Pepper Canyon West Student Housing Updated Informational Noise Study. October.

Harrison Studio, The. 1997. A Grand Park and a Campus Meanser for UC San Diego. December.

Michael Baker International, 2020. Drainage Study for UCSD Pepper Canyon West Housing and Open Space Preserve, May.

Ninyo and Moore. 2018. Geotechnical Evaluation Pepper Canyon West Study Housing UC San Diego. September

Ninyo and Moore. 2020. Addendum to Geotechnical Evaluation Updated Seismic Design Parameters and Bearing Capacity. January.

UC San Diego. 2018a. *2018 Long Range Development Plan*. November.

2018b. *2018 Long Range Development Plan Environmental Impact Report (EIR)*. November.

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Appendix A

Geotechnical Evaluation

January 28, 2020
Project No. 108614001

Ms. Juli Smith
UC San Diego
9500 Gilman Drive, MC 0916
La Jolla, California 92093

Subject: Addendum to Geotechnical Evaluation
Updated Seismic Design Parameters and Bearing Capacity
Pepper Canyon West Student Housing
UC San Diego, La Jolla, California
UCSD Project No. 5265

Dear Ms. Smith:

In accordance your request, we have prepared this letter as an addendum to the referenced geotechnical evaluation report (Ninyo & Moore, 2018) for the Pepper Canyon Student Housing project (UCSD Project No. 5265), which is currently in the design phase. Ninyo & Moore previously performed a geotechnical evaluation for the subject project at the preliminary schematic and planning phase. The geotechnical evaluation consisted of reviewing available geologic and seismic background information for the area, performing 31 exploratory borings, and performing geotechnical laboratory testing. The findings, conclusions, and recommendations presented in the referenced report were based on conceptual planning of the project. As such, our recommendations were based on typical types and sizes of structures and foundations and did not consider the specific location, size, and types of structures since the details of the structures and project were yet to be established.

After completion of our geotechnical evaluation, UC San Diego solicited and awarded a design-build contract to Clark Construction. Based on discussions with the University and Clark Construction, we understand that there are two high-rise towers planned as part of the project. Due to the height and size and of the proposed structures, we understand that the structure foundations are proposed to consist of 8- to 11-foot square footings, or larger mat foundations, supported on formational materials at a depth of 4½ feet below grade.

Based on discussions with you, Ninyo & Moore will be maintaining the role of Geotechnical Engineer of Record (GEOR) for the project. This letter serves as an addendum to provide updated seismic design parameters as well as allowable bearing capacities, based on the currently planned footing dimensions.

BACKGROUND INFORMATION

During design of the proposed project, Clark Construction retained a geotechnical consulting firm (Group Delta) to perform a third-party review of the referenced report. As a result of their third-party review, Group Delta recommended additional subsurface evaluation specific to the development currently proposed and being designed by Clark Construction. The proposed additional evaluation included drilling, logging, and sampling of two mud-rotary borings (R-19-001 and R-19-002) in the northern portion of the site as well as drilling one mud-rotary boring (R-19-003) in the southern portion of the site (Group Delta, 2019c). The purpose of the northern borings was to collect core samples of the formational materials to evaluate the unconfined compressive strength of the encountered materials while the purpose of the southern boring was to perform downhole P-S Suspension Logging to evaluate the shear wave velocity. A copy of the P-S Suspension Logging report is included as Attachment A.

Based on the memorandum dated January 3, 2020 prepared by Group Delta, the results of the downhole P-S Suspension Logging, which was performed by GeoVision, indicated a measured average shear wave velocity of the upper 100 feet (v_{s100}) of 1,456 feet per second. Group Delta's memorandum dated January 15, 2020 concludes that the underlying Scripps Formation is comparable to "soft rock" that exhibits strength characteristics which are similar to the results presented in our preliminary geotechnical report. The memorandum also indicates that an allowable bearing capacity of 10,000 pounds per square foot (psf) or greater is appropriate for footings that are 8 feet or more in width.

FIELD AND LABORATORY TESTING SERVICES

As GEOR, Ninyo & Moore performed observation, logging, and sampling of the additional borings performed by Group Delta and their drilling subcontractor (Tri-County Drilling). On November 25, 2019, boring R-19-001 was drilled to a depth of approximately 76¼ feet. Boring R-19-002 was drilled to a depth of approximately 74½ feet on November 26, 2019. Both borings were drilled using a truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. Conventional drilling and sampling was utilized in the upper approximately 15 feet in boring R-19-001 and approximately 9 feet in boring R-19-002. At these depths, drilling was switched to utilizing mud-rotary methods and continuous core samples were collected. The subsurface materials encountered within R-19-001 and R-19-002 were consistent with the materials encountered during our preliminary evaluation (Ninyo & Moore, 2018). Boring R-19-003 was drilled to a depth of approximately 120 feet using mud-rotary methods on December 2, 2019. As previously discussed, boring R-19-003 was to be used to evaluate the shear wave velocity within the upper 100 feet of subsurface materials at the southern portion of the site. The approximate locations of the three borings, along with our previous borings, are shown on Figure A.

In addition to the field services performed by our office, we also performed geotechnical laboratory testing on select intact core samples collected from borings R-19-001 and R-19-002. Prior to testing, Group Delta had selected six sample depths from boring R-19-001 and eight sample depths from boring R-19-002, which they considered representative of the Scripps Formation materials encountered. However, during preparation and splitting of the samples by Group Delta, some of the proposed samples were not considered viable for laboratory testing. Therefore, a total of four samples from R-19-001 and five samples from R-19-002 were provided to our office for testing. The provided samples ranged in depths from approximately 21 feet down to approximately 71 feet. Based on the anticipated size and depth of the proposed footings, Ninyo & Moore selected four of the nine samples (which represent depths between approximately 21 to 36 feet) to evaluate the unconfined compressive strength. The results of our testing is included in Attachment B.

FINDINGS AND CONCLUSIONS

Based on our review of the Group Delta Memoranda and geophysical report, and the results of the supplemental borings and additional laboratory testing, we conclude the following:

- Based on comparison of the measured v_{s100} value with the American Society of Civil Engineers (ASCE) Publication 7-10, the project site may be classified as Seismic Site Class C.
- The results of the supplemental borings and laboratory testing generally support the findings and results presented in our preliminary geotechnical report (Ninyo & Moore, 2018).
- The recommended increased allowable bearing capacity for the enlarged foundations is generally in line with the recommended allowable bearing capacity in our preliminary geotechnical report (Ninyo & Moore, 2018) when considering the allowable increase in bearing capacity for the larger foundation size.

RECOMMENDATIONS

The following recommendations have been prepared based on our preliminary report (Ninyo & Moore, 2018), our review of the Group Delta memoranda, the results of the supplemental laboratory testing, and our review of the proposed foundations designs and loads prepared by KPFF (Attachment C). The following recommendations supersede Section 7.1.2 Strong Ground Motion, Section 9.2 Seismic Design Considerations, and Section 10.3 Foundations of the preliminary report. Other recommendations and sections presented in the referenced geotechnical report remain applicable and valid.

7.1.2 Strong Ground Motion

The results of the downhole P-S Suspension Logging performed by GeoVision (Attachment A) indicates that the average shear wave velocity (V_{s100}) for the upper 100 feet (30 meters) of the soil profile at the site is approximately 1,456 feet per second (fps) (444 meters per second). Based on Table 20.3-1 of the American Society of Civil Engineers (ASCE) Publication 7-10 (2013), the measured V_{s100} corresponds to Seismic Site Class C.

The 2016 CBC specifies that the Risk-Targeted, Maximum Considered Earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The horizontal peak ground acceleration (PGA) that corresponds to the MCE_R for the site was calculated as 0.48g using the Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) (SEAOC/OSHPD, 2020) seismic design tool (web-based). Spectral response acceleration parameters, consistent with the 2016 CBC, are also provided in Section 9.2 for the evaluation of seismic loads on buildings and other structures.

The 2016 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-10 Standard (ASCE, 2013). The MCE_G peak ground acceleration is based on the geometric mean peak ground acceleration with a 2 percent probability of exceedance in 50 years. The MCE_G peak ground acceleration with adjustment for site class effects (PGA_M) was calculated as 0.52g using SEAOC/OSHPD (2020) seismic design tool that yielded a mapped MCE_G peak ground acceleration of 0.52g for the site and a site coefficient (F_{PGA}) of 1.000 for Site Class C (SEAOC/OSHPD, 2020).

9.2 Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the seismic design parameters for the site in accordance with the CBC (2016) guidelines and adjusted MCE_R spectral response acceleration parameters (SEAOC/OSHPD, 2020).

Table 1 – 2016 California Building Code Seismic Design Criteria	
Seismic Design Factors	**Value**
Site Class	C
Site Coefficient, F_a	1.000
Site Coefficient, F_v	1.337
Mapped Spectral Acceleration at 0.2-second Period, S_s	1.197g
Mapped Spectral Acceleration at 1.0-second Period, S_1	0.463g
Spectral Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.197g
Spectral Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.619g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	0.798g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.413g

10.3 Foundations

Based on information provided by KPFF (Attachment C), we understand that the structure foundations are proposed to consist of mat foundations and/or square footings with widths of 8 feet or more supported at depths of approximately 4½ feet below lowest adjacent grade. Additionally, we understand that the foundations will be supported on formational materials. The currently proposed foundations have increased widths and deeper embedments compared to the foundation size and embedment depth assumed at the time of our preliminary report (Ninyo & Moore, 2018).

Foundations should be designed in accordance with structural considerations and the following recommendations.

10.3.1 Shallow Foundations

Shallow, spread, or continuous footings, that are 8 feet or wider and are supported entirely on competent material comprising very old paralic deposits or the Scripps Formation may be designed using an allowable bearing capacity of 10,000 psf. The allowable bearing capacity may be increased by one-third when considering loads of short duration such as wind or seismic forces. The allowable bearing capacity is based on a factor of safety of roughly three.

Footings should be founded 3 feet or more below the finished building pad subgrade elevation. The footings should be reinforced in accordance with the recommendations of the project structural engineer. Additionally, footings located adjacent to or near descending slopes should be setback from the slope or deepened to provide a horizontal distance of 15 feet or more between the slope face and closest footing edge.

If required by the topography of the site or due to fill thickness, portions of the building foundations may need to be deepened to bear on competent material comprising very old paralic deposits or the Scripps Formation. As an alternative method to stepping down and deepening the footings, the deepened portions of the foundation excavations may be backfilled with controlled low-strength material (CLSM) to the bottom elevation of the concrete footing. For this alternative, footings may bear on a controlled low strength material (CLSM) backfill with a compressive strength of 150 pounds per square inch (psi) according to "Greenbook," Section 201-6 specifications. CLSM backfill should extend down to competent formational material consisting of very old paralic deposits or Scripps Formation.

10.3.1.1 Lateral Resistance

For resistance of footings to lateral loads, bearing on competent materials comprising very old paralic deposits or the Scripps Formation, we recommend an allowable passive pressure of 350 psf of depth be used with a value of up to 3,500 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a coefficient of friction of 0.35 be used between soil and concrete. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.3.1.2 Static Settlement

Based on the loading conditions reported by KPFF (Attachment C), we estimate that the proposed structures, designed and constructed as recommended herein will undergo total settlement on the order of 1 inch. Differential settlement on the order of ½ inch over a horizontal span of 40 feet should be expected.

LIMITATIONS

The geotechnical services described in this report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. Our conclusions and recommendations are based on an analysis of the observed site conditions and the references listed. If actual conditions differ from those described in this report, our office should be notified and additional recommendations, if warranted, can be provided upon request. Please note that our scope of services for this project did not include an evaluation of any potential environmental hazards at the site.

We appreciate the opportunity to continue to be of service.

Respectfully submitted,
NINYO & MOORE

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Attachments: References
Figure A – Boring Location Map
Attachment A – Report: PS Suspension Velocities prepared by GeoVision
Attachment B – Results of Unconfined Compression Testing
Attachment C – Foundation Drawings and Loads prepared by KPFF

Distribution: (1) Addressee (via e-mail)

REFERENCES

American Society of Civil Engineers (ASCE), 2013, Minimum Design Loads and Associated Criteria for Building and Other Structures, ASCE Standard 7-10.

California Building Standards Commission, 2016, California Building Code, Title 24, Part 2, Volumes 1 and 2: dated July 1.

GeoVision, 2019, PS Suspension Velocities, Borehole R19-003, UCSD Pepper Canyon, San Diego, California: dated December 20.

Group Delta, 2019a, Memorandum, Recommendation for Allowable Bearing Pressure, UCSD Pepper Canyon West Student Housing: dated August 12.

Group Delta, 2019b, Memorandum, Recommendation for Site Class for Seismic Design, UCSD Pepper Canyon West Student Housing, San Diego, California: dated August 9.

Group Delta, 2019c, Scope and Schedule Summary, Additional Subsurface Exploration and Laboratory Testing, Pepper Canyon West Student Housing, University of California, San Diego: dated September 27.

Group Delta, 2020a, Memorandum, Recommendations for Allowable Bearing Pressure, UCSD Pepper Canyon West Student Housing, San Diego, California: dated January 15.

Group Delta, 2020b, Memorandum, Recommendations for Site Class for Seismic Design, UCSD Pepper Canyon West Student Housing, San Diego, California: dated January 3.

Ninyo & Moore, 2018, Geotechnical Evaluation, Pepper Canyon West Student Housing, UC San Diego, La Jolla, California, UCSD Project No. 5265: dated September 28.

Structural Engineers Association of California/Office of Statewide Health Planning and Development (SEAOC/OSHPD), 2020, Seismic Design Maps, https://seismicmaps.org/.

LEGEND

SITE BOUNDARY

B-29 TD=51.2 BORING
TD=TOTAL DEPTH IN FEET

R-19-003 SUPPLEMENTAL BORING

C C' GEOLOGIC CROSS SECTION

Qaf FILL

Qvop VERY OLD PARALIC DEPOSITS, CIRCLED WHERE BURIED

Tsc SCRIPPS FORMATION, CIRCLED WHERE BURIED

N

FEET
0 120 240

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: GOOGLE EARTH, 2017

A_108614001_BL.mxd 1/28/2020 AOB

FIGURE A

BORING LOCATIONS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 | 1/20

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

ATTACHMENT A

Report: PS Suspension Velocities prepared by GeoVision

PS SUSPENSION VELOCITIES
BOREHOLE R19-003
UCSD Pepper Canyon
SAN DIEGO, CALIFORNIA

Prepared for

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December 20, 2019

Report 19510-01 rev 0

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APPENDICES

INTRODUCTION

GEO*Vision* acquired PS Suspension velocity data in one borehole along Gilman Dr. within the University of California – San Diego campus in La Jolla, San Diego, California. Fieldwork, data analysis, and report preparation were reviewed by a **GEO***Vision* Professional Geophysicist or Engineer.

SCOPE OF WORK

This report presents results of PS Suspension velocity data acquired in one borehole on December 03, 2019, as detailed in Table 1. The purpose of these measurements was to supplement stratigraphic information by acquiring shear wave and compressional wave velocities as a function of depth.

The OYO PS Suspension Logging System was used to obtain in-situ horizontal shear (S_H) and compressional (P) wave velocity measurements in an uncased borehole at 1.6 foot intervals. Measurements followed **GEO***Vision* Procedure for PS Suspension Seismic Velocity Logging, revision 1.5. Acquired data were analyzed and a profile of velocity versus depth was produced for both S_H and P waves.

A detailed reference for the PS Suspension velocity measurement techniques used in this study is:

> <u>Guidelines for Determining Design Basis Ground Motions</u>, Report TR-102293, Electric Power Research Institute, Palo Alto, California, November 1993, Sections 7 and 8.

INSTRUMENTATION

Suspension Velocity Instrumentation

Suspension velocity measurements were performed using the PS Suspension logging system, manufactured by OYO Corporation, and their subsidiary, Robertson Geologging. This system directly determines the average velocity of a 3.3-foot high segment of the soil column surrounding the borehole of interest by measuring the elapsed time between arrivals of a wave propagating upward through the soil column. The receivers that detect the wave, and the source that generates the wave, are moved as a unit in the borehole producing relatively constant amplitude signals at all depths.

The suspension system probe consists of a combined reversible polarity solenoid horizontal shear-wave source and compressional-wave source, joined to two biaxial receivers by a flexible isolation cylinder, as shown in Figure 1. The separation of the two receivers is 3.3 feet, allowing average wave velocity in the region between the receivers to be determined by inversion of the wave travel time between the two receivers. The total length of the probe as used in these surveys is approximately 25 feet, with the center point of the receiver pair 12.5 feet above the bottom end of the probe.

The probe receives control signals from, and sends the digitized receiver signals to, instrumentation on the surface via an armored multi-conductor cable. The cable is wound onto the drum of a winch and is used to support the probe. Cable travel is measured to provide probe depth data using a sheave of known circumference fitted with a digital rotary encoder.

The entire probe is suspended in the borehole by the cable; therefore, source motion is not coupled directly to the borehole walls; rather, the source motion creates a horizontally propagating impulsive pressure wave in the fluid filling the borehole and surrounding the source. This pressure wave is converted to P and S_H-waves in the surrounding soil and rock as it impinges upon the wall of the borehole. These waves propagate through the soil and rock surrounding the borehole, in turn causing a pressure wave to be generated in the fluid surrounding the receivers as the soil waves pass their location. Separation of the P and S_H-waves at the receivers is performed using the following steps:

1. Orientation of the horizontal receivers is maintained parallel to the axis of the source, maximizing the amplitude of the recorded S_H -wave signals.
2. At each depth, S_H-wave signals are recorded with the source actuated in opposite directions, producing S_H-wave signals of opposite polarity, providing a characteristic S_H-wave signature distinct from the P-wave signal.
3. The 6.3 foot separation of source and receiver 1 permits the P-wave signal to pass and damp significantly before the slower S_H-wave signal arrives at the receiver. In faster soils or rock, the isolation cylinder is extended to allow greater separation of the P- and S_H-wave signals.
4. In saturated soils, the received P-wave signal is typically of much higher frequency than the received S_H-wave signal, permitting additional separation of the two signals by low pass filtering.
5. Direct arrival of the original pressure pulse in the fluid is not detected at the receivers because the wavelength of the pressure pulse in fluid is significantly greater than the dimension of the fluid annulus surrounding the probe (feet versus inches scale), preventing significant energy transmission through the fluid medium.

In operation, a distinct, repeatable pattern of impulses is generated at each depth as follows:

1. The source is fired in one direction producing dominantly horizontal shear with some vertical compression, and the signals from the horizontal receivers situated parallel to the axis of motion of the source are recorded.
2. The source is fired again in the opposite direction and the horizontal receiver signals are recorded.
3. The source is fired again and the vertical receiver signals are recorded. The repeated source pattern facilitates the picking of the P and S_H-wave arrivals; reversal of the source changes the polarity of the S_H-wave pattern but not the P-wave pattern.

The data from each receiver during each source activation is recorded as a different channel on the recording system. The PS Suspension system has six channels (two simultaneous recording channels), each with a 1024 sample record. The recorded data are displayed as six channels with a common time scale. Data are stored on disk for further processing.

Review of the displayed data on the recorder or computer screen allows the operator to set the gains, filters, delay time, pulse length (energy), and sample rate to optimize the quality of the data before recording. Verification of the calibration of the PS Suspension digital recorder is performed at least every twelve months using a NIST traceable frequency source and counter, as presented in Appendix B.

MEASUREMENT PROCEDURES

Suspension Velocity Measurement Procedures

The borehole was logged uncased and filled with drilling fluid. Measurements followed the **GEO***Vision* Procedure for PS Suspension Seismic Velocity Logging, revision 1.5. Prior to the logging run, the probe was positioned with the top of the probe even with a stationary reference point. The electronic depth counter was set to the distance between the mid-point of the receiver and the top of the probe, minus the height of the stationary reference point, if any. Measurements were verified with a tape measure, and calculations recorded on a field log.

The probe was lowered to the bottom of the borehole, stopping at 1.6 foot intervals to collect data, as summarized in Table 2. At each measurement depth the measurement sequence of two opposite horizontal records and one vertical record was performed. Gains were adjusted as required. The data from each depth were viewed on the computer display, checked, and saved to disk before moving to the next depth.

Upon completion of the measurements, the probe was returned to the surface and the zero depth indication at the depth reference point was verified prior to removal from the borehole.

DATA ANALYSIS

Suspension Velocity Analysis

Using the proprietary OYO program PSLOG.EXE version 1.0, the recorded digital waveforms were analyzed to locate the most prominent first minima, first maxima, or first break on the vertical axis records, indicating the arrival of P-wave energy. The difference in travel time between receiver 1 and receiver 2 (R1-R2) arrivals was used to calculate the P-wave velocity for that 1.0 meter segment of the soil column. When observable, P-wave arrivals on the horizontal axis records were used to verify the velocities determined from the vertical axis data. The time picks were then transferred into a Microsoft Excel® template to complete the velocity calculations based on the arrival time picks made in PSLOG. The Microsoft Excel® analysis file accompanies this report.

The P-wave velocity over the 6.3-foot interval from source to receiver 1 (S-R1) was also picked using PSLOG, and calculated and plotted in Microsoft Excel®, for quality assurance of the velocity derived from the travel time between receivers. In this analysis, the depth values as recorded were increased by 4.8 feet to correspond to the mid-point of the 6.33-foot S-R1 interval. Travel times were obtained by picking the first break of the P-wave signal at receiver 1 and subtracting the calculated and experimentally verified delay, in milliseconds, from source trigger pulse (beginning of record) to source impact. This delay corresponds to the duration of acceleration of the solenoid before impact.

As with the P-wave records, the recorded digital waveforms were analyzed to locate clear S_H-wave pulses, as indicated by the presence of opposite polarity pulses on each pair of horizontal records. Ideally, the S_H-wave signals from the 'normal' and 'reverse' source pulses are very nearly inverted images of each other. Digital Fast Fourier Transform – Inverse Fast Fourier Transform (FFT – IFFT) lowpass filtering was used to remove the higher frequency P-wave signal from the S_H-wave signal. Different filter cutoffs were used to separate P- and S_H-waves at different depths, ranging from 600 Hz in the slowest zones to 4000 Hz in the regions of highest velocity. At each depth, the filter frequency was selected to be at least twice the fundamental frequency of the S_H-wave signal being filtered.

Generally, the first maxima were picked for the 'normal' signals and the first minima for the 'reverse' signals, although other points on the waveform were used if the first pulse was distorted. The absolute arrival time of the 'normal' and 'reverse' signals may vary by +/- 0.2 milliseconds, due to differences in the actuation time of the solenoid source caused by constant mechanical bias in the source, or by borehole inclination. This variation does not affect the R1-R2 velocity determinations, as the differential time is measured between arrivals of waves created by the same source actuation. The final velocity value is the average of the values obtained from the 'normal' and 'reverse' source actuations.

As with the P-wave data, S_H-wave velocity calculated from the travel time over the 6.33-foot interval from source to receiver 1 was calculated and plotted for verification of the velocity derived from the travel time between receivers. In this analysis, the depth values were increased by 4.8 feet to correspond to the mid-point of the 6.33-foot S-R1 interval. Travel times were obtained by picking the first break of the S_H-wave signal at the near receiver and subtracting the calculated and experimentally verified delay, in milliseconds, from the beginning of the record at the source trigger pulse to source impact.

Poisson's Ratio, **ν**, was calculated in the Microsoft Excel® template using the following formula:

$$\mathbf{v} = \frac{\left(\frac{V_s}{V_p}\right)^2 - 0.5}{\left(\frac{V_s}{V_p}\right)^2 - 1.0}$$

Figure 2 shows an example of R1 - R2 measurements on a sample filtered suspension record. In Figure 2, the time difference over the 3.3 foot interval of 1.88 milliseconds for the horizontal signals is equivalent to an S_H-wave velocity of 1745 feet/second. Whenever possible, time differences were determined from several phase points on the S_H-waveform records to verify the data obtained from the first arrival of the S_H-wave pulse. Figure 3 displays the same record before filtering of the S_H-waveform record with a 1400 Hz FFT - IFFT digital lowpass filter, illustrating the presence of higher frequency P-wave energy at the beginning of the record, and distortion of the lower frequency S_H-wave by residual P-wave signal.

Data and analyses were reviewed by a **GEO***Vision* Professional Geophysicist or Engineer as a component of the in-house data validation program.

Vs30 Analysis

The average shear wave velocity in the upper 30 meters (Vs30) was calculated using the NEHRP method. The PS Suspension logger measures directly the travel time over a 1 meter interval. However, data are logged at ½ meter intervals. The overlapped measurements (at nominal 0.5 m intervals) are overlapping travel times. It is not explicitly correct to use these as representing individual 0.5 m interval velocities. As a result, it is necessary to interpolate to obtain a distance-weighted average Vs value at each 1 m interval. These are then used to calculate the interval times, which are then accumulated to obtain the total travel time over 30 m. Vs30 is 30 m divided by this total travel time.

RESULTS

Suspension Velocity Results

Suspension R1-R2 P- and S_H-wave velocities for borehole R19-003 are plotted in Figures 4 and data are compiled in Table 3. The associated Microsoft Excel® analysis file accompanies this report.

P- and S_H-wave velocity data from R1-R2 analysis and quality assurance analysis of S-R1 data are plotted together in Figure A-1 in Appendix A to aid in visual comparison. Note that R1-R2 data are an average velocity over a 3.3-foot segment of the soil column; S-R1 data are an average over 6.3 feet, creating a significant smoothing relative to the R1-R2 plots. The S-R1 velocity data displayed in this figure is also compiled in Tables A-1. Included in the Microsoft Excel® analysis files are Poisson's Ratio calculations, tabulated data and plots.

Vs30 Results

The Vs30 value for borehole R19-003 is 444 meters/second, characterizing it as NEHRP site class C.*

* Site Classifications taken from Table 1615 1.1 Site Class Definitions published in 2000 International Building code, International Code Council, Inc. on page 350

SUMMARY

Discussion of Suspension Velocity Results

PS Suspension velocity data are ideally collected in uncased, fluid filled boreholes drilled with rotary wash methods, as was the borehole for this project.

Criteria	UCSD Pepper Canyon – BORING R19-003
Consistent data between receiver to receiver (R1 – R2) and source to receiver (S – R1) data.	Yes.
Consistency between data from adjacent depth intervals.	Yes
Consistent relationship between P-wave and S_H -wave (excluding transition to saturated soils)	Yes Saturation occurs at about 71ft BGS
Clarity of P-wave and S_H-wave onset, as well as damping of later oscillations.	S-wave is good data. P-wave above water table is difficult to interpret.
Consistency of profile between adjacent borings, if available.	Not applicable

Quality Assurance

These borehole geophysical measurements were performed using industry-standard or better methods for measurements and analysis. All work was performed under **GEO***Vision* quality assurance procedures, which include:

- Use of NIST-traceable calibrations, where applicable, for field and laboratory instrumentation
- Use of standard field data logs
- Use of independent verification of velocity data by comparison of receiver-to-receiver and source-to-receiver velocities
- Independent review of calculations and results by a registered professional engineer, geologist, or geophysicist.

Suspension Velocity Data Reliability

P- and S_H-wave velocity measurement using the Suspension Method gives average velocities over a 3.3-foot interval of depth. This high resolution results in the scatter of values shown in the graphs. Individual measurements are very reliable with estimated precision of +/- 5%. Depth indications are very reliable with estimated precision of +/- 0.2 feet. Standardized field procedures and quality assurance checks contribute to the reliability of these data.

CERTIFICATION

All geophysical data, analysis, interpretations, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a **GEO***Vision* California Professional Geophysicist or Engineer.

Prepared by:

12/20/2019

Jonathan J Jordan Date
GEO*Vision* Geophysical Services

Reviewed and approved by

REGISTERED PROFESSIONAL ENGINEER
J. G. DIEHL
No. 30362
CIVIL
STATE OF CALIFORNIA

12/20/2019

John Diehl Date
California Professional Engineer, P.E. 30362
GEO*Vision* Geophysical Services

* This geophysical investigation was conducted under the supervision of a California Professional Geophysicist using industry standard methods and equipment. A high degree of professionalism was maintained during all aspects of the project from the field investigation and data acquisition, through data processing, interpretation and reporting. All original field data files, field notes and observations, and other pertinent information are maintained in the project files and are available for the client to review for a period of at least one year.

A professional geophysicist's certification of interpreted geophysical conditions comprises a declaration of his/her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations or ordinances.

Table 1. Borehole locations and logging dates

BOREHOLE DESIGNATION	DATES LOGGED	COORDINATES [1] (Degrees)	
		Latitude	Longitude
R19-003	12/03/2019	32.8771828	-117.2324437

[1]Coordinates from phone GPS at time of data collection

Table 2. Logging dates and depth ranges

BOREHOLE NUMBER	TOOL AND RUN NUMBER	DEPTH RANGE (FEET)	OPEN HOLE (FEET)	SAMPLE INTERVAL (FEET)	DATE LOGGED
R19-003	SUSPENSION DOWN01	9.84 - 104.9	120	1.6	12/03/2019

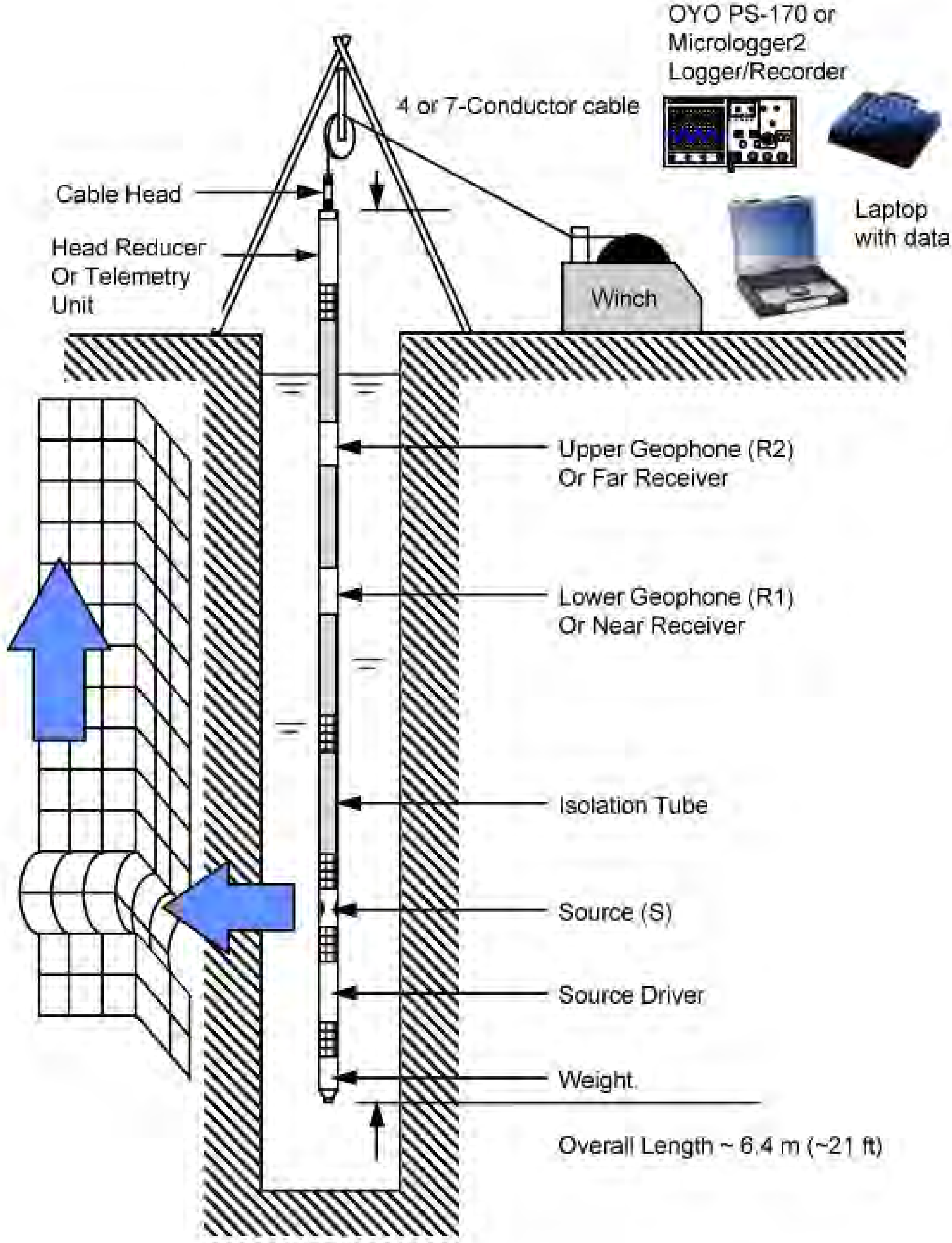


Figure 1: Concept illustration of PS logging system

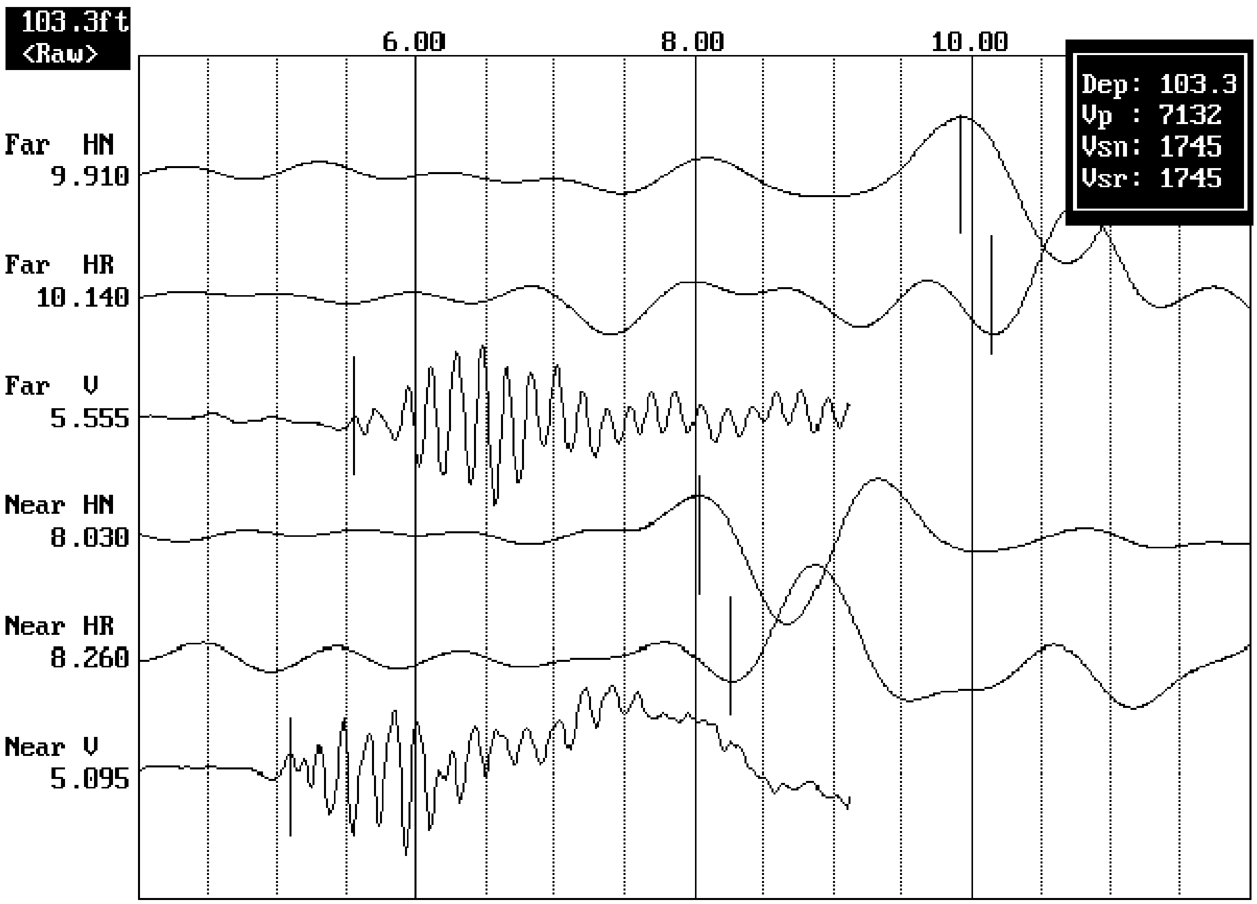


Figure 2: Example of filtered (1400 Hz lowpass) suspension record

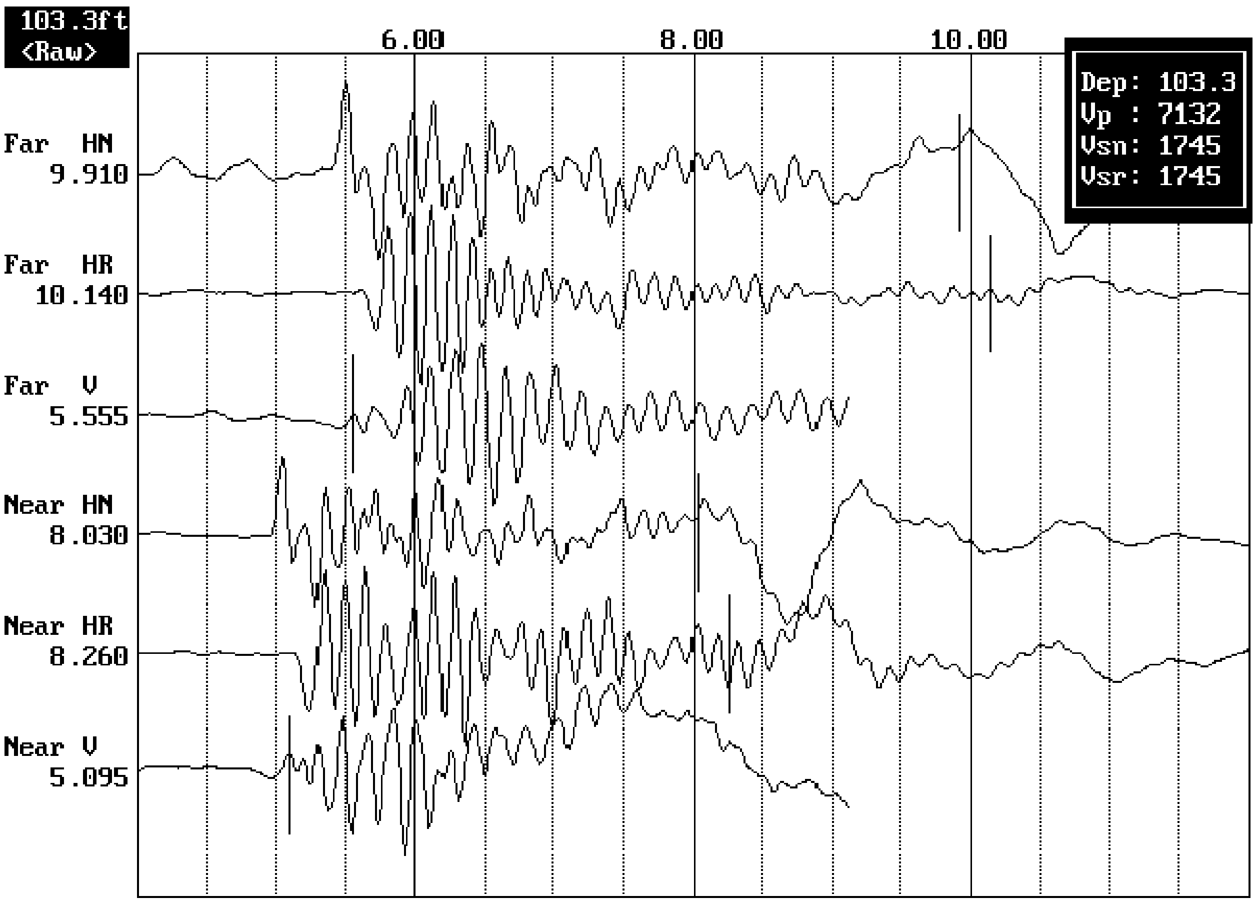


Figure 3. Example of unfiltered suspension record

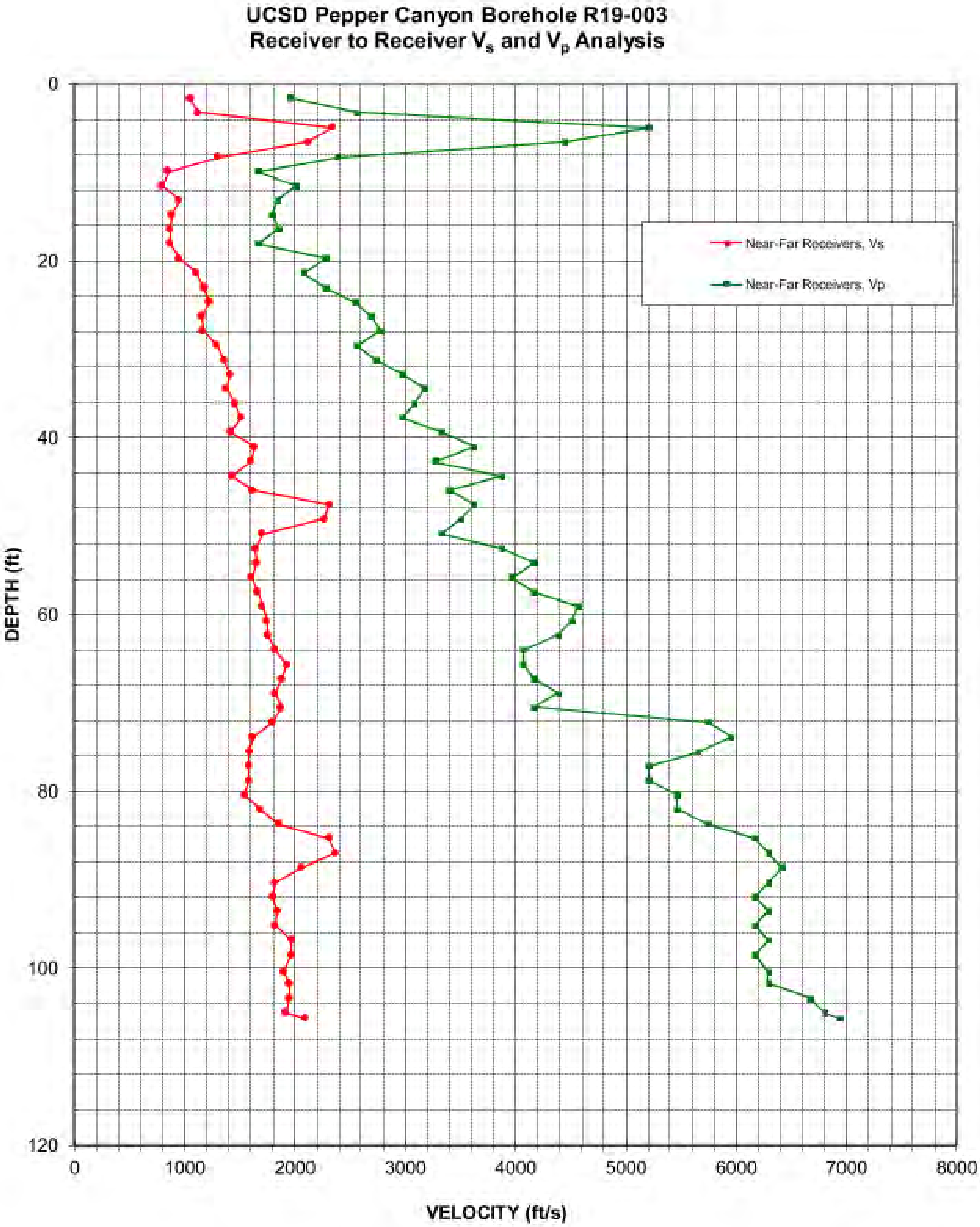


Figure 4: Borehole R19-003, Suspension R1-R2 P- and S_H-wave velocities

Table 3. Borehole R19-003 Suspension R1-R2 depths and P- and S_H-wave velocities

Summary of Compressional Wave Velocity, Shear Wave Velocity, and Poisson's Ratio
Based on Receiver-to-Receiver Travel Time Data - Borehole R19-003

American Units				Metric Units			
Depth at Midpoint Between Receivers	Velocity		Poisson's Ratio	Depth at Midpoint Between Receivers	Velocity		Poisson's Ratio
	V_s	V_p			V_s	V_p	
(ft)	(ft/s)	(ft/s)		(m)	(m/s)	(m/s)	
1.6	1050	1960	0.30	0.5	320	600	0.30
3.3	1120	2560	0.38	1.0	340	780	0.38
4.9	2340	5210	0.37	1.5	710	1590	0.37
6.6	2120	4440	0.35	2.0	650	1350	0.35
8.2	1300	2380	0.29	2.5	400	730	0.29
9.8	850	1670	0.33	3.0	260	510	0.33
11.5	800	2010	0.41	3.5	240	610	0.41
13.1	950	1840	0.32	4.0	290	560	0.32
14.8	880	1790	0.34	4.5	270	550	0.34
16.4	870	1850	0.36	5.0	260	560	0.36
18.0	870	1670	0.31	5.5	260	510	0.31
19.7	950	2280	0.40	6.0	290	700	0.40
21.3	1100	2080	0.30	6.5	340	640	0.30
23.0	1180	2280	0.32	7.0	360	700	0.32
24.6	1230	2540	0.35	7.5	370	780	0.35
26.3	1150	2690	0.39	8.0	350	820	0.39
27.9	1170	2780	0.39	8.5	360	850	0.39
29.5	1290	2560	0.33	9.0	390	780	0.33
31.2	1360	2730	0.34	9.5	410	830	0.34
32.8	1410	2980	0.36	10.0	430	910	0.36
34.5	1380	3170	0.38	10.5	420	970	0.38
36.1	1460	3090	0.36	11.0	440	940	0.36
37.7	1520	2980	0.33	11.5	460	910	0.33
39.4	1420	3330	0.39	12.0	430	1020	0.39
41.0	1630	3620	0.37	12.5	500	1100	0.37
42.7	1590	3270	0.34	13.0	490	1000	0.34
44.3	1430	3880	0.42	13.5	440	1180	0.42
45.9	1620	3400	0.35	14.0	490	1040	0.35
47.6	2310	3620	0.16	14.5	710	1100	0.16
49.2	2270	3510	0.14	15.0	690	1070	0.14
50.9	1700	3330	0.32	15.5	520	1020	0.32
52.5	1640	3880	0.39	16.0	500	1180	0.39
54.1	1650	4170	0.41	16.5	500	1270	0.41
55.8	1610	3970	0.40	17.0	490	1210	0.40
57.4	1660	4170	0.41	17.5	510	1270	0.41
59.1	1700	4570	0.42	18.0	520	1390	0.42
60.7	1750	4500	0.41	18.5	530	1370	0.41

Summary of Compressional Wave Velocity, Shear Wave Velocity, and Poisson's Ratio
Based on Receiver-to-Receiver Travel Time Data - Borehole R19-003

American Units				Metric Units			
Depth at Midpoint Between Receivers	Velocity V_s	Velocity V_p	Poisson's Ratio	Depth at Midpoint Between Receivers	Velocity V_s	Velocity V_p	Poisson's Ratio
(ft)	(ft/s)	(ft/s)		(m)	(m/s)	(m/s)	
62.3	1750	4390	0.40	19.0	530	1340	0.40
64.0	1820	4070	0.37	19.5	560	1240	0.37
65.6	1930	4070	0.36	20.0	590	1240	0.36
67.3	1880	4170	0.37	20.5	570	1270	0.37
68.9	1820	4390	0.40	21.0	560	1340	0.40
70.5	1870	4170	0.37	21.5	570	1270	0.37
72.2	1790	5750	0.45	22.0	550	1750	0.45
73.8	1620	5950	0.46	22.5	490	1810	0.46
75.5	1590	5650	0.46	23.0	480	1720	0.46
77.1	1580	5210	0.45	23.5	480	1590	0.45
78.7	1580	5210	0.45	24.0	480	1590	0.45
80.4	1540	5460	0.46	24.5	470	1670	0.46
82.0	1680	5460	0.45	25.0	510	1670	0.45
83.7	1850	5750	0.44	25.5	560	1750	0.44
85.3	2310	6170	0.42	26.0	710	1880	0.42
86.9	2360	6290	0.42	26.5	720	1920	0.42
88.6	2060	6410	0.44	27.0	630	1950	0.44
90.2	1820	6290	0.45	27.5	560	1920	0.45
91.9	1800	6170	0.45	28.0	550	1880	0.45
93.5	1840	6290	0.45	28.5	560	1920	0.45
95.1	1820	6170	0.45	29.0	560	1880	0.45
96.8	1970	6290	0.45	29.5	600	1920	0.45
98.4	1960	6170	0.44	30.0	600	1880	0.44
100.4	1890	6290	0.45	30.6	580	1920	0.45
101.7	1950	6290	0.45	31.0	590	1920	0.45
103.4	1950	6670	0.45	31.5	590	2030	0.45
105.0	1920	6800	0.46	32.0	580	2070	0.46
105.6	2100	6940	0.45	32.2	640	2120	0.45

APPENDIX A

SUSPENSION VELOCITY MEASUREMENT QUALITY ASSURANCE SUSPENSION SOURCE TO RECEIVER ANALYSIS RESULTS

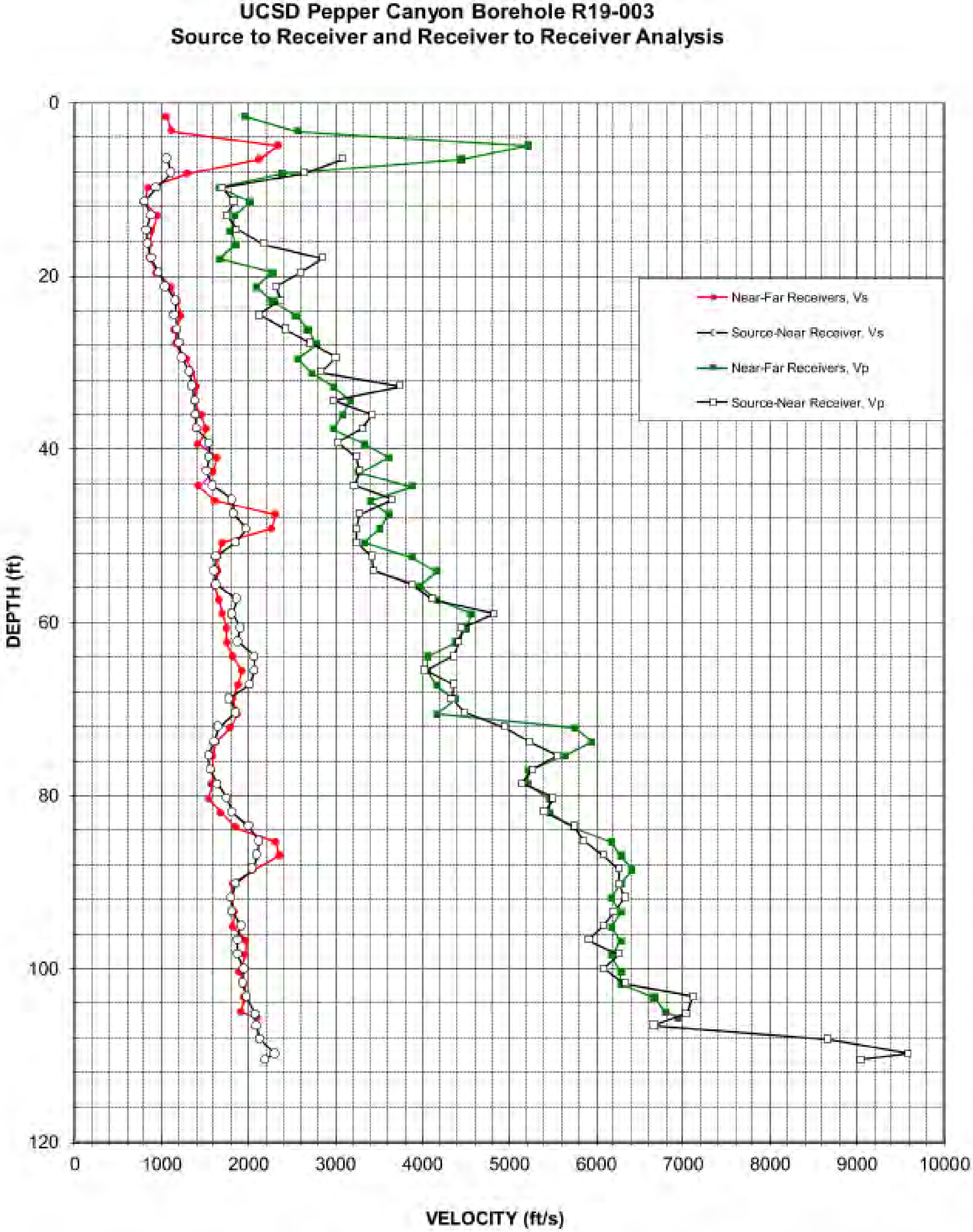


Figure A-1: Borehole R19-003, Suspension S-R1 P- and S_H-wave velocities

Table A-1. Borehole R19-003 S - R1 quality assurance analysis P- and S_H-wave data

Summary of Compressional Wave Velocity, Shear Wave Velocity, and Poisson's Ratio Based on Source-to-Receiver Travel Time Data - Borehole R19-003

American Units				Metric Units			
Depth at Midpoint Between Source and Near Receiver	Velocity		Poisson's Ratio	Depth at Midpoint Between Source and Near Receiver	Velocity		Poisson's Ratio
	V_s	V_p			V_s	V_p	
(ft)	(ft/s)	(ft/s)		(m)	(m/s)	(m/s)	
6.5	1060	3090	0.43	2.0	320	940	0.43
8.1	1100	2640	0.39	2.5	340	800	0.39
9.8	940	1690	0.28	3.0	290	510	0.28
11.4	810	1830	0.38	3.5	250	560	0.38
13.0	880	1750	0.33	4.0	270	530	0.33
14.7	830	1870	0.38	4.5	250	570	0.38
16.3	840	2180	0.41	5.0	260	660	0.41
18.0	880	2850	0.45	5.5	270	870	0.45
19.6	960	2590	0.42	6.0	290	790	0.42
21.2	1050	2320	0.37	6.5	320	710	0.37
22.9	1160	2370	0.34	7.0	350	720	0.34
24.5	1150	2120	0.29	7.5	350	650	0.29
26.2	1180	2430	0.34	8.0	360	740	0.34
27.8	1200	2720	0.38	8.5	360	830	0.38
29.4	1240	3000	0.40	9.0	380	910	0.40
31.1	1320	2840	0.36	9.5	400	870	0.36
32.7	1360	3750	0.42	10.0	410	1140	0.42
34.4	1380	2970	0.36	10.5	420	910	0.36
36.0	1390	3420	0.40	11.0	420	1040	0.40
37.6	1400	3310	0.39	11.5	430	1010	0.39
39.3	1550	3030	0.32	12.0	470	920	0.32
40.9	1550	3250	0.35	12.5	470	990	0.35
42.6	1520	3280	0.36	13.0	460	1000	0.36
44.2	1590	3210	0.34	13.5	480	980	0.34
45.8	1810	3660	0.34	14.0	550	1120	0.34
47.5	1830	3280	0.27	14.5	560	1000	0.27
49.1	1970	3250	0.21	15.0	600	990	0.21
50.8	1860	3250	0.26	15.5	570	990	0.26
52.4	1630	3420	0.35	16.0	500	1040	0.35
54.0	1600	3440	0.36	16.5	490	1050	0.36
55.7	1630	3880	0.39	17.0	500	1180	0.39
57.3	1870	4110	0.37	17.5	570	1250	0.37
59.0	1810	4830	0.42	18.0	550	1470	0.42
60.6	1900	4460	0.39	18.5	580	1360	0.39
62.2	1880	4430	0.39	19.0	570	1350	0.39
63.9	2060	4370	0.36	19.5	630	1330	0.36

Summary of Compressional Wave Velocity, Shear Wave Velocity, and Poisson's Ratio Based on Source-to-Receiver Travel Time Data - Borehole R19-003

American Units				Metric Units			
Depth at Midpoint Between Source and Near Receiver	Velocity		Poisson's Ratio	Depth at Midpoint Between Source and Near Receiver	Velocity		Poisson's Ratio
	V_s	V_p			V_s	V_p	
(ft)	(ft/s)	(ft/s)		(m)	(m/s)	(m/s)	
65.5	2060	4030	0.32	20.0	630	1230	0.32
67.2	2010	4370	0.37	20.5	610	1330	0.37
68.8	1780	4340	0.40	21.0	540	1320	0.40
70.5	1860	4490	0.40	21.5	570	1370	0.40
72.1	1650	4950	0.44	22.0	500	1510	0.44
73.7	1610	5230	0.45	22.5	490	1590	0.45
75.4	1540	5550	0.46	23.0	470	1690	0.46
77.0	1560	5280	0.45	23.5	480	1610	0.45
78.7	1640	5150	0.44	24.0	500	1570	0.44
80.3	1740	5500	0.44	24.5	530	1680	0.44
81.9	1810	5410	0.44	25.0	550	1650	0.44
83.6	2000	5750	0.43	25.5	610	1750	0.43
85.2	2120	5860	0.42	26.0	650	1790	0.42
86.9	2100	6090	0.43	26.5	640	1860	0.43
88.5	2050	6270	0.44	27.0	620	1910	0.44
90.1	1860	6270	0.45	27.5	570	1910	0.45
91.8	1800	6330	0.46	28.0	550	1930	0.46
93.4	1810	6210	0.45	28.5	550	1890	0.45
95.1	1910	6090	0.45	29.0	580	1860	0.45
96.7	1880	5920	0.44	29.5	570	1800	0.44
98.3	1880	6270	0.45	30.0	570	1910	0.45
100.0	1950	6090	0.44	30.5	590	1860	0.44
101.6	1940	6330	0.45	31.0	590	1930	0.45
103.3	1980	7110	0.46	31.5	600	2170	0.46
105.2	2080	7030	0.45	32.1	630	2140	0.45
106.5	2090	6660	0.45	32.5	640	2030	0.45
108.2	2130	8670	0.47	33.0	650	2640	0.47
109.8	2300	9590	0.47	33.5	700	2920	0.47
110.5	2190	9040	0.47	33.7	670	2760	0.47

APPENDIX B

BOREHOLE GEOPHYSICAL LOGGING SYSTEMS - NIST TRACEABLE CALIBRATION RECORDS

MICRO PRECISION

MICRO PRECISION CALIBRATION, INC
2165 N. Glassell St.,
Orange, CA 92865
714-901-5659

ilac-MRA ANAB ACCREDITED CALIBRATION LABORATORY AC-1363.03

Certificate of Calibration

Date: May 28, 2019 **Cert No. 551220083036926**

Customer:
GEOVISION
1124 OLYMPIC DRIVE
CORONA CA 92881

		Work Order #:	LA-90043197
		Purchase Order #:	19160-190520-01
MPC Control #:	AM6768	Serial Number:	160024
Asset ID:	160024	Department:	N/A
Gage Type:	LOGGER	Performed By:	TYLER MCKEEN
Manufacturer:	OYO	Received Condition:	IN TOLERANCE
Model Number:	3403	Returned Condition:	IN TOLERANCE
Size:	N/A	Cal. Date:	May 24, 2019
Temp/RH:	22.5°C / 42.9%	Cal. Interval:	12 MONTHS
Location:	Calibration performed at MPC facility	Cal. Due Date:	May 24, 2020

Calibration Notes:

See attached data sheet for calculations. (1 Page)

Calibrated IAW customer supplied data form Rev 2.1
Frequency measurement uncertainty = 0.0005 Hz
Unit calibrated with Laptop Panasonic Model CF-29,s/n: 6AKSB99869 and RG Micrologger II Serial No. 5772
Calibrated To 4:1 Accuracy Ratio

Calibration performed in accordance with approved GEOVision calibration procedures included in work Instruction No. 06
Software: ML PS 4.00 Suspension Logger, GVLog.jar (2004) and pslog.exe ver 1.00 software.

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
DB8748	GPS TIME AND FREQUENCY RECEIVER	58503A	3625A01225	HEWLETT PACKARD	Apr 30, 2021	551220083021224
LAS0018	ARB / FUNC GENERATOR	33250A	US40001522	AGILENT	Apr 30, 2020	551220083009506
BD7715	UNIVERSAL COUNTER	53131A	3416A05377	HEWLETT PACKARD	Apr 30, 2020	551220082934517

Calibrating Technician: QC Approval:

TYLER MCKEEN ILYA VAKS

MICRO PRECISION

MICRO PRECISION CALIBRATION, INC
2165 N. Glassell St.
Orange, CA 92865
714-901-5659

ilac-MRA ANAB ACCREDITED CALIBRATION LABORATORY AC-1969.03

Certificate of Calibration

Date: May 28, 2019 **Cert No. 551220083036926**

Procedures Used in this Event

Procedure Name	Description
GEOVISION SEISMIC Rev. 2.1	Seismic Logger/Recorder Calibration Procedure, Rev. 2.1

Calibrating Technician: TYLER MCKEEN

QC Approval: Ilya Vaks

ILYA VAKS

Statements of Pass or Fail Conformance: The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006.
The status of compliance with the acceptance criteria is reported as:
PASS - Compliant with specification
FAIL - Not compliant with specification
FAIL[3] - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.
PASS[3] - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.
The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, and may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.

GEOVision
geophysical services

SUSPENSION PS SEISMIC LOGGER/RECORDER CALIBRATION DATA FORM

INSTRUMENT DATA

System mfg.:	OYO	Model no.:	3403
Serial no.:	160024	Calibration date:	5/24/2019
By:	Micro Precision	Due date:	5/24/2020
Counter mfg.:	Hewlett Packard	Model no.:	53131A
Serial no.:	3416A05377	Calibration date:	4/02/2019
By:	Micro Precision	Due date:	4/30/2020
Signal generator mfg.:	Agilent	Model no.:	33250A
Serial no.:	US40001522	Calibration date:	4/03/2019
By:	Micro Precision	Due date:	4/30/2020
Laptop controller mfg.:	Panasonic	Model no.:	CF-29
Serial no.:	6AKSB99869	Calibration date:	N/A

SYSTEM SETTINGS:

Gain: 0
Filter: Low Pass 1K
Range: 5-200
Delay: 0
Stack (1 std): 1
System date = correct date and time: ✓ 11:42 AM 5/24/2019

PROCEDURE:

Set sine wave frequency to target frequency with amplitude of approximately 0.25 volt peak
Note actual frequency on data form.
Set sample period and record data file to disk. Note file name on data form. Acquired using ML PS 4.00
Pick duration of 9 cycles using PSLOG.EXE program, note duration on data form, and save as .sps file. Calculate average frequency for each channel pair and note on data form.

Average frequency must be within +/- 1% of actual frequency at all data points.

Maximum error ((AVG-ACT)/ACT*100)% As found ~~0.22%~~ 0.2% EF 5/30/19 As left ~~0.22%~~ 0.2% EF 5/30/19

Target Frequency (Hz)	Actual Frequency (Hz)	Sample Period (microS)	File Name	Time for 9 cycles Hn (msec)	Average Frequency Hn (Hz)	Time for 9 cycles Hr (msec)	Average Frequency Hr (Hz)	Time for 9 cycles V (msec)	Average Frequency V (Hz)
50.00	50.00	200	101	179.8	50.06	179.8	50.06	180.2	49.94
100.0	100.0	100	102	90.00	100.0	90.10	99.90	90.10	99.90
200.0	200.0	50	103	45.00	200.0	44.95	200.2	44.95	200.2
500.0	500.0	20	104	18.00	500.0	17.98	500.6	18.00	500.0
1000	1000	10	105	8.980	1002	9.000	1000	8.980	1002
2000	2000	5	106	4.500	2000	4.500	2000	4.495	2002

Calibrated by: Tyler McLean (Name) 5/24/19 (Date) (Signature)

Witnessed by: Emily Feldman (Name) 5/24/19 (Date) (Signature)

Suspension PS Seismic Recorder/Logger Calibration Data Form Rev 2.1 February 7, 2012

ATTACHMENT B

Results of Unconfined Compression Testing

Client:	Ninyo & Moore	Sampled By:	CAT/Group Delta	Date:	11-25 &11-26-19
Project Name:	UCSD Pepper Canyon	Submitted By:	M. Cuthbert	Date:	12/6/2019
Project No.:	5015-18-0034	Tested By:	M. Gibson	Date:	12/11 - 12/19/19
Project Location:	San Diego	Reviewed By:	M. Farr	Date:	12/19/2019

ASTM D 2166 - Unconfined Compressive Strength of Cohesive Soil

Lab No.	Boring ID	Sample Depth (ft)	Bulk Density (lb./ft^3)	Compressive Strength (psi)	Sample Description	Comments
33143	R-19-001	28.9	120.1	61	Friable fine silty sandstone (2/3) and mudstone (1/3)	Length/diameter ratio is 1.19
33144	R-19-002	21.5	129.0	404	Mudstone	Length/diameter ratio is 1.77
33145	R-19-002	29	127.4	356	Mudstone	Length/diameter ratio is 1.38
33146	R-19-002	36.1	118.7	26	Friable fine silty sandstone	Length/diameter ratio is 1.72

Notes:

1.) Due to small available sample length, all samples had a length/diameter ratio significantly less than the 2.0 to 2.5 ratio specified by the test method (see comments).

2.) Samples were intact core samples (not remolded). Prior to testing, samples were trimmed to a right cylinder with flat, relatively uniform ends oriented perpindicular to the core axis.

3.) All samples were tested at approximate as-received moisture content and standard laboratory room temperature.

4.) Bulk density based upon measured weight and dimensions.

5.) See attached photos for sample failure mode. No failures were observed to occur along pre-existing fractures.

Submitted by: ______________________

Mike Farr, CEG 1938

Associate Engineering Geologist

Client:	Ninyo & Moore
Project Name:	UCSD Pepper Canyon
Project No.:	5015-18-0034
Project Location:	San Diego, Ca.
Lab No.:	33143
Boring ID:	R-19-001
Depth (ft.):	28.9

Before testing

After break

Client:	Ninyo & Moore
Project Name:	UCSD Pepper Canyon
Project No.:	5015-18-0034
Project Location:	San Diego, Ca.
Lab No.:	33144
Boring ID:	R-19-002
Depth (ft.):	21.5

Before testing

After break

Client:	Ninyo & Moore
Project Name:	UCSD Pepper Canyon
Project No.:	5015-18-0034
Project Location:	San Diego, Ca.
Lab No.:	33145
Boring ID:	R-19-002
Depth (ft.):	29.0

Before testing

After break

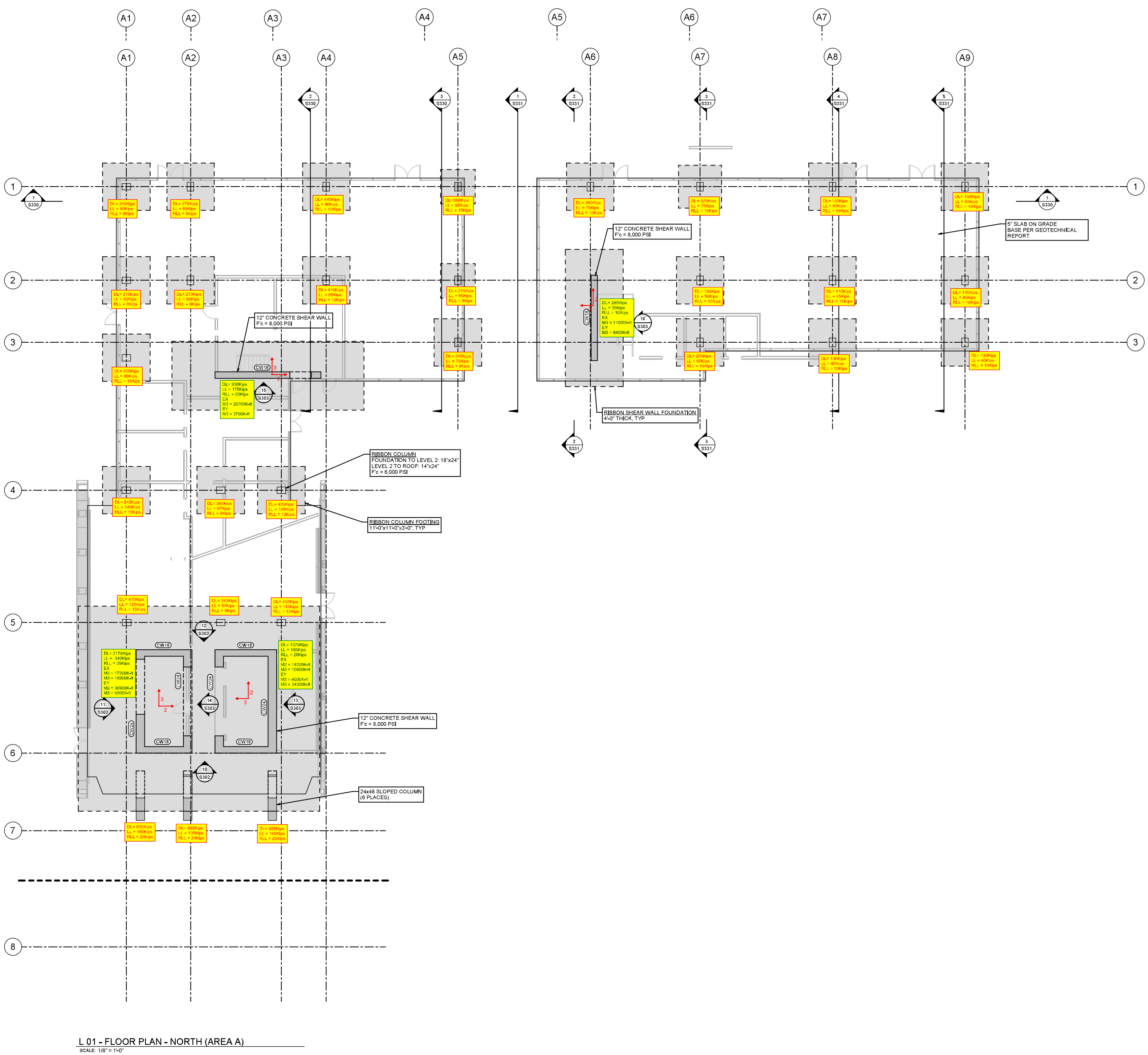
Client:	Ninyo & Moore
Project Name:	UCSD Pepper Canyon
Project No.:	5015-18-0034
Project Location:	San Diego, Ca.
Lab No.:	33146
Boring ID:	R-19-002
Depth (ft.):	36.1

Before testing

After break

ATTACHMENT C

Foundation Drawings and Loads prepared by KPFF



L 01 - FLOOR PLAN - NORTH (AREA A)

SCALE: 1/8" = 1'-0"

SHEET NOTES:

SEE S006 FOR ALL PLAN SYMBOLS AND ABBREVIATIONS.
SEE S010 FOR ALL TYPICAL PLAN NOTES.

KEYNOTE LEGEND:

Perkins&Will

CLARK

kpff
3131 Camino Del Rio North,
Suite 1080
San Diego, CA 92108
619.521.8500
kpff.com

5265: UCSD PEPPER CANYON WEST STUDENT HOUSING

University of California
San Diego Campus
La Jolla, California 92037

SCHEMATIC DESIGN CONFORMED
December 13, 2019

REGISTRATION STAMP

CFM STAMP

KEYPLAN

Job Number
Drawn Author
Checked Checker
Approved Approver

TITLE

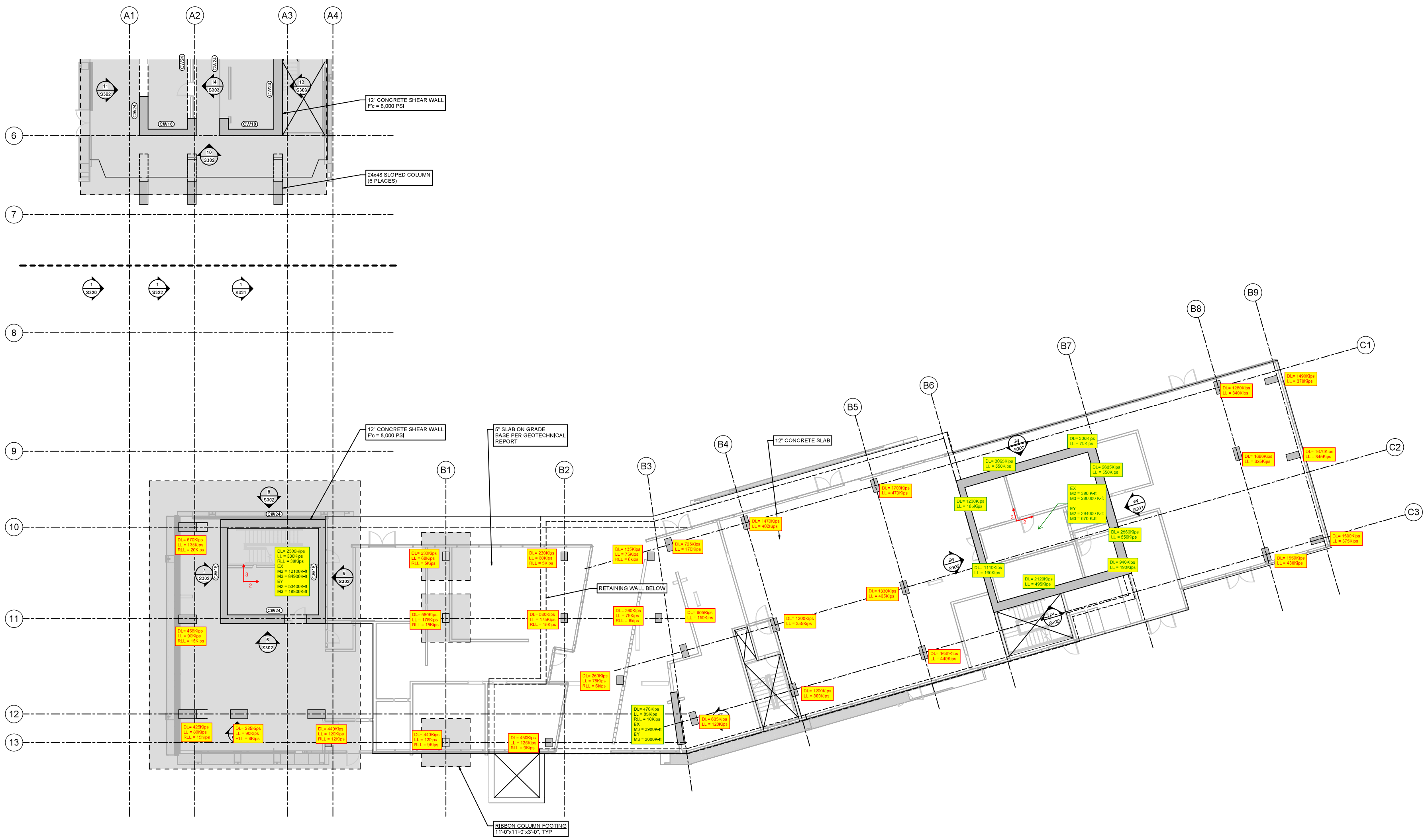
FLOOR PLAN - AREA A, LEVEL 01

SHEET NUMBER

S11N-01A

SHEET NOTES:

SEE S006 FOR ALL PLAN SYMBOLS AND ABBREVIATIONS.
SEE S010 FOR ALL TYPICAL PLAN NOTES.



L 01 - FLOOR PLAN - NORTH (AREA B)

SCALE: 1/8" = 1'-0"

Perkins&Will

CLARK

kpff

3131 Camino Del Rio North,
Suite 1080
San Diego, CA 92108
619.521.8500
kpff.com

5265: UCSD PEPPER CANYON WEST STUDENT HOUSING

University of California
San Diego Campus
La Jolla, California 92037

SCHEMATIC
DESIGN
CONFORMED
December 13, 2019

REGISTRATION STAMP

CFM STAMP

KEYPLAN

Job Number	
Drawn	Author
Checked	Checker
Approved	Approver

TITLE

FLOOR PLAN - AREA B, LEVEL 01

SHEET NUMBER

S11N-01B

Geotechnical Evaluation

Pepper Canyon West Student Housing
UC San Diego
La Jolla, California
UCSD Project No. 5265

UC San Diego

9500 Gilman Drive, MC 0916 | La Jolla, California 92093

September 28, 2018 | Project No. 108614001

Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

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Geotechnical Evaluation

Pepper Canyon West Student Housing
UC San Diego
La Jolla, California
UCSD Project No. 5265

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1 INTRODUCTION

In accordance with your request and our revised proposal dated May 22, 2018, we have performed a geotechnical evaluation and limited environmental soil sampling and analysis for the proposed Pepper Canyon West Student Housing project at UC San Diego, (UCSD) campus in La Jolla, California (Figure 1). This report presents the results of our field exploration and laboratory testing, our conclusions regarding the geotechnical conditions at the site, and our recommendations for the design and earthwork construction of this project and the handling of contaminated and potentially contaminated soils.

2 SCOPE OF SERVICES

Our scope of services included the following:

- Reviewing readily available geologic and seismic hazard data and other background information for the area.

- Performing a field reconnaissance of the site, including marking boring locations for utility clearance by Underground Service Alert, UCSD personnel, and a third-party utility locator.

- Acquiring a boring permit from the San Diego County Department of Environmental Health (DEH).

- Drilling, logging, and sampling of 31 exploratory borings using limited-access and truck-mounted drilling equipment with hollow-stem augers to depths up to 51.2 feet. Bulk and in-place samples of the encountered soils were collected and transported to our in-house geotechnical laboratory for testing. Additional samples were also collected for environmental testing. Borings were backfilled following drilling.

- Performing two infiltration tests for preliminary planning purposes. Infiltration testing was performed in general conformance with the guidelines presented in the City of San Diego Storm Water Standards Manual dated January 3, 2018.

- Performing geotechnical laboratory testing on selected soil samples including in-situ moisture and density, gradation (sieve analysis), Atterberg limits, consolidation, direct shear, expansion index, corrosivity (pH, resistivity, chlorides and sulfates), and R-value.

- Performing environmental analytical testing on soil samples in general accordance with UCSD Soil Management Policy (Policy 516-17) for Total Petroleum Hydrocarbons (TPH) and Title 22 Metals. Generally, samples were collected at depths of 2 feet, 5 feet, and approximate 5-foot intervals thereafter to the total depth explored, but no more than 10 feet into formation.

- Compiling and analyzing the data obtained from our background review, subsurface evaluation, and laboratory testing.

- Preparing this report presenting our findings, conclusions, and recommendations for the design and construction of the proposed improvements. We understand that this report will be provided to the design/build teams as part of the Request for Qualifications.

3 SITE DESCRIPTION

The site of the proposed Pepper Canyon West Student Housing is located to the northeast of the intersection of Gilman Drive and the northern terminus of Villa La Jolla Drive in La Jolla, California (Figure 1). The general site coordinates are approximately 32.8778°N latitude and -117.2329°W longitude. The site is approximately 6½ acres in size and is bounded by Gilman Drive to the south, Pepper Canyon to the east and north, and existing structures to the north and west. The ground elevation ranges from approximately 350 feet above mean sea level (MSL) in the northern portion of the site down to approximately 326 feet above MSL in the southern portion of the site. As noted previously, Pepper Canyon, which has a bottom elevation as low as approximately 285 feet above MSL, is situated along the eastern and northern edges of the site.

The northern approximately three-quarters of the site is currently occupied by eight, two-story residence halls, a single-story Dean's residence, a single-story student services building, a grass courtyard, and asphalt and concrete flatwork. Based on the as-built drawings (UCSD, 1966a), the existing structures consist of wood-framing supported on pile foundations and grade beams. The eight two-story residence halls were constructed in the 1960's while the Dean's residence and student services building were constructed in the late 1990's. The southern approximately one-quarter of the site is used as UCSD Lot P406, which is an asphalt concrete (AC) paved parking lot. Lot P406 was originally constructed in late 1980's and was reconfigured and reconstructed as part of the Gilman Drive widening project in the mid-2010's.

The National Resources Conservation Service (NRCS) soil survey maps (USDA, 2018) classify the on-site materials in the parking lot area (southern portion) as Soil Group C and the other portions of the site as Soil Group D. NRCS describes Soil Groups C and D as materials that have slow and very slow, respectively, infiltration characteristics when thoroughly wet. According to Table G.1-5 of the City of San Diego Storm Water BMP Design Manual (2018), Soil Group C has a potential infiltration rate ranging between 0 and 0.8 inches per hour and Soil Group D has a potential infiltration rate ranging between 0 and 0.02 inches per hour.

4 PROJECT DESCRIPTION

We understand that the Pepper Canyon West Student Housing project is planned to be delivered as a design-build project. As such, conceptual and/or design level drawings have yet to be developed. However, based on information provided by UCSD, we understand that the project will consist of the demolition of the existing buildings and the construction of new residential structures to house 1,200 to 1,400 students. The locations of the proposed improvements/structures are not known to us at this time. Based on recently designed and/or constructed residential buildings on UCSD campus, we anticipate that the new structures will be multi-story and will be of reinforced and/or post-tensioned concrete construction supported on shallow foundations. Based on discussions with UCSD, we understand that the residential structures may include a below-grade basement level. Other improvements are anticipated to include retaining and/or site walls, pavements, flatwork, and underground utilities.

5 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our subsurface exploration was conducted July 23 through July 27, 2018 and July 31, 2018 and consisted of excavating, logging, and sampling of 31 exploratory borings (IT-1, IT-2, and B-1 through B-29). Prior to excavating, the boring locations were cleared of underground utility conflicts by participating members of USA, by a private utility locator, and by UCSD Facilities Management personnel. Twenty-Four borings (B-2 through B-6, B-8 through B-17, B-19, B-21 through B-23, and B-25 through B-29) were drilled using a truck-mounted drill rig equipped with 8-inch diameter, hollow stem-augers, five borings (B-1, B-7, B-18, B-20, and B-24) were drilled using a limited-access drill rig equipped with 6-inch diameter, hollow-stem augers, and two borings (IT-1 and IT-2) were manually excavated using a 6-inch diameter hand auger. Samples of the encountered materials were collected at selected intervals and transported to our in-house geotechnical laboratory for testing and to an outside analytical testing laboratory to be analyzed for TPH and Title 22 Metals in accordance with UCSD Soil Management Policy (Policy 516-17). The approximate locations of the exploratory borings are shown on Figure 2 and the boring logs are presented in Appendix A.

5.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing of representative soil samples included evaluation of in-situ moisture and density, gradation (sieve) analysis, Atterberg limits, consolidation, shear strength parameters, expansion index, maximum dry density and optimum moisture relationship (modified Proctor), soil corrosivity, and R-value. The results of the in-situ moisture content tests are presented on the boring logs in Appendix A. The results of the other laboratory tests performed are presented in Appendix B.

5.2 Environmental Analytical Testing

Soil samples collected for environmental analytical laboratory testing were submitted to Enthalpy Analytical, a State-certified environmental testing laboratory. The samples were analyzed for TPH extended range (C8-C40) by United States Environmental Protection Agency (EPA) method 8015M and Title 22 Metals by EPA methods 6010B/7471A. In addition, soil samples that contained total lead concentrations at or above 50 milligrams per kilogram (mg/kg) were additional analyzed for soluble lead content by the Waste Extraction Test method and the toxicity characteristic leaching procedure (TCLP). The environmental analytical laboratory reports are presented in Appendix C. Laboratory analytical results are summarized on the attached Table 6 and Figures 3 and 4.

5.3 Field Infiltration Testing

As previously noted, NRCS soil survey maps show the site as having infiltration rates ranging between 0 and 0.8 inches per hour. As a means of evaluating the in-situ infiltration characteristics of near-surface materials in the northern and southern portions of the site, infiltration tests were performed on July 31 and August 1, 2018 at two locations designated IT-1 and IT-2 (Figure 2). As noted in Section 5, borings IT-1 and IT-2 were manually excavated to depths up to approximately 5 feet using a 6-inch diameter hand auger. Following the excavation, each infiltration test location was prepared by placing approximately 2 inches of gravel on the bottom, installing a 2-inch diameter perforated PVC pipe, and backfilling the annulus with pea gravel. As part of the test procedure, a presoak was performed on July 31, 2018 to represent adverse conditions for infiltration. The presoak consisted of maintaining approximately 1 foot of water in each test boring for approximately 4 hours. The water level was then allowed to drop overnight.

Infiltration testing at each location was performed on August 1, 2018 in general accordance with the City of San Diego BMP Design Manual (2018). The infiltration test holes were filled with approximately 12 inches of water and the water depth was measured in 30-minute intervals for the duration of the tests. The test holes were refilled after the 30-minute intervals as needed to restore the initial water level.

Infiltration rates were calculated using the Porchet method. Infiltration tests IT-1 and IT-2 indicated that the observed (i.e., unfactored) infiltration rates were 0.83 and 0.68 inches per hour, respectively. Infiltration test results and calculations are included in Appendix D and summarized in Table 1. These results are for planning purposes only. Accordingly, we have assumed a factor of safety of 2.0. The rates presented in Table 1 are to be used for preliminary planning purposes. Once locations and depths of proposed BMPs are selected, additional infiltration testing should be performed and appropriate factor-of-safety should be applied to satisfy the requirements of the City of San Diego BMP Design Manual (2018).

Table 1 – Preliminary Planning Infiltration Test Results Summary					
Infiltration Test	**Approximate Test Depth (feet)**	**Description (Geologic Unit)**	**Observed Infiltration Rate (in/hr)**	**Factor of Safety[1]**	**Reliable/Factored Infiltration Rate[2] (in/hr)**
IT-1	5	Silty SANDSTONE (Very Old Paralic Deposits)	0.83	2.00	0.41
IT-2	5	Clayey SANDSTONE (Very Old Paralic Deposits)	0.68	2.00	0.34

Notes:
in/hr = inches per hour
[1] Use FOS of 2 for planning phase feasibility screening – per Section C.3.3 of Appendix C in the City of San Diego BMP Design Manual (2018)
[2] These rates are for preliminary planning purposes. Once locations and depths of proposed BMPs are selected, additional infiltration testing should be performed and appropriate factor of safety should be applied to satisfy the requirements of the City of San Diego BMP Design Manual (2018).

We note that the in-situ infiltration rates presented in Table 1 represent general infiltration rates that may be anticipated in the northern and southern portions of the site. Variation in the infiltration rates can be expected at different depths and/or locations from those shown in the table. Additional infiltration testing should be performed to satisfy the City of San Diego BMP Design Manual (2018) requirements following selection of locations and depths of BMPs.

6 GEOLOGIC AND SUBSURFACE CONDITIONS

6.1 Regional Geologic Setting

The project area is located in the western San Diego County section of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990; Harden, 2004). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith. The portion of the province in western San Diego County that includes the project area consists generally of Quaternary-age surficial deposits, underlain by Tertiary- and Cretaceous-age sedimentary rocks (Figure 5).

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults are considered to be active. The Elsinore, San Jacinto and San Andreas faults are active fault systems located northeast of the project area and the Rose Canyon, Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project area. The location of the site relative to these regional faults is shown on Figures 6 and 7. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. The Rose Canyon Fault Zone, the nearest active fault system, has been mapped approximately 2.2 miles west of the project site. Further discussion of faulting relative to the site is provided in the faulting and seismicity section of this report.

6.2 Site Geology

The geology of the site vicinity is shown on Figure 5. Geologic units mapped at the site and encountered during our subsurface exploration included fill, very old paralic deposits, and materials of the Scripps Formation (Kennedy and Tan, 2008). Generalized descriptions of the earth units mapped in the vicinity and encountered during our field reconnaissance and subsurface exploration are provided in the subsequent sections. Additional descriptions of the subsurface units encountered are provided on the boring logs in Appendix A. Geologic cross sections are shown on Figures 8A and 8B.

6.2.1 Fill (Qaf)

Although not mapped, fill materials were encountered in each of our borings from the ground surface or underlying pavements to depths of approximately 12½ feet. As encountered, these materials generally consisted of brown, gray, and reddish yellow, dry to moist, loose to dense, silty and clayey sand. Gravel and cobbles were encountered in the fill materials. Information related to the placement and compaction of fill materials is not available for our review.

6.2.2 Very Old Paralic Deposits (Qvop)

Quaternary-age very old paralic deposits, formerly referred to as the Lindavista Formation, are mapped and were encountered within our borings with the exception of those within the parking lot (i.e., borings B-22, B-23, and B-25 through B-29). Where encountered, the very old paralic deposits extended from beneath the fill materials to the depths explored. As encountered, the very old paralic deposits were observed to consist of various shades of brown, gray, and yellow, moist, weakly to strongly cemented, silty to clayey sandstone and sandy siltstone, with gravel and cobbles. Strongly cemented zones are also present in these materials.

6.2.3 Scripps Formation (Tsc)

Materials of the Eocene-aged Scripps Formation are mapped and were encountered within our borings in the parking lot in the southern portion of the site (i.e., borings B-22, B-23, and B-25 through B-29). The Scripps Formation materials were encountered beneath the fill materials and extended to the depths explored. As encountered, the materials of the Scripps Formation were observed to consist of various shades of gray and brown, moist, weakly to strongly cemented, sandy siltstone with claystone interbeds. Strongly cemented or concretionary zones are commonly encountered within the Scripps Formation.

6.3 Groundwater

Groundwater was not encountered in our exploratory borings which extended to depths of approximately 51.2 feet at the site. Based on borings performed within Pepper Canyon for the Mid-Coast Corridor Transit project (Kleinfelder, 2015), groundwater is anticipated to be at an approximate elevation of 228 feet above MSL (i.e., approximately 100 feet or greater below existing ground surface at the site). Fluctuations in the level of groundwater may occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors which may not have been evident at the time of our field evaluation.

7 GEOLOGIC HAZARDS

In general, hazards associated with faulting and seismic activity include strong ground motion, ground surface rupture, and liquefaction. These considerations and other potential geologic hazards such as flooding and landsliding are discussed in the following sections.

7.1 Faulting and Seismicity

The numerous faults in southern California include active, potentially active, and inactive faults. As defined by the California Geological Survey, active faults are faults that have ruptured within Holocene time, or within approximately the last 11,000 years. Potentially active faults are those that show evidence of movement during Quaternary time (approximately the last 1.6 million years) but for which evidence of Holocene movement has not been established. Inactive faults have not ruptured in the last approximately 1.6 million years. The approximate locations of major active and potentially active faults in the vicinity of the site and their geographic relationship to the site are shown on Figure 6.

The site is located in a seismically active area, as is the majority of southern California and the potential for strong ground motion is considered significant during the design life of the proposed structure. Based on our review of the referenced geologic maps as well as on our site reconnaissance, the subject site is not underlain by known active faults and is not located within a State of California Earthquake Fault Zone (EFZ) (formerly known as an Alquist-Priolo Special

Studies Zone) (CGS, 1991). The nearest known active fault is the Rose Canyon Fault, which can generate an earthquake magnitude of up to 6.9 (USGS, 2008). The Rose Canyon Fault has been mapped approximately 2.2 miles west of the site.

The City of San Diego's seismic safety element (2008) depicts an area within 500 feet east of the site as within Hazard Category 12 (Figure 7) due to an inferred mapped fault. The proposed student housing complex is not located within the Hazard Category 12. Hazard Category 12 is considered a potentially active, inactive, presumed inactive, or activity unknown fault zone. As shown on Figure 5, the nearby fault is included in regional geologic mapping (Kennedy and Tan, 2008). Additionally, a pre-Quaternary aged, unnamed fault is located approximately 1 mile north of the site (Jennings, 2010). However, these and other mapped faults in the vicinity are not included in the United States Geological Survey (USGS) earthquake hazards database of faults active within the Quaternary (Treiman and Lundberg, 1999).

7.1.1 Surface Ground Rupture

Based on our review of the referenced literature and our site reconnaissance, active faults are not known to cross the project site. Therefore, the probability of damage from surface ground rupture is considered to be low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

7.1.2 Strong Ground Motion

The 2016 CBC specifies that the Risk-Targeted, Maximum Considered Earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The horizontal peak ground acceleration (PGA) that corresponds to the MCE_R for the site was calculated as 0.49g using the web-based USGS seismic design tool (USGS, 2018). Spectral response acceleration parameters, consistent with the 2016 CBC, are also provided in Section 9.2 for the evaluation of seismic loads on buildings and other structures.

The 2016 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-10 Standard (ASCE, 2013). The

MCE_G peak ground acceleration is based on the geometric mean peak ground acceleration with a 2 percent probability of exceedance in 50 years. The MCE_G peak ground acceleration with adjustment for site class effects (PGA_M) was calculated as 0.52g using the USGS seismic design tool that yielded a mapped MCE_G peak ground acceleration of 0.52g for the site and a site coefficient (F_{PGA}) of 1.000 for Site Class D (USGS, 2018).

7.1.3 Liquefaction and Seismically Induced Settlement

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Based on the relatively dense nature of the underlying materials and the absence of shallow groundwater, it is our opinion that the potential for liquefaction and seismically induced settlement is not a design consideration.

7.2 Tsunamis and Seiches

Tsunamis are long wavelength seismic sea waves (long compared to the ocean depth) generated by sudden movements of the ocean bottom during submarine earthquakes, landslides, or volcanic activity. Seiches are similar oscillating waves on inland or enclosed bodies of water. Based on the location and elevation of the site and the absence of water bodies, the potential for a tsunami or seiche to affect the site is not a design consideration. The site is also mapped outside of tsunami inundation areas (CEMA, 2009).

7.3 Flood and Dam Inundation Hazards

Based on our review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), the project site is located outside of the mapped 100- and 500-year flood zones. Therefore, flooding is not a design consideration for the project. Based on a review of the Multi-Jurisdictional Hazard Mitigation Plan (County of San Diego, 2017), the site is mapped as lying outside of mapped dam failure inundation zones.

7.4 Landsliding and Slope Stability

Based on our review of referenced geologic maps, literature, topographic maps, and stereoscopic aerial photographs, no landslides or indications of deep-seated landsliding were noted underlying the project site. The site is mapped within relative landslide susceptibility area 2, marginally susceptible (Tan, 1995). The City of San Diego's seismic safety element map (2008) depicts the southeast portion of the site is located within Geologic Hazard Category 25 which includes neutral or favorable geologic structure. As such, the potential for significant large-scale slope instability at the site is considered to be low.

7.5 City of San Diego Seismic Safety Study

As part of our evaluation, we have reviewed the City of San Diego Seismic Safety Study (City of San Diego, 2008). The site is located near the contact of multiple Geologic Hazard Categories (Figure 7). Portions of the site are located within categories 25, 51, and 53. The northern part of the site is mapped as category 51 – "Level mesas -- underlain by terrace deposits and bedrock nominal risk". The southern portion of the site is mapped as category 53 –"Level or sloping terrain, unfavorable geologic structure, Low to moderate risk". The southeastern portion of the site is mapped as category 25 – "Ardath: neutral or favorable geologic structure". As previously described, a fault segment is mapped approximately 500 feet east of the site. The fault segment is located within category 12 – "Potentially Active, Inactive, Presumed Inactive, or Activity Unknown". However, this is not considered an active fault by the State of California.

8 ENVIRONMENTAL SOIL CONDITIONS

The environmental laboratory analytical results indicated:

- TPH in the gasoline range (C_8-C_{10}) was not detected in the samples analyzed.
- TPH in the diesel range (C_{10}-C_{28}) was detected in 32 of the 131 samples analyzed at concentrations ranging from 10 to 200 milligrams per kilogram (mg/kg). The maximum concentration is less than the San Francisco Regional Water Quality Control Board Environmental Screening Level (ESL) for TPH in the diesel range of 230 mg/kg. However, soil exported from the site that contains detectable levels of TPH or that are odorous may require special handling.
- TPH in the oil range (C_{28}-C_{40}) was detected in 23 of the 131 samples analyzed at concentrations ranging from 13 to 560 mg/kg. The maximum concentration is less than the ESL for TPH in the oil range of 5,100 mg/kg. However, soil exported from the site that contains detectable levels of TPH or that are odorous may require special handling. In general, the majority of elevated heavy hydrocarbon concentrations appear to be in shallow soil beneath the parking lot, suggesting the presence of residual asphaltic concrete cross-contamination.
- Antimony, beryllium, cadmium, chromium, cobalt, molybdenum, nickel, thallium, vanadium, and zinc were detected in samples analyzed; however, the concentrations were not present at a level that would require special handling.
- Arsenic was detected in two samples (B-1 at 18 feet and B-3 at 15 feet) and barium and selenium were detected in one sample each (B-5 at 15 feet and B-29 at 2 feet, respectively) at concentrations above their respective hazardous waste trigger criteria. Based upon the low frequency at which elevated concentrations of these metals were detected, these concentrations are not likely prevalent throughout soil at the site and would therefore not likely require special handling.

- Copper was detected in one sample (B22 at 15 feet) at a concentration of 7,330 mg/kg, which is more than triple the California hazardous waste criteria. The analytical laboratory re-ran the sample and the subsequent result was 26.3 mg/kg, which appears to be more representative of the soil at the site. The remaining samples did not contain copper at concentration above the hazardous waste trigger criterion.

- Lead was detected in each of the samples analyzed at concentrations ranging from 1.26 to 430 mg/kg. In accordance with guidelines provided by the UCSD Office of Environmental, Health & Safety, post construction conditions for accessible soil (i.e., finished grade to 5 feet below finish grade) should not contain concentrations of total lead greater than 15 mg/kg and inaccessible soil (i.e., greater than 5 feet below finish grade or capped by impermeable surface) should not contain concentrations of lead greater than 49 mg/kg.

  - Fifty-two soil samples collected from 23 boring locations at depths from 2 to 20 feet bgs contained lead at concentrations at or above 15 mg/kg. Soil samples collected at 2 feet bgs from 18 borings contained lead at concentrations above 15 mg/kg. In nine of those borings, soil samples collected from a depth of 5 feet bgs contained lead at or above 15 mg/kg. Based on this information, soils at the site are likely to contain lead at concentration at or above 15 mg/kg.

  - Thirteen soil samples contained lead concentrations that exceeded 49 mg/kg, of which 10 of the samples were collected in fill materials at a depth of 2 feet bgs and one sample each was collected in formation at a depth of 5, 10, and 15 feet bgs. Based on this information, fill materials are likely to contain lead at concentrations that exceed 49 mg/kg.

  - Samples containing lead at or above 50 mg/kg were subsequently analyzed for soluble lead. Seven samples contained lead at a soluble threshold limit concentration (STLC) equal to or greater than the California-hazardous waste criterion of 5 milligrams per liter (mg/l). The samples were collected in the fill materials at a depth of 2 feet bgs. The samples did not contain soluble lead by TCLP at or above the Federal-hazardous waste criterion of 5 mg/l. Based on this, fill materials within the top 2 to 5 feet bgs are likely to contain lead at concentrations that would classify the soil as a California-hazardous waste.

9 CONCLUSIONS

Based on our review of the referenced background data, subsurface exploration, and laboratory testing, it is our opinion that construction of the proposed project is feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the design and construction of the project. In general, the following conclusions were made:

- The project site is underlain by fill soils, very old paralic deposits, and materials of the Scripps Formation. The fill materials are considered unsuitable for support of structures in their current condition. Recommendations for remedial grading are presented in Section 10.1.3 and 10.1.4 of this report.

- Environmental analytical testing indicated some on-site soils may be considered contaminated based on UC San Diego EH&S requirements and are not considered suitable for reuse. Soils defined as contaminated should be stockpiled separately and disposed of off-site.

- Site soils are likely to contain detectable concentrations of TPH in the diesel and motor oil range. Based on the concentrations detected, the soils are likely suitable for on-site reuse; however, soils exported from the site with detectable concentrations of TPH or that are odorous may require special handling.

- Lead was detected in each of the soil samples collected at the site. Based on analytical data, site soils are likely to contain lead at concentration at or above 15 mg/kg, fill materials are likely to contain lead at concentrations that exceed 49 mg/kg, and fill materials within the top 2 to 5 feet bgs are likely to contain lead at concentrations that would classify the soil as a California-hazardous waste and require special handling and disposal at a licensed landfill.

- In general, the on-site soils exhibit a low expansion index and are generally considered suitable for reuse as fill, provided they meet the recommendations for fill materials as presented in this report and UCSD EH&S guidelines. Materials to be reused should not be considered contaminated as defined by UC San Diego EH&S.

- The existing soils, as encountered in our borings, should be generally excavatable with heavy-duty earth moving equipment in good working condition. Additional efforts including heavy ripping should be anticipated in gravel and cobbles. Additional processing and handling of materials including screening and crushing should be anticipated. Based on our borings and experience, cobbles and strongly cemented zones should be anticipated within the very old paralic deposits and materials of the Scripps Formation. Due to the presence of these materials, the contractor should anticipate encountering difficulties with performing excavations and drilling operations.

- Groundwater was not encountered in our exploratory borings to a depth of approximately 50 feet at the site. Nearby borings by others indicate groundwater may be at depths of 100 feet or greater. Although groundwater is not considered a design consideration, perched water and/or seepage at the site may be encountered and should be anticipated.

- Preliminary field infiltration testing indicated factored infiltration rates of 0.41 and 0.34 inches per hour based on a planning/feasibility study factor of safety of 2.0. These rates are for preliminary planning purposes and design of infiltration devices and/or other stormwater BMPs should be based on infiltration rates measured at the locations and depths of the devices and application of appropriate factor-of-safety.

- The active Rose Canyon fault zone is located approximately 2.2 miles west of the site. Accordingly, the potential for relatively strong seismic ground motions should be considered in the project design.

- Based on the results of our soil corrosivity tests presented in Appendix B the site soils are considered non-corrosive based on the California Department of Transportation (Caltrans, 2018) corrosion guidelines.

10 RECOMMENDATIONS

Based on our understanding of the project, the following recommendations are provided for the design and construction of the proposed improvements. The proposed site improvements should be constructed in accordance with the requirements of the applicable governing agencies.

10.1 Earthwork

In general, earthwork should be performed in accordance with the recommendations presented in this report. Ninyo & Moore should be contacted for questions regarding the recommendations or guidelines presented herein.

10.1.1 Pre-Construction Conference

We recommend that a pre-construction conference be held. The owner and/or their representative, the governing agencies' representatives, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the work plan and project schedule and earthwork requirements.

10.1.2 Site Preparation

As noted previously, the existing buildings at the site are to be demolished. The demolition of the existing buildings should also include removal of foundations, underground utilities, and other underground improvements/obstructions within the project area. Prior to performing excavations or other earthwork, the site should be cleared of existing fill soils, debris, vegetation, and loose or otherwise unsuitable soils. Obstructions that extend below the finished grade (such as tree stumps, existing foundations, and underground utilities) should be removed and the resulting holes filled with compacted soil. Materials generated from the clearing operations should be removed from the project site and disposed of at a legal dump site.

10.1.3 Remedial Grading for Building Pad

We recommend that the existing fill soils within the building pads, if not removed during grading, be overexcavated down to competent formational materials consisting of very old paralic deposits or Scripps Formation. Depths of existing fill materials encountered during our subsurface exploration are approximately 5 feet in the northern portion of the site (B-18 and B-20) and approximately 13 feet within the existing parking area in the southern portion of the site (B-22). However, deeper fills may be present at the site. This overexcavation should extend to the horizontal limits of the structural footprint (including foundations for attached overhangs, canopies, and other building appurtenances) plus a horizontal distance of 5 feet. The extent and depths of removals and overexcavations should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. The resultant overexcavation surface should be scarified to a depth of approximately 8 inches, moisture conditioned and recompacted to a relative compaction of 90 percent as evaluated by the ASTM International (ASTM) Test Method D 1557 prior to placing new fill.

The resulting excavation should then be backfilled with granular soils with a very low to low expansion potential (i.e., an expansion index [EI] of 50 or less) up to 2 feet below bottom of footings and/or slab-on-grade. The upper 2 feet below bottom of footings and/or slab-on-grade should backfilled with granular soils with a very low expansion potential (i.e., an expansion index [EI] of 20 or less). These materials should be placed and compacted in accordance with the Compacted Fill section of this report.

As noted previously, the depth of existing fill materials within the parking lot area in the southern portion of the site is anticipated to be approximately 13 feet or more. If complete removal and replacement of the existing fill materials within the parking area is not feasible due to the removal depth, the remedial grading depth may be reduced provided that the structure is supported on deep foundations extending into formational materials. For structures supported on deep foundations extending into formational materials, the existing fill materials within the structural footprint plus a horizontal distance of 5 feet should be removed down to a depth of 2 feet below the slab elevation. The resultant overexcavation surface should be scarified to a depth of approximately 8 inches, moisture conditioned and recompacted to a relative compaction of 90 percent as evaluated by the ASTM International (ASTM) Test Method D 1557 prior to placing new fill. The resulting excavation should then be backfilled with granular soils with a very low expansion potential (i.e., an expansion index [EI] of 20 or less). These materials should be placed and compacted in accordance with the Compacted Fill section of this report.

10.1.3.1 Treatment of Cut/Fill Transitions Beneath Buildings

Based on the subsurface conditions at the site, cut/fill transitions may occur beneath proposed building locations. In order to mitigate the potential for differential settlement, we recommend that where a cut/fill transition line extends beneath a proposed building to be supported on formational material, the cut portion of the pad should be undercut and the foundations should be extended to be supported on formational materials. The undercut should be 2 feet below the bottom of the planned slab elevation and replaced with compacted fill exhibiting a very low expansion potential (i.e., an expansion index [EI] of 20 or less). The undercut should be extended outward a distance of 5 feet beyond the limits of the structure.

We recommend that where a cut/fill transition line extends beneath a proposed building to be supported on compacted fill, the cut portion of the pad should be undercut one-third of the depth of fill or 2 feet below the bottom of the footing, whichever is greater. The undercut should be extended outward a distance of 5 feet beyond the limits of the structure. The resulting excavation should then be backfilled with granular soils with a very low to low expansion potential (i.e., an expansion index [EI] of 50 or less) up to 2 feet below bottom of footings and/or slab-on-grade. The upper 2 feet below bottom of footings and/or slab-on-grade should backfilled with granular soils with a very low expansion potential (i.e., an expansion index [EI] of 20 or less). These materials should be placed and compacted in accordance with the Compacted Fill section of this report.

10.1.4 Remedial Grading for Retaining Walls and Site Walls

We recommend that the existing fill soils beneath retaining and/or site walls not connected to buildings, if not removed during grading, be overexcavated 3 feet below bottom of footings. This overexcavation should extend to the horizontal limits of the structural footprint plus a horizontal distance of 5 feet. The extent and depths of removals and overexcavations should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. The resultant overexcavation surface should be scarified to a depth of approximately 8 inches, moisture conditioned and recompacted to a relative compaction of 90 percent as evaluated by the ASTM International (ASTM) Test Method D 1557 prior to placing new fill. The resulting excavation should then be backfilled with granular soils with a very low to low expansion potential (i.e., an expansion index [EI] of 50 or less). These materials should be placed and compacted in accordance with the Compacted Fill section of this report.

10.1.5 Remedial Grading for Pavement and Flatwork

In the proposed pavement and flatwork areas, we recommend that the on-site soils be overexcavated to a depth of 1 foot below the planned finished surface elevation. The proposed overexcavations should extend outward horizontally 2 feet from the horizontal limits of the pavement or flatwork. The extent and depth of removals should be evaluated by Ninyo & Moore's representative in the field based on the material exposed. The resulting surface should be scarified 8 inches, moisture conditioned, and recompacted to a relative compaction of 90 percent as evaluated by ASTM D 1557. The overexcavation should then be filled with engineered fill. The engineered fill should be moisture conditioned to near optimum moisture content and compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557. The upper 12 inches of subgrade soils beneath vehicular pavements should be placed at a relative compaction of 95 percent as evaluated by ASTM D 1557.

10.1.6 Excavation Characteristics

The existing soils, as encountered in our borings, should be generally excavatable with heavy-duty earth moving equipment in good working condition. Additional efforts including heavy ripping should be anticipated in gravel and cobbles. Additional processing and handling of materials including screening and crushing should be anticipated. Based on our borings and experience, cobbles and strongly cemented zones should be anticipated within the very old paralic deposits and materials of the Scripps Formation. Due to the presence of these materials, the contractor should anticipate encountering difficulties with performing excavations and drilling operations. Oversize materials from the demolition activities, including foundations of the existing walls to be demolished, should be anticipated.

As previously discussed and as shown in Appendix C, results of the environmental analytical testing indicated that the on-site materials may contain elevated levels of lead and/or TPH. Materials generated from excavations within these areas should be stockpiled on-site for additional testing and evaluation. Recommendations for reuse and/or disposal of these materials should be based on the additional testing and evaluation and in accordance with UC San Diego EH&S guidelines and the recommendations presented herein.

10.1.7 Temporary Excavations

For temporary excavations, we recommend that the following Occupational Safety and Health Administration (OSHA) soil classifications be used:

Fill	*Type C*
Very Old Paralic Deposits and Scripps Formation	*Type B*

Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations. Temporary excavations should be constructed in accordance with OSHA recommendations. For trench or other excavations, OSHA requirements regarding personnel safety should be met using appropriate shoring (including trench boxes) or by laying back the slopes to no steeper than 1.5:1 (horizontal: vertical) in engineered fill and 1:1 in very old paralic deposits and materials of the Scripps Formation. Temporary excavations that encounter seepage may be shored or stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. On-site safety of personnel is the responsibility of the contractor.

10.1.8 Shoring

Due to the depth of remedial grading and the potential for below-grade basement levels, we anticipate that temporary shoring may be needed. Temporary shoring systems should be designed to resist the lateral loads generated from the fill and formational materials present at the site.

For preliminary design of the shoring system, the magnitude and distribution of lateral earth pressures presented on Figure 9 for braced shoring and Figure 10 for cantilevered shoring should be used. The recommended design earth pressures are based on the assumptions that (a) the shoring system is constructed without raising the ground surface elevation behind the shoring, (b) that there are no surcharge loads, such as soil stockpiles, construction materials, or vehicular traffic, and (c) that no loads act above a 1 to 1 plane extending up and back from the base of the shoring system. For shoring subjected to the above-mentioned surcharge loads, the contractor should include the effect of these loads on lateral earth pressures acting on the shoring wall.

Settlement of the ground surface may occur behind the shoring wall during excavation. The amount of settlement depends on the type of shoring system, the quality of contractor's workmanship, and soil conditions. Settlement may cause distress to adjacent structures, if present. To reduce the potential for distress to adjacent structures, we recommend that the shoring system be designed to limit the ground settlement behind the shoring to ½ inch or less. Possible causes of settlement that should be addressed include vibration during installation of the sheet piling, excavation for construction, construction vibrations, dewatering, and removal of the support system. We recommend that the potential settlement distress be evaluated carefully by the contractor prior to construction.

The contractor should retain a qualified and experienced engineer to design the shoring system. The shoring parameters presented in this report are for preliminary design purposes and the contractor should evaluate the adequacy of these parameters and make appropriate modifications for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed. We further recommend that the construction methods provided herein be carefully evaluated by a qualified specialty contractor prior to commencement of the construction.

10.1.9 Fill Material

On-site sandy soils (sand, silty sand, and clayey sand) with an organic content of less than approximately 3 percent by volume (or 1 percent by weight), that possess an expansion index (EI) less than 50, and meet UC San Diego EH&S guidelines, are suitable for reuse as engineered fill material. In general, fill material should not contain rocks or lumps over approximately 3 inches in diameter, and not more than approximately 30 percent larger than ¾ inch. Rocks or hard lumps larger than approximately 3 inches in diameter should be broken into smaller pieces or should be removed from the site.

Imported fill material should generally be granular soils with a very low expansion potential (i.e., an expansion index [EI] of 20 or less). Additionally, import material should not be considered corrosive as defined by Caltrans (2018) corrosion guidelines and ACI 318. The contractor should be responsible for the uniformity of import material brought to the site. We recommend that materials proposed for use as import fill be evaluated from a contractor’s stockpile rather than in-place materials. Materials for use as fill should be evaluated by Ninyo & Moore’s representative prior to filling or importing.

To reduce the potential for importation of contaminated materials to the site, soil materials obtained from off-site sources shall be evaluated prior to their delivery to the site by the supplier or contractor and certified as suitable for use in compliance with California Department of Toxic Substances Control “Information Advisory, Clean Imported Fill Material,” dated October 2001. In addition, import materials should be in compliance with UC San Diego Environment, Health & Safety (EH&S) requirements. Certification and detailed test results should be submitted to UC San Diego for approval prior to their delivery to the site. Importation of soils that exhibit a known risk to human health or the environment should not be permitted.

10.1.10 Fill Placement and Compaction

Prior to placement of compacted fill, the contractor should request an evaluation of the exposed ground surface by Ninyo & Moore. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve moisture contents generally above the optimum moisture content. The scarified materials should then be compacted to a relative compaction of 90 percent as evaluated in accordance with ASTM D 1557. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify this office and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Fill materials should be moisture conditioned to generally above the laboratory optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent within the soil mass.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve a moisture content generally above the laboratory optimum, mixed, and then compacted by mechanical methods, to a relative compaction of 90 percent as evaluated by ASTM D 1557. Successive lifts should be treated in a like manner until the desired finished grades are achieved. The upper 12 inches of the subgrade materials underneath vehicular pavements should be placed to a relative compaction of 95 percent as evaluated by the current version of ASTM D 1557. Additionally, aggregate base materials underneath vehicular pavements should be compacted to a relative compaction of 95 percent relative density as evaluated by the current version of ASTM D 1557.

10.1.11 Pipe Bedding and Modulus of Soil Reaction (E')

It is our recommendation that new pipelines (pipes), where constructed in open excavations, be supported on 6 or more inches of granular bedding material. Granular pipe bedding should be provided to distribute vertical loads around the pipe. Bedding material and compaction requirements should be in accordance with this report. Pipe bedding typically consists of graded aggregate with a coefficient of uniformity of three or more.

The modulus of soil reaction (E’) is used to characterize the stiffness of soil backfill placed at the sides of buried flexible pipes for the purpose of evaluating deflection caused by the weight of the backfill over the pipe (Hartley and Duncan, 1987). A soil reaction modulus of 1,000 pounds per square inch (psi) may be used for an excavation depth of up to approximately 5 feet when backfilled with granular soil compacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557. A soil reaction modulus of 1,400 psi may be used for trenches deeper than 5 feet.

10.1.12 Pipe Zone Backfill

The pipe zone backfill extends from the top of the pipe bedding material and continues to extend to 1 foot or more above the top of the pipe in accordance with the recent edition of the Standard Specifications for Public Works Construction ("Greenbook"). Pipe zone backfill should have a Sand Equivalent (SE) of 30 or more, and be placed around the sides and top of the pipe. Special care should be taken not to allow voids beneath and around the pipe. Compaction of the pipe zone backfill should proceed up both sides of the pipe.

It has been our experience that the voids within a crushed rock material are sufficiently large to allow fines to migrate into the voids, thereby creating the potential for sinkholes and depressions to develop at the ground surface. If open-graded gravel is utilized as pipe zone backfill, this material should be separated from the adjacent trench sidewalls and overlying trench backfill with a geosynthetic filter fabric.

10.1.13 Utility Trench Zone Backfill

Utility trench zone backfill material should be generally free of trash, debris, roots, vegetation, or deleterious materials. Trench zone backfill should generally be free of rocks or hard lumps of material in excess of 3 inches in diameter. Rocks or hard lumps larger than about 3 inches in diameter should be broken into smaller pieces or should be removed from the site. Oversize materials should be separated from material to be used as trench backfill. Moisture conditioning (including drying and/or mixing) of existing on-site materials is anticipated if reused as trench backfill.

10.1.14 Thrust Blocks

Thrust restraint for buried pipelines may be achieved by transferring the thrust force to the soil outside the pipe through a thrust block. Thrust blocks may be designed using the magnitude and distribution of passive lateral earth pressures presented on Figure 11. Thrust blocks should be backfilled with granular backfill material and compacted following the recommendations presented in this report.

10.2 Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the seismic design parameters for the site in accordance with the CBC (2016) guidelines and adjusted MCE_R spectral response acceleration parameters (USGS, 2018).

Table 2 – 2016 California Building Code Seismic Design Criteria	
Seismic Design Factors	**Value**
Site Class	D
Site Coefficient, Fa	1.021
Site Coefficient, Fv	1.537
Mapped Spectral Acceleration at 0.2-second Period, Ss	1.197g
Mapped Spectral Acceleration at 1.0-second Period, S1	0.463g
Spectral Acceleration at 0.2-second Period Adjusted for Site Class, SMS	1.222g
Spectral Acceleration at 1.0-second Period Adjusted for Site Class, SM1	0.712g
Design Spectral Response Acceleration at 0.2-second Period, SDS	0.815g
Design Spectral Response Acceleration at 1.0-second Period, SD1	0.475g

10.3 Foundations

As previously noted, conceptual and/or design level drawings have yet to be developed. Based on recently designed and/or constructed residential buildings on UCSD campus, we anticipate that the new structures will be supported on shallow and/or mat foundations. Additionally, within the existing parking lot area in the southern portion of the site, new structures may be supported on deep foundations. Foundations should be designed in accordance with structural considerations and the following preliminary recommendations. When additional project specifics are available, the preliminary recommendations presented in this report may need to be revised or modified accordingly. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

10.3.1 Shallow Foundations

Shallow, spread, or continuous footings, should be supported entirely on compacted fill or competent formational material. Additionally, to mitigate the potential for differential settlement, the whole foundation system for any single structure should be supported on either compacted fill or competent formational material. Footings supported entirely on compacted fill may be designed using a net allowable bearing capacity of 3,000 pounds per square foot (psf) and footings supported entirely on competent formational material may be designed using an allowable bearing capacity of 5,000 psf. These allowable bearing capacities may be increased by 250 psf for each additional foot of width or depth up to 4,000 psf in compacted fill and 6,000 psf in formation. Additionally, these allowable bearing capacities may be increased by one-third when considering loads of short duration such as wind or seismic forces. These allowable bearing capacities are based on a factor of safety of roughly three.

Footings should be founded 36 inches or more below the finished building pad subgrade elevation. Continuous footings should have a width of 18 inches and spread footings should be 24 inches in width. The footings should be reinforced in accordance with the recommendations of the project structural engineer. Additionally, footings located adjacent to or near descending slopes should be setback from the slope or deepened to provide a minimum horizontal distance of 15 feet between the slope face and closest footing edge.

If required by the topography of the site or due to fill thickness, portions of the building foundations may need to be deepened to bear on competent formational material. As an alternative method to stepping down and deepening the footings, the deepened portions of the foundation excavations more than 36 inches below finished pad subgrade elevation may be backfilled with controlled low-strength material (CLSM) to the bottom elevation of the concrete footing. For this alternative, footings may bear on a controlled low strength material (CLSM) backfill with a compressive strength of 150 pounds per square inch (psi) according to “Greenbook,” Section 201-6 specifications. CLSM backfill should extend down to competent formational material consisting of very old paralic deposits or Scripps Formation.

10.3.1.1 Lateral Resistance

For resistance of footings to lateral loads, bearing either on compacted fill or competent formational materials, we recommend an allowable passive pressure of 350 psf of depth be used with a value of up to 3,500 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a coefficient of friction of 0.35 be used between soil and concrete. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.3.1.2 Static Settlement

We estimate that the proposed structures, designed and constructed as recommended herein will undergo total settlement on the order of 1 inch. Differential settlement on the order of ½ inch over a horizontal span of 40 feet should be expected.

10.3.2 Cast-In-Drilled-Hole Piles

As noted previously, complete removal and replacement of the existing fill materials within the existing parking lot area as recommended in Section 10.1.3 of this report may not be feasible. As an alternative to the full-depth remedial grading, a partial depth remedial grading as described in Section 10.1.3 may be performed along with use of deep foundations. For this case, we recommend that the proposed structures be supported on cast-in-drilled-hole (CIDH) piles having a diameter of 2 feet or more. Additionally, we recommend that the CIDH piles extend through the fill materials and be embedded 5 feet or more into competent formational material. The length of piles will vary based on the thickness of fill at the proposed building locations. However, based the depth of fill encountered within our borings in the existing parking lot area, the CIDH piles may be 18 feet or more in length. The pile dimensions and spacing should be evaluated by the project structural engineer.

We recommend that the 2-foot CIDH piles embedded 5 feet into competent formational material be designed using an allowable axial capacity of 20 kips in downward compression. The allowable downward axial capacity may be increased by 2 kips per additional foot of embedment into the formational material. The allowable axial capacity does not consider end bearing resistance. We recommend that the 24-inch CIDH piles embedded 5 feet into competent formational material be designed for lateral capacities as shown on Table 3.

Table 3 – Lateral Load Capacity of 24-Inch Diameter CIDH Pile

Design Condition	Free Head	Fixed Head
Pile Length*	18 feet	
Allowable Deflection	¼-inch	
Lateral Capacity, kips	10.2	26.5
Maximum Positive Moment, ft-kip	41.5	35.3
Maximum Negative Moment, ft-kip	---	-129.2
Depth to Maximum Positive Moment, ft	6.9	11.3
Depth to Maximum Negative Moment, ft	---	0
Depth to 1st Point of Zero Deflection, ft	12.7	14.7

Note:
*Design length based on depth of fill encountered in boring B-22 plus 5 feet of embedment into formation.

For lateral loading, piles in a pile group may be considered to act individually when the center-to-center spacing is greater than 3D (where D is the diameter of the pile) in the direction normal to loading and greater than 8D in the direction parallel to loading. Table 4 presents the lateral load reduction factors to be applied for various pile spacing for in-line loading.

Table 4 – Preliminary Lateral Load Reduction Factors			
Center-To-Center Pile Spacing for In-Line Loading (Diameters)	Group Efficiency (Ratio of Lateral Resistance of Pile in a Group to a Single Pile)		
	Row 1	Row 2	Row 3 and Higher
2D	0.60	0.35	0.25
3D	0.75	0.55	0.40
5D	1.00	0.85	0.70
7D	1.00	1.00	0.90

Note:
Based on California Amendments to AASHTO LRFD Bridge Design Specifications, 4th Edition, November 2011

Drilled pile excavations may be difficult to perform due to the presence of gravel and/or cobbles in the fill materials, as well as concretions and cemented zones within the formational materials. The drilled pile installation should be observed by Ninyo & Moore during construction to evaluate if the piles have been extended to the design depths and embedment. The drilled holes should be cleaned of loose soil and gravel. It is the contractor's responsibility to (a) take appropriate measures for maintaining the integrity of the drilled holes, (b) see that the holes are cleaned and straight, and (c) see that sloughed loose soil is removed from the bottom of the hole prior to the placement of concrete. Drilled piles should be checked for alignment and plumbness during installation. The amount of acceptable misalignment of a pile is approximately 3 inches from the plan location. It is usually acceptable for a pile to be out of plumb by 1 percent of the depth of the pile. The center-to-center spacing of piles should be no less than three times the nominal diameter of the pile.

The contractor should clean the bottoms of the excavations with either a cleanout plate/bucket or vacuum to remove loose materials from the bottom of the excavation. Due to the variability in the existing fill materials, we recommend that the contractor consider taking appropriate measures during construction to reduce the potential for caving of the drilled holes. Although groundwater was not present during our subsurface exploration, if encountered, groundwater will have an impact on construction of the CIDH piles. The contractor should be prepared to case the excavations where caving occurs. Drilling mud may be used in lieu of casing to aid in retaining the soils. Concrete should be tremied into place with an adequate head to displace water or drilling mud. Concrete should be placed in such a manner to see that the aggregate and cement do not segregate during concrete placement. Concrete should not be placed freefall or in such a manner as to hit the sidewalls of the excavation.

10.3.2.1 Static Settlement

We estimate that the proposed structures supported on CIDH piles, designed and constructed as recommended herein, will undergo total settlement on the order of ¾-inch. Differential settlement on the order of ½-inch over a horizontal span of 40 feet should be expected.

10.3.3 Canopy/Shade Structure Foundations

Canopy/shade structures, if proposed, may be supported on CIDH piles. Canopy/shade structures typically impose relatively light axial loads on foundations. Although we anticipate that pile dimensions will be generally governed by the lateral load demand, we recommend that drilled canopy/shade structure foundations have a diameter of 24 inches or more. The pile dimensions (i.e., diameter and embedment) should be evaluated by the project structural engineer.

Drilled pile excavations may be difficult to perform due to the presence of gravel and/or cobbles in the fill materials, as well as concretions and cemented zones within the formational materials. The drilled pile construction should be observed by Ninyo & Moore during construction to evaluate if the piles have been extended to the design depths. The drilled holes should be cleaned of loose soil and gravel. It is the contractor's responsibility to (a) take appropriate measures for maintaining the integrity of the drilled holes, (b) see that the holes are cleaned and straight, and (c) see that sloughed loose soil is removed from the bottom of the hole prior to the placement of concrete. Drilled piles should be checked for alignment and plumbness during installation. The amount of acceptable misalignment of a pile is approximately 3 inches from the plan location. It is usually acceptable for a pile to be out of plumb by 1 percent of the depth of the pile. The center-to-center spacing of piles should be no less than three times the nominal diameter of the pile.

For resistance of shade structure footings to lateral loads that are founded in existing soil or compacted fill materials, we recommend an allowable passive pressure of 300 psf per foot of depth be used with a value of up to 3,000 psf. This value assumes that the shade structures are designed to tolerate ½ inch of deflection at the surface and that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a coefficient of friction of 0.35 be used between soil and concrete. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.4 Retaining Walls

Retaining walls supported on compacted fill, prepared in accordance with the remedial grading recommendations, may be designed using a net allowable bearing capacity of 3,000 pounds per square foot (psf). Retaining wall foundations should be 18 inches or more below the finished building pad subgrade elevation and should have a width of 18 inches or more. For the design of a yielding retaining wall that is not restrained against movement by rigid corners or structural connections, preliminary lateral pressures are presented on Figure 12. Restrained walls (non-yielding) may be designed for preliminary lateral pressures presented on Figure 13. These pressures assume select backfill materials are used and free draining conditions. Measures should be taken to reduce the potential for build-up of moisture behind the retaining walls. A drain should be provided behind the retaining wall as shown on Figure 14. The drain should be connected to an appropriate outlet. The remedial grading and foundation recommendations provided in previous sections are also applicable for retaining walls.

10.5 Interior Slabs-on-Grade

We recommend that conventional, interior concrete slab-on-grade floors be underlain by compacted fill materials of generally very low to low expansion potential. Interior concrete slabs-on-grade should be 5 inches thick and be reinforced with No. 4 reinforcing bars spaced 18 inches on center each way. The reinforcing bars should be placed near the middle of the slab. As a means to help reduce shrinkage cracks, we recommend that the slabs be provided with crack-control joints at intervals of approximately 12 feet each way. The slab reinforcement and expansion joint spacing should be designed by the project structural engineer.

If moisture sensitive floor coverings are to be used, we recommend that slabs be underlain by a vapor retarder and capillary break system consisting of a 10-mil polyethylene (or equivalent) membrane placed over 4 inches of medium to coarse, clean sand or pea gravel. The steel reinforcements for the floor slabs shall be placed on the vapor retarder using chairs, as appropriate.

10.6 Concrete Flatwork

Exterior concrete flatwork should be 4 inches in thickness and should be reinforced with No. 3 reinforcing bars placed at 24 inches on-center both ways. A vapor retarder is not needed for exterior flatwork. To reduce the potential manifestation of distress to exterior concrete flatwork due to movement of the underlying soil, we recommend that such flatwork be installed with crack-control joints at appropriate spacing as designed by the design engineer. Before placement of concrete, remedial grading should be performed in accordance with Section 9.1.4 of this report. Positive drainage should be established and maintained adjacent to flatwork.

10.7 Corrosion

Laboratory testing was performed on representative samples of near-surface soil to evaluate soil pH, electrical resistivity, water-soluble chloride content, and water-soluble sulfate content. The soil pH and electrical resistivity tests were performed in general accordance with California Test Method (CT) 643. Chloride content tests were performed in general accordance with CT 422. Sulfate testing was performed in general accordance with CT 417.

The pH values of tested samples were measured at approximately 7.4 and 9.6, the electrical resistivities were measured at approximately 2,600 and 4,000 ohm-centimeters, the chloride contents were measured at approximately 75 an 20 parts per million (ppm), and the sulfate contents were measured at approximately 0.001 percent (i.e., 10 ppm). Based on the Caltrans (2018) corrosion criteria, the project site would not be classified as a corrosive site. Caltrans (2018) defines a corrosive site as having earth materials with greater than 500 ppm chlorides, greater than 0.15 percent sulfates (i.e., 1,500 ppm), a pH of 5.5 or less, and/or an electrical resistivity of 1,000 ohm-centimeters or less.

10.8 Concrete

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical deterioration. Laboratory testing indicated sulfate contents of the samples tested of 0.001 percent (i.e., 10 ppm). According to the ACI 318, the potential for sulfate attack is negligible for water-soluble sulfate content of up to about 0.10 percent by weight (i.e., 1,000 ppm) in soils. Therefore, the site soils may be considered to have a negligible potential for sulfate attack. However, due to the potential variability of site soils, we recommend using Type II/V cement and concrete with a water-cement ratio no higher than 0.45 by weight for the project.

10.9 Drainage

Roof, pad, and slope drainage should be conveyed such that runoff water is diverted away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.). Positive drainage adjacent to structures should be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 5 percent or steeper for a distance of 10 feet or more outside the building perimeter, or 2 percent or steeper for a distance of 10 feet or more outside the building perimeter if paved. Drainage should be further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site should be provided so that water is not permitted to pond. A gradient of 2 percent or steeper should be maintained over the pad area and drainage patterns should be established to divert and remove water from the site to appropriate outlets.

Care should be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of final grading should be maintained for the life of the project. The property owner and the maintenance personnel should be made aware that altering drainage patterns might be detrimental to slope stability and foundation performance.

10.10 Preliminary Pavement Design

The results of our laboratory testing indicated R-values of 9 and 31. For preliminary design of site pavements, we have used an R-value of 9 and Traffic Index (TI) of 5, 6, and 7 for typical pavement areas. In accordance with the City of San Diego Fire and Hazard Prevention Services Policy A-00-9, we have included a TI of 9.5 for fire lanes at the project site. Actual pavement recommendations should be based on R-value tests performed on bulk samples of the soils that are exposed at the finished subgrade elevations across the site at the completion of the earthwork operations.

10.10.1 Preliminary Flexible Pavement Design

The preliminary flexible pavement sections are presented in the following Table 5.

Table 5 – Recommended Preliminary Flexible Pavement Sections			
Traffic Index	Design R-Value	Asphalt Concrete (in)	Class 2 or Crushed Aggregate Base (in)
5	9	3	9
6	9	4	11
7	9	5	13
9.5	9	7	18

We recommend that the upper 12 inches of the subgrade be compacted to 95 percent of its Proctor density as evaluated by ASTM D 1557. The aggregate base materials should be compacted to 95 percent of its Proctor density as evaluated by ASTM D 1557. Additionally, the AC materials should be compacted to 95 percent of the materials Hveem density. The above pavement section should provide an approximate pavement life of 20 years. If traffic loads are different from those assumed, the pavement design should be re-evaluated.

10.10.2 Preliminary Rigid Pavement Design

We suggest that consideration be given to using Portland cement concrete (PCC) pavements in areas where dumpsters will be stored and where refuse trucks will stop and load. Experience indicates that refuse truck traffic can significantly shorten the useful life of AC sections. We recommend that in these areas, 9 inches of 600 psi flexural strength Portland cement concrete reinforced with No. 3 bars, 18-inches on center, be placed over 12 inches or more of aggregate base materials compacted to a relative compaction of 95 percent. Additionally, the upper 12 inches of the subgrade beneath the aggregate base should be compacted to 95 percent of its Proctor density as evaluated by ASTM D 1557. The above section may also be used for fire lane PCC pavements.

For light duty vehicle pavement areas, we recommend 7½ inches of 600 psi flexural strength Portland cement concrete reinforced with No. 3 bars, 24-inches on center, be placed over 6 inches or more of aggregate base materials. The aggregate base materials should be compacted to 95 percent of its Proctor density as evaluated by ASTM D 1557. Additionally, the upper 12 inches of the subgrade beneath the aggregate base should be compacted to 95 percent of its Proctor density as evaluated by ASTM D 1557.

10.11 Environmental Soil Handling

Based on the findings of the environmental soil sampling and analysis, we recommend the following:

- Fill materials within the top 2 to 5 feet bgs are likely to contain lead at concentrations that would classify the soil as a California-hazardous waste, which will require special handling and disposal. These materials, if excavated, should be segregated and stockpiled separately from other excavated materials, tested in accordance with the accepting landfill facility's requirements, and disposed of at a landfill permitted to receive this type of waste.

- Soils at the site have the potential to contain detectable concentrations of TPH in the diesel and motor oil range. Based on the concentrations detected, the soils may be suitable for on-site reuse; however, if materials are to be placed in the vicinity of buildings proposed for occupation, additional testing should be performed to evaluate potential vapor risks. Soils proposed for export with detectable concentrations of TPH or that are odorous may require special handling.

- Prepare a Soil Management Plan (SMP) to address monitoring of excavated soil, grading, soil handling, stockpiling, characterization, on-site reuse, export, and disposal protocols. The SMP will also assist the contractor with notifications, segregation, characterization, and disposal of waste that may be encountered during earthwork activities.

- Prepare a Community Health and Safety Plan (CHSP) in accordance with the County of San Diego Department of Environmental Health Site Assessment and Mitigation Manual guidelines. The objective of the CHSP will be to promote a safe and healthy environment for the public by minimizing community exposures to hazards associated with contaminated soils from site activities and/or releases that may migrate off site.

- The prime contractor should be required to prepare and implement a Site-Specific Health and Safety Plan for the project in accordance with the Federal and State OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standards: 29 CFR 1910.120 and 8 CCR Section 5192 and include potential risks associated with the excavation and handling of lead and petroleum contaminated soils.

- Personnel at the site who will or may be exposed to contaminated soil (e.g., through inhalation, ingestion, dermal contact) should possess current OSHA training certification(s) commensurate with their potential exposure

11 PLAN REVIEW AND CONSTRUCTION OBSERVATION

The conclusions and recommendations presented in this report are based on analysis of observed conditions in widely spaced exploratory borings. If conditions are found to vary from those described in this report, Ninyo & Moore should be notified, and additional recommendations will be provided upon request. Additionally, the recommendations presented in this report are preliminary and were provided without the benefit of project specifics. When additional project specifics are available, the preliminary recommendations presented in this report may need to be revised or modified accordingly. Ninyo & Moore should review the final project drawings and specifications prior to the commencement of construction. Ninyo & Moore should perform the needed observation and testing services during construction operations.

The recommendations provided in this report are based on the assumption that Ninyo & Moore will provide geotechnical observation and testing services during construction. In the event that it is decided not to utilize the services of Ninyo & Moore during construction, we request that the selected consultant provide the client with a letter (with a copy to Ninyo & Moore) indicating that they fully understand Ninyo & Moore's recommendations, and that they are in full agreement with the design parameters and recommendations contained in this report. Construction of proposed improvements should be performed by qualified subcontractors utilizing appropriate techniques and construction materials.

12 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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TABLE 6

Soil Sample Analytical Results

Table 6 – Soil Sample Analytical Results

Boring	Sample ID	Date Sampled	Depth (feet bgs)	TPH (mg/kg)			Detected Title 22 Metals (mg/kg)																
				C_8-C_{10}	C_{10}-C_{28}	C_{28}-C_{40}	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	STLC (mg/l)	TCLP (mg/l)	Molybdenum	Nickel	Selenium	Thallium	Vanadium	Zinc
B-1	B-1 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	12.3	152	<0.5	<0.5	13.0	5.24	10.4	10.8	--	--	<1	6.94	<3	<3	27.5	35.0
	B-1 @ 5'		5.0	<10	<10	<10	<3	22.0	22.4	<0.5	<0.5	9.83	4.35	9.76	5.37	--	--	<1	7.72	<3	<3	19.8	27.2
	B-1 @ 10'		10.0	<10	<10	<10	<3	11.7	37.3	<0.5	<0.5	10.1	5.74	10.7	7.13	--	--	<1	7.24	<3	<3	22.0	41.6
	B-1 @ 15'		15.0	<10	<10	<10	<3	17.4	24	<0.5	<0.5	14.3	4.40	25.1	12.6	--	--	<1	7.73	<3	<3	36.1	52.7
	B-1 @ 18'		18.0	<10	<10	<10	<3	**84.4**	20.6	<0.5	<0.5	9.36	5.51	9.81	7.41	--	--	<1	7.47	<3	<3	21.1	41.4
B-2	B-2, 2'	7/26/2018	2.0	<10	<10	<10	<3	14.0	542	<0.5	<0.5	21.2	6.37	25.8	**65.1**	2.01	0.057	<1	7.92	<3	<3	44.4	50.6
	B-2, 5'		5.0	<10	<10	<10	<3	12.6	383	<0.5	<0.5	18.7	5.85	21.6	39.9	--	--	<1	7.07	<3	<3	37.0	47.2
	B-2, 10'		10.0	<10	<10	<10	<3	21.0	170	<0.5	<0.5	13.4	14.1	14.7	13.8	--	--	<1	9.12	<3	<3	33.0	49.0
	B-2, 15'		15.0	<10	**42**	<10	3.44	22.3	67.4	<0.5	<0.5	9.45	3.75	24.2	18.0	--	--	1.39	6.93	<3	<3	37.1	43.6
B-3	B-3, 2'	7/26/2018	2.0	<10	<10	<10	<3	11.5	420	<0.5	<0.5	13.7	4.48	17.8	**59.0**	1.651	<0.05	<1	5.41	<3	<3	30.4	31.5
	B-3, 5'		5.0	<10	<10	<10	<3	15.7	153	<0.5	<0.5	27.1	4.26	12.6	18.9	--	--	1.00	6.76	<3	<3	34.8	28.6
	B-3, 10'		10.0	<10	<10	<10	<3	23.7	524	<0.5	<0.5	9.34	3.19	4.64	7.84	--	--	1.87	4.50	<3	<3	33.0	28.4
	B-3, 15'		15.0	<10	**74**	**38**	<3	**63.2**	190	<0.5	0.92	12.0	7.85	12.5	14.5	--	--	1.48	9.44	<3	<3	51.8	63.2
	B-3, 18.5'		18.5	<10	<10	<10	<3	22.9	891	<0.5	<0.5	27.1	3.86	13.5	27.9	--	--	2.56	7.22	<3	<3	40.7	32.4
B-4	B-4, 2'	7/26/2018	2.0	<10	<10	<10	<3	4.66	219	<0.5	<0.5	25.2	4.05	6.4	4.52	--	--	<1	4.90	<3	<3	31.2	15.9
	B-4, 5'		5.0	<10	<10	<10	<3	9.15	54.8	<0.5	<0.5	21.2	4.13	5.0	4.84	--	--	<1	4.68	<3	<3	27.1	17.0
B-5	B-5 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	2.11	230	<0.5	<0.5	11.7	2.94	4.57	1.48	--	--	<1	3.60	<3	<3	22.4	13.8
	B-5 @ 5'		5.0	<10	<10	<10	<3	1.33	122	<0.5	<0.5	10.0	2.55	4.18	2.15	--	--	<1	3.12	<3	<3	19.0	12.1
	B-5 @ 10'		10.0	<10	**33**	<10	<3	12.9	92	<0.5	<0.5	7.67	2.03	6.50	15.7	--	--	4.10	2.40	<3	<3	21.3	12.1
	B-5 @ 15'		15.0	<10	**17**	<10	<3	12.70	**1,020**	<0.5	<0.5	15.2	3.24	76.5	34.3	--	--	3.71	5.86	<3	3.84	29.6	40.3
B-6	B-6 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	3.68	188	<0.5	<0.5	11.2	3.17	4.72	3.35	--	--	<1	3.91	<3	<3	22.4	13.5
	B-6 @ 5'		5.0	<10	<10	<10	<3	2.08	64.1	<0.5	<0.5	12.4	3.51	4.72	1.88	--	--	<1	3.50	<3	<3	24.8	13.9
	B-6 @ 10'		10.0	<10	<10	<10	<3	8.68	207	<0.5	<0.5	7.06	1.96	4.17	7.24	--	--	1.23	2.51	<3	<3	16.3	16.7
	B-6 @ 15'		15.0	<10	**46**	<10	<3	12.50	246	<0.5	<0.5	11.3	4.42	5.18	15.0	--	--	1.64	3.48	<3	<3	21.5	20.4
	B-6 @ 18.5'		18.5	<10	<10	<10	<3	19.90	260	<0.5	<0.5	14.4	5.83	18.8	20.4	--	--	2.37	6.74	<3	3.79	40.9	51.2
B-7	B-7 @ 2'	7/25/2018	2.0	<10	**110**	**72**	<3	8.39	149	<0.5	<0.5	16.6	4.66	16.0	17.7	--	--	<1	6.25	<3	<3	38.7	33.6
	B-7 @ 5'		5.0	<10	<10	<10	<3	13.20	14	<0.5	<0.5	11.0	3.35	7.13	6.76	--	--	<1	5.57	<3	<3	36.6	23.7
	B-7 @ 10'		10.0	<10	<10	<10	<3	14.60	17.7	<0.5	<0.5	7.39	3.68	15.8	11.2	--	--	<1	5.28	<3	<3	37.7	30.7
	B-7 @ 15'		15.0	<10	<10	<10	<3	4.19	13.3	<0.5	<0.5	8.16	4.09	8.03	5.58	--	--	<1	4.99	<3	<3	33.8	29.6
B-8	B-8, 2'	7/26/2018	2.0	<10	**16**	**18**	<3	<1	27.7	<0.5	<0.5	8.11	3.00	5.51	16.6	--	--	<1	2.56	<3	<3	16.5	16.3
	B-8, 5'		5.0	<10	<10	<10	<3	1.44	189	<0.5	<0.5	14.8	3.62	5.19	3.86	--	--	<1	4.22	<3	<3	28.2	14.2
	B-8, 10'		10.0	<10	**42**	**32**	<3	8.04	96	<0.5	<0.5	14.3	3.85	6.10	8.68	--	--	<1	17.6	<3	<3	22.3	25.3
B-9	B-9 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	1.22	246	<0.5	<0.5	12.7	3.64	12.5	34.5	--	--	<1	4.60	<3	<3	23.9	15.8
	B-9 @ 5'		5.0	<10	<10	<10	<3	1.25	178	<0.5	<0.5	11.4	3.51	97.1	**204**	3.38	0.522	1.06	5.48	<3	<3	22.8	20.0
	B-9 @ 10'		10.0	<10	<10	<10	<3	7.41	43.4	<0.5	<0.5	9.61	3.24	6.14	8.60	--	--	<1	4.13	<3	<3	27.4	28.2
	B-9 @ 15'		15.0	<10	<10	<10	<3	12.60	28.2	<0.5	<0.5	14.4	5.93	15.7	16.1	--	--	<1	10.5	<3	<3	32.9	69.7
	B-9 @ 18.5'		18.5	<10	<10	<10	<3	6.99	61.5	<0.5	<0.5	10.9	7.18	15.6	12.5	--	--	<1	7.20	<3	<3	23.5	49.7
B-10	B-10 @ 2'	7/25/2018	2.0	<10	**46**	**38**	<3	4.44	85.8	<0.5	<0.5	11.7	3.62	128	**274**	**31.8**	0.921	1.10	4.48	<3	<3	22.7	41.4
	B-10 @ 5'		5.0	<10	<10	<10	<3	2.63	62	<0.5	<0.5	24.8	4.16	11.4	6.22	--	--	1.47	6.76	<3	<3	30.1	20.0
	B-10 @ 10'		10.0	<10	<10	<10	<3	3.08	27.8	<0.5	<0.5	7.41	4.83	5.48	4.39	--	--	<1	3.58	<3	<3	26.8	27.4
	B-10 @ 15'		15.0	<10	**11**	<10	<3	17.0	124	<0.5	<0.5	11.5	5.99	13.9	13.2	--	--	<1	6.74	<3	<3	35.4	38.5
	B-10 @ 18.5		18.5	<10	<10	<10	<3	8.96	47.9	<0.5	<0.5	14.8	9.55	21.1	17.3	--	--	<1	12.4	<3	<3	31.8	76.9
B-11	B-11, 2'	7/26/2018	2.0	<10	<10	<10	<3	6.61	240	<0.5	<0.5	15.4	3.53	5.38	7.23	--	--	<1	4.29	<3	<3	28.8	24.7
	B-11, 5'		5.0	<10	<10	<10	<3	8.42	281	<0.5	<0.5	16.0	3.68	5.71	6.51	--	--	<1	4.51	<3	<3	27.8	25.3
	B-11, 10'		10.0	<10	<10	<10	<3	19.10	71.4	<0.5	0.62	16.3	23.2	28.4	22.9	--	--	<1	18.2	<3	<3	27.9	84.9
	B-11, 15'		15.0	<10	<10	<10	<3	8.64	24.3	<0.5	<0.5	9.00	4.26	4.81	4.27	--	--	<1	6.14	<3	<3	16.4	39.0
	B-11-18.5'		18.5	<10	**120**	**250**	<3	16.20	57.9	<0.5	<0.5	27.3	14.8	16.8	19.6	--	--	1.20	9.75	<3	<3	33.1	52.4

Table 6 – Soil Sample Analytical Results

Boring	Sample ID	Date Sampled	Depth (feet bgs)	TPH (mg/kg)			Detected Title 22 Metals (mg/kg)																
				C_8-C_{10}	C_{10}-C_{28}	C_{28}-C_{40}	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	STLC (mg/l)	TCLP (mg/l)	Molybdenum	Nickel	Selenium	Thallium	Vanadium	Zinc
B-12	B-12, 2'	7/27/2018	2.0	<10	<10	<10	<3	4.44	101	<0.5	<0.5	12.0	3.88	37.9	**108**	**5.00**	0.124	<1	4.31	<3	<3	23.8	37.4
	B-12, 5'		5.0	<10	<10	<10	<3	3.72	93.5	<0.5	<0.5	14.0	3.37	6.71	9.58	--	--	<1	4.21	<3	<3	27.4	17.0
	B-12, 10'		10.0	<10	<10	<10	<3	5.18	88.5	<0.5	<0.5	30.6	2.84	8.33	9.41	--	--	<1	4.12	<3	<3	19.2	22.9
	B-12, 15'		15.0	<10	<10	<10	<3	15.1	25.2	<0.5	<0.5	13.4	4.57	20.2	10.2	--	--	<1	9.10	<3	<3	27.7	57.2
	B-12, 18.5'		18.5	<10	<10	<10	<3	10.20	246	<0.5	<0.5	13.6	45.4	28.2	**81.1**	0.535	<0.05	1.68	21.0	5.55	<3	27.6	67.5
B-13	B-13 @ 2'	7/25/2018	2.0	<10	**19**	**16**	<3	<1	20.9	<0.5	<0.5	6.68	1.93	11.3	24.7	--	--	<1	2.42	<3	<3	14.0	10.8
	B-13 @ 5'		5.0	<10	**13**	<10	<3	2.67	262	<0.5	<0.5	13.9	2.96	9.85	19.3	--	--	<1	4.33	<3	<3	26.5	14.0
	B-13 @ 10'		10.0	<10	<10	<10	<3	14.3	23.8	<0.5	<0.5	9.75	3.27	11.5	11.2	--	--	<1	5.69	<3	<3	24.4	37.5
	B-13 @ 15'		15.0	<10	<10	<10	<3	2.24	297	<0.5	<0.5	16.2	3.48	11.2	21.5	--	--	<1	5.30	<3	<3	29.9	16.3
	B-13 @ 18.5'		18.5	<10	<10	<10	<3	1.60	22.5	<0.5	<0.5	7.05	2.00	11.8	27.6	--	--	<1	2.79	<3	<3	15.0	11.1
B-14	B-14 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	1.63	46.8	<0.5	<0.5	11.5	2.93	7.58	15.5	--	--	<1	3.46	<3	<3	21.6	17.6
	B-14 @ 5'		5.0	<10	<10	<10	<3	3.52	157	<0.5	<0.5	12.5	2.94	4.66	6.51	--	--	<1	4.24	<3	<3	25.3	12.9
	B-14 @ 10'		10.0	<10	<10	<10	<3	2.14	20.9	<0.5	<0.5	11.2	2.03	7.81	6.40	--	--	<1	3.65	<3	<3	10.8	23.1
	B-14 @ 15'		15.0	<10	<10	<10	<3	7.28	31.4	<0.5	<0.5	7.15	4.21	4.61	8.86	--	--	1.26	4.95	<3	<3	16.4	33.3
	B-14 @ 18.5		18.5	<10	<10	<10	<3	8.72	27.7	<0.5	<0.5	13.0	6.66	17.8	13.2	--	--	1.33	10.8	<3	4.06	29.3	71.6
B-15	B-15, 2'	7/26/2018	2.0	<20	<20	**26**	<3	5.14	46.2	<0.5	<0.5	13.0	20.7	47.3	**430**	**10.8**	0.610	<1	4.01	<3	<3	19.4	51.8
	B-15, 5'		5.0	<10	<10	<10	<3	13.5	89.2	<0.5	<0.5	12.1	3.94	11.9	12.8	--	--	<1	3.86	<3	<3	25.1	31.5
	B-15, 10'		10.0	<10	<10	<10	<3	14.70	27.1	<0.5	<0.5	26.3	10.8	23.0	19.3	--	--	1.49	10.6	<3	<3	28.0	56.3
	B-15, 15'		15.0	<10	**10**	<10	<3	5.51	51.1	<0.5	<0.5	9.42	5.59	7.29	6.32	--	--	<1	6.91	<3	<3	18.4	40.4
	B-15, 18.5'		18.5	<10	<10	<10	<3	21.80	306	<0.5	0.92	13.3	13.2	25.0	32.1	--	--	<1	11.9	<3	<3	43.2	79.4
B-16	B-16, 2'	7/27/2018	2.0	<20	<20	<20	<3	9.57	187	<0.5	<0.5	11.9	7.15	38.1	**114**	**6.06**	0.181	<1	6.83	<3	<3	25.3	56.8
	B-16, 5'		5.0	<10	<10	<10	<3	11.3	208	<0.5	<0.5	13.0	4.03	21.5	38.4	--	--	<1	6.05	<3	<3	29.5	40.3
B-17	B-17, 2'	7/27/2018	2.0	<10	**16**	<10	<3	8.19	166	<0.5	<0.5	12.4	3.90	55.2	**174**	**11.1**	0.149	<1	4.96	<3	<3	24.1	70.3
	B-17, 5'		5.0	<10	<10	<10	<3	12.60	223	<0.5	<0.5	15.3	5.77	25.3	23.8	--	--	<1	7.4	<3	<3	32.7	53.8
	B-17, 10'		10.0	<10	<10	<10	<3	23.60	26.9	<0.5	<0.5	13.4	4.59	15.9	21.4	--	--	<1	10.9	<3	<3	30.0	54.4
	B-17, 15'		15.0	<10	<10	<10	<3	29.30	37.1	<0.5	<0.5	14.9	5.88	18.5	14.2	--	--	<1	8.44	<3	<3	34.0	67.6
	B-17, 18.5'		18.5	<10	**27**	<10	<3	14.60	69	0.69	<0.5	19.8	8.05	51.2	39.1	--	--	<1	12.7	<3	<3	35.2	93.0
B-18	B-18 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	17.8	22	<0.5	<0.5	7.48	14.8	7.78	8.40	--	--	<1	5.28	<3	<3	18.9	31.8
	B-18 @ 5'		5.0	<10	<10	<10	<3	7.11	26.4	<0.5	<0.5	11.4	5.37	15.6	10.9	--	--	<1	8.52	<3	<3	21.1	48.1
	B-18 @ 10'		10.0	<10	<10	<10	<3	13.0	23.6	<0.5	<0.5	11.5	8.02	23.5	20.0	--	--	<	8.46	<3	<3	33.2	70.1
	B-18 @ 15'		15.0	<10	<10	<10	<3	9.06	84.8	<0.5	<0.5	10.6	3.90	13.0	10.4	--	--	<1	6.42	<3	<3	23.7	47.2
	B-18 @ 18'		18.0	<10	<10	<10	<3	9.15	19.7	<0.5	<0.5	7.58	4.78	8.28	5.79	--	--	<1	8.40	<3	<3	17.1	46.7
B-19	B-19, 2'	7/26/2018	2.0	<10	**15**	**19**	<3	6.85	242	<0.5	<0.5	13.6	4.12	39.4	**405**	**14.6**	0.227	<1	6.51	<3	<3	27.5	31.9
	B-19, 5'		5.0	<10	<10	<10	<3	31.0	947	<0.5	<0.5	13.9	3.18	11.7	19.2	--	--	<1	6.17	<3	<3	40.2	27.5
	B-19, 10'		10.0	<10	<10	<10	<3	12.3	25.9	<0.5	<0.5	12.5	5.27	21.3	10.0	--	--	<1	11.0	<3	<3	28.0	58.1
	B-19, 15'		15.0	<10	<10	<10	<3	5.02	20.5	<0.5	<0.5	7.96	4.22	3.89	4.08	--	--	<1	5.08	<3	<3	16.8	36.4
	B-19, 18.5'		18.5	<10	<10	<10	<3	14.30	29.4	<0.5	0.5	15.5	5.99	24.5	16.8	--	--	<1	9.69	<3	<3	34.0	60.7
B-20	B-20 @ 2'	7/25/2018	2.0	<10	<10	<10	<3	5.93	122	<0.5	<0.5	10.2	4.07	39.2	**197**	**7.60**	0.328	<1	4.43	<3	<3	21.4	47.2
	B-20 @ 5'		5.0	<10	<10	<10	<3	15.2	17.9	<0.5	<0.5	13.0	5.36	22.0	12.4	--	--	<1	7.21	<3	<3	26.9	56.2
	B-20 @ 10'		10.0	<10	<10	<10	<3	5.51	57.7	<0.5	<0.5	7.52	3.32	5.42	5.79	--	--	<1	3.34	<3	<3	19.9	26.9
	B-20 @ 15'		15.0	<10	<10	<10	<3	14.1	111	<0.5	<0.5	7.21	5.69	4.73	4.46	--	--	<1	5.39	<3	<3	24.7	33.8
	B-20 @ 18'		18.0	<10	<10	<10	<3	5.69	32.9	<0.5	<0.5	11.4	5.55	31.6	9.80	--	--	<1	9.85	<3	<3	23.1	64.5
B-21	B-21 @ 2'	7/27/2018	2.0	<10	<10	<10	<3	3.84	76.4	<0.5	<0.5	16.8	7.09	8.25	13.2	--	--	<1	6.93	4.36	<3	39.4	43.5
	B-21 @ 5'		5.0	<10	<10	<10	<3	2.84	74.7	<0.5	<0.5	15.2	5.29	5.81	5.71	--	--	<1	6.61	<3	<3	28.0	26.7
B-22	B-22, 2'	7/23/2018	2.0	<10	<10	**13**	6.84	10.4	103	<0.5	<0.5	15.5	6.45	13.2	22.1	--	--	<1	6.47	<3	<3	33.6	43.3
	B-22, 5'		5.0	<10	<10	<10	<3	6.52	85.2	<0.5	<0.5	18.3	6.90	9.05	6.02	--	--	<1	6.80	<3	<3	42.8	53.4
	B-22, 10'		10.0	<10	<10	<10	4.89	3.39	93.7	<0.5	<0.5	19.2	6.27	10.4	15.7	--	--	1.15	7.01	4.89	<3	37.3	45.1
	B-22, 15'		15.0	<10	**38**	<10	5.24	10.0	94.1	<0.5	<0.5	17.7	6.80	**7,330**/26.3	**131**	0.200	<0.05	1.51	8.60	<3	<3	30.5	802
	B-22, 20'		20.0	<10	<10	<10	3.19	8.65	196	<0.5	<0.5	14.8	7.63	80.9	12.9	--	--	<1	11.6	5.07	<3	30.7	66.0

Table 6 – Soil Sample Analytical Results

Boring	Sample ID	Date Sampled	Depth (feet bgs)	TPH (mg/kg)			Detected Title 22 Metals (mg/kg)																
				C_8-C_{10}	C_{10}-C_{28}	C_{28}-C_{40}	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	STLC (mg/l)	TCLP (mg/l)	Molybdenum	Nickel	Selenium	Thallium	Vanadium	Zinc
B-23	B-23, 2'	7/24/2018	2.0	<100	**200**	**560**	<3	3.55	75	<0.5	<0.5	16.8	5.59	6.49	5.40	--	--	<1	6.59	<3	<3	30.8	32.2
	B-23, 5'		5.0	<50	**97**	**260**	<3	3.32	76.4	<0.5	<0.5	19.9	6.61	7.42	5.42	--	--	<1	6.88	<3	<3	37.1	39.1
	B-23, 10'		10.0	<10	<10	<10	<3	4.45	62.5	<0.5	<0.5	14.9	6.69	5.09	2.19	--	--	<1	6.35	<3	<3	32.4	39.8
	B-23, 15'		15.0	<10	<10	<10	<3	9.51	61.8	<0.5	<0.5	12.2	4.43	18.4	6.82	--	--	<1	5.36	<3	<3	32.6	44.2
	B-23, 19'		19.0	<10	**16**	<10	<3	17.8	248	<0.5	0.69	10.7	135	29.8	13.3	--	--	1.16	25.6	<3	<3	35.5	51.4
B-24	B-24 @ 2'	7/25/2018	2.0	<10	**85**	**49**	<3	9.89	81.7	<0.5	<0.5	15.8	5.94	18.1	**60.4**	3.10	0.084	<1	7.03	<3	<3	32.8	66.4
	B-24 @ 5'		5.0	<10	<10	<10	<3	1.66	27.9	<0.5	<0.5	13.2	3.18	6.26	5.73	--	--	<1	4.63	<3	<3	9.62	22.2
	B-24 @ 10'		10.0	<10	<10	<10	<3	3.97	22.8	<0.5	<0.5	6.73	5.03	4.40	5.07	--	--	<1	3.84	<3	<3	16.1	29.4
	B-24 @ 15'		15.0	<10	<10	<10	<3	5.15	19.8	<0.5	<0.5	9.40	4.94	11.7	7.90	--	--	<1	6.74	<3	<3	18.7	46.4
	B-24 @ 18'		18.0	<10	<10	<10	<3	2.02	345	<0.5	<0.5	7.92	3.97	5.18	4.77	--	--	<1	5.10	<3	<3	17.6	36.0
B-25	B-25, 2'	7/24/2018	2.0	<50	**120**	**450**	<3	2.88	97.2	<0.5	<0.5	16.9	7.51	8.98	4.69	--	--	<1	6.64	<3	<3	41.4	47.6
	B-25, 5'		5.0	<10	**12**	**45**	<3	3.74	71.1	<0.5	<0.5	16.1	6.89	5.54	2.64	--	--	<1	5.62	<3	<3	47.5	41.9
	B-25, 10'		10.0	<10	<10	<10	<3	18.0	52.5	<0.5	<0.5	13.1	6.89	15.8	20.5	--	--	<1	8.35	<3	<3	30.3	48.6
	B-25, 15'		15.0	<10	<10	<10	<3	3.98	412	<0.5	<0.5	6.54	2.43	3.73	3.27	--	--	<1	2.61	<3	<3	16.9	19.7
	B-25, 20'		20.0	<10	**66**	<10	<3	9.74	111	<0.5	<0.5	14.6	5.86	11.2	10.3	--	--	<1	6.88	<3	<3	26.1	40.9
B-26	B-26, 2'	7/24/2018	2.0	<10	**17**	**59**	<3	5.27	102	<0.5	<0.5	16.8	7.39	7.19	2.95	--	--	<1	6.47	<3	<3	41.9	47.5
	B-26, 5'		5.0	<10	**11**	**58**	<3	3.11	91.4	<0.5	<0.5	14.6	6.76	6.00	1.26	--	--	<1	5.42	<3	<3	37.4	41.1
	B-26, 10'		10.0	<10	<10	<10	<3	2.76	77	<0.5	<0.5	15.4	7.00	5.51	1.40	--	--	<1	6.32	<3	<3	34.8	42.6
	B-26, 15'		15.0	<10	<10	<10	<3	18.6	91	<0.5	<0.5	14.1	7.30	15.5	8.82	--	--	<1	9.20	<3	<3	32.3	48.9
	B-26, 20'		20.0	<10	<10	<10	<3	14.1	58	<0.5	<0.5	10.9	6.60	10.8	8.51	--	--	<1	7.06	<3	<3	24.2	39.1
B-27	B-27, 2'	7/24/2018	2.0	<20	**34**	**110**	<3	3.45	40.6	<0.5	<0.5	22.5	8.36	3.88	2.59	--	--	<1	5.31	<3	<3	47.0	17.5
	B-27, 5'		5.0	<20	**30**	**100**	<3	1.64	48.6	<0.5	<0.5	25.8	8.68	4.79	3.54	--	--	<1	6.16	<3	<3	47.2	21.3
	B-27, 10'		10.0	<10	<10	<10	<3	2.23	82.2	<0.5	<0.5	15.9	6.89	7.38	2.28	--	--	<1	5.61	<3	<3	38.9	43.4
	B-27, 15'		15.0	<10	<10	<10	<3	3.96	96.8	<0.5	<0.5	16.2	7.08	6.75	1.90	--	--	<1	5.86	<3	<3	38.6	52.6
	B-27, 20'		20.0	<10	<10	<10	<3	3.44	79.4	<0.5	<0.5	20.8	8.55	9.30	2.68	--	--	<1	8.07	<3	<3	48.5	60.5
B-28	B-28, 2'	7/23/2018	2.0	<20	**38**	**110**	3.98	9.12	106	<0.5	<0.5	18.2	7.76	21.0	21.7	--	--	<1	8.67	<3	<3	31.4	48.6
	B-28, 5'		5.0	<50	**77**	**200**	<3	6.23	75	<0.5	<0.5	17.1	5.12	17.6	28.3	--	--	<1	6.78	7.94	<3	24.8	50.7
	B-28, 10'		10.0	<10	<10	<10	<3	11.8	243	<0.5	<0.5	12.1	5.09	17.4	18.2	--	--	<1	6.34	4.71	<3	25.9	36.3
	B-28, 15'		15.0	<10	<10	<10	<3	6.25	108	<0.5	<0.5	25.2	7.10	30.5	9.42	--	--	<1	7.81	4.81	<3	39.6	64.9
	B-28, 20'		20.0	<10	**33**	<10	<3	16.7	84.1	<0.5	0.51	15.8	7.07	30.9	19.4	--	--	<1	11.7	4.94	<3	35.4	76.1
B-29	B-29, 2'	7/23/2018	2.0	<200	<200	**320**	3.64	5.84	82.4	<0.5	<0.5	17.6	13.8	48.9	15.1	--	--	1.07	6.48	**10.6**	<3	24.1	41.9
	B-29, 5'		5.0	<20	<20	**22**	3.36	11.9	93.3	<0.5	<0.5	17.5	9.95	25.0	29.3	--	--	<1	10.7	8.73	<3	33.2	52.3
	B-29, 10'		10.0	<10	<10	<10	<3	10.8	147	<0.5	<0.5	14.1	5.27	51.4	10.9	--	--	<1	6.39	5.58	<3	29.1	41.7
	B-29, 15'		15.0	<10	<10	<10	<3	9.02	136	<0.5	<0.5	15.6	6.13	38.6	14.0	--	--	<1	7.39	4.20	<3	30.1	56.7
	B-29, 20'		20.0	<10	<10	<10	4.87	6.61	177	<0.5	<0.5	17.7	7.76	28.7	17.6	--	--	<1	10.7	4.85	<3	32.3	66.1

Notes:

bgs - below ground surface

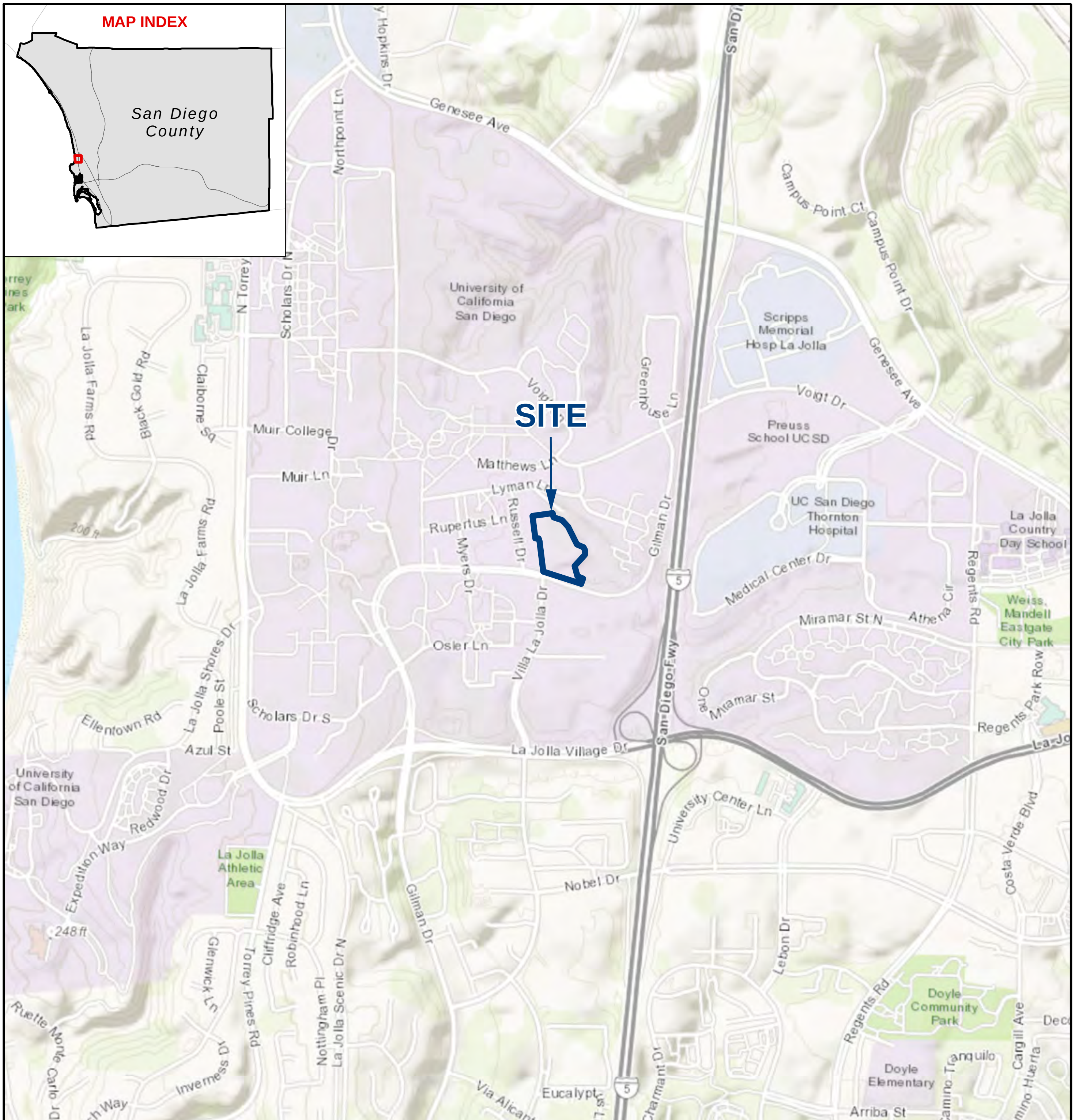
mg/kg - milligrams per kilogram

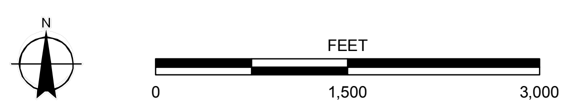
TPH - total petroleum hydrocarbons

Bold results indicate analyte detected at or above potential regulated waste trigger criteria.

Highlighted results indicate analyte detected at or above hazardous waste criteria.

FIGURES





NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: ESRI WORLD TOPO, 2017

1_108614001_SL.mxd 9/12/2018 AOB

FIGURE 1

SITE LOCATION

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

LEGEND

SITE BOUNDARY

B-29 TD=51.2 — BORING, TD=TOTAL DEPTH IN FEET

IT-2 TD=5.0 — INFILTRATION TEST, TD=TOTAL DEPTH IN FEET

C C' — GEOLOGIC CROSS SECTION

Qaf — FILL

Qvop — VERY OLD PARALIC DEPOSITS, CIRCLED WHERE BURIED

Tsc — SCRIPPS FORMATION, CIRCLED WHERE BURIED

352 — TOPOGRAPHIC CONTOURS (SANGIS, 1999)

N

FEET

0 120 240

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: GOOGLE EARTH, 2017

2_108614001_BL.mxd 9/27/2018 AOB

FIGURE 2

BORING LOCATIONS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 | 9/18

Ninyo & Moore
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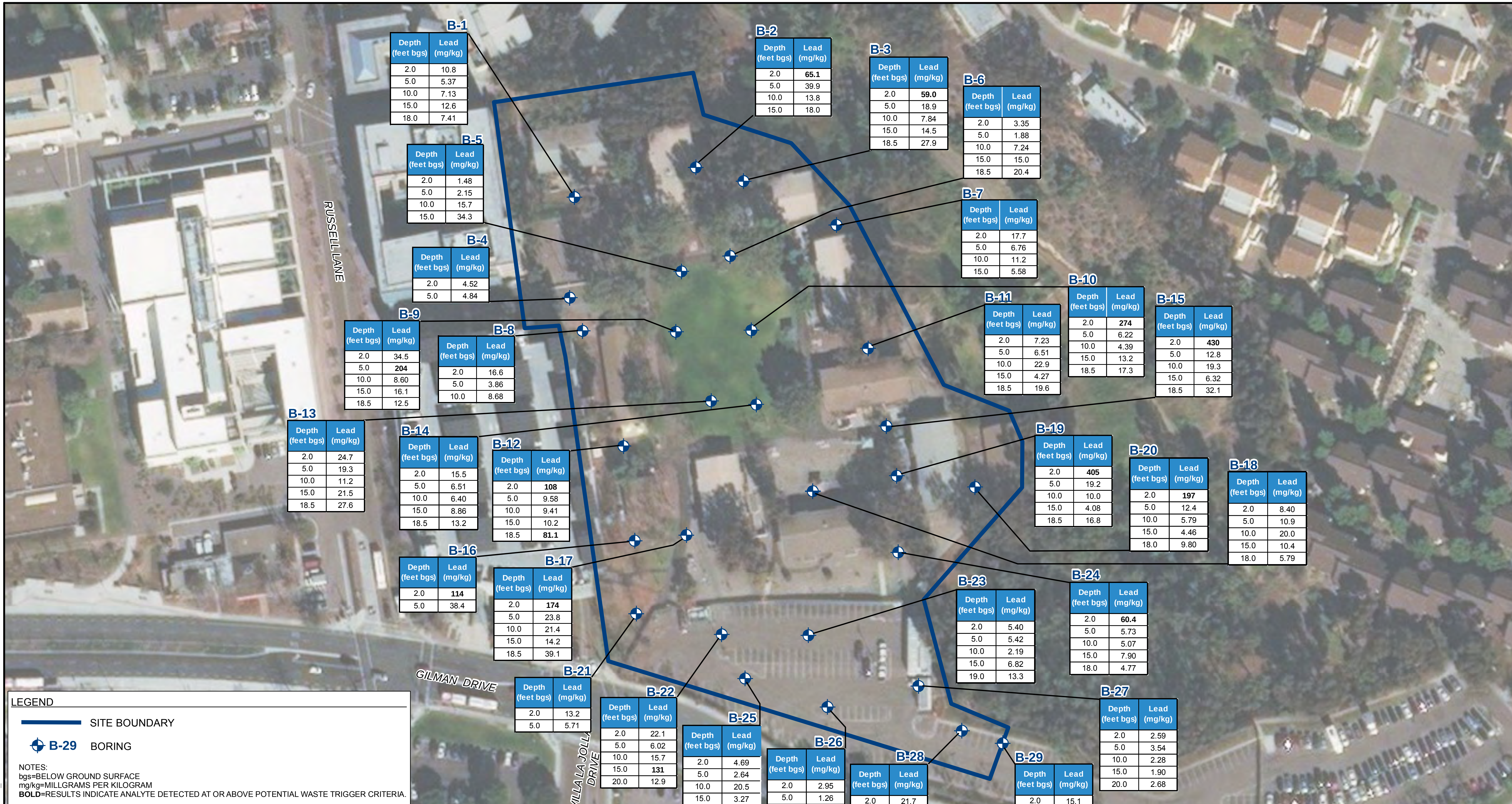

B-1

Depth (feet bgs)	Lead (mg/kg)
2.0	10.8
5.0	5.37
10.0	7.13
15.0	12.6
18.0	7.41

B-2

Depth (feet bgs)	Lead (mg/kg)
2.0	**65.1**
5.0	39.9
10.0	13.8
15.0	18.0

B-3

Depth (feet bgs)	Lead (mg/kg)
2.0	**59.0**
5.0	18.9
10.0	7.84
15.0	14.5
18.5	27.9

B-6

Depth (feet bgs)	Lead (mg/kg)
2.0	3.35
5.0	1.88
10.0	7.24
15.0	15.0
18.5	20.4

B-5

Depth (feet bgs)	Lead (mg/kg)
2.0	1.48
5.0	2.15
10.0	15.7
15.0	34.3

B-7

Depth (feet bgs)	Lead (mg/kg)
2.0	17.7
5.0	6.76
10.0	11.2
15.0	5.58

B-4

Depth (feet bgs)	Lead (mg/kg)
2.0	4.52
5.0	4.84

B-9

Depth (feet bgs)	Lead (mg/kg)
2.0	34.5
5.0	**204**
10.0	8.60
15.0	16.1
18.5	12.5

B-8

Depth (feet bgs)	Lead (mg/kg)
2.0	16.6
5.0	3.86
10.0	8.68

B-10

Depth (feet bgs)	Lead (mg/kg)
2.0	**274**
5.0	6.22
10.0	4.39
15.0	13.2
18.5	17.3

B-11

Depth (feet bgs)	Lead (mg/kg)
2.0	7.23
5.0	6.51
10.0	22.9
15.0	4.27
18.5	19.6

B-15

Depth (feet bgs)	Lead (mg/kg)
2.0	**430**
5.0	12.8
10.0	19.3
15.0	6.32
18.5	32.1

B-13

Depth (feet bgs)	Lead (mg/kg)
2.0	24.7
5.0	19.3
10.0	11.2
15.0	21.5
18.5	27.6

B-14

Depth (feet bgs)	Lead (mg/kg)
2.0	15.5
5.0	6.51
10.0	6.40
15.0	8.86
18.5	13.2

B-12

Depth (feet bgs)	Lead (mg/kg)
2.0	**108**
5.0	9.58
10.0	9.41
15.0	10.2
18.5	**81.1**

B-19

Depth (feet bgs)	Lead (mg/kg)
2.0	**405**
5.0	19.2
10.0	10.0
15.0	4.08
18.5	16.8

B-20

Depth (feet bgs)	Lead (mg/kg)
2.0	**197**
5.0	12.4
10.0	5.79
15.0	4.46
18.0	9.80

B-18

Depth (feet bgs)	Lead (mg/kg)
2.0	8.40
5.0	10.9
10.0	20.0
15.0	10.4
18.0	5.79

B-16

Depth (feet bgs)	Lead (mg/kg)
2.0	**114**
5.0	38.4

B-17

Depth (feet bgs)	Lead (mg/kg)
2.0	**174**
5.0	23.8
10.0	21.4
15.0	14.2
18.5	39.1

B-23

Depth (feet bgs)	Lead (mg/kg)
2.0	5.40
5.0	5.42
10.0	2.19
15.0	6.82
19.0	13.3

B-24

Depth (feet bgs)	Lead (mg/kg)
2.0	**60.4**
5.0	5.73
10.0	5.07
15.0	7.90
18.0	4.77

B-21

Depth (feet bgs)	Lead (mg/kg)
2.0	13.2
5.0	5.71

B-22

Depth (feet bgs)	Lead (mg/kg)
2.0	22.1
5.0	6.02
10.0	15.7
15.0	**131**
20.0	12.9

B-25

Depth (feet bgs)	Lead (mg/kg)
2.0	4.69
5.0	2.64
10.0	20.5
15.0	3.27
20.0	10.3

B-26

Depth (feet bgs)	Lead (mg/kg)
2.0	2.95
5.0	1.26
10.0	1.40
15.0	8.82
20.0	8.51

B-28

Depth (feet bgs)	Lead (mg/kg)
2.0	21.7
5.0	28.3
10.0	18.2
15.0	9.42
20.0	19.4

B-29

Depth (feet bgs)	Lead (mg/kg)
2.0	15.1
5.0	29.3
10.0	10.9
15.0	14.0
20.0	17.6

B-27

Depth (feet bgs)	Lead (mg/kg)
2.0	2.59
5.0	3.54
10.0	2.28
15.0	1.90
20.0	2.68

LEGEND

SITE BOUNDARY

B-29 BORING

NOTES:
bgs=BELOW GROUND SURFACE
mg/kg=MILLGRAMS PER KILOGRAM
BOLD=RESULTS INDICATE ANALYTE DETECTED AT OR ABOVE POTENTIAL WASTE TRIGGER CRITERIA.

N

FEET 0 100 200

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: GOOGLE EARTH, 2017

3_108614002_SSAR_Lead.mxd 9/26/2018 AOB

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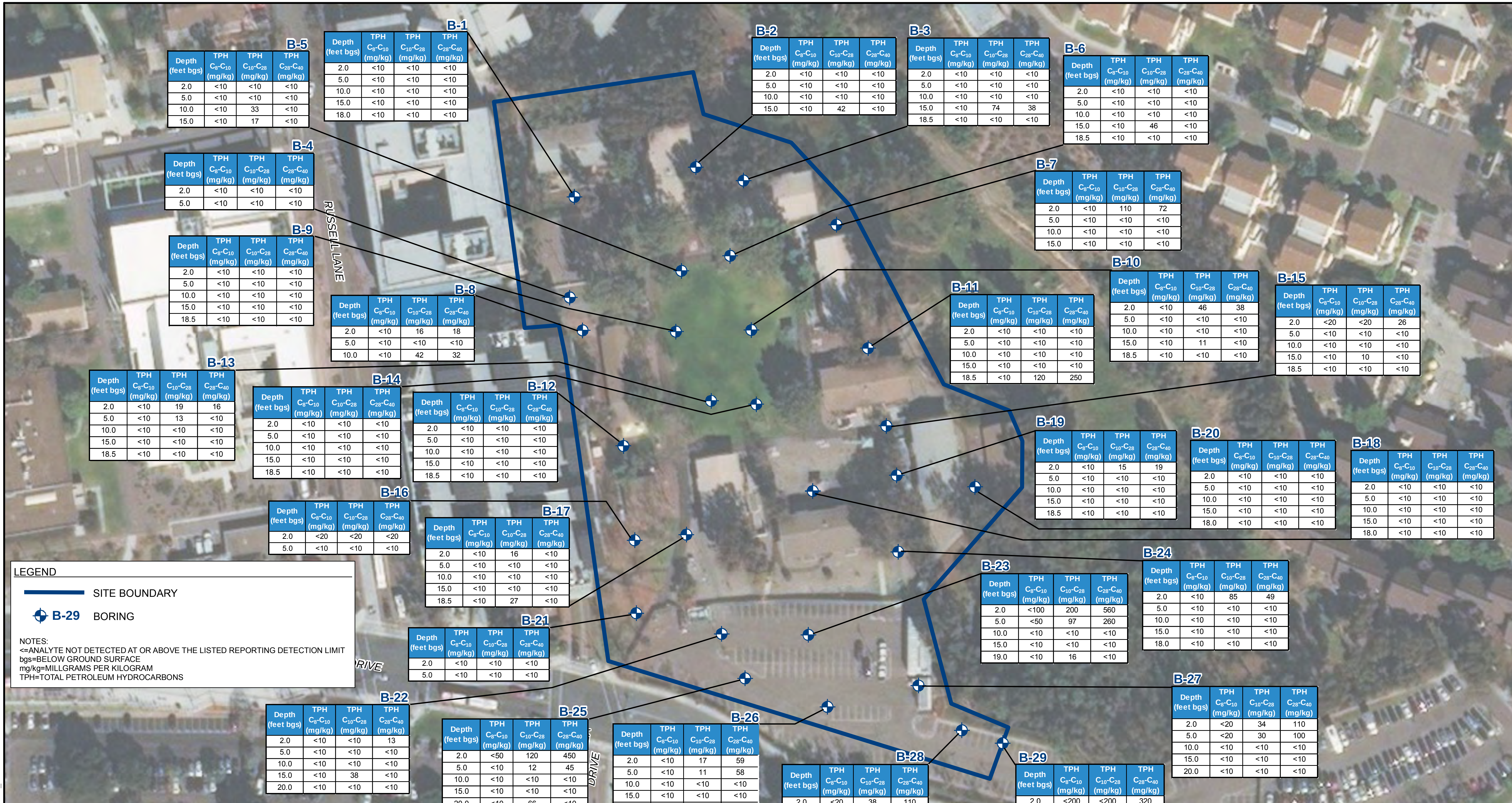
FIGURE 3

SOIL SAMPLE ANALYTICAL RESULTS - LEAD

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614002 | 9/18



LEGEND

SITE BOUNDARY

B-29 BORING

NOTES:
<=ANALYTE NOT DETECTED AT OR ABOVE THE LISTED REPORTING DETECTION LIMIT
bgs=BELOW GROUND SURFACE
mg/kg=MILLGRAMS PER KILOGRAM
TPH=TOTAL PETROLEUM HYDROCARBONS

B-1

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.0	<10	<10	<10

B-2

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	42	<10

B-3

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	74	38
18.5	<10	<10	<10

B-4

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10

B-5

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	33	<10
15.0	<10	17	<10

B-6

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	46	<10
18.5	<10	<10	<10

B-7

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	110	72
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10

B-8

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	16	18
5.0	<10	<10	<10
10.0	<10	42	32

B-9

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	<10	<10

B-10

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	46	38
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	11	<10
18.5	<10	<10	<10

B-11

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	120	250

B-12

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	<10	<10

B-13

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	19	16
5.0	<10	13	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	<10	<10

B-14

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	<10	<10

B-15

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<20	<20	26
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	10	<10
18.5	<10	<10	<10

B-16

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<20	<20	<20
5.0	<10	<10	<10

B-17

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	16	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	27	<10

B-18

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.0	<10	<10	<10

B-19

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	15	19
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.5	<10	<10	<10

B-20

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.0	<10	<10	<10

B-21

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	<10
5.0	<10	<10	<10

B-22

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	<10	13
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	38	<10
20.0	<10	<10	<10

B-23

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<100	200	560
5.0	<50	97	260
10.0	<10	<10	<10
15.0	<10	<10	<10
19.0	<10	16	<10

B-24

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	85	49
5.0	<10	<10	<10
10.0	<10	<10	<10
15.0	<10	<10	<10
18.0	<10	<10	<10

B-25

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<50	120	450
5.0	<10	12	45
10.0	<10	<10	<10
15.0	<10	<10	<10
20.0	<10	66	<10

B-26

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<10	17	59
5.0	<10	11	58
10.0	<10	<10	<10
15.0	<10	<10	<10
20.0	<10	<10	<10

B-27

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<20	34	110
5.0	<20	30	100
10.0	<10	<10	<10
15.0	<10	<10	<10
20.0	<10	<10	<10

B-28

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<20	38	110
5.0	<50	77	200
10.0	<10	<10	<10
15.0	<10	<10	<10
20.0	<10	33	<10

B-29

Depth (feet bgs)	TPH C_8-C_{10} (mg/kg)	TPH C_{10}-C_{28} (mg/kg)	TPH C_{28}-C_{40} (mg/kg)
2.0	<200	<200	320
5.0	<20	<20	22
10.0	<10	<10	<10
15.0	<10	<10	<10
20.0	<10	<10	<10

N

FEET
0 100 200

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: GOOGLE EARTH, 2017

4_108614002_SSAR_TPH.mxd 9/26/2018 AOB

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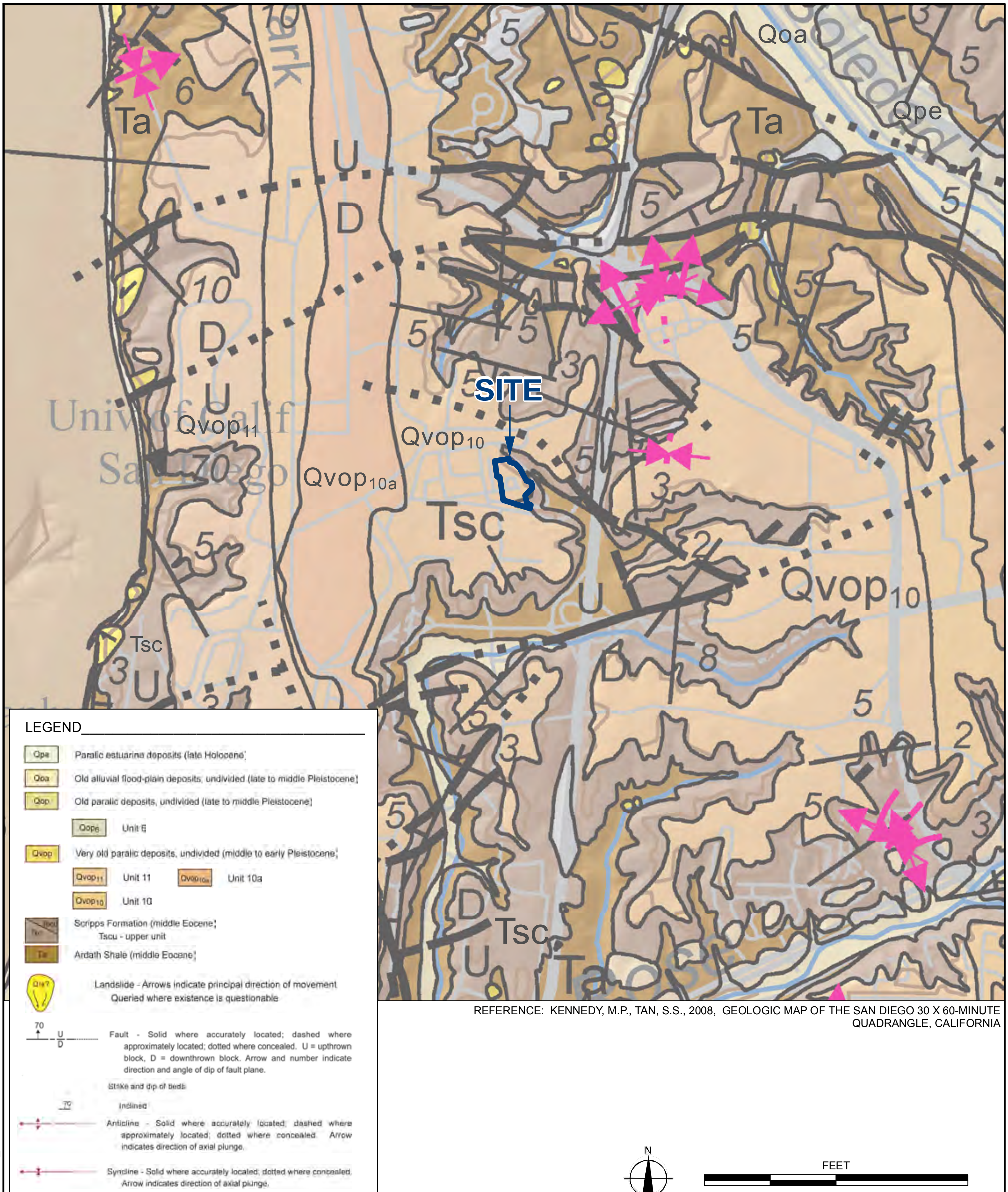
FIGURE 4

SOIL SAMPLE ANALYTICAL RESULTS - TPH

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614002 | 9/18



REFERENCE: KENNEDY, M.P., TAN, S.S., 2008, GEOLOGIC MAP OF THE SAN DIEGO 30 X 60-MINUTE QUADRANGLE, CALIFORNIA

5_108614001_G.mxd 9/26/2018 AOB

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 5

GEOLOGY

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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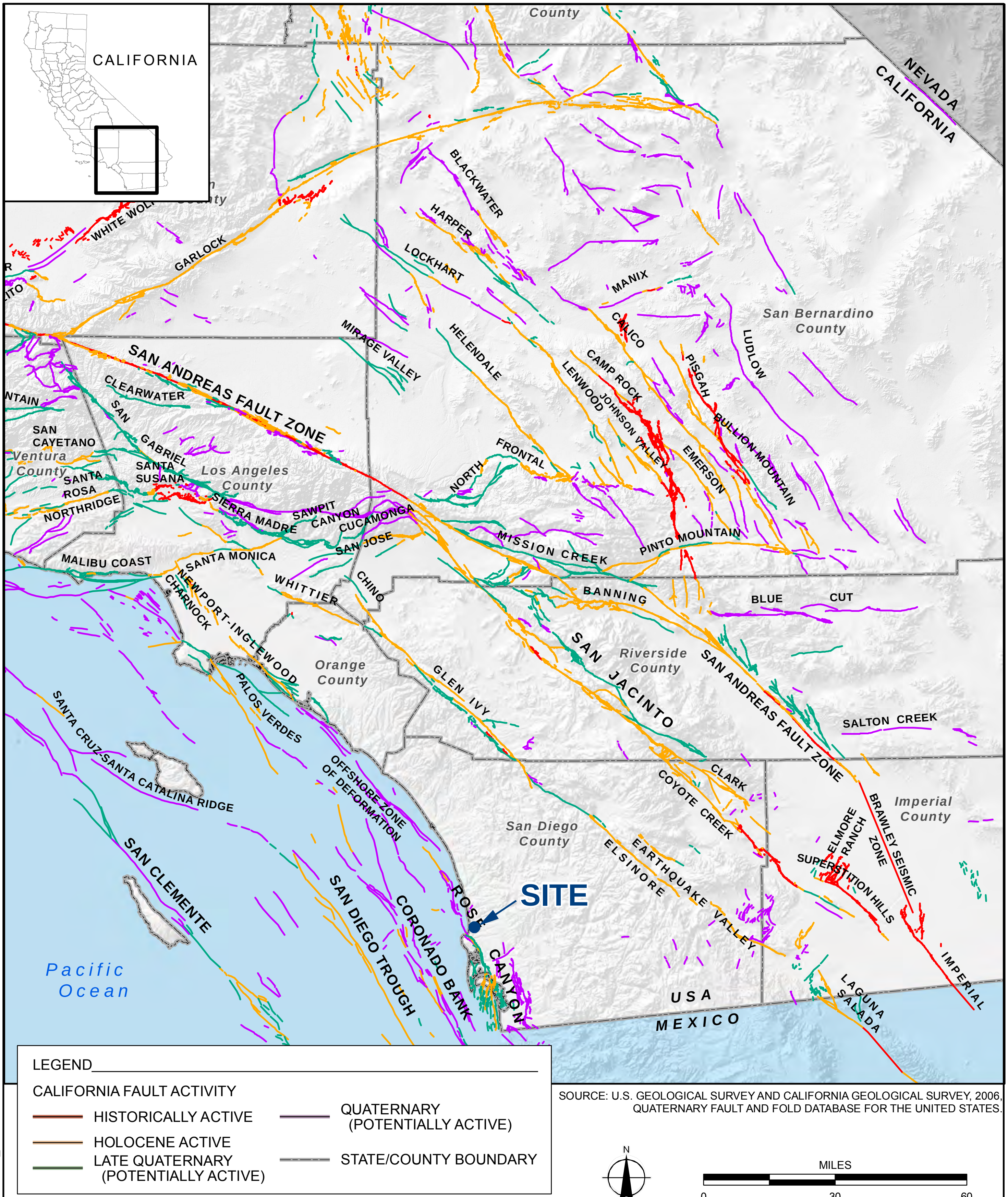

6_108614001_FL.mxd 9/26/2018 AOB

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 6

FAULT LOCATIONS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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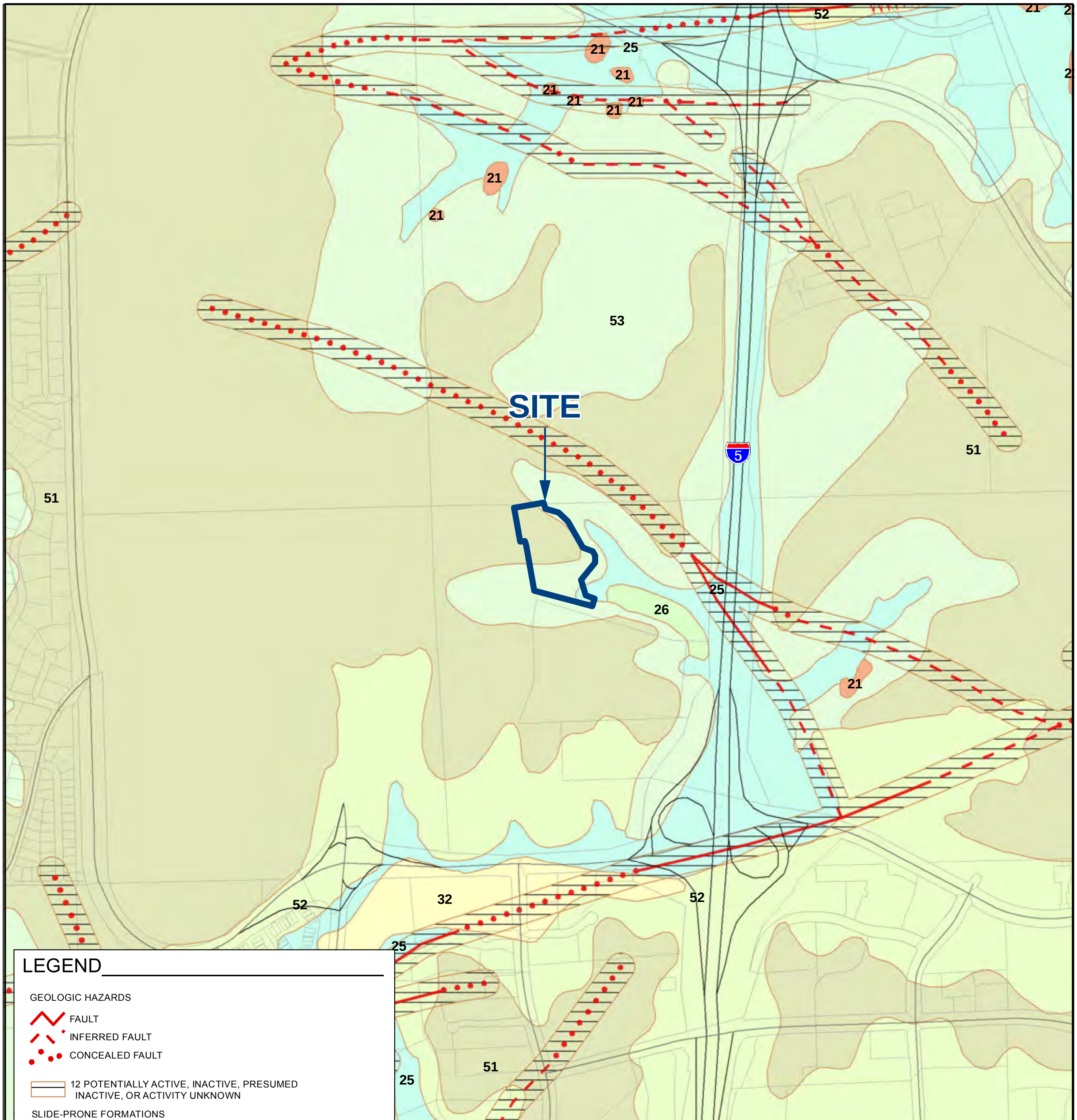

LEGEND

GEOLOGIC HAZARDS

- FAULT
- INFERRED FAULT
- CONCEALED FAULT
- 12 POTENTIALLY ACTIVE, INACTIVE, PRESUMED INACTIVE, OR ACTIVITY UNKNOWN

SLIDE-PRONE FORMATIONS

- 25 ARDATH: NEUTRAL OR FAVORABLE GEOLOGIC STRUCTURE
- 26 ARDATH: UNFAVORABLE GEOLOGIC STRUCTURE

OTHER TERRAIN

- 51 LEVEL MESAS -- UNDERLAIN BY TERRACE DEPOSITS AND BEDROCK NOMINAL RISK
- 52 OTHER LEVEL AREAS, GENTLY SLOPING TO STEEP TERRAIN, FAVORABLE GEOLOGIC STRUCTURE, LOW RISK
- 53 LEVEL OR SLOPING TERRAIN, UNFAVORABLE GEOLOGIC STRUCTURE, LOW TO MODERATE RISK

SOURCE: CITY OF SAN DIEGO SEISMIC SAFETY STUDY GEOLOGIC HAZARDS AND FAULTS, SANGIS, 2008

N

FEET

0 1,000 2,000

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

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FIGURE 7

SEISMIC SAFETY ELEMENT

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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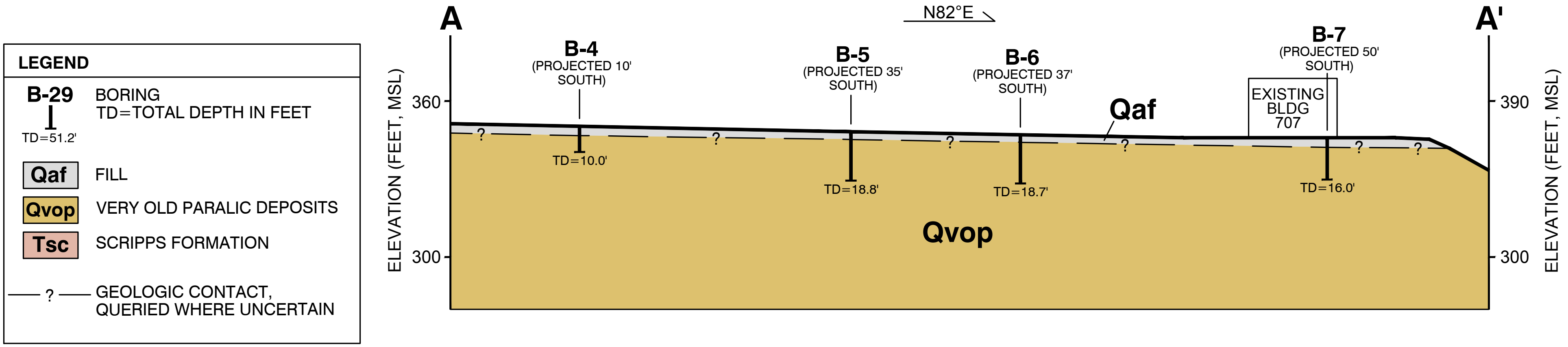

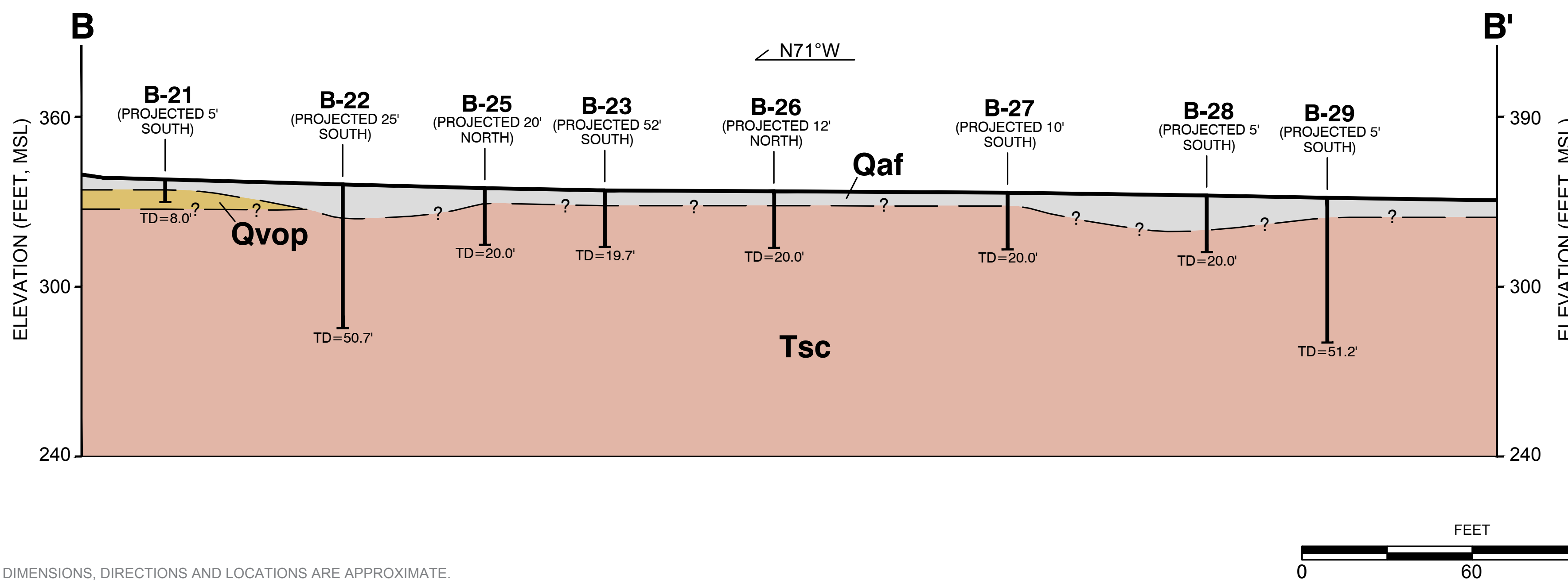

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

8A 108614001 CS A-A' B-B'.DWG

FIGURE 8A

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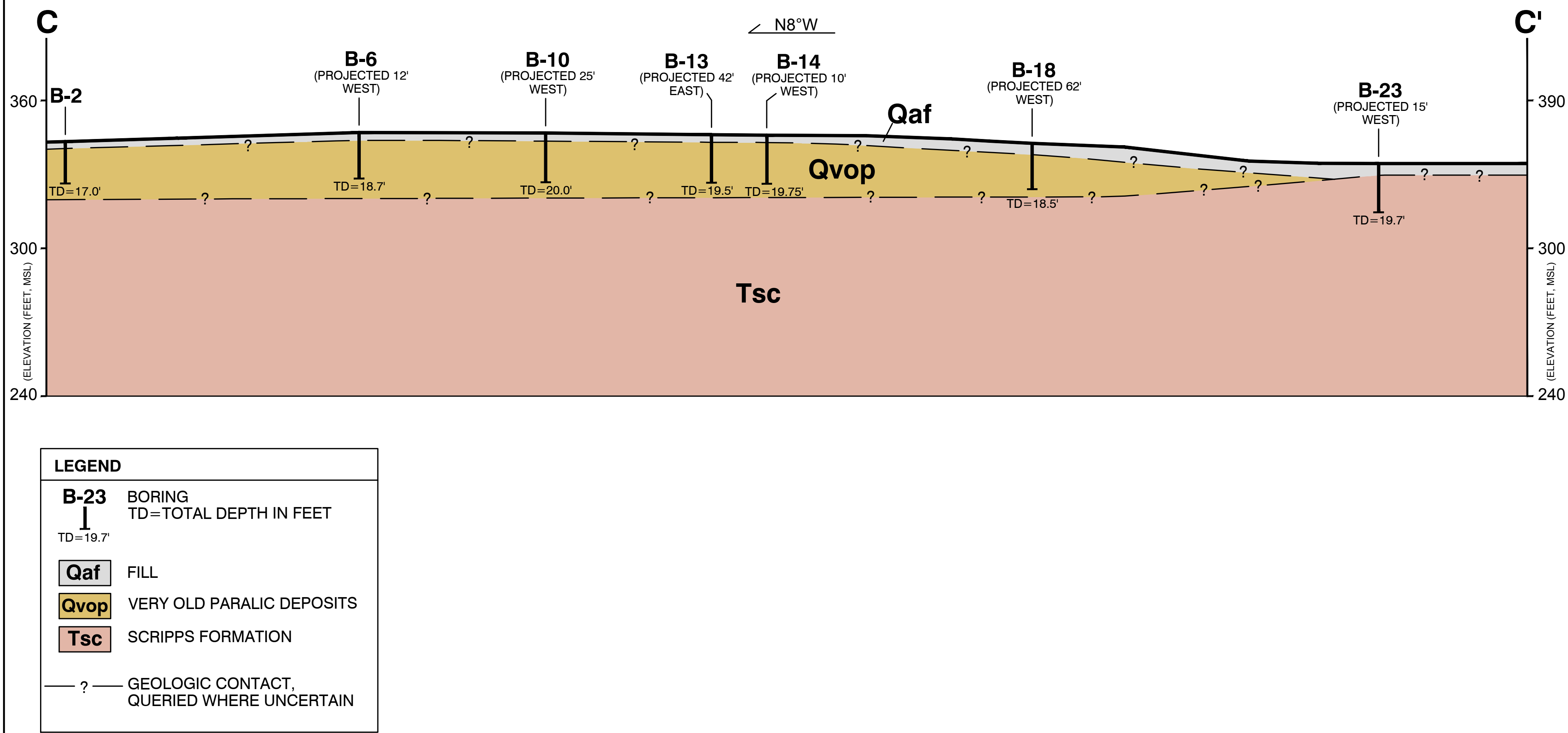
GEOLOGIC CROSS SECTION A-A' AND B-B'

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 I 9/18



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 8B

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GEOLOGIC CROSS SECTION C-C'

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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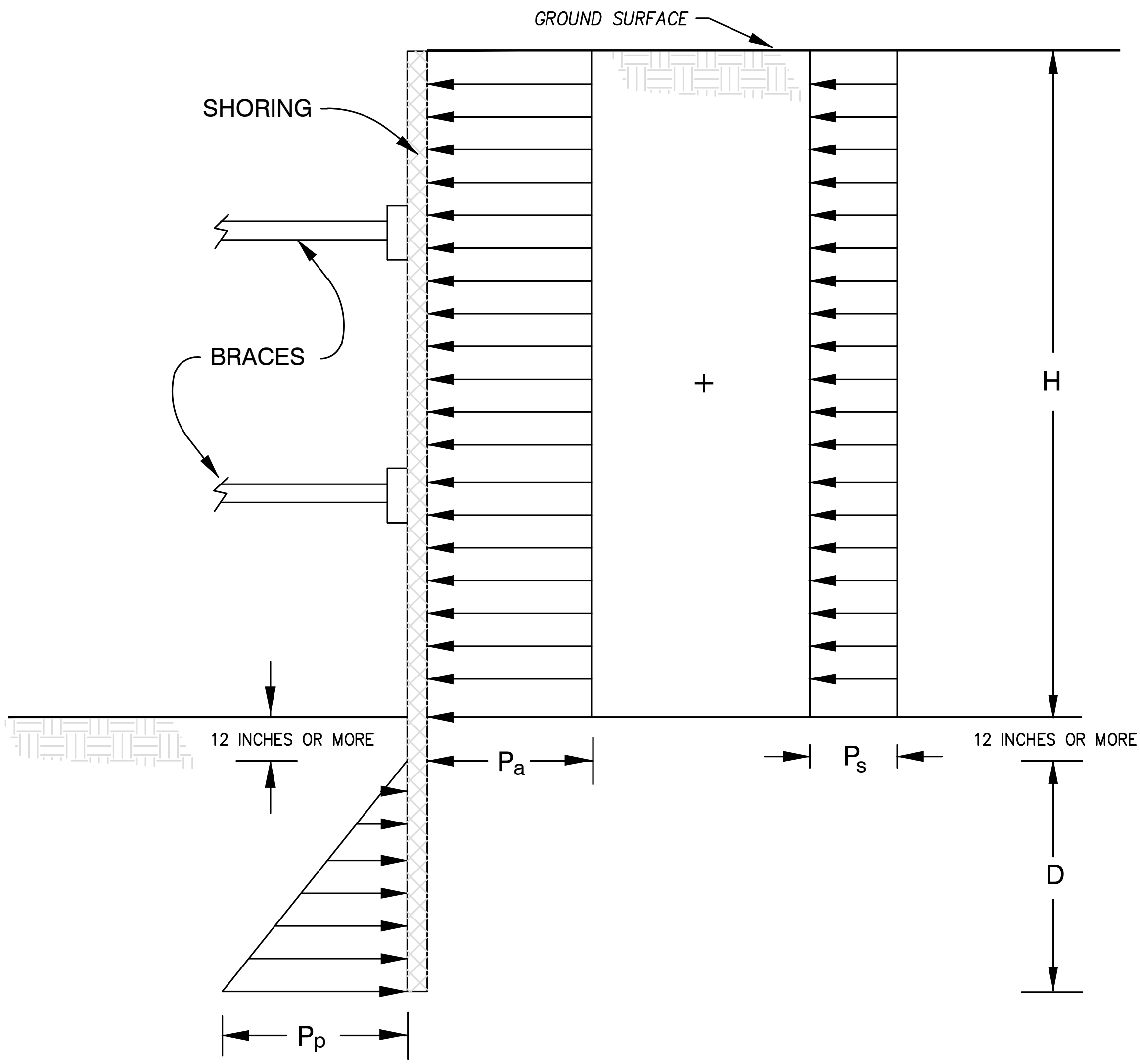

NOTES:

1. APPARENT LATERAL EARTH PRESSURE, P_a
   P_a = 28 H psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   P_s = 120 psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
   P_p = 350 D psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H AND D ARE IN FEET

NOT TO SCALE

9 108614001 D-BEGS.DWG

FIGURE 9

LATERAL EARTH PRESSURES FOR BRACED EXCAVATION

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 I 9/18

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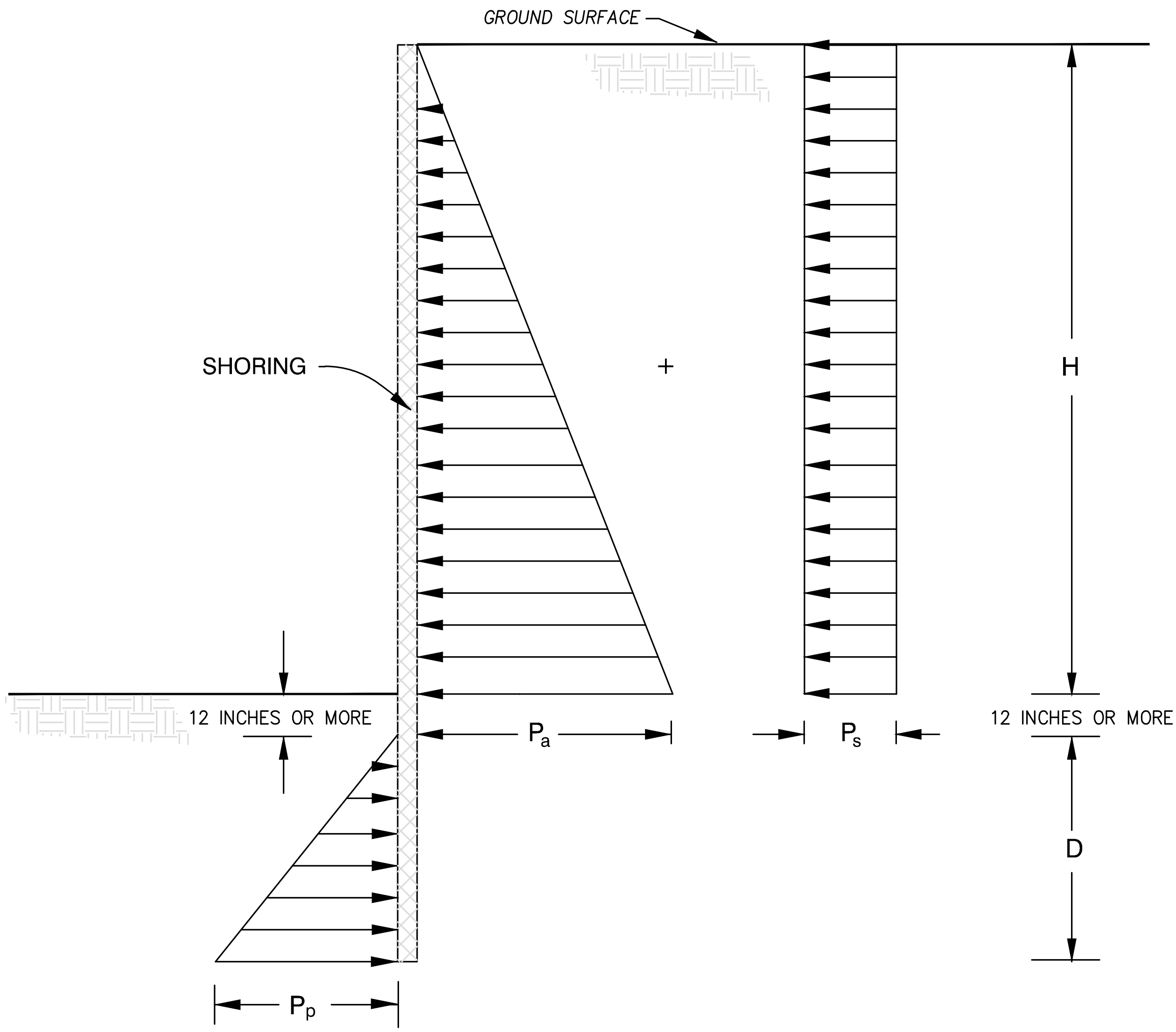

NOTES:

1. ACTIVE LATERAL EARTH PRESSURE, P_a
   $P_a = 43$ H psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   $P_s = 120$ psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
   $P_p = 350$ D psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. H AND D ARE IN FEET

NOT TO SCALE

10 108614001 D-CS.DWG

FIGURE 10

LATERAL EARTH PRESSURES FOR TEMPORARY CANTILEVERED SHORING

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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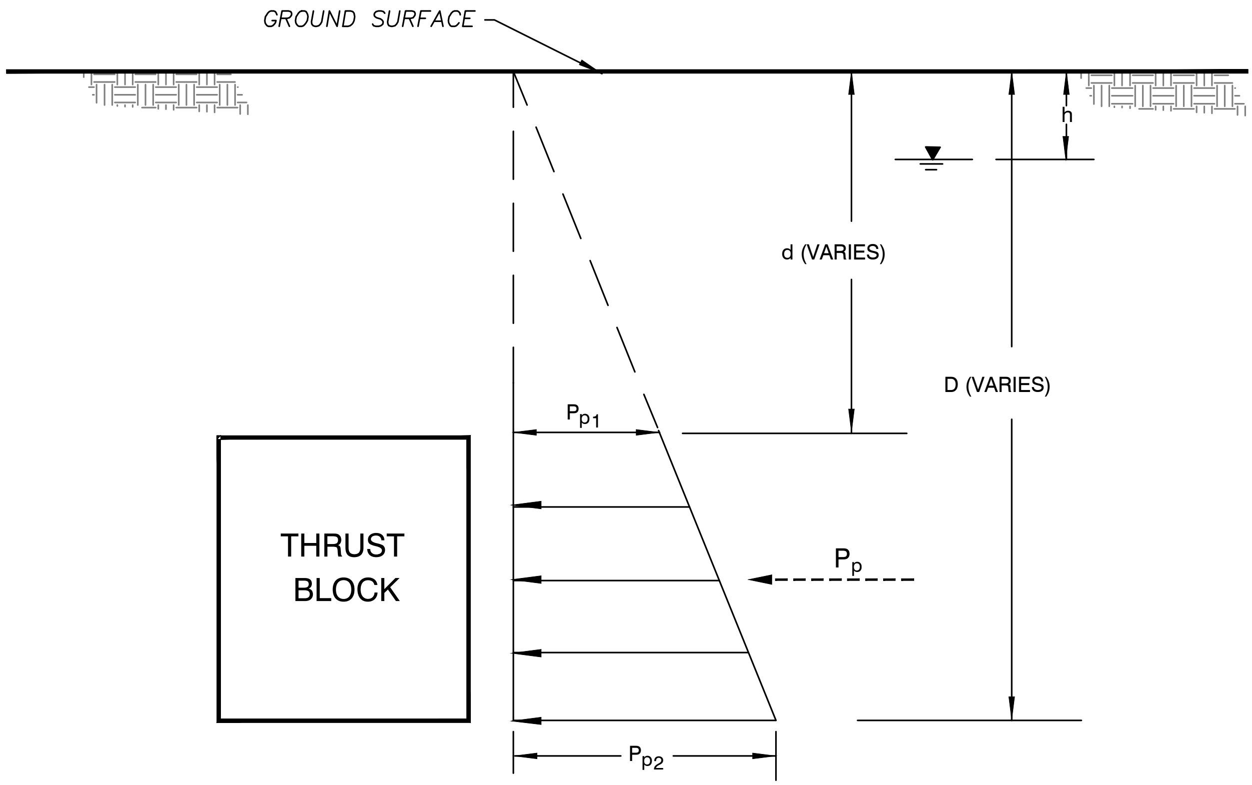
Geotechnical & Environmental Sciences Consultants



NOTES:

1. GROUNDWATER BELOW BLOCK
   $P_p = 175\ (D^2 - d^2)$ lb/ft
2. GROUNDWATER ABOVE BLOCK
   $P_p = 1.4\ (D - d)[\ 124.8h + 63\ (D+d)]$ lb/ft
3. ASSUMES BACKFILL IS GRANULAR MATERIAL
4. ASSUMES THRUST BLOCK IS ADJACENT TO COMPETENT MATERIAL
5. D, d AND h ARE IN FEET
6. GROUNDWATER TABLE

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NOT TO SCALE

FIGURE 11

THRUST BLOCK LATERAL EARTH PRESSURE DIAGRAM

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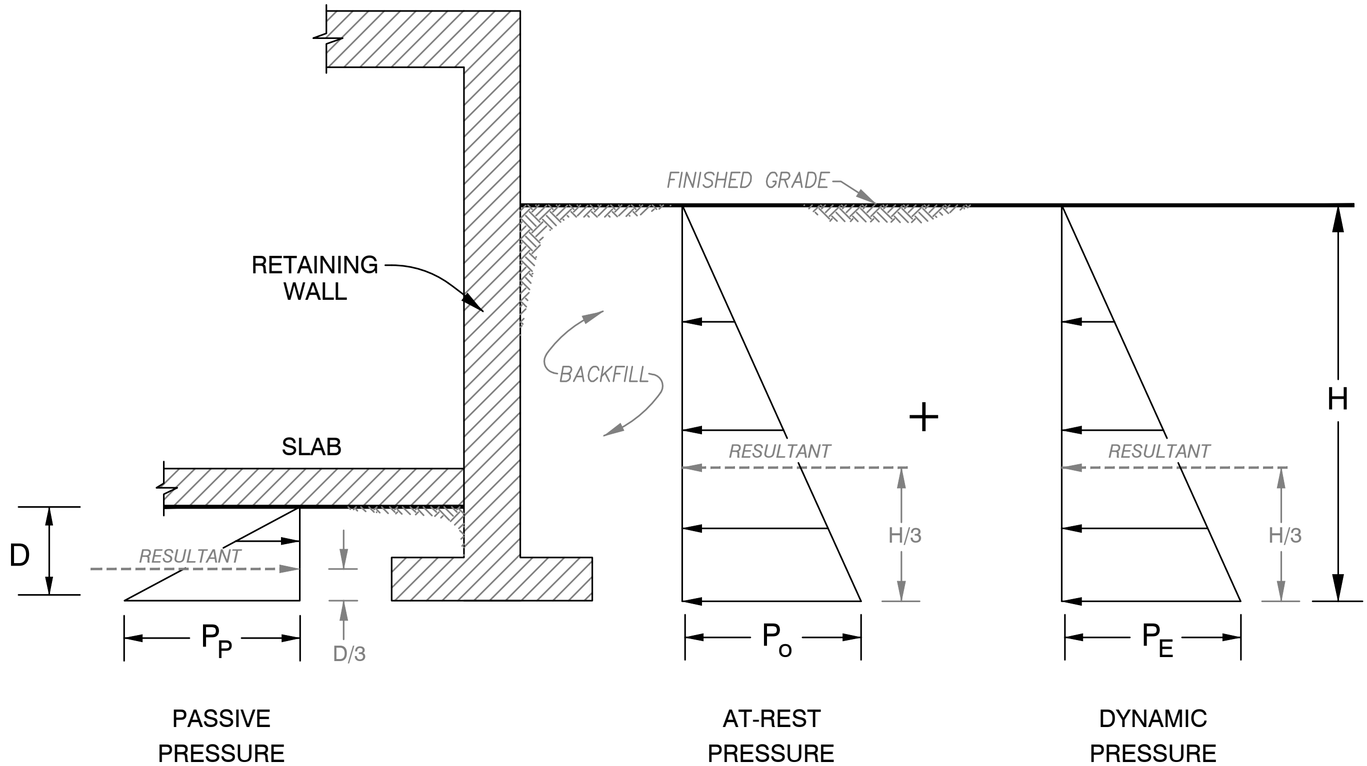

NOTES:

1. ASSUMES NO HYDROSTATIC PRESSURE BUILD-UP BEHIND THE RETAINING WALL
2. STRUCTURAL, GRANULAR BACKFILL MATERIALS SHOULD BE USED FOR RETAINING WALL BACKFILL
3. DRAINS AS RECOMMENDED IN THE RETAINING WALL DRAINAGE DETAIL SHOULD BE INSTALLED BEHIND THE RETAINING WALL
4. DYNAMIC LATERAL EARTH PRESSURE IS BASED ON A PEAK GROUND ACCELERATION OF 0.52g
5. P_E IS CALCULATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF MONONOBE AND MATSUO (1929), AND ATIK AND SITAR (2010).
6. SURCHARGE PRESSURES CAUSED BY VEHICLES OR NEARBY STRUCTURES ARE NOT INCLUDED
7. H AND D ARE IN FEET

RECOMMENDED GEOTECHNICAL DESIGN PARAMETERS

Lateral Earth Pressure	Equivalent Fluid Pressure (lb/ft^2/ft) (1)	
P_O	Level Backfill with Granular Soils (2)	2H:1V Sloping Backfill with Granular Soils (2)
	65 H	93 H
P_E	28 H	
P_P	Level Ground	2H:1V Descending Ground
	350 D	130 D

NOT TO SCALE

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FIGURE 12

LATERAL EARTH PRESSURES FOR RESTRAINED RETAINING WALLS

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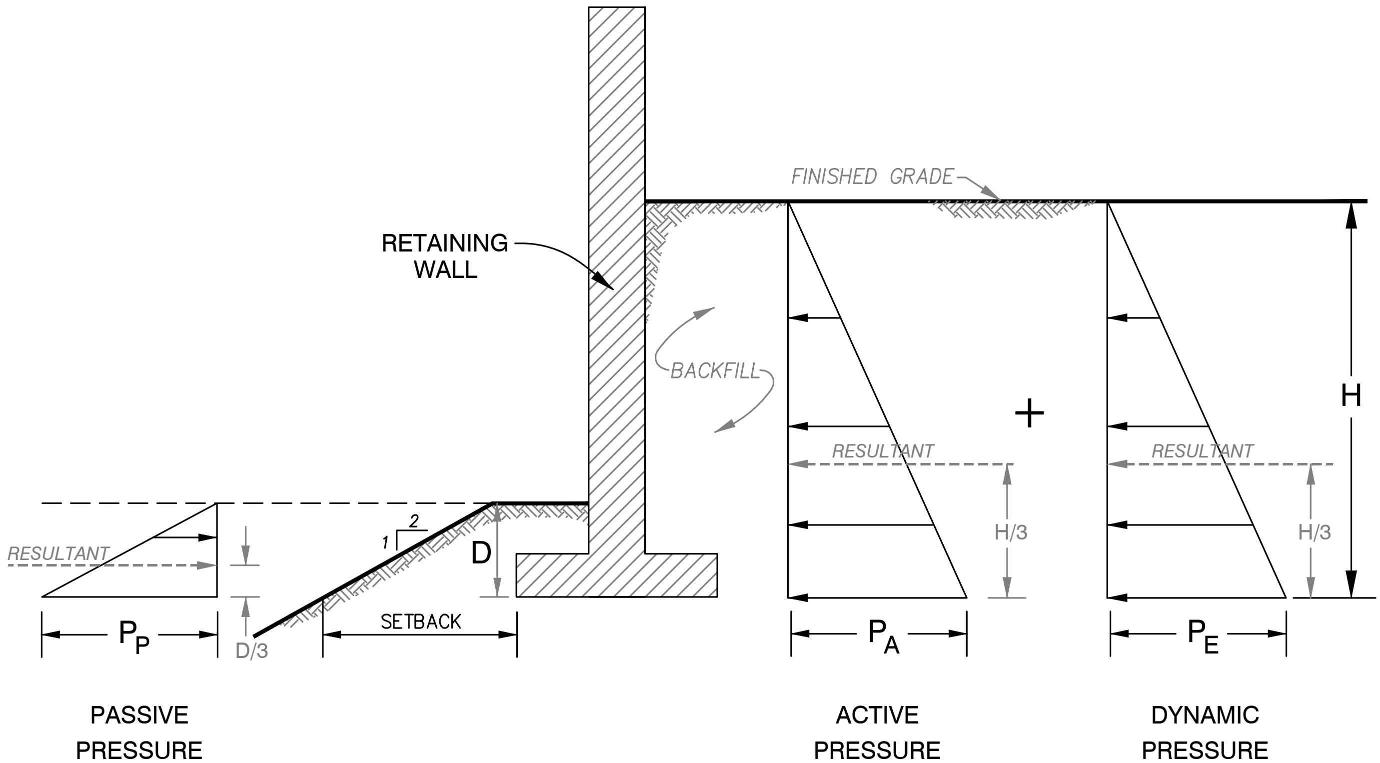

NOTES:

1. ASSUMES NO HYDROSTATIC PRESSURE BUILD-UP BEHIND THE RETAINING WALL
2. STRUCTURAL, GRANULAR BACKFILL MATERIALS SHOULD BE USED FOR RETAINING WALL BACKFILL
3. DRAINS AS RECOMMENDED IN THE RETAINING WALL DRAINAGE DETAIL SHOULD BE INSTALLED BEHIND THE RETAINING WALL
4. DYNAMIC LATERAL EARTH PRESSURE IS BASED ON A PEAK GROUND ACCELERATION OF 0.52g
5. P_E IS CALCULATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF MONONOBE AND MATSUO (1929), AND ATIK AND SITAR (2010).
6. SURCHARGE PRESSURES CAUSED BY VEHICLES OR NEARBY STRUCTURES ARE NOT INCLUDED
7. H AND D ARE IN FEET
8. SETBACK SHOULD BE IN ACCORDANCE WITH THE CBC

RECOMMENDED GEOTECHNICAL DESIGN PARAMETERS

Lateral Earth Pressure	Equivalent Fluid Pressure ($lb/ft^2/ft$) (1)	
P_A	Level Backfill with Granular Soils (2)	2H:1V Sloping Backfill with Granular Soils (2)
	43 H	72 H
P_E	28 H	
P_P	Level Ground	2H:1V Descending Ground
	350 D	130 D

NOT TO SCALE

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FIGURE 13

LATERAL EARTH PRESSURES FOR YIELDING RETAINING WALLS

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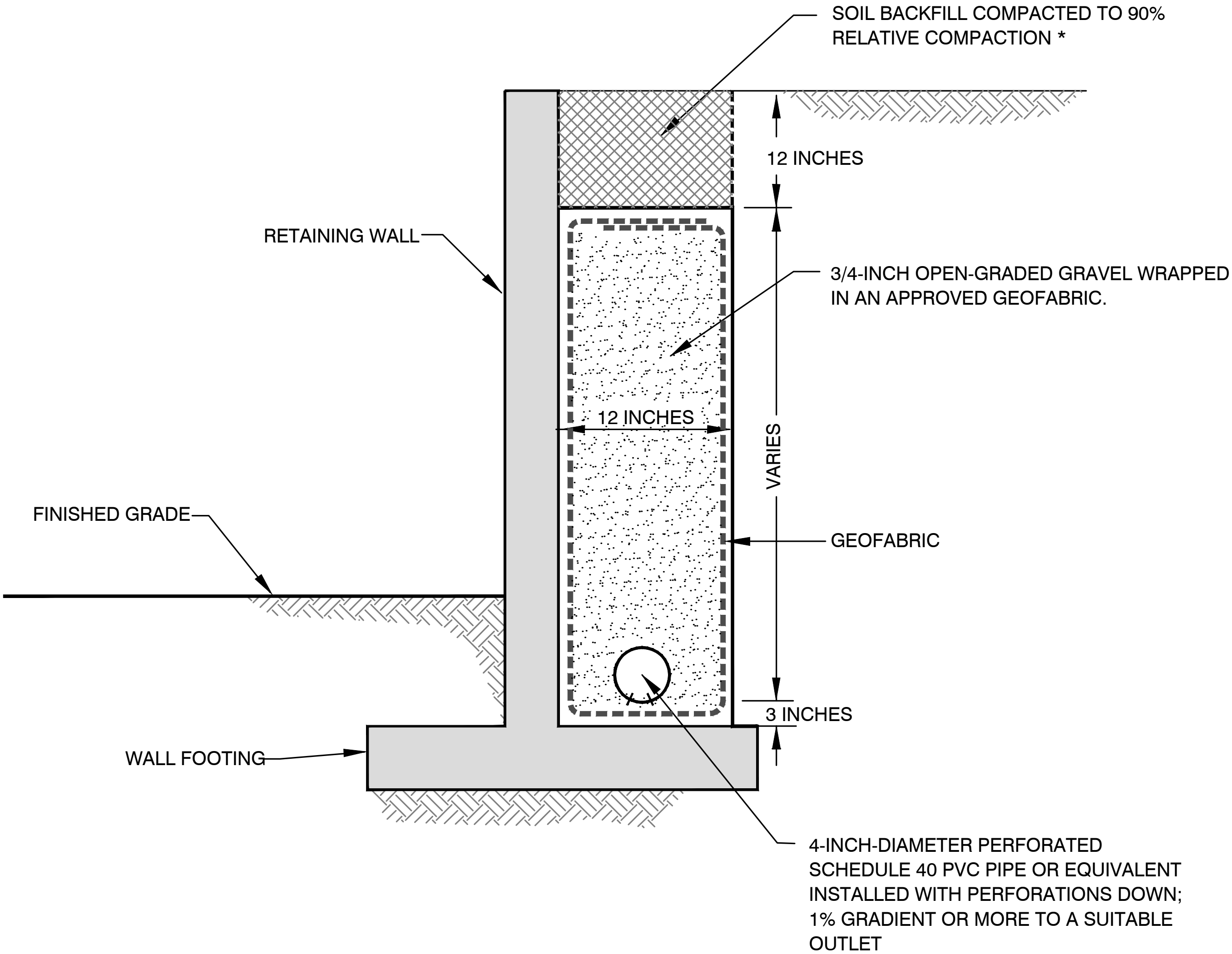

*BASED ON ASTM D1557

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NOT TO SCALE

FIGURE 14

RETAINING WALL DRAINAGE DETAIL

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UC SAN DIEGO, LA JOLLA, CALIFORNIA

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APPENDIX A

Boring Logs

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler

Relatively undisturbed soil samples were obtained in the field using the Modified Split-Barrel Drive Sampler. The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a 140-pound hammer, in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

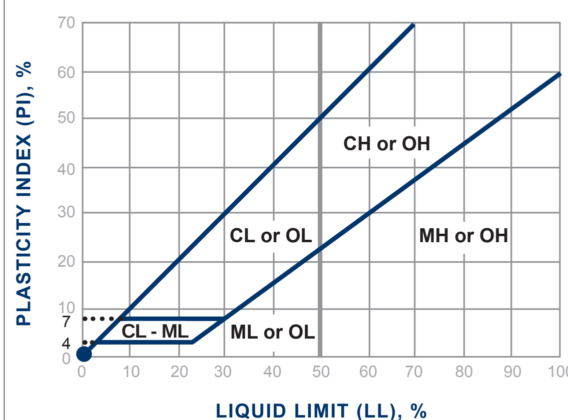
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions: Group Symbol	Secondary Divisions: Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fine	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fine	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with
		GRAVEL with FINES more than 12% fine	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fine	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fine	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fine	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-size
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

Consistency - Fine-Grained Soil

Consistency	Spooling Cable or Cathead: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								Groundwater encountered during drilling.
								Groundwater measured after drilling.
							SM	MAJOR MATERIAL TYPE (SOIL): Solid line denotes unit change.
							CL	Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Shear Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, dry to moist, loose, silty SAND.
								VERY OLD PARALIC DEPOSITS: Yellow and light gray, moist, moderately cemented, silty SANDSTONE; fine- to coarse-grained; trace gravel.
			50/4"	10.7	100.1			
								Difficult drilling.
10			74/11"					
								Gray, moist, moderately cemented, sandy SILTSTONE.
								Reddish yellow, moist, moderately cemented, silty SANDSTONE; fine-grained.
			50/4"	2.5	121.8			Reddish yellow, moist, strongly cemented, silty SANDSTONE; fine-grained and gray, moist, strongly cemented, sandy SILSTONE; interbedded.
								Reddish yellow and gray, moist, strongly cemented, silty SANDSTONE; fine-grained; trace oxidation staining.
			50/6"					
								Total Depth = 19 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18.
20								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-1

GROUND ELEVATION 342' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 6" Diameter Hollow Stem Auger (Fraste) (Pacific Drilling)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 7/26/18 BORING NO. B-2 GROUND ELEVATION 343' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja) DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30" SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE. Iron oxide staining present.
			50/6"	9.0	101.4			
								Cobbles.
10			50/4"					
			50/3"					
								Cobbles.
								Total Depth = 17 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
			50/5"	9.1	108.0			VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE. Iron oxide staining present.
								Cobbles.
10			50/3"					
			50/5"					
			50/2"					Total Depth = 18.7 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18.
20								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/26/18 BORING NO. B-3

GROUND ELEVATION 343' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

BORING LOG FIGURE A- 3

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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	ASPHALT CONCRETE: Approximately 3-1/2" thick.
								FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to grayish brown, moist, strongly cemented, silty fine- to medium SANDSTONE.
		X	50/2"	6.0	118.2			
								Cobbles; hard drilling.
10			50/0"					Hard drilling. No recovery with SPT.
								Total Depth = 10 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18.
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DATE DRILLED 7/26/18 BORING NO. B-4

GROUND ELEVATION 350' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

BORING LOG FIGURE A- 4

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PEPPER CANYON WEST STUDENT HOUSING
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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ASPHALT CONCRETE: Approximately 5-1/2" thick.
								FILL: Light brown, moist, medium dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, moderately cemented, silty fine- to medium-grained SANDSTONE.
			50/6"	6.5	103.8			
10			50/2"					Few cobbles.
			50/1"					Strongly cemented; hard drilling.
			50/11"					
20								Total Depth = 18.8 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-5

GROUND ELEVATION 348' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

BORING LOG FIGURE A- 5

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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 7/25/18 BORING NO. B-6 GROUND ELEVATION 346' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja) DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30" SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT DESCRIPTION/INTERPRETATION
0							SM	ASPHALT CONCRETE: Approximately 5-1/2" thick.
	X							FILL: Light brown, moist, medium dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE.
		X	50/4"	7.9	100.7			
10		X	50/3"					
		X	50/2"					Hard drilling; few gravel.
		X	50/2"					
20								Total Depth = 18.7 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED	7/25/18	BORING NO.	B-7
GROUND ELEVATION	345' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	6" Diameter Hollow Stem Auger (Fraste) (Pacific Drilling)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY	ZH	LOGGED BY ZH	REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SM	FILL: Brown, dry to moist, loose, silty SAND; little gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish brown, moist, weakly to moderately cemented, silty SANDSTONE; medium-grained; trace oxidation; laminated.
		■	50/6"	6.7	105.8			
10		◤	50/6"					Gray, moist, weakly to moderately cemented, sandy SILTSTONE.
								Reddish yellow and light gray, moist, weakly to moderately cemented, silty SANDSTONE; medium-grained.
		■	50/6"					Yellowish brown; trace oxidation staining.
20								
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Total Depth = 16 feet.
Groundwater not encountered during drilling.
Backfilled shortly after drilling on 7/25/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 7/26/18 BORING NO. B-8 GROUND ELEVATION 350' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja) DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30" SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT DESCRIPTION/INTERPRETATION
0							SC	FILL: Brown, moist, medium dense, clayey SAND; few roots; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to grayish brown, moist, moderately to strongly cemented, silty fine- to medium-grained SANDSTONE.
			50/2"	26.6	101.8			
								Cobbles.
10			50/2"					Reddish brown.
								Cobbles; hard drilling.
								Total Depth = 12 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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BORING LOG FIGURE A- 8

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PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

DATE DRILLED	7/25/18	BORING NO.	B-9
GROUND ELEVATION	347' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-75) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY	GSW	LOGGED BY GSW	REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	FILL: Brown, dry to moist, medium dense to dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish brown to reddish brown, moist, strongly cemented, fine- to medium-grained SANDSTONE.
		X	50/3"	10.4	112.7			
10		X	50/3"					Grayish brown; iron oxide staining present.
		X	50/4"					Slightly micaceous.
		X	50/6"					
20								Total Depth = 19.5 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-10

GROUND ELEVATION 346' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, fine- to medium-grained SANDSTONE; iron oxide staining.
			50/4"	10.4	106.7			
10			92					Moderately cemented.
			50/2"	13.4	101.8			Strongly cemented.
			79					Moderately cemented.
20								Total Depth = 20 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED	7/26/18
BORING NO.	B-11
GROUND ELEVATION	345' ± (MSL)
SHEET	1 OF 1
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-75) (Baja)
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)
DROP	30"
SAMPLED BY	GSW
LOGGED BY	GSW
REVIEWED BY	CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE.
			50/4"	9.0	107.0			
								Gravelly.
10			50/6"					
			50/4"					Grayish brown.
			50/6"					
20								Total Depth = 19 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/27/18 BORING NO. B-12

GROUND ELEVATION 348' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE.
		X	50/6"	12.3	106.8			
								Grayish brown.
								Hard drilling.
10		X	77/11"					Moderately cemented; iron oxide staining.
		X	50/3"	20.6	105.0			Strongly cemented.
		X	91/11"					Moderately cemented.
20								Total Depth = 19.9 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/27/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	FILL: Brown, moist, medium dense, silty SAND; little gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, fine- to medium-grained SANDSTONE.
		X	50/4"	18.9	98.2			
10		X	50/2"					Iron oxide staining.
		X	50/6"					Light gray.
		X	50/6"					
20								Total Depth = 19.5 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-13

GROUND ELEVATION 347' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 7/25/18 BORING NO. B-14 GROUND ELEVATION 345' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja) DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30" SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, fine- to medium-grained SANDSTONE.
			50/6"	11.3	104.9			
10			50/3"					Iron oxide staining.
			50/5"					
			72/9"					
20								Total Depth = 19.8 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.
0							SM
			91/10"	9.2	98.6		
10			50/4"				
			50/4"				
			50/2"				
20							
30							
40							

DATE DRILLED 7/26/18 BORING NO. B-15

GROUND ELEVATION 341' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DESCRIPTION/INTERPRETATION

ASPHALT CONCRETE:
Approximately 3" thick.

FILL:
Brown, moist, medium dense, silty SAND; few gravel; few cobble.

VERY OLD PARALIC DEPOSITS:
Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE.

Gravelly.

Grayish brown; Iron oxide staining.

Total Depth = 19.2 feet.
Groundwater not encountered during drilling.
Backfilled shortly after drilling on 7/26/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
		■	50/2"	11.3	111.8			VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE. Cobbles; hard drilling.
10								Total Depth = 8 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/27/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/27/18 BORING NO. B-16

GROUND ELEVATION 341' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DATE DRILLED	7/27/18	BORING NO.	B-17
GROUND ELEVATION	342' ± (MSL)	SHEET	1 OF 1
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-75) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY	GSW	LOGGED BY	GSW
REVIEWED BY	CAT		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; scattered cobbles.
								VERY OLD PARALIC DEPOSITS: Yellowish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE
		X	50/3"	10.6	109.1			
10		X	86					Moderately cemented; iron oxide staining.
		X	88/9"					
		X	84/11"					
20								Total Depth = 19.9 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/27/18.
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Total Depth = 19.9 feet.
Groundwater not encountered during drilling.
Backfilled shortly after drilling on 7/27/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DATE DRILLED	7/25/18	BORING NO.	B-18
GROUND ELEVATION	341' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	6" Diameter Hollow Stem Auger (Fraste) (Pacific Drilling)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY ZH	LOGGED BY ZH	REVIEWED BY	CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GP	ASPHALT CONCRETE: Approximately 3" thick.
							SM	AGGREGATE BASE: Approximately 5-1/2" thick.
								FILL: Reddish yellow, moist, loose, silty SAND.
								VERY OLD PARALIC DEPOSITS: Light gray, moist, weakly cemented, silty SANDSTONE; fine-grained.
		X	57					Pale brown, moist, weakly cemented, sandy SILTSTONE; trace oxidation staining present.
10		X	50/6"	20.2	101.0			Pale brown and reddish yellow; strongly cemented; interbedded.
								Light gray, moist, weakly cemented, silty SANDSTONE; fine-grained.
		X	74					Pale brown to light gray, moist, weakly cemented, sandy SILTSTONE.
								Yellowish brown, moist, strongly cemented, silty SANDSTONE.
		X	50/6"					
20								Total Depth = 18.5 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/26/18	BORING NO. B-19
GROUND ELEVATION 339' ± (MSL)	SHEET 1 OF 1
METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-75) (Baja)	
DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer)	DROP 30"
SAMPLED BY GSW LOGGED BY GSW	REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE.
			50/2"	12.0	110.7			
10			50/6"					
			50/6"					Grayish brown.
			50/4"					Iron oxide staining.
20								Total Depth = 19.3 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/26/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, dry, medium dense, silty SAND; few to little gravel; fine to coarse gravel.
								Abundant gravel and cobbles.
			85					
								VERY OLD PARALIC DEPOSITS: Pale brown to light gray, moist, weakly to moderately cemented, silty SANDSTONE; trace oxidation staining; little gravel.
								Light gray.
10			50/6"	5.5	104.3			
			82					
			50					
20								Total Depth = 18.5 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-20

GROUND ELEVATION 336' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 6" Diameter Hollow Stem Auger (Fraste) (Pacific Drilling)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY CAT

DATE DRILLED	7/27/18	BORING NO.	B-21
GROUND ELEVATION	338' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-75) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY	GSW	LOGGED BY GSW	REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SM	FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
		X	32	16.0	113.3			VERY OLD PARALIC DEPOSITS: Dark brown to gray, moist, weakly cemented, clayey fine- to medium-grained SANDSTONE. Hard drilling.
10								Total Depth = 8 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/27/18.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED	7/23/18	BORING NO.	B-22
GROUND ELEVATION	335' ± (MSL)	SHEET 1 OF 2	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-95) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip Hammer)	DROP	30"
SAMPLED BY	GSW	LOGGED BY GSW	REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SC	ASPHALT CONCRETE: Approximately 3-1/2" thick.
								FILL: Brown to gray, moist, medium dense, clayey SAND; some gravel; few cobbles.
			42	13.6	125.3			
10			33	14.1	115.6			Dark gray.
								SCRIPPS FORMATION: Light gray to brown, moist, strongly cemented, sandy SILTSTONE.
			50.4"	21.0	105.1			
20			47/2"					
			50/3"					
30			67					Moderately cemented; iron oxide staining.
			50/3"					Strongly cemented.
40								

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PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA
108614001 | 9/18

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.
40		◤	50/4"				
		◤	50/6"				
50		◤	50/2"				
60							
70							
80							

DATE DRILLED 7/23/18 BORING NO. B-22

GROUND ELEVATION 335' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DESCRIPTION/INTERPRETATION

SCRIPPS FORMATION: (Continued)
Light gray to brown, moist, strongly cemented, sandy SILTSTONE.

Total Depth = 50.7 feet.
Groundwater not encountered during drilling.
Backfilled with approximately 17.7 cubic feet of bentonite grout shortly after drilling on 7/23/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DATE DRILLED 7/24/18 BORING NO. B-23

GROUND ELEVATION 332' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ASPHALT CONCRETE: Approximately 3-1/2" thick.
								FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
			70	13.8	115.5			SCRIPPS FORMATION: Light brown to gray, moist, moderately cemented, sandy SILTSTONE.
10			52					Dark gray; weakly cemented.
			50/4"					Light brown to gray; strongly cemented.
								Claystone interbeds; Iron oxide staining.
			86/8"					
20								Total Depth = 19.7 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/24/18.
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Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

BORING LOG FIGURE A- 24

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, loose, silty SAND; fine sand; landscape related gravel on the surface.
			78	14.3	103.7			VERY OLD PARALIC DEPOSITS: Very light gray to pale brown, moist, moderately cemented, sandy SILTSTONE.
								Light gray, moist, weakly cemented, silty SANDSTONE; fine-grained, friable.
10			59					
			50/4"	10.7	98.8			Grayish brown; strongly cemented; trace oxidation staining.
			70					Moderately cemented.
20								Total Depth = 19.5 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/25/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
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DATE DRILLED 7/25/18 BORING NO. B-24

GROUND ELEVATION 335' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 6" Diameter Hollow Stem Auger (Fraste) (Pacific Drilling)

DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30"

SAMPLED BY ZH LOGGED BY ZH REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.

DATE DRILLED 7/24/18 BORING NO. B-25

GROUND ELEVATION 334' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DESCRIPTION/INTERPRETATION

DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0				SM	ASPHALT CONCRETE: Approximately 3-1/4" thick. FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
	41	13.3	113.8		SCRIPPS FORMATION: Light brown to gray, moist, weakly cemented, sandy SILTSTONE.
10	23	12.9	115.0		
	39				
	28				
20					Total Depth = 20 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/24/18.
30					
40					

Total Depth = 20 feet.
Groundwater not encountered during drilling.
Backfilled shortly after drilling on 7/24/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.

DATE DRILLED 7/24/18 BORING NO. B-26

GROUND ELEVATION 333' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DESCRIPTION/INTERPRETATION

Depth (feet)	Blows/Foot	Moisture (%)	Dry Density (PCF)	U.S.C.S.	Description/Interpretation
0				SM	ASPHALT CONCRETE: Approximately 3-1/4" thick. FILL: Brown to light brown, moist, medium dense, silty SAND; few gravel; few cobble.
	57	13.6	119.6		SCRIPPS FORMATION: Light brown to gray, moist, weakly cemented, sandy SILTSTONE.
10	35	13.6	114.8		
	40				
	22				Iron oxide staining present.
20					Total Depth = 20 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/24/18.
30					
40					

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DATE DRILLED 7/24/18 BORING NO. B-27

GROUND ELEVATION 329' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ASPHALT CONCRETE: Approximately 3-1/4" thick. FILL: Brown, moist, medium dense, silty SAND.
			98/9"	7.2	120.8			SCRIPPS FORMATION: Light brown to gray, moist, moderately cemented, sandy SILTSTONE.
10			61					
			52					Slightly micaceous.
20								Total Depth = 20 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/24/18.
30								
40								

Total Depth = 20 feet.
Groundwater not encountered during drilling.
Backfilled shortly after drilling on 7/24/18.

Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ASPHALT CONCRETE: Approximately 6-1/2" thick.
								FILL: Brown, moist, medium dense, silty SAND; few gravel; few cobble.
			36	14.9	112.7			
10			36	13.9	113.4			Dark gray; slight hydrocarbon odor.
								SCRIPPS FORMATION: Light brown to gray, moist, weakly cemented, sandy SILTSTONE; iron oxide staining.
			27	11.1	108.2			
			24					
20								Total Depth = 20 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 7/23/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
30								
40								

DATE DRILLED 7/23/18 BORING NO. B-28

GROUND ELEVATION 331' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SC	ASPHALT CONCRETE: Approximately 5-1/2" thick.
								FILL: Brown, moist, medium dense, clayey SAND; few gravel; few cobble.
			53	13.2	112.9			
								SCRIPPS FORMATION: Light brown to gray, moist, weakly cemented, sandy SILTSTONE.
10			42	14.5	109.1			Light brown to dark gray.
			38					Light brown to gray.
20			21					
			31					
30			36					Iron oxide staining.
			84/10"					Moderately cemented.
40								

DATE DRILLED 7/23/18 BORING NO. B-29

GROUND ELEVATION 331' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40		■	50/6"					SCRIPPS FORMATION: (Continued) Light brown to gray, moist, strongly cemented sandy SILTSTONE; slightly micaceous.
		■	50/5"					
50		■	82/8"					Finely laminated.
								Total Depth = 51.2 feet. Groundwater not encountered during drilling. Backfilled with approximately 17.9 cubic feet of bentonite grout grout shortly after drilling on 7/23/18. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
60								
70								
80								

DATE DRILLED 7/23/18 BORING NO. B-29

GROUND ELEVATION 331' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip Hammer) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 7/31/18 BORING NO. IT-1 GROUND ELEVATION 347' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING Manual DRIVE WEIGHT N/A DROP N/A SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT **DESCRIPTION/INTERPRETATION**
0							SM	FILL: Brown, moist, medium dense, silty SAND; few roots; few gravel; few cobble.
								VERY OLD PARALIC DEPOSITS: Yellowish to reddish brown, moist, strongly cemented, silty fine- to coarse-grained SANDSTONE; few cobble.
								Total Depth = 5 feet. Groundwater not encountered. Backfilled shortly after completion of infiltration testing on 8/01/18. Notes: Groundwater, though not encountered at the time of excavation, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
10								
20								
30								
40								

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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, medium dense, silty SAND; few gravel.
								VERY OLD PARALIC DEPOSITS: Light brown to gray, moist, strongly cemented, clayey fine- to medium-grained SANDSTONE; few gravel; few cobble.
								Total Depth = 5 feet. Groundwater not encountered. Backfilled shortly after completion of infiltration testing on 8/01/18.
10								Notes: Groundwater, though not encountered at the time of excavation, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20								
30								
40								

DATE DRILLED 7/31/18 BORING NO. IT-2

GROUND ELEVATION 338' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING Manual

DRIVE WEIGHT N/A DROP N/A

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY CAT

APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-8. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure B-9.

Consolidation Tests

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figures B-10 and B-11.

Direct Shear Tests

Direct shear tests were performed on relatively undisturbed and/or remolded samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figures B-12 through B-17.

Expansion Index Tests

The expansion index of selected materials was evaluated in general accordance with Uniform Building Code (UBC) Standard No. 18-2 (ASTM D 4829). Specimens were molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimens were loaded with a surcharge of 144 pounds per square foot and were inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of these tests are presented on Figure B-18.

Proctor Density Tests

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated using the Modified Proctor method in general accordance with ASTM D 1557. The results of these tests are summarized on Figures B-19 and B-20.

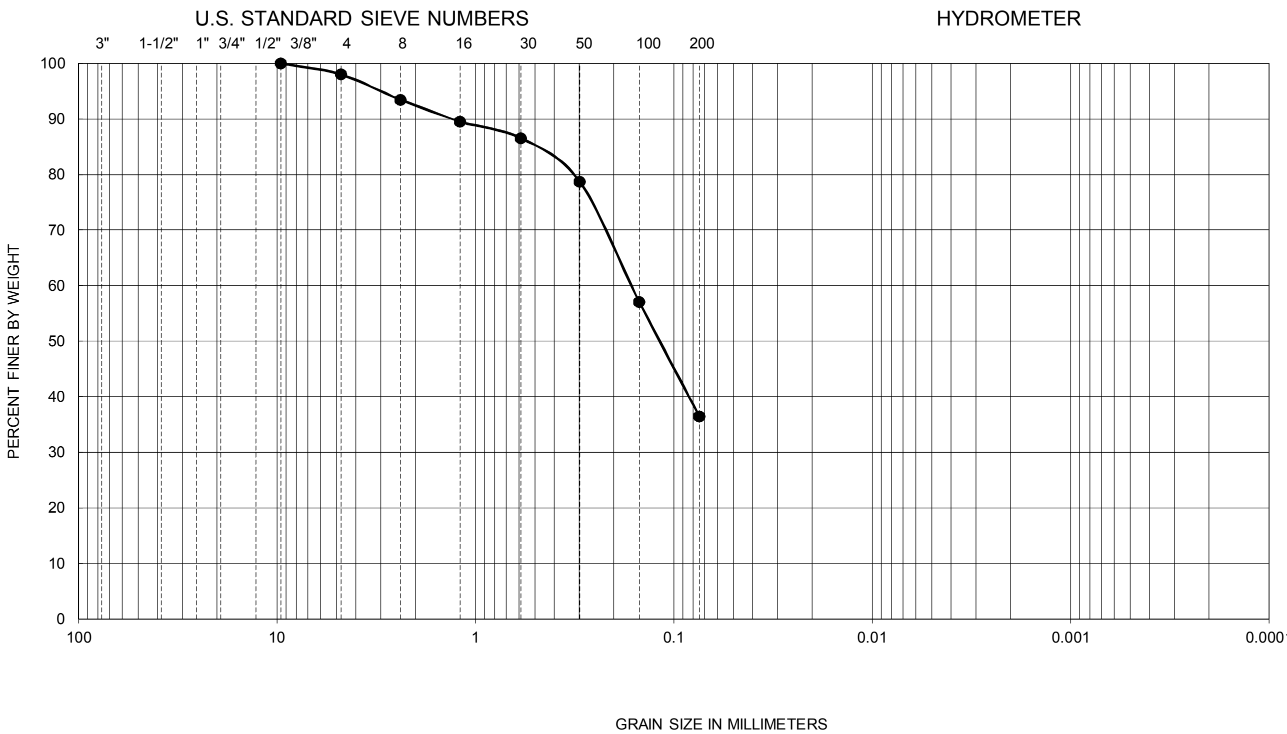
Soil Corrosivity Tests

Soil pH, and resistivity tests were performed on representative samples in general accordance with California Test (CT) 643. The soluble sulfate and chloride contents of selected samples were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-21.

R-Value

The resistance value, or R-value, for site soils was evaluated in general accordance with California Test (CT) 301. Samples were prepared and evaluated for exudation pressure and expansion pressure. The equilibrium R-value is reported as the lesser or more conservative of the two calculated results. The test results are shown on Figure B-22.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	Equivalent USCS
●	B-1	1.0-5.0	--	--	--	--	--	--	--	--	36	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE B-1

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GRADATION TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

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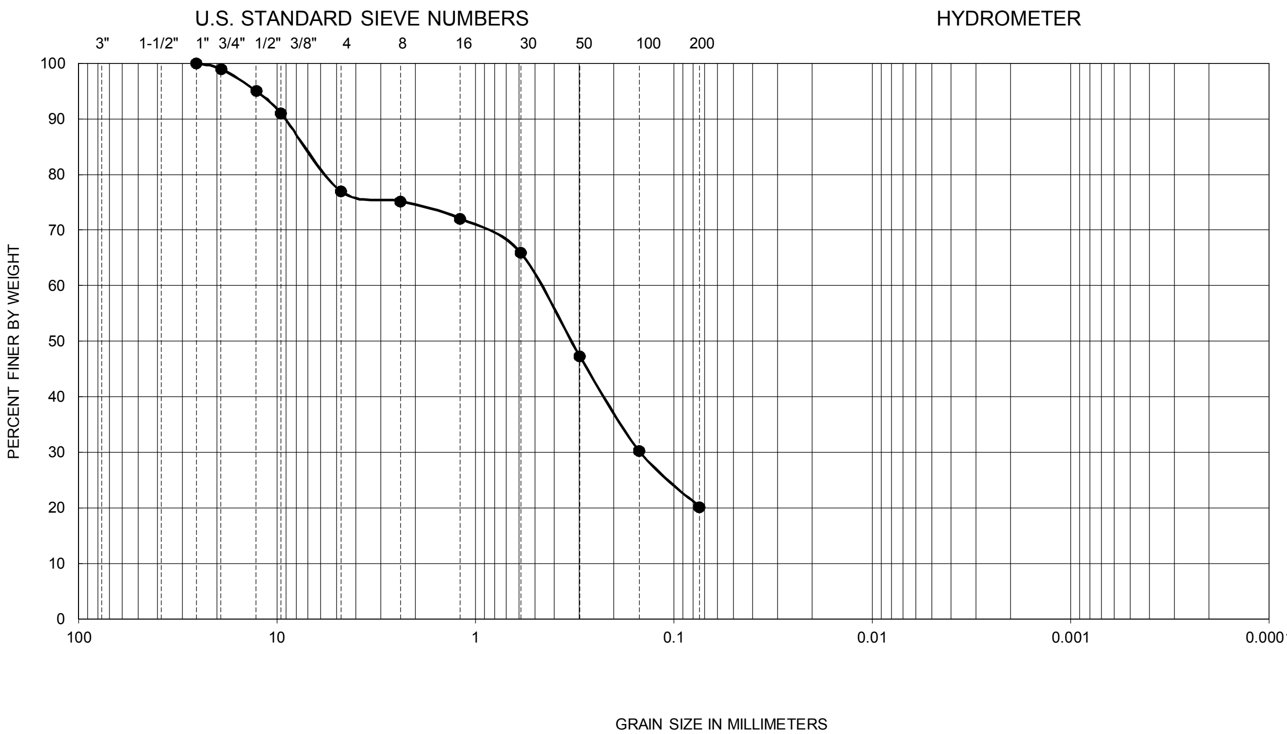
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-7	0.0-5.0	--	--	--	--	--	--	--	--	20	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE B-2

GRADATION TEST RESULTS

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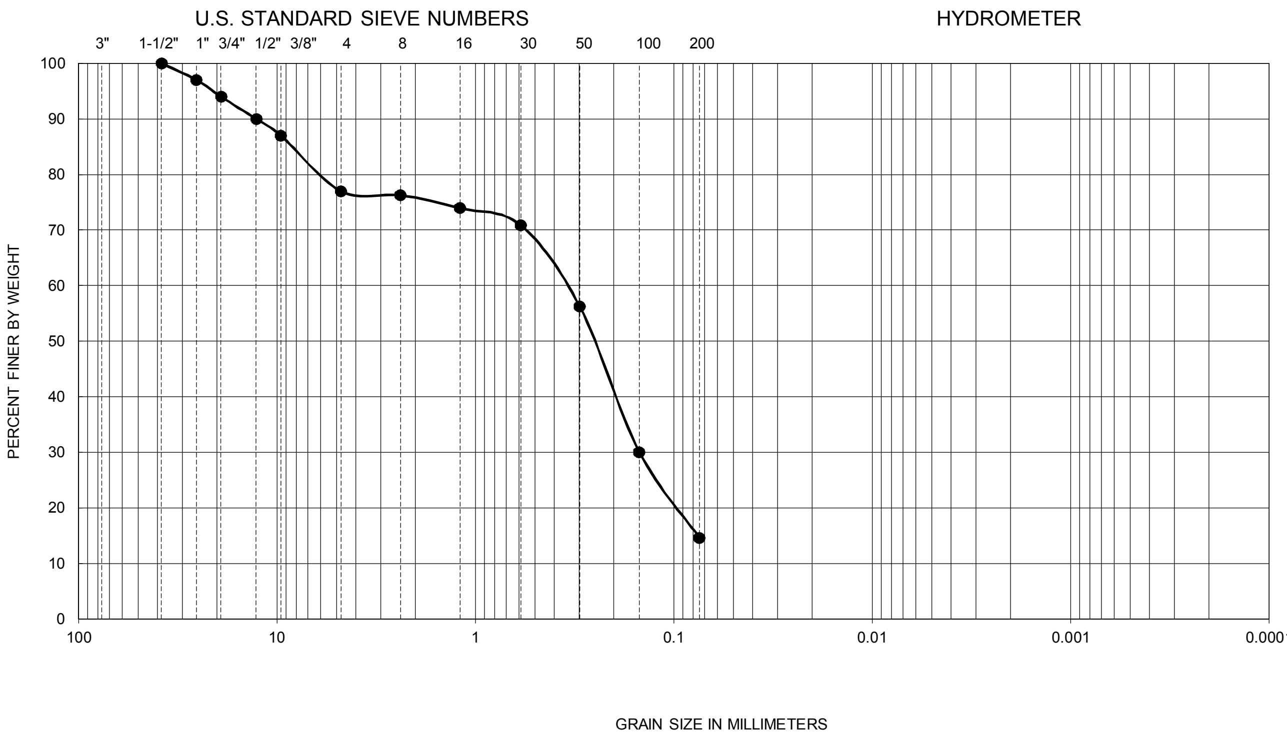
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-13	0.0-3.0	--	--	--	--	--	--	--	--	15	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE B-3

GRADATION TEST RESULTS

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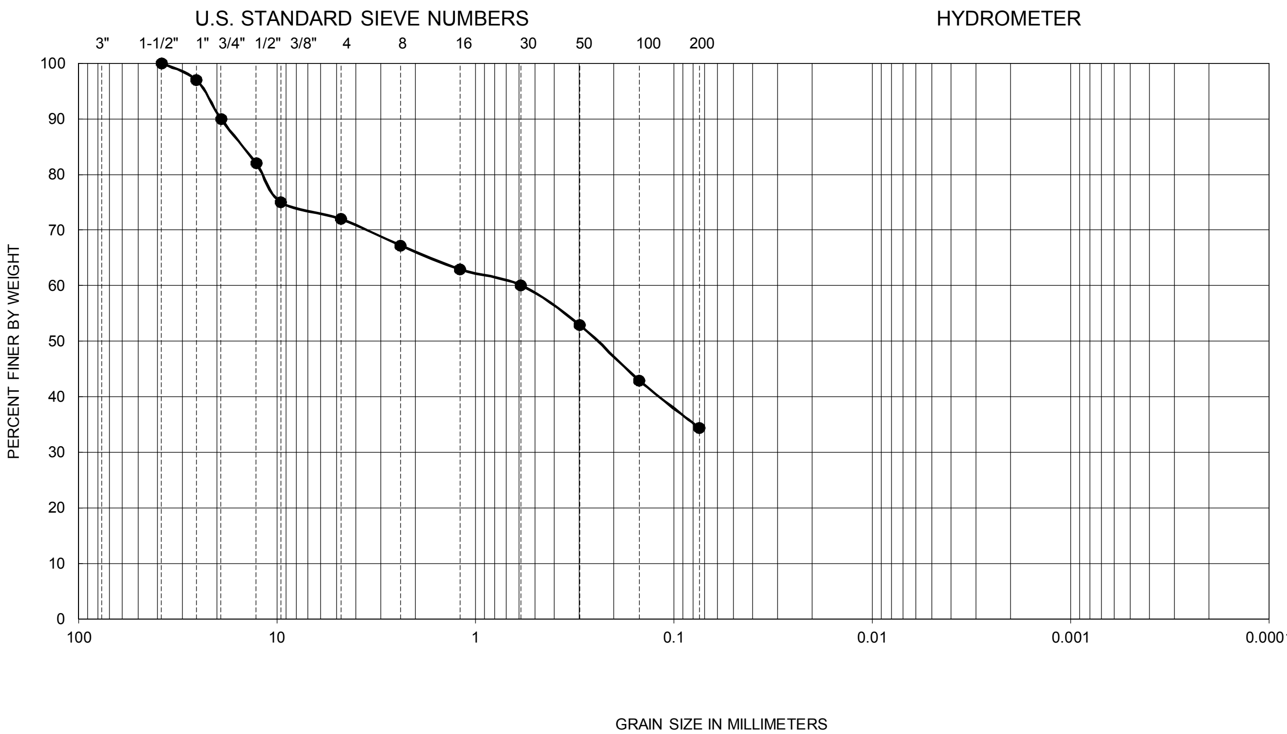
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	Equivalent USCS
●	B-20	6.0-10.0	--	--	--	--	--	--	--	--	34	SM

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FIGURE B-4

GRADATION TEST RESULTS

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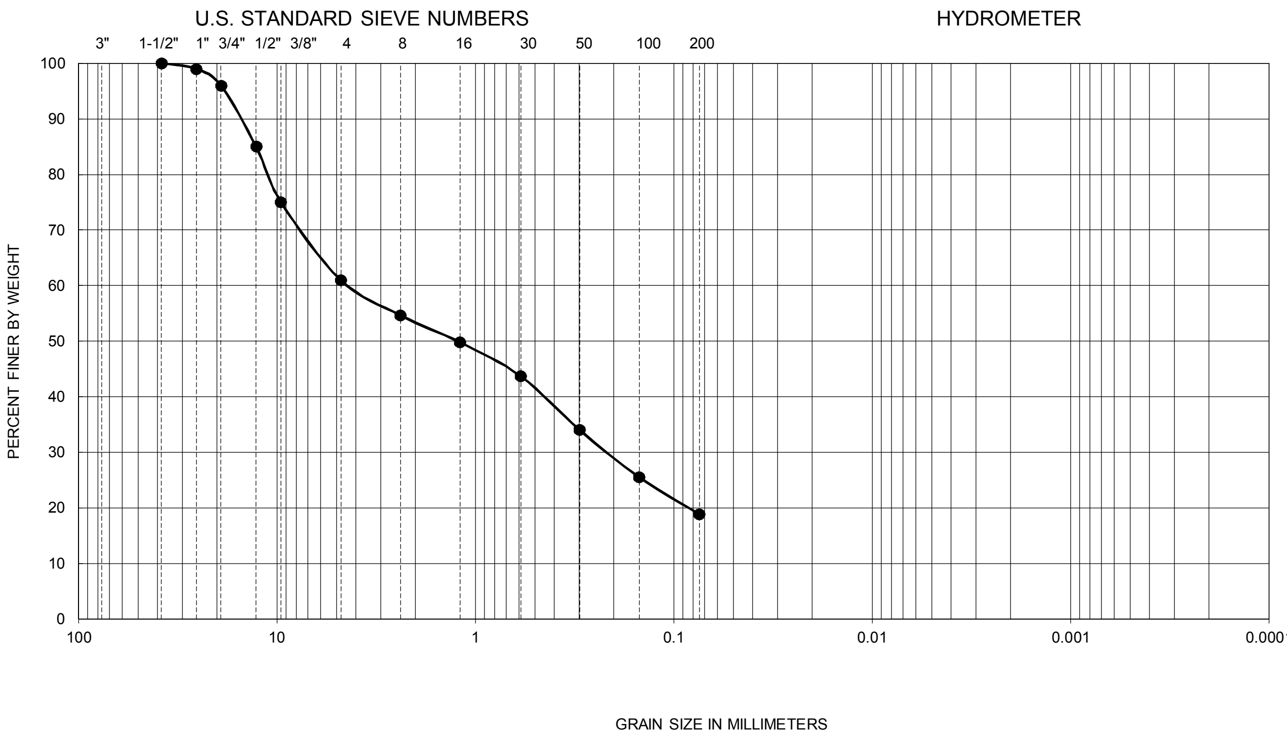
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-22	0.29-5.0	--	--	--	--	--	--	--	--	19	SC

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FIGURE B-5

GRADATION TEST RESULTS

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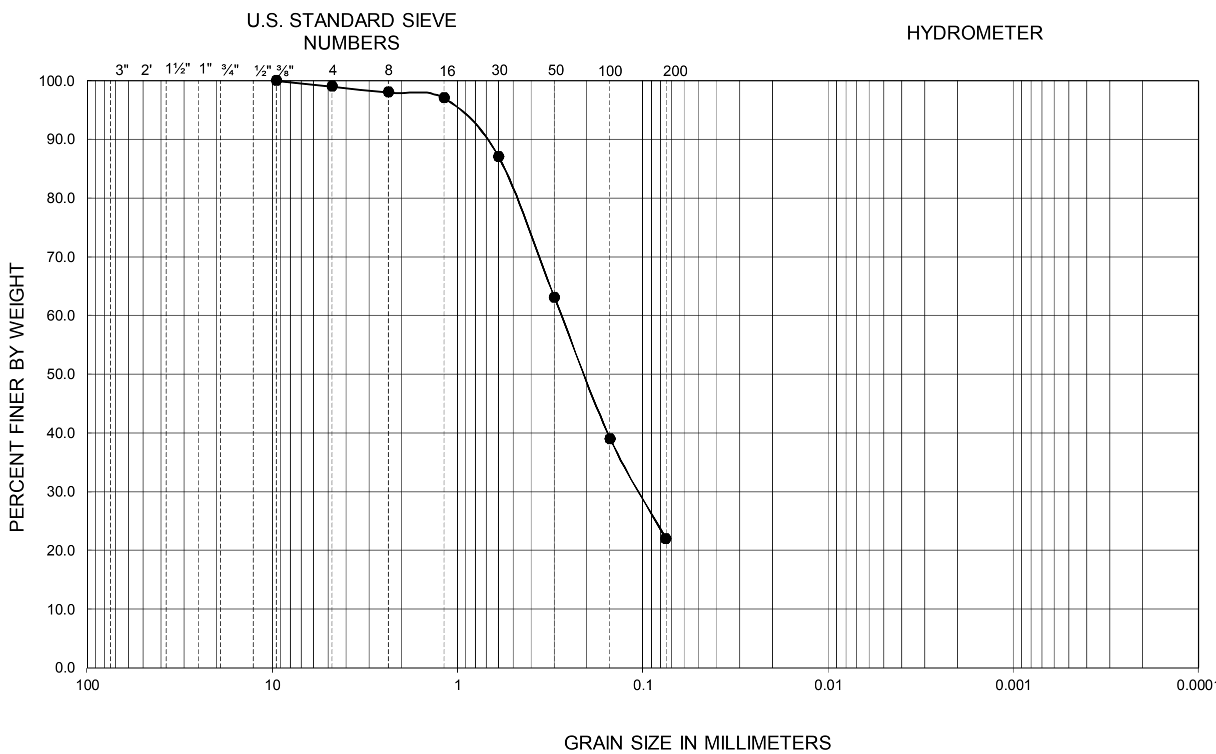
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-23	5.0-6.5	--	--	--	--	--	--	--	--	22	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE B-6

GRADATION TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
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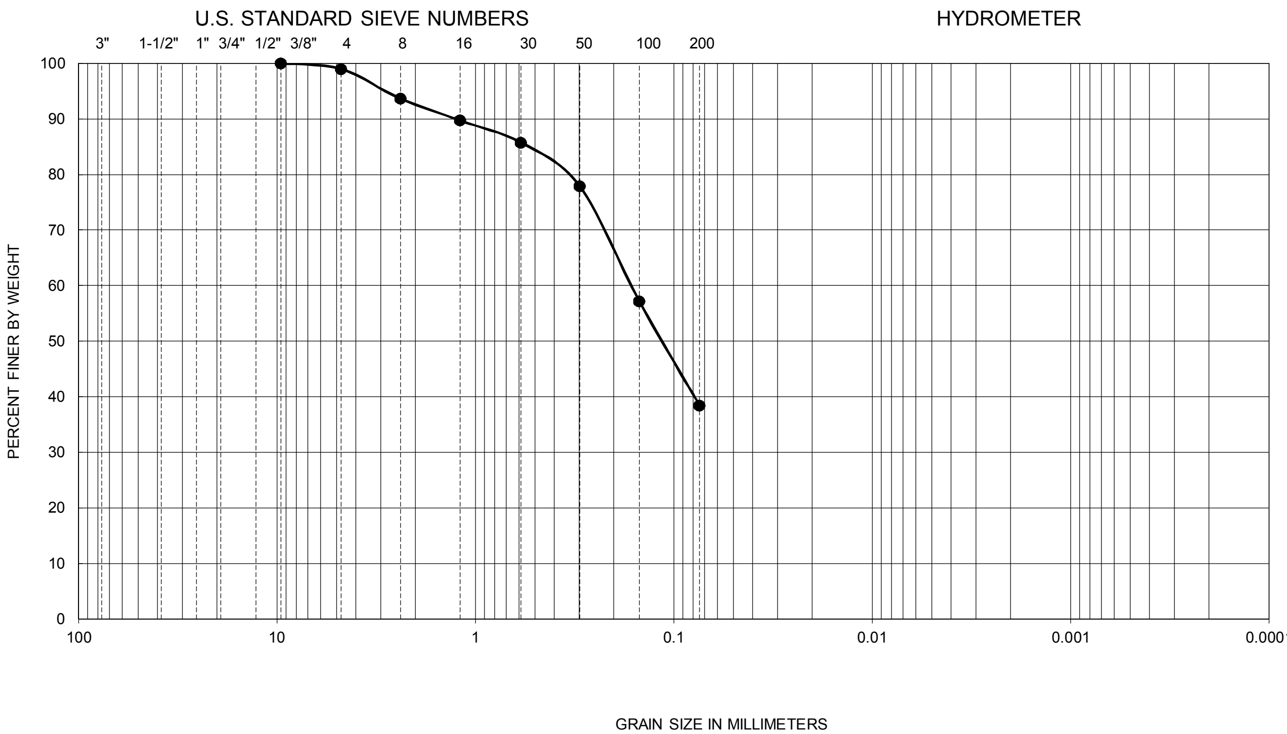
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-29	0.46-5.0	--	--	--	--	--	--	--	--	38	SC

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FIGURE B-7

GRADATION TEST RESULTS

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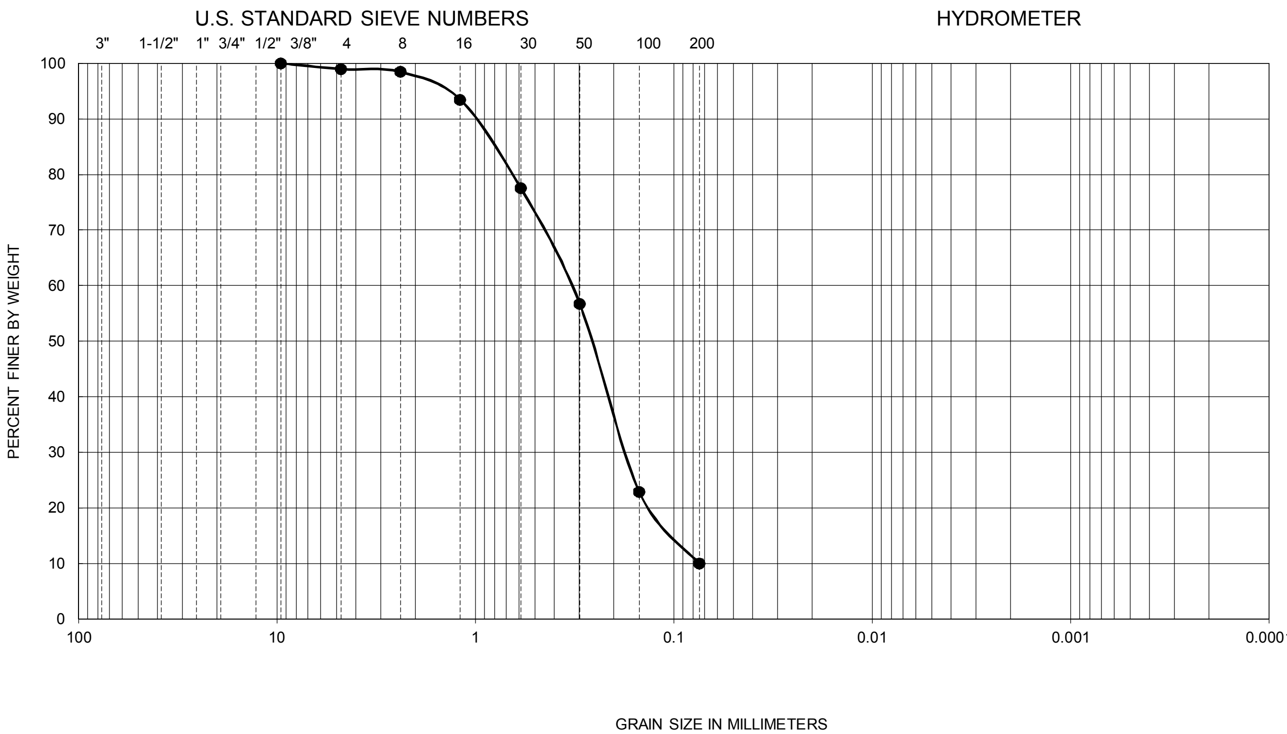
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	Equivalent USCS
●	IT-1	2.0-5.0	--	--	--	0.07	0.18	0.33	4.4	1.3	10	SP-SM

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FIGURE B-8

GRADATION TEST RESULTS

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SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS
●	B-4	0.29-3.0	NP	NP	NP	ML	SM
■	B-28	0.54-5.0	NP	NP	NP	ML	SM

NP - INDICATES NON-PLASTIC

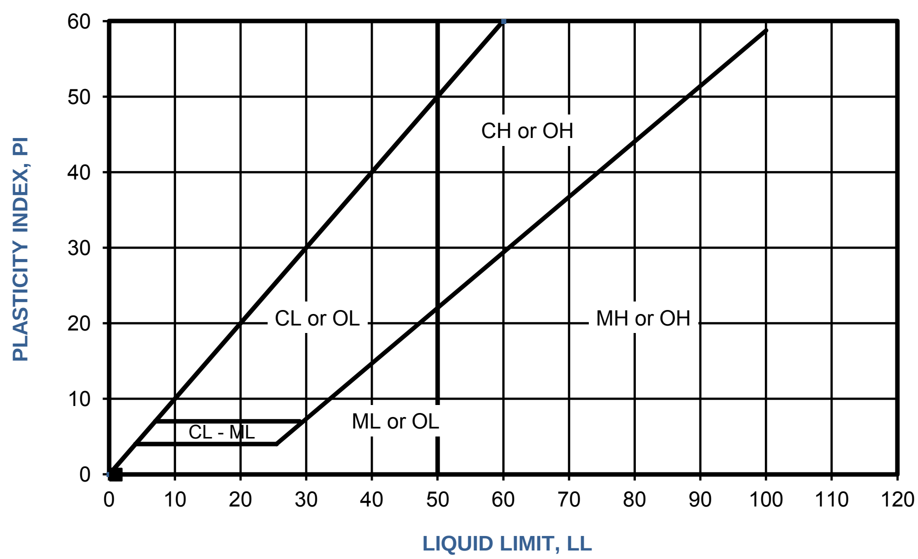

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FIGURE B-9

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ATTERBERG LIMITS TEST RESULTS

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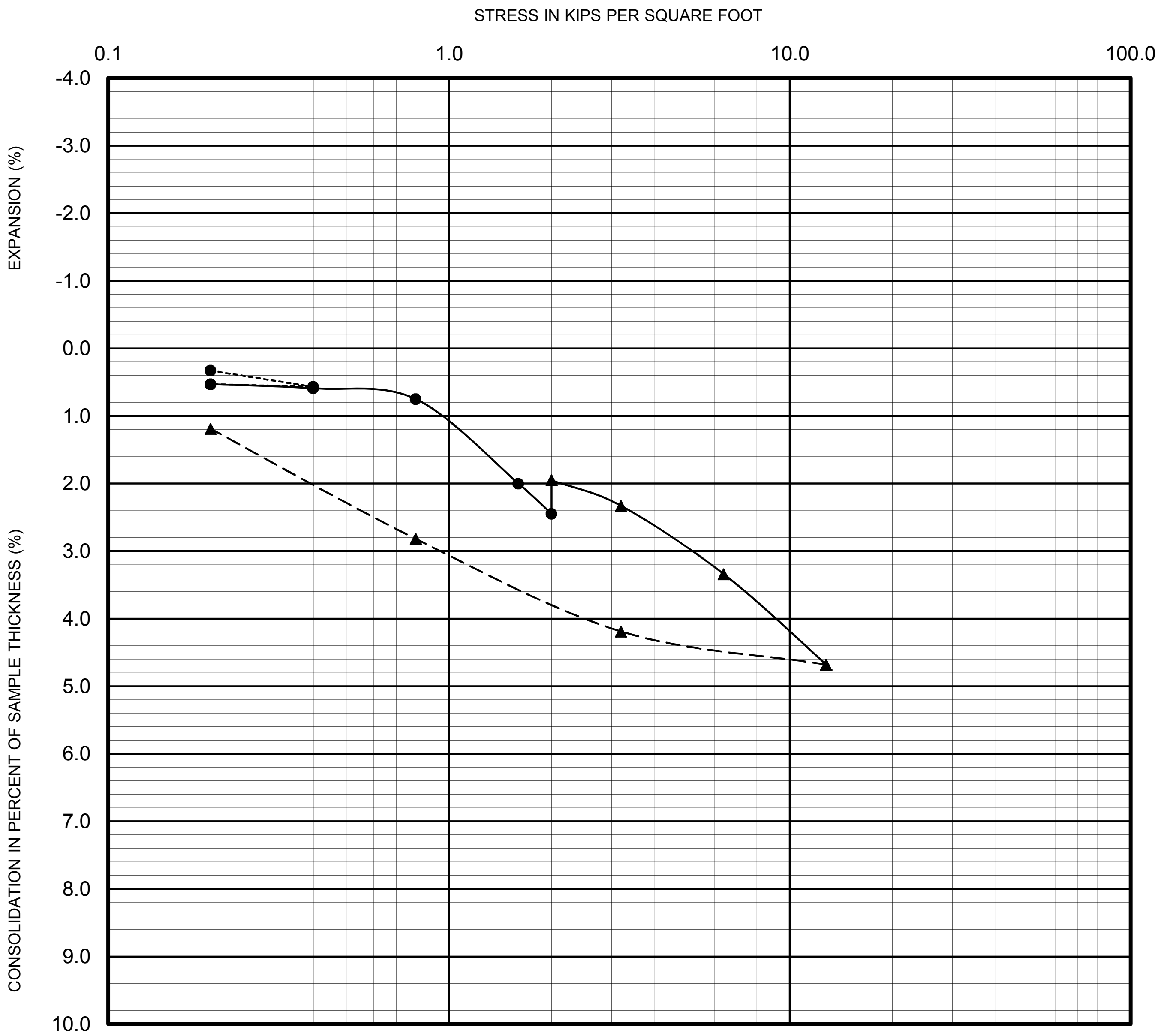

Seating Cycle		Sample Location	B-22
Loading Prior to Inundation		Depth (ft)	10.0-11.5
Loading After Inundation		Soil Type	SC
Rebound Cycle			

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FIGURE B-10

CONSOLIDATION TEST RESULTS

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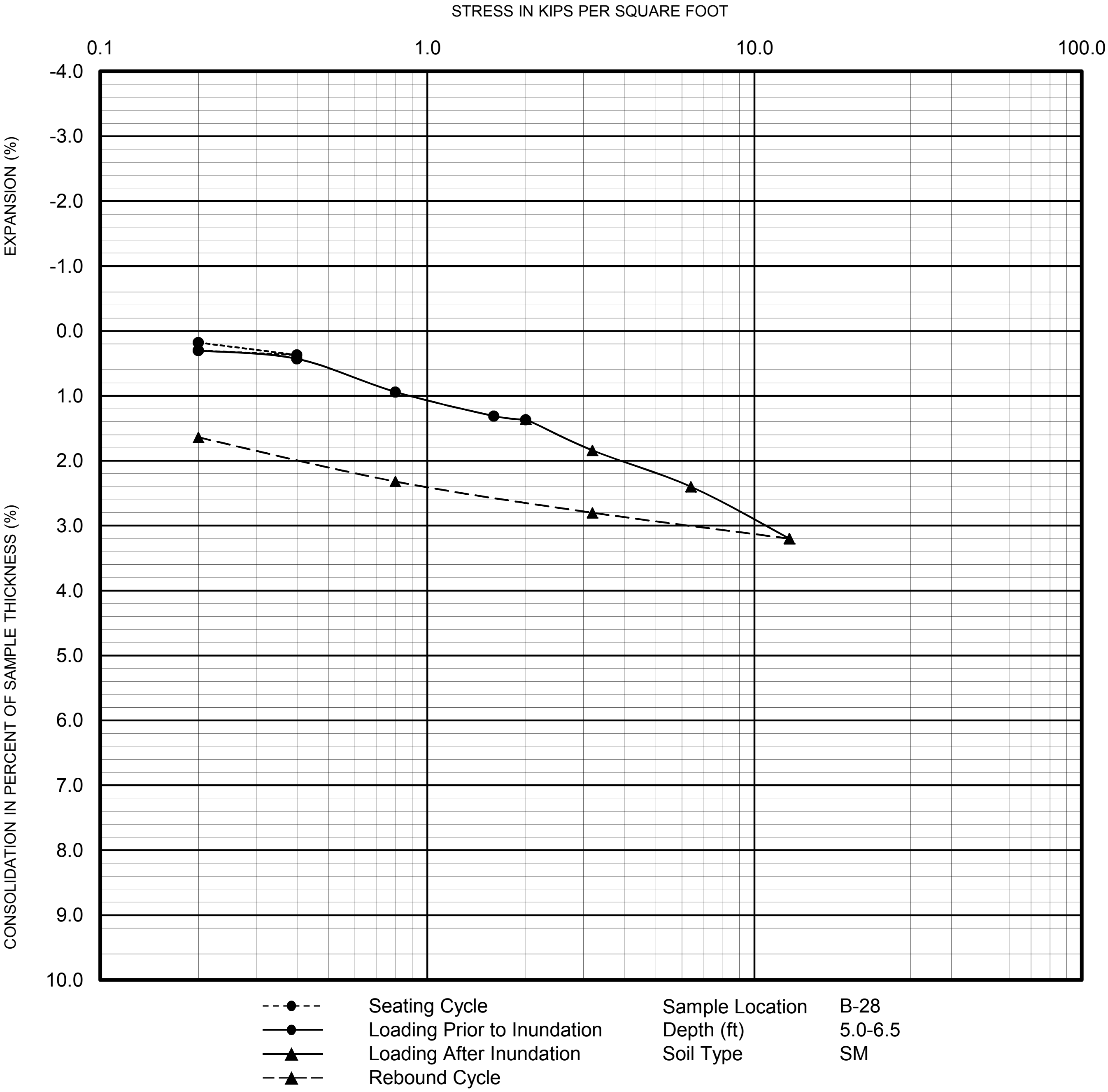

Sample Location	B-28
Depth (ft)	5.0-6.5
Soil Type	SM

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FIGURE B-11

CONSOLIDATION TEST RESULTS

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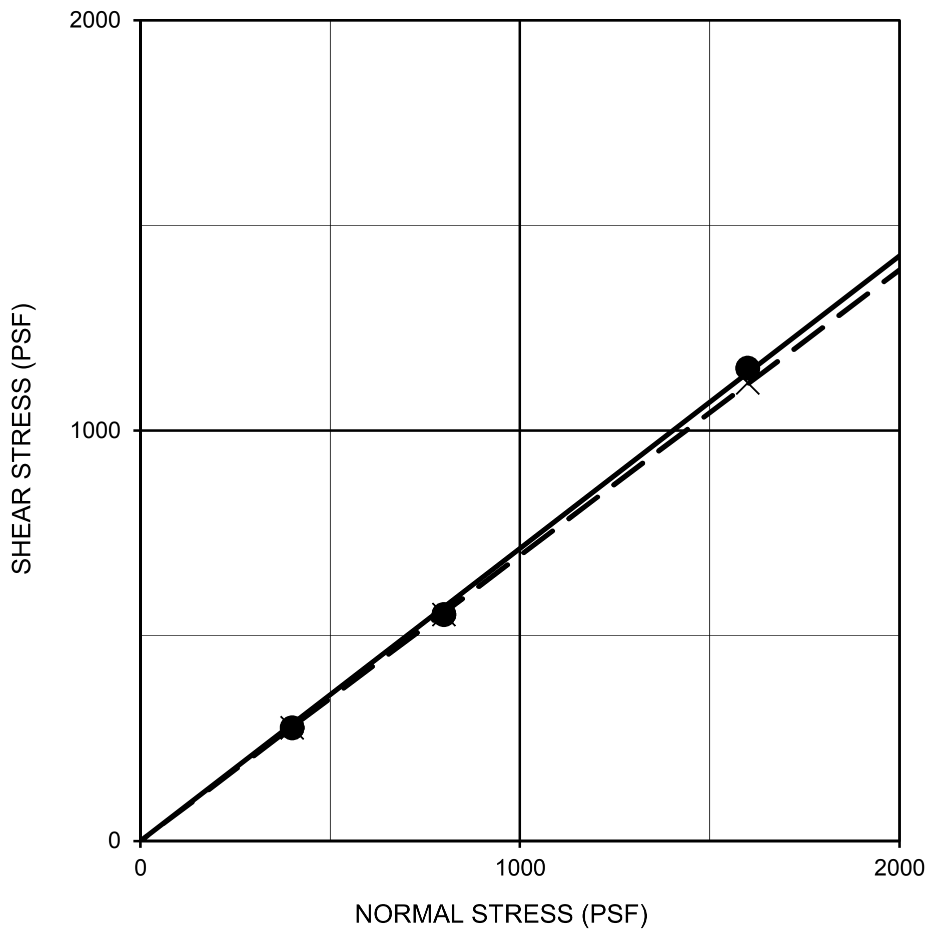

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Silty SANDSTONE	——●——	B-1	5.0-6.5	Peak	0	35	Formation
Silty SANDSTONE	– – X – –	B-1	5.0-6.5	Ultimate	0	35	Formation

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FIGURE B-12

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DIRECT SHEAR TEST RESULTS

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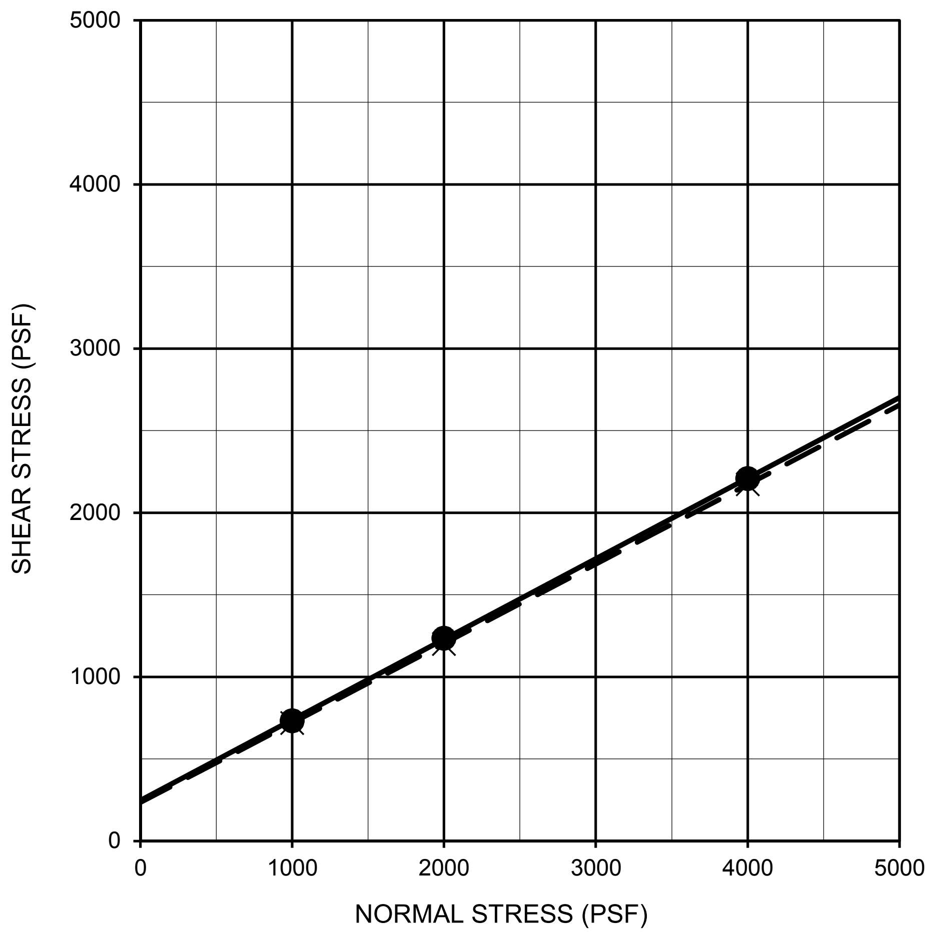

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Remolded @ 90% Relative Compaction	——●——	B-4	0.29-3.0	Peak	250	26	SM
	– – X – –	B-4	0.29-3.0	Ultimate	230	26	SM

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FIGURE B-13

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DIRECT SHEAR TEST RESULTS

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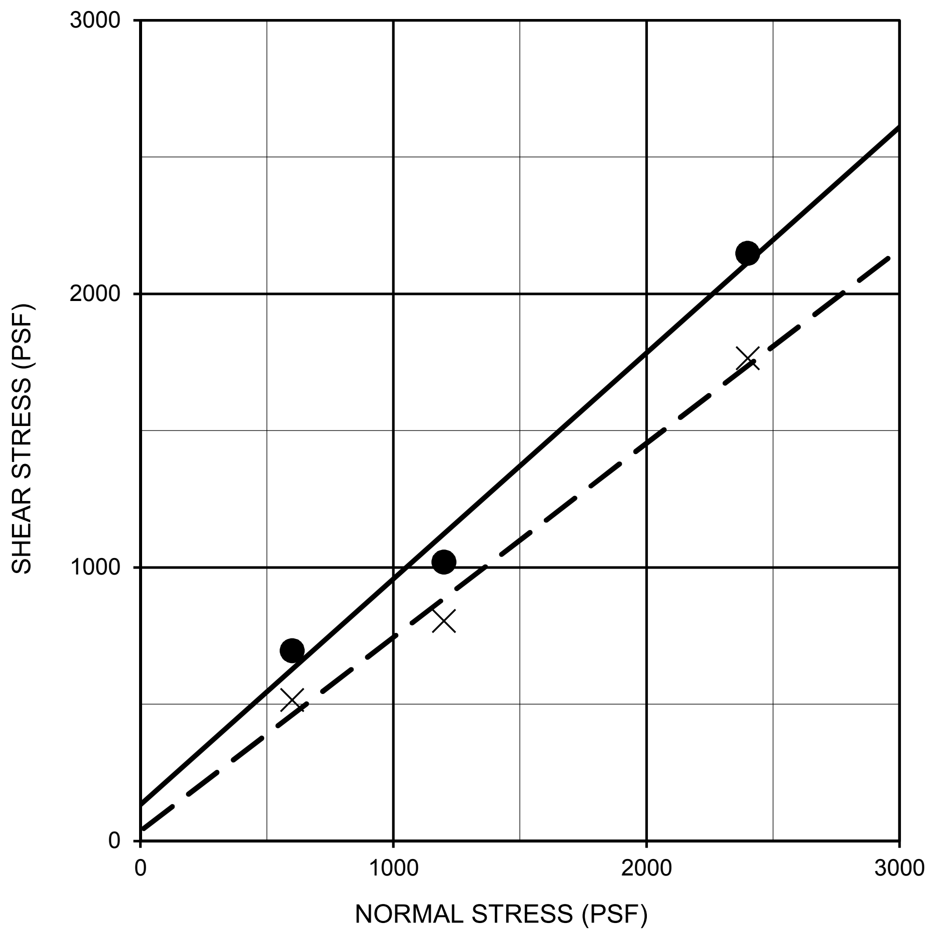

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Silty SANDSTONE	——●——	B-6	10.0-10.75	Peak	130	40	Formation
Silty SANDSTONE	– – X – –	B-6	10.0-10.75	Ultimate	40	35	Formation

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FIGURE B-14

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DIRECT SHEAR TEST RESULTS

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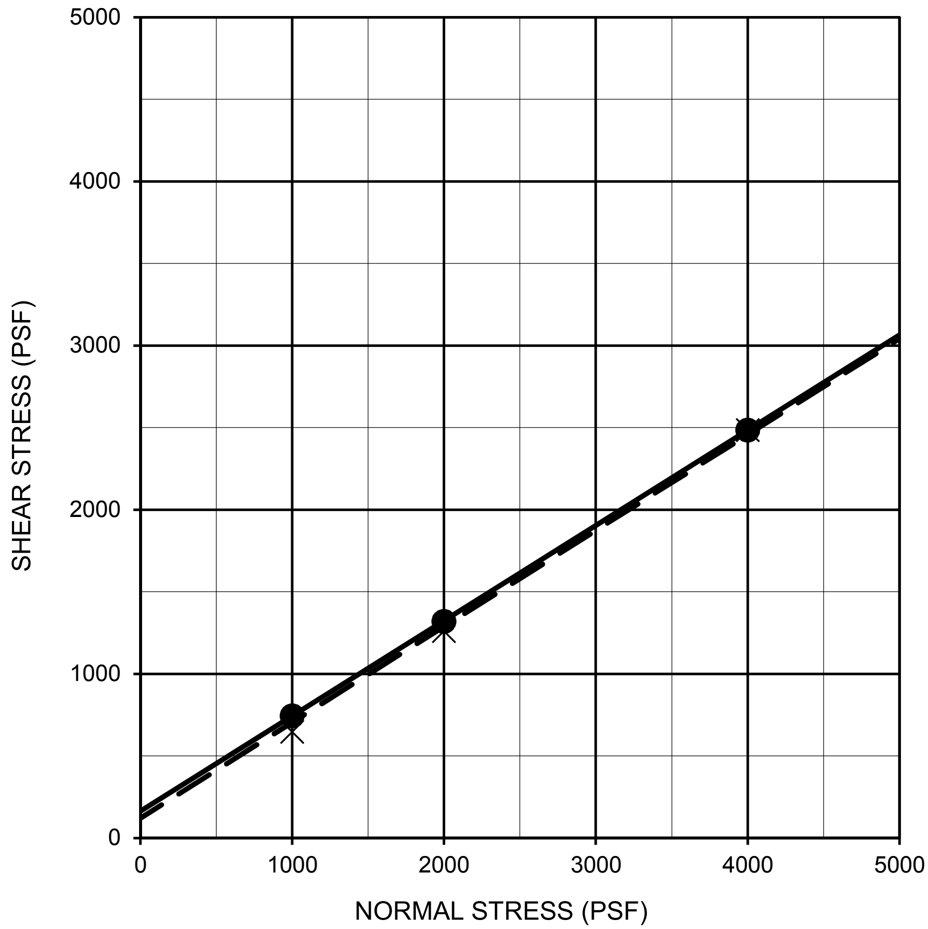

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Remolded @ 90% Relative Compaction	—●—	B-19	0.0-3.0	Peak	160	30	SM
	- - x - -	B-19	0.0-3.0	Ultimate	120	30	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE B-15

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DIRECT SHEAR TEST RESULTS

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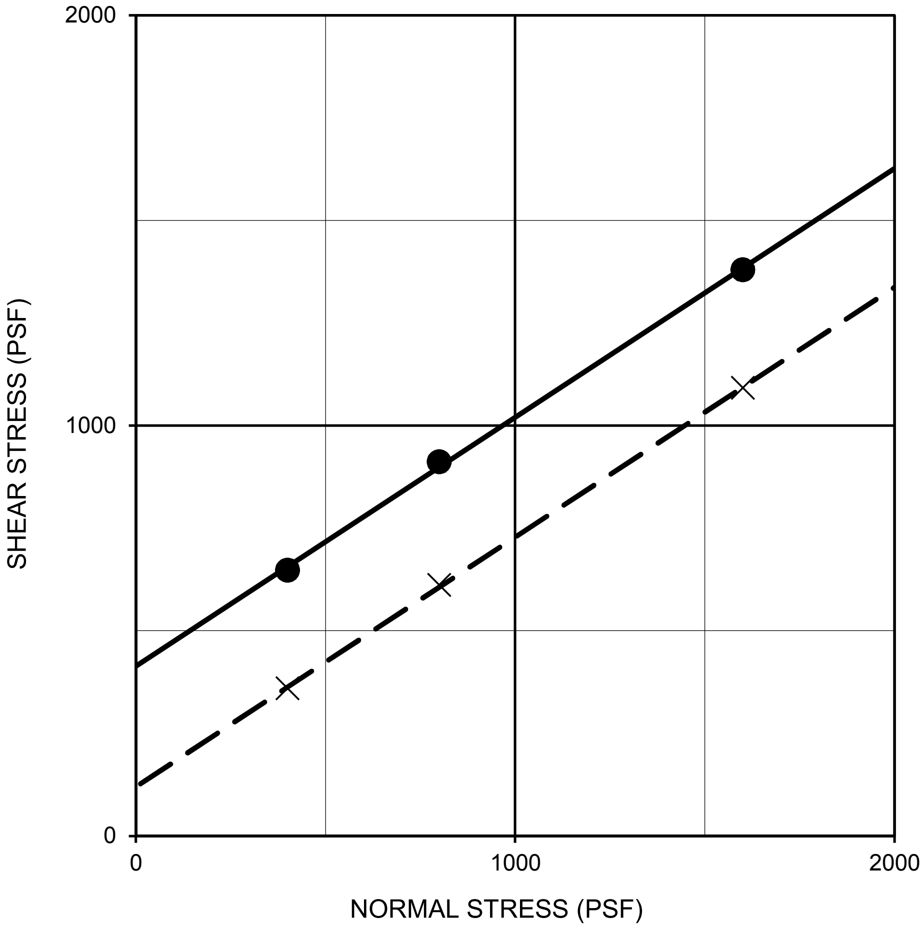

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Clayey SAND	——●——	B-22	5.0-6.5	Peak	410	31	SC
Clayey SAND	– – X – –	B-22	5.0-6.5	Ultimate	120	31	SC

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FIGURE B-16

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DIRECT SHEAR TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
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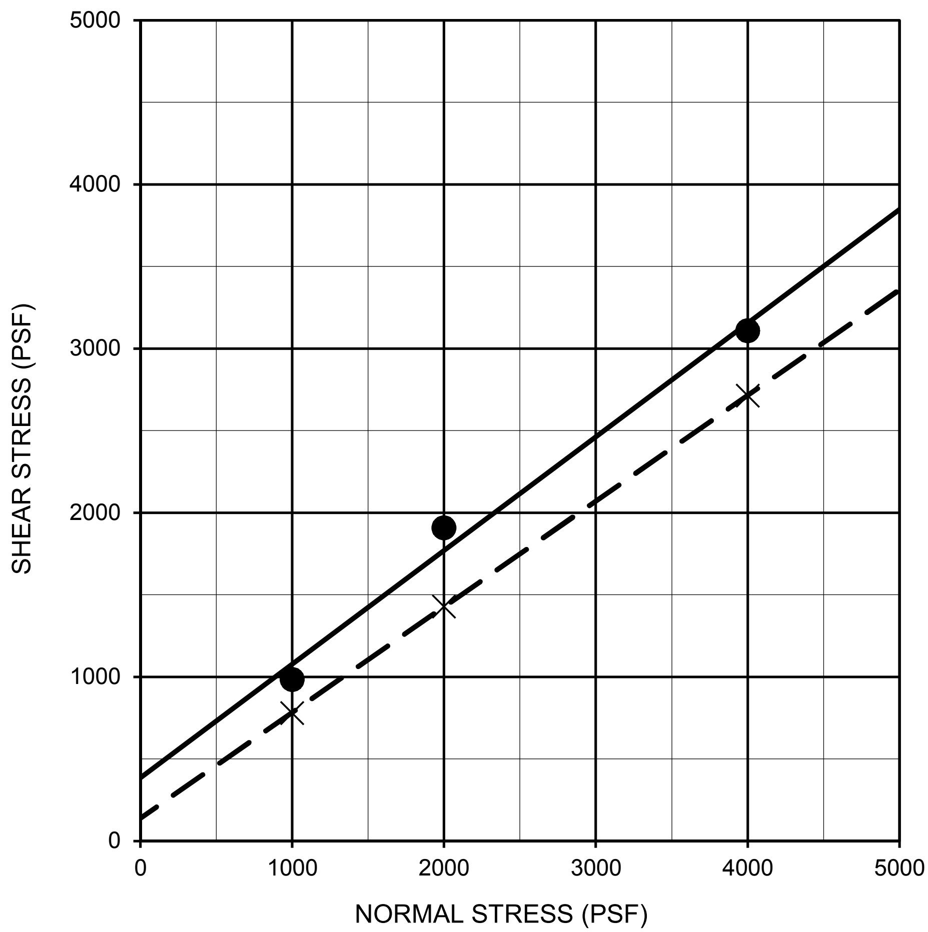


Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
Sandy SILTSTONE	——●——	B-25	15.0-16.5	Peak	380	35	Formation
Sandy SILTSTONE	– – X – –	B-25	15.0-16.5	Ultimate	140	33	Formation

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE B-17

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

DIRECT SHEAR TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 | 9/18

SAMPLE LOCATION	SAMPLE DEPTH (ft)	INITIAL MOISTURE (percent)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (percent)	VOLUMETRIC SWELL (in)	EXPANSION INDEX	POTENTIAL EXPANSION
B-12	0.0-3.0	11.0	107.3	22.8	0.024	24	Low
B-22	0.29-5.0	9.5	111.3	18.6	0.026	26	Low
B-28	0.54-5.0	9.5	111.5	18.6	0.029	29	Low

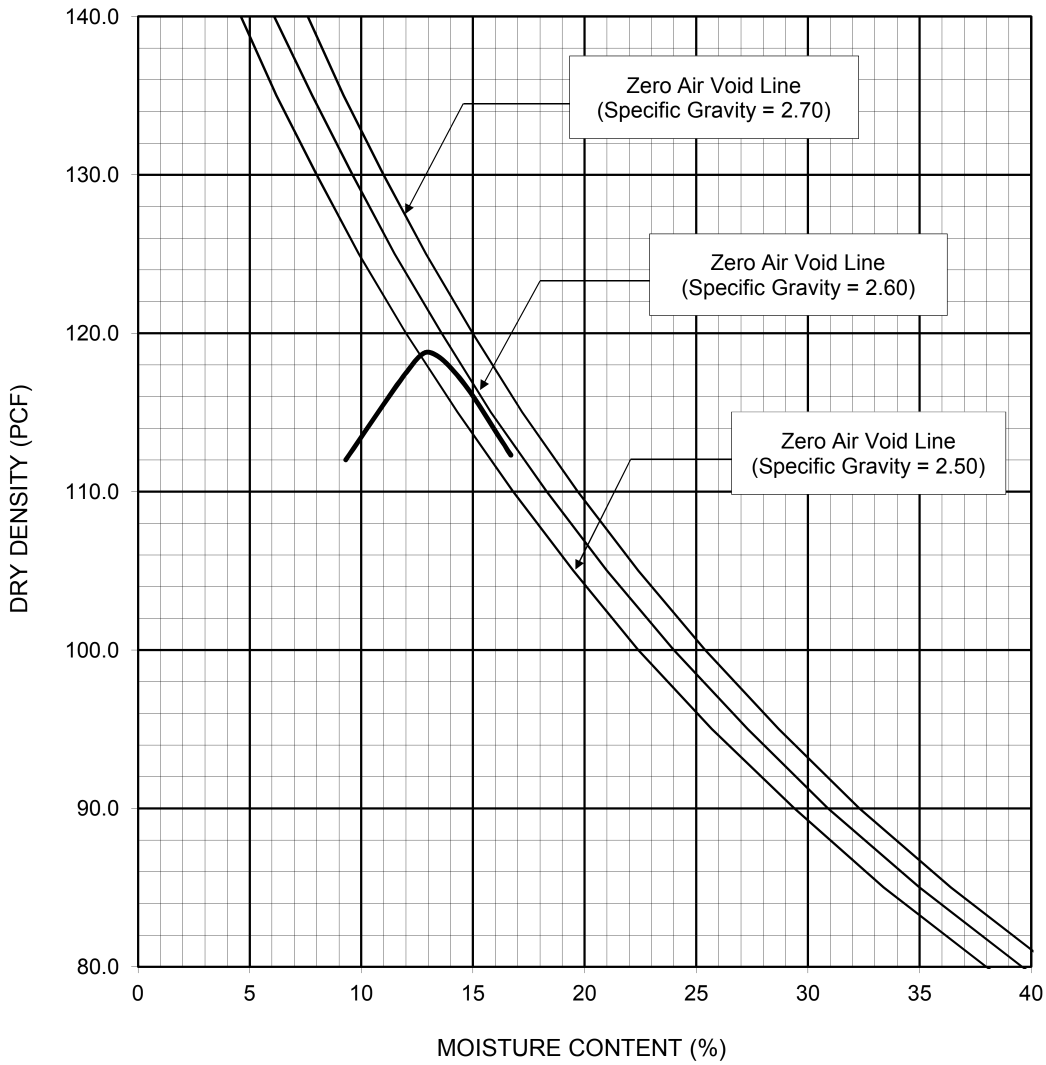
PERFORMED IN GENERAL ACCORDANCE WITH ☐ UBC STANDARD 18-2 ☑ ASTM D 4829

FIGURE B-18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

EXPANSION INDEX TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (percent)
B-4	0.29-3.0	Silty SAND	118.8	13.0

PERFORMED IN GENERAL ACCORDANCE WITH ☑ ASTM D 1557 ☐ ASTM D 698 METHOD ☑ A ☐ B ☐ C

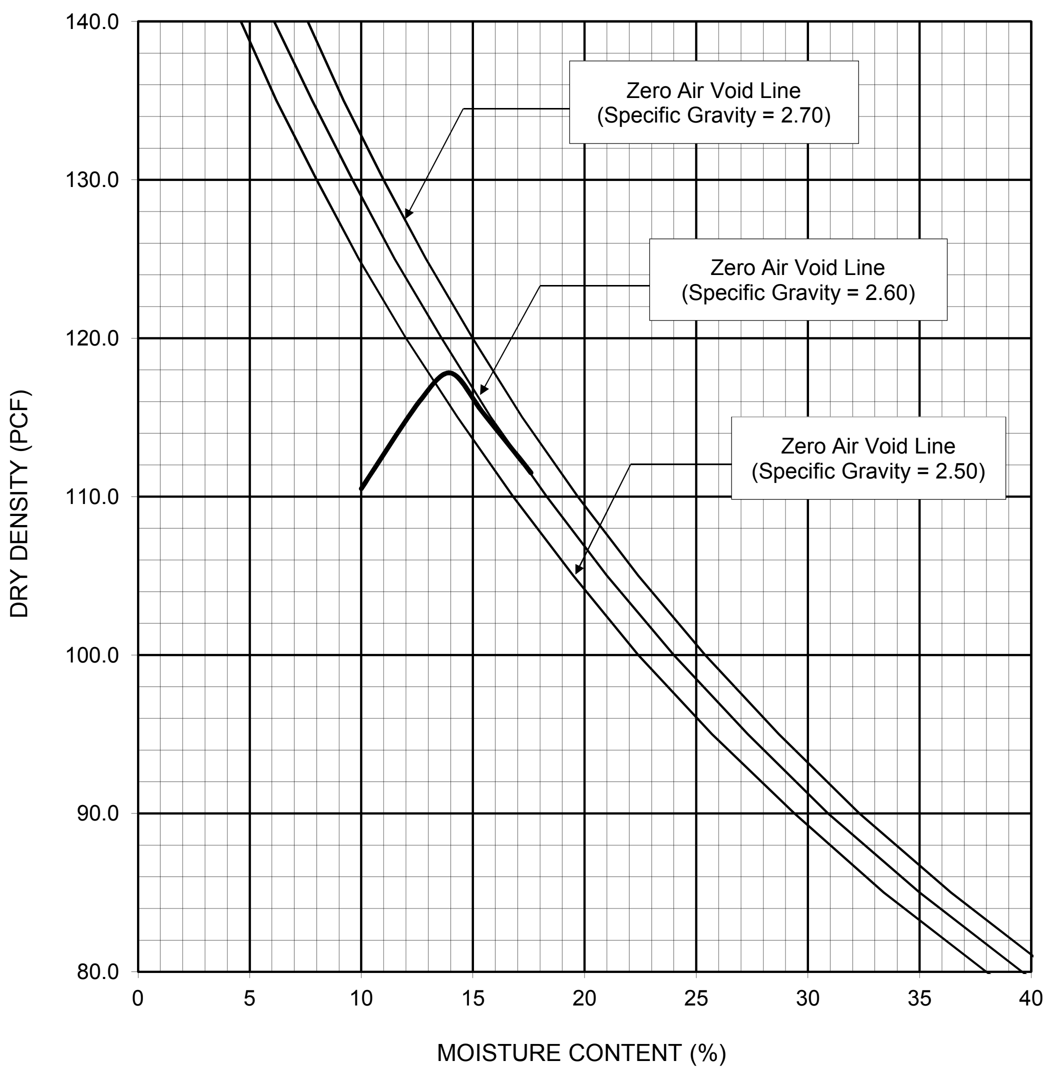
FIGURE B-19

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

PROCTOR DENSITY TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

108614001 | 9/18



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (percent)
B-19	0.0-3.0	Silty SAND	117.8	14.0

PERFORMED IN GENERAL ACCORDANCE WITH ☑ ASTM D 1557 ☐ ASTM D 698 METHOD ☑ A ☐ B ☐ C

FIGURE B-20

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

PROCTOR DENSITY TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-12	0.0-3.0	7.4	2,600	10	0.001	75
B-22	0.29-5.0	9.6	4,000	10	0.001	20

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE B-21

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

CORROSIVITY TEST RESULTS

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

SAMPLE LOCATION	SAMPLE DEPTH (ft)	SOIL TYPE	R-VALUE
B-12	0.0-3.0	SM	31
B-22	0.29-5.0	SC	9

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2844/CT 301

FIGURE B-22

R-VALUE TEST RESULTS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

PEPPER CANYON WEST STUDENT HOUSING
UC SAN DIEGO, LA JOLLA, CALIFORNIA

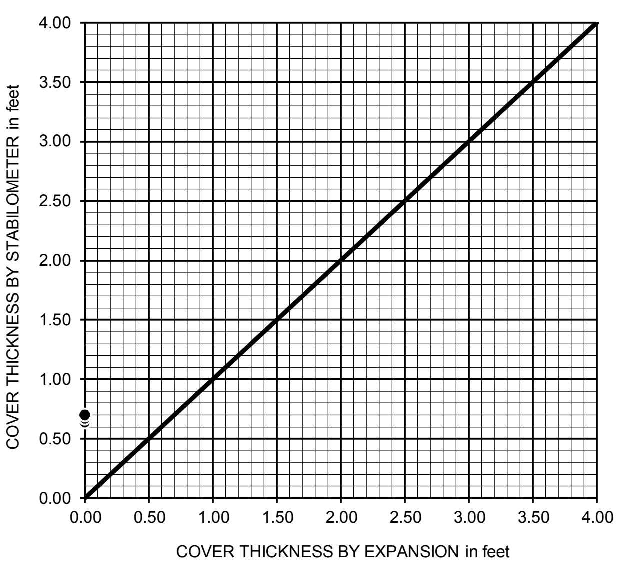
108614001 | 9/18

R-VALUE TEST RESULTS

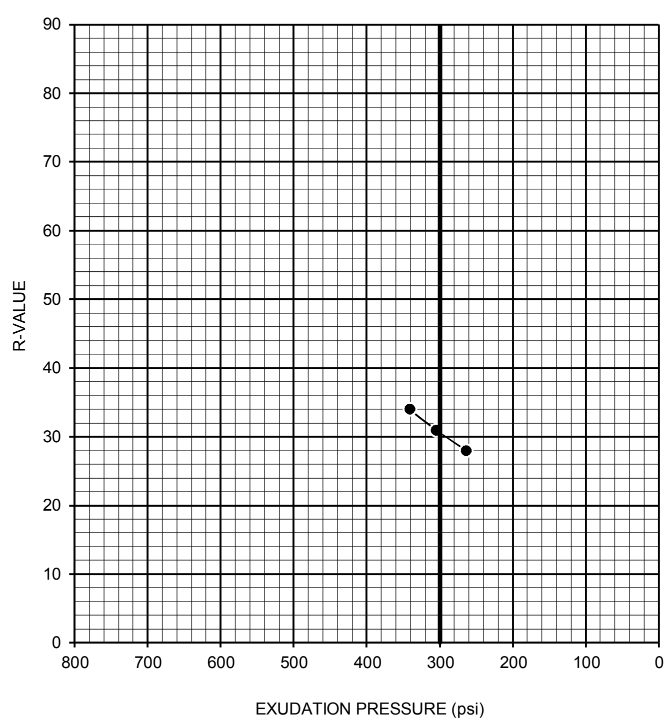
PROJECT NAME:	PEPPER CANYON	PROJECT NUMBER:	108614001
SAMPLE DESCRIPTION:	Silty SAND	DATE SAMPLED:	7/25/2018
SAMPLE LOCATION:	B12 @ 0.0-3.0	TECHNICIAN:	APT
		SAMPLE NUMBER:	

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	12.2	12.7	13.2
HEIGHT OF SAMPLE, Inches	2.44	2.51	2.50
DRY DENSITY, pcf	118.0	117.0	116.4
COMPACTOR AIR PRESSURE, psi	100	75	50
EXUDATION PRESSURE, psi	341	305	264
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	85	90	95
TURNS DISPLACEMENT	4.32	4.41	4.44
R-VALUE UNCORRECTED	34	31	28
R-VALUE CORRECTED	34	31	28
R-VALUE BY EXUDATION		**31**	
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	1.06	1.10	1.15
TRAFFIC INDEX		5.0	
STABILOMETER THICKNESS, ft.	0.64	0.67	0.70
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	31
EQUILIBRIUM R-VALUE:	31

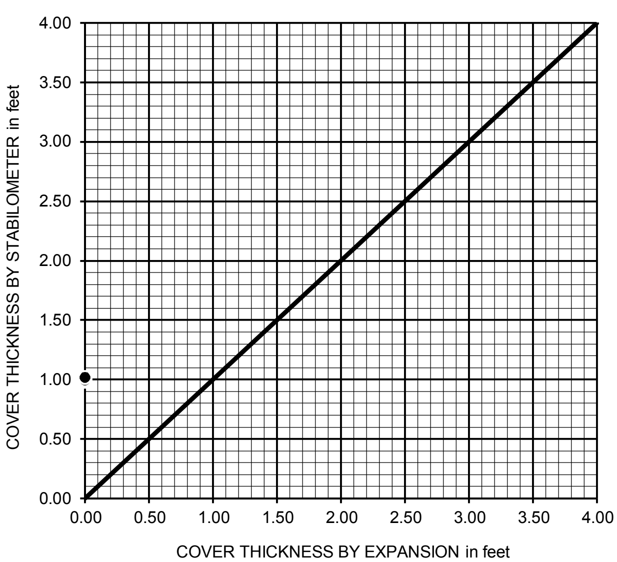
Ninyo & Moore

R-VALUE TEST RESULTS

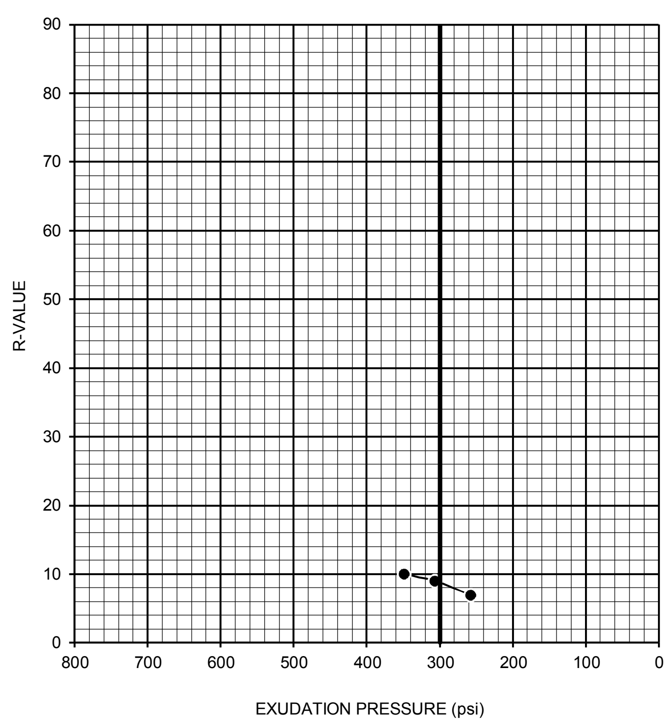
PROJECT NAME:	PEPPER CANYON	PROJECT NUMBER:	108614001
SAMPLE DESCRIPTION:	Clayey SAND	DATE SAMPLED:	7/25/2018
SAMPLE LOCATION:	B22 @ 3.5-5.0	TECHNICIAN:	APT
		SAMPLE NUMBER:	

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	14.7	15.2	15.7
HEIGHT OF SAMPLE, Inches	2.44	2.55	2.53
DRY DENSITY, pcf	117.7	117.0	115.5
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	349	307	258
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	130	134	139
TURNS DISPLACEMENT	5.02	5.12	5.16
R-VALUE UNCORRECTED	10	9	7
R-VALUE CORRECTED	10	9	7
R-VALUE BY EXUDATION	**9**		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	1.44	1.46	1.49
TRAFFIC INDEX	5.0		
STABILOMETER THICKNESS, ft.	0.99	1.00	1.02
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	9
EQUILIBRIUM R-VALUE:	9

APPENDIX C

Environmental Analytical Laboratory Reports

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404875
Address:	5710 Ruffin Road	Report Date:	08/22/2018
	San Diego, CA 92123	Date Received:	07/24/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 108614002

The Copper result for sample "B-22, 15'" was originally reported as 7,330 mg/kg. This result seemed anomalous compared to the rest of the site, so the sample was re-digested and re-analyzed. Upon re-analysis, the result was only 26 mg/kg, which is more in-line with the rest of the results. The heterogeneous nature of the soil sample most likely contributed to this difference.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404875-001	B-22, 2'
404875-002	B-22, 5'
404875-003	B-22, 10'
404875-004	B-22, 15'
404875-005	B-22, 20'
404875-006	B-29, 2'
404875-007	B-29, 5'
404875-008	B-29, 10'
404875-009	B-29, 15'
404875-010	B-29, 20'
404875-011	B-28, 2'
404875-012	B-28, 5'
404875-013	B-28, 10'
404875-014	B-28, 15'
404875-015	B-28, 20'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	
Sampled:	07/23/2018 08:30	**Site:**			
Sample #:	**404875-001**	**Client Sample #:**	B-22, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193742		
Antimony	**6.84**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**10.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**103**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**15.5**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**6.45**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**13.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**22.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.47**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**33.6**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**43.3**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	**13**	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*65*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/23/2018 08:30	Site:	
Sample #: **404875-002**	Client Sample #: B-22, 5'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193742		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**6.52**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**85.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**18.3**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**6.90**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**9.05**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**6.02**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.80**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**42.8**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**53.4**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*129*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 09:00	**Site:**			
Sample #:	**404875-003**	**Client Sample #:**	B-22, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**4.89**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**3.39**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**93.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**19.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**6.27**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**10.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**15.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	**1.15**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**7.01**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.89**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**37.3**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**45.1**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*128*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 09:00	**Site:**			
Sample #:	**404875-004**	**Client Sample #:**	B-22, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**5.24**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**10.0**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**94.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**17.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**6.80**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**26.3**	1	1	mg/Kg	08/21/18	08/22/18	JP	
Copper	**7330**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**131**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	**1.51**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**8.60**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**30.5**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**802**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	**38**	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*122*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 09:00	**Site:**			
Sample #:	**404875-005**	**Client Sample #:**	B-22, 20'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**3.19**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**8.65**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**196**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**14.8**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**7.63**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**80.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**12.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**11.6**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**5.07**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**30.7**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**66.0**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/08	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/08	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/08	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*119*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 11:45	**Site:**			
Sample #:	**404875-006**	**Client Sample #:**	B-29, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**3.64**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**5.84**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**82.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**17.6**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**13.8**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**48.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**15.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	**1.07**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.48**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**10.6**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**24.1**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**41.9**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	20	200	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**320**	20	200	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	20	200	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*	
Triacontane (SUR)	*00*	*50-150*	*S2*	*Surrogate was diluted out.*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 12:00	**Site:**			
Sample #:	**404875-007**	**Client Sample #:**	B-29, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**3.36**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**11.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**93.3**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**17.5**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**9.95**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**25.0**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**29.3**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**10.7**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**8.73**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**33.2**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**52.3**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	2	20	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	**22**	2	20	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*130*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/23/2018 12:20	Site:			
Sample #:	**404875-008**	Client Sample #:	B-29, 10'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**10.8**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**147**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**14.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**5.27**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**51.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**10.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.39**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**5.58**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**29.1**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**41.7**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193762		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*132*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 12:45	**Site:**			
Sample #:	**404875-009**	**Client Sample #:**	B-29, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**9.02**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**136**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**15.6**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**6.13**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**38.6**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**14.0**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**7.39**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.20**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**30.1**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**56.7**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*113*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 13:00	**Site:**			
Sample #:	**404875-010**	**Client Sample #:**	B-29, 20'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**4.87**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**6.61**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**177**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**17.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**7.76**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**28.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**17.6**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**10.7**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.85**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**32.3**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**66.1**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 14:35	**Site:**			
Sample #:	**404875-011**	**Client Sample #:**	B-28, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	**3.98**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**9.12**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**106**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**18.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**7.76**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**21.0**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**21.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**8.67**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**31.4**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**48.6**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**38**	2	20	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	**110**	2	20	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*120*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 14:40	**Site:**			
Sample #:	**404875-012**	**Client Sample #:**	B-28, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**6.23**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**75.0**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**17.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**5.12**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Copper	**17.6**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**28.3**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.78**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**7.94**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**24.8**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**50.7**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**77**	5	50	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	**200**	5	50	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	5	50	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*135*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 15:00	**Site:**			
Sample #:	404875-013	**Client Sample #:**	B-28, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**11.8**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**243**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**12.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**5.09**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**17.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**18.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**6.34**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.71**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**25.9**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**36.3**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*119*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 15:05	**Site:**			
Sample #:	**404875-014**	**Client Sample #:**	B-28, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**6.25**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**108**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**25.2**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**7.10**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**30.5**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**9.42**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**7.81**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.81**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**39.6**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**64.9**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*120*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/23/2018 15:10	Site:			
Sample #:	**404875-015**	Client Sample #:	B-28, 20'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193743		
Antimony	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Arsenic	**16.7**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Barium	**84.1**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Cadmium	**0.51**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Chromium	**15.8**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Cobalt	**7.07**	1	0.5	mg/Kg	07/26/18	07/27/18	KLN	
Copper	**30.9**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Lead	**19.4**	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/26/18	07/26/18	KLN	
Nickel	**11.7**	1	1.5	mg/Kg	07/26/18	07/26/18	KLN	
Selenium	**4.94**	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Thallium	ND	1	3	mg/Kg	07/26/18	07/26/18	KLN	
Vanadium	**35.4**	1	0.5	mg/Kg	07/26/18	07/26/18	KLN	
Zinc	**76.1**	1	5	mg/Kg	07/26/18	07/26/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193894		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**33**	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*113*	*50-150*	

QCBatchID: QC1193742	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/26/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193742MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193742LCS1											
Antimony	100		103		mg/Kg	103			80-120		
Arsenic	100		92.1		mg/Kg	92			80-120		
Barium	100		94.8		mg/Kg	95			80-120		
Beryllium	100		92.2		mg/Kg	92			80-120		
Cadmium	100		95.7		mg/Kg	96			80-120		
Chromium	100		94.2		mg/Kg	94			80-120		
Cobalt	100		102		mg/Kg	102			80-120		
Copper	100		95.6		mg/Kg	96			80-120		
Lead	100		92.8		mg/Kg	93			80-120		
Molybdenum	100		89.5		mg/Kg	90			80-120		
Nickel	100		93.8		mg/Kg	94			80-120		
Selenium	100		85.1		mg/Kg	85			80-120		
Silver	100		87.6		mg/Kg	88			80-120		
Thallium	100		91.5		mg/Kg	92			80-120		
Vanadium	100		93.9		mg/Kg	94			80-120		
Zinc	100		98.8		mg/Kg	99			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193742MS1, QC1193742MSD1											**Source:**	**404789-019**
Antimony	3.13	100	100	56.9	57.4	mg/Kg	54	54	0.9	75-125	20	M
Arsenic	5.17	100	100	104	105	mg/Kg	99	100	1.0	75-125	20	
Barium	62.5	100	100	155	160	mg/Kg	93	98	3.2	75-125	20	
Beryllium	ND	100	100	95.5	94.6	mg/Kg	96	95	0.9	75-125	20	
Cadmium	0.35	100	100	96.0	95.2	mg/Kg	96	95	0.8	75-125	20	
Chromium	26.9	100	100	122	121	mg/Kg	95	94	0.8	75-125	20	
Cobalt	10.4	100	100	106	104	mg/Kg	96	94	1.9	75-125	20	
Copper	18.9	100	100	124	124	mg/Kg	105	105	0.0	75-125	20	
Lead	16.7	100	100	109	114	mg/Kg	92	97	4.5	75-125	20	
Molybdenum	1.04	100	100	89.2	89.2	mg/Kg	88	88	0.0	75-125	20	

QCBatchID: QC1193742	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/26/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193742MS1, QC1193742MSD1											**Source:**	**404789-019**
Nickel	19.6	100	100	111	108	mg/Kg	91	88	2.7	75-125	20	
Selenium	4.62	100	100	96.1	94.5	mg/Kg	91	90	1.7	75-125	20	
Silver	ND	100	100	92.5	93.0	mg/Kg	93	93	0.5	75-125	20	
Thallium	1.86	100	100	87.1	86.6	mg/Kg	85	85	0.6	75-125	20	
Vanadium	37.0	100	100	137	137	mg/Kg	100	100	0.0	75-125	20	
Zinc	44.9	100	100	142	139	mg/Kg	97	94	2.1	75-125	20	

QCBatchID: QC1193743	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/26/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193743MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silicon, as Silica	ND	mg/Kg		107	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193743LCS1											
Antimony	100		115		mg/Kg	115			80-120		
Arsenic	100		104		mg/Kg	104			80-120		
Barium	100		108		mg/Kg	108			80-120		
Beryllium	100		98.5		mg/Kg	99			80-120		
Cadmium	100		107		mg/Kg	107			80-120		
Chromium	100		107		mg/Kg	107			80-120		
Cobalt	100		101		mg/Kg	101			80-120		
Copper	100		109		mg/Kg	109			80-120		
Lead	100		107		mg/Kg	107			80-120		
Molybdenum	100		100		mg/Kg	100			80-120		
Nickel	100		106		mg/Kg	106			80-120		
Selenium	100		94.2		mg/Kg	94			80-120		
Silver	100		99.9		mg/Kg	100			80-120		
Thallium	100		102		mg/Kg	102			80-120		
Vanadium	100		107		mg/Kg	107			80-120		
Zinc	100		111		mg/Kg	111			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193743MS1, QC1193743MSD1											**Source:**	**404875-003**
Antimony	4.89	100	100	49.2	66.0	mg/Kg	44	61	29.2	75-125	20	M,M,D
Arsenic	3.39	100	100	113	110	mg/Kg	110	107	2.7	75-125	20	
Barium	93.7	100	100	192	201	mg/Kg	98	107	4.6	75-125	20	
Beryllium	ND	100	100	102	104	mg/Kg	102	104	1.9	75-125	20	
Cadmium	ND	100	100	105	106	mg/Kg	105	106	0.9	75-125	20	
Chromium	19.2	100	100	126	126	mg/Kg	107	107	0.0	75-125	20	
Cobalt	6.27	100	100	108	102	mg/Kg	102	96	5.7	75-125	20	
Copper	10.4	100	100	124	126	mg/Kg	114	116	1.6	75-125	20	
Lead	15.7	100	100	117	121	mg/Kg	101	105	3.4	75-125	20	

QCBatchID: QC1193743	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/26/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193743MS1, QC1193743MSD1											**Source:**	**404875-003**
Molybdenum	1.15	100	100	94.6	95.9	mg/Kg	93	95	1.4	75-125	20	
Nickel	7.01	100	100	109	110	mg/Kg	102	103	0.9	75-125	20	
Selenium	4.89	100	100	106	105	mg/Kg	101	100	0.9	75-125	20	
Silver	ND	100	100	102	102	mg/Kg	102	102	0.0	75-125	20	
Thallium	2.23	100	100	97.8	100	mg/Kg	96	98	2.2	75-125	20	
Vanadium	37.3	100	100	149	147	mg/Kg	112	110	1.4	75-125	20	
Zinc	45.1	100	100	152	154	mg/Kg	107	109	1.3	75-125	20	

QCBatchID: QC1193762	Analyst: Jarriaga	Method: EPA 8015M
Matrix: Solid	Analyzed: 07/26/2018	Instrument: SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193762MB1					
TPH (C10 to C28)	ND	mg/Kg		10	
TPH (C13 to C22)	ND	mg/Kg		10	
TPH (C23 to C44)	ND	mg/Kg		20	
TPH (C28 to C40)	ND	mg/Kg		20	
TPH (C28 to C44)	ND	mg/Kg		20	
TPH (C6 to C10)	ND	mg/Kg		10	
TPH (C6 to C12)	ND	mg/Kg		10	
TPH (C8 to C10)	ND	mg/Kg		10	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193762LCS1											
TPH (C10 to C28)	250		250		mg/Kg	100			70-130		

QCBatchID: QC1193773	Analyst: ssabir	Method: EPA 8015M
Matrix: Solid	Analyzed: 07/26/2018	Instrument: SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193773MB1						
TPH (C10 to C28)	ND	mg/Kg		10		
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C28 to C40)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		
TPH (C8 to C10)	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1193773LCS1											
TPH (C6 to C44) Total	250		280		mg/Kg	112			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1193773MS1, QC1193773MSD1											**Source:**	**404926-001**
TPH (C10 to C28)	ND	250	250	350	260	mg/Kg	140	104	29.5	70-130	20	M

QCBatchID: QC1193894	Analyst: dswafford	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193894MB1					
Mercury	ND	mg/Kg		0.14	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193894LCS1											
Mercury	0.83		0.87		mg/Kg	105			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193894MS1, QC1193894MSD1											**Source:**	**404875-003**
Mercury	ND	0.83	0.83	0.86	0.81	mg/Kg	104	98	6.0	75-125	20	

QCBatchID: QC1194616	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/21/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1194616MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194616LCS1											
Antimony	100		93.5		mg/Kg	94			80-120		
Arsenic	100		87.2		mg/Kg	87			80-120		
Barium	100		104		mg/Kg	104			80-120		
Beryllium	100		91.9		mg/Kg	92			80-120		
Cadmium	100		98.5		mg/Kg	99			80-120		
Chromium	100		92.8		mg/Kg	93			80-120		
Cobalt	100		100		mg/Kg	100			80-120		
Copper	100		98.3		mg/Kg	98			80-120		
Lead	100		102		mg/Kg	102			80-120		
Molybdenum	100		90.8		mg/Kg	91			80-120		
Nickel	100		99.7		mg/Kg	100			80-120		
Selenium	100		92.0		mg/Kg	92			80-120		
Silver	100		99.6		mg/Kg	100			80-120		
Thallium	100		92.0		mg/Kg	92			80-120		
Vanadium	100		97.8		mg/Kg	98			80-120		
Zinc	100		102		mg/Kg	102			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194616MS1, QC1194616MSD1											**Source:**	**405638-005**
Antimony	0.76	100	100	48.4	53.0	mg/Kg	48	52	9.1	75-125	20	M
Arsenic	5.50	100	100	93.8	102	mg/Kg	88	97	8.4	75-125	20	
Barium	60.9	100	100	167	180	mg/Kg	106	119	7.5	75-125	20	
Beryllium	ND	100	100	95.9	92.6	mg/Kg	96	93	3.5	75-125	20	
Cadmium	0.39	100	100	94.8	93.0	mg/Kg	94	93	1.9	75-125	20	
Chromium	11.1	100	100	106	104	mg/Kg	95	93	1.9	75-125	20	
Cobalt	5.04	100	100	102	99.9	mg/Kg	97	95	2.1	75-125	20	
Copper	11.9	100	100	112	113	mg/Kg	100	101	0.9	75-125	20	
Lead	8.20	100	100	120	108	mg/Kg	112	100	10.5	75-125	20	
Molybdenum	1.66	100	100	89.5	92.5	mg/Kg	88	91	3.3	75-125	20	

QCBatchID: QC1194616	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/21/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194616MS1, QC1194616MSD1											**Source:**	**405638-005**
Nickel	11.3	100	100	119	113	mg/Kg	108	102	5.2	75-125	20	
Selenium	3.51	100	100	99.7	97.1	mg/Kg	96	94	2.6	75-125	20	
Silver	ND	100	100	99.1	102	mg/Kg	99	102	2.9	75-125	20	
Thallium	2.85	100	100	87.7	89.2	mg/Kg	85	86	1.7	75-125	20	
Vanadium	26.6	100	100	129	130	mg/Kg	102	103	0.8	75-125	20	
Zinc	49.5	100	100	168	159	mg/Kg	119	110	5.5	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client’s instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client’s request.
T4	Sample was analyzed out of hold time per client’s request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868
Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875
Page: 1 of 3

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-22, 2'	7/23/18	8:30	S	1		X	X	
2	B-22, 5'		8:30						
3	B-22, 10'		9:00						
4	B-22, 15'		9:00						
5	B-22, 20'		9:00						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/24 8:00
1 Received By:	[signature]	Saul Rami	EA	7/24/18 1500
2 Relinquished By:	[signature]	Saul Rami	EA	7/24/18 1705
2 Received By:	[signature]	[illegible] Herman	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

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1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875

Page: 2 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-29, 2'	7/23/18	11:45	S	1		X	X								
2	B-29, 5'		12:00													
3	B-29, 10'		12:20													
4	B-29, 15'		12:45													
5	B-29, 20'		1:00													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Saul Rami	EA	7/24/18 1500
2 Relinquished By:	[signature]	Saul Rami	EA	7/24/18 1705
2 Received By:	[signature]	[illegible]	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868	Lab No: 404875	Standard: X · 4 Day: · 3 Day:
Phone: (714) 771-6900 Fax: (714)771-9933	Page: 3 of 3	2 Day: · 1 Day: · Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-28, 2'	7/23/18	2:35	S	1		X	X	
2	B-28, 5'		2:40						
3	B-28, 10'		3:00						
4	B-28, 15'		3:05						
5	B-28, 20'		3:10						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Sal [illegible]	EA	7/24/18 1500
2 Relinquished By:	[signature]	Sal [illegible]	EA	7/24/18 1705
2 Received By:	[signature]	[illegible]	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore   Project: UCSD Pepper Canyon

Date Received: 7/24/18   Sampler's Name Present: ☒ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1   ☐ No (skip section 2)   Sample Temp (°C) (No Cooler): ____

Sample Temp (°C), One from each cooler: #1: 4.7 #2: ____ #3: ____ #4: ____

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ____

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ____

Cooler Temp (°C): #1: 1.6 #2: ____ #3: ____ #4: ____

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ____ Date/Time ____

☐ Email (email sent to/on): ____ / ____

Project Manager's response:

Completed By: [signature] Date: 07/24/18

Ranjit Clarke

From: Lisa Bestard
Sent: Thursday, July 26, 2018 2:14 PM
To: Ranjit Clarke
Cc: Sean Leffler
Subject: RE: COCs: UCSD Pepper Canyon West
Attachments: 404875 Revised COC.pdf; 404893 Revised COC.pdf

Ranjit-
Please see the changes to the attached COCs. To analyze the additional samples. I have instructed staff to make sure they are drawing the arrow down to indicate analyses on all required samples. I already made the changes to the COCs for samples that were to be picked up by the courier today, so those should be set to go.

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (**x11279**) | (858) 204-2864 (Cell)
www.ninyoandmoore.com

30 Years of Quality Service

From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, July 26, 2018 1:42 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>
Cc: Sean Leffler <sean.leffler@enthalpy.com>
Subject: FW: COCs: UCSD Pepper Canyon West
Importance: High

Here you go.

ENTHALPY ANALYTICAL

Ranjit Clarke
Senior Project Manager
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

From: Ranjit Clarke <ranjit.clarke@enthalpy.com>
Sent: Thursday, July 26, 2018 9:50 AM

To: Lisa Bestard (lbestard@ninyoandmoore.com) <lbestard@ninyoandmoore.com>
Subject: COCs: UCSD Pepper Canyon West
Importance: High

Lisa,

Attached are the COCs for samples collected on 07/23 and 07/24.

Please let me know which samples require analysis and which should be put on hold.

Thanks,

Ranjit

In accordance with our paperless initiative, we are no longer mailing or faxing reports by default. If you require a hard copy, please inform your Project Manager.

Ranjit Clarke
Senior Project Manager
Enthalpy Analytical
931 W. Barkley Ave., Orange, CA 92868
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875

Page: 1 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-22, 2'	7/23/18	8:30	S	1		X	X								
2	B-22, 5'		8:30													
3	B-22, 10'		9:00						LB							
4	B-22, 15'		9:00													
5	B-22, 20'		9:00													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/24 8:00
[1] Received By:	[signature]	Saul Fani	EA	7/24/18 1500
[2] Relinquished By:	[signature]	Saul Fani	EA	7/24/18 1705
[2] Received By:	[signature]	Unlea Therman	EA	07/24/18 1705
[3] Relinquished By:				
[3] Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875

Page: 2 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)		Test Instructions / Comments
1	B-29, 2'	7/23/18	11:45	S	1		X	X		
2	B-29, 5'		12:00							
3	B-29, 10'		12:20						LB	
4	B-29, 15'		12:45							
5	B-29, 20'		1:00							
6										
7										
8										
9										
10										

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[illegible]	Saul Rami	EA	7/24/18 1500
2 Relinquished By:	[illegible]	Saul Rami	EA	7/24/18 1705
2 Received By:	[illegible]	[illegible]	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.		Chain of Custody Record				Turn Around Time (Rush by advanced notice only)					
931 W. Barkley Ave, Orange, CA 92868		Lab No:	404875			Standard:	X	4 Day:		3 Day:	
Phone: (714) 771-6900 Fax: (714)771-9933		Page:	3	of	3	2 Day:		1 Day:		Same Day:	
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	ENTHALPY ANALYTICAL	Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other				Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other					

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-28, 2'	7/23/18	2:35	S	1		X	X								
2	B-28, 5'		2:40													
3	B-28, 10'		3:00						LB							
4	B-28, 15'		3:05													
5	B-28, 20'		3:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Sam Ram	EA	7/24/18 1500
2 Relinquished By:	[signature]	Sam Ram	EA	7/24/18 1705
2 Received By:	[signature]	Waleed Heerman	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo + Moore   Project: UCSD Pepper Canyon

Date Received: 7/24/18   Sampler's Name Present: ☒ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)   Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 4.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 1.6 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/24/18

Enthalpy Analytical, LLC

931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404875
Address:	5710 Ruffin Road	Report Date:	09/11/2018
	San Diego, CA 92123	Date Received:	07/24/2018
		Client ID:	15885
Attn:	Lisa Bestard		

Comments: UCSD Pepper Canyon West
PO# 108614002

Supplemental Report 1 - STLC and TCLP results are reported herein.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404875-004	B-22, 15'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/23/2018 09:00	**Site:**			
Sample #:	**404875-004**	**Client Sample #:**	B-22, 15'	**Sample Type:**	

Analyte		Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A						QCBatchID: QC1195337		
Lead		ND	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC						QCBatchID: QC1195265		
Lead		**0.200**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Enthalpy Analytical, LLC

QCBatchID: QC1195265	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/07/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1195265MB1					
Lead	**0.027**	mg/L		0.015	

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195265MS1, QC1195265MSD1											**Source:**	**404875-004**
Lead	0.200	10	10	7.31	7.50	mg/L	71	73	2.6	75-125	20	M

QCBatchID: QC1195337	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/11/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1195337MB1						
Lead	ND	mg/L		0.05		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1195337LCS1											
Lead	2		2.05		mg/L	103			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1195337MS1, QC1195337MSD1											**Source:**	**404875-004**
Lead	0.039	1	1	0.948	1.021	mg/L	91	98	7.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

Chain of Custody Record

Lab No: 404875

Page: 1 of 3

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-22, 2'	7/23/18	8:30	S	1		X	X								
2	B-22, 5'	↓	8:30	↓	↓											
3	B-22, 10'	↓	9:00	↓	↓											
4	B-22, 15'	↓	9:00	↓	↓											
5	B-22, 20'	↓	9:00	↓	↓											
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/24 / 8:00
1 Received By:	[signature]	Saul Ramirez	EA	7/24/18 1500
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/24/18 1705
2 Received By:	[signature]	[illegible] Herman	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

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1 Park Plaza, Suite 1000, Irvine, CA 92614

Chain of Custody Record

Lab No: 404875

Page: 2 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-29, 2'	7/23/18	11:45	S	1		X	X								
2	B-29, 5'		12:00													
3	B-29, 10'		12:20													
4	B-29, 15'		12:45													
5	B-29, 20'		1:00													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Saul Rami	EA	7/24/18 1500
2 Relinquished By:	[signature]	Saul Rami	EA	7/24/18 1705
2 Received By:	[signature]	[illegible]	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404875

Page: 3 of 3

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-28, 2'	7/23/18	2:35	S	1		X	X								
2	B-28, 5'		2:40													
3	B-28, 10'		3:00													
4	B-28, 15'		3:05													
5	B-28, 20'		3:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Sam Lam	EA	7/24/18 1500
2 Relinquished By:	[signature]	Sam Lam	EA	7/24/18 1705
2 Received By:	[signature]	Wale Aheman	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo + Moore   Project: UCSD Pepper Canyon

Date Received: 7/24/18   Sampler's Name Present: ☒ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1   ☐ No (skip section 2)   Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 4.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 1.6 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/24/18

Ranjit Clarke

From: Lisa Bestard
Sent: Thursday, July 26, 2018 2:14 PM
To: Ranjit Clarke
Cc: Sean Leffler
Subject: RE: COCs: UCSD Pepper Canyon West
Attachments: 404875 Revised COC.pdf; 404893 Revised COC.pdf

Ranjit-
Please see the changes to the attached COCs. To analyze the additional samples. I have instructed staff to make sure they are drawing the arrow down to indicate analyses on all required samples. I already made the changes to the COCs for samples that were to be picked up by the courier today, so those should be set to go.

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (**x11279**) | (858) 204-2864 (Cell)
www.ninyoandmoore.com

30 Years of Quality Service

From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, July 26, 2018 1:42 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>
Cc: Sean Leffler <sean.leffler@enthalpy.com>
Subject: FW: COCs: UCSD Pepper Canyon West
Importance: High

Here you go.

ENTHALPY ANALYTICAL

Ranjit Clarke
Senior Project Manager
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

From: Ranjit Clarke <ranjit.clarke@enthalpy.com>
Sent: Thursday, July 26, 2018 9:50 AM

To: Lisa Bestard (lbestard@ninyoandmoore.com) <lbestard@ninyoandmoore.com>
Subject: COCs: UCSD Pepper Canyon West
Importance: High

Lisa,

Attached are the COCs for samples collected on 07/23 and 07/24.

Please let me know which samples require analysis and which should be put on hold.

Thanks,

Ranjit

In accordance with our paperless initiative, we are no longer mailing or faxing reports by default. If you require a hard copy, please inform your Project Manager.

ENTHALPY ANALYTICAL

Ranjit Clarke
Senior Project Manager
Enthalpy Analytical
931 W. Barkley Ave., Orange, CA 92868
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875

Page: 1 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-22, 2'	7/23/18	8:30	S	1		X	X								
2	B-22, 5'		8:30													
3	B-22, 10'		9:00						LB							
4	B-22, 15'		9:00													
5	B-22, 20'		9:00													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/24 8:00
1 Received By:	[signature]	Saul Lam	EA	7/24/18 1500
2 Relinquished By:	[signature]	Saul Lam	EA	7/24/18 1705
2 Received By:	[signature]	Unknown Therman	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404875

Page: 2 of 3

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request: Title 22 Metals (6010B/7471A); TPH C8-C40 (8015M)

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-29, 2'	7/23/18	11:45	S	1		X	X	
2	B-29, 5'		12:00						
3	B-29, 10'		12:20						
4	B-29, 15'		12:45						
5	B-29, 20'		1:00						
6									
7									
8									
9									
10									

LB

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
[1] Received By:	[signature]	Saul Rain	EA	7/24/18 1500
[2] Relinquished By:	[signature]	Saul Rain	EA	7/24/18 1705
[2] Received By:	[signature]	Yaleatheoman	EA	07/24/18 1705
[3] Relinquished By:				
[3] Received By:				

ENTHALPY ANALYTICAL, LLC.

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Chain of Custody Record

Lab No: 404875

Page: 3 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-28, 2'	7/23/18	2:35	S	1		X	X								
2	B-28, 5'		2:40													
3	B-28, 10'		3:00						LB							
4	B-28, 15'		3:05													
5	B-28, 20'		3:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/24
1 Received By:	[signature]	Sam Ran	EA	7/24/18 1500
2 Relinquished By:	[signature]	Sam Ran	EA	7/24/18 1705
2 Received By:	[signature]	[illegible]	EA	07/24/18 1705
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo + Moore

Project: UCSD Pepper Canyon

Date Received: 7/24/18

Sampler's Name Present: [X] Yes [ ] No

Section 2

Sample(s) received in a cooler? [✓] Yes, How many? 1 [ ] No (skip section 2)

Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 4.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: [✓] Ice [ ] Ice Packs [ ] Bubble Wrap [ ] Styrofoam [ ] Paper [ ] None [ ] Other ______

Cooler Temp (°C): #1: 1.6 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? [ ] Verbal PM Initials: ______ Date/Time ______

[ ] Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/24/18

Ranjit Clarke

From: Lisa Bestard
Sent: Friday, August 31, 2018 9:21 AM
To: Ranjit Clarke; Sean Leffler
Subject: RE: UCSD Pepper Canyon

Ranjit-
Please analyze the following samples from the UCSD Pepper Canyon project for soluble lead by TCLP and STLC on a standard turnaround time:
B-15, 2'
B-19, 2'
B-10 @ 2'
B-9 @ 5'
B-20 @ 2'
B-17, 2'
B-22, 15'
B-16, 2'
B-12, 2'
B-12, 18.5'
B-2, 2'
B-24 @ 2'
B-3, 2'

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (x11279) | (858) 204-2864 (Cell) www.ninyoandmoore.com

30 Years of Quality Service

-----Original Message-----
From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, August 30, 2018 3:31 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>; Sean Leffler <sean.leffler@enthalpy.com>
Subject: RE: UCSD Pepper Canyon

Lisa,

Enthalpy Analytical, LLC

931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

MONTROSE ENVIRONMENTAL

Client:	Ninyo & Moore - San Diego	Lab Request:	404893
Address:	5710 Ruffin Road	Report Date:	07/31/2018
	San Diego, CA 92123	Date Received:	07/25/2018
		Client ID:	15885
Attn:	Lisa Bestard		
Comments:	UCSD Pepper Canyon West PO# 108614002		

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404893-001	B-25, 2'
404893-002	B-25, 5'
404893-003	B-25, 10'
404893-004	B-25, 15'
404893-005	B-25, 20'
404893-006	B-26, 2'
404893-007	B-26, 5'
404893-008	B-26, 10'
404893-009	B-26, 15'
404893-010	B-26, 20'
404893-011	B-27, 2'
404893-012	B-27, 5'
404893-013	B-27, 10'
404893-014	B-27, 15'
404893-015	B-27, 20'
404893-016	B-23, 2'
404893-017	B-23, 5'
404893-018	B-23, 10'
404893-019	B-23, 15'
404893-020	B-23, 19'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

ACCREDITED IN ACCORDANCE WITH nelac

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	
Sampled:	07/24/2018 08:40	**Site:**			
Sample #:	**404893-001**	**Client Sample #:**	B-25, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**2.88**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**97.2**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**16.9**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**7.51**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**8.98**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**4.69**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.64**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**41.4**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**47.6**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**120**	5	50	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	**450**	5	50	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	5	50	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*	
Triacontane (SUR)	*346*	*50-150*	*S*	*Matix interference. Dark sample*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 08:45	**Site:**			
Sample #:	**404893-002**	**Client Sample #:**	B-25, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.74**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**71.1**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**16.1**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.89**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**5.54**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.64**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.62**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**47.5**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**41.9**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**12**	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	**45**	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*144*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 08:50	**Site:**			
Sample #:	**404893-003**	**Client Sample #:**	B-25, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**18.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**52.5**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**13.1**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.89**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**15.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**20.5**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**8.35**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**30.3**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**48.6**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*144*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 08:55	**Site:**			
Sample #:	**404893-004**	**Client Sample #:**	B-25, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.98**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**412**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**6.54**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**2.43**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**3.73**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**3.27**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**2.61**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**16.9**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**19.7**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*149*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/24/2018 09:00	Site:			
Sample #:	**404893-005**	Client Sample #:	B-25, 20'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**9.74**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**111**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**14.6**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**5.86**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**11.2**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**10.3**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.88**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**26.1**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**40.9**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**66**	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*139*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 09:50	**Site:**			
Sample #:	**404893-006**	**Client Sample #:**	B-26, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**5.27**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**102**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**16.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**7.39**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**7.19**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.95**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.47**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**41.9**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**47.5**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**17**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**59**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*140*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 09:55	**Site:**			
Sample #:	**404893-007**	**Client Sample #:**	B-26, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.11**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**91.4**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**14.6**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.76**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**6.00**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**1.26**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.42**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**37.4**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**41.1**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**11**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**58**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*150*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 10:00	**Site:**			
Sample #:	**404893-008**	**Client Sample #:**	B-26, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**2.76**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**77.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**15.4**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**7.00**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**5.51**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**1.40**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.32**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**34.8**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**42.6**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*159*	*50-150*	*S*

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 10:05	**Site:**			
Sample #:	**404893-009**	**Client Sample #:**	B-26, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**18.6**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**91.0**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**14.1**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**7.30**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**15.5**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**8.82**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**9.20**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**32.3**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**48.9**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/01/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/01/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/01/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*165*	*50-150*	*S*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 10:10	**Site:**			
Sample #:	**404893-010**	**Client Sample #:**	B-26, 20'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**14.1**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**58.0**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**10.9**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.60**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**10.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**8.51**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**7.06**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**24.2**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**39.1**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*146*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 11:00	**Site:**			
Sample #:	**404893-011**	**Client Sample #:**	B-27, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.45**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**40.6**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**22.5**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**8.36**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**3.88**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.59**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.31**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**47.0**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**17.5**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**34**	2	20	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**110**	2	20	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*148*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/24/2018 11:05	Site:			
Sample #:	**404893-012**	Client Sample #:	B-27, 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**1.64**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**48.6**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**25.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**8.68**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**4.79**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**3.54**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.16**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**47.2**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**21.3**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**30**	2	20	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**100**	2	20	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*147*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 11:10	**Site:**			
Sample #:	**404893-013**	**Client Sample #:**	B-27, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193811		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**2.23**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**82.2**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Chromium	**15.9**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.89**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**7.38**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.28**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.61**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**38.9**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**43.4**	1	5	mg/Kg	07/27/18	07/30/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193906		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18		
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18		
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18		

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*164*	*50-150*	*S*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 11:15	**Site:**			
Sample #:	**404893-014**	**Client Sample #:**	B-27, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.96**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**96.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**16.2**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**7.08**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**6.75**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**1.90**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.86**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**38.6**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**52.6**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*165*	*50-150*	*S*

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/24/2018 11:20	Site:			
Sample #:	**404893-015**	Client Sample #:	B-27, 20'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.44**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**79.4**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**20.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**8.55**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**9.30**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.68**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**8.07**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**48.5**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**60.5**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*163*	*50-150*	*S*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 13:10	**Site:**			
Sample #:	**404893-016**	**Client Sample #:**	B-23, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.55**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**75.0**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**16.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**5.59**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**6.49**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**5.40**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	**1.70**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.59**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	**0.68**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**30.8**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**32.2**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**200**	10	100	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**560**	10	100	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	10	100	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*136*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/24/2018 13:15	Site:	
Sample #: **404893-017**	Client Sample #: B-23, 5'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**3.32**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**76.4**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**19.9**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.61**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**7.43**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**5.42**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	**1.18**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.88**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**37.1**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**39.1**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**97**	5	50	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**260**	5	50	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	5	50	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*144*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/24/2018 13:20	**Site:**			
Sample #:	**404893-018**	**Client Sample #:**	B-23, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**4.45**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**62.5**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**14.9**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**6.69**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**5.09**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**2.19**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.35**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**32.4**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**39.8**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*156*	*50-150*	*S*

Matrix: Solid **Client:** Ninyo & Moore - San Diego **Collector:** Client
Sampled: 07/24/2018 13:25 **Site:**
Sample #: **404893-019** **Client Sample #:** B-23, 15' **Sample Type:**

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**9.51**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**61.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**12.2**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**4.43**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**18.4**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**6.82**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**5.36**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**32.6**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**44.2**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*155*	*50-150*	*S*

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/24/2018 13:30	Site:			
Sample #:	404893-020	Client Sample #:	B-23, 19'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**17.8**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**248**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Cadmium	**0.69**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**10.7**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Cobalt	**135**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Copper	**29.8**	1	1	mg/Kg	07/27/18	07/30/18	KLN	
Lead	**13.3**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	**1.16**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**25.6**	1	1.5	mg/Kg	07/27/18	07/30/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**35.5**	1	0.5	mg/Kg	07/27/18	07/30/18	KLN	
Zinc	**51.4**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193769		
TPH (C10 to C28)	**16**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*148*	*50-150*	

QCBatchID:	QC1193769	**Analyst:**	ssabir	**Method:**	EPA 8015M
Matrix:	Solid	**Analyzed:**	07/26/2018	**Instrument:**	SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193769MB1						
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193769LCS1											
TPH (C10 to C28)	250		270		mg/Kg	108			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193769MS1, QC1193769MSD1											**Source:**	**404893-004**
TPH (C10 to C28)	ND	250	250	270	280	mg/Kg	108	112	3.6	70-130	20	M

QCBatchID:	QC1193811	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	07/27/2018	Instrument:	AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193811MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193811LCS1											
Antimony	100		94.3		mg/Kg	94			80-120		
Arsenic	100		87.2		mg/Kg	87			80-120		
Barium	100		96.2		mg/Kg	96			80-120		
Beryllium	100		93.1		mg/Kg	93			80-120		
Cadmium	100		90.4		mg/Kg	90			80-120		
Chromium	100		94.3		mg/Kg	94			80-120		
Cobalt	100		95.8		mg/Kg	96			80-120		
Copper	100		94.0		mg/Kg	94			80-120		
Lead	100		92.5		mg/Kg	93			80-120		
Molybdenum	100		90.2		mg/Kg	90			80-120		
Nickel	100		94.0		mg/Kg	94			80-120		
Selenium	100		80.4		mg/Kg	80			80-120		
Silver	100		96.2		mg/Kg	96			80-120		
Thallium	100		89.7		mg/Kg	90			80-120		
Vanadium	100		95.6		mg/Kg	96			80-120		
Zinc	100		91.7		mg/Kg	92			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193811MS1, QC1193811MSD1											**Source:**	**404862-015**
Antimony	ND	100	100	32.5	30.0	mg/Kg	33	30	8.0	75-125	20	M
Arsenic	3.58	100	100	91.2	88.3	mg/Kg	88	85	3.2	75-125	20	
Barium	42.4	100	100	135	130	mg/Kg	93	88	3.8	75-125	20	
Beryllium	ND	100	100	87.4	89.4	mg/Kg	87	89	2.3	75-125	20	
Cadmium	0.54	100	100	84.5	81.7	mg/Kg	84	81	3.4	75-125	20	
Chromium	11.9	100	100	106	102	mg/Kg	94	90	3.8	75-125	20	
Cobalt	5.41	100	100	93.2	89.5	mg/Kg	88	84	4.1	75-125	20	
Copper	9.15	100	100	100	96.6	mg/Kg	91	87	3.5	75-125	20	
Lead	9.00	100	100	94.2	90.1	mg/Kg	85	81	4.4	75-125	20	
Molybdenum	2.70	100	100	88.3	84.3	mg/Kg	86	82	4.6	75-125	20	

QCBatchID: QC1193811	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/27/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193811MS1, QC1193811MSD1											**Source:**	**404862-015**
Nickel	9.78	100	100	97.2	93.5	mg/Kg	87	84	3.9	75-125	20	
Selenium	ND	100	100	15.5	8.11	mg/Kg	16	8	62.6	75-125	20	M
Silver	0.33	100	100	93.5	88.4	mg/Kg	93	88	5.6	75-125	20	
Thallium	ND	100	100	79.4	76.8	mg/Kg	79	77	3.3	75-125	20	
Vanadium	20.2	100	100	119	114	mg/Kg	99	94	4.3	75-125	20	
Zinc	25.5	100	100	113	109	mg/Kg	88	84	3.6	75-125	20	

QCBatchID: QC1193812	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/27/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193812MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193812LCS1											
Antimony	100		99.5		mg/Kg	100			80-120		
Arsenic	100		93.3		mg/Kg	93			80-120		
Barium	100		92.7		mg/Kg	93			80-120		
Beryllium	100		90.3		mg/Kg	90			80-120		
Cadmium	100		101		mg/Kg	101			80-120		
Chromium	100		91.7		mg/Kg	92			80-120		
Cobalt	100		92.1		mg/Kg	92			80-120		
Copper	100		92.4		mg/Kg	92			80-120		
Lead	100		87.0		mg/Kg	87			80-120		
Molybdenum	100		97.0		mg/Kg	97			80-120		
Nickel	100		90.5		mg/Kg	91			80-120		
Selenium	100		82.2		mg/Kg	82			80-120		
Silver	100		94.7		mg/Kg	95			80-120		
Thallium	100		97.0		mg/Kg	97			80-120		
Vanadium	100		94.6		mg/Kg	95			80-120		
Zinc	100		101		mg/Kg	101			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193812MS1, QC1193812MSD1											**Source:**	**404893-014**
Antimony	ND	100	100	51.7	33.0	mg/Kg	52	33	44.2	75-125	20	M
Arsenic	3.96	100	100	92.3	96.6	mg/Kg	88	93	4.6	75-125	20	
Barium	96.8	100	100	208	212	mg/Kg	111	115	1.9	75-125	20	
Beryllium	ND	100	100	90.8	89.8	mg/Kg	94	93	1.1	75-125	20	
Cadmium	0.46	100	100	93.4	96.7	mg/Kg	93	96	3.5	75-125	20	
Chromium	16.2	100	100	114	113	mg/Kg	98	97	0.9	75-125	20	
Cobalt	7.08	100	100	97.7	96.8	mg/Kg	91	90	0.9	75-125	20	
Copper	6.75	100	100	103	104	mg/Kg	96	97	1.0	75-125	20	
Lead	1.90	100	100	92.2	94.6	mg/Kg	90	93	2.6	75-125	20	
Molybdenum	0.79	100	100	90.1	91.9	mg/Kg	89	91	2.0	75-125	20	

QCBatchID: QC1193812	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/27/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193812MS1, QC1193812MSD1											**Source:**	**404893-014**
Nickel	5.86	100	100	94.9	92.7	mg/Kg	89	87	2.3	75-125	20	
Selenium	ND	100	100	23.1	16.2	mg/Kg	23	16	35.1	75-125	20	M
Silver	0.22	100	100	115	120	mg/Kg	115	120	4.3	75-125	20	
Thallium	ND	100	100	84.9	87.3	mg/Kg	85	87	2.8	75-125	20	
Vanadium	38.6	100	100	144	146	mg/Kg	105	107	1.4	75-125	20	
Zinc	52.6	100	100	147	156	mg/Kg	94	103	5.9	75-125	20	

QCBatchID: QC1193897	Analyst: sbailey-woo	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193897MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193897LCS1											
Mercury	0.83		0.95		mg/Kg	114			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193897MS1, QC1193897MSD1											**Source:**	**404893-014**
Mercury	ND	0.83	0.83	0.91	1.01	mg/Kg	110	122	10.4	75-125	20	

QCBatchID:	QC1193906	Analyst:	cota	Method:	EPA 7471A
Matrix:	Solid	Analyzed:	07/31/2018	Instrument:	AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193906MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193906LCS1											
Mercury	0.83		0.81		mg/Kg	98			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193906MS1, QC1193906MSD1											**Source:**	**404862-015**
Mercury	0.04	0.83	0.83	1.07	1.01	mg/Kg	124	117	5.8	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

Chain of Custody Record

Lab No: 404893

Page: 1 of 4

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-25, 2'	7/24	8:40	S	1		X	X									
2	B-25, 5'	↓	8:45	↓	↓												
3	B-25, 10'	↓	8:50	↓	↓												
4	B-25, 15'	↓	8:55	↓	↓												
5	B-25, 20'	↓	9:00	↓	↓												
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/25
1 Received By:	[signature]	San Lam	EA	7/25/18 1212
2 Relinquished By:	[signature]	San Lam	EA	7/25/18 1500
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/25/18 1500
3 Relinquished By:				
3 Received By:				

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Fax:	858-576-9600	Sampled By:	Greg Wilson

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3	B-26, 10'	↓	10:00	↓	↓												
4	B-26, 15'	↓	10:05	↓	↓												
5	B-26, 20'	↓	10:10	↓	↓												
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/25/18
1 Received By:	[signature]	Saul Ramirez	EA	7/25/18 1212
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/25/18 1500
2 Received By:	[signature]	Anthony L. Shaw	E.A.	07/25/18 1500
3 Relinquished By:				
3 Received By:				

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 401893
Page: 3 of 4

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Turn Around Time (Rush by advanced notice only)

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Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
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2	B-27, 5'	↓	11:05	↓	↓											
3	B-27, 10'	↓	11:10	↓	↓											
4	B-27, 15'	↓	11:15	↓	↓											
5	B-27, 20'	↓	11:20	↓	↓											
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/25/18
1 Received By:	[signature]	Saul Ramirez	EA	7/25/18 1212
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/25/18 1500
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/25/18 1500
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

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Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
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Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

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1	B-23, 2'	7/24/18	1:10	S	1		X	X									
2	B-23, 5'		1:15														
3	B-23, 10'		1:20														
4	B-23, 15'		1:25														
5	B-23, 19'		1:30														
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	Ninyo & Moore / Geologist	7/25
1 Received By:	[illegible]	Saul [illegible]	EA	7/25/18 1212
2 Relinquished By:	[illegible]	Saul Kam[illegible]	EA	7/25/18 1500
2 Received By:	[illegible]	Antonio L. Shaw	EA	07/25/18 1900
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore

Project: UCSD Pepper Canyon West

Date Received: 07/25/18

Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)

Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 5.8 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: -1.4 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)	✓		
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______
☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/25/18

Ranjit Clarke

From: Lisa Bestard
Sent: Thursday, July 26, 2018 2:14 PM
To: Ranjit Clarke
Cc: Sean Leffler
Subject: RE: COCs: UCSD Pepper Canyon West
Attachments: 404875 Revised COC.pdf; 404893 Revised COC.pdf

Ranjit-
Please see the changes to the attached COCs. To analyze the additional samples. I have instructed staff to make sure they are drawing the arrow down to indicate analyses on all required samples. I already made the changes to the COCs for samples that were to be picked up by the courier today, so those should be set to go.

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (**x11279**) | (858) 204-2864 (Cell)
www.ninyoandmoore.com

30 Years of Quality Service

From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, July 26, 2018 1:42 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>
Cc: Sean Leffler <sean.leffler@enthalpy.com>
Subject: FW: COCs: UCSD Pepper Canyon West
Importance: High

Here you go.

ENTHALPY ANALYTICAL

Ranjit Clarke
Senior Project Manager
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

From: Ranjit Clarke <ranjit.clarke@enthalpy.com>
Sent: Thursday, July 26, 2018 9:50 AM

To: Lisa Bestard (lbestard@ninyoandmoore.com) <lbestard@ninyoandmoore.com>
Subject: COCs: UCSD Pepper Canyon West
Importance: High

Lisa,

Attached are the COCs for samples collected on 07/23 and 07/24.

Please let me know which samples require analysis and which should be put on hold.

Thanks,

Ranjit

In accordance with our paperless initiative, we are no longer mailing or faxing reports by default. If you require a hard copy, please inform your Project Manager.

ENTHALPY ANALYTICAL

Ranjit Clarke
Senior Project Manager
Enthalpy Analytical
931 W. Barkley Ave., Orange, CA 92868
O: 714-771-9906 / M: 657-274-9864 / F: 714-538-1209
Ranjit.Clarke@Enthalpy.com

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Phone: (714) 771-6900 Fax: (714)771-9933

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404893
Page: 1 of 4

Turn Around Time (Rush by advanced notice only)

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Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

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Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / Test Instructions / Comments

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)		Test Instructions / Comments
1	B-25, 2'	7/24	8:40	S	1		X	X		
2	B-25, 5'	↓	8:45	↓	↓		↓	↓	LB	
3	B-25, 10'	↓	8:50	↓	↓		↓	↓		
4	B-25, 15'	↓	8:55	↓	↓		↓	↓		
5	B-25, 20'	↓	9:00	↓	↓		↓	↓		
6										
7										
8										
9										
10										

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/25
1 Received By:	[signature]	Sau Lam	EA	7/25/18 1212
2 Relinquished By:	[signature]	Sau Lam	EA	7/25/18 1500
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/25/18 1500
3 Relinquished By:				
3 Received By:				

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ENTHALPY ANALYTICAL

Chain of Custody Record

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Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

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1	B-26, 2'	7/24/18	9:50	S	1		X	X								
2	B-26, 5'		9:55						L	B						
3	B-26, 10'		10:00													
4	B-26, 15'		10:05													
5	B-26, 20'		10:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GLW	Greg Wilson	Ninyo & Moore / Geologist	7/25/18
1 Received By:	[signature]	Saul Rami	EA	7/25/18 1212
2 Relinquished By:	[signature]	Saul Rami	EA	7/25/18 1500
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/25/18 1500
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868	Lab No: 401893	Standard: X; 4 Day: ; 3 Day:
Phone: (714) 771-6900 Fax: (714)771-9933	Page: 3 of 4	2 Day: ; 1 Day: ; Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

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Fax:	858-576-9600	Sampled By:	Greg Wilson

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2	B-27, 5'	↓	11:05	↓	↓		↓	↓	LB							
3	B-27, 10'	↓	11:10	↓	↓		↓	↓								
4	B-27, 15'	↓	11:15	↓	↓		↓	↓								
5	B-27, 20'	↓	11:20	↓	↓		↓	↓								
6																
7																
8																
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10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/25/18
1 Received By:	[signature]	Saul Ramirez	EA	7/25/18 1212
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2 Received By:	[signature]	Andrew L. Shaw	E.A	07/25/18 1500
3 Relinquished By:				
3 Received By:				

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ENTHALPY ANALYTICAL

Chain of Custody Record

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Fax:	858-576-9600	Sampled By:	Greg Wilson

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2	B-23, 5'		1:15														
3	B-23, 10'		1:20						L	B							
4	B-23, 15'		1:25														
5	B-23, 19'		1:30														
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:		Greg Wilson	Ninyo & Moore / Geologist	7/25
[1] Received By:		Saul Ramirez	EA	7/25/18 1212
[2] Relinquished By:		Saul Ramirez	EA	7/25/18 1500
[2] Received By:		Antonio L. Shaw	EA	07/25/18 1900
[3] Relinquished By:				
[3] Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore
Project: UCSD Pepper Canyon West
Date Received: 07/25/18
Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)
Sample Temp (°C) (No Cooler): ______
Sample Temp (°C), One from each cooler: #1: 5.8 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: -1.4 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)	✓		
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______
☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/25/18

Enthalpy Analytical, LLC

931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
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MONTROSE ENVIRONMENTAL

Client:	Ninyo & Moore - San Diego	Lab Request:	404921
Address:	5710 Ruffin Road	Report Date:	08/01/2018
	San Diego, CA 92123	Date Received:	07/26/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 108614002

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404921-001	B-1 @ 2'
404921-002	B-1 @ 5'
404921-003	B-1 @ 10'
404921-004	B-1 @ 15'
404921-005	B-1 @ 18'
404921-006	B-7 @ 2'
404921-007	B-7 @ 5'
404921-008	B-7 @ 10'
404921-009	B-7 @ 15'
404921-010	B-18 @ 2'
404921-011	B-18 @ 5'
404921-012	B-18 @ 10'
404921-013	B-18 @ 15'
404921-014	B-18 @ 18'
404921-015	B-20 @ 2'
404921-016	B-20 @ 5'
404921-017	B-20 @ 10'
404921-018	B-20 @ 15'
404921-019	B-20 @ 18'
404921-020	B-24 @ 2'
404921-021	B-24 @ 5'
404921-022	B-24 @ 10'
404921-023	B-24 @ 15'
404921-024	B-24 @ 18'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

ACCREDITED IN ACCORDANCE WITH nelac

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector:
Sampled: 07/25/2018 09:00	Site:	
Sample #: **404921-001**	Client Sample #: B-1 @ 2'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**12.3**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**152**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**13.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**5.24**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**10.4**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**10.8**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.94**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**27.5**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**35.0**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*126*	*50-150*	

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Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 09:17	**Site:**			
Sample #:	**404921-002**	**Client Sample #:**	B-1 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**22.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**22.4**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**9.83**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**4.35**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**9.76**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**5.37**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**7.72**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	**0.52**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**19.8**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**27.2**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*122*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 09:36	**Site:**			
Sample #:	**404921-003**	**Client Sample #:**	B-1 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**11.7**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**37.3**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**10.1**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**5.74**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**10.7**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**7.13**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**7.24**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**22.0**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**41.6**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*124*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 09:56	**Site:**			
Sample #:	**404921-004**	**Client Sample #:**	B-1 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**17.4**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**24.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**14.3**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**4.40**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**25.1**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**12.6**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**7.73**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**36.1**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**52.7**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*130*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 10:16	**Site:**			
Sample #:	**404921-005**	**Client Sample #:**	B-1 @ 18'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**84.4**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**20.6**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**9.36**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**5.51**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**9.81**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**7.41**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**7.47**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**21.1**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**41.4**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*122*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 10:42	**Site:**			
Sample #:	**404921-006**	**Client Sample #:**	B-7 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193812		
Antimony	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Arsenic	**8.39**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Barium	**149**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Chromium	**16.6**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Cobalt	**4.66**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Copper	**16.0**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Lead	**17.7**	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/27/18	07/31/18	KLN	
Nickel	**6.25**	1	1.5	mg/Kg	07/27/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/27/18	07/31/18	KLN	
Vanadium	**38.7**	1	0.5	mg/Kg	07/27/18	07/31/18	KLN	
Zinc	**33.6**	1	5	mg/Kg	07/27/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193897		
Mercury	ND	1	0.14	mg/Kg	07/30/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	**110**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**72**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*129*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 10:50	**Site:**			
Sample #:	**404921-007**	**Client Sample #:**	B-7 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**13.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**14.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.35**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**7.13**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**6.76**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.57**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**36.6**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**23.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*117*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 11:03	**Site:**			
Sample #:	**404921-008**	**Client Sample #:**	B-7 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**14.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**17.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.39**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.68**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**15.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**11.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.28**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**37.7**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**30.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*114*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 11:17	**Site:**			
Sample #:	**404921-009**	**Client Sample #:**	B-7 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**4.19**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**13.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**8.16**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.09**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**8.03**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**5.58**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.99**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**33.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**29.6**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 15:10	**Site:**			
Sample #:	**404921-010**	**Client Sample #:**	B-18 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**17.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**22.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.48**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**14.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**7.78**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**8.40**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.28**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**18.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**31.8**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*128*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 15:22	**Site:**			
Sample #:	**404921-011**	**Client Sample #:**	B-18 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**7.11**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**26.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.37**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**15.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**10.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**8.52**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**21.1**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**48.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*127*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 15:34	**Site:**			
Sample #:	**404921-012**	**Client Sample #:**	B-18 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**13.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**23.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**8.02**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**23.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**20.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**8.46**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**33.2**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**70.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*110*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 15:46	**Site:**			
Sample #:	**404921-013**	**Client Sample #:**	B-18 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**9.06**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**84.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**10.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.90**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**13.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**10.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**6.42**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**23.7**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**47.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*112*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 15:56	**Site:**			
Sample #:	**404921-014**	**Client Sample #:**	B-18 @ 18'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**9.15**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**19.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.58**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.78**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**8.28**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**5.79**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**8.40**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**17.1**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**46.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*125*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:24	**Site:**			
Sample #:	**404921-015**	**Client Sample #:**	B-20 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**5.93**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**122**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**10.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.07**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**39.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**197**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.43**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**21.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**47.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:45	**Site:**			
Sample #:	**404921-016**	**Client Sample #:**	B-20 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**15.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**17.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**13.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.36**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**22.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**12.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**7.21**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**26.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**56.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*126*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 13:58	Site:			
Sample #:	**404921-017**	Client Sample #:	B-20 @ 10'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**5.51**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**57.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.52**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.32**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**5.42**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**5.79**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.34**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**19.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**26.9**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*119*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:18	**Site:**			
Sample #:	404921-018	**Client Sample #:**	B-20 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**14.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**111**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.21**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.69**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.73**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**4.46**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.39**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**24.7**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**33.8**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*126*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:28	**Site:**			
Sample #:	**404921-019**	**Client Sample #:**	B-20 @ 18'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**5.63**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**32.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.55**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**31.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**9.80**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**9.85**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**23.1**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**64.5**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*121*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 11:55	**Site:**			
Sample #:	**404921-020**	**Client Sample #:**	B-24 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**9.89**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**81.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**15.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.94**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**18.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**60.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**7.03**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**32.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**66.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193770		
TPH (C10 to C28)	**85**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C28 to C40)	**49**	1	10	mg/Kg	07/26/18	07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*129*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:06	**Site:**			
Sample #:	**404921-021**	**Client Sample #:**	B-24 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.66**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**27.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**13.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.18**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**6.26**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**5.73**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.63**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**9.62**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**22.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*98*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:18	**Site:**			
Sample #:	**404921-022**	**Client Sample #:**	B-24 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**3.97**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**22.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**6.73**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.03**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.40**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**5.07**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.84**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**16.1**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**29.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*97*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:39	**Site:**			
Sample #:	**404921-023**	**Client Sample #:**	B-24 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**5.15**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**19.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**9.40**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.94**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**7.90**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**6.74**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**18.7**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**46.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*116*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:59	**Site:**			
Sample #:	**404921-024**	**Client Sample #:**	B-24 @ 18'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.02**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**345**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.92**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.97**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**5.18**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**4.77**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.10**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**17.6**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**36.0**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*114*	*50-150*	

QCBatchID:	QC1193770	**Analyst:**	ssabir	**Method:**	EPA 8015M
Matrix:	Solid	**Analyzed:**	07/26/2018	**Instrument:**	SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193770MB1						
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193770LCS1											
TPH (C10 to C28)	250		310		mg/Kg	124			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193770MS1, QC1193770MSD1											**Source:**	**404921-014**
TPH (C10 to C28)	ND	250	250	280	260	mg/Kg	112	104	7.4	70-130	20	

QCBatchID:	QC1193773	Analyst:	ssabir	Method:	EPA 8015M
Matrix:	Solid	Analyzed:	07/26/2018	Instrument:	SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193773MB1					
TPH (C10 to C28)	ND	mg/Kg		10	
TPH (C13 to C22)	ND	mg/Kg		10	
TPH (C28 to C40)	ND	mg/Kg		10	
TPH (C6 to C44) Total	ND	mg/Kg		10	
TPH (C8 to C10)	ND	mg/Kg		10	

Lab Control Spike/ Lab Control Spike Duplicate Summary

	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	LCS	LCSD	LCS	LCSD	Units	LCS	LCSD	RPD	%Rec	RPD	Notes
QC1193773LCS1											
TPH (C6 to C44) Total	250		280		mg/Kg	112			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

	Sample	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	Amount	MS	MSD	MS	MSD	Units	MS	MSD	RPD	%Rec	RPD	Notes
QC1193773MS1, QC1193773MSD1											**Source:**	**404926-001**
TPH (C10 to C28)	ND	250	250	350	260	mg/Kg	140	104	29.5	70-130	20	M

QCBatchID: QC1193812	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/27/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193812MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	LCS	LCSD	LCS	LCSD	Units	LCS	LCSD	RPD	%Rec	RPD	Notes
QC1193812LCS1											
Antimony	100		99.5		mg/Kg	100			80-120		
Arsenic	100		93.3		mg/Kg	93			80-120		
Barium	100		92.7		mg/Kg	93			80-120		
Beryllium	100		90.3		mg/Kg	90			80-120		
Cadmium	100		101		mg/Kg	101			80-120		
Chromium	100		91.7		mg/Kg	92			80-120		
Cobalt	100		92.1		mg/Kg	92			80-120		
Copper	100		92.4		mg/Kg	92			80-120		
Lead	100		87.0		mg/Kg	87			80-120		
Molybdenum	100		97.0		mg/Kg	97			80-120		
Nickel	100		90.5		mg/Kg	91			80-120		
Selenium	100		82.2		mg/Kg	82			80-120		
Silver	100		94.7		mg/Kg	95			80-120		
Thallium	100		97.0		mg/Kg	97			80-120		
Vanadium	100		94.6		mg/Kg	95			80-120		
Zinc	100		101		mg/Kg	101			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

	Sample	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	Amount	MS	MSD	MS	MSD	Units	MS	MSD	RPD	%Rec	RPD	Notes
QC1193812MS1, QC1193812MSD1											**Source:**	**404893-014**
Antimony	ND	100	100	51.7	33.0	mg/Kg	52	33	44.2	75-125	20	M
Arsenic	3.96	100	100	92.3	96.6	mg/Kg	88	93	4.6	75-125	20	
Barium	96.8	100	100	208	212	mg/Kg	111	115	1.9	75-125	20	
Beryllium	ND	100	100	90.8	89.8	mg/Kg	94	93	1.1	75-125	20	
Cadmium	0.46	100	100	93.4	96.7	mg/Kg	93	96	3.5	75-125	20	
Chromium	16.2	100	100	114	113	mg/Kg	98	97	0.9	75-125	20	
Cobalt	7.08	100	100	97.7	96.8	mg/Kg	91	90	0.9	75-125	20	
Copper	6.75	100	100	103	104	mg/Kg	96	97	1.0	75-125	20	
Lead	1.90	100	100	92.2	94.6	mg/Kg	90	93	2.6	75-125	20	
Molybdenum	0.79	100	100	90.1	91.9	mg/Kg	89	91	2.0	75-125	20	

QCBatchID: QC1193812	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/27/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193812MS1, QC1193812MSD1											**Source:**	**404893-014**
Nickel	5.86	100	100	94.9	92.7	mg/Kg	89	87	2.3	75-125	20	
Selenium	ND	100	100	23.1	16.2	mg/Kg	23	16	35.1	75-125	20	M
Silver	0.22	100	100	115	120	mg/Kg	115	120	4.3	75-125	20	
Thallium	ND	100	100	84.9	87.3	mg/Kg	85	87	2.8	75-125	20	
Vanadium	38.6	100	100	144	146	mg/Kg	105	107	1.4	75-125	20	
Zinc	52.6	100	100	147	156	mg/Kg	94	103	5.9	75-125	20	

QCBatchID: QC1193847	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193847MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847LCS1											
Antimony	100		116		mg/Kg	116			80-120		
Arsenic	100		96.0		mg/Kg	96			80-120		
Barium	100		99.1		mg/Kg	99			80-120		
Beryllium	100		94.2		mg/Kg	94			80-120		
Cadmium	100		95.3		mg/Kg	95			80-120		
Chromium	100		96.2		mg/Kg	96			80-120		
Cobalt	100		99.5		mg/Kg	100			80-120		
Copper	100		97.9		mg/Kg	98			80-120		
Lead	100		99.8		mg/Kg	100			80-120		
Molybdenum	100		97.3		mg/Kg	97			80-120		
Nickel	100		104		mg/Kg	104			80-120		
Selenium	100		90.2		mg/Kg	90			80-120		
Silver	100		89.8		mg/Kg	90			80-120		
Thallium	100		94.0		mg/Kg	94			80-120		
Vanadium	100		100		mg/Kg	100			80-120		
Zinc	100		106		mg/Kg	106			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847MS1, QC1193847MSD1											**Source:**	**404921-007**
Antimony	ND	100	100	53.0	45.7	mg/Kg	53	46	14.8	75-125	20	M
Arsenic	13.2	100	100	111	106	mg/Kg	98	93	4.6	75-125	20	
Barium	14.0	100	100	123	121	mg/Kg	109	107	1.6	75-125	20	
Beryllium	ND	100	100	99.0	101	mg/Kg	99	101	2.0	75-125	20	
Cadmium	ND	100	100	101	98.4	mg/Kg	101	98	2.6	75-125	20	
Chromium	11.0	100	100	115	112	mg/Kg	104	101	2.6	75-125	20	
Cobalt	3.35	100	100	108	105	mg/Kg	105	102	2.8	75-125	20	
Copper	7.13	100	100	112	108	mg/Kg	105	101	3.6	75-125	20	
Lead	6.76	100	100	106	105	mg/Kg	99	98	0.9	75-125	20	
Molybdenum	0.48	100	100	88.5	88.3	mg/Kg	88	88	0.2	75-125	20	

QCBatchID:	QC1193847	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	07/30/2018	Instrument:	AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847MS1, QC1193847MSD1											**Source:**	**404921-007**
Nickel	5.57	100	100	109	107	mg/Kg	103	101	1.9	75-125	20	
Selenium	ND	100	100	87.7	87.5	mg/Kg	88	88	0.2	75-125	20	
Silver	ND	100	100	96.1	92.8	mg/Kg	96	93	3.5	75-125	20	
Thallium	ND	100	100	92.1	92.9	mg/Kg	92	93	0.9	75-125	20	
Vanadium	36.6	100	100	151	143	mg/Kg	114	106	5.4	75-125	20	
Zinc	23.7	100	100	128	126	mg/Kg	104	102	1.6	75-125	20	

QCBatchID: QC1193897	Analyst: sbailey-woo	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193897MB1					
Mercury	ND	mg/Kg		0.14	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193897LCS1											
Mercury	0.83		0.95		mg/Kg	114			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193897MS1, QC1193897MSD1											**Source:**	**404893-014**
Mercury	ND	0.83	0.83	0.91	1.01	mg/Kg	110	122	10.4	75-125	20	

QCBatchID: QC1193908	Analyst: cota	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193908MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193908LCS1											
Mercury	0.83		0.94		mg/Kg	113			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193908MS1, QC1193908MSD1											**Source:**	**404921-007**
Mercury	ND	0.83	0.83	0.98	0.80	mg/Kg	118	96	20.2	75-125	20	M

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL

931 W. Barkley Ave., Orange, CA 92868

Phone: (714) 771-6900 Fax: (714) 538-1209

Billing: Enthalpy Analytical
1 Park Plaza, Suite 1000
Irvine, CA 92614

ENTHALPY analytical, inc.

Chain of Custody Record

Lab No: 4C4921

Page: 1 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

Analysis Request | Test Instructions / Comments

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-1 @ 2'	7/25/18	9:00	S	1		✓	✓									
2	B-1 @ 5'	7/25/18	9:17	S	1		✓	✓									
3	B-1 @ 10'	7/25/18	9:36	S	1		✓	✓									
4	B-1 @ 15"	7/25/18	9:56	S	1		✓	✓									
5	B-1 @ 18"	7/25/18	10:16	S	1		✓	✓									
6	B-7 @ 2'	7/25/18	10:42	S	1		✓	✓									
7	B-7 @ 5'	7/25/18	10:50	S	1		✓	✓									
8	B-7 @ 10'	7/25/18	11:03	S	1		✓	✓									
9	B-7 @ 15'	7/25/18	11:17	S	1		✓	✓									
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
1 Received By:	[signature]	Saul Rami	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Rami	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

931 W. Barkley Ave., Orange, CA 92868

Phone: (714) 771-6900 Fax: (714) 538-1209

Billing: Enthalpy Analytical
1 Park Plaza, Suite 1000
Irvine, CA 92614

Chain of Custody Record

Lab No: 404921

Page: 2 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water
FL = Food Liquid FS = Food Solid L = Liquid
PP = Pure Product S = Solid SeaW = Sea Water
SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-18 @ 2'	7/25/18	15:10	S	1		✓	✓								
2	B-18 @ 5'	7/25/18	15:22	S	1		✓	✓								
3	B-18 @ 10'	7/25/18	15:34	S	1		✓	✓								
4	B-18 @ 15"	7/25/18	15:46	S	1		✓	✓								
5	B-18 @ 18"	7/25/18	15:56	S	1		✓	✓								
6	B-20 @ 2'	7/25/18	13:24	S	1		✓	✓								
7	B-20 @ 5'	7/25/18	13:45	S	1		✓	✓								
8	B-20 @ 10'	7/25/18	13:58	S	1		✓	✓								
9	B-20 @ 15'	7/25/18	14:18	S	1		✓	✓								
10	B-20 @ 18'	7/25/18	14:28	S	1		✓	✓								

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
1 Received By:	[signature]	Saul Rami	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Rami	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

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ENTHALPY analytical, inc.

Chain of Custody Record

Lab No: 404921

Page: 3 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

Analysis Request / Test Instructions / Comments

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-24 @ 2'	7/25/18	11:55	S	1		✓	✓	
2	B-24 @ 5'	7/25/18	12:06	S	1		✓	✓	
3	B-24 @ 10'	7/25/18	12:18	S	1		✓	✓	
4	B-24 @ 15"	7/25/18	12:39	S	1		✓	✓	
5	B-24 @ 18"	7/25/18	12:59	S	1		✓	✓	
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
1 Received By:	[signature]	Saul Lam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Lam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. [illegible]	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore

Project: UCSD Pepper Canyon West

Date Received: 07/26/18

Sampler's Name Present: ☐ Yes ☑ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)

Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 9.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 7.2 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/26/18

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900   Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404921
Address:	5710 Ruffin Road	Report Date:	09/11/2018
	San Diego, CA 92123	Date Received:	07/26/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 108614002

Supplemental Report 1 - STLC and TCLP results are reported herein.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404921-015	B-20 @ 2'
404921-020	B-24 @ 2'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:24	**Site:**			
Sample #:	**404921-015**	**Client Sample #:**	B-20 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC* Prep Method: EPA 1311/3010A						QCBatchID: QC1195337		
Lead	**0.328**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC* Prep Method: STLC						QCBatchID: QC1195265		
Lead	**7.60**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 11:55	**Site:**			
Sample #:	**404921-020**	**Client Sample #:**	B-24 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC* Prep Method: EPA 1311/3010A						QCBatchID: QC1195337		
Lead	**0.084**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC* Prep Method: STLC						QCBatchID: QC1195265		
Lead	**3.10**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

QCBatchID: QC1195265	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/07/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1195265MB1					
Lead	**0.027**	mg/L		0.015	

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195265MS1, QC1195265MSD1											**Source:**	**404875-004**
Lead	0.200	10	10	7.31	7.50	mg/L	71	73	2.6	75-125	20	M

QCBatchID: QC1195337	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/11/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1195337MB1						
Lead	ND	mg/L		0.05		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1195337LCS1											
Lead	2		2.05		mg/L	103			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1195337MS1, QC1195337MSD1											**Source:**	**404875-004**
Lead	0.039	1	1	0.948	1.021	mg/L	91	98	7.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL
931 W. Barkley Ave., Orange, CA 92868
Phone: (714) 771-6900 Fax: (714) 538-1209
Billing: Enthalpy Analytical
1 Park Plaza, Suite 1000
Irvine, CA 92614

Chain of Custody Record

Lab No: 404921
Page: 1 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water
FL = Food Liquid FS = Food Solid L = Liquid
PP = Pure Product S = Solid SeaW = Sea Water
SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-1 @ 2'	7/25/18	9:00	S	1		✓	✓									
2	B-1 @ 5'	7/25/18	9:17	S	1		✓	✓									
3	B-1 @ 10'	7/25/18	9:36	S	1		✓	✓									
4	B-1 @ 15"	7/25/18	9:56	S	1		✓	✓									
5	B-1 @ 18"	7/25/18	10:16	S	1		✓	✓									
6	B-7 @ 2'	7/25/18	10:42	S	1		✓	✓									
7	B-7 @ 5'	7/25/18	10:50	S	1		✓	✓									
8	B-7 @ 10'	7/25/18	11:03	S	1		✓	✓									
9	B-7 @ 15'	7/25/18	11:17	S	1		✓	✓									
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
1 Received By:	[signature]	Saul Lami	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Lami	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

931 W. Barkley Ave., Orange, CA 92868

Phone: (714) 771-6900 Fax: (714) 538-1209

Billing: Enthalpy Analytical
1 Park Plaza, Suite 1000
Irvine, CA 92614

ENTHALPY analytical, inc.

Chain of Custody Record

Lab No: 404921

Page: 2 of 3

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

Analysis Request

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-18 @ 2'	7/25/18	15:10	S	1		✓	✓								
2	B-18 @ 5'	7/25/18	15:22	S	1		✓	✓								
3	B-18 @ 10'	7/25/18	15:34	S	1		✓	✓								
4	B-18 @ 15"	7/25/18	15:46	S	1		✓	✓								
5	B-18 @ 18"	7/25/18	15:56	S	1		✓	✓								
6	B-20 @ 2'	7/25/18	13:24	S	1		✓	✓								
7	B-20 @ 5'	7/25/18	13:45	S	1		✓	✓								
8	B-20 @ 10'	7/25/18	13:58	S	1		✓	✓								
9	B-20 @ 15'	7/25/18	14:18	S	1		✓	✓								
10	B-20 @ 18'	7/25/18	14:28	S	1		✓	✓								

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
[1] Received By:	[signature]	Saul Rami	EA	7/26/18 1205
[2] Relinquished By:	[signature]	Saul Rami	EA	7/26/18 1505
[2] Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
[3] Relinquished By:				
[3] Received By:				

ENTHALPY ANALYTICAL

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ENTHALPY analytical, inc.

Chain of Custody Record

Lab No: 404921

Page: 3 of 3

Turn Around Time (Rush by advanced notice only)

Standard:	✓	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water
FL = Food Liquid FS = Food Solid L = Liquid
PP = Pure Product S = Solid SeaW = Sea Water
SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-24 @ 2'	7/25/18	11:55	S	1		✓	✓									
2	B-24 @ 5'	7/25/18	12:06	S	1		✓	✓									
3	B-24 @ 10'	7/25/18	12:18	S	1		✓	✓									
4	B-24 @ 15"	7/25/18	12:39	S	1		✓	✓									
5	B-24 @ 18"	7/25/18	12:59	S	1		✓	✓									
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Zachary Hasten	Ninyo & Moore/Project Geologist	7/26/18 8:30 AM
1 Received By:	[signature]	Saul Lam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Lam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. [illegible]	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore　　Project: UCSD Pepper Canyon West

Date Received: 07/26/18　　Sampler's Name Present: ☐ Yes ☑ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1　☐ No (skip section 2)　Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 9.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 7.2 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature]　Date: 07/26/18

Ranjit Clarke

From: Lisa Bestard
Sent: Friday, August 31, 2018 9:21 AM
To: Ranjit Clarke; Sean Leffler
Subject: RE: UCSD Pepper Canyon

Ranjit-
Please analyze the following samples from the UCSD Pepper Canyon project for soluble lead by TCLP and STLC on a standard turnaround time:
B-15, 2'
B-19, 2'
B-10 @ 2'
B-9 @ 5'
B-20 @ 2'
B-17, 2'
B-22, 15'
B-16, 2'
B-12, 2'
B-12, 18.5'
B-2, 2'
B-24 @ 2'
B-3, 2'

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (x11279) | (858) 204-2864 (Cell) www.ninyoandmoore.com

30 Years of Quality Service

-----Original Message-----
From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, August 30, 2018 3:31 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>; Sean Leffler <sean.leffler@enthalpy.com>
Subject: RE: UCSD Pepper Canyon

Lisa,

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

MONTROSE ENVIRONMENTAL

Client:	Ninyo & Moore - San Diego	Lab Request:	404926
Address:	5710 Ruffin Road San Diego, CA 92123	Report Date:	08/01/2018
		Date Received:	07/26/2018
		Client ID:	15885
Attn:	Lisa Bestard		
Comments:	UCSD Pepper Canyon West PO# 108614002		

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID	Sample #	Client Sample ID
404926-001	B-5 @ 2'	404926-025	B-13 @ 2'
404926-002	B-5 @ 5'	404926-026	B-13 @ 5'
404926-003	B-5 @ 10'	404926-027	B-13 @ 10'
404926-004	B-5 @ 15'	404926-028	B-13 @ 15'
404926-005	B-6 @ 2'	404926-029	B-13 @ 18.5'
404926-006	B-6 @ 5'		
404926-007	B-6 @ 10'		
404926-008	B-6 @ 15'		
404926-009	B-6 @ 18.5'		
404926-010	B-9 @ 2'		
404926-011	B-9 @ 5'		
404926-012	B-9 @ 10'		
404926-013	B-9 @ 15'		
404926-014	B-9 @ 18.5'		
404926-015	B-10 @ 2'		
404926-016	B-10 @ 5'		
404926-017	B-10 @ 10'		
404926-018	B-10 @ 15'		
404926-019	B-10 @ 18.5'		
404926-020	B-14 @ 2'		
404926-021	B-14 @ 5'		
404926-022	B-14 @ 10'		
404926-023	B-14 @ 15'		
404926-024	B-14 @ 18.5'		

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

ACCREDITED IN ACCORDANCE WITH nelac

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	
Sampled:	07/25/2018 09:00	**Site:**			
Sample #:	**404926-001**	**Client Sample #:**	B-5 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.11**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**230**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.94**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.57**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**1.48**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.60**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**22.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**13.8**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 09:05	Site:			
Sample #:	**404926-002**	Client Sample #:	B-5 @ 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193847		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.33**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**122**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**10.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.55**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.18**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**2.15**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.12**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**19.0**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**12.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193908		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*104*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 09:10	**Site:**			
Sample #:	**404926-003**	**Client Sample #:**	B-5 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**12.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**92.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.67**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.03**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**6.50**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**15.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**4.10**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**2.40**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**21.3**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**12.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**33**	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*98*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 09:15	**Site:**			
Sample #:	**404926-004**	**Client Sample #:**	B-5 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**12.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**1020**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**15.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.24**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**76.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**34.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**3.71**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.86**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	**3.84**	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**29.6**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**40.3**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**17**	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*97*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 10:45	Site:			
Sample #:	**404926-005**	Client Sample #:	B-6 @ 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**3.68**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**188**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.17**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.72**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**3.35**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.91**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**22.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**13.5**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*103*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 10:45	Site:			
Sample #:	**404926-006**	Client Sample #:	B-6 @ 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.08**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**64.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**12.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.51**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.72**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**1.88**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.50**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**24.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**13.9**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*107*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 10:50	**Site:**			
Sample #:	**404926-007**	**Client Sample #:**	B-6 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**8.68**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**207**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.06**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**1.96**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.17**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**7.24**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.23**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**2.51**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**16.3**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**16.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*111*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 10:55	**Site:**			
Sample #:	**404926-008**	**Client Sample #:**	B-6 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**12.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**246**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.42**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**5.18**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**15.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.64**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.48**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**21.5**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**20.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	**46**	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*105*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 11:00	**Site:**			
Sample #:	**404926-009**	**Client Sample #:**	B-6 @ 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**19.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**260**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**14.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.83**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**18.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**20.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**2.37**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**6.74**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	**3.79**	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**40.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**51.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193773		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/26/18	07/26/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:00	**Site:**			
Sample #:	**404926-010**	**Client Sample #:**	B-9 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.22**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**246**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**12.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.64**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**12.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**34.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.60**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**23.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**15.8**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*121*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 12:05	Site:			
Sample #:	**404926-011**	Client Sample #:	B-9 @ 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.25**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**178**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.51**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**97.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**204**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.06**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.48**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**22.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**20.0**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/25/2018 12:10	Site:	
Sample #: **404926-012**	Client Sample #: B-9 @ 10'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**7.41**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**43.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**9.61**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.24**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**6.14**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**8.60**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.13**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**27.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**28.2**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/27/18	JAR	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:15	**Site:**			
Sample #:	**404926-013**	**Client Sample #:**	B-9 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**12.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**28.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**14.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.93**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**15.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**16.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**10.5**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**32.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**69.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*103*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:20	**Site:**			
Sample #:	**404926-014**	**Client Sample #:**	B-9 @ 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**6.99**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**61.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**10.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**7.18**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**15.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**12.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**7.20**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**23.5**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**49.7**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*107*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 13:00	Site:			
Sample #:	**404926-015**	Client Sample #:	B-10 @ 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**4.44**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**85.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.62**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**128**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**274**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.10**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.48**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**22.7**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**41.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	**46**	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	**38**	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*113*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:05	**Site:**			
Sample #:	**404926-016**	**Client Sample #:**	B-10 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.63**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**62.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**24.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.16**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**6.22**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.47**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**6.76**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**30.1**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**20.0**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*112*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:10	**Site:**			
Sample #:	**404926-017**	**Client Sample #:**	B-10 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**3.08**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**27.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.41**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.83**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**5.48**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**4.39**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.58**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**26.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**27.4**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:15	**Site:**			
Sample #:	**404926-018**	**Client Sample #:**	B-10 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**17.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**124**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**5.99**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**13.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**13.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**6.74**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**35.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**38.5**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	**11**	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*114*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:20	**Site:**			
Sample #:	**404926-019**	**Client Sample #:**	B-10 @ 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**8.96**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**47.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**14.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**9.55**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**21.1**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**17.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**12.4**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**31.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**76.9**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*107*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/25/2018 14:20	Site:			
Sample #:	**404926-020**	Client Sample #:	B-14 @ 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.63**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**46.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.93**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**7.58**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**15.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.46**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**21.6**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**17.6**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*110*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:35	**Site:**			
Sample #:	**404926-021**	**Client Sample #:**	B-14 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**3.52**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**157**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**12.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.94**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.66**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**6.51**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.24**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**25.3**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**12.9**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/27/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/27/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*126*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:40	**Site:**			
Sample #:	**404926-022**	**Client Sample #:**	B-14 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193850		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.14**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**20.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**11.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.03**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**7.81**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**6.40**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**3.65**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**10.8**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**23.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193909		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*110*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:45	**Site:**			
Sample #:	**404926-023**	**Client Sample #:**	B-14 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**7.28**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**31.4**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.15**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**4.21**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**4.61**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**8.86**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.26**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.95**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**16.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**33.3**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*118*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 14:50	**Site:**			
Sample #:	**404926-024**	**Client Sample #:**	B-14 @ 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**8.72**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**27.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**13.0**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**6.66**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**17.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**13.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	**1.33**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**10.8**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	**4.06**	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**29.3**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**71.6**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*120*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/25/2018 16:10	Site:	
Sample #: **404926-025**	Client Sample #: B-13 @ 2'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**20.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**6.68**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**1.93**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**24.7**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**2.42**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**14.0**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**10.8**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	**19**	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	**16**	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*121*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 16:15	**Site:**			
Sample #:	**404926-026**	**Client Sample #:**	B-13 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.67**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**262**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**13.9**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.96**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**9.85**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**19.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**4.33**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**26.5**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**14.0**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	**13**	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 16:20	**Site:**			
Sample #:	**404926-027**	**Client Sample #:**	B-13 @ 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**14.3**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**23.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**9.75**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.27**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**11.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.69**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**24.4**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**37.5**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*112*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 16:25	**Site:**			
Sample #:	**404926-028**	**Client Sample #:**	B-13 @ 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**2.24**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**297**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**16.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**3.48**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.2**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**21.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**5.30**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**29.9**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**16.3**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*109*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 16:30	**Site:**			
Sample #:	**404926-029**	**Client Sample #:**	B-13 @ 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193851		
Antimony	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Arsenic	**1.60**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Barium	**22.5**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Chromium	**7.05**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Cobalt	**2.00**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Copper	**11.8**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Lead	**27.6**	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	07/31/18	KLN	
Nickel	**2.79**	1	1.5	mg/Kg	07/30/18	07/31/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	07/31/18	KLN	
Vanadium	**15.0**	1	0.5	mg/Kg	07/30/18	07/31/18	KLN	
Zinc	**11.1**	1	5	mg/Kg	07/30/18	07/31/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193910		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	SBW	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193774		
TPH (C10 to C28)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg		07/28/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg		07/28/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*107*	*50-150*	

QCBatchID: QC1193773	Analyst: ssabir	Method: EPA 8015M
Matrix: Solid	Analyzed: 07/26/2018	Instrument: SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193773MB1						
TPH (C10 to C28)	ND	mg/Kg		10		
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C28 to C40)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		
TPH (C8 to C10)	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	LCS	LCSD	LCS	LCSD	Units	LCS	LCSD	RPD	%Rec	RPD	Notes
QC1193773LCS1											
TPH (C6 to C44) Total	250		280		mg/Kg	112			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

	Sample	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	Amount	MS	MSD	MS	MSD	Units	MS	MSD	RPD	%Rec	RPD	Notes
QC1193773MS1, QC1193773MSD1												**Source: 404926-001**
TPH (C10 to C28)	ND	250	250	350	260	mg/Kg	140	104	29.5	70-130	20	M

QCBatchID: QC1193774	Analyst: ssabir	Method: EPA 8015M
Matrix: Solid	Analyzed: 07/26/2018	Instrument: SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193774MB1						
TPH (C10 to C28)	ND	mg/Kg		10		
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C28 to C40)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		
TPH (C8 to C10)	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193774LCS1											
TPH (C10 to C28)	250		230		mg/Kg	92			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193774MS1, QC1193774MSD1												**Source: 404926-021**
TPH (C10 to C28)	ND	250	250	220	210	mg/Kg	88	84	4.7	70-130	20	

QCBatchID: QC1193847	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193847MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847LCS1											
Antimony	100		116		mg/Kg	116			80-120		
Arsenic	100		96.0		mg/Kg	96			80-120		
Barium	100		99.1		mg/Kg	99			80-120		
Beryllium	100		94.2		mg/Kg	94			80-120		
Cadmium	100		95.3		mg/Kg	95			80-120		
Chromium	100		96.2		mg/Kg	96			80-120		
Cobalt	100		99.5		mg/Kg	100			80-120		
Copper	100		97.9		mg/Kg	98			80-120		
Lead	100		99.8		mg/Kg	100			80-120		
Molybdenum	100		97.3		mg/Kg	97			80-120		
Nickel	100		104		mg/Kg	104			80-120		
Selenium	100		90.2		mg/Kg	90			80-120		
Silver	100		89.8		mg/Kg	90			80-120		
Thallium	100		94.0		mg/Kg	94			80-120		
Vanadium	100		100		mg/Kg	100			80-120		
Zinc	100		106		mg/Kg	106			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847MS1, QC1193847MSD1											Source:	404921-007
Antimony	ND	100	100	53.0	45.7	mg/Kg	53	46	14.8	75-125	20	M
Arsenic	13.2	100	100	111	106	mg/Kg	98	93	4.6	75-125	20	
Barium	14.0	100	100	123	121	mg/Kg	109	107	1.6	75-125	20	
Beryllium	ND	100	100	99.0	101	mg/Kg	99	101	2.0	75-125	20	
Cadmium	ND	100	100	101	98.4	mg/Kg	101	98	2.6	75-125	20	
Chromium	11.0	100	100	115	112	mg/Kg	104	101	2.6	75-125	20	
Cobalt	3.35	100	100	108	105	mg/Kg	105	102	2.8	75-125	20	
Copper	7.13	100	100	112	108	mg/Kg	105	101	3.6	75-125	20	
Lead	6.76	100	100	106	105	mg/Kg	99	98	0.9	75-125	20	
Molybdenum	0.48	100	100	88.5	88.3	mg/Kg	88	88	0.2	75-125	20	

QCBatchID:	**QC1193847**	**Analyst:**	dswafford	**Method:**	EPA 6010B
Matrix:	Solid	**Analyzed:**	07/30/2018	**Instrument:**	AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193847MS1, QC1193847MSD1											**Source:**	**404921-007**
Nickel	5.57	100	100	109	107	mg/Kg	103	101	1.9	75-125	20	
Selenium	ND	100	100	87.7	87.5	mg/Kg	88	88	0.2	75-125	20	
Silver	ND	100	100	96.1	92.8	mg/Kg	96	93	3.5	75-125	20	
Thallium	ND	100	100	92.1	92.9	mg/Kg	92	93	0.9	75-125	20	
Vanadium	36.6	100	100	151	143	mg/Kg	114	106	5.4	75-125	20	
Zinc	23.7	100	100	128	126	mg/Kg	104	102	1.6	75-125	20	

QCBatchID: QC1193850	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193850MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193850LCS1											
Antimony	100		118		mg/Kg	118			80-120		
Arsenic	100		100		mg/Kg	100			80-120		
Barium	100		109		mg/Kg	109			80-120		
Beryllium	100		98.0		mg/Kg	98			80-120		
Cadmium	100		103		mg/Kg	103			80-120		
Chromium	100		103		mg/Kg	103			80-120		
Cobalt	100		107		mg/Kg	107			80-120		
Copper	100		106		mg/Kg	106			80-120		
Lead	100		103		mg/Kg	103			80-120		
Molybdenum	100		101		mg/Kg	101			80-120		
Nickel	100		107		mg/Kg	107			80-120		
Selenium	100		93.4		mg/Kg	93			80-120		
Silver	100		98.2		mg/Kg	98			80-120		
Thallium	100		97.2		mg/Kg	97			80-120		
Vanadium	100		108		mg/Kg	108			80-120		
Zinc	100		108		mg/Kg	108			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193850MS1, QC1193850MSD1											**Source:**	**404926-003**
Antimony	ND	100	100	55.5	53.9	mg/Kg	56	54	2.9	75-125	20	M
Arsenic	12.9	100	100	108	112	mg/Kg	95	99	3.6	75-125	20	
Barium	92.0	100	100	212	222	mg/Kg	120	130	4.6	75-125	20	M
Beryllium	ND	100	100	102	102	mg/Kg	102	102	0.0	75-125	20	
Cadmium	ND	100	100	101	100	mg/Kg	101	100	1.0	75-125	20	
Chromium	7.67	100	100	113	112	mg/Kg	105	104	0.9	75-125	20	
Cobalt	2.03	100	100	106	106	mg/Kg	104	104	0.0	75-125	20	
Copper	6.50	100	100	110	109	mg/Kg	104	103	0.9	75-125	20	
Lead	15.7	100	100	118	126	mg/Kg	102	110	6.6	75-125	20	
Molybdenum	4.10	100	100	93.8	97.4	mg/Kg	90	93	3.8	75-125	20	

QCBatchID:	QC1193850	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	07/30/2018	Instrument:	AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193850MS1, QC1193850MSD1											**Source:**	**404926-003**
Nickel	2.40	100	100	105	109	mg/Kg	103	107	3.7	75-125	20	
Selenium	ND	100	100	88.5	92.2	mg/Kg	89	92	4.1	75-125	20	
Silver	ND	100	100	96.8	96.1	mg/Kg	97	96	0.7	75-125	20	
Thallium	2.22	100	100	89.7	97.4	mg/Kg	87	95	8.2	75-125	20	
Vanadium	21.3	100	100	136	134	mg/Kg	115	113	1.5	75-125	20	
Zinc	12.1	100	100	116	120	mg/Kg	104	108	3.4	75-125	20	

QCBatchID:	QC1193851	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	07/30/2018	Instrument:	AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193851MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Iron	**14.5**	mg/Kg		5	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193851LCS1											
Antimony	100		116		mg/Kg	116			80-120		
Arsenic	100		97.7		mg/Kg	98			80-120		
Barium	100		104		mg/Kg	104			80-120		
Beryllium	100		96.3		mg/Kg	96			80-120		
Cadmium	100		98.7		mg/Kg	99			80-120		
Chromium	100		98.0		mg/Kg	98			80-120		
Cobalt	100		103		mg/Kg	103			80-120		
Copper	100		100		mg/Kg	100			80-120		
Lead	100		101		mg/Kg	101			80-120		
Molybdenum	100		97.5		mg/Kg	98			80-120		
Nickel	100		105		mg/Kg	105			80-120		
Selenium	100		90.8		mg/Kg	91			80-120		
Silver	100		93.3		mg/Kg	93			80-120		
Thallium	100		94.4		mg/Kg	94			80-120		
Vanadium	100		103		mg/Kg	103			80-120		
Zinc	100		106		mg/Kg	106			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193851MS1, QC1193851MSD1										**Source:**	**404926-023**	
Antimony	1.21	100	100	61.9	61.8	mg/Kg				75-125	20	
Arsenic	7.28	100	100	107	108	mg/Kg				75-125	20	
Barium	31.4	100	100	152	153	mg/Kg				75-125	20	
Beryllium	ND	100	100	97.9	100	mg/Kg				75-125	20	
Cadmium	ND	100	100	97.1	97.9	mg/Kg				75-125	20	
Chromium	7.15	100	100	105	107	mg/Kg				75-125	20	
Cobalt	4.21	100	100	104	105	mg/Kg				75-125	20	
Copper	4.61	100	100	106	107	mg/Kg				75-125	20	
Lead	8.86	100	100	107	108	mg/Kg				75-125	20	

QCBatchID:	**QC1193851**	**Analyst:**	dswafford	**Method:**	EPA 6010B
Matrix:	Solid	**Analyzed:**	07/30/2018	**Instrument:**	AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193851MS1, QC1193851MSD1											**Source:**	**404926-023**
Molybdenum	1.26	100	100	92.5	94.3	mg/Kg				75-125	20	
Nickel	4.95	100	100	106	107	mg/Kg				75-125	20	
Selenium	ND	100	100	88.8	92.9	mg/Kg				75-125	20	
Silver	ND	50	50	91.6	92.7	mg/Kg				75-125	20	
Thallium	2.25	100	100	90.5	94.1	mg/Kg				75-125	20	
Vanadium	16.4	100	100	123	124	mg/Kg				75-125	20	
Zinc	33.3	100	100	143	144	mg/Kg				75-125	20	

QCBatchID: QC1193908	Analyst: cota	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193908MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193908LCS1											
Mercury	0.83		0.94		mg/Kg	113			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193908MS1, QC1193908MSD1											**Source:**	**404921-007**
Mercury	ND	0.83	0.83	0.98	0.80	mg/Kg	118	96	20.2	75-125	20	M

QCBatchID: QC1193909	Analyst: cota	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193909MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193909LCS1											
Mercury	0.83		0.79		mg/Kg	95			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193909MS1, QC1193909MSD1											**Source:**	**404926-003**
Mercury	ND	0.83	0.83	0.75	0.72	mg/Kg	90	87	4.1	75-125	20	

QCBatchID: QC1193910	Analyst: cota	Method: EPA 7471A
Matrix: Solid	Analyzed: 07/31/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193910MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193910LCS1											
Mercury	0.83		0.77		mg/Kg	93			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193910MS1, QC1193910MSD1											**Source:**	**404926-023**
Mercury	ND	0.83	0.83	0.85	0.80	mg/Kg	102	96	6.1	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

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931 W. Barkley Ave, Orange, CA 92868
Phone: (714) 771-6900 Fax: (714)771-9933

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c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404926
Page: 1 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-5, 2'	7/25/18	9:00	S	1		X	X	
2	B-5, 5'		9:05						
3	B-5, 10'		9:10						
4	B-5, 15'		9:15						
5									
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/26/18
1 Received By:	[signature]	Saul Ramirez	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404926

Page: 2 of 6

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-6, 2'	7/25/18	10:40	S	1		X	X								
2	B-6, 5'		10:45													
3	B-6, 10'		10:50													
4	B-6, 15'		10:55													
5	B-6, 18.5'		11:00													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/26/18
1 Received By:	[signature]	Saul Ramirez	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record				Turn Around Time (Rush by advanced notice only)					
931 W. Barkley Ave, Orange, CA 92868	Lab No:	404926			Standard:	X	4 Day:		3 Day:	
Phone: (714) 771-6900 Fax: (714)771-9933	Page:	3	of	6	2 Day:		1 Day:		Same Day:	

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c/o Montrose Environmental Group
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Matrix: A = Air DW = Drinking Water
FL = Food Liquid FS = Food Solid L = Liquid
PP = Pure Product S = Solid SeaW = Sea Water
SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / Test Instructions / Comments

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-9, 2'	7/25/18	12:00	S	1		X	X	
2	B-9, 5'		12:05						
3	B-9, 10'		12:10						
4	B-9, 15'		12:15						
5	B-9, 18.5'		12:20						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:		Greg Wilson	N+M / Geologist	7/26/18
1 Received By:		Sau Lam	EA	7/26/18 1205
2 Relinquished By:		Sau Lam	EA	7/26/18 1505
2 Received By:		Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 40492 6

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Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-10, 2'	7/25/18	1:00	S	1		X	X	
2	B-10, 5'	↓	1:05	↓	↓		↓	↓	
3	B-10, 10'	↓	1:10	↓	↓		↓	↓	
4	B-10, 15'	↓	1:15	↓	↓		↓	↓	
5	B-10, 18.5'	↓	1:20	↓	↓		↓	↓	
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/26/18
1 Received By:	[signature]	Say Kam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Say Kam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404926

Page: 5 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-14, 2'	7/25/18	2:30	S	1		X	X								
2	B-14, 5'		2:35													
3	B-14, 10'		2:40													
4	B-14, 15'		2:45													
5	B-14, 18.5'		2:50													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	N+M Geologist	7/26/18
1 Received By:	[signature]	Saul Rami	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Rami	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 409926

Page: 6 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-13, 2'	7/25/18	4:10	S	1		X	X									
2	B-13, 5'		4:15														
3	B-13, 10'		4:20														
4	B-13, 15'		4:25														
5	B-13, 18.5'		4:30														
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/26/18
1 Received By:	[signature]	Saul Lam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Lam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

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SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore   Project: UCSD Pepper Canyon West

Date Received: 07/26/18   Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1   ☐ No (skip section 2)   Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 8.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 7.2 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)	✓		
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature] Date: 07/26/18

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404926
Address:	5710 Ruffin Road	Report Date:	09/11/2018
	San Diego, CA 92123	Date Received:	07/26/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 108614002

Supplemental Report 1 - STLC and TCLP results are reported herein.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404926-011	B-9 @ 5'
404926-015	B-10 @ 2'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 12:05	**Site:**			
Sample #:	**404926-011**	**Client Sample #:**	B-9 @ 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.522**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**3.38**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/25/2018 13:00	**Site:**			
Sample #:	**404926-015**	**Client Sample #:**	B-10 @ 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.921**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**31.8**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

QCBatchID:	QC1195265	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	09/07/2018	Instrument:	AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1195265MB1						
Lead	**0.027**	mg/L		0.015		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195265MS1, QC1195265MSD1											**Source:**	**404875-004**
Lead	0.200	10	10	7.31	7.50	mg/L	71	73	2.6	75-125	20	M

QCBatchID: QC1195337	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/11/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1195337MB1					
Lead	ND	mg/L		0.05	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1195337LCS1											
Lead	2		2.05		mg/L	103			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1195337MS1, QC1195337MSD1											**Source:**	**404875-004**
Lead	0.039	1	1	0.948	1.021	mg/L	91	98	7.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404926

Page: 1 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-5 , 2'	7/25/18	9:00	S	1		X	X								
2	B-5 , 5'		9:05													
3	B-5 , 10'		9:10													
4	B-5 , 15'		9:15													
5																
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	Ninyo & Moore / Geologist	7/26/18
1 Received By:	[signature]	Saul Ramirez	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868 Phone: (714) 771-6900 Fax: (714)771-9933	Lab No: 404926 Page: 2 of 6	Standard: X · 4 Day: · 3 Day: 2 Day: · 1 Day: · Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

ENTHALPY ANALYTICAL

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request · **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-6, 2'	7/25/18	10:40	S	1		X	X									
2	B-6, 5'	↓	10:45	↓	↓		↓	↓									
3	B-6, 10'	↓	10:50	↓	↓		↓	↓									
4	B-6, 15'	↓	10:55	↓	↓		↓	↓									
5	B-6, 18.5'	↓	11:00	↓	↓		↓	↓									
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	[signature]	Greg Wilson	Ninyo & Moore / Geologist	7/26/18
[1] Received By:	[signature]	Saul Ramirez	EA	7/26/18 1205
[2] Relinquished By:	[signature]	Saul Ramirez	EA	7/26/18 1505
[2] Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
[3] Relinquished By:				
[3] Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

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Chain of Custody Record

Lab No: 404926

Page: 3 of 6

Turn Around Time (Rush by advanced notice only)					
Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-9, 2'	7/25/18	12:00	S	1		X	X								
2	B-9, 5'		12:05													
3	B-9, 10'		12:10													
4	B-9, 15'		12:15													
5	B-9, 18.5'		12:20													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/26/18
1 Received By:	[signature]	Sam Lam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Sam Lam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 40492 6

Page: 4 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-10, 2'	7/25/18	1:00	S	1		X	X	
2	B-10, 5'	↓	1:05	↓	↓		↓	↓	
3	B-10, 10'	↓	1:10	↓	↓		↓	↓	
4	B-10, 15'	↓	1:15	↓	↓		↓	↓	
5	B-10, 18.5'	↓	1:20	↓	↓		↓	↓	
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N&M / Geologist	7/26/18
1 Received By:	[signature]	Say Kam	EA	7/26/18 1205
2 Relinquished By:	[signature]	Say Kam	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868	Lab No: 404926	Standard: X · 4 Day: · 3 Day:
Phone: (714) 771-6900 Fax: (714)771-9933	Page: 5 of 6	2 Day: · 1 Day: · Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

ENTHALPY ANALYTICAL

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-14, 2'	7/25/18	2:30	S	1		X	X	
2	B-14, 5'		2:35						
3	B-14, 10'		2:40						
4	B-14, 15'		2:45						
5	B-14, 18.5'		2:50						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	GW	Greg Wilson	N+M Geologist	7/26/18
[1] Received By:	[signature]	Saul Ramirez	EA	7/26/18 1205
[2] Relinquished By:	[signature]	Saul Ramirez	EA	7/26/18 1505
[2] Received By:	[signature]	Andrew L. Shaw	E.A.	07/26/18 1505
[3] Relinquished By:				
[3] Received By:				

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c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

Chain of Custody Record

Lab No: 404926

Page: 6 of 6

Turn Around Time (Rush by advanced notice only)					
Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / Test Instructions / Comments

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-13, 2'	7/25/18	4:10	S	1		X	X	
2	B-13, 5'		4:15						
3	B-13, 10'		4:20						
4	B-13, 15'		4:25						
5	B-13, 18.5'		4:30						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/26/18
1 Received By:	[signature]	Saul Lamin	EA	7/26/18 1205
2 Relinquished By:	[signature]	Saul Lamin	EA	7/26/18 1505
2 Received By:	[signature]	Andrew L. Shaw	EA	07/26/18 1505
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore　　Project: UCSD Pepper Canyon West

Date Received: 07/26/18　　Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1　　☐ No (skip section 2)　　Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 8.7 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 7.2 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)	✓		
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature]　　Date: 07/26/18

Ranjit Clarke

From: Lisa Bestard
Sent: Friday, August 31, 2018 9:21 AM
To: Ranjit Clarke; Sean Leffler
Subject: RE: UCSD Pepper Canyon

Ranjit-
Please analyze the following samples from the UCSD Pepper Canyon project for soluble lead by TCLP and STLC on a standard turnaround time:
B-15, 2'
B-19, 2'
B-10 @ 2'
B-9 @ 5'
B-20 @ 2'
B-17, 2'
B-22, 15'
B-16, 2'
B-12, 2'
B-12, 18.5'
B-2, 2'
B-24 @ 2'
B-3, 2'

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (x11279) | (858) 204-2864 (Cell) www.ninyoandmoore.com

30 Years of Quality Service

-----Original Message-----
From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, August 30, 2018 3:31 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>; Sean Leffler <sean.leffler@enthalpy.com>
Subject: RE: UCSD Pepper Canyon

Lisa,

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404972
Address:	5710 Ruffin Road	Report Date:	08/03/2018
	San Diego, CA 92123	Date Received:	07/27/2018
		Client ID:	15885
Attn:	Lisa Bestard		

Comments: UCSD Pepper Canyon West
PO# 108614002

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID	Sample #	Client Sample ID
404972-001	B-19, 2'	404972-025	B-4, 2'
404972-002	B-19, 5'	404972-026	B-4, 5'
404972-003	B-19, 10'	404972-027	B-8, 2'
404972-004	B-19, 15'	404972-028	B-8, 5'
404972-005	B-19, 18.5'	404972-029	B-8, 10'
404972-006	B-15, 2'		
404972-007	B-15, 5'		
404972-008	B-15, 10'		
404972-009	B-15, 15'		
404972-010	B-15, 18.5'		
404972-011	B-11, 2'		
404972-012	B-11, 5'		
404972-013	B-11, 10'		
404972-014	B-11, 15'		
404972-015	B-11, 18.5		
404972-016	B-3, 2'		
404972-017	B-3, 5'		
404972-018	B-3, 10'		
404972-019	B-3, 15'		
404972-020	B-3, 18.5'		
404972-021	B-2, 2'		
404972-022	B-2, 5'		
404972-023	B-2, 10'		
404972-024	B-2, 15'		

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Diane M. Galvan

Report Review performed by: Diane Galvan, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector:
Sampled: 07/26/2018 07:50	Site:	
Sample #: **404972-001**	Client Sample #: B-19, 2'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Arsenic	**6.85**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Barium	**242**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Chromium	**13.6**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Cobalt	**4.12**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Copper	**39.4**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Lead	**405**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Nickel	**6.51**	1	1.5	mg/Kg	07/30/18	08/01/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Vanadium	**27.5**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Zinc	**31.9**	1	5	mg/Kg	07/30/18	08/01/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	**15**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	**19**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*149*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/26/2018 07:55	Site:			
Sample #:	**404972-002**	Client Sample #:	B-19, 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Arsenic	**31.0**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Barium	**947**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Chromium	**13.9**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Cobalt	**3.18**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Copper	**11.7**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Lead	**19.2**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Nickel	**6.17**	1	1.5	mg/Kg	07/30/18	08/01/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Vanadium	**40.2**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Zinc	**27.5**	1	5	mg/Kg	07/30/18	08/01/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*145*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 08:00	**Site:**			
Sample #:	**404972-003**	**Client Sample #:**	B-19, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Arsenic	**12.3**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Barium	**25.9**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Chromium	**12.5**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Cobalt	**5.27**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Copper	**21.3**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Lead	**10.0**	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/01/18	KLN	
Nickel	**11.0**	1	1.5	mg/Kg	07/30/18	08/01/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/01/18	KLN	
Vanadium	**28.0**	1	0.5	mg/Kg	07/30/18	08/01/18	KLN	
Zinc	**58.1**	1	5	mg/Kg	07/30/18	08/01/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*143*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 08:05	**Site:**			
Sample #:	**404972-004**	**Client Sample #:**	B-19, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**5.02**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**20.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**7.96**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.22**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**3.89**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**4.08**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**5.08**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**16.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**36.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*138*	*50-150*	

Enthalpy Analytical, LLC

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/26/2018 08:10	Site:			
Sample #:	**404972-005**	Client Sample #:	B-19, 18.5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**14.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**29.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	**0.50**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**15.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**5.99**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**24.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**16.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**9.69**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**34.0**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**60.7**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*148*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 09:15	**Site:**			
Sample #:	**404972-006**	**Client Sample #:**	B-15, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**5.14**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**46.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**13.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**20.7**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**47.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**430**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.01**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**19.4**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**51.8**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	2	20	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	**26**	2	20	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*139*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/26/2018 09:20	Site:			
Sample #:	**404972-007**	Client Sample #:	B-15, 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**13.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**89.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**12.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.94**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**11.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**12.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**3.86**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**25.1**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**31.5**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*155*	*50-150*	*S*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 09:25	**Site:**			
Sample #:	**404972-008**	**Client Sample #:**	B-15, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**14.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**27.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**26.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**10.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**23.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**19.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.49**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**10.6**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**28.0**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**56.3**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*158*	*50-150*	*S*

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 09:30	**Site:**			
Sample #:	**404972-009**	**Client Sample #:**	B-15, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**5.51**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**51.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**9.42**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**5.59**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**7.29**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**6.32**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**6.91**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**18.4**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**40.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193925		
Mercury	ND	1	0.14	mg/Kg	07/31/18	07/31/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	**10**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*137*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 09:35	**Site:**			
Sample #:	**404972-010**	**Client Sample #:**	B-15, 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193860		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**21.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**306**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	**0.92**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**13.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**13.2**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**25.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**32.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**11.9**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**43.2**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**79.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*146*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 11:25	**Site:**			
Sample #:	**404972-011**	**Client Sample #:**	B-11, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**6.61**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**240**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**15.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.53**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**5.38**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**7.23**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.29**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**28.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**24.7**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*135*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 11:30	**Site:**			
Sample #:	**404972-012**	**Client Sample #:**	B-11, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**8.42**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**281**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**16.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.68**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**5.71**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**6.51**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.51**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**27.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**25.3**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*133*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 11:35	**Site:**			
Sample #:	**404972-013**	**Client Sample #:**	B-11, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**19.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**71.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	**0.62**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**16.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**23.2**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**28.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**22.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**18.2**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**27.9**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**84.9**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*139*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 11:40	**Site:**			
Sample #:	**404972-014**	**Client Sample #:**	B-11, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**8.64**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**24.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**9.00**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.26**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**4.81**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**4.27**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**6.14**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**16.4**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**39.0**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*133*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 11:45	**Site:**			
Sample #:	**404972-015**	**Client Sample #:**	B-11, 18.5	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**16.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**57.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**27.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**14.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**16.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**19.6**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.20**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**9.75**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**33.1**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**52.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	**120**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	**250**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*118*	*50-150*	

Matrix: Solid		**Client:** Ninyo & Moore - San Diego		**Collector:** Client	
Sampled: 07/26/2018 12:45		**Site:**			
Sample #: **404972-016**		**Client Sample #:** B-3, 2'		**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**11.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**420**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**13.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.48**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**17.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**59.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**5.41**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**30.4**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**31.5**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*109*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 12:50	**Site:**			
Sample #:	**404972-017**	**Client Sample #:**	B-3, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**15.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**153**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**27.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.26**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**12.6**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**18.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.00**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**6.76**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**34.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**28.6**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*103*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 12:55	**Site:**			
Sample #:	**404972-018**	**Client Sample #:**	B-3, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**23.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**524**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**9.34**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.19**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**4.64**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**7.84**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.87**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.50**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**33.0**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**28.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*99*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 13:00	**Site:**			
Sample #:	**404972-019**	**Client Sample #:**	B-3, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**63.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**190**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	**0.92**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**12.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**7.85**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**12.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**14.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.48**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**9.44**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**51.8**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**63.2**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	**74**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	**38**	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*102*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/27/2018 13:05	**Site:**			
Sample #:	**404972-020**	**Client Sample #:**	B-3, 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**22.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**891**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**27.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.86**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**13.5**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**27.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**2.56**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**7.22**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**40.7**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**32.4**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193840		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/31/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*96*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/27/2018 13:45	**Site:**			
Sample #:	**404972-021**	**Client Sample #:**	B-2, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**14.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**542**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**21.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**6.37**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**25.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**65.1**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**7.92**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**44.4**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**50.6**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*116*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/27/2018 13:50	Site:	
Sample #: **404972-022**	Client Sample #: B-2, 5'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**12.6**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**383**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**18.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**5.85**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**21.6**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**39.9**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**7.07**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**37.0**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**47.2**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*122*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/27/2018 13:55	**Site:**			
Sample #:	**404972-023**	**Client Sample #:**	B-2, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**21.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**170**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**13.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**14.1**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**14.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**13.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**9.12**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**33.0**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**49.0**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/27/2018 14:00	**Site:**			
Sample #:	**404972-024**	**Client Sample #:**	B-2, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	**3.44**	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**22.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**67.4**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**9.45**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.75**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**24.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**18.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	**1.39**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**6.93**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**37.1**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**43.6**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	**42**	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*113*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 15:05	**Site:**			
Sample #:	**404972-025**	**Client Sample #:**	B-4, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**4.66**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**219**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**25.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.05**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**6.40**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**4.52**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.90**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**31.2**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**15.9**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*119*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 15:10	**Site:**			
Sample #:	**404972-026**	**Client Sample #:**	B-4, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**9.15**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**54.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**21.2**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**4.13**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**5.00**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**4.84**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.68**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**27.1**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**17.0**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*121*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 16:00	**Site:**			
Sample #:	**404972-027**	**Client Sample #:**	B-8, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**27.7**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**8.11**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.00**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**5.51**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**16.6**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**2.56**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**16.5**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**16.3**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193926		
Mercury	ND	1	0.14	mg/Kg	07/31/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	**16**	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	**18**	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*131*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 16:05	**Site:**			
Sample #:	**404972-028**	**Client Sample #:**	B-8, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**1.44**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**189**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**14.8**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.62**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**5.19**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**3.86**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**4.22**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**28.2**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**14.2**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193964		
Mercury	ND	1	0.14	mg/Kg	07/30/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*115*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/26/2018 16:10	**Site:**			
Sample #:	**404972-029**	**Client Sample #:**	B-8, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1193861		
Antimony	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Arsenic	**8.04**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Barium	**96.0**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Chromium	**14.3**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Cobalt	**3.85**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Copper	**6.10**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Lead	**8.68**	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Molybdenum	ND	1	1	mg/Kg	07/30/18	08/02/18	KLN	
Nickel	**17.6**	1	1.5	mg/Kg	07/30/18	08/02/18	KLN	
Selenium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Silver	ND	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Thallium	ND	1	3	mg/Kg	07/30/18	08/02/18	KLN	
Vanadium	**22.3**	1	0.5	mg/Kg	07/30/18	08/02/18	KLN	
Zinc	**25.3**	1	5	mg/Kg	07/30/18	08/02/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1193964		
Mercury	ND	1	0.14	mg/Kg	07/30/18	08/01/18	CO	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193866		
TPH (C10 to C28)	**42**	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C28 to C40)	**32**	1	10	mg/Kg	07/30/18	07/30/18	BB	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/30/18	07/30/18	BB	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*118*	*50-150*	

QCBatchID:	QC1193840	**Analyst:**	Abanh	**Method:**	EPA 8015M
Matrix:	Solid	**Analyzed:**	07/30/2018	**Instrument:**	SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193840MB1					
TPH (C10 to C28)	ND	mg/Kg		10	
TPH (C13 to C22)	ND	mg/Kg		10	
TPH (C28 to C40)	ND	mg/Kg		10	
TPH (C6 to C44) Total	ND	mg/Kg		10	
TPH (C8 to C10)	ND	mg/Kg		10	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193840LCS1											
TPH (C10 to C28)	250		240		mg/Kg	96			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193840MS1, QC1193840MSD1												**Source: 404972-002**
TPH (C10 to C28)	ND	250	250	310	370	mg/Kg	124	148	17.6	70-130	20	

QCBatchID: QC1193860	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193860MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	LCS	LCSD	LCS	LCSD	Units	LCS	LCSD	RPD	%Rec	RPD	Notes
QC1193860LCS1											
Antimony	100		91.0		mg/Kg	91			80-120		
Arsenic	100		87.6		mg/Kg	88			80-120		
Barium	100		91.9		mg/Kg	92			80-120		
Beryllium	100		93.4		mg/Kg	93			80-120		
Cadmium	100		87.2		mg/Kg	87			80-120		
Chromium	100		93.1		mg/Kg	93			80-120		
Cobalt	100		91.9		mg/Kg	92			80-120		
Copper	100		91.3		mg/Kg	91			80-120		
Lead	100		90.6		mg/Kg	91			80-120		
Molybdenum	100		87.7		mg/Kg	88			80-120		
Nickel	100		92.9		mg/Kg	93			80-120		
Selenium	100		84.0		mg/Kg	84			80-120		
Silver	100		93.0		mg/Kg	93			80-120		
Thallium	100		88.4		mg/Kg	88			80-120		
Vanadium	100		93.8		mg/Kg	94			80-120		
Zinc	100		87.8		mg/Kg	88			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

	Sample	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	Amount	MS	MSD	MS	MSD	Units	MS	MSD	RPD	%Rec	RPD	Notes
QC1193860MS1, QC1193860MSD1											**Source:**	**404958-001**
Antimony	ND	100	100	31.4	28.0	mg/Kg	31	28	11.4	75-125	20	M
Arsenic	2.11	100	100	87.4	88.6	mg/Kg	85	86	1.4	75-125	20	
Barium	135	100	100	225	223	mg/Kg	90	88	0.9	75-125	20	
Beryllium	ND	100	100	91.0	91.8	mg/Kg	91	92	0.9	75-125	20	
Cadmium	0.23	100	100	87.8	85.7	mg/Kg	88	85	2.4	75-125	20	
Chromium	11.2	100	100	104	102	mg/Kg	93	91	1.9	75-125	20	
Cobalt	6.28	100	100	97.6	95.2	mg/Kg	91	89	2.5	75-125	20	
Copper	8.20	100	100	102	99.2	mg/Kg	94	91	2.8	75-125	20	
Lead	1.44	100	100	86.2	87.4	mg/Kg	85	86	1.4	75-125	20	

QCBatchID:	QC1193860	Analyst:	dswafford	Method:	EPA 6010B
Matrix:	Solid	Analyzed:	07/30/2018	Instrument:	AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193860MS1, QC1193860MSD1											**Source:**	**404958-001**
Molybdenum	1.20	100	100	83.7	84.0	mg/Kg	83	83	0.4	75-125	20	
Nickel	5.83	100	100	94.8	94.7	mg/Kg	89	89	0.1	75-125	20	
Selenium	ND	100	100	40.1	45.7	mg/Kg	40	46	13.1	75-125	20	M
Silver	ND	100	100	94.7	92.4	mg/Kg	95	92	2.5	75-125	20	
Thallium	ND	100	100	81.5	81.9	mg/Kg	82	82	0.5	75-125	20	
Vanadium	27.4	100	100	124	122	mg/Kg	97	95	1.6	75-125	20	
Zinc	33.3	100	100	122	119	mg/Kg	89	86	2.5	75-125	20	

QCBatchID: QC1193861	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193861MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193861LCS1											
Antimony	100		106		mg/Kg	106			80-120		
Arsenic	100		100		mg/Kg	100			80-120		
Barium	100		108		mg/Kg	108			80-120		
Beryllium	100		103		mg/Kg	103			80-120		
Cadmium	100		106		mg/Kg	106			80-120		
Chromium	100		106		mg/Kg	106			80-120		
Cobalt	100		108		mg/Kg	108			80-120		
Copper	100		98.4		mg/Kg	98			80-120		
Lead	100		106		mg/Kg	106			80-120		
Molybdenum	100		104		mg/Kg	104			80-120		
Nickel	100		110		mg/Kg	110			80-120		
Selenium	100		94.1		mg/Kg	94			80-120		
Silver	100		93.5		mg/Kg	94			80-120		
Thallium	100		102		mg/Kg	102			80-120		
Vanadium	100		101		mg/Kg	101			80-120		
Zinc	100		108		mg/Kg	108			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193861MS1, QC1193861MSD1											**Source:**	**404972-011**
Antimony	ND	100	100	36.4	36.5	mg/Kg	36	37	0.3	75-125	20	M
Arsenic	6.61	100	100	101	102	mg/Kg	94	95	1.0	75-125	20	
Barium	240	100	100	395	351	mg/Kg	155	111	11.8	75-125	20	M
Beryllium	ND	100	100	102	104	mg/Kg	102	104	1.9	75-125	20	
Cadmium	0.33	100	100	103	102	mg/Kg	103	102	1.0	75-125	20	
Chromium	15.4	100	100	120	120	mg/Kg	105	105	0.0	75-125	20	
Cobalt	3.53	100	100	106	104	mg/Kg	102	100	1.9	75-125	20	
Copper	5.38	100	100	101	100	mg/Kg	96	95	1.0	75-125	20	
Lead	7.23	100	100	105	108	mg/Kg	98	101	2.8	75-125	20	

QCBatchID: QC1193861	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 07/30/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193861MS1, QC1193861MSD1											**Source:**	**404972-011**
Molybdenum	0.14	100	100	90.8	92.1	mg/Kg	91	92	1.4	75-125	20	
Nickel	4.29	100	100	108	107	mg/Kg	104	103	0.9	75-125	20	
Selenium	ND	100	100	56.2	63.0	mg/Kg	56	63	11.4	75-125	20	M
Silver	ND	100	100	90.5	90.5	mg/Kg	91	91	0.0	75-125	20	
Thallium	ND	100	100	92.6	95.3	mg/Kg	93	95	2.9	75-125	20	
Vanadium	28.8	100	100	129	127	mg/Kg	100	98	1.6	75-125	20	
Zinc	24.7	100	100	132	129	mg/Kg	107	104	2.3	75-125	20	

QCBatchID: QC1193866	Analyst: Abanh	Method: EPA 8015M
Matrix: Solid	Analyzed: 07/30/2018	Instrument: SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1193866MB1					
TPH (C10 to C28)	ND	mg/Kg		10	
TPH (C13 to C22)	ND	mg/Kg		10	
TPH (C23 to C40)	ND	mg/Kg		10	
TPH (C28 to C40)	ND	mg/Kg		10	
TPH (C6 to C12)	ND	mg/Kg		10	
TPH (C6 to C44) Total	ND	mg/Kg		10	
TPH (C8 to C10)	ND	mg/Kg		10	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193866LCS1											
TPH (C10 to C28)	250		240		mg/Kg	96			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193866MS1, QC1193866MSD1										**Source:**	**404972-021**	
TPH (C10 to C28)	ND	250	250	320	290	mg/Kg	128	116	9.8	70-130	20	

QCBatchID:	QC1193925	Analyst:	JParedes	Method:	EPA 7471A
Matrix:	Solid	Analyzed:	07/31/2018	Instrument:	AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193925MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193925LCS1											
Mercury	0.83		0.92		mg/Kg	111			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193925MS1, QC1193925MSD1											**Source:**	**404956-001**
Mercury	ND	0.83	0.83	0.76	0.80	mg/Kg	92	96	5.1	75-125	20	

QCBatchID:	QC1193926	Analyst:	JParedes	Method:	EPA 7471A
Matrix:	Solid	Analyzed:	07/31/2018	Instrument:	AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193926MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193926LCS1											
Mercury	0.83		0.86		mg/Kg	104			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193926MS1, QC1193926MSD1											**Source:**	**404972-011**
Mercury	ND	0.83	0.83	0.89	0.91	mg/Kg	107	110	2.2	75-125	20	

QCBatchID: QC1193964	Analyst: cota	Method: EPA 7471A
Matrix: Solid	Analyzed: 08/01/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193964MB1						
Mercury	ND	mg/Kg		0.14		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193964LCS1											
Mercury	0.83		0.91		mg/Kg	110			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1193964MS1, QC1193964MSD1											**Source:**	**404977-001**
Mercury	0.03	0.83	0.83	0.87	0.90	mg/Kg	101	105	3.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record				Turn Around Time (Rush by advanced notice only)					
931 W. Barkley Ave, Orange, CA 92868	Lab No:	404972			Standard:	X	4 Day:		3 Day:	
Phone: (714) 771-6900 Fax: (714)771-9933	Page:	\	of	6	2 Day:		1 Day:		Same Day:	

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Matrix: A = Air DW = Drinking Water
FL = Food Liquid FS = Food Solid L = Liquid
PP = Pure Product S = Solid SeaW = Sea Water
SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-19, 2'	7/26/18	7:50	S	1		X	X								
2	B-19, 5'		7:55													
3	, 10'		8:00													
4	, 15'		8:05													
5	, 18.5'		8:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:		Greg Wilson	N&M / Geologist	7/27
1 Received By:		Saul Rami[illegible]	EA	7/27/18 1255
2 Relinquished By:		Saul Rami[illegible]	EA	7/27/18 1620
2 Received By:		[illegible]leatherman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404972
Page: 2 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-15, 2'	7/26/18	9:15	S	1		X	X									
2	, 5'		9:20														
3	, 10'		9:25														
4	, 15'		9:30														
5	, 18.5'		9:35														
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GDW	Greg Wilson	N&M / Geologist	7/27/18
1 Received By:	[signature]	Saul Rami[illegible]	EA	7/27/18 1255
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/27/18 1620
2 Received By:	[signature]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868	Lab No: 404972	Standard: X / 4 Day: / 3 Day:
Phone: (714) 771-6900 Fax: (714)771-9933	Page: 3 of 6	2 Day: / 1 Day: / Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

ENTHALPY ANALYTICAL

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-11, 2'	7/26/18	11:25	S	1		X	X								
2	, 5'		11:30													
3	, 10'		11:35													
4	, 15'		11:40													
5	, 18.5'		11:45													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	Saul [illegible]	~~EA~~ Saul [illegible]	EA	7/27/18 1255
2 Relinquished By:	[illegible]	Saul [illegible]	EA	7/27/18 1620
2 Received By:	[illegible]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record	Turn Around Time (Rush by advanced notice only)
931 W. Barkley Ave, Orange, CA 92868	Lab No: 404972	Standard: X; 4 Day: ; 3 Day:
Phone: (714) 771-6900 Fax: (714)771-9933	Page: 4 of 6	2 Day: ; 1 Day: ; Same Day:
Billing: Enthalpy - SoCal c/o Montrose Environmental Group 1 Park Plaza, Suite 1000, Irvine, CA 92614	**Matrix:** A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other	**Preservatives:** 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

ENTHALPY ANALYTICAL

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Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-3, 2'	7/26/18	12:45	S	1		X	X	
2	, 5'	↓	12:50	↓	↓		↓	↓	
3	, 10'	↓	12:55	↓	↓		↓	↓	
4	, 15'	↓	1:00	↓	↓		↓	↓	
5	, 18.5	↓	1:05	↓	↓		↓	↓	
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	[signature]	Saul Rami	EA	7/27/18 1255
2 Relinquished By:	[signature]	Saul Rami	EA	7/27/18 1620
2 Received By:	[signature]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404972

Page: 5 of 6

Turn Around Time (Rush by advanced notice only)

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2 Day:		1 Day:		Same Day:	

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CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-2, 2'	7/20/18	1:45	S	1		X	X								
2	, 5'		1:50													
3	, 10'		1:55													
4	, 15'		2:00													
5																
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	ADW	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	[signature]	Saul Ramirez	EA	7/27/18 1256
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/27/18 1620
2 Received By:	[signature]	Ceala Huerman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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Phone: (714) 771-6900 Fax: (714)771-9933

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ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404972
Page: 6 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-4, 2'	7/26/18	3:05	S	1		X	X	
2	↓ , 5'	↓	3:10	↓	↓		↓	↓	
3									
4	B-8, 2'		4:00				X	X	
5	B-8, 5'		4:05						
6	B-8, 10'	↓	4:10	↓	↓		↓	↓	
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N&M / Geologist	7/27/18
1 Received By:	[signature]	Say Kami	EA	7/27/18 1255
2 Relinquished By:	[signature]	Say Kami	EA	7/27/18 1620
2 Received By:	[signature]	Wale atherman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore | Project: UCSD Pepper Canyon

Date Received: 7/27/18 | Sampler's Name Present: [✓] Yes [ ] No

Section 2

Sample(s) received in a cooler? [✓] Yes, How many? 1 [ ] No (skip section 2) | Sample Temp (°C) (No Cooler): ____

Sample Temp (°C), One from each cooler: #1: 8.9 #2: ____ #3: ____ #4: ____

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ____

Section 3

Was the cooler packed with: [✓] Ice [ ] Ice Packs [ ] Bubble Wrap [ ] Styrofoam [ ] Paper [ ] None [ ] Other ____

Cooler Temp (°C): #1: 5.9 #2: ____ #3: ____ #4: ____

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓	~~✓~~	
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

RR 7/27

Section 5 Explanations/Comments

Out of temp. range.

Section 6

For discrepancies, how was the Project Manager notified? [ ] Verbal PM Initials: ____ Date/Time ____

[X] Email (email sent to/on): RC / 07/27/18 @ 1753

Project Manager's response:

Completed By: [signature] Date: 07/27/18

Enthalpy Analytical, a subsidiary of Montrose Environmental Group ,Inc.
931 W. Barkley Ave, Orange, CA 92868 • T: (714) 771-6900 • F: (714) 538-1209
www.enthalpy.com/socal

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	404972
Address:	5710 Ruffin Road	Report Date:	09/11/2018
	San Diego, CA 92123	Date Received:	07/27/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 108614002

Supplemental Report 1 - STLC and TCLP results are reported herein.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
404972-001	B-19, 2'
404972-006	B-15, 2'
404972-016	B-3, 2'
404972-021	B-2, 2'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	
Sampled:	07/26/2018 07:50	Site:			
Sample #:	**404972-001**	Client Sample #:	B-19, 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.227**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**14.6**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/26/2018 09:15	Site:			
Sample #:	**404972-006**	Client Sample #:	B-15, 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.610**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**10.8**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/26/2018 12:45	Site:			
Sample #:	**404972-016**	Client Sample #:	B-3, 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	ND	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**1.651**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/27/2018 13:45	Site:			
Sample #:	**404972-021**	Client Sample #:	B-2, 2'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.057**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**2.01**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

QCBatchID:	**QC1195265**	**Analyst:**	dswafford	**Method:**	EPA 6010B
Matrix:	Solid	**Analyzed:**	09/07/2018	**Instrument:**	AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1195265MB1					
Lead	**0.027**	mg/L		0.015	

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195265MS1, QC1195265MSD1											**Source:**	**404875-004**
Lead	0.200	10	10	7.31	7.50	mg/L	71	73	2.6	75-125	20	M

QCBatchID:	**QC1195337**	**Analyst:**	dswafford	**Method:**	EPA 6010B
Matrix:	Solid	**Analyzed:**	09/11/2018	**Instrument:**	AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1195337MB1						
Lead	ND	mg/L		0.05		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195337LCS1											
Lead	2		2.05		mg/L	103			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195337MS1, QC1195337MSD1											**Source:**	**404875-004**
Lead	0.039	1	1	0.948	1.021	mg/L	91	98	7.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.	Chain of Custody Record				Turn Around Time (Rush by advanced notice only)					
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Phone: (714) 771-6900 Fax: (714)771-9933	Page:	\	of	6	2 Day:		1 Day:		Same Day:	

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4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
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Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-19, 2'	7/26/18	7:50	S	1		X	X								
2	B-19, 5'		7:55													
3	, 10'		8:00													
4	, 15'		8:05													
5	, 18.5'		8:10													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GDW	Greg Wilson	N&M / Geologist	7/27
1 Received By:	[illegible]	Saul Ramirez	EA	7/27/18 1255
2 Relinquished By:	[illegible]	Saul Ramirez	EA	7/27/18 1620
2 Received By:	[illegible]	Leah Leatherman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 404972

Page: 2 of 6

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-15, 2'	7/26/18	9:15	S	1		X	X								
2	, 5'		9:20													
3	, 10'		9:25													
4	, 15'		9:30													
5	, 18.5'		9:35													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GDW	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	[illegible]	Saul Rami[illegible]	EA	7/27/18 1255
2 Relinquished By:	[illegible]	Saul Ramirez	EA	7/27/18 1620
2 Received By:	[illegible]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404972

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Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-11, 2'	7/26/18	11:25	S	1		X	X	
2	, 5'		11:30						
3	, 10'		11:35						
4	, 15'		11:40						
5	, 18.5'		11:45						
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	Saul [illegible]	~~EA~~ Saul [illegible]	EA	7/27/18 1255
2 Relinquished By:	[illegible]	Saul [illegible]	EA	7/27/18 1620
2 Received By:	[illegible]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404972

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Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-3, 2'	7/26/18	12:45	S	1		X	X								
2	, 5'		12:50													
3	, 10'		12:55													
4	, 15'		1:00													
5	, 18.5		1:05													
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	[signature]	Saul Ramirez	EA	7/27/18 12:55
2 Relinquished By:	[signature]	Saul Ramirez	EA	7/27/18 1620
2 Received By:	[signature]	[illegible]	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404972

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Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-2, 2'	7/26/18	1:45	S	1		X	X	
2	, 5'		1:50						
3	, 10'		1:55						
4	, 15'		2:00						
5									
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	ADW	Greg Wilson	N+M / Geologist	7/27/18
1 Received By:	[signature]	Saul Ramirez	EA	7/27/18 1256
2 Relinquished By:	[signature]	Saul Rami—	EA	7/27/18 1620
2 Received By:	[signature]	Carla Atherman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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Chain of Custody Record

Lab No: 404972

Page: 6 of 6

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-4, 2'	7/26/18	3:05	S	1		X	X	
2	↓ , 5'	↓	3:10	↓	↓		↓	↓	
3									
4	B-8, 2'		4:00				X	X	
5	B-8, 5'		4:05						
6	B-8, 10'	↓	4:10	↓	↓		↓	↓	
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N&M / Geologist	7/27/18
1 Received By:	[signature]	Say Kamin	EA	7/27/18 12 55
2 Relinquished By:	[signature]	Say Kamin	EA	7/27/18 1620
2 Received By:	[signature]	Kale Atherman	EA	07/27/18 1620
3 Relinquished By:				
3 Received By:				

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SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore   Project: UCSD Pepper Canyon

Date Received: 7/27/18   Sampler's Name Present: [X] Yes [ ] No

Section 2

Sample(s) received in a cooler? [✓] Yes, How many? 1 [ ] No (skip section 2)   Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 8.9 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: [✓] Ice [ ] Ice Packs [ ] Bubble Wrap [ ] Styrofoam [ ] Paper [ ] None [ ] Other ______

Cooler Temp (°C): #1: 5.9 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓	~~✓~~	
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

RR 7/27

Section 5 Explanations/Comments

Out of temp. range.

Section 6

For discrepancies, how was the Project Manager notified? [ ] Verbal PM Initials: ______ Date/Time ______

[X] Email (email sent to/on): RC / 07/27/18 @ 1753

Project Manager's response:

Completed By: [signature] Date: 07/27/18

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

MONTROSE ENVIRONMENTAL

Client:	Ninyo & Moore - San Diego	Lab Request:	405017
Address:	5710 Ruffin Road	Report Date:	08/06/2018
	San Diego, CA 92123	Date Received:	07/30/2018
		Client ID:	15885

Attn: Lisa Bestard

Comments: UCSD Pepper Canyon West
PO# 08614002

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
405017-001	B-12, 2'
405017-002	B-12, 5'
405017-003	B-12, 10'
405017-004	B-12, 15'
405017-005	B-12, 18.5'
405017-006	B-17, 2'
405017-007	B-17, 5'
405017-008	B-17, 10'
405017-009	B-17, 15'
405017-010	B-17, 18.5'
405017-011	B-16, 2'
405017-012	B-16, 5'
405017-013	B-21, 2'
405017-014	B-21, 5'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Diane M. Galvan

Report Review performed by: Diane Galvan, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

ACCREDITED IN ACCORDANCE WITH nelac

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:
Sampled:	07/30/2018 07:30	Site:		
Sample #:	**405017-001**	Client Sample #:	B-12, 2'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194017		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**4.44**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**101**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**12.0**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**3.88**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**37.9**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**108**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**4.31**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**23.8**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**37.4**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*109*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/30/2018 07:35	Site:			
Sample #:	**405017-002**	Client Sample #:	B-12, 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194017		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**3.72**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**93.5**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**14.0**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**3.37**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**6.71**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**9.58**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**4.21**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**27.4**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**17.0**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 07:40	**Site:**			
Sample #:	**405017-003**	**Client Sample #:**	B-12, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194017		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**5.18**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**88.5**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**30.6**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**2.84**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**8.33**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**9.41**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**4.12**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**19.2**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**22.9**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*112*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/30/2018 07:45	Site:			
Sample #:	**405017-004**	Client Sample #:	B-12, 15'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**15.1**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**25.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**13.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**4.57**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**20.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**10.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**9.10**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**27.7**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**57.2**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*143*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 07:50	**Site:**			
Sample #:	**405017-005**	**Client Sample #:**	B-12, 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**10.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**246**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**13.6**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**45.4**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**28.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**81.1**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	**1.68**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**21.0**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	**5.55**	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**27.6**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**67.5**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	% Recovery	Limits	Notes
Triacontane (SUR)	*109*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 09:00	**Site:**			
Sample #:	**405017-006**	**Client Sample #:**	B-17, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**8.19**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**166**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**12.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**3.90**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**55.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**174**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**4.96**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**24.1**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**70.3**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	**16**	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*133*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 09:05	**Site:**			
Sample #:	**405017-007**	**Client Sample #:**	B-17, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**12.6**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**223**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**15.3**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**5.77**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**25.3**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**23.8**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**7.40**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**32.7**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**53.8**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*110*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 09:10	**Site:**			
Sample #:	**405017-008**	**Client Sample #:**	B-17, 10'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**23.6**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**26.9**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**13.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**4.59**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**15.9**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**21.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**10.9**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**30.0**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**54.4**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*103*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 09:20	**Site:**			
Sample #:	**405017-009**	**Client Sample #:**	B-17, 15'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**29.3**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**37.1**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**14.9**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**5.88**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**18.5**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**14.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**8.44**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**34.0**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**67.6**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*114*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/30/2018 09:25	Site:	
Sample #: **405017-010**	Client Sample #: B-17, 18.5'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**14.6**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**69.0**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	**0.69**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**19.8**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**8.05**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**51.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**39.1**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**12.7**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**35.2**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**93.0**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	**27**	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*113*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 11:00	**Site:**			
Sample #:	**405017-011**	**Client Sample #:**	B-16, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*		Prep Method: EPA 3050B				QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**9.57**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**187**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**11.9**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**7.15**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**38.1**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**114**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**6.83**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**25.3**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**56.8**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*		Prep Method: EPA 7471A				QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M		Prep Method: EPA 3580A				QCBatchID: QC1193921		
TPH (C10 to C28)	ND	2	20	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	2	20	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	2	20	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*116*	*50-150*	

Matrix:	Solid	Client:	Ninyo & Moore - San Diego	Collector:	Client
Sampled:	07/30/2018 11:05	Site:			
Sample #:	**405017-012**	Client Sample #:	B-16, 5'	Sample Type:	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**11.3**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**208**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**13.0**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**4.30**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**21.5**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**38.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**6.05**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**29.5**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**40.3**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*108*	*50-150*	

Matrix: Solid	Client: Ninyo & Moore - San Diego	Collector: Client
Sampled: 07/30/2018 12:00	Site:	
Sample #: **405017-013**	Client Sample #: B-21, 2'	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**3.84**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**76.4**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**16.8**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**7.09**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**8.25**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**13.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**6.93**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	**4.36**	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**39.4**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**43.5**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*109*	*50-150*	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 12:05	**Site:**			
Sample #:	**405017-014**	**Client Sample #:**	B-21, 5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 3050B					QCBatchID: QC1194018		
Antimony	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Arsenic	**2.84**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Barium	**74.7**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Beryllium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Cadmium	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Chromium	**15.2**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Cobalt	**5.29**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Copper	**5.81**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Lead	**5.71**	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Molybdenum	ND	1	1	mg/Kg	08/03/18	08/06/18	KLN	
Nickel	**6.61**	1	1.5	mg/Kg	08/03/18	08/06/18	KLN	
Selenium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Silver	ND	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Thallium	ND	1	3	mg/Kg	08/03/18	08/06/18	KLN	
Vanadium	**28.0**	1	0.5	mg/Kg	08/03/18	08/06/18	KLN	
Zinc	**26.7**	1	5	mg/Kg	08/03/18	08/06/18	KLN	
Method: EPA 7471A *NELAC*	Prep Method: EPA 7471A					QCBatchID: QC1194055		
Mercury	ND	1	0.14	mg/Kg	08/06/18	08/06/18	JP	
Method: EPA 8015M	Prep Method: EPA 3580A					QCBatchID: QC1193921		
TPH (C10 to C28)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C28 to C40)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	
TPH (C8 to C10)	ND	1	10	mg/Kg	07/31/18	08/04/18	JAR	

Surrogate	*% Recovery*	*Limits*	*Notes*
Triacontane (SUR)	*112*	*50-150*	

QCBatchID:	QC1193921	Analyst:	Jarriaga	Method:	EPA 8015M
Matrix:	Solid	Analyzed:	07/31/2018	Instrument:	SVOA-GC (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1193921MB1						
TPH (C10 to C28)	ND	mg/Kg		10		
TPH (C13 to C22)	ND	mg/Kg		10		
TPH (C28 to C40)	ND	mg/Kg		10		
TPH (C6 to C12)	ND	mg/Kg		10		
TPH (C6 to C44) Total	ND	mg/Kg		10		
TPH (C8 to C10)	ND	mg/Kg		10		

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD		%Rec	RPD	
QC1193921LCS1											
TPH (C10 to C28)	250		210		mg/Kg	84			70-130		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
		MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1193921MS1, QC1193921MSD1											**Source:**	**405017-001**
TPH (C10 to C28)	ND	250	250	290	260	mg/Kg	116	104	10.9	70-130	20	

QCBatchID: QC1194017	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/03/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1194017MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194017LCS1											
Antimony	100		112		mg/Kg	112			80-120		
Arsenic	100		96.6		mg/Kg	97			80-120		
Barium	100		101		mg/Kg	101			80-120		
Beryllium	100		93.8		mg/Kg	94			80-120		
Cadmium	100		95.2		mg/Kg	95			80-120		
Chromium	100		95.3		mg/Kg	95			80-120		
Cobalt	100		98.9		mg/Kg	99			80-120		
Copper	100		97.0		mg/Kg	97			80-120		
Lead	100		98.3		mg/Kg	98			80-120		
Molybdenum	100		91.0		mg/Kg	91			80-120		
Nickel	100		99.9		mg/Kg	100			80-120		
Selenium	100		92.8		mg/Kg	93			80-120		
Silver	100		87.5		mg/Kg	88			80-120		
Thallium	100		91.2		mg/Kg	91			80-120		
Vanadium	100		98.3		mg/Kg	98			80-120		
Zinc	100		101		mg/Kg	101			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194017MS1, QC1194017MSD1											**Source:**	**404993-003**
Antimony	2.73	100	100	48.0	61.8	mg/Kg	45	59	25.1	75-125	20	M
Arsenic	48.1	100	100	130	137	mg/Kg	82	89	5.2	75-125	20	
Barium	1810	100	100	1360	1650	mg/Kg	0	0	19.3	75-125	20	NC
Beryllium	ND	100	100	90.5	91.0	mg/Kg	91	91	0.6	75-125	20	
Cadmium	ND	100	100	80.2	86.4	mg/Kg	80	86	7.4	75-125	20	
Chromium	20.9	100	100	103	109	mg/Kg	82	88	5.7	75-125	20	
Cobalt	4.23	100	100	87.8	92.6	mg/Kg	84	88	5.3	75-125	20	
Copper	12.4	100	100	94.1	100	mg/Kg	82	88	6.1	75-125	20	
Lead	4.00	100	100	93.3	94.3	mg/Kg	89	90	1.1	75-125	20	
Molybdenum	1.57	100	100	82.5	86.2	mg/Kg	81	85	4.4	75-125	20	

QCBatchID: QC1194017	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/03/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194017MS1, QC1194017MSD1											**Source:**	**404993-003**
Nickel	16.4	100	100	102	106	mg/Kg	86	90	3.8	75-125	20	
Selenium	ND	100	100	90.5	90.2	mg/Kg	91	90	0.3	75-125	20	
Silver	ND	100	100	77.6	81.7	mg/Kg	78	82	5.1	75-125	20	
Thallium	3.03	100	100	81.4	84.3	mg/Kg	78	81	3.5	75-125	20	
Vanadium	29.9	100	100	122	131	mg/Kg	92	101	7.1	75-125	20	
Zinc	35.0	100	100	123	124	mg/Kg	88	89	0.8	75-125	20	

QCBatchID: QC1194018	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/03/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1194018MB1					
Antimony	ND	mg/Kg		3	
Arsenic	ND	mg/Kg		1	
Barium	ND	mg/Kg		1	
Beryllium	ND	mg/Kg		0.5	
Cadmium	ND	mg/Kg		0.5	
Chromium	ND	mg/Kg		1	
Cobalt	ND	mg/Kg		0.5	
Copper	ND	mg/Kg		1	
Lead	ND	mg/Kg		1	
Molybdenum	ND	mg/Kg		1	
Nickel	ND	mg/Kg		1.5	
Selenium	ND	mg/Kg		3	
Silver	ND	mg/Kg		0.5	
Thallium	ND	mg/Kg		3	
Vanadium	ND	mg/Kg		0.5	
Zinc	ND	mg/Kg		5	

Lab Control Spike/ Lab Control Spike Duplicate Summary

	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	LCS	LCSD	LCS	LCSD	Units	LCS	LCSD	RPD	%Rec	RPD	Notes
QC1194018LCS1											
Antimony	100		107		mg/Kg	107			80-120		
Arsenic	100		95.0		mg/Kg	95			80-120		
Barium	100		102		mg/Kg	102			80-120		
Beryllium	100		93.5		mg/Kg	94			80-120		
Cadmium	100		94.1		mg/Kg	94			80-120		
Chromium	100		95.4		mg/Kg	95			80-120		
Cobalt	100		99.9		mg/Kg	100			80-120		
Copper	100		96.9		mg/Kg	97			80-120		
Lead	100		98.7		mg/Kg	99			80-120		
Molybdenum	100		92.6		mg/Kg	93			80-120		
Nickel	100		99.7		mg/Kg	100			80-120		
Selenium	100		91.0		mg/Kg	91			80-120		
Silver	100		87.2		mg/Kg	87			80-120		
Thallium	100		90.6		mg/Kg	91			80-120		
Vanadium	100		98.9		mg/Kg	99			80-120		
Zinc	100		100		mg/Kg	100			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

	Sample	Spike Amount		Spike Result			Recoveries			Limits		
Analyte	Amount	MS	MSD	MS	MSD	Units	MS	MSD	RPD	%Rec	RPD	Notes
QC1194018MS1, QC1194018MSD1											**Source:**	**405017-004**
Antimony	2.46	100	100	36.0	33.5	mg/Kg	34	31	7.2	75-125	20	M
Arsenic	15.1	100	100	112	121	mg/Kg	97	106	7.7	75-125	20	
Barium	25.2	100	100	136	146	mg/Kg	111	121	7.1	75-125	20	
Beryllium	0.38	100	100	100	102	mg/Kg	100	102	2.0	75-125	20	
Cadmium	ND	100	100	96.5	98.5	mg/Kg	97	99	2.1	75-125	20	
Chromium	13.4	100	100	114	114	mg/Kg	101	101	0.0	75-125	20	
Cobalt	4.57	100	100	105	110	mg/Kg	100	105	4.7	75-125	20	
Copper	20.2	100	100	117	135	mg/Kg	97	115	14.3	75-125	20	
Lead	10.2	100	100	111	122	mg/Kg	101	112	9.4	75-125	20	
Molybdenum	0.28	100	100	88.2	89.1	mg/Kg	88	89	1.0	75-125	20	

QCBatchID: QC1194018	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 08/03/2018	Instrument: AAICP (group)

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194018MS1, QC1194018MSD1											**Source:**	**405017-004**
Nickel	9.10	100	100	111	120	mg/Kg	102	111	7.8	75-125	20	
Selenium	1.81	100	100	101	101	mg/Kg	99	99	0.0	75-125	20	
Silver	ND	100	100	89.6	90.7	mg/Kg	90	91	1.2	75-125	20	
Thallium	2.22	100	100	92.9	93.2	mg/Kg	91	91	0.3	75-125	20	
Vanadium	27.7	100	100	128	136	mg/Kg	100	108	6.1	75-125	20	
Zinc	57.2	100	100	155	177	mg/Kg	98	120	13.3	75-125	20	

QCBatchID: QC1194055	Analyst: sbailey-woo	Method: EPA 7471A
Matrix: Solid	Analyzed: 08/06/2018	Instrument: AAICP-HG1

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1194055MB1					
Mercury	ND	mg/Kg		0.14	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194055LCS1											
Mercury	0.83		0.90		mg/Kg	108			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1194055MS1, QC1194055MSD1											**Source:**	**405077-014**
Mercury	ND	0.83	0.83	0.85	0.80	mg/Kg	102	96	6.1	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.
931 W. Barkley Ave, Orange, CA 92868
Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 40597
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Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / **Test Instructions / Comments**

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-12, 2'	7/27/18	7:30	S	1		X	X								
2	, 5'		7:35													
3	, 10'		7:40													
4	, 15'		7:45													
5	, 18.5'		7:50													
6	B-17, 2'		9:00													
7	, 5'		9:05													
8	, 10'		9:10													
9	, 15'		9:20													
10	, 18.5'		9:25													

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	N&M / Geologist	7/28/18 [illegible]
1 Received By:	[illegible]	Saul [illegible]	EA	7/30/18 1315
2 Relinquished By:	[illegible]	Saul [illegible]	EA	7/30/18 1550
2 Received By:	[illegible]	[illegible]	EA	07/30/18 1550
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

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c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 405017

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Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / Test Instructions / Comments

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)	Test Instructions / Comments
1	B-16, 2'	7/27/18	11:00	S	1		X	X	
2	↓, 5'	↓	11:05	↓	↓		↓	↓	
3									
4	B-21, 2'		12:00				X	X	
5	↓, 5'	↓	12:05	↓	↓		↓	↓	
6									
7									
8									
9									
10									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Greg Wilson	N&M / Geologist	7/28/18 ±
1 Received By:	[signature]	Saul Rami	EA	7/30/18 1315
2 Relinquished By:	[signature]	Saul Rami	EA	7/30/18 1550
2 Received By:	[signature]	Andrew L. Shaw	EA	07/30/18 1550
3 Relinquished By:				
3 Received By:				

Lx/LHA

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SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore   Project: UCSD Pepper Canyon West

Date Received: 07/30/18   Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)   Sample Temp (°C) (No Cooler): ____

Sample Temp (°C), One from each cooler: #1: 4.8 #2: ____ #3: ____ #4: ____

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ____

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ____

Cooler Temp (°C): #1: 4.6 #2: ____ #3: ____ #4: ____

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ____ Date/Time ____

☐ Email (email sent to/on): ____ / ____

Project Manager's response:

Completed By: [signature] Date: 07/30/18

Enthalpy Analytical, LLC
931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com

Client:	Ninyo & Moore - San Diego	Lab Request:	405017
Address:	5710 Ruffin Road	Report Date:	09/11/2018
	San Diego, CA 92123	Date Received:	07/30/2018
		Client ID:	15885
Attn:	Lisa Bestard		

Comments: UCSD Pepper Canyon West
PO# 08614002

Supplemental Report 1 - STLC and TCLP results are reported herein.

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample #	Client Sample ID
405017-001	B-12, 2'
405017-005	B-12, 18.5'
405017-006	B-17, 2'
405017-011	B-16, 2'

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Ranjit K. K. Clarke

Report Review performed by: Ranjit Clarke, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	
Sampled:	07/30/2018 07:30	**Site:**			
Sample #:	**405017-001**	**Client Sample #:**	B-12, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.124**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**5.00**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 07:50	**Site:**			
Sample #:	**405017-005**	**Client Sample #:**	B-12, 18.5'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	ND	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**0.535**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 09:00	**Site:**			
Sample #:	**405017-006**	**Client Sample #:**	B-17, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.149**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**11.1**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

Matrix:	Solid	**Client:**	Ninyo & Moore - San Diego	**Collector:**	Client
Sampled:	07/30/2018 11:00	**Site:**			
Sample #:	**405017-011**	**Client Sample #:**	B-16, 2'	**Sample Type:**	

Analyte	Result	DF	RDL	Units	Prepared	Analyzed	By	Notes
Method: EPA 6010B *NELAC*	Prep Method: EPA 1311/3010A					QCBatchID: QC1195337		
Lead	**0.181**	1	0.05	mg/L	09/11/18	09/11/18	SBW	
Method: EPA 6010B *NELAC*	Prep Method: STLC					QCBatchID: QC1195265		
Lead	**6.06**	10	0.15	mg/L	09/07/18	09/07/18	SBW	

QCBatchID: QC1195265	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/07/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes	
QC1195265MB1						
Lead	**0.027**	mg/L		0.015		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample	Spike Amount		Spike Result		Units	Recoveries		RPD	Limits		Notes
	Amount	MS	MSD	MS	MSD		MS	MSD		%Rec	RPD	
QC1195265MS1, QC1195265MSD1											**Source:**	**404875-004**
Lead	0.200	10	10	7.31	7.50	mg/L	71	73	2.6	75-125	20	M

QCBatchID: QC1195337	Analyst: dswafford	Method: EPA 6010B
Matrix: Solid	Analyzed: 09/11/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units		RDL	Notes
QC1195337MB1					
Lead	ND	mg/L		0.05	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount LCS	Spike Amount LCSD	Spike Result LCS	Spike Result LCSD	Units	Recoveries LCS	Recoveries LCSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195337LCS1											
Lead	2		2.05		mg/L	103			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount MS	Spike Amount MSD	Spike Result MS	Spike Result MSD	Units	Recoveries MS	Recoveries MSD	RPD	Limits %Rec	Limits RPD	Notes
QC1195337MS1, QC1195337MSD1											**Source:**	**404875-004**
Lead	0.039	1	1	0.948	1.021	mg/L	91	98	7.4	75-125	20	

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds

ENTHALPY ANALYTICAL, LLC.
931 W. Barkley Ave, Orange, CA 92868
Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal
c/o Montrose Environmental Group
1 Park Plaza, Suite 1000, Irvine, CA 92614

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Chain of Custody Record

Lab No: 40597
Page: 1 of 2

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)									Test Instructions / Comments
1	B-12, 2'	7/27/18	7:30	S	1		X	X									
2	, 5'		7:35														
3	, 10'		7:40														
4	, 15'		7:45														
5	, 18.5'		7:50														
6	B-17, 2'		9:00														
7	, 5'		9:05														
8	, 10'		9:10														
9	, 15'		9:20														
10	, 18.5'		9:25														

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[illegible]	Greg Wilson	N+M / Geologist	7/28/18 ±
1 Received By:	[illegible]	Saul [illegible]	EA	7/30/18 1315
2 Relinquished By:	[illegible]	Saul [illegible]	EA	7/30/18 1550
2 Received By:	[illegible]	[illegible]	EA	07/30/18 1550
3 Relinquished By:				
3 Received By:				

ENTHALPY ANALYTICAL, LLC.

931 W. Barkley Ave, Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 405017

Page: 2 of 2

Matrix: A = Air DW = Drinking Water FL = Food Liquid FS = Food Solid L = Liquid PP = Pure Product S = Solid SeaW = Sea Water SW = Swab W = Water WP = Wipe O = Other

Turn Around Time (Rush by advanced notice only)

Standard:	X	4 Day:		3 Day:	
2 Day:		1 Day:		Same Day:	

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Ninyo & Moore	Name:	UCSD Pepper Canyon West
Report To:	Lisa Bestard	Number:	108614002
Email:	lbestard@ninyoandmoore.com	P.O. #:	108614002
Address:	5710 Ruffin Road	Address:	
	San Diego, CA 92123		
Phone:	858-576-1000 x11279	Global ID:	
Fax:	858-576-9600	Sampled By:	Greg Wilson

Analysis Request / Test Instructions / Comments

	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	Title 22 Metals (6010B/7471A)	TPH C8-C40 (8015M)								Test Instructions / Comments
1	B-16, 2'	7/27/18	11:00	S	1		X	X								
2	↓ , 5'	↓	11:05	↓	↓		↓	↓								
3																
4	B-21, 2'		12:00				X	X								
5	↓ , 5'	↓	12:05	↓	↓		↓	↓								
6																
7																
8																
9																
10																

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	GW	Greg Wilson	N+M / Geologist	7/28/18 ±
1 Received By:	[signature]	Saul Rami	EA	7/30/18 1315
2 Relinquished By:	[signature]	Saul Rami	EA	7/30/18 1550
2 Received By:	[signature]	Andrew L. Shaw	EA	07/30/18 1550
3 Relinquished By:				
3 Received By:				

Cx/CHA

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SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Ninyo & Moore　　Project: UCSD Pepper Canyon West

Date Received: 07/30/18　　Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1　☐ No (skip section 2)　Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 4.8 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 4.6 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✓
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?			✓
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______
☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: [signature]　　Date: 07/30/18

Ranjit Clarke

From: Lisa Bestard
Sent: Friday, August 31, 2018 9:21 AM
To: Ranjit Clarke; Sean Leffler
Subject: RE: UCSD Pepper Canyon

Ranjit-
Please analyze the following samples from the UCSD Pepper Canyon project for soluble lead by TCLP and STLC on a standard turnaround time:
B-15, 2'
B-19, 2'
B-10 @ 2'
B-9 @ 5'
B-20 @ 2'
B-17, 2'
B-22, 15'
B-16, 2'
B-12, 2'
B-12, 18.5'
B-2, 2'
B-24 @ 2'
B-3, 2'

Thank you,

Lisa Bestard
Senior Environmental Scientist
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants
5710 Ruffin Road | San Diego, CA 92123
(858) 576-1000 (x11279) | (858) 204-2864 (Cell) www.ninyoandmoore.com

30 Years of Quality Service

-----Original Message-----
From: Ranjit Clarke [mailto:ranjit.clarke@enthalpy.com]
Sent: Thursday, August 30, 2018 3:31 PM
To: Lisa Bestard <lbestard@ninyoandmoore.com>; Sean Leffler <sean.leffler@enthalpy.com>
Subject: RE: UCSD Pepper Canyon

Lisa,

APPENDIX D

Infiltration Testing

Test Date:	8/1/2018						Infiltration Test No.:	IT-1
Test Hole Diameter, D (inches):			6.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.00

t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:00	4.10	7:25	4.40	25	0.30	7	0.75	1.23
7:25	4.10	7:50	4.38	25	0.28	7	0.76	1.14
7:50	4.10	8:20	4.35	30	0.25	10	0.78	0.83
8:20	4.10	8:50	4.36	30	0.26	10	0.77	0.87
8:50	4.10	9:20	4.35	30	0.25	10	0.78	0.83
9:20	4.10	9:50	4.35	30	0.25	10	0.78	0.83
9:50	4.10	10:20	4.36	30	0.26	10	0.77	0.87
10:20	4.10	10:50	4.35	30	0.25	10	0.78	0.83
10:50	4.10	11:20	4.35	30	0.25	10	0.78	0.83
11:20	4.10	11:50	4.35	30	0.25	10	0.78	0.83
11:50	4.10	12:20	4.35	30	0.25	10	0.78	0.83
12:20	4.10	12:50	4.35	30	0.25	10	0.78	0.83

Test Date:	8/1/2018						Infiltration Test No.:	IT-2
Test Hole Diameter, D (inches):			6.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.00

t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:05	3.50	7:30	3.85	25	0.35	6	1.33	0.87
7:30	3.50	7:55	3.83	25	0.33	6	1.34	0.81
7:55	3.50	8:25	3.82	30	0.32	8	1.34	0.66
8:25	3.50	8:55	3.83	30	0.33	8	1.34	0.68
8:55	3.50	9:25	3.83	30	0.33	8	1.34	0.68
9:25	3.50	9:55	3.84	30	0.34	7	1.33	0.70
9:55	3.50	10:25	3.83	30	0.33	8	1.34	0.68
10:25	3.50	10:55	3.83	30	0.33	8	1.34	0.68
10:55	3.50	11:25	3.83	30	0.33	8	1.34	0.68
11:25	3.50	11:55	3.83	30	0.33	8	1.34	0.68
11:55	3.50	12:25	3.83	30	0.33	8	1.34	0.68
12:25	3.50	12:55	3.83	30	0.33	8	1.34	0.68

Notes:

t_1 = initial time when filling or refilling is completed

d_1 = initial depth to water in hole at t_1

t_2 = final time when incremental water level reading is taken

d_2 = final depth to water in hole at t_2

Δt = change in time between initial and final water level readings

ΔH = change in depth to water or change in height of water column (i.e., d_2 - d_1)

H_0 = Initial height of water column

in/hr = inches per hour

Percolation Rate to Infiltration Rate Conversion [1]

$$I_t = \frac{\Delta H \times 60 \times r}{\Delta t(r + 2H_{avg})}$$

I_t = tested infiltration rate, inches/hour

ΔH = change in head over the time interval, inches

Δt = time interval, minutes

r = effective radius of test hole

H_{avg} = average head over the time interval, inches

[1] Based on the "Porchet Method" as presented in:
Riverside County Flood Control, 2011, Design Handbook for Low Impact Development Best Management Practices: dated September.

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

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Appendix B

Drainage Study

Drainage Study for

UCSD Pepper Canyon West Housing and Open Space Preserve

Prepared For:

University of California, San Diego
San Diego, CA 92093

UCSD Project #5265

Project Location:

Gilman Drive & Villa La Jolla Drive
San Diego, CA 92093
City of San Diego, County of San Diego, CA

Prepared By:

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174027	February 2020
	REV. April 2020
	REV. May 15, 2020

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Section 1 Project Information

1.1 Project Description

The UCSD Pepper Canyon West Housing improvements include the demolition of existing on-site structures and associated hardscape within the 6.5-acre "project site." New student dormitories are proposed along with an access road, new landscape, and new hardscape. The project site drains easterly to a regional basin that will be improved as part of the proposed development. This large canyon-like depression is surrounded by existing development and has an approximate 63-acre tributary area.

Proposed improvements within the regional basin, herein "Open Space Preserve (OSP)," include grading and installation of rock, soil media, perforated sub-drains and a riser for regional flow control. In addition to providing storm water mitigation for the project site, the OSP has been designed to mitigate inflow from other on-going development projects within the tributary watershed, including: Triton Pavilion, Design and Innovation Center, Pepper Canyon Amphitheater, Mid Coast Trolley, Pepper Canyon West Housing (this project), and the Pepper Canyon Open Space Preserve (this project). The Voigt Drive street improvement project is located north east of the OSP and has been determined to drain southeasterly, via Sixth Lane, ultimately discharging into the open channel adjacent to I-5. This area is not accounted for in the OSP tributary area.

1.2 Project Features

Based on the Natural Resources Conservation Service's (NRCS) Websoil Survey, the Pepper Canyon West Housing project site is comprised of approximately 26.6-percent Chesterton fine sandy loam (CfB), with slopes ranging from 5 to 9 percent (hydrologic soil type D); and approximately 73.4-percent Altamont Clay (AtF) (hydrologic soil type C). During surface exploration Geocon Inc. encountered man-made fill material across the project site. Due to this material, the site is considered Hydrologic Soil Type D for hydrologic analyses.

Based on the Natural Resources Conservation Service's (NRCS) Websoil Survey, the OSP regional basin project site is comprised of approximately 0.8% Altamont clay (AtE2) soil type D, 19.9% Chesterton fine sandy loam (CfB) soil type D, Chesterton-urban land complex (CgC) soil type D, Huerhuero-Urban land complex (HuE) ssoil type D, and Salinas clay loam (SbC) soil type C.

The Federal Emergency Management Agency (FEMA) has not mapped a Special Flood Hazard Area (SFHA) within the project site vicinity nor the OSP regional basin. Both areas lie within un-shaded Zone X, which correlates with areas determined to be outside the 500-year floodplain. An exhibit is provided in Appendix A of this report.

An existing wetland has been identified in the southwest corner of the OSP. Development and/or any ground disturbance must be avoided within this area or the setback, which have been delineated on the exhibits included herein.

SANDAG is finalizing construction of the mid-coast trolley, which spans overtop the OSP regional basin. One of the support columns has been located within the OSP and is identified on the exhibits herein. Additionally, this project will inherit a post-construction BMP within the OSP, as left by SANDAG. This vegetated swale will be protected in place during construction and will continue to provide conveyance under post-construction conditions, to the maximum extent.

1.3 Scope of Report

The scope of this report includes project site analysis of the 10-year and 100-year peak flows under existing and proposed conditions. Project site analysis also includes sizing for new private, on-site storm drain infrastructure. This report also includes OSP regional basin tributary watershed analysis for the 10-year and 100-year peak flows, including the hydraulic performance of the existing and proposed outlet structures within the OSP regional basin. Refer to Section 3 for methodology and the appendices for exhibits.

This report does not address temporary Best Management Practices (BMPs) required during construction, refer to the project Storm Water Pollution Prevention Plan (SWPPP). Design of post Construction BMPs for the purposes of water quality are addressed in the project Storm Water Quality Management Plan (SWQMP). The OSP regional basin is included herein as it relates to peak flow attenuation.

UCSD is listed as a non-traditional Permittee of the Phase II Small MS4 General Permit, Order No. 2013-0001-DWQ NPDES No. CA2000004. To comply with Section F of the General Permit, *Non-Traditional Small MS4 Permittee Provisions*, UCSD has developed programs designed to reduce storm water pollution and protect water quality.

1.4 Existing Conditions: Pepper Canyon West Housing

The project site is developed in the existing condition and has been hydrologically analyzed as three drainage basins. Impervious area is comprised of concrete walkways, parking stalls, drive isles and roofing. Pervious area is comprised of landscape located within parking islands and adjacent to the existing building. Refer to Appendix B for an exhibit detailing the existing condition.

Basin 1 is approximately 2.04-acres and includes a portion of the parking lot on the northern edge of the site. Runoff is collected by curb inlets and conveyed easterly via existing storm drain. Runoff ultimately discharges from the project site through a 24” PVC pipe, which discharges into the canyon (OSP regional basin) just east of the site at drainage node 110.

Basin 2 is approximately 1.56-acres and includes existing structures, hardscape, and an existing courtyard. Runoff is collected via area drains and is conveyed east. Runoff ultimately discharges from the project site through a 36” RCP, which discharges into the canyon (OSP regional basin) just east of the site at drainage node 210.

Basin 3 is approximately 2.85-acres and includes existing buildings and the southerly existing parking area. Runoff is collected via two curb inlets located at the easterly end of the existing parking lot. Two separate pipes convey runoff easterly into the canyon (OSP regional basin) at drainage node 310.

1.5 Existing Conditions: Open Space Preserve (OSP)

SANDAG has recently completed construction of the mid-coast trolley, a portion of which is elevated over the OSP regional basin and is supported by a large column located within the OSP area. The OSP receives storm water inflow from a portion of the main campus and the surrounding adjacent areas, as shown on the exhibits in Appendix E. Storm water is ultimately discharge from the OSP in the southeast corner via two existing Type F inlets.

1. The first Type F inlet is 4’ x 4’ and is located in a small depression in the middle of the canyon. This inlet is connected to a second Type F inlet to the south by a 24” HDPE that transitions to a 30” RCP.
    a. A storm drain inspection performed by Affordable Pipeline Services in 2013 identified structural damage to the 30” RCP (See *Figures 1.5A & 1.5B* below). Survey data from the inspection is included in Appendix G
    b. This damage is not anticipated to impact conveyance capacity; however, proposed improvements include removal and replacement.
2. The second Type F inlet is 5’ x 5’ and has openings roughly 1.5’ above the opening of the first Type F inlet. These two inlets ultimately discharge Pepper Canyon to the south through a 48” RCP.

The 48” RCP, ultimately discharging into an open channel adjacent to I-5. The 2016 study identified this 48-inch RCP as partially clogged with sediment. (See *Figure 1.5A & B* below). The calculations and determination documented herein is predicated on the assumption this 48” RCP is unclogged and free of obstructions. As such, the 48” will require maintenance to remove all accumulated sediment, at which time new CCTV survey shall be completed to ensure additional maintenance is not required to achieve a clean, functioning storm drain system. Further discussion is included in Section 1.7 below.

Figure 1.5A – 50% pipe clogging in the 48" RCP

Figure 1.5B – Longitudinal cracking in 30" RCP. This 30" RPC is downstream of the 24" HDPE per the operator's verbal comments and survey reports (see Appendix G).

Figures 1.5A & 1.5B – Photographs of the 24" HDPE, 30" & 48" RCP documented by Affordable Pipeline Services 2013

An existing wetland area and associated channel has been identified within the OSP regional basin. The wetland and development setback are shown on the exhibits in Appendix E and will be protected.

1.6 Proposed Conditions: Pepper Canyon West Housing

New onsite roof leaders, area drains, and new private storm drains will collect and route project site runoff to the OSP regional basin to the east, consistent with existing conditions. Discharge from the project site will outlet at two locations: the first location is the northeast corner consistent with existing conditions (Node 110); the second location is the southeast corner consistent with existing conditions (Node 310). Refer to the Proposed Conditions Hydrology Exhibit in Appendix C for more details.

Basin 1 is approximately 3.68-acres and is comprised of the northerly half of the site. Runoff is collected via area drains and roof leaders and routed to the OSP regional basin via new storm drain.

Basin 2 is approximately 2.86-acres and is comprised of the southerly half of the site. Runoff is collected via area drains and roof leaders and routed to the OSP regional basin via new storm drain.

Refer to Appendix C for an exhibit detailing the project site under proposed conditions. The graded depressions can be sized for peak flow attenuation if desired by UCSD. Currently, all storm water compliance is achieved within the OSP regional basin.

1.7 Proposed Conditions: Open Space Preserve (OSP)

Proposed improvements include a graded and lined biofiltration basin within OSP located immediately east of the site. The biofiltration basin will feature 18" of engineered soil media over 24" of gravel. A network of 8" perforated PVC pipe will be located 3" above the bottom of the gravel layer and will connect to a newly proposed riser structure. Storm water will be allowed to pond 12" prior to discharge through the new riser. The two existing Type-F inlets will be removed and replaced with two new outlet structures sized to mitigated peak flow from the tributary area. New 48" storm drain is proposed in-place of the existing 24", 30" and 42" RCP and show on the proposed work map found in Appendix E.

The existing 48" RCP outlet pipe may require lining to repair spring line cracking, that determination will be made by others as on-going work within this vicinity is completed. Cal Trans has re-built the discharge headwall and the pipe is now considered free of sediment based on correspondence provided to MBI from the project team.

Section 2 Study Objectives & Deliverables

The specific objectives of this study are as follows:

- Quantify the Pepper Canyon West Housing 10-year and 100-year peak flow discharge rates under existing and proposed conditions;
- Quantify the OSP regional basin 10-year and 100-year peak flow discharge rates under existing and proposed conditions;
- Develop measures that demonstrate a reduction in 10-year and 100-year peak flow discharge from the Pepper Canyon West Housing development;
- Demonstrate the proposed improvements will not increase the potential for erosion on the project site or downstream area, not contribute to any adverse impacts associated with storm water runoff.

- Document this Hydraulic Grade Line for all new and existing storm drain, along with 10-year and 100-year water surface elevations within the OSP regional basin.

Section 3 Methodology

3.1 Hydrology

Advanced Engineering Solutions (AES – HydroWIN 2013) was used to model the hydrologic characteristics of the project site and off-site tributary area under pre and post development conditions. This software utilizes the Rational Method and conforms to the hydrologic methodologies outlined in the San Diego County Hydrology Manual (SDCHM, June 2003). The Rational Method is a physically based model that calculates peak flow rates (Q) as a function of runoff coefficients (C), rainfall intensities (I), and drainage areas (A):

$$Q = C * I * A$$

Weighted runoff coefficients (c) have been established using regional guidance for impervious and pervious area. Refer to the existing and proposed condition hydrologic work maps in Appendices B and C, respectively.

Time of concentration and rainfall intensities were developed internally within the AES software. The 'San Diego' AES module was used for this analysis and conforms to the methodologies described in the SDCHM (June 2003). This software is accepted by both the City and County of San Diego. Refer to Appendices B and C for existing and proposed condition calculations, respectively.

Area delineations were developed using project specific 1-foot contour topography.

The project site has been studied under existing and proposed on-site conditions to determine peak flow discharge. The OSP has been studied under two similar conditions; however, the watershed is assumed built-out in both scenarios. The OSP existing-condition analysis includes the project under existing conditions and the remainder of the watershed under ultimate built-out conditions. The OSP proposed-condition analysis assumes the project under proposed conditions and the remainder of the watershed under ultimate built-out conditions. The primary difference in the two OSP analyses is the existing and proposed OSP grading and outlet structures.

3.2 Hydraulics

The Hydraflow Hydrographs Extension within AutoCAD has been used to model peak flows from the project as they are mitigated by the regional basin (OSP). Hydrographs generated by Rick Engineering Company's RatHydro software have been routed through the storage area modeled in Hydraflow Hydrographs. Refer to Appendix C for the modelling input and output.

Bentley's Culvert Master has been used to analyze the capture capacity of the proposed pipes (vertical orifices) capturing runoff on-site under proposed conditions. Culvert Master solves for inlet and outlet control using built in FHWA Hydraulic Design of Highway Culverts (HDS-5) methodology.

Bentley's Flow Master has been used to analyze pipe flow capacity based on normal depth. Flow Master uses Manning's equation with user supplied pipe information (diameter, n value, slope, and Q) to determine normal depth within the proposed pipes. Given this software does not account for hydraulic losses associated with manholes and pipe angles, pipe capacity has not been maxed out; rather, limited to 75% full based on 100-year peak flow.

Section 4 Results

4.1 Hydrologic Results: Pepper Canyon West Housing

The tables below summarize the hydrologic results under existing and proposed conditions for the Pepper Canyon West Housing and Open Space Preserve (OSP) Regional Basin. Calculations are included in Appendices B (existing) and C (proposed).

Table 4-1 – Pepper Canyon West Housing Hydrologic Summary

Discharge Node	C	I Q10/Q100 (in/hr)	A (ac)	Q_{10} (cfs)	Q_{100} (cfs)
Existing Condition					
110	0.53	2.45/3.93	2.13	2.9	4.4
210	0.53	2.17/3.43	1.56	1.8	2.8
310	0.62	2.63/4.14	2.85	5.1	7.9
Total	**-**	**-**	**6.54**	**9.8**	**15.1**
Post-Development					
110	0.63	2.71/4.18	3.68	6.3	9.7
210	*Intentionally Blank**				
310	0.57	2.69/3.99	2.86	4.4	6.8
Total	**-**	**-**	**6.54**	**10.7**	**16.5**
*Under proposed conditions, the Pepper Canyon West Housing site will not discharge runoff at Node 210. Proposed On-site peak flow is mitigated to Pre-development conditions through attenuation provided via the OSP Regional Basin. Refer to Table 4-5.					

As shown above, proposed improvements result in decreased peak flow at the southerly end (Node 310) and increased peak flow at the northerly end. Overall, improvements will result in a slight total increase of peak flow into the OSP regional basin, as compared to pre-development conditions. The new OSP grading the outlet structures have been designed to mitigate this increase.

4.2 Hydrologic Results: Open Space Preserve (OSP)

The table below summarizes peak flow discharge into the Open Space Preserve (OSP) regional basin. These peak flows are derived from the AES hydrologic analyses and do not account for attenuation provided by the OSP Regional Basin. Refer to Table 4-5 for a summary of attenuation provided by the OSP and total peak flow discharge out of the OSP regional basin.

Table 4-2 – OSP Regional Basin Hydrologic Summary: Total Inflow

Node	Area	EX. Q_{10}	PR. Q_{10}	EX. Q_{100}	PR. Q_{100}
	(ac)	(cfs)	(cfs)	(cfs)	(cfs)
Southerly OSP Tributary Area					
1000	31.2	69.4	69.1	108.2	107.7
Northerly OSP Tributary Area					
3000	25.3	53.92	55.57	84.0	87.5
Confluence Nodes 1000 and 3000					
Total QSP Basin Inflow	63.7	131.2	130.7	204.8	206.7

Node 1000 is located at the southwesterly corner of the OSP regional basin. On-site sub-basin 300 is included within this analysis. Discharge into the OSP regional basin is 107.7 cfs during the 100-year, proposed storm event, at this location.

Node 3000 is located at the northerly end of the OSP regional basin. On-site sub-basins 100 and 200 are included within this analysis. Discharge into the OSP regional basin is 87.5 cfs during the 100-year, proposed storm event, at this location.

Hydrologic results for Nodes 1000 and 3000 have been confluenced within AES using respective times of concentration. As such, the total OSP inflow during 100-year, proposed condition, is 206.7 cfs. Adding peak flow at Nodes 1000 and 3000, to derive total basin inflow, does not account for the differing times of concentration and thus has been intentionally omitted.

Based on the project site's location within the OSP's total tributary area, proposed improvements do not have a significant impact on total inflow into the OSP. When considering a ***total confluence of all QSP Regional Basin inflow***, the proposed improvements result in a slightly reduced 10-year event and a slightly increased 100-year event. These results highlight the impact differing times of concentration, routing, and storm intensity can have on peak flow. Refer to Table 4-5 for total OSP regional basin discharge, which is a function of topography, hydrologic routing, and the hydraulic performance of the existing and proposed outlet structures.

4.3 Hydraulic Results: Pepper Canyon West Housing

Proposed on-site storm water infrastructure consists of area drains and storm drains. The table below summarizes proposed On-Site pipe flow capacities based on normal depth. In all cases, the most conservative 100-year peak flow rate has been used, with a pipe slope of 1.00%. A pipe slope of 1% represents the flattest proposed pipe slope and thus is conservative for locations where pipe slope is steeper. All area drains in sump have been sized to limit ponding depths to 6" during 100-year storms. Refer to Appendix D for capacity determination and Appendix D for a Hydraulic work map showing all on-site storm drain and inlets.

Table 4-3 – Pepper Canyon West Housing Storm Drain Capacity Summary

Node	Q100 (cfs)	Min. Pipe Diameter (in)	Normal Depth (in)	% Full	Velocity (ft/sec)
107	3.0	12	8.4	70.9	5.1
108	5.2	18	8.9	49.7	5.9
110	9.7	18	13.6	75.8	6.8
307	2.4	12	7.2	60.1	4.9
310	4.3	18	8.0	44.6	5.7

4.4 Hydraulic Results: Open Space Preserve (OSP)

The table below summarizes peak flow discharge out of the OSP regional basin. Peak flow discharge has been determined by routing hydrographs through the OSP under existing and proposed conditions.

Table 4-4 – OSP Regional Basin Hydrologic Summary: Total Discharge

ID	Outlet Type	C	A	Q_{10}	Q_{100}
		-	(ac)	(cfs)	(cfs)
Existing Condition	2 Type-F Inlets	0.82	64.8	73.5	94.8
Proposed Condition	2 Perforated Risers	0.82	64.8	53.9	85.6

The OSP regional basin has been designed to reduce 100-year peak flow by 9.2 cfs. Of this 9.2 cfs reduction, 1.4 cfs is attributed to the Pepper Canyon West Housing. This leaves an additional 7.8 cfs reduction that can be applied to the on-going projects within the OSP tributary area. Ponding depths, drawdown time, and volumes are tabulated below.

Table 4-6 – OSP Regional Basin Hydrologic Summary: Attenuation Results

ID	Outlet Type	10YR-Water Surface Elevation (ft)	100-YR Water Surface Elevation (ft)	100 -YR Drawdown Time (Hours)	100-YR storm water Volume tributary to OSP (cuft)
Existing Condition	2 F-Type Inlets	292.96	294.08	6.30	418,799
Proposed Condition	2 Perforated Risers	293.75	294.69	10.5	418,812

Two new risers are is proposed within the OSP to mitigate project site 10-year and 100-year peak flows, as well as provide additional attenuation for on-going projects located within the OSP tributary area. Additional coordination with UCSD is required to allocate the total peak flow mitigation achieved by the proposed riser and grading. Refer to Appendix E for calculations and exhibits.

Section 5 Conclusions

This report documents an anticipated reduction in peak flow, under 10-year and 100-year conditions, as a result of the proposed improvements at the Pepper Canyon West Housing site and the OSP regional basin.

An existing wetland area immediately downstream of Node 310 (within the OSP area) has been identified and shown on the exhibits included in Appendix E. The applicability of 401 and/or 404 permitting is currently under review. This report will be updated, and appropriate permits obtained (by others), as additional information on the proposed improvements within the QSP and the approving agencies interpretation of those improvements is finalized.

The proposed improvements will not result in an increase potential for erosion. Project site runoff is captured and conveyed to the OSP without in-site concentrated discharge. New discharge locations into the OSP are not proposed; rather, one (1) existing discharge location (Node 210 on the Existing Condition Hydrologic Work Map) will not be used under proposed conditions.

Existing storm drain infrastructure within the OSP will be replaced with new 48” RCP and perforated sub-drains. Ultimately, the OSP discharges to an open channel immediately adjacent to I-5 via an existing 48” RCP that will remain. This 48” RCP has been recently cleaned of sediment via on-going work (by others) within the outfall vicinity. Proposed improvements do not include changes or improvements at the 48” outfall. Additionally, proposed improvements result in a reduction in total peak flow, as compared to existing conditions. As such, the off-site open channel is expected to function better in the proposed condition, as compared to existing, based on a reduction in peak flow.

Section 6 CEQA Thresholds of Significance

1. **Will the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?**

The proposed project will not result in a substantial alteration to the existing drainage pattern across the site. Upon completion of the project, runoff will continue to discharge easterly into the Open Space Preserve (OSP) Regional Basin, as it does under existing conditions, as concentrated flow. No new discharge locations are proposed, and all existing discharge locations are adequately protected against erosion under present day conditions.

2. **Will the project increase water surface elevation in a watercourse within a watershed equal to or greater than 1 square mile, by 1 foot or more in height and in the case of the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River and Otay River, 2/10 of a foot or more?**

The project will not result in an increase to 100-year water surface elevations within any watercourse. The 100-year depth of flow within the OSP will be reduced, as compared to pre-development conditions, through proposed grading and a hydraulically improved outlet structure.

3. **Will the project result in increased velocities and peak flow rates exiting the project site that could cause flooding downstream or exceed the storm water drainage system capacity serving the site?**

The project will not increase peak flow rates leaving the OSP Regional Basin. The project will not cause flooding downstream, nor will it hydraulically impact on-site or downstream storm water infrastructure.

4. **Will the project result in placing housing, habitable structures, or unanchored impediments to flow in a 100-year floodplain area or other special flood hazard area, as shown on a FIRM, a County Flood Plain Map or County Alluvial Fan Map, which would subsequently endanger health, safety and property due to flooding?**

The project will not result in placing any structures within a 100-year floodplain or any other Special Flood Hazard Area (SFHA).

5. **Will the project place structures within a 100-year flood hazard or alter the floodway in a manner that would redirect or impede flow resulting in any of the following:**

    a. **Alter the line of inundation resulting in the placement of other housing in a 100 year flood hazard**

    b. **Increase water surface elevation in a watercourse with a watershed equal to or greater than 1 square mile by 1 foot or more in height and in the case of the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River and Otay River, 2/10 of a foot or more?**

The proposed project does not include fill, grading, or any other work within a mapped Regulatory Floodplain or Floodway. The project will not place any structures within a 100-year floodplain.

6. **Will the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

The proposed project will not result in a substantial alteration to the existing drainage pattern across the site. Upon completion of the project, runoff will continue to discharge easterly into the Open Space Preserve (OSP) Regional Basin, as it does under existing conditions, as concentrated flow. No new discharge locations are proposed, and all existing discharge locations are adequately protected against erosion under present day conditions.

7. **Will the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

The proposed project will not result in a substantial alteration to the existing drainage pattern across the site. Upon completion of the project, runoff will continue to discharge easterly into the Open Space Preserve (OSP) Regional Basin, as it does under existing conditions, as concentrated flow. No new discharge locations are proposed, and all existing discharge locations are adequately protected against erosion under present day conditions.

8. Will the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The project will not increase peak flow rates leaving the OSP Regional Basin. The project will not cause flooding downstream, nor will it hydraulically impact on-site or downstream storm water infrastructure.

9. Will the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No levees or dams are located within the project area or surrounding area. The proposed project will not result in a substantial alteration to the existing drainage pattern across the site. Upon completion of the project, runoff will continue to discharge easterly into the Open Space Preserve (OSP) Regional Basin, as it does under existing conditions, as concentrated flow. No new discharge locations are proposed, and all existing discharge locations are adequately protected against erosion under present day conditions.

10. Will the project cause inundation by seiche, tsunami, or mudflow?

Based on project location it is unlikely that the project is subject to inundation by seiche, tsunami or mudflow.

Section 7 Declaration of Responsible Charge

I, hereby declare that I am the Civil Engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by UCSD is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for the project design.

	5-15-2020
Jay Sullivan RCE 77445	Date

Section 8 Bibliography

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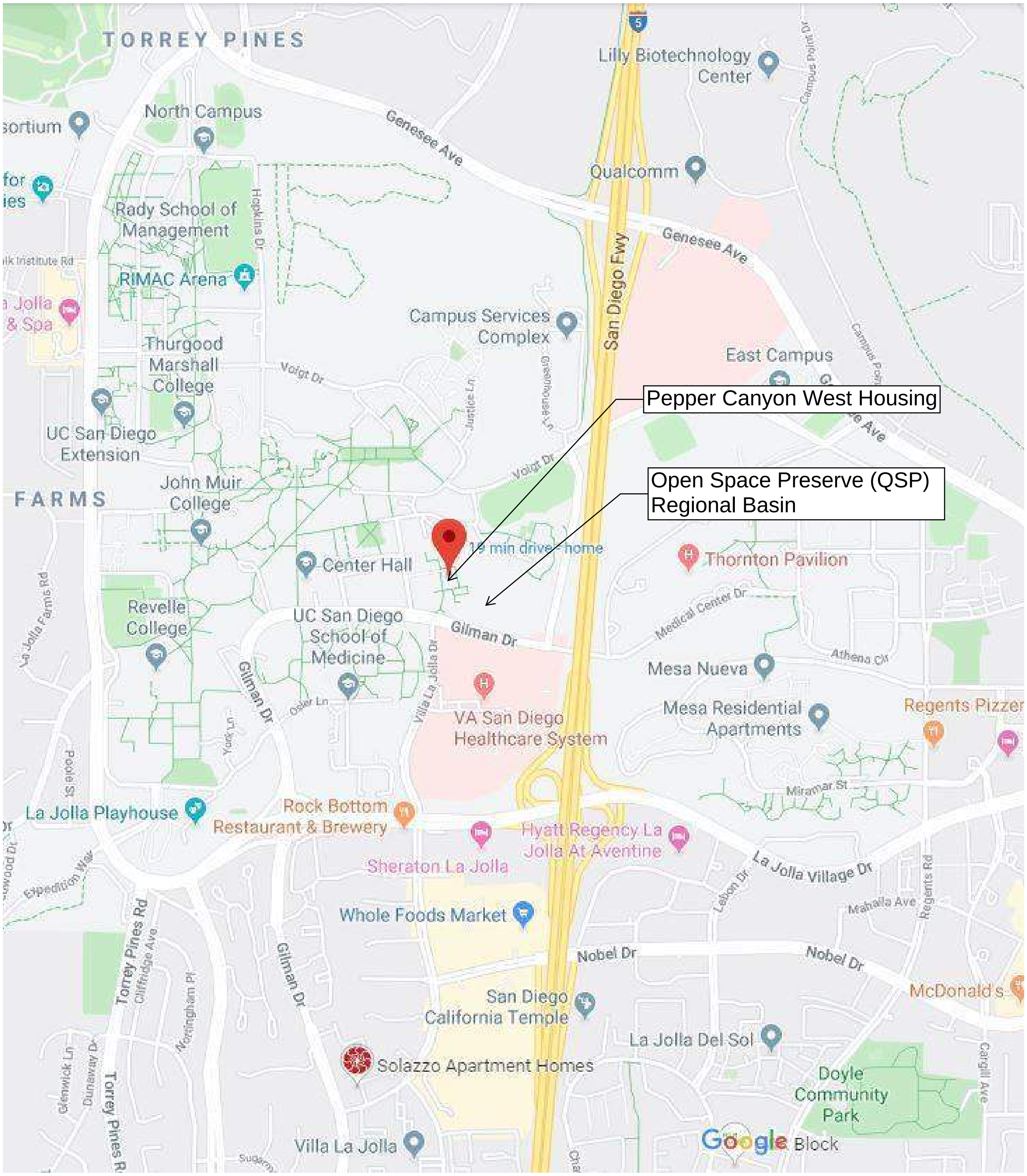
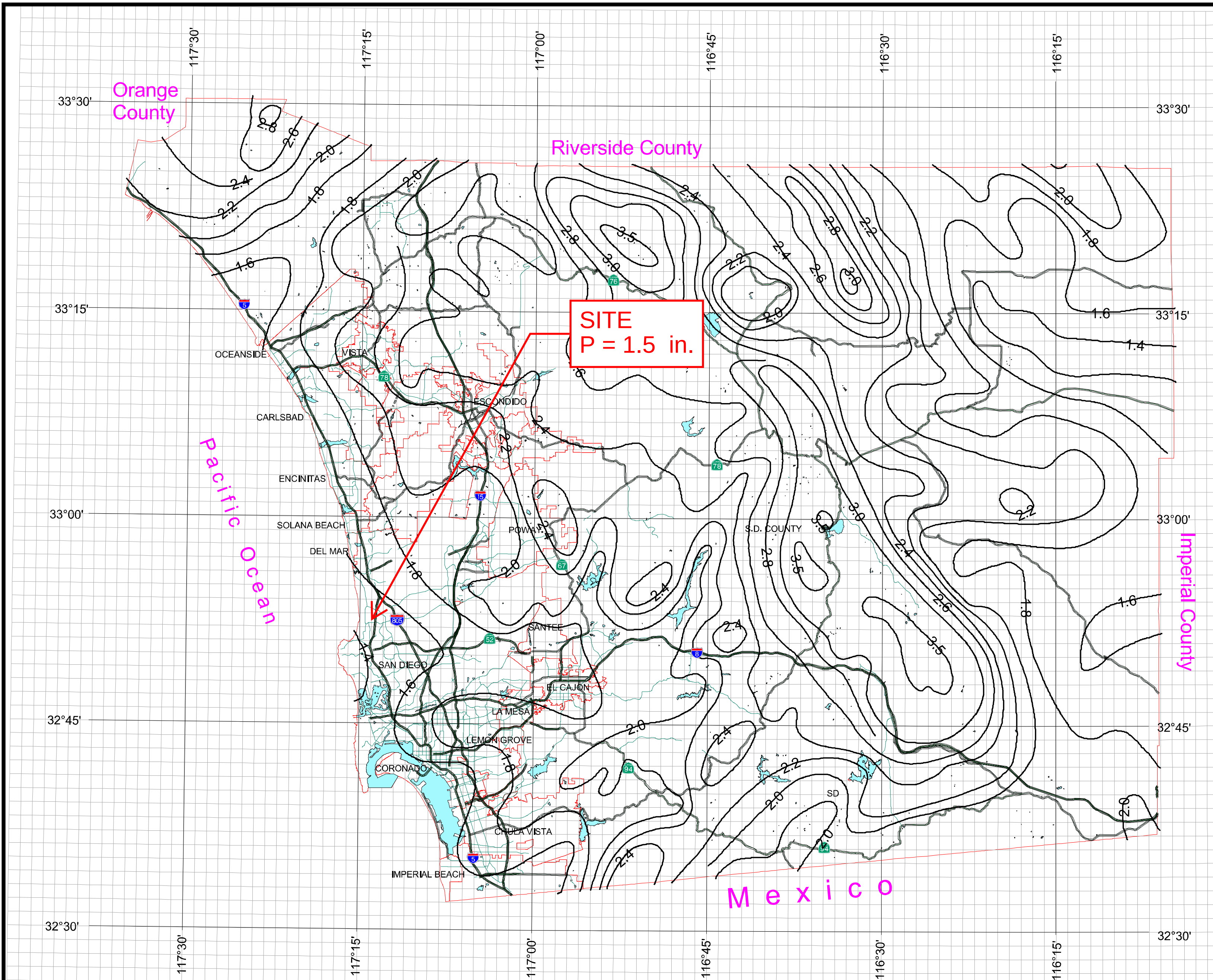
Appendix A – Site Information

Vicinity Map
Rainfall Isopluvials
FEMA FIRM
NRCS WebSoil Survey



VICINITY MAP

NO SCALE



County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 6 Hours

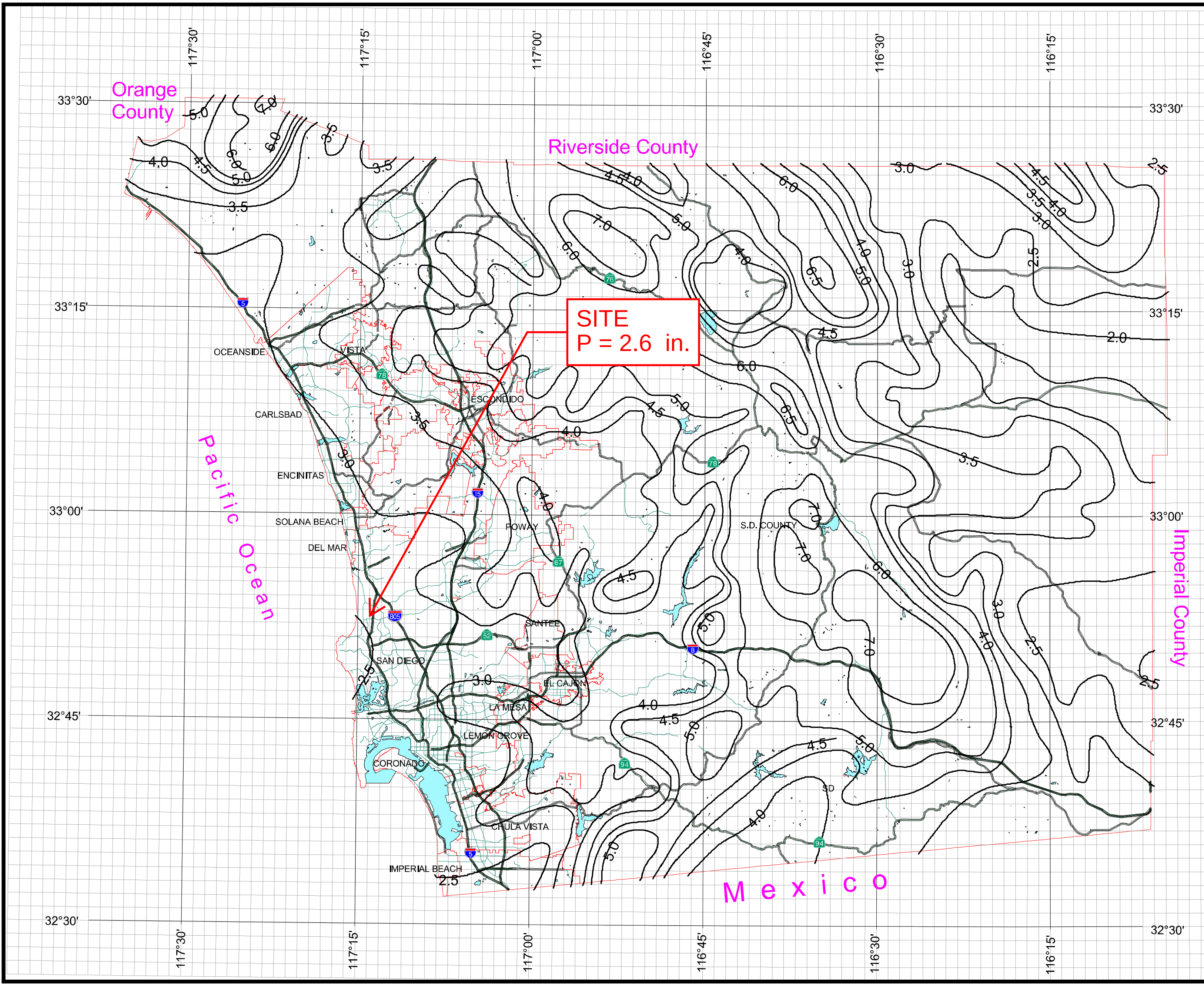
Isopluvial (inches)

DPW GIS
Department of Public Works Geographic Information Services

SanGIS
We Have San Diego Covered!

N S W E

3 0 3 Miles



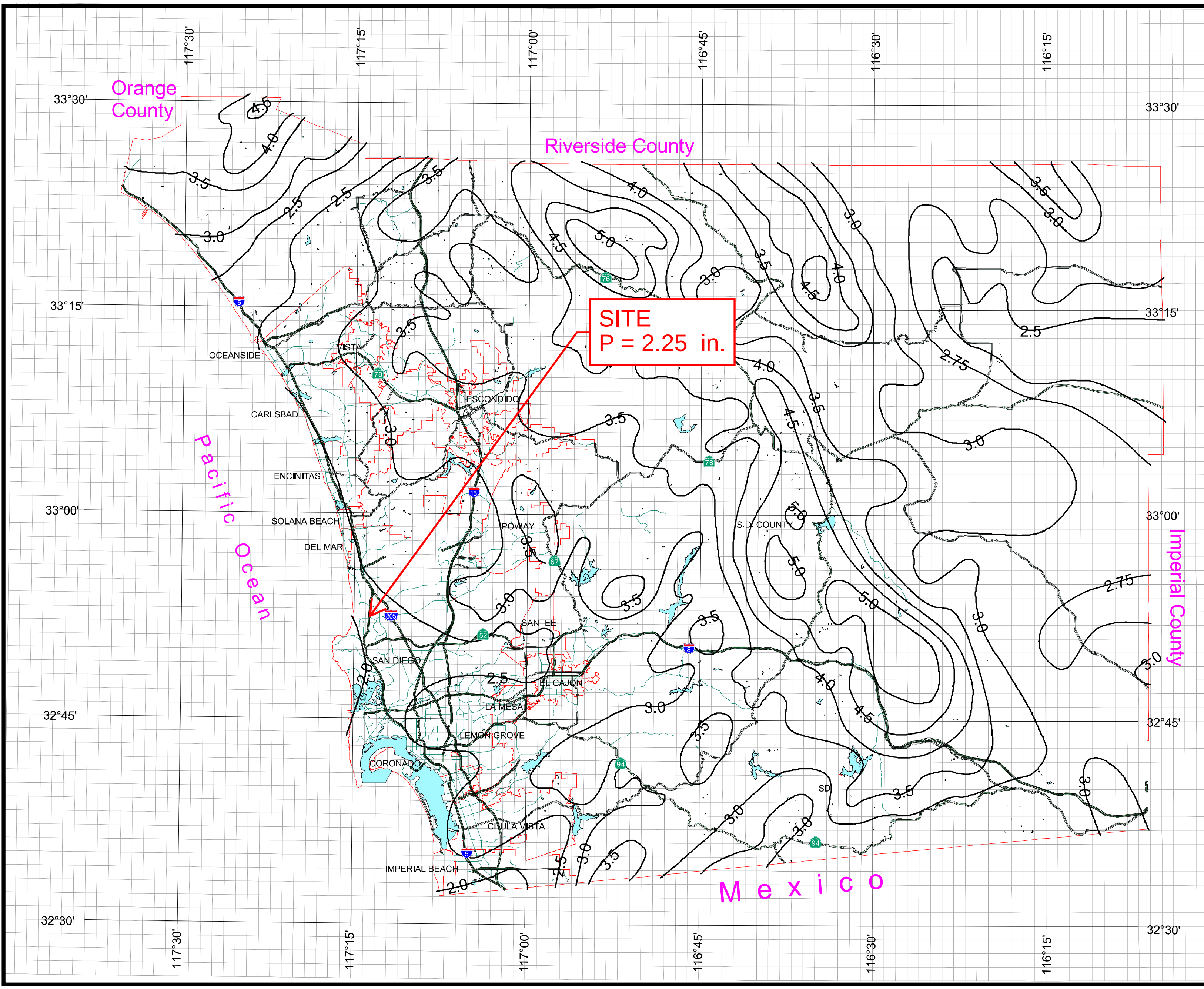
County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 24 Hours

Isopluvial (inches)

3 0 3 Miles



County of San Diego Hydrology Manual

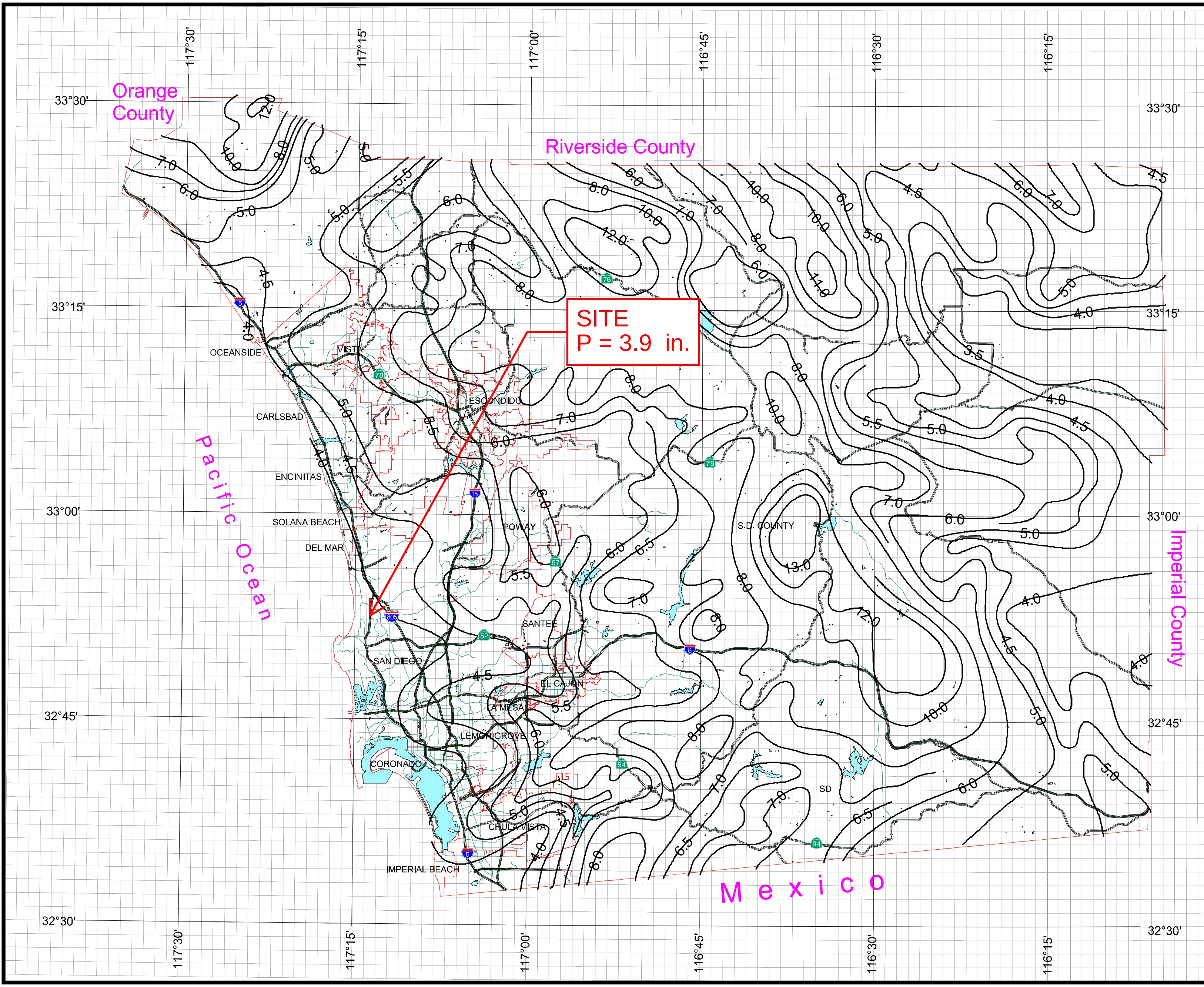
Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

N
W E
S

3 0 3 Miles



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

N
W
E
S

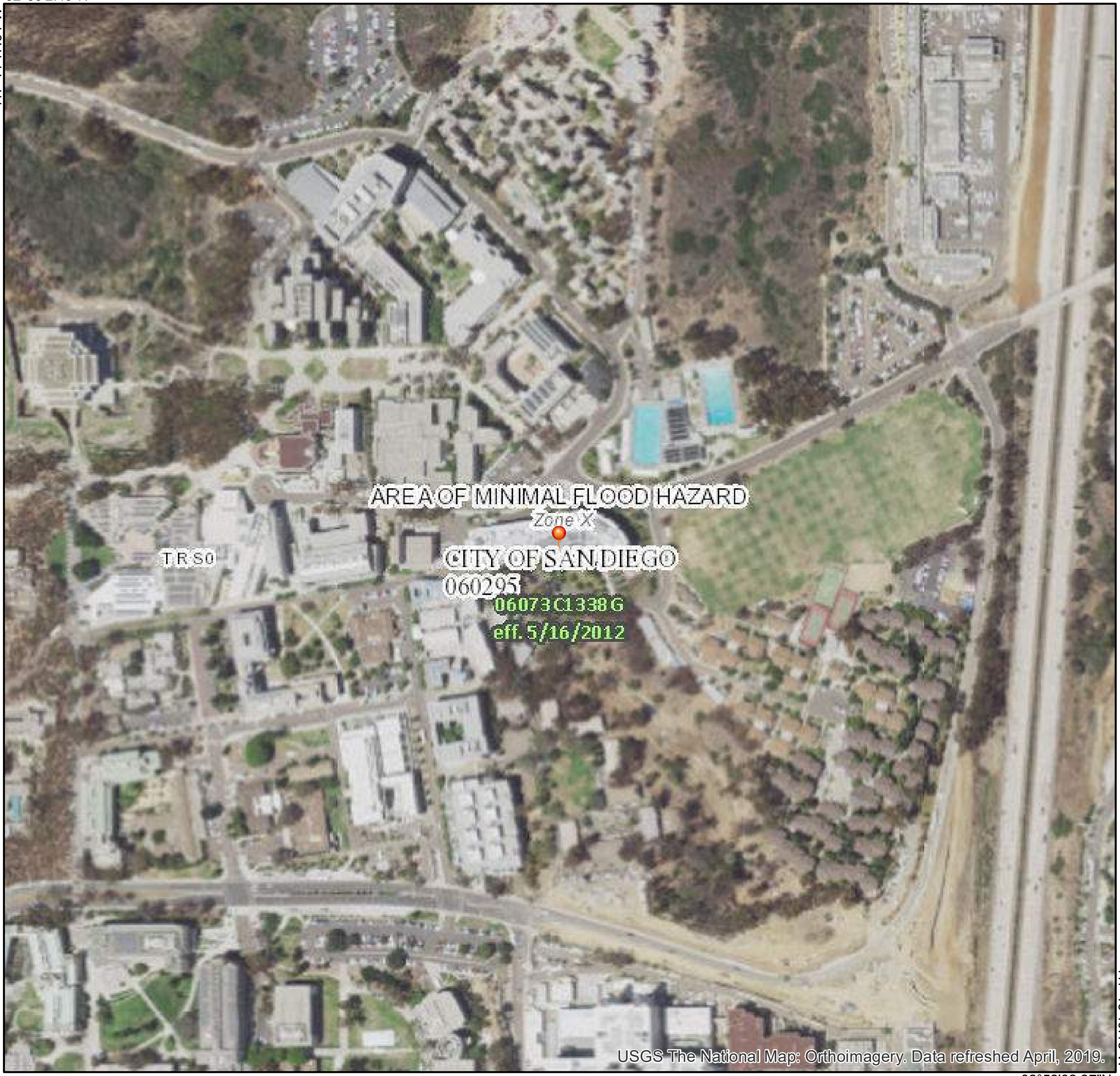
3 0 3 Miles

National Flood Hazard Layer FIRMette

FEMA

32°53'2.49"N

117°14'17.64"W



117°13'40.18"W

32°52'32.27"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

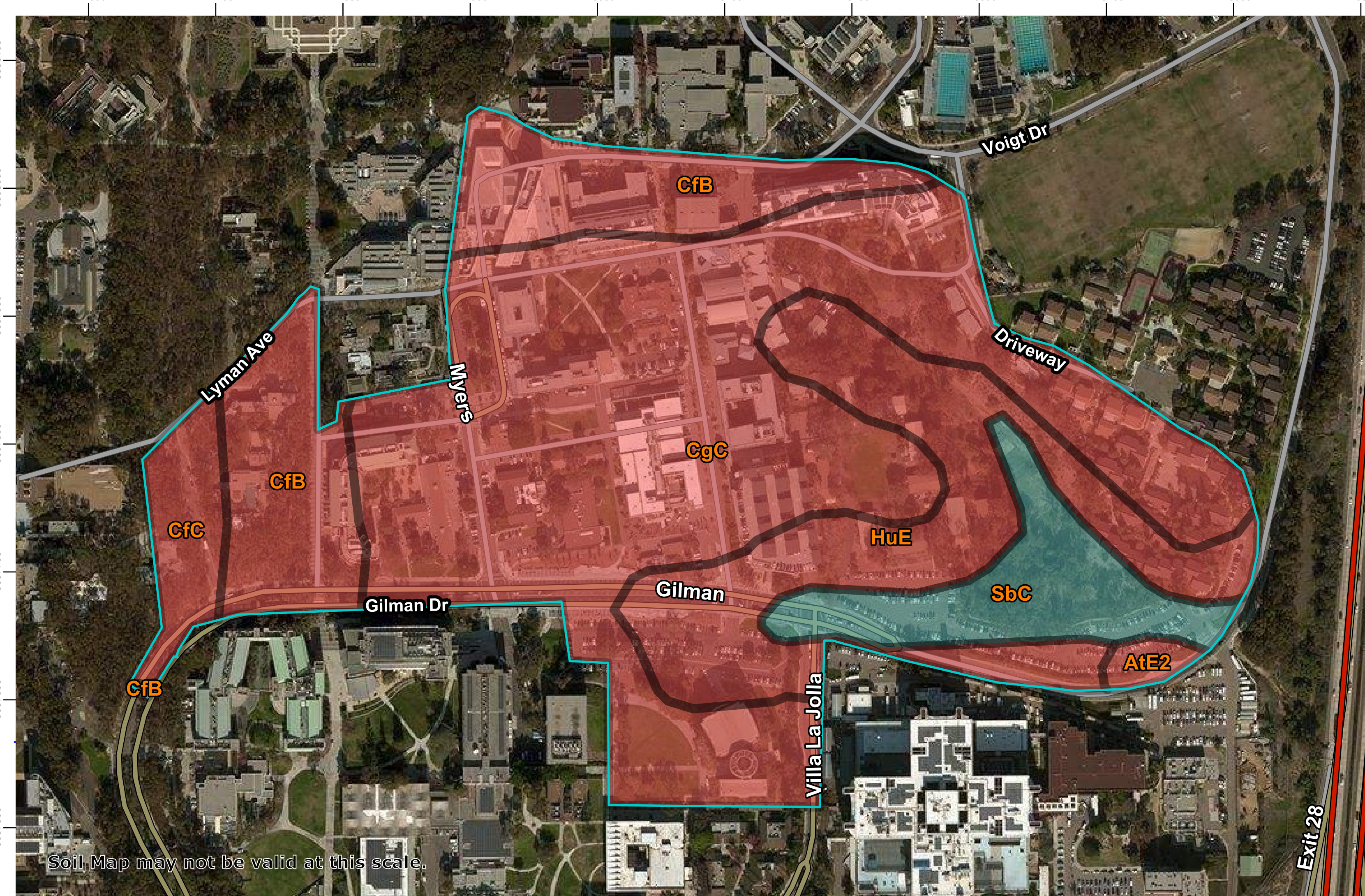
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/18/2019 at 10:51:01 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Map Scale: 1:4,880 if printed on A landscape (11" x 8.5") sheet.

N

0 50 100 200 300 Meters

0 200 400 800 1200 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 14, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtE2	Altamont clay, 15 to 30 percent slopes, eroded	D	0.6	0.8%
CfB	Chesterton fine sandy loam, 2 to 5 percent slopes	D	10.9	16.1%
CfC	Chesterton fine sandy loam, 5 to 9 percent slopes	D	2.5	3.8%
CgC	Chesterton-Urban land complex, 2 to 9 percent slopes	D	35.0	51.8%
HuE	Huerhuero-Urban land complex, 9 to 30 percent slopes	D	13.2	19.5%
SbC	Salinas clay loam, 2 to 9 percent slopes	C	5.4	8.0%
Totals for Area of Interest			**67.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

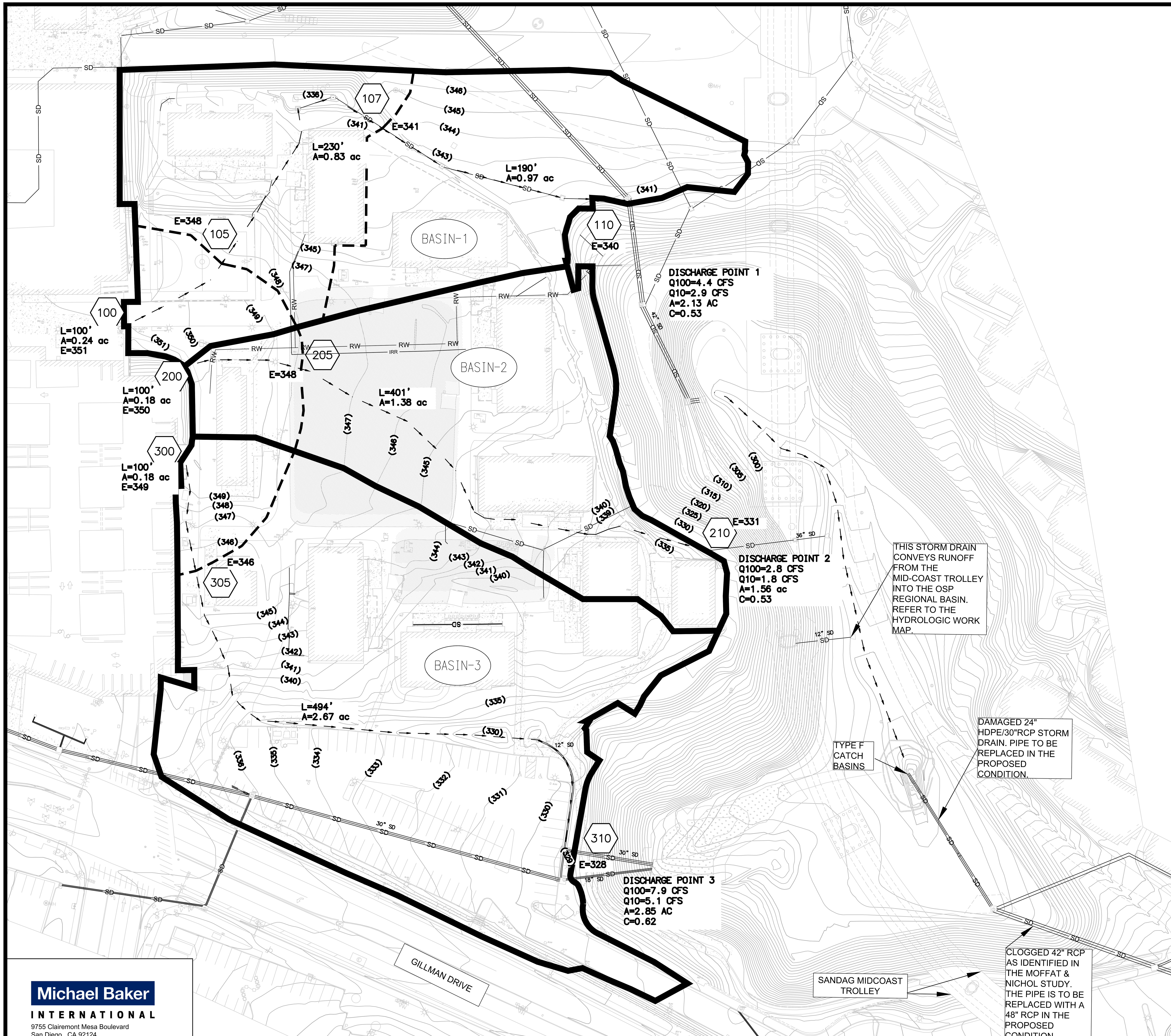
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B –Existing Hydrology

On-Site Hydrologic Work Map
AES Output



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LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 100 HYDROLOGY NODE
- 442 NODE ELEVATION

Basin 1 Existing

Impervious Area	31,476 SF	0.72 ac
Pervious Area	61,316 SF	1.41 ac
Total	92,792 SF	2.13 ac

Effective Imperviousness

((0.72*0.9)+(1.41*0.3)) = 1.07 ac

C factor = Effective Impervious/Total Basin Area C=1.07/2.13

C Value =0.50
Use C = 0.53

Basin 2 Existing

Impervious Area	22,304 SF	0.51 ac
Pervious Area	45,708 SF	1.05 ac
Total	68,012 SF	1.56 ac

Effective Imperviousness
((0.51*0.9)+(1.05*0.3)) = .77 ac
C factor = Effective Impervious/Total Basin Area C=0.77/1.56

C Value =0.50
Use C = 0.53

Basin 3 Existing

Impervious Area	61,959 SF	1.42 ac
Pervious Area	62,354 SF	1.43 ac
Total	124,313 SF	2.85 ac

Effective Imperviousness
((1.42*0.90)+(1.43*0.3)) = 1.70 ac
C factor = Effective Impervious/Total Basin Area C=1.70/2.85

C Value = 0.60
Use C = 0.62

PEPPER CANYON WEST HOUSING EXISTING CONDITION HYDROLOGIC WORK MAP

```
****************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2016 Advanced Engineering Software (aes)
           Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                          Analysis prepared by:





 ************************* DESCRIPTION OF STUDY **************************
* Pepper Canyon West Housing (on-site)                                    *
* 10 Year Study                                                           *
* Existing Condition                                                      *
 **************************************************************************

  FILE NAME: PEPEX10.DAT
  TIME/DATE OF STUDY: 14:19 04/02/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    351.00
  DOWNSTREAM ELEVATION(FEET) =    348.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.559
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
           (Reference: Table 3-1B of Hydrology Manual)
```

```
        THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.317
 SUBAREA RUNOFF(CFS) =      0.42
 TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    348.00  DOWNSTREAM(FEET) =    336.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00   CHANNEL SLOPE =  0.0522
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  10.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.713
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.60
 AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   2.40
 Tc(MIN.) =    8.96
 SUBAREA AREA(ACRES) =     0.83       SUBAREA RUNOFF(CFS) =    1.19
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.530
 TOTAL AREA(ACRES) =       1.1        PEAK FLOW RATE(CFS) =       1.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   1.69
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =     330.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   336.00  DOWNSTREAM(FEET) =   335.00
 FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.16
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.54
 PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =    9.96
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.534
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5300
 SUBAREA AREA(ACRES) =    1.06   SUBAREA RUNOFF(CFS) =    1.42
 TOTAL AREA(ACRES) =       2.1   TOTAL RUNOFF(CFS) =      2.86
 TC(MIN.) =    9.96

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    205.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    351.00
  DOWNSTREAM ELEVATION(FEET) =    348.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.749
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.257
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    210.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    348.00  DOWNSTREAM(FEET) =    331.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.00   CHANNEL SLOPE =  0.0424
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   3.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.119
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.12
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.05
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   6.39
  Tc(MIN.) =   13.14
  SUBAREA AREA(ACRES) =     1.38       SUBAREA RUNOFF(CFS) =    1.55
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.530
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =       1.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    210.00 =     501.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    305.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    350.00
  DOWNSTREAM ELEVATION(FEET) =    346.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.235
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    92.50
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.837
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    310.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    346.00  DOWNSTREAM(FEET) =    328.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   494.00   CHANNEL SLOPE =  0.0364
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.864
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.74
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   3.00
  Tc(MIN.) =    8.24
  SUBAREA AREA(ACRES) =     2.67       SUBAREA RUNOFF(CFS) =    4.74
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.620
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       5.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   3.38
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    310.00 =     594.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.9  TC(MIN.) =      8.24
  PEAK FLOW RATE(CFS)   =       5.06
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                            Analysis prepared by:





 ************************* DESCRIPTION OF STUDY *************************
* Pepper Canyon West Housing (on-site)                                    *
* 100 Year Study                                                          *
* Existing Condition                                                      *
 **************************************************************************

  FILE NAME: PEPEX100.DAT
  TIME/DATE OF STUDY: 14:25 04/02/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.250
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0    20.0     0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    351.00
  DOWNSTREAM ELEVATION(FEET) =    348.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.559
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
           (Reference: Table 3-1B of Hydrology Manual)
```

```
        THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.976
  SUBAREA RUNOFF(CFS) =      0.63
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.63

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    348.00  DOWNSTREAM(FEET) =    336.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00   CHANNEL SLOPE =  0.0522
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.110
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.69
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   2.26
  Tc(MIN.) =    8.82
  SUBAREA AREA(ACRES) =     0.83       SUBAREA RUNOFF(CFS) =    1.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.530
  TOTAL AREA(ACRES) =        1.1         PEAK FLOW RATE(CFS) =       2.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.80
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =     330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   336.00  DOWNSTREAM(FEET) =   335.00
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.56
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.33
  PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     520.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.863
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5300
  SUBAREA AREA(ACRES) =    1.06   SUBAREA RUNOFF(CFS) =    2.17
  TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       4.36
  TC(MIN.) =    9.71

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    205.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    351.00
  DOWNSTREAM ELEVATION(FEET) =    348.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.749
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.885
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    210.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    348.00  DOWNSTREAM(FEET) =    331.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.00   CHANNEL SLOPE =  0.0424
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   3.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.417
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.34
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   5.00
  Tc(MIN.) =   11.75
  SUBAREA AREA(ACRES) =     1.38       SUBAREA RUNOFF(CFS) =    2.50
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.530
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =      2.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.59
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    210.00 =     501.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    305.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    350.00
  DOWNSTREAM ELEVATION(FEET) =    346.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.235
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    92.50
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.755
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.64

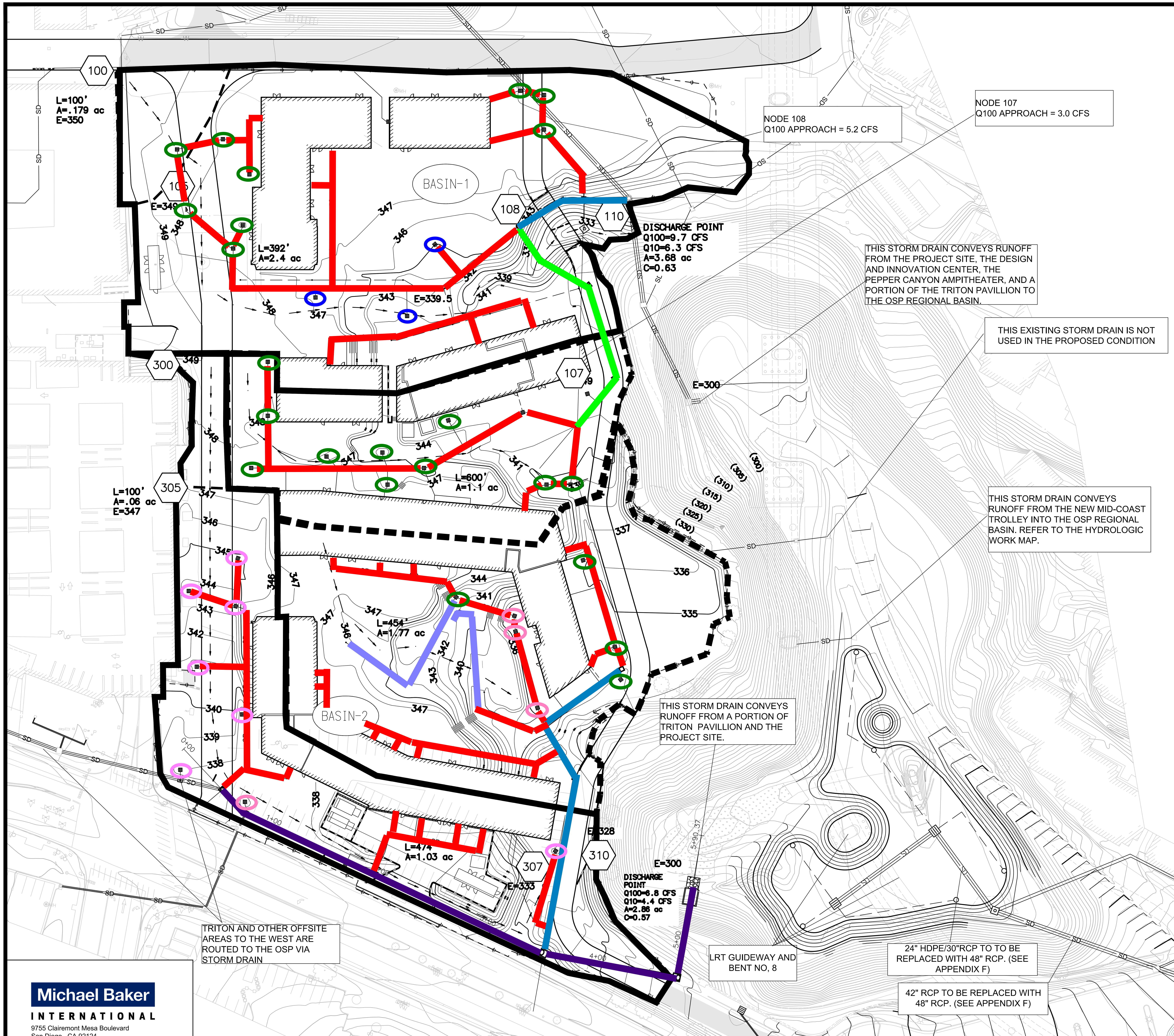
****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    310.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    346.00  DOWNSTREAM(FEET) =    328.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   494.00   CHANNEL SLOPE =  0.0364
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.464
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6200
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.26
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =    7.76
  SUBAREA AREA(ACRES) =     2.67       SUBAREA RUNOFF(CFS) =    7.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.620
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       7.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   4.00
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    310.00 =    594.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.9  TC(MIN.) =      7.76
  PEAK FLOW RATE(CFS)   =       7.89
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix C – Proposed Hydrology

On-Site Hydrologic Work Map
AES Output



LEGEND

DRAINAGE BOUNDARY
SUBAREA BOUNDARY
FLOW PATH
100 HYDROLOGY NODE
442 NODE ELEVATION
MAPPED SENSITIVE WETLANDS

Basin 1 Proposed		
Impervious Area	78,412 SF	1.80 ac
Pervious Area	81,845 SF	1.88 ac
Total	160,257 SF	3.68 ac
C Value =0.63		

Basin 2 Proposed		
Impervious Area	50,151 SF	1.15 ac
Pervious Area	74,430 SF	1.71 ac
Total	124,581 SF	2.86 ac
C Value =0.57		

12"X12" GRATE CAPACITY = 1.48 CFS (ACCOEMDATES 6" OF PONDING)

18"X18" GRATE CAPACITY = 2.23 CFS (ACCOMEDATES 6" OF PONDING)

24"X24" GRATE CAPACITY = 2.97 CFS (ACCOMEDATES 6" OF PONDING)

48" STORM DRAIN

24" STORM DRAIN

18" STORM DRAIN

12" STORM DRAIN

8" PERFORATED PIPE

PEPPER CANYON WEST HOUSING PROPOSED CONDITION HYDROLOGIC WORK MAP

Michael Baker INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

H:\PDATA\174027\CADD\STRMWATER\PEPPER CANYON ON SITE HYDROLOGY PR.DWG ROST, RYAN 5/5/2020 1:00 PM

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                             Analysis prepared by:





 ************************** DESCRIPTION OF STUDY **************************
* Pepper Canyon West Housing (on-site)                                     *
* 10-Year                                                                  *
* Proposed Condition                                                       *
 **************************************************************************

  FILE NAME: PEPPR10.DAT
  TIME/DATE OF STUDY: 10:33 02/02/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
| Begin Basin 1                                                            |
| North side of Pepper Canyon West Housing                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    350.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    349.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.553
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    60.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.319
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   349.00  DOWNSTREAM(FEET) =   339.50
  FLOW LENGTH(FEET) =   392.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   1.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.55
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.38
  PIPE TRAVEL TIME(MIN.) =   1.84    Tc(MIN.) =    8.39
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =    492.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.830
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    1.72   SUBAREA RUNOFF(CFS) =    3.07
  TOTAL AREA(ACRES) =        1.9   TOTAL RUNOFF(CFS) =      3.39
  TC(MIN.) =    8.39

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.830
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    1.11   SUBAREA RUNOFF(CFS) =    1.98
  TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =      5.37
  TC(MIN.) =    8.39

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.50  DOWNSTREAM(FEET) =   335.00
  FLOW LENGTH(FEET) =   206.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.52
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.37
```

```
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =    8.85
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     698.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.735
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    0.67   SUBAREA RUNOFF(CFS) =    1.15
  TOTAL AREA(ACRES) =       3.7   TOTAL RUNOFF(CFS) =      6.34
  TC(MIN.) =    8.85

+--------------------------------------------------------------------------+
| Begin Basin 2                                                            |
| South side of Pepper Canyon West Housing                                 |
| Node 200 intentionally omitted (no proposed discharge as compared to EX  |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    305.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    346.00
  DOWNSTREAM ELEVATION(FEET) =    343.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.275
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.413
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    310.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   343.00  DOWNSTREAM(FEET) =   328.00
  FLOW LENGTH(FEET) =   454.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   1.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.69
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.12
  PIPE TRAVEL TIME(MIN.) =   2.82    Tc(MIN.) =    9.09
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    310.00 =     554.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.688
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
  SUBAREA AREA(ACRES) =    1.77   SUBAREA RUNOFF(CFS) =    2.71
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =      2.80
  TC(MIN.) =    9.09

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.688
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
  SUBAREA AREA(ACRES) =    1.03   SUBAREA RUNOFF(CFS) =    1.58
  TOTAL AREA(ACRES) =        2.9   TOTAL RUNOFF(CFS) =      4.38
  TC(MIN.) =    9.09
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.9  TC(MIN.) =      9.09
  PEAK FLOW RATE(CFS)   =       4.38
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                             Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* Pepper Canyon West Housing (on-site)                                    *
* 100-Year                                                                *
* Proposed Condition                                                      *
 **************************************************************************

  FILE NAME: PEPPR100.DAT
  TIME/DATE OF STUDY: 10:38 02/02/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.250
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
| Begin Basin 1                                                            |
| North side of Pepper Canyon West Housing                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    105.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    350.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    349.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.553
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    60.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.979
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   349.00  DOWNSTREAM(FEET) =   339.50
  FLOW LENGTH(FEET) =   392.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   2.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.01
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.56
  PIPE TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =    8.18
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =    492.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.315
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    1.72   SUBAREA RUNOFF(CFS) =    4.68
  TOTAL AREA(ACRES) =        1.9   TOTAL RUNOFF(CFS) =      5.17
  TC(MIN.) =    8.18

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.315
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    1.11   SUBAREA RUNOFF(CFS) =    3.02
  TOTAL AREA(ACRES) =        3.0   TOTAL RUNOFF(CFS) =      8.18
  TC(MIN.) =    8.18

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.50  DOWNSTREAM(FEET) =   335.00
  FLOW LENGTH(FEET) =   206.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.47
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.18
```

```
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =    8.59
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     698.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.183
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6300
  SUBAREA AREA(ACRES) =    0.67   SUBAREA RUNOFF(CFS) =    1.77
  TOTAL AREA(ACRES) =        3.7   TOTAL RUNOFF(CFS) =       9.70
  TC(MIN.) =    8.59

+--------------------------------------------------------------------------+
| Begin Basin 2                                                            |
| South side of Pepper Canyon West Housing                                 |
| Node 200 intentionally omitted (no proposed discharge as compared to EX  |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    305.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    346.00
  DOWNSTREAM ELEVATION(FEET) =    343.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.275
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.120
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    310.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   343.00  DOWNSTREAM(FEET) =   328.00
  FLOW LENGTH(FEET) =   454.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   1.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.16
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.18
  PIPE TRAVEL TIME(MIN.) =   2.40    Tc(MIN.) =    8.67
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    310.00 =     554.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.156
  *USER SPECIFIED(SUBAREA):
```

```
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
  SUBAREA AREA(ACRES) =    1.77   SUBAREA RUNOFF(CFS) =    4.19
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =      4.34
  TC(MIN.) =    8.67

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    310.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.156
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5700
  SUBAREA AREA(ACRES) =    1.03   SUBAREA RUNOFF(CFS) =    2.44
  TOTAL AREA(ACRES) =        2.9   TOTAL RUNOFF(CFS) =      6.78
  TC(MIN.) =    8.67
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.9  TC(MIN.) =      8.67
  PEAK FLOW RATE(CFS)   =       6.78
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix D – Hydraulics

Storm Drain Pipe Capacity
Inlet Capacity

Storm Drain at Node 107

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Diameter	12.0 in
Discharge	3.00 cfs

Results

Normal Depth	8.4 in
Flow Area	0.6 ft²
Wetted Perimeter	2.0 ft
Hydraulic Radius	3.6 in
Top Width	0.91 ft
Critical Depth	8.9 in
Percent Full	70.3 %
Critical Slope	0.009 ft/ft
Velocity	5.08 ft/s
Velocity Head	0.40 ft
Specific Energy	1.10 ft
Froude Number	1.116
Maximum Discharge	3.83 cfs
Discharge Full	3.56 cfs
Slope Full	0.007 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	70.3 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.4 in
Critical Depth	8.9 in
Channel Slope	0.010 ft/ft
Critical Slope	0.009 ft/ft

Culvert Analysis Report
Culvert-1
HDWL at Node 107

Culvert Summary

Computed Headwater Eleva	101.17	ft	Discharge	3.00	cfs
Inlet Control HW Elev.	101.17	ft	Tailwater Elevation	N/A	ft
Outlet Control HW Elev.	101.17	ft	Control Type	Entrance Control	
Headwater Depth/Height	1.17				

Grades

Upstream Invert	100.00	ft	Downstream Invert	99.00	ft
Length	100.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.70	ft
Slope Type	Steep		Normal Depth	0.70	ft
Flow Regime	Supercritical		Critical Depth	0.74	ft
Velocity Downstream	5.08	ft/s	Critical Slope	0.008726	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	1.00	ft
Section Size	12 inch		Rise	1.00	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	101.17	ft	Upstream Velocity Head	0.36	ft
Ke	0.20		Entrance Loss	0.07	ft

Inlet Control Properties

Inlet Control HW Elev.	101.17	ft	Flow Control	Transition	
Inlet Type	Beveled ring, 45° bevels		Area Full	0.8	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	A	
C	0.03000		Equation Form	1	
Y	0.74000				

Storm Drain Upstream of Node 108

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Diameter	18.0 in
Discharge	5.20 cfs

Results

Normal Depth	8.9 in
Flow Area	0.9 ft²
Wetted Perimeter	2.3 ft
Hydraulic Radius	4.5 in
Top Width	1.50 ft
Critical Depth	10.5 in
Percent Full	49.7 %
Critical Slope	0.006 ft/ft
Velocity	5.93 ft/s
Velocity Head	0.55 ft
Specific Energy	1.29 ft
Froude Number	1.368
Maximum Discharge	11.30 cfs
Discharge Full	10.50 cfs
Slope Full	0.002 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	49.7 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.9 in
Critical Depth	10.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.006 ft/ft

Culvert Analysis Report
Culvert-1

HDWL at Node 108

Culvert Summary

Computed Headwater Eleva	101.31	ft	Discharge	5.20	cfs
Inlet Control HW Elev.	101.26	ft	Tailwater Elevation	N/A	ft
Outlet Control HW Elev.	101.31	ft	Control Type	Entrance Control	
Headwater Depth/Height	0.88				

Grades

Upstream Invert	100.00	ft	Downstream Invert	99.00	ft
Length	100.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	0.75	ft
Slope Type	Steep		Normal Depth	0.75	ft
Flow Regime	Supercritical		Critical Depth	0.88	ft
Velocity Downstream	5.93	ft/s	Critical Slope	0.005860	ft/ft

Section

Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	1.50	ft
Section Size	18 inch	Rise	1.50	ft
Number Sections	1			

Outlet Control Properties

Outlet Control HW Elev.	101.31	ft	Upstream Velocity Head	0.36	ft
Ke	0.20		Entrance Loss	0.07	ft

Inlet Control Properties

Inlet Control HW Elev.	101.26	ft	Flow Control	Unsubmerged	
Inlet Type	Beveled ring, 45° bevels		Area Full	1.8	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	A	
C	0.03000		Equation Form	1	
Y	0.74000				

Storm Drain at Node 110

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Diameter	18.0 in
Discharge	9.70 cfs

Results

Normal Depth	13.6 in
Flow Area	1.4 ft²
Wetted Perimeter	3.2 ft
Hydraulic Radius	5.4 in
Top Width	1.28 ft
Critical Depth	14.4 in
Percent Full	75.8 %
Critical Slope	0.009 ft/ft
Velocity	6.75 ft/s
Velocity Head	0.71 ft
Specific Energy	1.84 ft
Froude Number	1.124
Maximum Discharge	11.30 cfs
Discharge Full	10.50 cfs
Slope Full	0.009 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	75.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	13.6 in
Critical Depth	14.4 in
Channel Slope	0.010 ft/ft
Critical Slope	0.009 ft/ft

Storm Drain at Node 307

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Diameter	12.0 in
Discharge	2.40 cfs

Results

Normal Depth	7.2 in
Flow Area	0.5 ft²
Wetted Perimeter	1.8 ft
Hydraulic Radius	3.3 in
Top Width	0.98 ft
Critical Depth	8.0 in
Percent Full	60.1 %
Critical Slope	0.007 ft/ft
Velocity	4.87 ft/s
Velocity Head	0.37 ft
Specific Energy	0.97 ft
Froude Number	1.209
Maximum Discharge	3.83 cfs
Discharge Full	3.56 cfs
Slope Full	0.005 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	60.1 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.2 in
Critical Depth	8.0 in
Channel Slope	0.010 ft/ft
Critical Slope	0.007 ft/ft

Storm Drain at Node 310

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Diameter	18.0 in
Discharge	4.30 cfs

Results

Normal Depth	8.0 in
Flow Area	0.8 ft²
Wetted Perimeter	2.2 ft
Hydraulic Radius	4.2 in
Top Width	1.49 ft
Critical Depth	9.5 in
Percent Full	44.6 %
Critical Slope	0.006 ft/ft
Velocity	5.65 ft/s
Velocity Head	0.50 ft
Specific Energy	1.16 ft
Froude Number	1.393
Maximum Discharge	11.30 cfs
Discharge Full	10.50 cfs
Slope Full	0.002 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	44.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.0 in
Critical Depth	9.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.006 ft/ft

Culvert Analysis Report
Culvert-1
HDWL at Node 310

Culvert Summary

Computed Headwater Eleva	102.01	ft	Discharge	9.70	cfs
Inlet Control HW Elev.	102.01	ft	Tailwater Elevation	N/A	ft
Outlet Control HW Elev.	101.96	ft	Control Type	Inlet Control	
Headwater Depth/Height	1.34				

Grades

Upstream Invert	100.00	ft	Downstream Invert	99.00	ft
Length	100.00	ft	Constructed Slope	0.010000	ft/ft

Hydraulic Profile

Profile	S2		Depth, Downstream	1.14	ft
Slope Type	Steep		Normal Depth	1.14	ft
Flow Regime	Supercritical		Critical Depth	1.20	ft
Velocity Downstream	6.75	ft/s	Critical Slope	0.008893	ft/ft

Section

Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	1.50	ft
Section Size	18 inch		Rise	1.50	ft
Number Sections	1				

Outlet Control Properties

Outlet Control HW Elev.	101.96	ft	Upstream Velocity Head	0.63	ft
Ke	0.20		Entrance Loss	0.13	ft

Inlet Control Properties

Inlet Control HW Elev.	102.01	ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 45° bevels		Area Full	1.8	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	A	
C	0.03000		Equation Form	1	
Y	0.74000				

UCSD Pepper Canyon West Housiing
Grate Inlet Sizing/Capacity Calculations

GRATE INLET CAPACITY (GRATED INLET OPERATING AS A WEIR)											
On-Site Drainage Subarea	Q100 (cfs)	Sag or On-Grade	Grate Dimensions (ft)		Bar & Clog Factor (65%)[2]	Perimeter (ft)	Effective Perimeter (ft)	Grate Inlet Coefficient[1]		Capacity (cfs)	Needs to Be Upsized
			L	W	CL	P	Pe	C_w	d (PONDING)	Q	
12"X12" GRATE	1.47	Sag	1	1	0.65	4	1.4	3	0.5	1.48	No
18"X18" GRATE	2.22	Sag	1.5	1.5	0.65	6	2.1	3	0.5	2.23	No
24"X24" GRATE	2.96	Sag	2	2	0.65	8	2.8	3	0.5	2.97	No

1 Using equation 3-10 from the City of SD DDM

2 50% clogging and 15% for grate bars

UCSD Pepper Canyon West Housiing
Grate Inlet Sizing/Capacity Calculations

Sized per 50-year storm event as the storm frequeny for the pipes is to convey the 50-year. Section 3.1.2.2 of CSDDDM The basic criteria for storm drain inlet design shall be that any inlet will be sized to accept one hundred percent (100%) of the drainage received without bypass for the design storm frequency required for the system.

GRATE INLET CAPACITY (GRATED INLET OPERATING AS AN ORIFICE)											
On-Site Drainage Subarea	Q100 (cfs)	Sag or On-Grade	Grate Dimensions (ft)		Bar & Clog Factor (65%)[2]	Area (ft)	Effective Grate Area (sqft)	Orifice Coefficient	Ponding (ft)	Capacity (cfs)	Needs to Be Upsized
			L	W	CA	A	Ae	Co	d	Q	
12"X12" GRATE	1.35	Sag	1	1	0.65	4	1.4	0.67	0.5	5.32	No
18"X18" GRATE	2.05	Sag	1.5	1.5	0.65	6	2.1	0.67	0.5	7.98	No
24"X24" GRATE	2.10	Sag	2	2	0.65	8	2.8	0.67	0.5	10.65	No

1 Using equation 3-12 from the City of SD DDM
2 50% clogging and 15% for grate bars

CHAPTER 3: STREET DRAINAGE, CLEANOUTS, AND INLETS

Equation 3-10. Grate Inlet Capacity

$$Q = C_W P_e d^{3/2}$$

where:

Q	=	inlet capacity of the grated inlet (ft^3/s)
C_W	=	weir coefficient (C_W=3.0 for U.S. Traditional Units)
P_e	=	effective grate perimeter length (ft.)
d	=	flow depth approaching inlet (ft.)

To account for the effects of clogging of a grated inlet operating as a weir, a clogging factor of fifty percent (C_L=0.50) shall be applied to the actual (unclogged) perimeter of the grate (*P*). This is determined by Equation 3–11.

Equation 3-11. Grate Perimeter Length

$$P_e=(1-C_L)P$$

where:

P_e	=	effective grate perimeter length (ft)
C_L	=	clogging factor (C_L=0.50)
P	=	actual grate perimeter (ft.; i.e., the perimeter less the total width of bars or vanes), P=2W+L for grates next to a curb, and P=2(L+W) for grates with flow approaching from all sides

Step 2. Calculate the capacity of a grate inlet operating as an orifice. Use the orifice equation (Equation 3–12) assuming the clear opening of the grate reduced by a clogging factor C_A=0.50. A San Diego Regional Standard No. D-15 grate has an actual clear opening of A=4.7 ft^2. The FHWA Urban Drainage Design Manual (HEC 22) provides guidance for other grate types and configurations.

Equation 3-12. Capacity of Grate Inlet Operating as Orifice

$$Q=C_O A_e (2gd)^{1/2}$$

$$A_e=(1-C_A)A$$

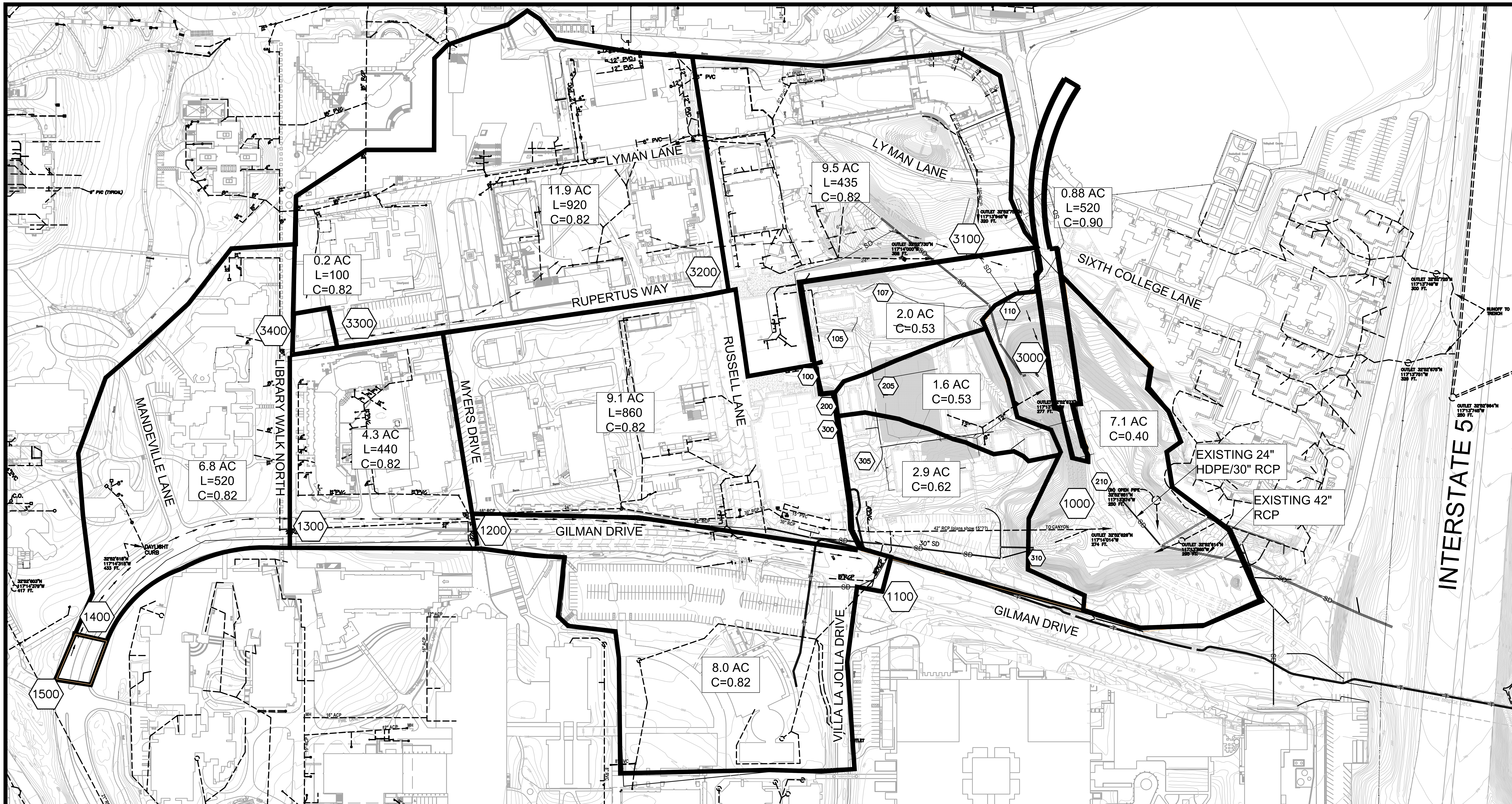
where:

Q	=	inlet capacity of the grated inlet (ft^3/s)
C_O	=	orifice coefficient (C_O=0.67 for U.S. Traditional Units)
g	=	gravitational acceleration (32.2 ft/s^2)
d	=	flow depth above inlet (ft)
A_e	=	effective grate area (ft^2)
C_A	=	area clogging factor (C_A=0.50)
A	=	actual opening area of the grate inlet (i.e., the total area less the area of bars or vanes)

Step 3. Use the more conservative of the two results.

Appendix E – Open Space Preserve (OSP) Regional Basin

Existing and Proposed:
AES
Work Maps
Hydrographs
Regional Basin Hydraulic Routing



LEGEND

	DRAINAGE BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
C=0.00	RUN-OFF COEFFICIENT
A=0.00	AREA (ACRES)
100	HYDROLOGY NODE
442	NODE ELEVATION

PEPPER CANYON REGIONAL BASIN
EXISTING WATERSHED HYDROLOGY

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

H:\PDATA\174027\CADD\STRMWATER\PEPPER CANYON REGIONAL BASIN HYDROLOGY EX.DWG ROST, RYAN 5/13/2020 10:48 PM

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____________________________________________________________________________
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            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                           Analysis prepared by:






 ************************** DESCRIPTION OF STUDY **************************
* Regional Basin                                                          *
* Existing Condition                                                      *
* 10 Year                                                                 *
 **************************************************************************

  FILE NAME: C:\EX10\RBEX10.DAT
  TIME/DATE OF STUDY: 08:54 05/14/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======   ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
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| Begin Southerly Off-Site analysis                                         |
| Tributary Area to OSP Regional Basin                                      |
|                                                                           |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1400.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    388.00
  DOWNSTREAM ELEVATION(FEET) =    386.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.464
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.952
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   1400.00 TO NODE   1300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  386.00  DOWNSTREAM ELEVATION(FEET) =  376.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.30
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.29
  STREET FLOW TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =    6.04
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.498
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =   19.50
  TOTAL AREA(ACRES) =        7.0        PEAK FLOW RATE(CFS) =      20.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.29
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.77
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1300.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE   1200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  376.00  DOWNSTREAM ELEVATION(FEET) =  362.00
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.27
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =    7.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.044
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =   10.73
  TOTAL AREA(ACRES) =       11.3        PEAK FLOW RATE(CFS) =      28.15
```

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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.84
  FLOW VELOCITY(FEET/SEC.) =  5.17   DEPTH*VELOCITY(FT*FT/SEC.) =   2.39
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1200.00 =    1060.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   362.00  DOWNSTREAM(FEET) =   339.00
  FLOW LENGTH(FEET) =   860.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.82
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.15
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1100.00 =    1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    8.00   SUBAREA RUNOFF(CFS) =   18.25
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      43.99
  TC(MIN.) =    8.61

****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    9.10   SUBAREA RUNOFF(CFS) =   20.76
  TOTAL AREA(ACRES) =       28.4   TOTAL RUNOFF(CFS) =      64.76
  TC(MIN.) =    8.61

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1000.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.00  DOWNSTREAM(FEET) =   336.00
  FLOW LENGTH(FEET) =   420.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  27.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.53
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.76
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =    9.35
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.35
  RAINFALL INTENSITY(INCH/HR) =   2.64
  TOTAL STREAM AREA(ACRES) =    28.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     64.76

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-site AES at Node 310 (existing condition)                    |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE   1000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   8.24   RAIN INTENSITY(INCH/HOUR) =  2.86
  TOTAL AREA(ACRES) =     2.85   TOTAL RUNOFF(CFS) =      5.06

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.24
  RAINFALL INTENSITY(INCH/HR) =   2.86
```

```
  TOTAL STREAM AREA(ACRES) =     2.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       64.76     9.35        2.640         28.38
      2        5.06     8.24        2.863          2.85

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       62.13     8.24       2.863
      2       69.42     9.35       2.640

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      69.42   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

+--------------------------------------------------------------------------+
| Begin Northerly Off-Site Analysis                                        |
| Tributary Area to OSP Regional Basin                                     |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3300.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
```

```
  UPSTREAM ELEVATION(FEET) =    376.00
  DOWNSTREAM ELEVATION(FEET) =    372.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.012
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.952
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.65
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.65

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  372.00  DOWNSTREAM ELEVATION(FEET) =  351.00
  STREET LENGTH(FEET) =   920.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.58
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   19.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =    6.21
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.436
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =   11.90      SUBAREA RUNOFF(CFS) =   33.53
  TOTAL AREA(ACRES) =       12.1        PEAK FLOW RATE(CFS) =      34.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  25.66
  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   3.48
```

```
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3200.00 =    1020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  351.00  DOWNSTREAM ELEVATION(FEET) =  348.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.16
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.70   FLOOD WIDTH(FEET) =   31.58
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.41
    SPLIT DEPTH(FEET) =    0.60   SPLIT FLOOD WIDTH(FEET) =   24.65
    SPLIT FLOW(CFS) =   17.00   SPLIT VELOCITY(FEET/SEC.) =    3.03
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   31.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.38
  STREET FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =    8.34
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.842
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    9.50      SUBAREA RUNOFF(CFS) =   22.14
  TOTAL AREA(ACRES) =       21.6        PEAK FLOW RATE(CFS) =      50.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
  FLOW VELOCITY(FEET/SEC.) =  3.41   DEPTH*VELOCITY(FT*FT/SEC.) =   2.38
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  435.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   30.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3100.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3100.00 =    1455.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   348.00  DOWNSTREAM(FEET) =   301.00
  FLOW LENGTH(FEET) =   316.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.31
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.33
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    8.53
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.53
  RAINFALL INTENSITY(INCH/HR) =   2.80
  TOTAL STREAM AREA(ACRES) =    21.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     50.33

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-Site                                         |
| Refer to On-Site AES at Node 110                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   9.96   RAIN INTENSITY(INCH/HOUR) =  2.53
  TOTAL AREA(ACRES) =     2.13   TOTAL RUNOFF(CFS) =      2.86

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.96
  RAINFALL INTENSITY(INCH/HR) =   2.53
```

```
  TOTAL STREAM AREA(ACRES) =     2.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.86

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-Site AES at Node 210 (existing condition)                    |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  13.14   RAIN INTENSITY(INCH/HOUR) =  2.12
  TOTAL AREA(ACRES) =     1.56   TOTAL RUNOFF(CFS) =      1.75

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.14
  RAINFALL INTENSITY(INCH/HR) =   2.12
  TOTAL STREAM AREA(ACRES) =     1.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       50.33     8.53        2.800         21.60
      2        2.86     9.96        2.534          2.13
      3        1.75    13.14        2.119          1.56

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       53.92     8.53       2.800
      2       49.73     9.96       2.534
      3       42.23    13.14       2.119

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      53.92   Tc(MIN.) =    8.53
```

```
  TOTAL AREA(ACRES) =       25.3
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

+--------------------------------------------------------------------------+
| Add Area from New Mid-Coast Trolley                                      |
| A = 0.88                                                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.800
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7818
  SUBAREA AREA(ACRES) =    0.88   SUBAREA RUNOFF(CFS) =    2.22
  TOTAL AREA(ACRES) =       26.2   TOTAL RUNOFF(CFS) =      57.29
  TC(MIN.) =    8.53

+--------------------------------------------------------------------------+
| Add area: OSP Regional Basin                                             |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.800
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6975
  SUBAREA AREA(ACRES) =    7.41   SUBAREA RUNOFF(CFS) =    8.30
  TOTAL AREA(ACRES) =       33.6   TOTAL RUNOFF(CFS) =      65.59
  TC(MIN.) =    8.53

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   1000.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

```
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       65.59     8.53       2.800       33.58
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   1000.00 =    1771.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       69.42     9.35       2.640       31.23
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     128.93       8.53        2.800
      2     131.24       9.35        2.640

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     131.24   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =       64.8
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       64.8  TC(MIN.) =      9.35
  PEAK FLOW RATE(CFS)   =     131.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/14/2020

TIME OF CONCENTRATION 9 MIN.

6 HOUR RAINFALL 2.25 INCHES

BASIN AREA 64.8

RUNOFF COEFFICIENT 0.75

PEAK DISCHARGE 131.24 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 9	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 4.4
TIME (MIN) = 27	DISCHARGE (CFS) = 4.4
TIME (MIN) = 36	DISCHARGE (CFS) = 4.6
TIME (MIN) = 45	DISCHARGE (CFS) = 4.7
TIME (MIN) = 54	DISCHARGE (CFS) = 4.9
TIME (MIN) = 63	DISCHARGE (CFS) = 5
TIME (MIN) = 72	DISCHARGE (CFS) = 5.2
TIME (MIN) = 81	DISCHARGE (CFS) = 5.3
TIME (MIN) = 90	DISCHARGE (CFS) = 5.5
TIME (MIN) = 99	DISCHARGE (CFS) = 5.7
TIME (MIN) = 108	DISCHARGE (CFS) = 6
TIME (MIN) = 117	DISCHARGE (CFS) = 6.2
TIME (MIN) = 126	DISCHARGE (CFS) = 6.5
TIME (MIN) = 135	DISCHARGE (CFS) = 6.8
TIME (MIN) = 144	DISCHARGE (CFS) = 7.2
TIME (MIN) = 153	DISCHARGE (CFS) = 7.5
TIME (MIN) = 162	DISCHARGE (CFS) = 8.2
TIME (MIN) = 171	DISCHARGE (CFS) = 8.6
TIME (MIN) = 180	DISCHARGE (CFS) = 9.5
TIME (MIN) = 189	DISCHARGE (CFS) = 10.1
TIME (MIN) = 198	DISCHARGE (CFS) = 11.5
TIME (MIN) = 207	DISCHARGE (CFS) = 12.5
TIME (MIN) = 216	DISCHARGE (CFS) = 15.3
TIME (MIN) = 225	DISCHARGE (CFS) = 17.4
TIME (MIN) = 234	DISCHARGE (CFS) = 25.6
TIME (MIN) = 243	DISCHARGE (CFS) = 36.3
TIME (MIN) = 252	DISCHARGE (CFS) = 131.24
TIME (MIN) = 261	DISCHARGE (CFS) = 20.5
TIME (MIN) = 270	DISCHARGE (CFS) = 13.7
TIME (MIN) = 279	DISCHARGE (CFS) = 10.7
TIME (MIN) = 288	DISCHARGE (CFS) = 9
TIME (MIN) = 297	DISCHARGE (CFS) = 7.8
TIME (MIN) = 306	DISCHARGE (CFS) = 7
TIME (MIN) = 315	DISCHARGE (CFS) = 6.3
TIME (MIN) = 324	DISCHARGE (CFS) = 5.8
TIME (MIN) = 333	DISCHARGE (CFS) = 5.4
TIME (MIN) = 342	DISCHARGE (CFS) = 5.1
TIME (MIN) = 351	DISCHARGE (CFS) = 4.8
TIME (MIN) = 360	DISCHARGE (CFS) = 4.5
TIME (MIN) = 369	DISCHARGE (CFS) = 0

```
____________________________________________________________________________
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* Regional Basin                                                           *
* Existing Condition                                                       *
* 100 Year                                                                 *
 **************************************************************************

  FILE NAME: C:\EX100\RBEX100.DAT
  TIME/DATE OF STUDY: 08:53 05/14/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.250
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
```

```
| Begin Southerly Off-Site analysis                                          |
| Tributary Area to OSP Regional Basin                                       |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1400.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    388.00
  DOWNSTREAM ELEVATION(FEET) =    386.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.464
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.928
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.87

****************************************************************************
  FLOW PROCESS FROM NODE   1400.00 TO NODE   1300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  386.00  DOWNSTREAM ELEVATION(FEET) =  376.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   14.80
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.59
  STREET FLOW TRAVEL TIME(MIN.) =   2.33   Tc(MIN.) =    5.80
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.388
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =   30.04
  TOTAL AREA(ACRES) =       7.0        PEAK FLOW RATE(CFS) =      30.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.41
  FLOW VELOCITY(FEET/SEC.) =  4.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1300.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE   1200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  376.00  DOWNSTREAM ELEVATION(FEET) =  362.00
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   19.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.83
  STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =    7.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.723
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =   16.65
  TOTAL AREA(ACRES) =      11.3        PEAK FLOW RATE(CFS) =      43.69
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  20.12
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1200.00 =    1060.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   362.00  DOWNSTREAM(FEET) =   339.00
  FLOW LENGTH(FEET) =   860.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.27
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.69
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =    8.12
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1100.00 =    1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.337
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    8.00   SUBAREA RUNOFF(CFS) =   28.45
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      68.57
  TC(MIN.) =    8.12

****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.337
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    9.10   SUBAREA RUNOFF(CFS) =   32.37
  TOTAL AREA(ACRES) =       28.4   TOTAL RUNOFF(CFS) =     100.94
  TC(MIN.) =    8.12

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1000.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.00  DOWNSTREAM(FEET) =   336.00
  FLOW LENGTH(FEET) =   420.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.49
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     100.94
  PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =    8.78
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.78
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    28.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    100.94

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-site AES at Node 310 (existing condition)                    |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE   1000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   7.76   RAIN INTENSITY(INCH/HOUR) =  4.46
  TOTAL AREA(ACRES) =     2.85   TOTAL RUNOFF(CFS) =      7.89

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.76
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.46
  TOTAL STREAM AREA(ACRES) =     2.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.89

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      100.94     8.78        4.122         28.38
      2        7.89     7.76        4.465          2.85

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       97.07     7.76       4.465
      2      108.22     8.78       4.122

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     108.22   Tc(MIN.) =    8.78
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

+--------------------------------------------------------------------------+
| Begin Northerly Off-Site Analysis                                        |
| Tributary Area to OSP Regional Basin                                     |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3300.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    376.00
  DOWNSTREAM ELEVATION(FEET) =    372.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.012
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.928
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  372.00  DOWNSTREAM ELEVATION(FEET) =  351.00
  STREET LENGTH(FEET) =   920.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.18
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   23.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.09
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =    5.90
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.329
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =   11.90      SUBAREA RUNOFF(CFS) =   52.00
  TOTAL AREA(ACRES) =       12.1        PEAK FLOW RATE(CFS) =      52.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
```

```
  FLOW VELOCITY(FEET/SEC.) =  6.20   DEPTH*VELOCITY(FT*FT/SEC.) =   4.33
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  920.0 FT WITH ELEVATION-DROP =  21.0 FT, IS   57.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3200.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3200.00 =    1020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  351.00  DOWNSTREAM ELEVATION(FEET) =  348.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.17
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   33.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =    7.86
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.427
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    9.50      SUBAREA RUNOFF(CFS) =   34.49
  TOTAL AREA(ACRES) =       21.6        PEAK FLOW RATE(CFS) =      78.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  34.54
  FLOW VELOCITY(FEET/SEC.) =  3.84   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  435.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   46.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3100.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3100.00 =    1455.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   348.00  DOWNSTREAM(FEET) =   301.00
  FLOW LENGTH(FEET) =   316.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.01
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      78.42
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.03
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.03
  RAINFALL INTENSITY(INCH/HR) =   4.37
  TOTAL STREAM AREA(ACRES) =    21.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     78.42

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-Site                                         |
| Refer to On-Site AES at Node 110                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   9.71   RAIN INTENSITY(INCH/HOUR) =  3.86
  TOTAL AREA(ACRES) =     2.13   TOTAL RUNOFF(CFS) =      4.40

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.71
  RAINFALL INTENSITY(INCH/HR) =   3.86
```

```
  TOTAL STREAM AREA(ACRES) =     2.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.40

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-Site AES at Node 210 (existing condition)                    |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.75   RAIN INTENSITY(INCH/HOUR) =  3.42
  TOTAL AREA(ACRES) =     1.56   TOTAL RUNOFF(CFS) =      2.82

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.75
  RAINFALL INTENSITY(INCH/HR) =   3.42
  TOTAL STREAM AREA(ACRES) =     1.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       78.42     8.03        4.367         21.60
      2        4.40     9.71        3.864          2.13
      3        2.82    11.75        3.416          1.56

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       83.98     8.03       4.367
      2       76.11     9.71       3.864
      3       68.06    11.75       3.416

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      83.98   Tc(MIN.) =    8.03
```

```
  TOTAL AREA(ACRES) =       25.3
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

+--------------------------------------------------------------------------+
| Add Area from New Mid-Coast Trolley                                      |
| A = 0.88                                                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.367
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7821
  SUBAREA AREA(ACRES) =    0.88   SUBAREA RUNOFF(CFS) =    3.46
  TOTAL AREA(ACRES) =       26.2   TOTAL RUNOFF(CFS) =      89.38
  TC(MIN.) =    8.03

+--------------------------------------------------------------------------+
| Add area: OSP Regional Basin                                             |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.367
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6978
  SUBAREA AREA(ACRES) =    7.41   SUBAREA RUNOFF(CFS) =   12.94
  TOTAL AREA(ACRES) =       33.6   TOTAL RUNOFF(CFS) =     102.32
  TC(MIN.) =    8.03

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   1000.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

```
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      102.32     8.03       4.367       33.58
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   1000.00 =    1771.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      108.22     8.78       4.122       31.23
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     201.28       8.03        4.367
      2     204.81       8.78        4.122

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     204.81   Tc(MIN.) =    8.78
  TOTAL AREA(ACRES) =       64.8
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       64.8  TC(MIN.) =      8.78
  PEAK FLOW RATE(CFS)   =     204.81
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/14/2020

TIME OF CONCENTRATION 9 MIN.

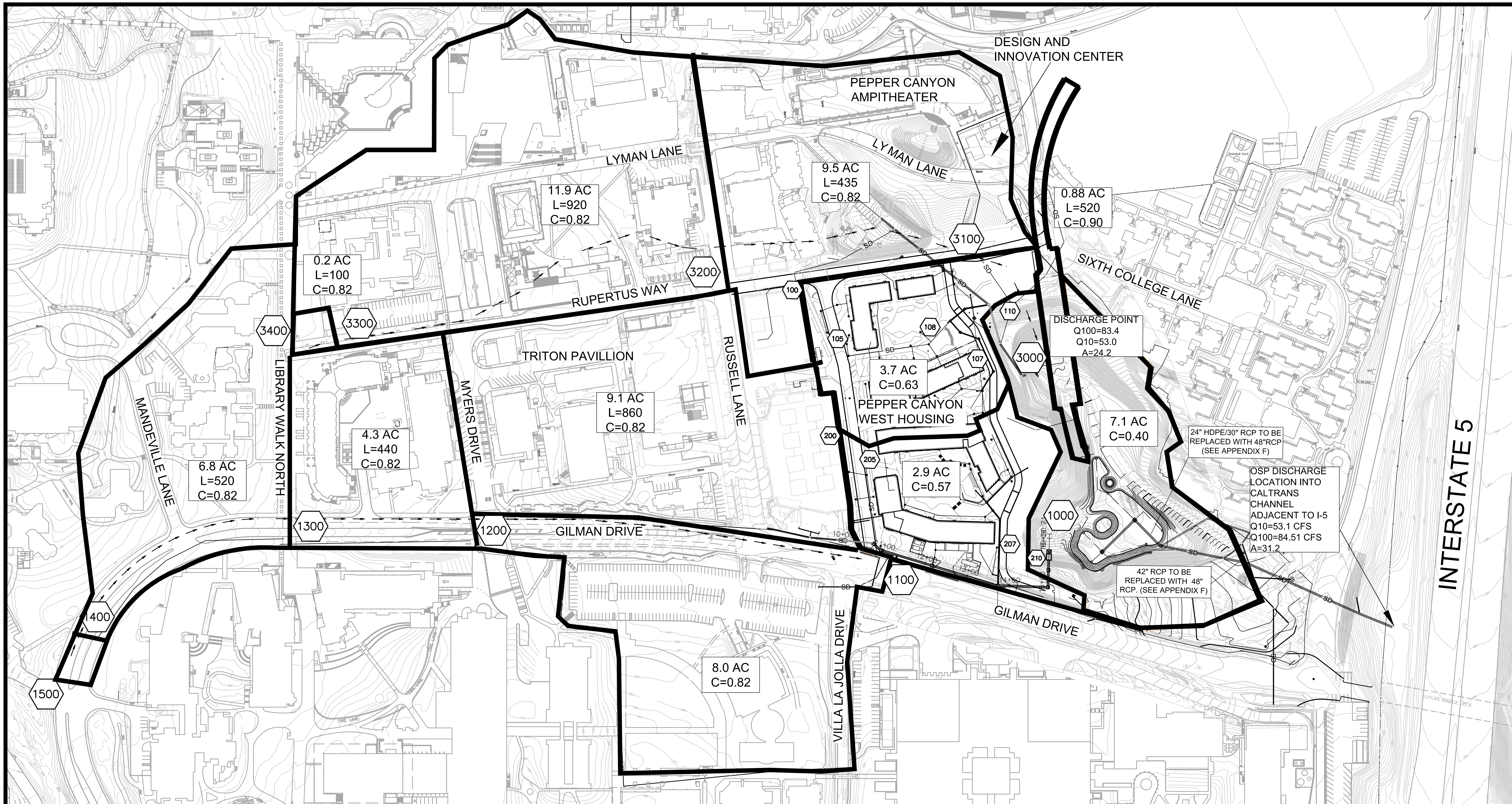
6 HOUR RAINFALL 2.25 INCHES

BASIN AREA 64.8

RUNOFF COEFFICIENT 0.75

PEAK DISCHARGE 204.81 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 9	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 6.5
TIME (MIN) = 27	DISCHARGE (CFS) = 6.6
TIME (MIN) = 36	DISCHARGE (CFS) = 6.9
TIME (MIN) = 45	DISCHARGE (CFS) = 7
TIME (MIN) = 54	DISCHARGE (CFS) = 7.3
TIME (MIN) = 63	DISCHARGE (CFS) = 7.4
TIME (MIN) = 72	DISCHARGE (CFS) = 7.8
TIME (MIN) = 81	DISCHARGE (CFS) = 7.9
TIME (MIN) = 90	DISCHARGE (CFS) = 8.3
TIME (MIN) = 99	DISCHARGE (CFS) = 8.5
TIME (MIN) = 108	DISCHARGE (CFS) = 9
TIME (MIN) = 117	DISCHARGE (CFS) = 9.2
TIME (MIN) = 126	DISCHARGE (CFS) = 9.8
TIME (MIN) = 135	DISCHARGE (CFS) = 10.1
TIME (MIN) = 144	DISCHARGE (CFS) = 10.9
TIME (MIN) = 153	DISCHARGE (CFS) = 11.3
TIME (MIN) = 162	DISCHARGE (CFS) = 12.3
TIME (MIN) = 171	DISCHARGE (CFS) = 12.8
TIME (MIN) = 180	DISCHARGE (CFS) = 14.2
TIME (MIN) = 189	DISCHARGE (CFS) = 15.1
TIME (MIN) = 198	DISCHARGE (CFS) = 17.3
TIME (MIN) = 207	DISCHARGE (CFS) = 18.8
TIME (MIN) = 216	DISCHARGE (CFS) = 23
TIME (MIN) = 225	DISCHARGE (CFS) = 26.1
TIME (MIN) = 234	DISCHARGE (CFS) = 38.4
TIME (MIN) = 243	DISCHARGE (CFS) = 46.9
TIME (MIN) = 252	DISCHARGE (CFS) = 204.81
TIME (MIN) = 261	DISCHARGE (CFS) = 30.8
TIME (MIN) = 270	DISCHARGE (CFS) = 20.6
TIME (MIN) = 279	DISCHARGE (CFS) = 16.1
TIME (MIN) = 288	DISCHARGE (CFS) = 13.5
TIME (MIN) = 297	DISCHARGE (CFS) = 11.7
TIME (MIN) = 306	DISCHARGE (CFS) = 10.5
TIME (MIN) = 315	DISCHARGE (CFS) = 9.5
TIME (MIN) = 324	DISCHARGE (CFS) = 8.7
TIME (MIN) = 333	DISCHARGE (CFS) = 8.1
TIME (MIN) = 342	DISCHARGE (CFS) = 7.6
TIME (MIN) = 351	DISCHARGE (CFS) = 7.1
TIME (MIN) = 360	DISCHARGE (CFS) = 6.8
TIME (MIN) = 369	DISCHARGE (CFS) = 0



LEGEND

(solid heavy line)	DRAINAGE BOUNDARY
(dashed line)	SUBAREA BOUNDARY
(dash-arrow line)	FLOW PATH
C=0.00	RUN-OFF COEFFICIENT
A=0.00	AREA (ACRES)
100	HYDROLOGY NODE
442	NODE ELEVATION

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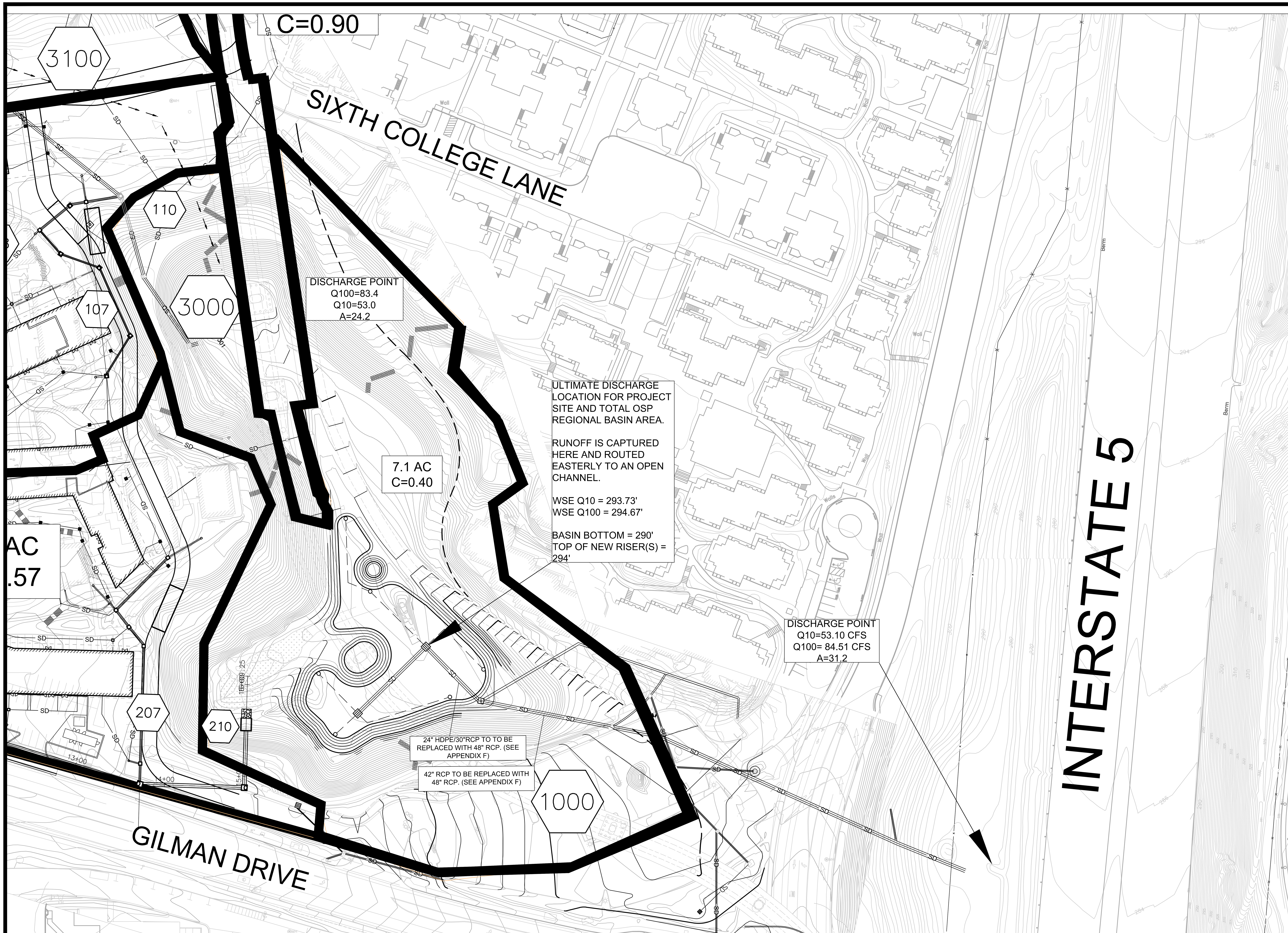
PEPPER CANYON REGIONAL BASIN WATERSHED HYDROLOGY

H:\PDATA\174027\CADD\STRMWATER\PEPPER CANYON REGIONAL BASIN HYDROLOGY PR.DWG ROST, RYAN 5/13/2020 11:37 PM



LEGEND

	DRAINAGE BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
C=0.00	RUN-OFF COEFFICIENT
A=0.00	AREA (ACRES)
100	HYDROLOGY NODE
442	NODE ELEVATION
	MAPPED SENSITIVE WETLAND

PEPPER CANYON REGIONAL BASIN
WATERSHED HYDROLOGY

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____________________________________________________________________________
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* Regional Basin                                                           *
* Proposed Condition                                                       *
* 10 Year                                                                  *
 **************************************************************************

  FILE NAME: C:\PR10\RBPR10.DAT
  TIME/DATE OF STUDY: 08:52 05/14/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
```

```
| Begin Southerly Off-Site analysis                                         |
| Tributary Area to OSP Regional Basin                                      |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1400.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    388.00
  DOWNSTREAM ELEVATION(FEET) =    386.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.464
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.952
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE   1400.00 TO NODE   1300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  386.00  DOWNSTREAM ELEVATION(FEET) =  376.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.30
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.29
  STREET FLOW TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =    6.04
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.498
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =   19.50
  TOTAL AREA(ACRES) =        7.0        PEAK FLOW RATE(CFS) =      20.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.29
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.77
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1300.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE   1200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  376.00  DOWNSTREAM ELEVATION(FEET) =  362.00
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.27
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =    7.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.044
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =   10.73
  TOTAL AREA(ACRES) =       11.3        PEAK FLOW RATE(CFS) =      28.15
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.84
  FLOW VELOCITY(FEET/SEC.) =  5.17   DEPTH*VELOCITY(FT*FT/SEC.) =   2.39
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1200.00 =    1060.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   362.00  DOWNSTREAM(FEET) =   339.00
  FLOW LENGTH(FEET) =   860.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.82
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.15
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1100.00 =    1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    8.00   SUBAREA RUNOFF(CFS) =   18.25
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      43.99
  TC(MIN.) =    8.61

****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.783
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    9.10   SUBAREA RUNOFF(CFS) =   20.76
  TOTAL AREA(ACRES) =       28.4   TOTAL RUNOFF(CFS) =      64.76
  TC(MIN.) =    8.61

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1000.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.00  DOWNSTREAM(FEET) =   336.00
  FLOW LENGTH(FEET) =   420.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  27.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.53
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.76
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =    9.35
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.35
  RAINFALL INTENSITY(INCH/HR) =   2.64
  TOTAL STREAM AREA(ACRES) =    28.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     64.76

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-site AES at Node 310                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE   1000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   9.09   RAIN INTENSITY(INCH/HOUR) =  2.69
  TOTAL AREA(ACRES) =     2.86   TOTAL RUNOFF(CFS) =      4.38

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.09
  RAINFALL INTENSITY(INCH/HR) =   2.69
```

```
  TOTAL STREAM AREA(ACRES) =     2.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.38

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       64.76     9.35        2.640         28.38
      2        4.38     9.09        2.688          2.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       67.34     9.09       2.688
      2       69.06     9.35       2.640

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      69.06   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

+--------------------------------------------------------------------------+
| Begin Northerly Off-Site Analysis                                        |
| Tributary Area to OSP Regional Basin                                     |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3300.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
```

```
  UPSTREAM ELEVATION(FEET) =    376.00
  DOWNSTREAM ELEVATION(FEET) =    372.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.012
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.952
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.65
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.65

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  372.00  DOWNSTREAM ELEVATION(FEET) =  351.00
  STREET LENGTH(FEET) =   920.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.58
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   19.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =    6.21
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.436
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =   11.90      SUBAREA RUNOFF(CFS) =   33.53
  TOTAL AREA(ACRES) =       12.1        PEAK FLOW RATE(CFS) =      34.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  25.66
  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   3.48
```

```
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3200.00 =    1020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  351.00  DOWNSTREAM ELEVATION(FEET) =  348.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.16
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.70   FLOOD WIDTH(FEET) =   31.58
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.41
    SPLIT DEPTH(FEET) =    0.60   SPLIT FLOOD WIDTH(FEET) =   24.65
    SPLIT FLOW(CFS) =   17.00   SPLIT VELOCITY(FEET/SEC.) =    3.03
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   31.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.38
  STREET FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =    8.34
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.842
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    9.50      SUBAREA RUNOFF(CFS) =   22.14
  TOTAL AREA(ACRES) =       21.6        PEAK FLOW RATE(CFS) =      50.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
  FLOW VELOCITY(FEET/SEC.) =  3.41   DEPTH*VELOCITY(FT*FT/SEC.) =   2.38
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  435.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   30.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3100.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3100.00 =    1455.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   348.00  DOWNSTREAM(FEET) =   301.00
  FLOW LENGTH(FEET) =   316.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.31
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.33
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    8.53
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.53
  RAINFALL INTENSITY(INCH/HR) =   2.80
  TOTAL STREAM AREA(ACRES) =    21.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     50.33

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-Site                                         |
| Refer to On-Site AES at Node 110                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   6.34   RAIN INTENSITY(INCH/HOUR) =  3.39
  TOTAL AREA(ACRES) =     3.68   TOTAL RUNOFF(CFS) =      6.34

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.34
```

```
  RAINFALL INTENSITY(INCH/HR) =   3.39
  TOTAL STREAM AREA(ACRES) =     3.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.34

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       50.33     8.53        2.800         21.60
      2        6.34     6.34        3.391          3.68

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       43.75     6.34       3.391
      2       55.57     8.53       2.800

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      55.57   Tc(MIN.) =    8.53
  TOTAL AREA(ACRES) =       25.3
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

+----------------------------------------------------------------------------+
| Add Area from New Mid-Coast Trolley                                        |
| A = 0.88                                                                   |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.800
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7788
  SUBAREA AREA(ACRES) =    0.88   SUBAREA RUNOFF(CFS) =    2.22
  TOTAL AREA(ACRES) =       26.2   TOTAL RUNOFF(CFS) =      57.05
  TC(MIN.) =    8.53

+----------------------------------------------------------------------------+
| Add area: OSP Regional Basin                                               |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.800
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6952
  SUBAREA AREA(ACRES) =    7.41   SUBAREA RUNOFF(CFS) =    8.30
  TOTAL AREA(ACRES) =       33.6   TOTAL RUNOFF(CFS) =      65.35
  TC(MIN.) =    8.53

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   1000.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       65.35     8.53       2.800       33.57
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   1000.00 =    1771.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       69.06     9.35       2.640       31.24
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     128.36       8.53        2.800
      2     130.66       9.35        2.640

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     130.66   Tc(MIN.) =    9.35
  TOTAL AREA(ACRES) =       64.8
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       64.8  TC(MIN.) =      9.35
  PEAK FLOW RATE(CFS)   =     130.66
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/14/2020

TIME OF CONCENTRATION 9 MIN.

6 HOUR RAINFALL 2.25 INCHES

BASIN AREA 64.8

RUNOFF COEFFICIENT 0.75

PEAK DISCHARGE 130.66 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 9	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 4.4
TIME (MIN) = 27	DISCHARGE (CFS) = 4.4
TIME (MIN) = 36	DISCHARGE (CFS) = 4.6
TIME (MIN) = 45	DISCHARGE (CFS) = 4.7
TIME (MIN) = 54	DISCHARGE (CFS) = 4.9
TIME (MIN) = 63	DISCHARGE (CFS) = 5
TIME (MIN) = 72	DISCHARGE (CFS) = 5.2
TIME (MIN) = 81	DISCHARGE (CFS) = 5.3
TIME (MIN) = 90	DISCHARGE (CFS) = 5.5
TIME (MIN) = 99	DISCHARGE (CFS) = 5.7
TIME (MIN) = 108	DISCHARGE (CFS) = 6
TIME (MIN) = 117	DISCHARGE (CFS) = 6.2
TIME (MIN) = 126	DISCHARGE (CFS) = 6.5
TIME (MIN) = 135	DISCHARGE (CFS) = 6.8
TIME (MIN) = 144	DISCHARGE (CFS) = 7.2
TIME (MIN) = 153	DISCHARGE (CFS) = 7.5
TIME (MIN) = 162	DISCHARGE (CFS) = 8.2
TIME (MIN) = 171	DISCHARGE (CFS) = 8.6
TIME (MIN) = 180	DISCHARGE (CFS) = 9.5
TIME (MIN) = 189	DISCHARGE (CFS) = 10.1
TIME (MIN) = 198	DISCHARGE (CFS) = 11.5
TIME (MIN) = 207	DISCHARGE (CFS) = 12.5
TIME (MIN) = 216	DISCHARGE (CFS) = 15.3
TIME (MIN) = 225	DISCHARGE (CFS) = 17.4
TIME (MIN) = 234	DISCHARGE (CFS) = 25.6
TIME (MIN) = 243	DISCHARGE (CFS) = 36.8
TIME (MIN) = 252	DISCHARGE (CFS) = 130.66
TIME (MIN) = 261	DISCHARGE (CFS) = 20.5
TIME (MIN) = 270	DISCHARGE (CFS) = 13.7
TIME (MIN) = 279	DISCHARGE (CFS) = 10.7
TIME (MIN) = 288	DISCHARGE (CFS) = 9
TIME (MIN) = 297	DISCHARGE (CFS) = 7.8
TIME (MIN) = 306	DISCHARGE (CFS) = 7
TIME (MIN) = 315	DISCHARGE (CFS) = 6.3
TIME (MIN) = 324	DISCHARGE (CFS) = 5.8
TIME (MIN) = 333	DISCHARGE (CFS) = 5.4
TIME (MIN) = 342	DISCHARGE (CFS) = 5.1
TIME (MIN) = 351	DISCHARGE (CFS) = 4.8
TIME (MIN) = 360	DISCHARGE (CFS) = 4.5
TIME (MIN) = 369	DISCHARGE (CFS) = 0

```
____________________________________________________________________________
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                           Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* Regional Basin                                                          *
* Proposed Condition                                                      *
* 100 Year                                                                *
 **************************************************************************

  FILE NAME: C:\PR100\RBPR100.DAT
  TIME/DATE OF STUDY: 08:43 05/14/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.250
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======   ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
```

```
| Begin Southerly Off-Site analysis                                          |
| Tributary Area to OSP Regional Basin                                       |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE   1400.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    388.00
  DOWNSTREAM ELEVATION(FEET) =    386.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.464
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.928
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.87

****************************************************************************
  FLOW PROCESS FROM NODE   1400.00 TO NODE   1300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  386.00  DOWNSTREAM ELEVATION(FEET) =  376.00
  STREET LENGTH(FEET) =   520.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   14.80
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.59
  STREET FLOW TRAVEL TIME(MIN.) =   2.33   Tc(MIN.) =    5.80
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.388
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =   30.04
  TOTAL AREA(ACRES) =       7.0        PEAK FLOW RATE(CFS) =      30.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.41
  FLOW VELOCITY(FEET/SEC.) =  4.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1300.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE   1200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  376.00  DOWNSTREAM ELEVATION(FEET) =  362.00
  STREET LENGTH(FEET) =   440.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   19.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.83
  STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =    7.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.723
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =   16.65
  TOTAL AREA(ACRES) =      11.3        PEAK FLOW RATE(CFS) =      43.69
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  20.12
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1200.00 =    1060.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   362.00  DOWNSTREAM(FEET) =   339.00
  FLOW LENGTH(FEET) =   860.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.27
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.69
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =    8.12
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1100.00 =    1920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.337
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    8.00   SUBAREA RUNOFF(CFS) =   28.45
  TOTAL AREA(ACRES) =       19.3   TOTAL RUNOFF(CFS) =      68.57
  TC(MIN.) =    8.12

****************************************************************************
  FLOW PROCESS FROM NODE   1105.00 TO NODE   1100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.337
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8200
  SUBAREA AREA(ACRES) =    9.10   SUBAREA RUNOFF(CFS) =   32.37
  TOTAL AREA(ACRES) =       28.4   TOTAL RUNOFF(CFS) =     100.94
  TC(MIN.) =    8.12

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1000.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   339.00  DOWNSTREAM(FEET) =   336.00
  FLOW LENGTH(FEET) =   420.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.49
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     100.94
  PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =    8.78
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.78
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    28.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    100.94

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-site                                         |
| Refer to On-site AES at Node 310                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE   1000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   8.67   RAIN INTENSITY(INCH/HOUR) =  4.16
  TOTAL AREA(ACRES) =     2.86   TOTAL RUNOFF(CFS) =      6.78

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.67
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.16
  TOTAL STREAM AREA(ACRES) =     2.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.78

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      100.94     8.78        4.122         28.38
     2        6.78     8.67        4.157          2.86

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      106.41     8.67       4.157
     2      107.66     8.78       4.122

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     107.66   Tc(MIN.) =    8.78
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

+--------------------------------------------------------------------------+
| Begin Northerly Off-Site Analysis                                        |
| Tributary Area to OSP Regional Basin                                     |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3300.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    376.00
  DOWNSTREAM ELEVATION(FEET) =    372.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.012
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    90.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.928
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  372.00  DOWNSTREAM ELEVATION(FEET) =  351.00
  STREET LENGTH(FEET) =   920.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.18
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   23.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.09
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =    5.90
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.329
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =   11.90      SUBAREA RUNOFF(CFS) =   52.00
  TOTAL AREA(ACRES) =       12.1        PEAK FLOW RATE(CFS) =      52.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
```

```
  FLOW VELOCITY(FEET/SEC.) =  6.20   DEPTH*VELOCITY(FT*FT/SEC.) =   4.33
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  920.0 FT WITH ELEVATION-DROP =  21.0 FT, IS   57.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3200.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3200.00 =    1020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  351.00  DOWNSTREAM ELEVATION(FEET) =  348.00
  STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.17
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   33.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =    7.86
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.427
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =    9.50      SUBAREA RUNOFF(CFS) =   34.49
  TOTAL AREA(ACRES) =       21.6        PEAK FLOW RATE(CFS) =      78.42

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  34.54
  FLOW VELOCITY(FEET/SEC.) =  3.84   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  435.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   46.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   3100.00
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3100.00 =    1455.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   348.00  DOWNSTREAM(FEET) =   301.00
  FLOW LENGTH(FEET) =   316.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.01
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      78.42
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.03
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.03
  RAINFALL INTENSITY(INCH/HR) =   4.37
  TOTAL STREAM AREA(ACRES) =    21.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     78.42

+--------------------------------------------------------------------------+
| Confluence ON-Site with Off-Site                                         |
| Refer to On-Site AES at Node 110                                         |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE   3000.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   8.59   RAIN INTENSITY(INCH/HOUR) =  4.18
  TOTAL AREA(ACRES) =     3.68   TOTAL RUNOFF(CFS) =      9.70

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.59
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.18
  TOTAL STREAM AREA(ACRES) =     3.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       78.42     8.03        4.367         21.60
      2        9.70     8.59        4.181          3.68

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       87.49     8.03       4.367
      2       84.79     8.59       4.181

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      87.49   Tc(MIN.) =    8.03
  TOTAL AREA(ACRES) =       25.3
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3000.00 =    1771.00 FEET.

+--------------------------------------------------------------------------+
| Add Area from New Mid-Coast Trolley                                      |
| A = 0.88                                                                 |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.367
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7960
  SUBAREA AREA(ACRES) =    0.88   SUBAREA RUNOFF(CFS) =    3.46
  TOTAL AREA(ACRES) =       26.2   TOTAL RUNOFF(CFS) =      90.93
  TC(MIN.) =    8.03

+--------------------------------------------------------------------------+
| Add area: OSP Regional Basin                                             |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   3000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.367
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7086
  SUBAREA AREA(ACRES) =    7.41   SUBAREA RUNOFF(CFS) =   12.94
  TOTAL AREA(ACRES) =       33.6   TOTAL RUNOFF(CFS) =     103.87
  TC(MIN.) =    8.03

****************************************************************************
  FLOW PROCESS FROM NODE   3000.00 TO NODE   1000.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      103.87     8.03       4.367       33.57
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   1000.00 =    1771.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      107.66     8.78       4.122       31.24
  LONGEST FLOWPATH FROM NODE   1500.00 TO NODE   1000.00 =    2340.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     202.32       8.03        4.367
      2     205.71       8.78        4.122

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     205.71   Tc(MIN.) =    8.78
  TOTAL AREA(ACRES) =       64.8
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       64.8  TC(MIN.) =      8.78
  PEAK FLOW RATE(CFS)   =     205.71
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/14/2020

TIME OF CONCENTRATION 9 MIN.

6 HOUR RAINFALL 2.25 INCHES

BASIN AREA 64.8

RUNOFF COEFFICIENT 0.75

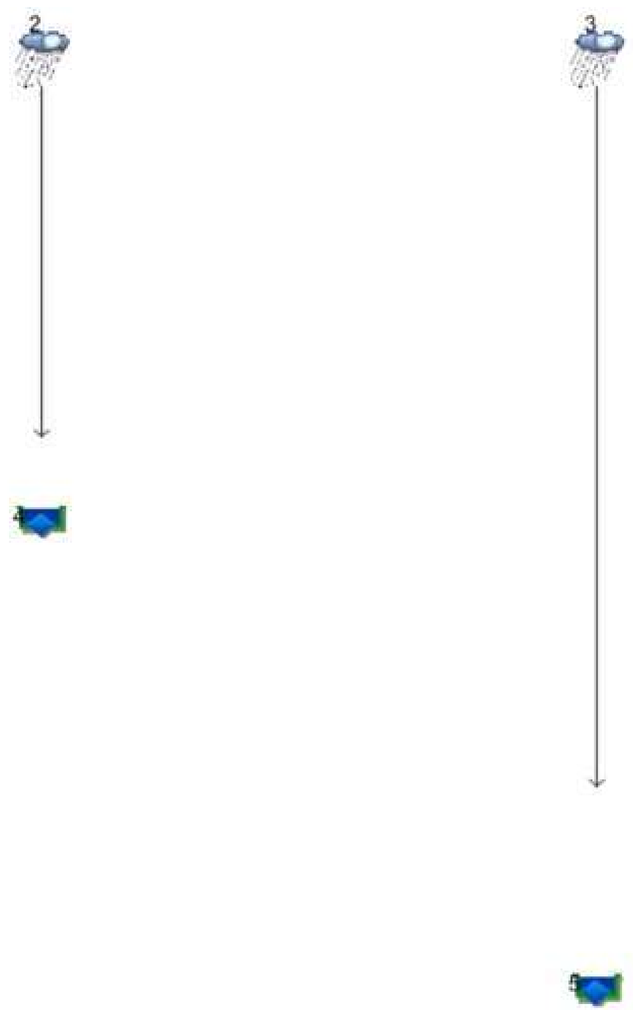
PEAK DISCHARGE 205.71 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 9	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 6.5
TIME (MIN) = 27	DISCHARGE (CFS) = 6.6
TIME (MIN) = 36	DISCHARGE (CFS) = 6.9
TIME (MIN) = 45	DISCHARGE (CFS) = 7
TIME (MIN) = 54	DISCHARGE (CFS) = 7.3
TIME (MIN) = 63	DISCHARGE (CFS) = 7.4
TIME (MIN) = 72	DISCHARGE (CFS) = 7.8
TIME (MIN) = 81	DISCHARGE (CFS) = 7.9
TIME (MIN) = 90	DISCHARGE (CFS) = 8.3
TIME (MIN) = 99	DISCHARGE (CFS) = 8.5
TIME (MIN) = 108	DISCHARGE (CFS) = 9
TIME (MIN) = 117	DISCHARGE (CFS) = 9.2
TIME (MIN) = 126	DISCHARGE (CFS) = 9.8
TIME (MIN) = 135	DISCHARGE (CFS) = 10.1
TIME (MIN) = 144	DISCHARGE (CFS) = 10.9
TIME (MIN) = 153	DISCHARGE (CFS) = 11.3
TIME (MIN) = 162	DISCHARGE (CFS) = 12.3
TIME (MIN) = 171	DISCHARGE (CFS) = 12.8
TIME (MIN) = 180	DISCHARGE (CFS) = 14.2
TIME (MIN) = 189	DISCHARGE (CFS) = 15.1
TIME (MIN) = 198	DISCHARGE (CFS) = 17.3
TIME (MIN) = 207	DISCHARGE (CFS) = 18.8
TIME (MIN) = 216	DISCHARGE (CFS) = 23
TIME (MIN) = 225	DISCHARGE (CFS) = 26.1
TIME (MIN) = 234	DISCHARGE (CFS) = 38.4
TIME (MIN) = 243	DISCHARGE (CFS) = 45.6
TIME (MIN) = 252	DISCHARGE (CFS) = 205.7
TIME (MIN) = 261	DISCHARGE (CFS) = 30.8
TIME (MIN) = 270	DISCHARGE (CFS) = 20.6
TIME (MIN) = 279	DISCHARGE (CFS) = 16.1
TIME (MIN) = 288	DISCHARGE (CFS) = 13.5
TIME (MIN) = 297	DISCHARGE (CFS) = 11.7
TIME (MIN) = 306	DISCHARGE (CFS) = 10.5
TIME (MIN) = 315	DISCHARGE (CFS) = 9.5
TIME (MIN) = 324	DISCHARGE (CFS) = 8.7
TIME (MIN) = 333	DISCHARGE (CFS) = 8.1
TIME (MIN) = 342	DISCHARGE (CFS) = 7.6
TIME (MIN) = 351	DISCHARGE (CFS) = 7.1
TIME (MIN) = 360	DISCHARGE (CFS) = 6.8
TIME (MIN) = 369	DISCHARGE (CFS) = 0

3

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3



Project: Pepper Canyon_5_14_2020_TWO_risers.gpw	Thursday, 05 / 14 / 2020

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
2	Manual	------	-------	0.000	-------	-------	131.24	-------	-------	204.81	Existing Inflow
3	Manual	------	-------	0.000	-------	-------	130.66	-------	-------	205.70	Proposed inflow
4	Reservoir	2	-------	0.000	-------	-------	73.55	-------	-------	94.79	Existing Outflow
5	Reservoir	3	-------	0.000	-------	-------	53.86	-------	-------	85.62	Proposed Outflow

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	Manual	131.24	9	252	281,416	------	------	------	Existing Inflow
3	Manual	130.66	9	252	280,616	------	------	------	Proposed inflow
4	Reservoir	73.55	9	261	279,352	2	292.95	34,187	Existing Outflow
5	Reservoir	53.86	9	261	247,184	3	293.75	104,847	Proposed Outflow

Pepper Canyon_5_14_2020_TWO_risers.gpw | Return Period: 10 Year | Thursday, 05 / 14 / 2020

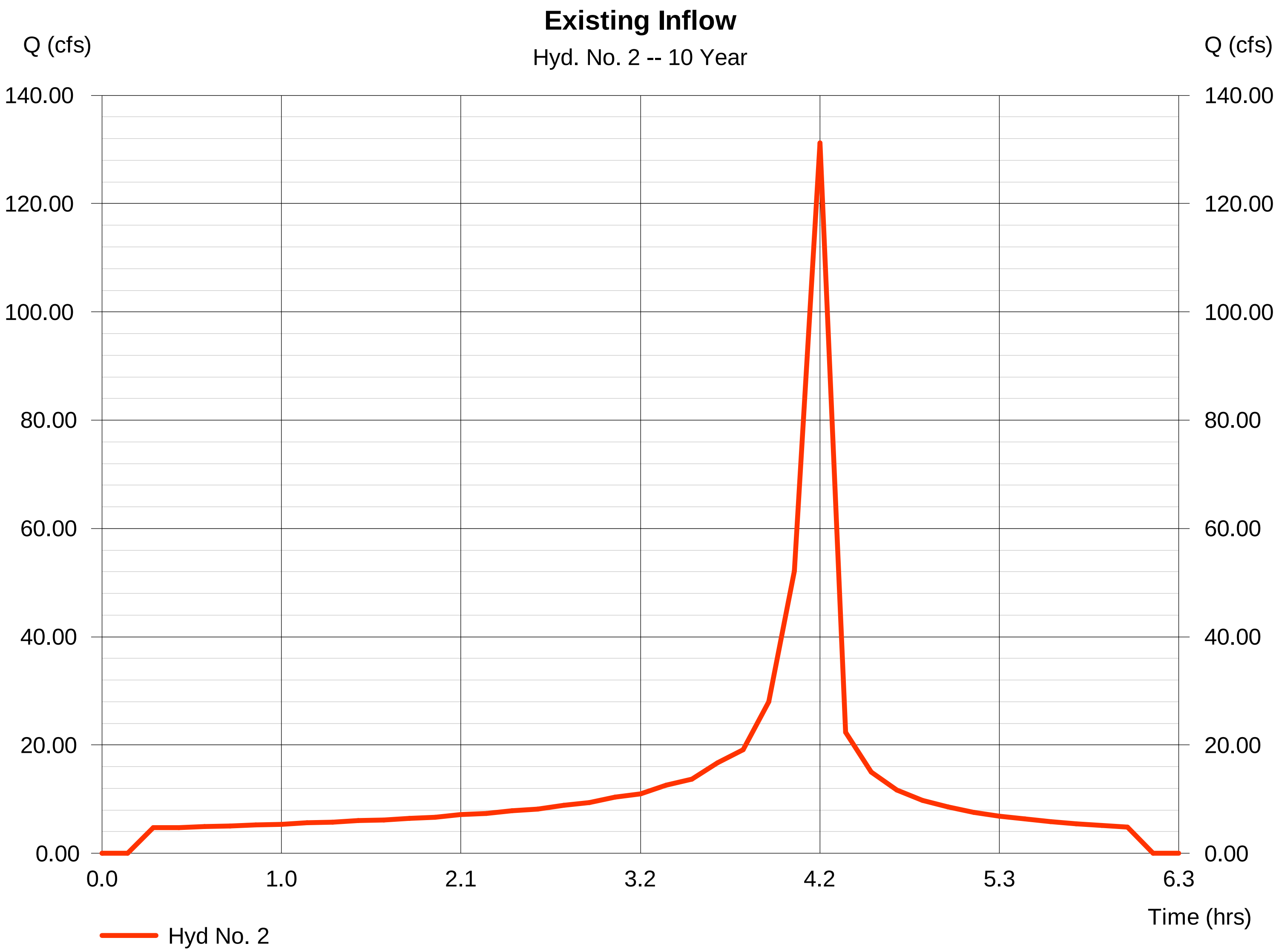
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 2

Existing Inflow

Hydrograph type	= Manual	Peak discharge	= 131.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 281,416 cuft



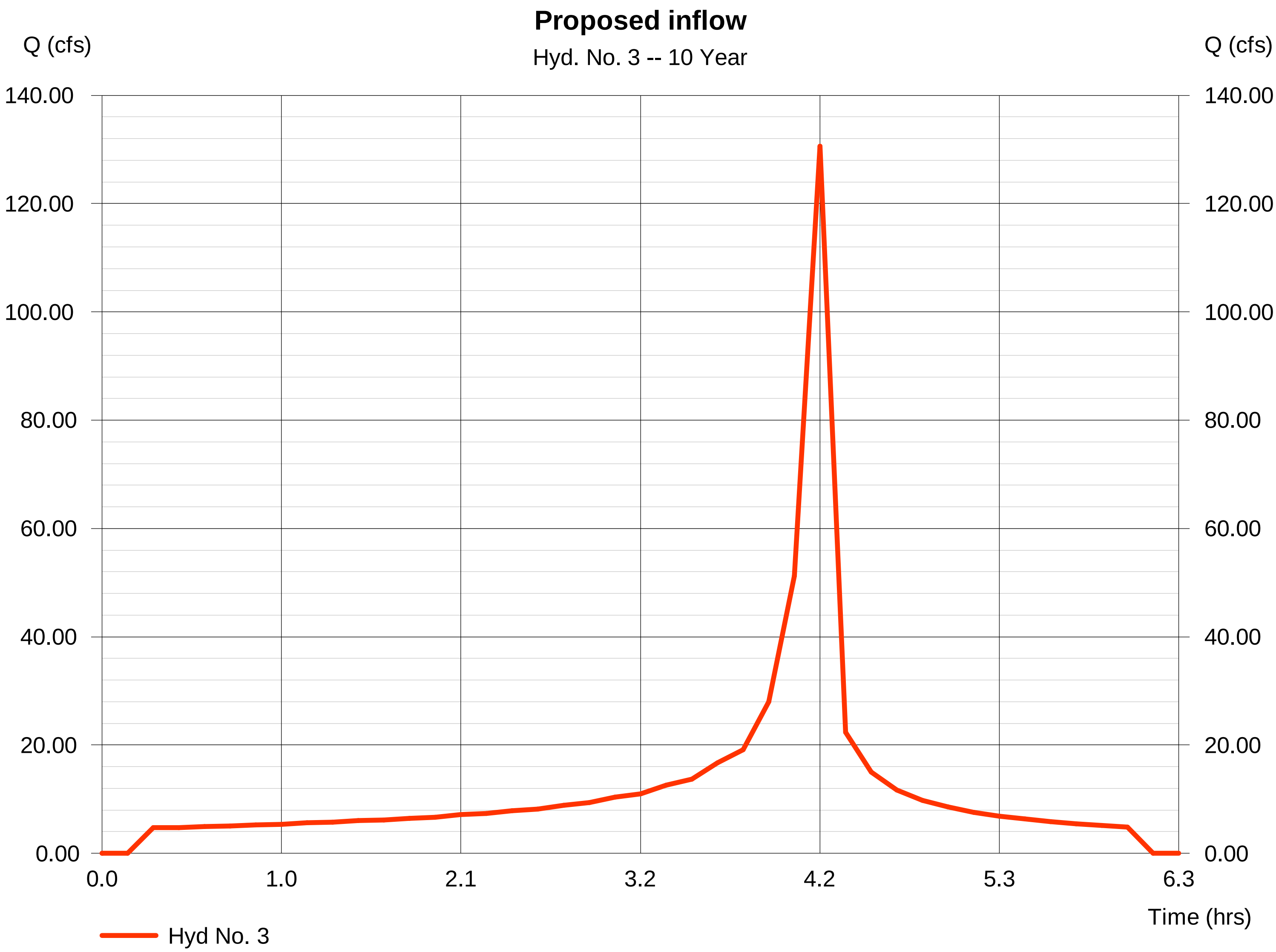
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 3

Proposed inflow

Hydrograph type	= Manual	Peak discharge	= 130.66 cfs
Storm frequency	= 10 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 280,616 cuft



Hydrograph Report

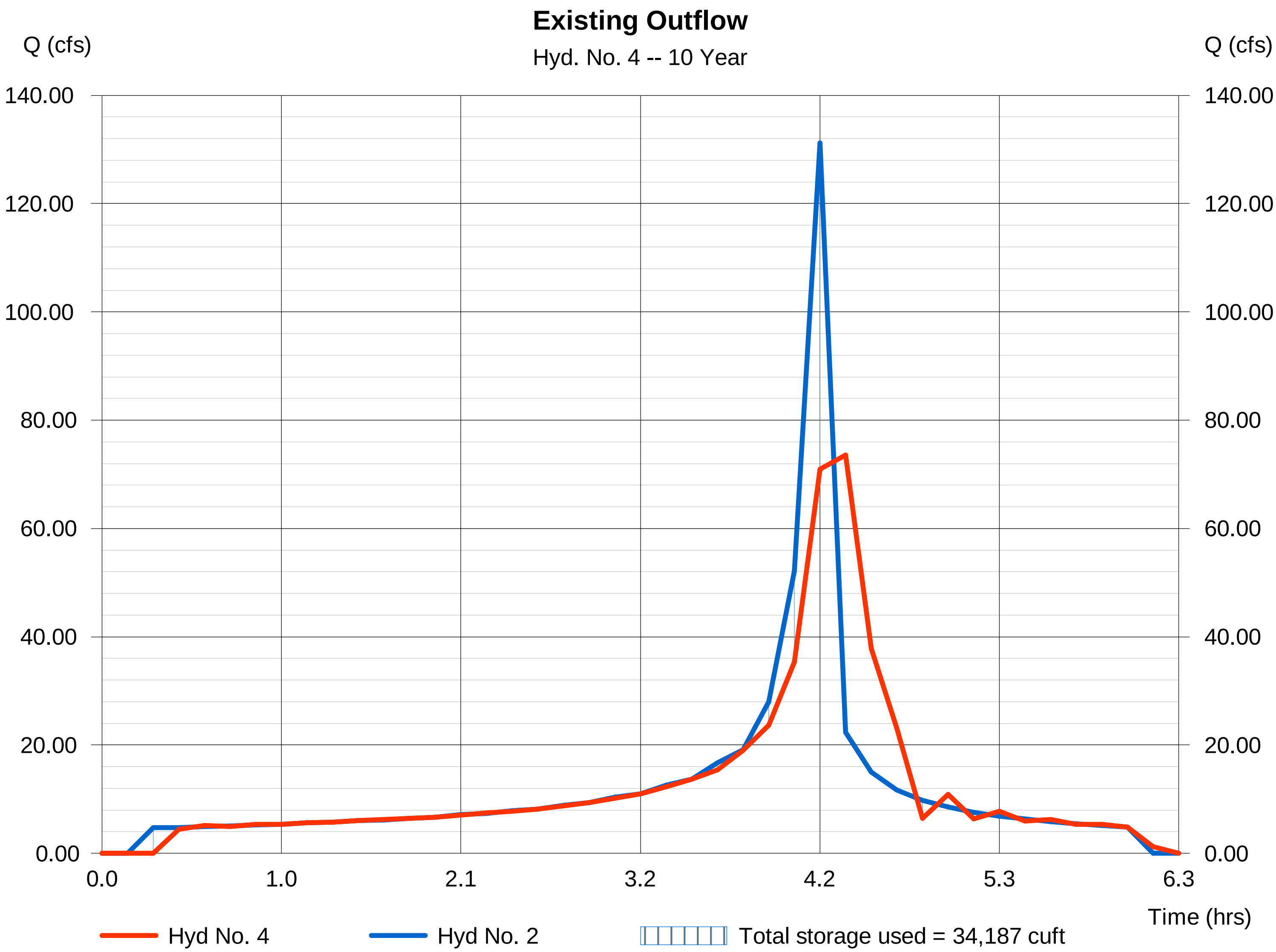
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 4

Existing Outflow

Hydrograph type	= Reservoir	Peak discharge	= 73.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 4.35 hrs
Time interval	= 9 min	Hyd. volume	= 279,352 cuft
Inflow hyd. No.	= 2 - Existing Inflow	Max. Elevation	= 292.95 ft
Reservoir name	= Regional Basin Existing	Max. Storage	= 34,187 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Pond No. 2 - Regional Basin Existing

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 286.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	286.00	232	0	0
1.00	287.00	408	320	320
2.00	288.00	673	541	861
3.00	289.00	1,456	1,065	1,925
4.00	290.00	3,136	2,296	4,221
5.00	291.00	8,752	5,944	10,165
6.00	292.00	19,909	14,331	24,496
7.00	293.00	29,765	24,837	49,333
8.00	294.00	39,512	34,639	83,971
9.00	295.00	49,506	44,509	128,480

Culvert / Orifice Structures

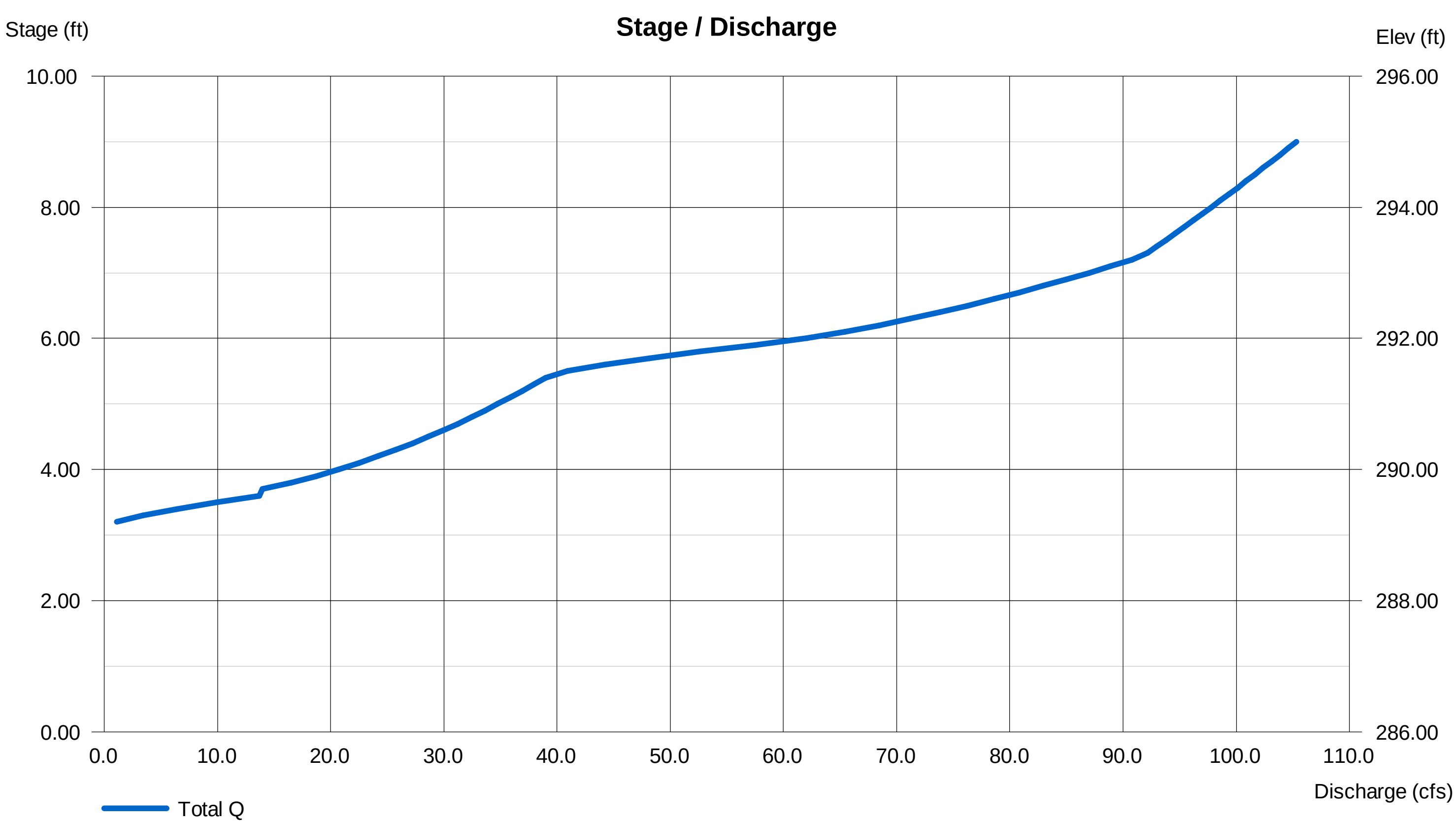
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 42.00	6.50	6.50	0.00
Span (in)	= 42.00	36.00	48.00	0.00
No. Barrels	= 1	4	4	0
Invert El. (ft)	= 286.00	289.11	291.42	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydrograph Report

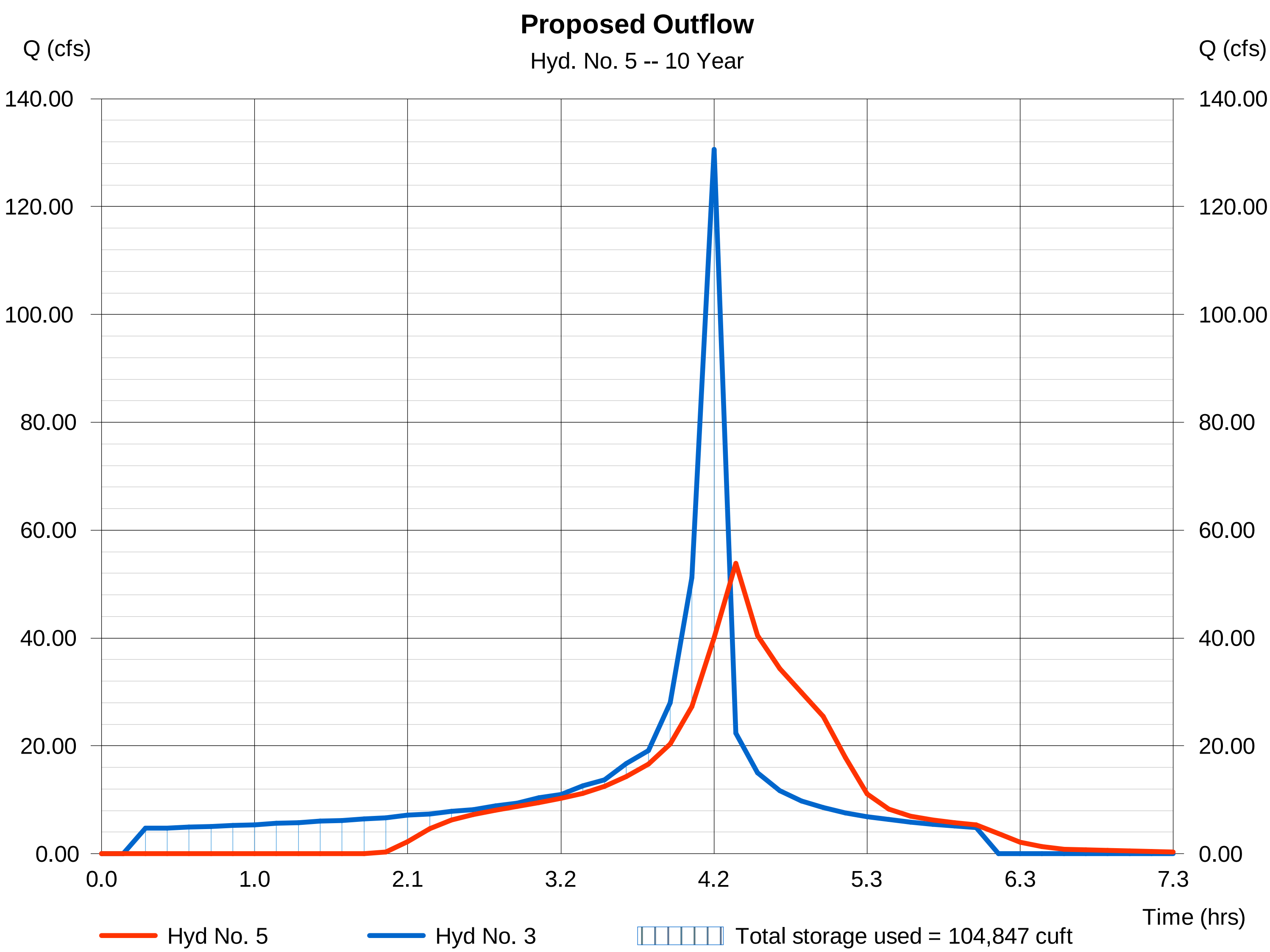
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 5

Proposed Outflow

Hydrograph type	= Reservoir	Peak discharge	= 53.86 cfs
Storm frequency	= 10 yrs	Time to peak	= 4.35 hrs
Time interval	= 9 min	Hyd. volume	= 247,184 cuft
Inflow hyd. No.	= 3 - Proposed inflow	Max. Elevation	= 293.75 ft
Reservoir name	= Regional Basin Proposed 18 24	Max. Storage	= 104,847 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Pond No. 3 - Regional Basin Proposed 18 24

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 290.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	290.00	19,052	0	0
1.00	291.00	21,675	20,364	20,364
2.00	292.00	30,590	26,133	46,496
3.00	293.00	38,481	34,536	81,032
4.00	294.00	47,416	42,949	123,980
5.00	295.00	49,500	48,458	172,438
6.00	296.00	50,492	49,996	222,434
7.00	297.00	53,906	52,199	274,633
8.00	298.00	57,372	55,639	330,272
9.00	299.00	60,892	59,132	389,404
10.00	300.00	64,464	62,678	452,082

Culvert / Orifice Structures

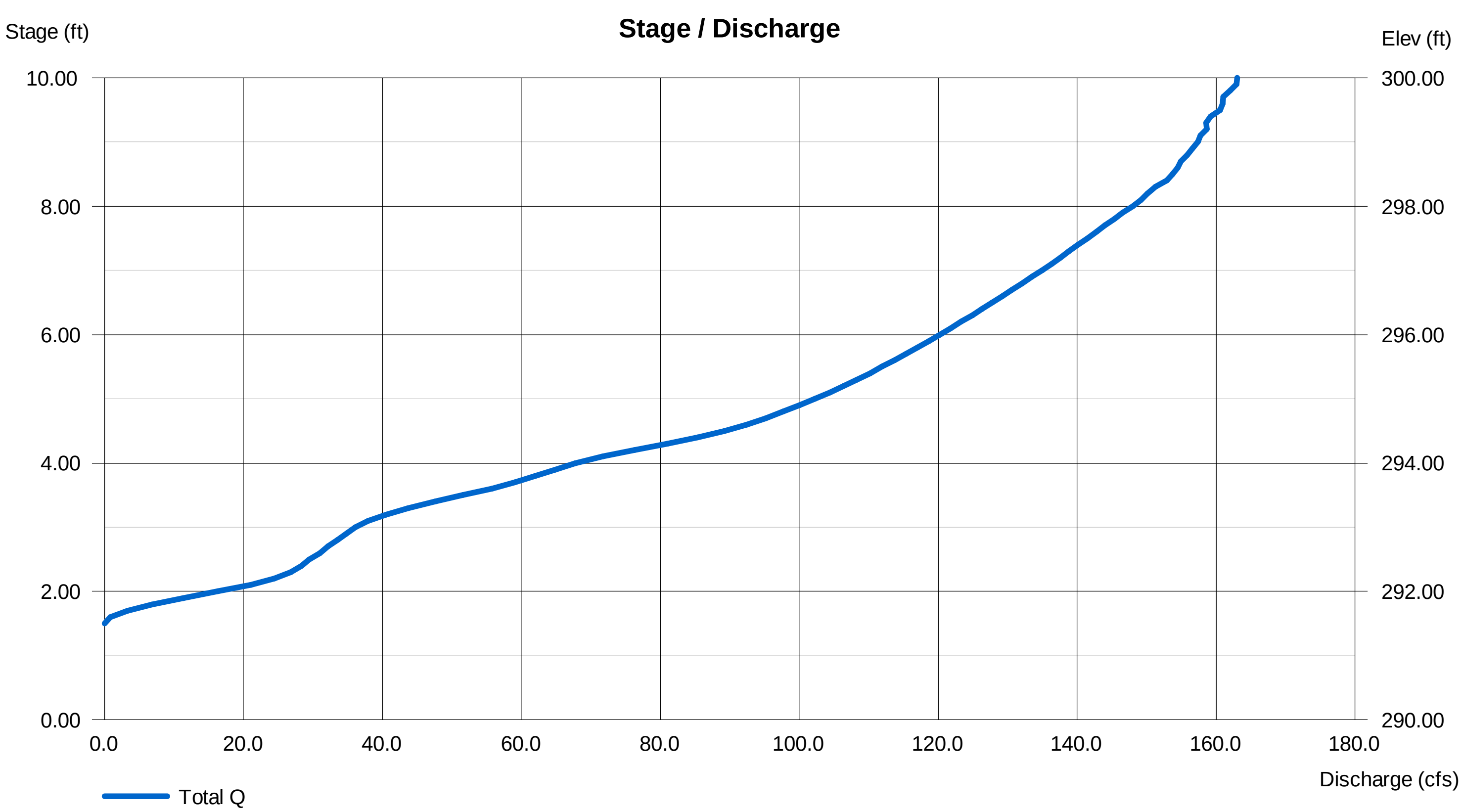
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 48.00	8.00	8.00	0.00
Span (in)	= 48.00	8.00	8.00	0.00
No. Barrels	= 1	24	24	0
Invert El. (ft)	= 290.00	291.50	293.00	0.00
Length (ft)	= 690.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 40.00	0.00	0.00	0.00
Crest El. (ft)	= 294.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	Manual	204.81	9	252	422,609	------	------	------	Existing Inflow
3	Manual	205.70	9	252	422,280	------	------	------	Proposed inflow
4	Reservoir	94.79	9	261	420,625	2	294.08	70,915	Existing Outflow
5	Reservoir	85.62	9	261	388,847	3	294.69	143,602	Proposed Outflow

Pepper Canyon_5_14_2020_TWO_risers.gpw Return Period: 100 Year Thursday, 05 / 14 / 2020

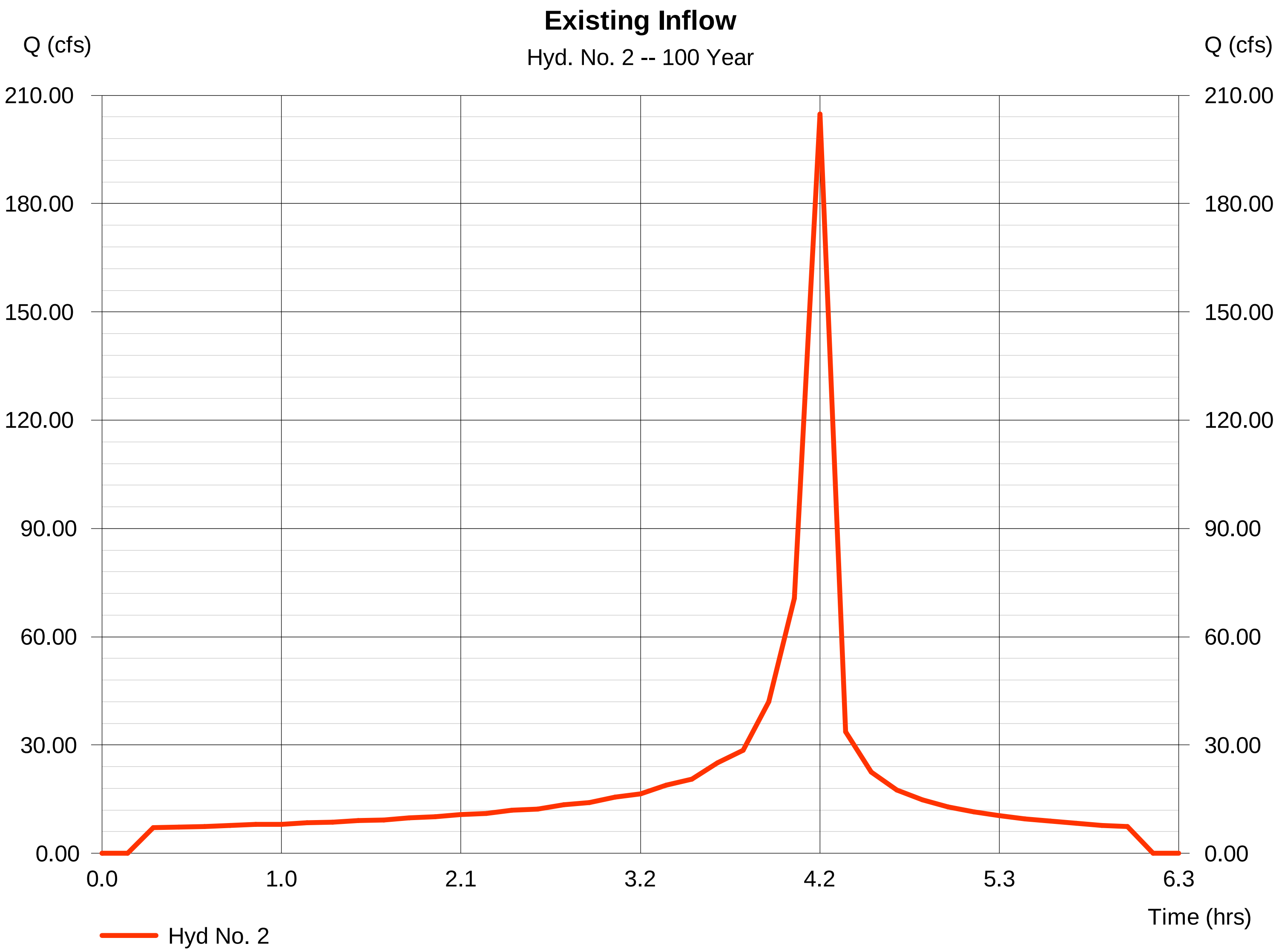
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 2

Existing Inflow

Hydrograph type	= Manual	Peak discharge	= 204.81 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 422,609 cuft



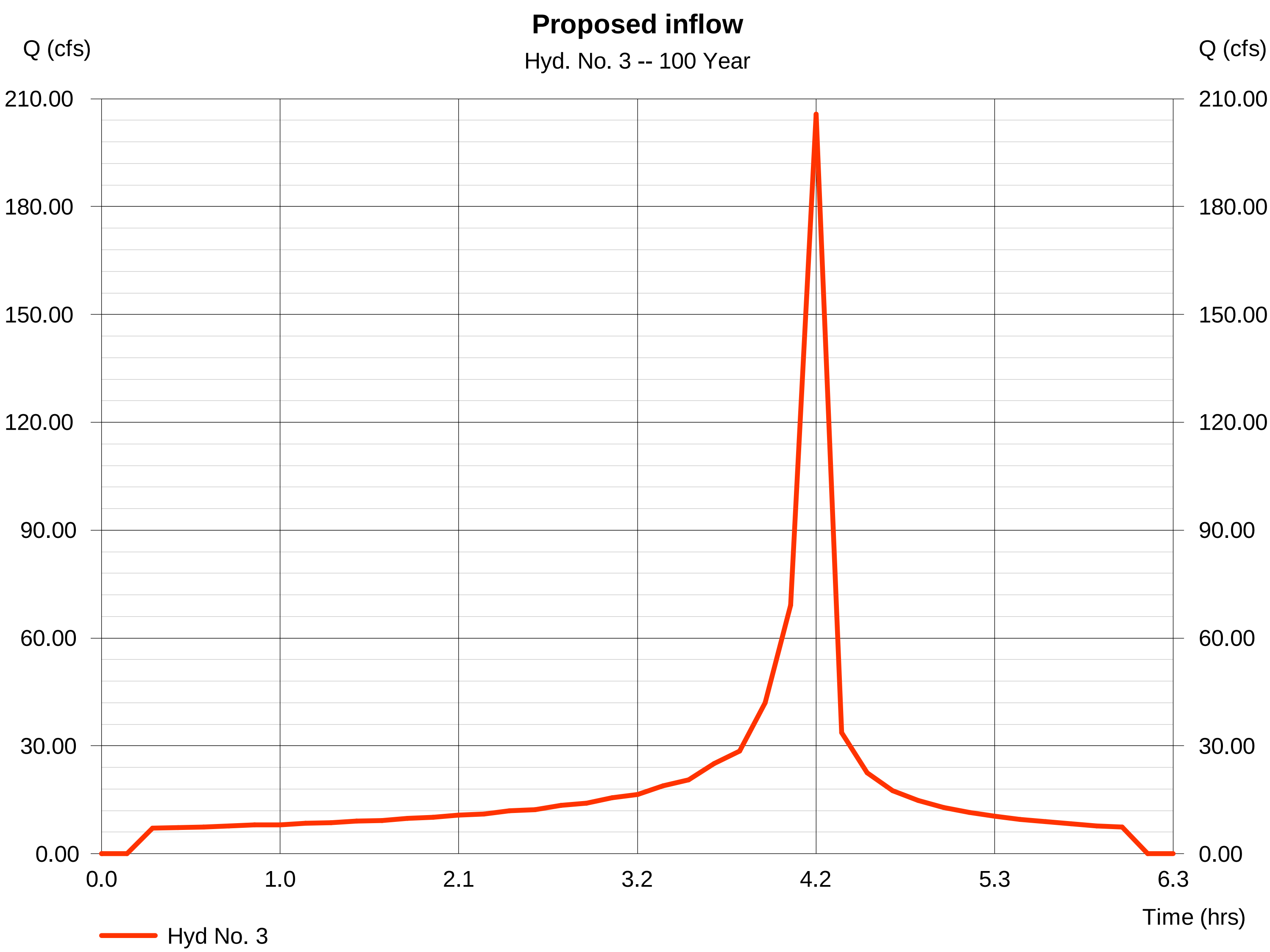
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 3

Proposed inflow

Hydrograph type	= Manual	Peak discharge	= 205.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 9 min	Hyd. volume	= 422,280 cuft



Hydrograph Report

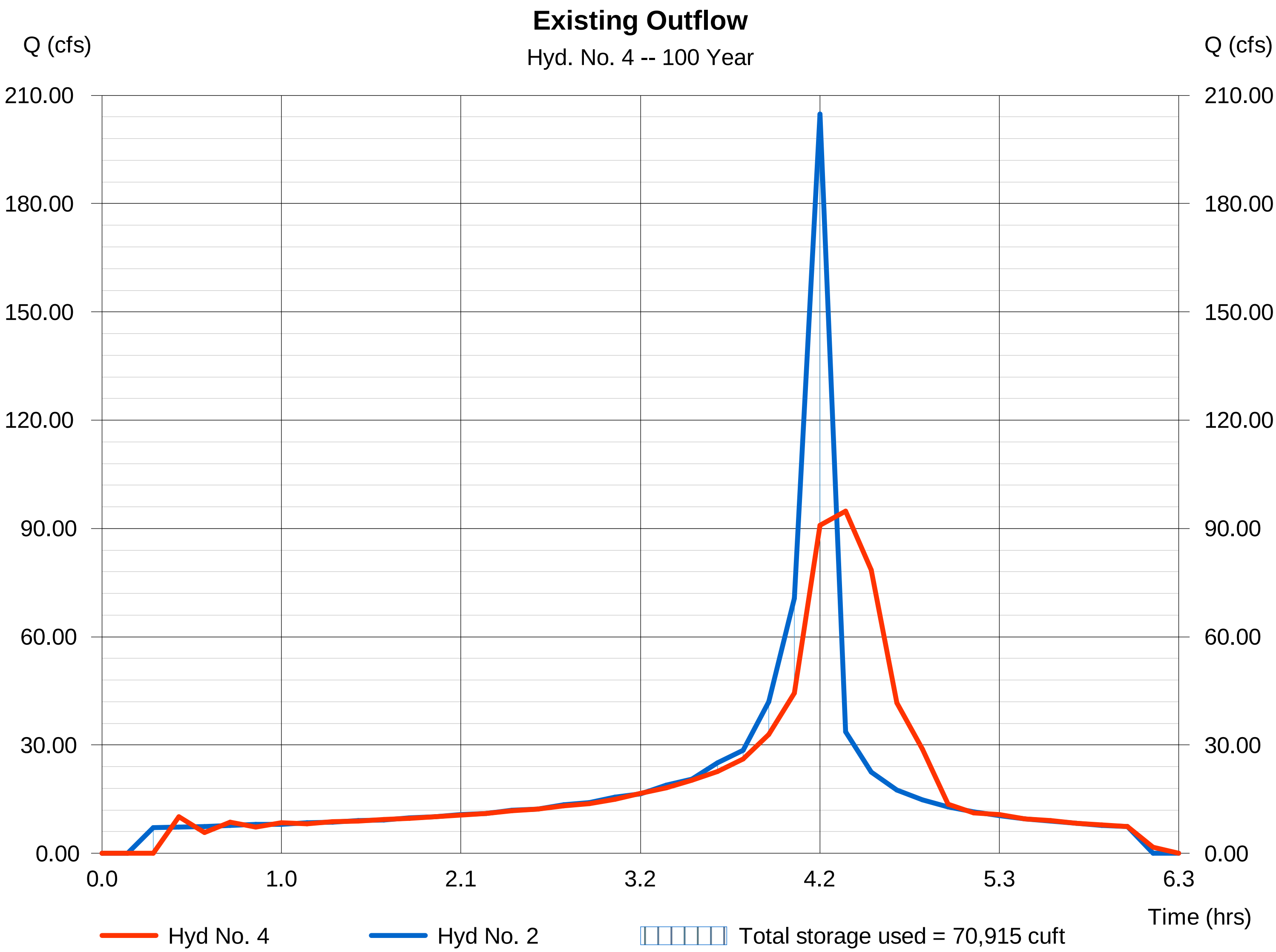
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 4

Existing Outflow

Hydrograph type	= Reservoir	Peak discharge	= 94.79 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.35 hrs
Time interval	= 9 min	Hyd. volume	= 420,625 cuft
Inflow hyd. No.	= 2 - Existing Inflow	Max. Elevation	= 294.08 ft
Reservoir name	= Regional Basin Existing	Max. Storage	= 70,915 cuft

Storage Indication method used.



Hydrograph Report

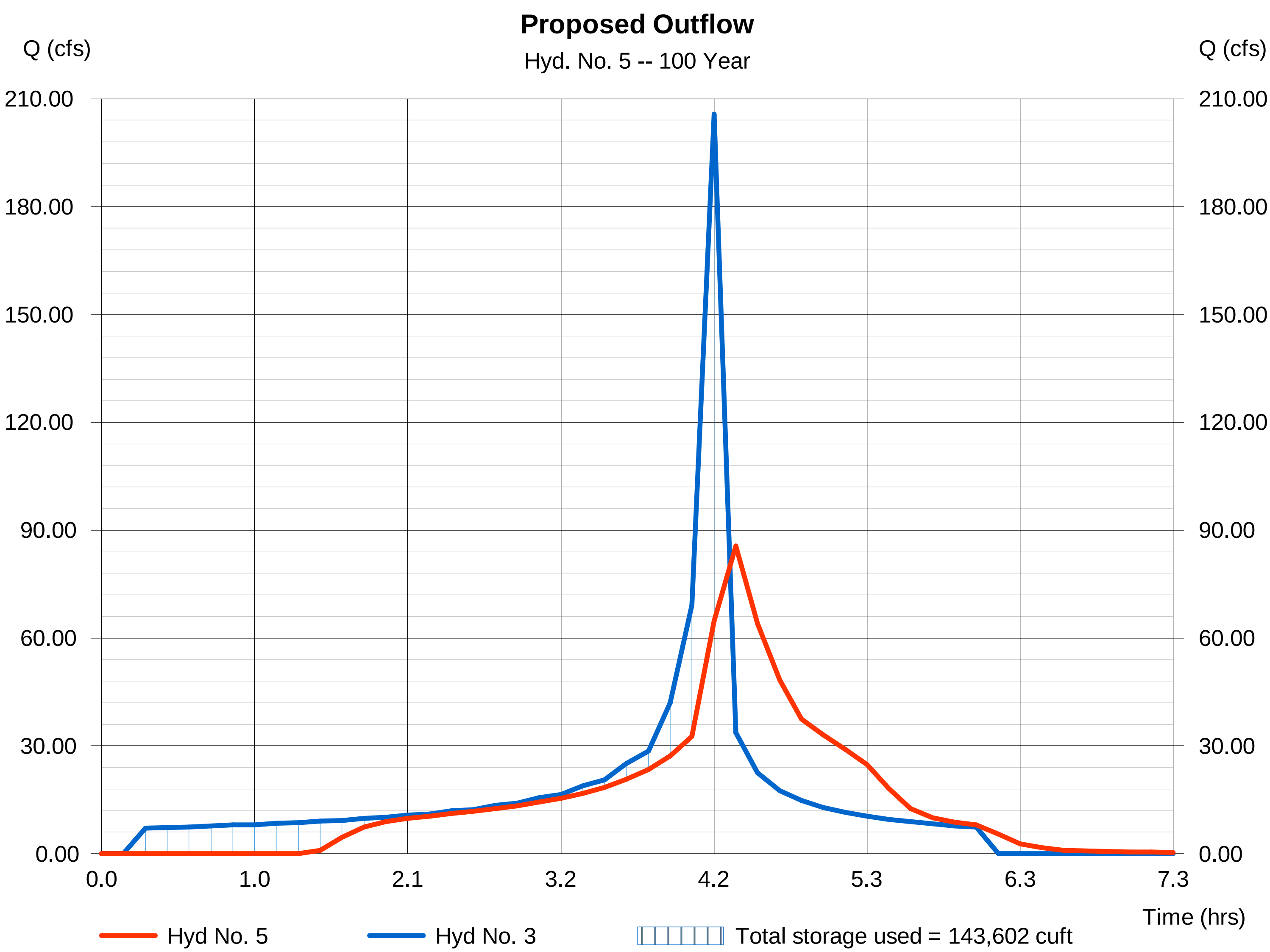
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3 Thursday, 05 / 14 / 2020

Hyd. No. 5

Proposed Outflow

Hydrograph type	= Reservoir	Peak discharge	= 85.62 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.35 hrs
Time interval	= 9 min	Hyd. volume	= 388,847 cuft
Inflow hyd. No.	= 3 - Proposed inflow	Max. Elevation	= 294.69 ft
Reservoir name	= Regional Basin Proposed 18 24	Max. Storage	= 143,602 cuft

Storage Indication method used.



Appendix F – Excerpts from Michael Baker International's Grading Plan

UNIVERSITY OF CALIFORNIA, SAN DIEGO
PEPPER CANYON OPEN SPACE PRESERVE

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALTIC CONCRETE
ACOE	ARMY CORPS OF ENGINEERS
BF	BACKFLOW
BW	BOTTOM OF WALL
CB	CATCH BASIN
CDFW	CALIFORNIA DEPARTMENT OF FISH & WILDLIFE
CHW	CHILLED WATER
CL	CENTER LINE
CML&C	CEMENT MORTAR LINED AND COATED
COM	TELECOMMUNICATION
CONC	CONCRETE
CY	CUBIC YARD
C&G	CURB AND GUTTER
EX	EXISTING
F	FIRE WATER
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISH FLOOR
FL	FLOW LINE
FG	FINISHED GRADE
FS	FINISHED SURFACE
GB	GRADE BREAK
HP	HIGH PRESSURE WATER
HTHW	HIGH TEMP WATER
HHW	HEATING HOT WATER
IE	INVERT ELEVATION
JS	JUNCTION STRUCTURE
LF	LINEAL FEET
LP	LOW PRESSURE WATER
LRT	LIGHT RAIL TRANSIT
LS	LANDSCAPE
MTHW	MEDIUM TEMPERATURE WATER
NC	NORMALLY CLOSED
NTS	NOT TO SCALE
OC	ON CENTER
PCC	PORTLAND CEMENT CONCRETE
PCR	POINT OF CURB RETURN
PIV	POST INDICATOR VALVE
PL	PROPERTY LINE
POC	POINT OF CONNECTION
PVT	PRIVATE
R/W	RIGHT OF WAY
RD	ROOF DRAIN
RIM	RIM OF SD/SEWER COVER
RW	RECLAIMED WATER
S	SEWER
SCO	SEWER CLEANOUT
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SL	STREET LIGHT
SMH	SEWER MANHOLE
S&R	SUPPLY & RETURN
TC	TOP OF CURB
TF	TOP OF FOOTING
TG	TOP OF GRATE
TP	TOP OF PIPE
TW	TOP OF WALL
TYP	TYPICAL
W	WATER
X.X	PROPOSED ELEVATION
(X.X)	EXISTING ELEVATION
X.X%	PROPOSED SLOPE
(X.X%)	EXISTING SLOPE

TOPOGRAPHY SOURCE

AEROTECH MAPPING, INC.
29970 TECHNOLOGY DRIVE, SUITE 220-C
MURRIETA, CA 92563
(619) 606-5020

PROJECT NUMBER: ATM#CA0719-092
DATE OF PHOTOGRAPHY: 07/26/2019
CONTOUR INTERVAL: 1'

&

TOPOGRAPHIC DATA AS SHOWN ON THE SANDAG MID-COAST CORRIDOR TRANSIT GRADING AND DRAINAGE PROJECT, DATED AUGUST 3, 2018.

STORM WATER PROTECTION NOTES

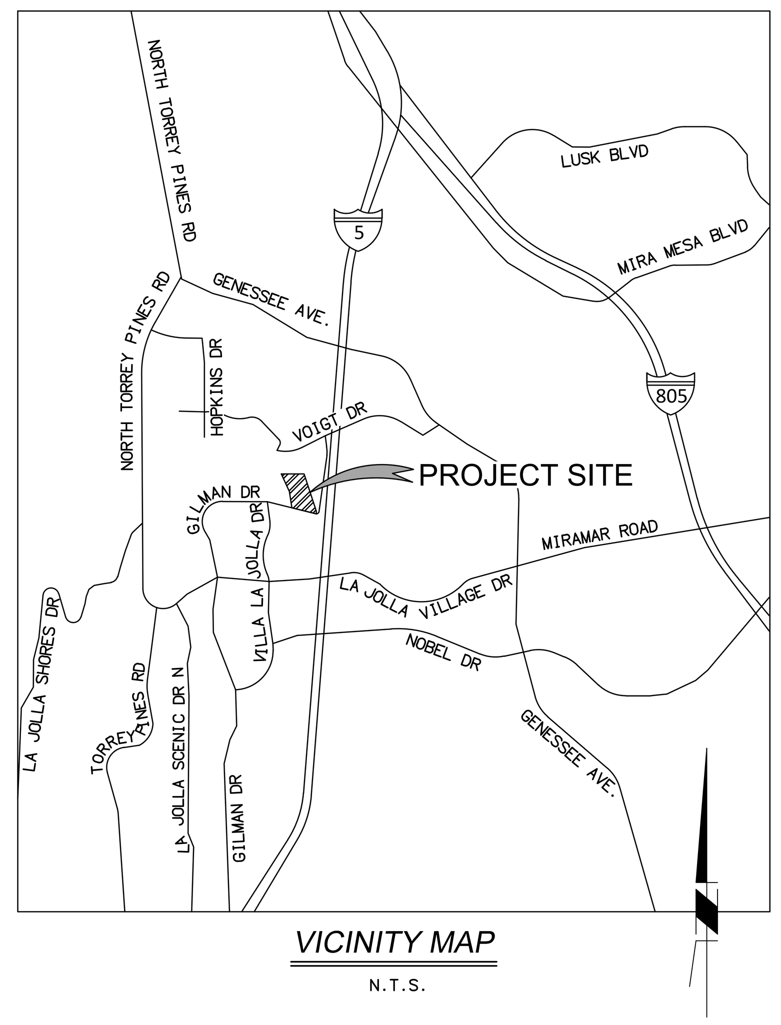
1. THIS PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT ORDER NO. 2013-0001-DWQ; AND RISK LEVEL/TYPE: CHECK ONE BELOW
   - ☐ WPCP
   - ☐ CGP RISK LEVEL 1 ☐ CGP LUP TYPE 1
   - ☒ CGP RISK LEVEL 2 ☐ CGP LUP TYPE 2
   - ☐ CGP RISK LEVEL 3 ☐ CGP LUP TYPE 3
2. WDID NO: ____________
3. CHECK ONE
   - ☐ THIS PROJECT WILL EXCEED THE MAXIMUM DISTURBED AREA LIMIT, THEREFORE A WEATHER TRIGGERED ACTION PLAN (WTAP) IS REQUIRED.
   - ☐ THIS PROJECT WILL FOLLOW PHASED GRADING NOT TO EXCEED FIVE (5) ACRES PER PHASE.
   - ☒ NOT APPLICABLE
4. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE WPCP OR SWPPP AS APPLICABLE.
5. WATERSHED: PENASQUITOS (906.1)
6. HYDRAULIC SUB AREA NAME (UCSD WATERSHED): MIRAMAR (906.4)
7. HYDRAULIC SUB AREA NUMBER: (906)

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE UNIVERSITY OF CALIFORNIA, SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

____________________________________ ________
BRIAN D. STUP R.C.E. NO. 58259 EXP. 06-30-2020 DATE



VICINITY MAP

N.T.S.

SITE ADDRESS

GILMAN DRIVE & VILLA LA JOLLA DRIVE, SAN DIEGO, CA 92093

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE UNIVERSITY OF CALIFORNIA SAN DIEGO AND THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-01	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2018 EDITION
PWPI010119-02	CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2018 EDITION
PWPI030119-07	CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (REVISION 4), 2014 EDITION
PWPI030119-05	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD SPECIFICATIONS, 2018 EDITION

STANDARD DRAWINGS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-03	CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2018 EDITION
PWPI030119-06	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD PLANS, 2018 EDITION

DESIGN GUIDELINES:

UNIVERSITY OF CALIFORNIA, SAN DIEGO DESIGN GUIDELINES - DATED OCTOBER 5, 2018

REFERENCES

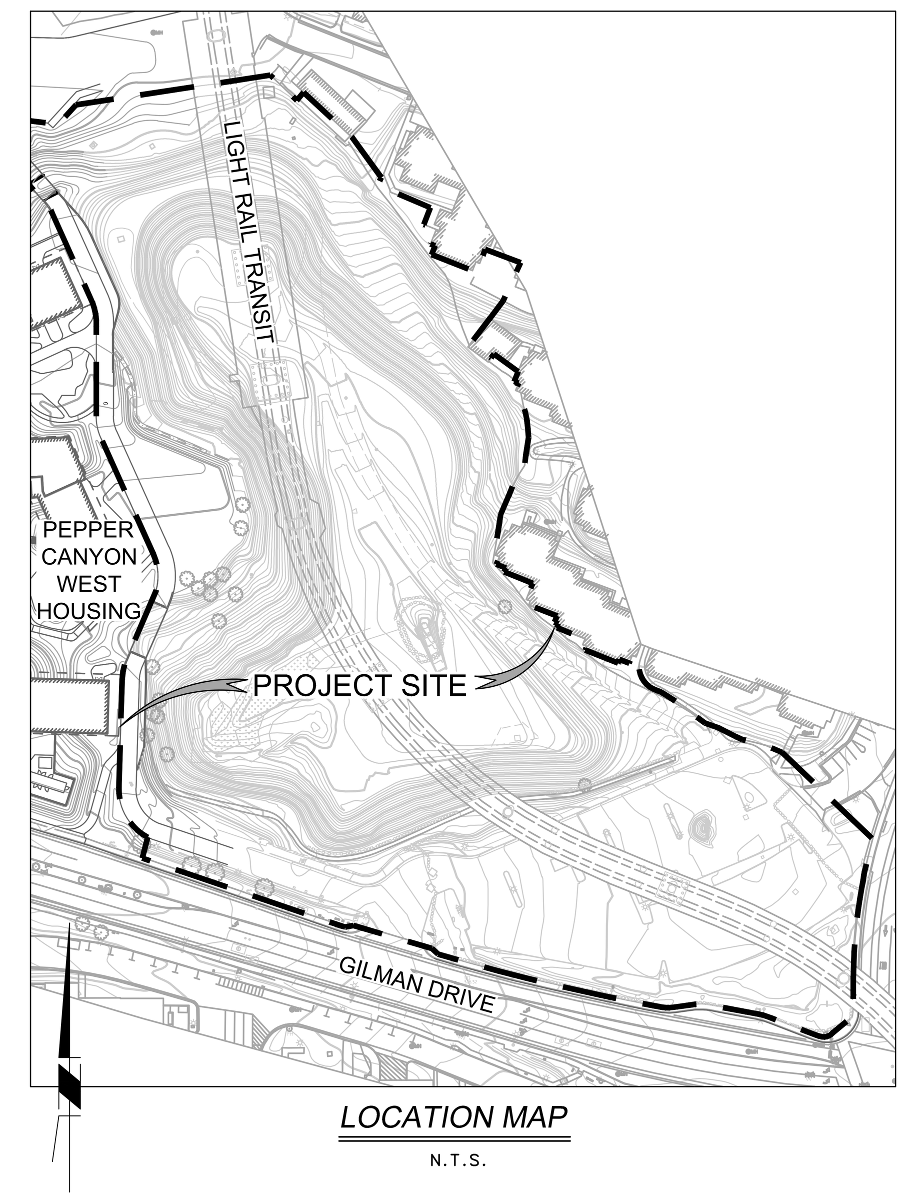
- SANDAG MID-COAST CORRIDOR TRANSIT PROJECT - CONTRACT NO. 5008600.4 (2018)
- GILMAN DRIVE ROADWAY IMPROVEMENTS & BRIDGE UTILITIES - UCSD PROJECT NO. 4912 (2015)
- RECLAIMED WATER PHASE 2, MAINLINE SCHOOL OF MEDICINE TO CAMPUS SERVICES COMPLEX - UCSD PROJECT NO. 4970A (2016)
- WARREN - UNIVERSITY CENTER UTILITIES LOOP, GILMAN DRIVE SEWER - UCSD PROJECT NO. 1936 (1993)
- WARREN CAMPUS GAS LINE REPLACEMENT, CAMP SNOOPY GAS AND WATER (1979)
- UCSD FACILITIES INFORMATION SYSTEM WEBPAGE
- TOPOGRAPHIC SURVEY PREPARED BY SNIPES-DYE ASSOCIATES, DATED OCTOBER 16, 2018.

CIVIL PROJECT SUMMARY

SITE GRADING FOR THE PEPPER CANYON OPEN SPACE PRESERVE PROJECT.

NOTES

APPROXIMATE SITE AREA = 8.1 ACRES



LOCATION MAP

N.T.S.

BASIS OF COORDINATES & BEARINGS

THE COORDINATES AND BEARINGS SHOWN HEREON ARE BASED UPON THE CALIFORNIA COORDINATE SYSTEM OF 1983, CCS83, ZONE 6, (EPOCH 1991.35). SAID COORDINATES AND BEARINGS ARE BASED LOCALLY UPON FIELD-OBSERVED TIES TO THE FOLLOWING CONTROL STATIONS PER UCSD SURVEY CONTROL.

STATION	NORTHING (ft.) GRID	EASTING (ft.) GRID
9062	1901211.775	6259401.491
1622	1900299.769	6259557.275

THE BASIS OF BEARINGS IS THE CALCULATED BEARING BETWEEN SAID CONTROL STATIONS 1622 & 9062.
I.E. N9°41'36"W

DISTANCES SHOWN HEREON ARE GROUND AND IN TERMS OF THE U.S. SURVEY FOOT.

BENCHMARK

THE BASIS OF ELEVATIONS FOR THIS SURVEY IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) PER UCSD SURVEY CONTROL
BENCHMARK DESIGNATION: #9062
ELEVATION: 348.54 (NGVD29)

SHEET INDEX

LEGEND

ITEM	SYMBOL
EXISTING CONTOUR	(345)
EXISTING BUILDING	
EXISTING CONCRETE	
APPROXIMATE PROJECT LIMITS	
EXISTING ITEM TO BE REMOVED	
EXISTING WATER	W W
EXISTING RECLAIMED WATER	RW RW
EXISTING SEWER	S S
EXISTING ABANDONED SEWER	SS SS
EXISTING STORM DRAIN	SD SD
EXISTING GAS	GAS GAS
EXISTING TELECOMMUNICATION SERVICE	T T
EXISTING ELECTRICAL	E E
EXISTING STREET LIGHT SERVICE	SL SL
EXISTING IRRIGATION	IRR
EXISTING WALL	
EXISTING FIRE HYDRANT	FH
EXISTING CATCH BASIN	
EXISTING MANHOLE	MH
EXISTING VALVE	
EXISTING LIGHT POLE	
EXISTING TREE	
EXISTING SPOT ELEVATION	(508.0X)
PROPOSED SPOT ELEVATION	508.00
PROPOSED MAJOR CONTOUR	340
PROPOSED MINOR CONTOUR	339
GRADE BREAK	GB
SURFACE FLOW DIRECTION	
PROPOSED PAVEMENT	
PROPOSED PATH PER LANDSCAPE	
PROPOSED STORM DRAIN	SD SD
PROPOSED CATCH BASIN	
PROPOSED STORM DRAIN CLEAN OUT	

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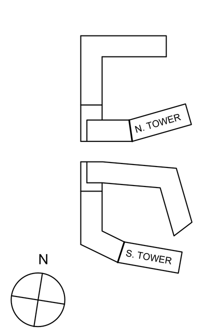
University of California San Diego Campus La Jolla, California 92037

PACKAGE 4
Open Space Preserve
100% DD
May 1, 2020

REGISTERED PROFESSIONAL ENGINEER
BRIAN D. STUP
No. 58259
Exp. 6/30/20
CIVIL
STATE OF CALIFORNIA

REGISTRATION STAMP

CFM STAMP



KEYPLAN

MARK	ISSUE	DATE

Job Number	161911.000
Drawn	Author
Checked	Checker
Approved	Approver

TITLE

CIVIL - TITLE SHEET

SHEET NUMBER

C0.01

VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

DEMOLITION LEGEND

- EXISTING LRT EASEMENT (APPROX)
- EXISTING ASPHALT TO BE REMOVED
- EXISTING WATER
- EXISTING RECLAIMED WATER
- EXISTING SEWER
- EXISTING ABANDONED SEWER
- EXISTING STORM DRAIN
- EXISTING IRRIGATION
- EXISTING STREET LIGHT CONDUIT
- EXISTING GAS
- EXISTING TELECOM
- EXISTING ELECTRIC
- EXISTING ITEM TO BE REMOVED
- APPROXIMATE PROJECT LIMITS

NOTES:

1. EXISTING UTILITIES SHOWN ARE BASED ON AS-BUILT AND TOPOGRAPHIC SURVEY INFORMATION. CONTRACTOR TO FIELD VERIFY ALL UTILITIES PRIOR TO DEMOLITION.
2. DEMOLITION OF IRRIGATION LINES TO BE COORDINATED WITH OJB LANDSCAPE ARCHITECTURE PRIOR TO DEMOLITION.
3. EXISTING CONDITIONS (AS SHOWN HEREON) FOR THE ADJACENT PEPPER CANYON WEST HOUSING SITE ARE SHOWN PER THE DEVELOPED CONDITION.
4. EXISTING CONDITIONS (AS SHOWN HEREON) FOR THE OPEN SPACE PRESERVE, ARE BASED ON THE AERIAL TOPOGRAPHY SURVEY DATED JULY 26, 2019 (PREPARED BY AEROTECH MAPPING, INC). PRIOR TO CONSTRUCTION, AS-BUILT FILES WILL BE PROVIDED BY SANDAG, AND INCORPORATED INTO THE FINAL DESIGN DOCUMENTS FOR THE OPEN SPACE PRESERVE.
5. THIS PLAN ASSUMES THAT ALL GRADING, INFRASTRUCTURE, AND EROSION CONTROL MEASURES (BMPS) HAVE BEEN INSTALLED (AND REMAIN IN PLACE) PER THE SANDAG CONTRACT NO. 5008600.4 (2018).
6. SEE GRADING SHEET C2.01 FOR LIMITS OF GRADING AND REMOVAL OF THE EXISTING DRAINAGE CHANNEL PER SANDAG CONTRACT NO. 5008600.4

DEMOLITION NOTES

- (3) REMOVE EXISTING STORM DRAIN LINE
- (9) REMOVE EXISTING MANHOLE
- (14) REMOVE EXISTING CONCRETE
- (15) REMOVE EXISTING ASPHALT
- (16) REMOVE EXISTING LIGHT POLE
- (19) REMOVE EXISTING CURB
- (20) REMOVE EXISTING CURB & GUTTER
- (24) REMOVE EXISTING CURB INLET

PROTECTION NOTES

- 1 PROTECT IN PLACE EXISTING WATER LINE
- 2 PROTECT IN PLACE EXISTING SEWER LINE
- 3 PROTECT IN PLACE EXISTING STORM DRAIN LINE
- 4 PROTECT IN PLACE EXISTING RECLAIMED WATER LINE
- 6 PROTECT IN PLACE EXISTING TELECOM CONDUIT
- 9 PROTECT IN PLACE EXISTING MANHOLE
- 11 PROTECT IN PLACE EXISTING FIRE WATER APPURTENANCES
- 12 PROTECT IN PLACE EXISTING WETLAND
- 16 PROTECT IN PLACE EXISTING LIGHT POLE
- 17 PROTECT IN PLACE EXISTING INLET
- 18 PROTECT IN PLACE EXISTING CONCRETE PATH
- 19 PROTECT IN PLACE EXISTING RETAINING WALL
- 20 PROTECT IN PLACE EXISTING SD CLEANOUT
- 21 PROTECT IN PLACE EXISTING HEADWALL

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CIVIL
STATE OF CALIFORNIA

REGISTRATION STAMP

CFM STAMP

N. TOWER
S. TOWER
N

KEYPLAN

MARK	ISSUE	DATE
Job Number		161911.000
Drawn		Author
Checked		Checker
Approved		Approver

TITLE
CIVIL - EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER
C1.00

VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

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LEGEND

- EXISTING BUILDING
- EXISTING LRT EASEMENT (APPROX)
- APPROXIMATE PROJECT LIMITS
- EXISTING WATER
- EXISTING RECLAIMED WATER
- EXISTING SEWER
- EXISTING ABANDONED SEWER
- EXISTING STORM DRAIN
- EXISTING IRRIGATION
- EXISTING STREET LIGHT CONDUIT
- EXISTING GAS
- EXISTING TELECOM
- EXISTING ELECTRIC
- PROPOSED AC PAVEMENT
- TRAIL/PATH PER LANDSCAPE PLANS
- TRAIL STEP PER LANDSCAPE PLANS
- PROPOSED STORM DRAIN
- PROPOSED PERFORATED PIPE
- MAJOR CONTOUR
- MINOR CONTOUR
- CATCH BASIN / RISER
- PROPOSED STORM DRAIN CLEANOUT

NOTES:

1. EXISTING UTILITIES SHOWN ARE BASED OFF OF AS-BUILT AND TOPOGRAPHIC SURVEY INFORMATION. CONTRACTOR TO FIELD VERIFY ALL UTILITIES PRIOR TO DEMOLITION.
2. GEOTECHNICAL FIRM OF RECORD TO PERFORM INFILTRATION TESTING DURING CONSTRUCTION.
3. SEE LANDSCAPE PLANS FOR PLANTING, HARDSCAPE MATERIALS/FINISHES, BIKE PATH, AND STEP DETAILS.

SCALE: 1"=40'

VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

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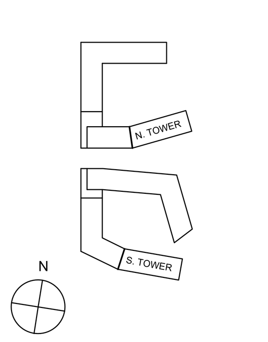

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MARK	ISSUE	DATE

Job Number	161911.000
Drawn	Author
Checked	Checker
Approved	Approver

TITLE

CIVIL - GRADING PLAN

SHEET NUMBER

C2.01

EROSION CONTROL LEGEND

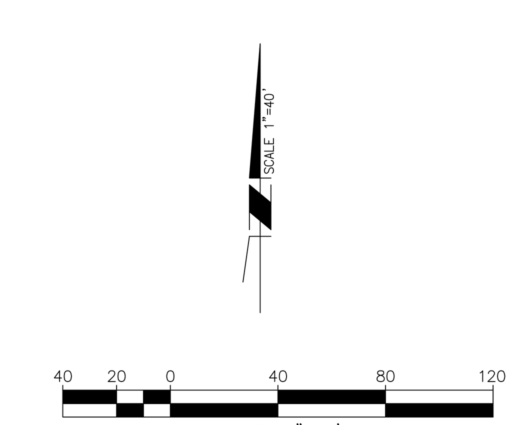
ITEM	DETAIL / SHEET	SYMBOL
JUTE EROSION CONTROL MAT (EC-7)	1 / C2.03	
SILT FENCE (SE-1)	2 / C2.03	——x——x——
STABILIZED CONSTRUCTION ENTRANCE (TC-1)	3 / C2.03	
CURB INLET PROTECTION (SE-10)	4 / C2.03	
CATCH BASIN / INLET PROTECTION (SE-10)	5 / C2.03	
BURLAP GRAVEL BAGS (SE-6)	6 / C2.03	
ACCESS ROAD STABILIZATION (BIOPOLYMER)		

CONSTRUCTION SITE BMPS

- WE-1 WIND EROSION CONTROL PER WE-1
- WM-1 MATERIAL DELIVERY AND STORAGE PER WM-1
- WM-3 STOCKPILE MANAGEMENT PER WM-3
- WM-4 SPILL PREVENTION AND CONTROL PER WM-4
- WM-5 SOLID WASTE MANAGEMENT PER WM-5
- WM-8 CONCRETE WASTE MANAGEMENT AND CONCRETE WASHOUT PER WM-8
- WM-9 SANITARY/SEPTIC WASTE MANAGEMENT PER WM-9

NOTES

THIS EROSION CONTROL PLAN ASSUMES THAT ALL PREVIOUSLY ESTABLISHED BMPS, AS INSTALLED PER SANDAG CONTRACT NO.5008600.4 (2018), REMAIN OPERATIONAL AND IN-PLACE. FUTURE BUDGET MAY REQUIRE ONGOING MAINTENANCE UNTIL PROJECT CLOSE-OUT.



VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

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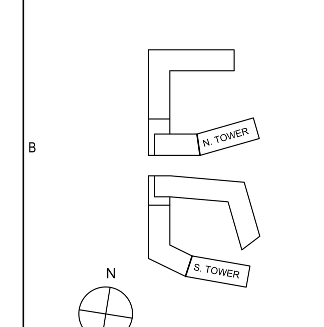

KEYPLAN

MARK	ISSUE	DATE

Job Number	161911.000
Drawn	Author
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TITLE

CIVIL - EROSION CONTROL PLAN

SHEET NUMBER

C2.02

TIME OF INSTALLATION:

IT IS THE INTENT THAT THE HYDROSEED MIX BE APPLIED NO SOONER THAN JUST BEFORE THE FIRST RAIN, IN NOVEMBER, AND NO LATER THAN JUST AFTER THE SECOND RAIN AFTER THE FIRST RAIN IN NOVEMBER.

EROSION CONTROL:

PROVIDE ONE ROW OF GRAVEL BAGS OR STRAW ROLL AT THE BASE OF ALL HYDRO-SEEDED SLOPES AND DOWN SLOPE LIMITS OF GRADING.

EROSION AND SEDIMENT CONTROL NOTES:

TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE CITY OF SAN DIEGO ''LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED GRADING/IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND/OR WATER POLLUTION CONTROL PLAN (WPCP) FOR CONSTRUCTION LEVEL BMP'S AND FOR PERMANENT POST CONSTRUCTION TREATMENT CONTROL PERMANENT BMP'S, THE WATER QUALITY TECHNICAL REPORT (WQTR) IF APPLICABLE.
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. FOR INLETS LOCATED AT SUMPS ADJACENT TO TOP OF SLOPES, THE CONTRACTOR SHALL ENSURE THAT WATER DRAINING TO THE SUMP IS DIRECTED INTO THE INLET AND THAT A MINIMUM OF 1.00' FREEBOARD EXISTS AND IS MAINTAINED ABOVE THE TOP OF THE INLET. IF FREEBOARD IS NOT PROVIDED BY GRADING SHOWN ON THESE PLANS, THE CONTRACTOR SHALL PROVIDE IT VIA TEMPORARY MEASURES, I.E. GRAVEL BAGS OR DIKES.
4. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR OR QUALIFIED PERSON SHALL CHECK AND MAINTAIN ALL LINED AND UNLINED DITCHES AFTER EACH RAINFALL.
6. CONTRACTOR SHALL PLACE BMPS TO PROTECT THE WETLAND, SUCH THAT NO SEDIMENT IS ALLOWED TO FLOW INTO THE WETLAND BOUNDARIES. IF SILT/ DEBRIS ERRANTLY ENTERS THE WETLAND, THE CONTRACTOR WILL NEED TO REMOVE THE SILT/DEBRIS BY HAND UNDER THE SUPERVISION OF A BIOLOGICAL MONITOR.
7. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
8. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
9. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
10. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
12. ALL EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED GRADING PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
13. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
14. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
15. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDIMENT CONTROL MEASURES.
16. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER/DEVELOPER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

HYDROSEEDING NOTES FOR SLOPE AREAS:

WITHIN 48 HOURS OF SLOPE COMPACTION, THE FOLLOWING SHALL BE APPLIED:

SEED

SEED SHALL BE DELIVERED TO THE SITE IN SEALED CONTAINERS. EACH CONTAINER SHALL HAVE AN ATTACHED SEED LABEL WHICH PROVIDES THE NET WEIGHT AND GENUS/SPECIES OF THE SEED, THE PERCENT PURITY, GERMINATION, INERT AND WEED SEED. THE WEED SEED SHALL NOT EXCEED 15 PERCENT. SEED TESTS FOR EACH OF THE SEEDS USED ON THE PROJECT SHALL BE MADE AVAILABLE TO THE OWNER'S REPRESENTATIVE UPON DEMAND. ANY WET, MOLDY, SPROUTED, OR OTHERWISE CONTAMINATED SEED SHALL NOT BE ACCEPTED. THE OWNER'S REPRESENTATIVE MAY PULL SAMPLES FROM EACH OF THE BAGS OF SEED FOR TESTING PURPOSES. NO CHANGES TO THE SEED MIX OR SUBSTITUTIONS MAY BE MADE WITHOUT FIRST SUBMITTING SUCH A REQUEST, IN WRITING, TO THE OWNER'S REPRESENTATIVE.

A SIGNED LETTER OF CONFORMANCE SHALL BE PROVIDED FROM THE SEED VENDOR CERTIFYING THAT EACH CONTAINER OF SEED DELIVERED IS FULLY LABELED IN ACCORDANCE WITH THE CALIFORNIA STATE AGRICULTURAL CODE AND MEETS SPECIFICATIONS. SEED MIX TO BE NON-INVASIVE SPECIES ONLY.

STORMWATER AND EROSION CONTROL FIBER ROLLS

STORMWATER AND EROSION CONTROL FIBER ROLLS SHALL BE USED ON ALL SLOPE AREAS THAT ARE 4:1 GRADIENT AND STEEPER FOR SOIL STABILIZATION. SEE SPECIFICATIONS FOR INSTALLATION.

HYDROSEEDING

THE COMBINATION OF SEED, MECHANICALLY BONDED FIBER MATRIX, FERTILIZER, AND WATER SHALL BE ADDED TO THE HYDROSEEDING MACHINE ON-SITE, IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. THE WATER AND MECHANICALLY BONDED FIBER MATRIX SHALL BE ADDED FIRST AND MIXED HOMOGENEOUSLY UNTIL ALL PRODUCTS ARE VISIBLY MIXED WELL. ONCE PRODUCT IS WELL BLENDED, SEED AND FERTILIZER SHALL BE ADDED AND MIXED UNTIL THE SEED AND FERTILIZER ARE VISIBLE THROUGHOUT THE SLURRY. ONCE THE SEED AND FERITILIZER IS ADDED, THE AGITATION OF THE SLURRY SHOULD BE MINIMAL, SO AS NOT TO DAMAGE THE SEEDS. THE MATERIAL SHOULD THEN BE SPRAYED ONTO THE DESIGNATED PLANTING AREAS, AND CARE SHOULD BE TAKEN TO CLEAN UP ANY OVERSPRAY OR SPILLAGE.

INTERIM BINDER NOTE

GRADED, DISTURBED, OR ERODED AREAS TO BE TREATED WITH NON-IRRIGATED HYDROSEED MIX SHALL RECEIVE AN INTERIM BINDER/TACKIFIER AS NEEDED BETWEEN APRIL 2ND AND AUGUST 31ST FOR DUST-EROSION CONTROL WITH SUBSEQUENT APPLICATION OF HYDROSEED MIX DURING THE RAINY SEASON BETWEEN OCTOBER 1ST AND APRIL 1ST.

MECHANICALLY BONDED FIBER MATRIX (3600LBS.ACRE)

THE MECHANICALLY BONDED FIBER MATRIX SHALL BE COMPOSED OF WOOD FIBER, CRIMPED POLYESTER FIBERS, POLYSACCHARIDE CROSSLINKED HYDRO-COLLOID POLYMER TACKIFIER, AND CONTAIN NO GERMINATION-INHIBITING OR GROWTH-INHIBITING FACTORS. THE MECHANICALLY BONDED FIBER MATRIX SHALL HAVE A TEMPORARY GREEN DYE AND SHALL NOT HAVE ANY ADVERSE AFFECTS OR BE INJURIOUS TO PLANTS OR ANIMALS. A CERTIFICATE OF COMPLIANCE SHALL BE PROVIDED BY THE PRODUCT MANUFACTURER TO CERTIFY COMPLIANCE WITH THE SPECIFICATIONS.

AMENDMENTS

ANY SPECIFIED SOIL AMENDMENTS MUST BE APPLIED PRIOR TO THE HYDROSEEDING APPLICATION. IF THE AMENDMENT IS TO BE INCORPORATED INTO THE SEEDBED, IT MUST BE DONE IN SUCH A MANNER TO DISPERSE THE AMENDMENT EVENLY THROUGHOUT THE PLANTING AREA. ALL SOIL AMENDMENTS MUST BE APPLIED AT THE RATES SHOWN IN THE SPECIFICATIONS, AND AS SPECIFIED ON THE SOILS ANALYSIS REPORT(S). ANY DEVIATIONS FROM THESE NEEDS TO BE APPROVED BY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO MAKING ANY SUCH CHANGES.

PLANTING LEGEND FOR TEMPORARY EROSION CONTROL

HYDROSEED SLURRY COMPONENT FOR AREAS WITH ALL GRADIENTS

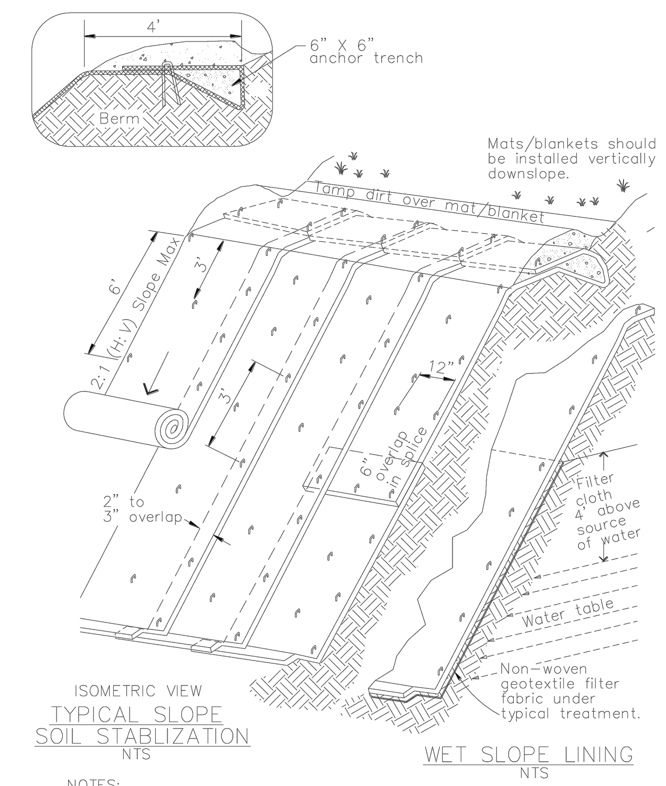
	COMMON NAME	BULK #'S
FIBER MULCH:	CONWED FIBERS 1000	1500 LBS/ACRE
BINDER/TACKIFIER:	ECOLOGY CONTROLS	150 LBS/ACRE
COMPOST:	HYDROPOST (PREMIUM)	1000 LBS/ACRE
SEED:	FESTUCA RUBRA 'MOLATE' KOELERIA MACRANTHA STIPA PULCHRA STIPA CERNUA	25 LBS/ACRE (85 PLS) 5 LBS/ACRE (85 PLS) 20 LBS/ACRE (85 PLS) 10 LBS/ACRE (85 PLS)
FERTILIZER/AMENDMENTS:	BIOSOL MIX 7-2-3 MYCORRHIZAL INOCULUM	1000 LBS/ACRE 60 LBS/ACRE

NOTES:

1. ALL SLOPE AREAS THAT ARE 4:1 GRADIENT AND STEEPER THAT RECEIVE HYDROSEED MIX SHALL ALSO RECEIVE STORMWATER AND EROSION CONTROL FIBER ROLLS. SEE SPECIFICATIONS FOR INSTALLATION.

HYDROSEED NOTES

1. SEED MIXES SHALL BE SPECIFIED BY THE PURE LIVE SEED OF EACH SPECIES.
2. FIBER MULCH SHALL BE APPLIED AT A MINIMUM RATE OF 2,000 POUNDS PER ACRE EXCEPT WHEN USED IN CONJUNCTION WITH STRAW MULCH, WHEN IT SHALL BE APPLIED AT A MINIMUM RATE OF 400 POUNDS PER ACRE.
3. A WETTING AGENT CONSISTING OF 95 PERCENT ALKYL POLYETHYLENE GLYCOL SHALL BE APPLIED AS PER MANUFACTURERS' RECOMMENDATIONS
4. EQUIPMENT USED FOR THE APPLICATION OF SLURRY SHALL HAVE A BUILD-IN AGITATION SYSTEM TO SUSPEND AND HOMOGENEOUSLY MIX THE SLURRY. THE SLURRY MIX SHALL BE DIED GREEN. THE EQUIPMENT MUST HAVE A PUMP CAPABLE OF APPLYING SLURRY UNIFORMLY.

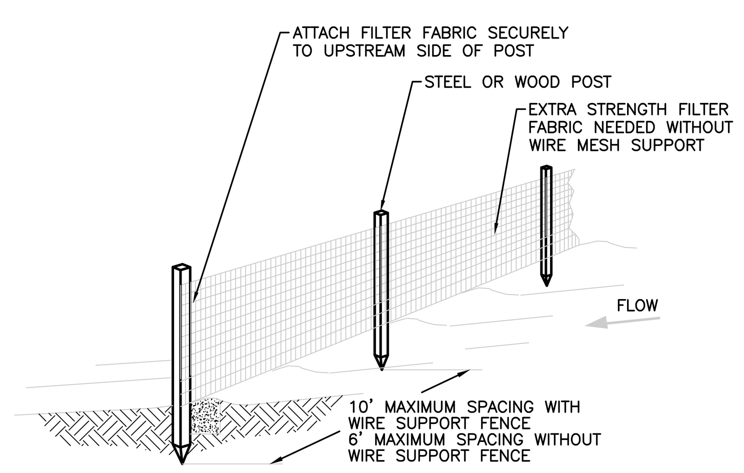


NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

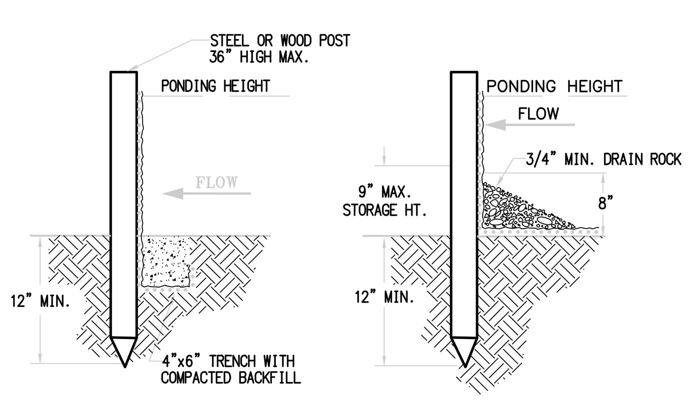
TYPICAL INSTALLATION DETAIL

1 / –
JUTE EROSION CONTROL MAT DETAIL
N.T.S.



NOTES:

PREFABRICATED SILT FENCE MAY BE USED IN LIEU OF IN PLACE CONSTRUCTION.



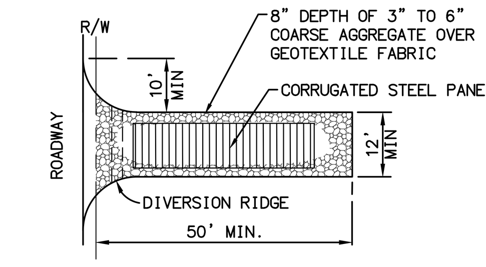
TRENCH DETAIL

INSTALLATION WITHOUT TRENCHING

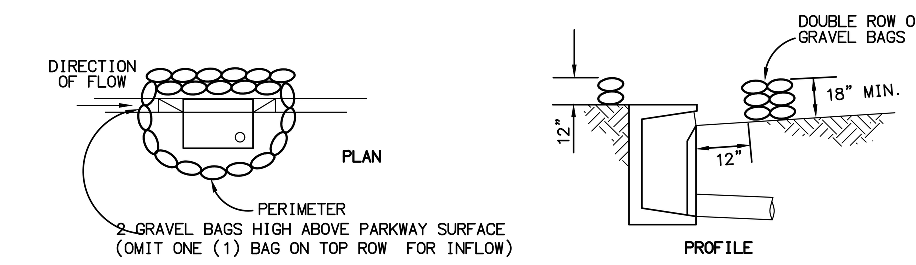
NOTES:

1. SILT FENCE SHALL BE PLACE ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

2 / –
SILT FENCE DETAIL
N.T.S.



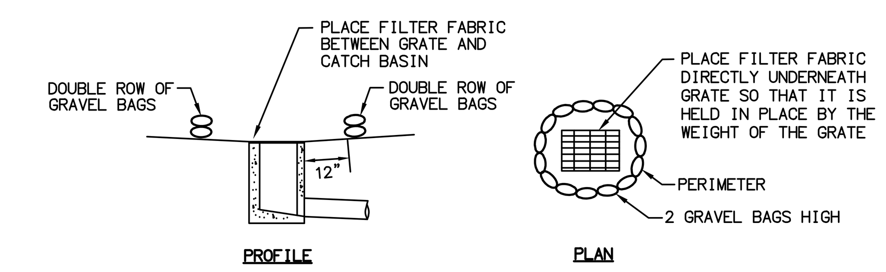
3 / –
STABILIZED CONSTRUCTION ENTRANCE
N.T.S.



NOTES:

1. GRAVEL BAGS (OF BURLAP FABRIC) ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
2. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

4 / –
CURB INLET PROTECTION
N.T.S.



NOTES:

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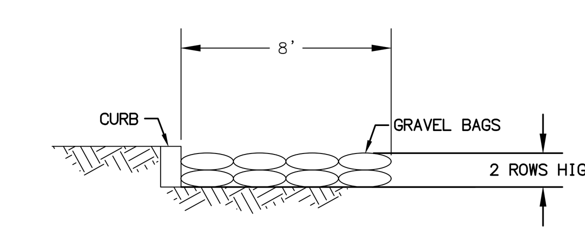
2. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

5 / –
CATCH BASIN / INLET PROTECTION
N.T.S.



NOTES:

1. GRAVEL BAGS (OF BURLAP FABRIC) ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
2. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

6 / –
GRAVEL BAG DETAIL
N.T.S.

VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

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5265: UCSD PEPPER CANYON WEST STUDENT HOUSING

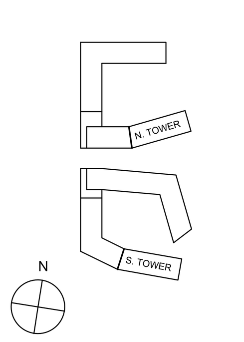
University of California
San Diego Campus
La Jolla, California 92037

PACKAGE 4
Open Space Preserve
100% DD
May 1, 2020

REGISTERED PROFESSIONAL ENGINEER
BRIAN D. STUP
No. 58259
Exp. 6/30/20
CIVIL
STATE OF CALIFORNIA

REGISTRATION STAMP

CFM STAMP



KEYPLAN

MARK	ISSUE	DATE
Job Number		161911.000
Drawn		Author
Checked		Checker
Approved		Approver

TITLE

CIVIL - EROSION CONTROL DETAILS

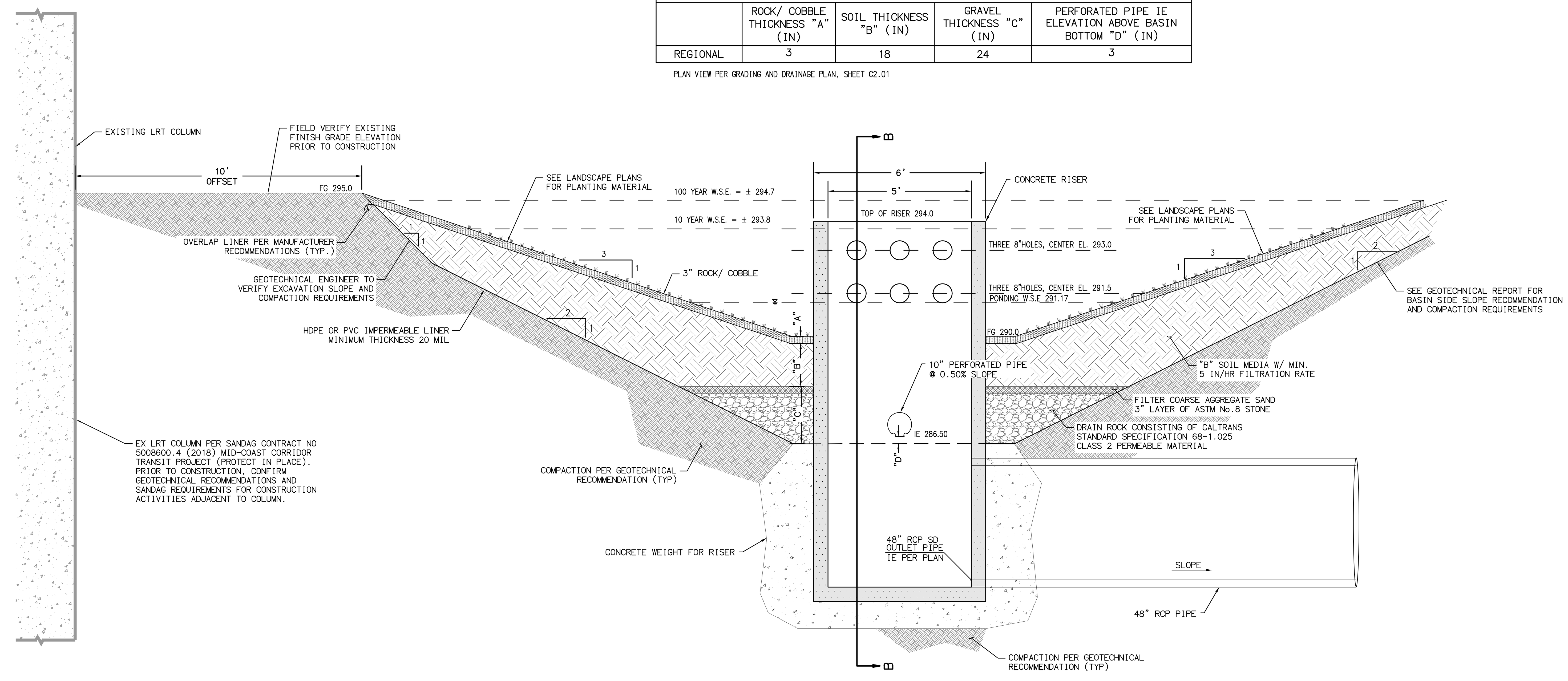
SHEET NUMBER

C2.03

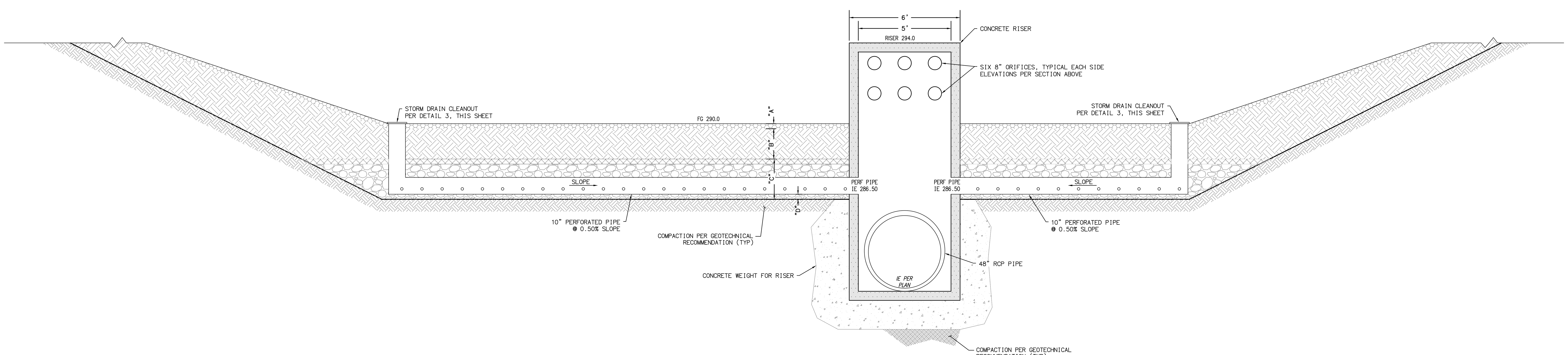
BASIN SPECIFICATIONS

	ROCK/ COBBLE THICKNESS "A" (IN)	SOIL THICKNESS "B" (IN)	GRAVEL THICKNESS "C" (IN)	PERFORATED PIPE IE ELEVATION ABOVE BASIN BOTTOM "D" (IN)
REGIONAL	3	18	24	3

PLAN VIEW PER GRADING AND DRAINAGE PLAN, SHEET C2.01

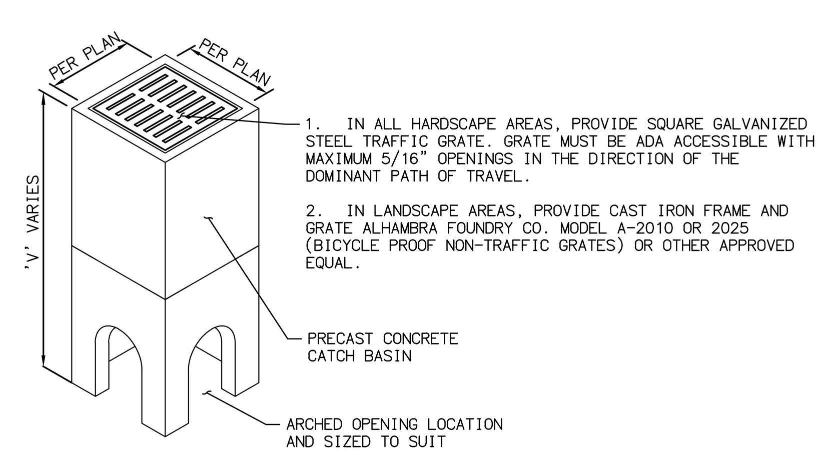


SECTION A-A
N.T.S



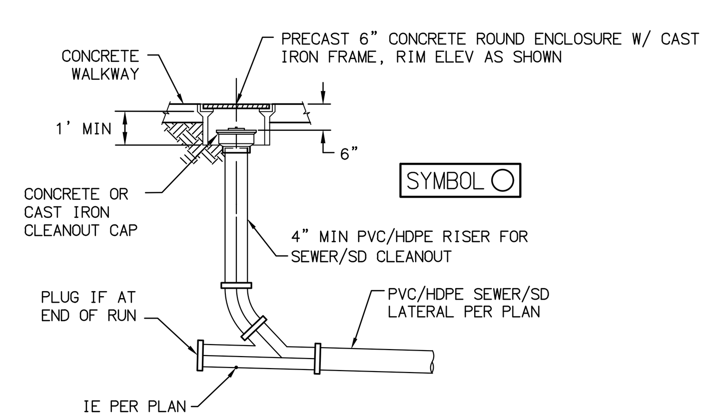
SECTION B-B
N.T.S

1 / C3.01 **BIOFILTRATION BASIN**
N.T.S



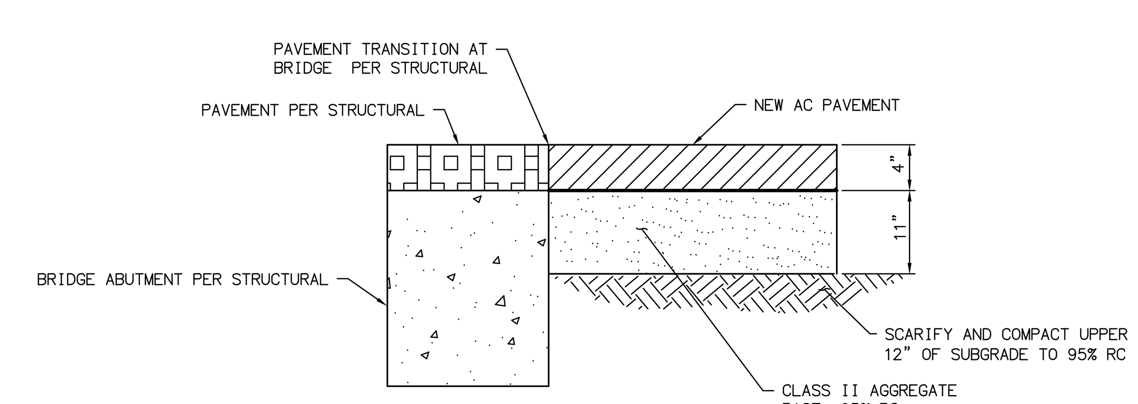
NOTES:
1. USE PRECAST CONCRETE BOTTOM OR AT CONTRACTORS OPTION, POUR A 6" THICK CONCRETE BOTTOM.
2. FOR LARGER PIPES, THE USE OF THE CONCRETE COLLAR SHOWN IS OPTIONAL.
3. SEE STORM DRAIN PLANS FOR PIPE SIZES
4. MAY USE SOLID COVER FOR JUNCTION STRUCTURE.
5. 'V' INCLUDES STACKING PRECAST INLETS TO INVERT OF STORM DRAIN AS NECESSARY.

DETAIL
2 / C3.01 **PRECAST CONCRETE CATCH BASIN 1**
N.T.S.



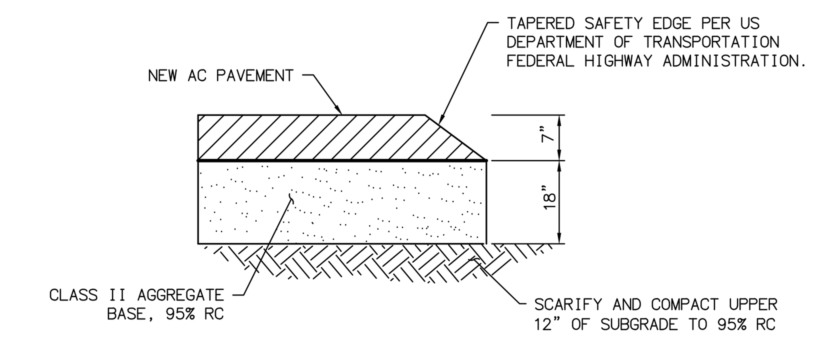
NOTES:
1. CLEANOUT PIPE SIZE SHALL MATCH LATERAL PIPE SIZE, MINIMUM 4".
2. SINGLE CLEANOUTS SHALL BE INSTALLED ON SERVICE LINES AS INDICATED ON PLANS.
3. SINGLE CLEANOUTS SHALL ALWAYS BE ORIENTATED TO FACILITATE CLEANING DOWN STREAM.
4. DUAL CLEANOUTS SHALL BE USED AT BUILDINGS (PER MECHANICAL AND SUBCONTRACTOR SCOPE).

DETAIL
3 / C3.01 **STORM DRAIN/SEWER CLEANOUT**
N.T.S.



NOTE:
1. SECTIONS TO BE CONSTRUCTED PER GEOTECHNICAL EVALUATION.
2. ASPHALT PAVEMENTS TO INCLUDE SAFETY EDGE PER US DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION.

DETAIL
4 / C3.01 **AC PAVEMENT**
N.T.S.



NOTE:
1. SECTIONS TO BE CONSTRUCTED PER GEOTECHNICAL EVALUATION AND SPECIFICATIONS.

DETAIL
5 / C3.01 **RECYCLED AC PAVEMENT**
N.T.S.

VERTICAL DATUM: NGVD 29
HORIZONTAL DATUM: NAD 83 (1991.35)

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University of California San Diego Campus
La Jolla, California 92037

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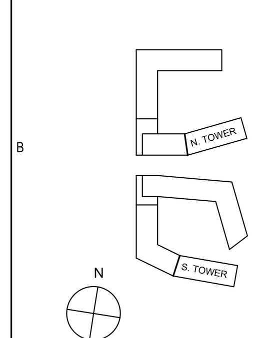
100% DD
May 1, 2020

REGISTRATION STAMP

CFM STAMP



KEYPLAN

MARK	ISSUE	DATE
Job Number		161911.000
Drawn		Author
Checked		Checker
Approved		Approver

TITLE
CIVIL - DETAIL SHEET

SHEET NUMBER
C3.01

Appendix G – Excerpts from Affordable Pipeline Service 2013 Storm Drain Survey

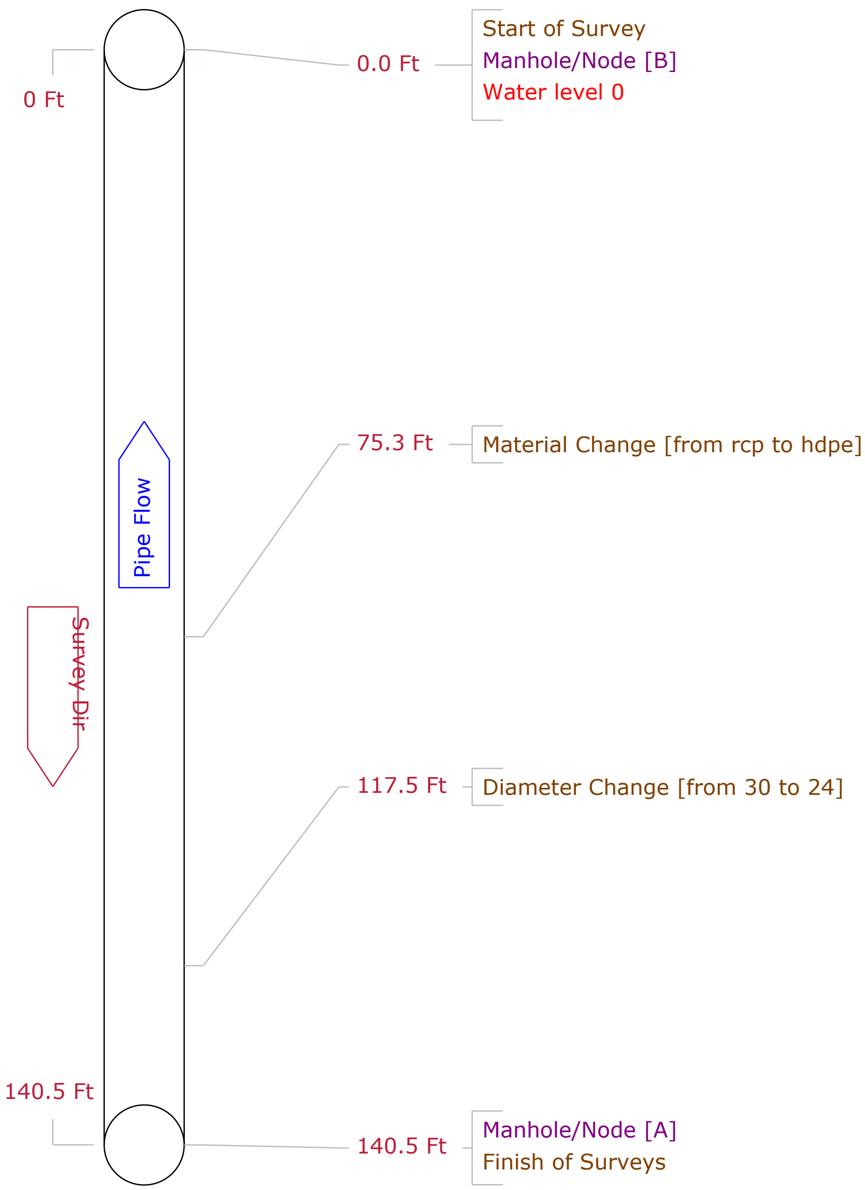
Pipe Graphic Report of PLR A X for UCSD

Work Order		Contract		Video		Setup	1
Facility		Operator	CK	Van Ref	10	Surveyed On	03/01/2013

Street Name	Pepper Canyon	City	UCSD
Location type	Private - with easement		
Surface	Landscaping, Light shrubs, Garden		
Survey purpose		Weather	Dry

Pipe Use	Storm	Schedule length	140.5 Ft	From	B	Depth	Ft
Shape	Circular	Size	30 by ins	To	A	Depth	Ft
Material	Reinforced Concrete Pipe	Joint spacing	Ft	Direction	Upstream		
Lining		Year laid		Pre-clean		Last cleaned	

General note	Structural	Service	Constructional
Location note	Miscellaneous	Hydraulic	



Affordable Pipeline Services
Phone: 858-689-4000
Fax: 858-689-4035

Tabular Report of PLR A X for UCSD

Work Order	Contract	Video	Setup 1
Facility	Operator CK	Van Ref 10	Surveyed On 03/01/2013

Street Name Pepper Canyon   City UCSD
Location type Private - with easement
Surface Landscaping, Light shrubs, Garden
Survey purpose   Weather Dry

Pipe Use Storm	Sched length 140.5 Ft	From B Depth Ft
Shape Circular	Size 30 by ins	To A Depth Ft
Material Reinforced Concrete Pipe	Joint Spacing Ft	Direction Up
Lining	Year laid	Pre-clean Last Cleaned

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					B
	0.0		WL	Water level				0	
	75.3		MC	Material Change					from rcp to hdpe
	117.5		DC	Diameter Change					from 30 to 24
	140.5		MH	Manhole/Node					A
	140.5		FH	Finish of Surveys					

140.5 Ft Total Length Surveyed

Scores

Structural:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0
Service:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0

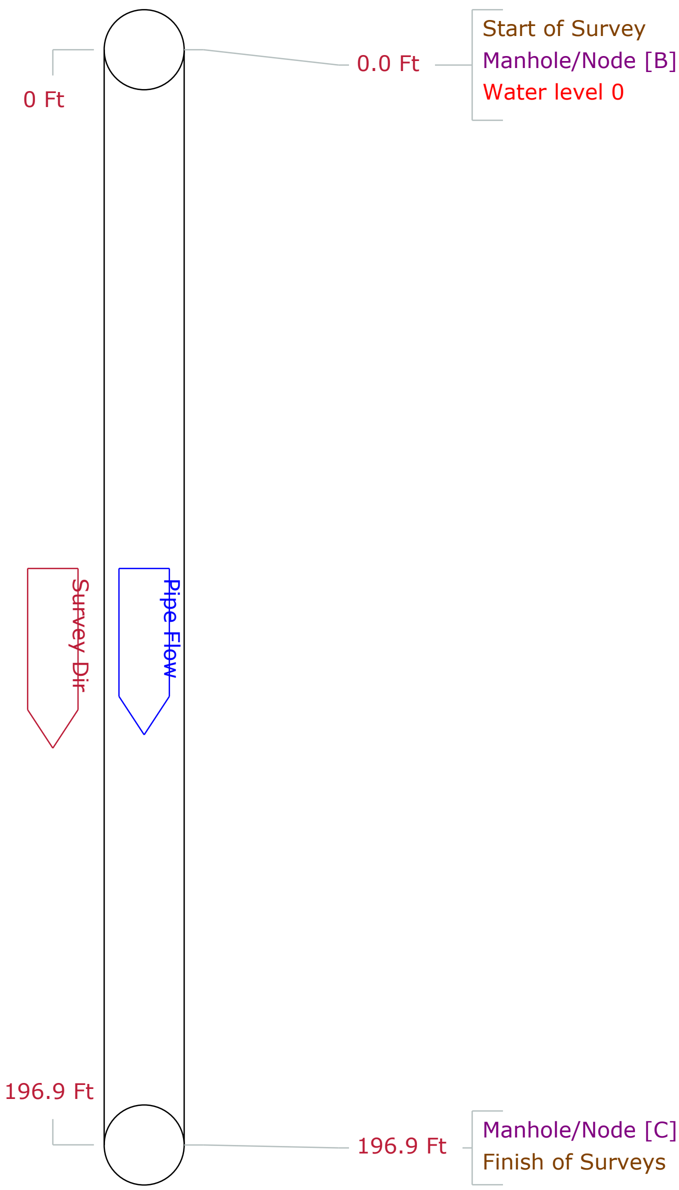
Pipe Graphic Report of PLR B X for UCSD

Work Order		Contract		Video		Setup	2
Facility		Operator	CK	Van Ref	10	Surveyed On	03/01/2013

Street Name	Pepper Canyon	City	UCSD
Location type	Private - with easement		
Surface	Landscaping, Light shrubs, Garden		
Survey purpose		Weather	Dry

Pipe Use	Storm	Schedule length	196.9 Ft	From B	Depth Ft
Shape	Circular	Size 48 by	ins	To C	Depth Ft
Material	Reinforced Concrete Pipe	Joint spacing	Ft	Direction	Downstream
Lining		Year laid		Pre-clean	Last cleaned

General note	Structural	Service	Constructional
Location note	Miscellaneous	Hydraulic	



Affordable Pipeline Services
Phone: 858-689-4000
Fax: 858-689-4035

Tabular Report of PLR B X for UCSD

Work Order	Contract	Video	Setup 2
Facility	Operator CK	Van Ref 10	Surveyed On 03/01/2013

Street Name Pepper Canyon
City UCSD
Location type Private - with easement
Surface Landscaping, Light shrubs, Garden
Survey purpose
Weather Dry

Pipe Use Storm	Sched length 196.9 Ft	From B Depth Ft
Shape Circular	Size 48 by ins	To C Depth Ft
Material Reinforced Concrete Pipe	Joint Spacing Ft	Direction Down
Lining	Year laid	Pre-clean Last Cleaned

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					B
	0.0		WL	Water level				0	
	196.9		MH	Manhole/Node					C
	196.9		FH	Finish of Surveys					

196.9 Ft Total Length Surveyed

Scores

Structural:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0
Service:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0

Affordable Pipeline Services
Phone: 858-689-4000
Fax: 858-689-4035

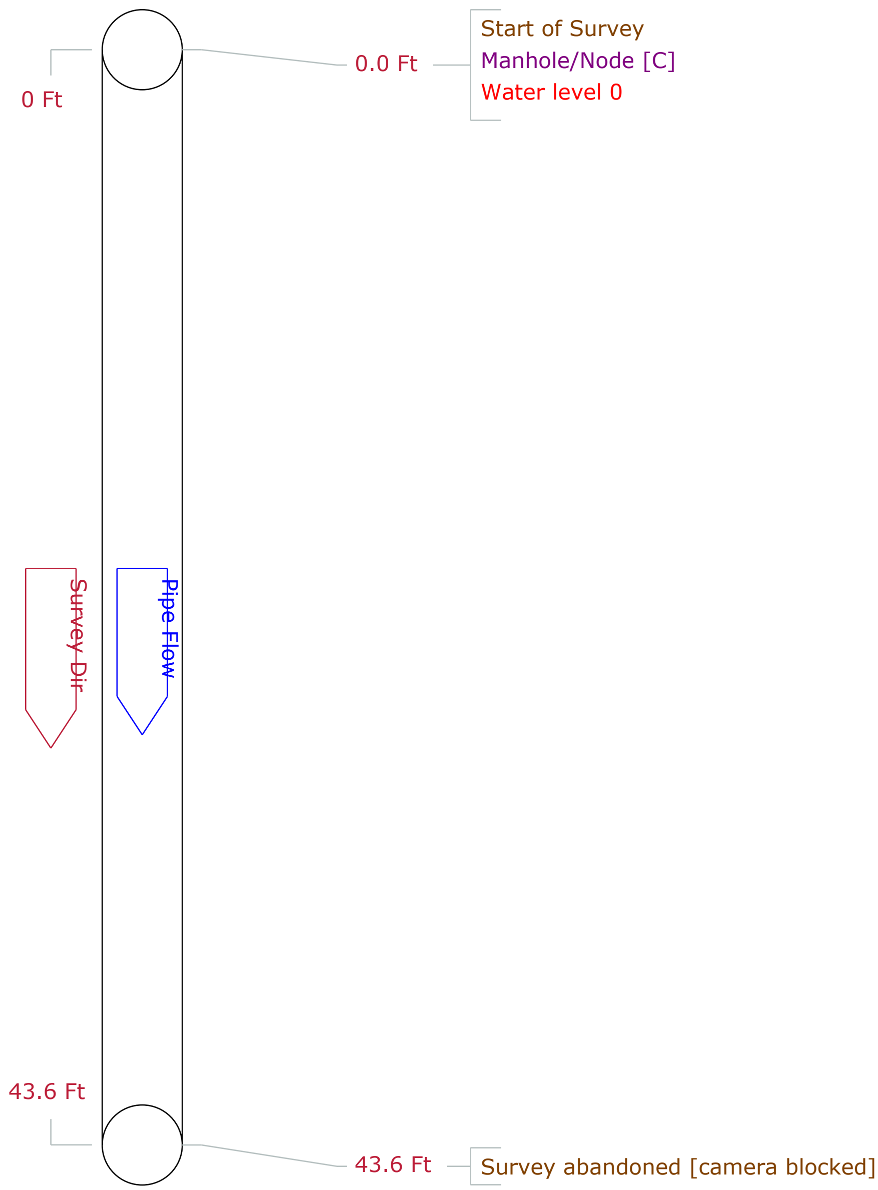
Pipe Graphic Report of PLR C X for UCSD

Work Order		Contract		Video		Setup	3
Facility		Operator	CK	Van Ref	10	Surveyed On	03/01/2013

Street Name	Pepper Canyon	City	UCSD
Location type	Private - with easement		
Surface	Landscaping, Light shrubs, Garden		
Survey purpose		Weather	Dry

Pipe Use	Storm	Schedule length	Ft	From	C		Depth		Ft
Shape	Circular	Size	48 by ins	To	D		Depth		Ft
Material	Reinforced Concrete Pipe	Joint spacing	Ft	Direction	Downstream				
Lining		Year laid		Pre-clean		Last cleaned			

General note	Structural	Service	Constructional
Location note	Miscellaneous	Hydraulic	



Affordable Pipeline Services
Phone: 858-689-4000
Fax: 858-689-4035

Tabular Report of PLR C X for UCSD

Work Order	Contract	Video	Setup 3
Facility	Operator CK	Van Ref 10	Surveyed On 03/01/2013

Street Name Pepper Canyon — City UCSD
Location type Private - with easement
Surface Landscaping, Light shrubs, Garden
Survey purpose — Weather Dry

Pipe Use Storm	Sched length Ft	From C Depth Ft
Shape Circular	Size 48 by ins	To D Depth Ft
Material Reinforced Concrete Pipe	Joint Spacing Ft	Direction Down
Lining	Year laid	Pre-clean Last Cleaned

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					C
	0.0		WL	Water level				0	
	43.6		SA	Survey abandoned					camera blocked

43.6 Ft Total Length Surveyed

Scores

Structural:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0
Service:	Total 0	Mean Defect 0	Peak 0	Mean Pipe 0

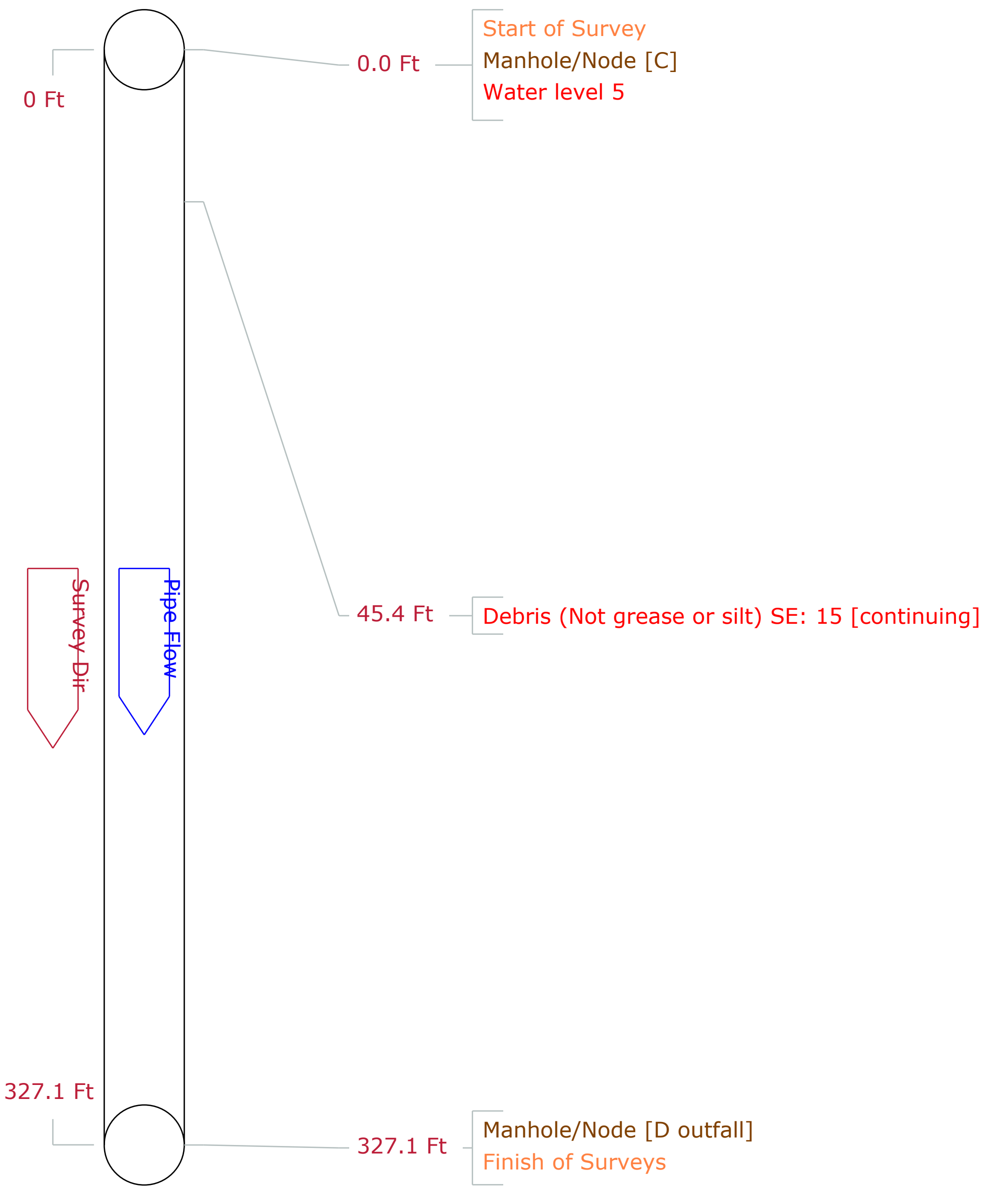
Pipe Graphic Report of PLR C X for UCSD

Work Order		Contract		Video		Setup	4
Facility		Operator	CK	Van Ref	10	Surveyed On	05/28/2013

Street Name	Pepper Canyon	City	UCSD
Location type	Private - with easement		
Surface			
Survey purpose		Weather	Dry

Pipe Use	Storm	Schedule length	327.1 Ft	From	C	Depth	Ft
Shape	Circular	Size	48 by ins	To	D	Depth	Ft
Material		Joint spacing	Ft	Direction	Downstream		
Lining		Year laid		Pre-clean		Last cleaned	

General note	Structural	Service	Constructional
Location note	Miscellaneous	Hydralic	



Affordable Pipeline Services
Phone: 858-689-4000
Fax: 858-689-4035

Tabular Report of PLR C X for UCSD

Work Order	Contract	Video	Setup 4
Facility	Operator CK	Van Ref 10	Surveyed On 05/28/2013

Street Name	Pepper Canyon	City UCSD	
Location type	Private - with easement		
Surface	LAND		
Survey purpose		Weather	Dry

Pipe Use	Storm	Sched length	327.1 Ft	From C	Depth Ft
Shape	Circular	Size 48 by	ins	To D	Depth Ft
Material	RCP	Joint Spacing	Ft	Direction Down	
Lining		Year laid		Pre-clean	Last Cleaned

General note	Structural	Service	Constructional
Location note	Miscellaneous	Hydralic	

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					C
	0.0		WL	Water level				5	
	45.4		DE	Debris (Not grease or silt)	L				continuing
	327.1		MH	Manhole/Node					D outfall
	327.1		FH	Finish of Surveys					

327.1 Ft Total Length Surveyed

Scores

Structural:	Total	Mean Defect	Peak	Mean Pipe
Service:	Total	Mean Defect	Peak	Mean Pipe

Appendix C

Noise Study

Charles M. Salter
ASSOCIATES INC.

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Blake M. Wells, LEED GA
Katherine M. Moore
Jordan L. Roberts
Sybille M. Roth
Bryce M. Graven
Heather A. Salter
Dee E. Garcia
Catherine F. Spurlock

22 October 2019

Kelly Schnell
Perkins+Will
1301 Fifth Avenue, Suite 2300
Seattle, WA 98101
Email: kelly.schnell@perkinswill.com

Subject: **UC San Diego Pepper Canyon West Student Housing**
Updated Environmental Noise Study
Salter Project 19-0270

Dear Kelly:

As requested, we have conducted an environmental noise study for the project. The purpose of the study is to determine the noise environment at the site, compare the measured data with applicable standards, and recommend mitigation measures as necessary. This report summarizes the results.

PROJECT CRITERIA

State Noise Standards

Section 1207.4 of the 2016 California Building Code requires that the indoor noise levels attributable to exterior noise sources not exceed DNL[1] 45 dB in multi-family residences (including student apartments).

City Noise Standards

The City Noise Element is consistent with the State Standards (i.e., an interior criterion DNL of 45 dB).

NOISE ENVIRONMENT

Existing

The project is located on the UC San Diego Campus, bounded by Gilman Drive, Russell Lane, and Lyman Lane.

To quantify the existing noise environment, we conducted four long-term noise measurements from 9 to 10 May 2019. The meters measured continuous noise levels and recorded “loud” noise events allowing us to identify the source of the noise (e.g., sirens and loud vehicle passbys). Three of the meters were attached to trees and utility poles at an approximate height of 12 feet above grade. One

---

[1] DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn}.

of the meters was located on the roof of Pepper Canyon Hall. **Figure 1** shows the measurement locations and measured DNL.

Based on our measured data, we calculated the expected DNL at the various facades and elevations. We do not yet have projected future traffic volumes for the roadways, so we have added 1 dB to the measured noise levels to account for future traffic increases[2].

Future

We understand the Metro Blue Line Light Rail will be extended into this area. To quantify the future contribution of train noise at the site, we conducted short-term noise measurements on 9 May 2019 at two locations near the 12th and Imperial Transit Center in San Diego.

The measurements were conducted near the existing portion of Metro Blue Line, both at a turn and along a straightaway. We incorporated this data into our calculations to get a more accurate assessment of the noise environment when the Light Rail will be in use. We also cross-checked our data with that published in the exterior noise feasibility study by Veneklasen Associates.

We understand that an outdoor amphitheater is planned for north of the project site. It is unknown at this time the potential acoustical impact of the amphitheater on this project. If provided with information on the proposed uses (e.g., frequency of use, levels of amplified noise), we can provide additional analysis. Based on current plans, it appears that the speakers will be pointed away from this project, which is acoustically beneficial.

ANALYSIS AND RECOMMENDATIONS

Using the floor plans and elevations shown on the Progress Print drawings dated 2 October 2019, we calculated the window and exterior door STC ratings needed to meet the project criterion. Our calculations are based on the following assumptions:

- All apartment rooms will have hard-surfaced flooring (e.g., polished concrete)
- Residential ceilings will be approximately nine feet high
- The building exterior will be a unitized curtainwall system

To meet the State's indoor DNL 45 dB criterion, it will be necessary for some of the windows to be sound rated. See **Figures 2 to 5** for the minimum required STC ratings. For reference, typical construction-grade dual-pane windows achieve an STC rating of 28. Insulated one-inch thick assemblies (1/4-inch pane + 1/2-inch airspace + 1/4-inch pane) achieve approximately STC 32. Where ratings above STC 33 are needed, typically at least one pane is required to be laminated.

The recommended STC ratings are for full window assemblies (glass and frame) rather than just the glass itself. Tested sound-rated assemblies should be used.

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[2] The California Department of Transportation assumes a traffic volume increase of three-percent per year, which corresponds to a one-dB increase in DNL over a ten-year period.

Where sound-rated windows are needed, you should consider an alternative method of supplying fresh air (e.g., mechanical ventilation, z-ducts). This issue should be discussed with the project's mechanical engineer. At locations where there is no STC noted on the figures, fresh air can be provided via open windows.

* * *

This concludes our updated environmental noise study for the UC San Diego Pepper Canyon West Student housing project. If you have any questions, please give us a call.

Sincerely,

CHARLES M SALTER ASSOCIATES, INC.

Jake Schpero
Consultant

Eric Mori, PE
Senior Vice President

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Audiovisual
Telecommunications
Security

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Charles M. Salter
ASSOCIATES INC.

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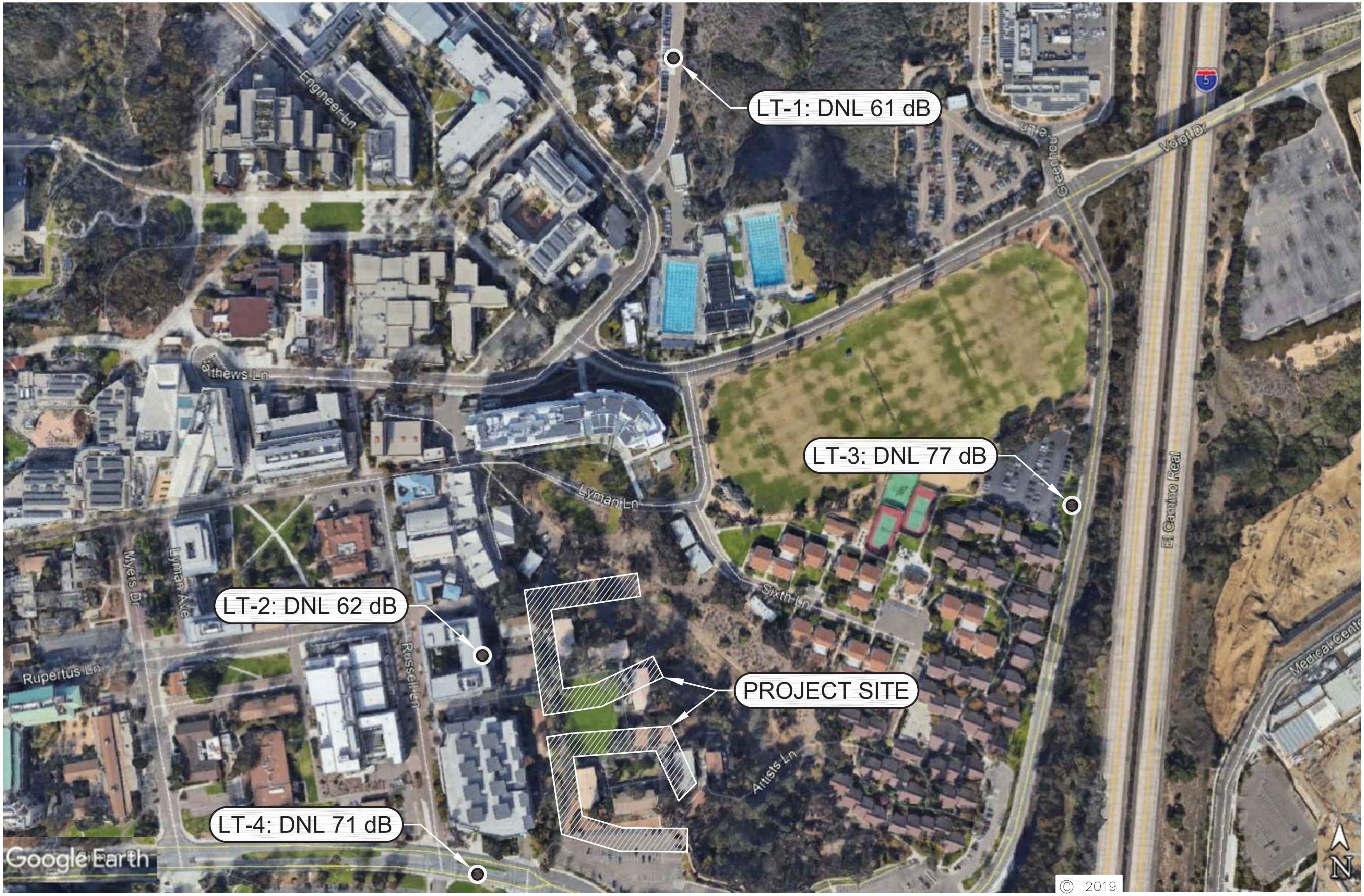

UCSD PEPPER CANYON WEST HOUSING MEASUREMENT LOCATIONS AND MEASURED NOISE LEVELS

FIGURE 1

Salter #	BDP/EBM
19-0270	10.23.19

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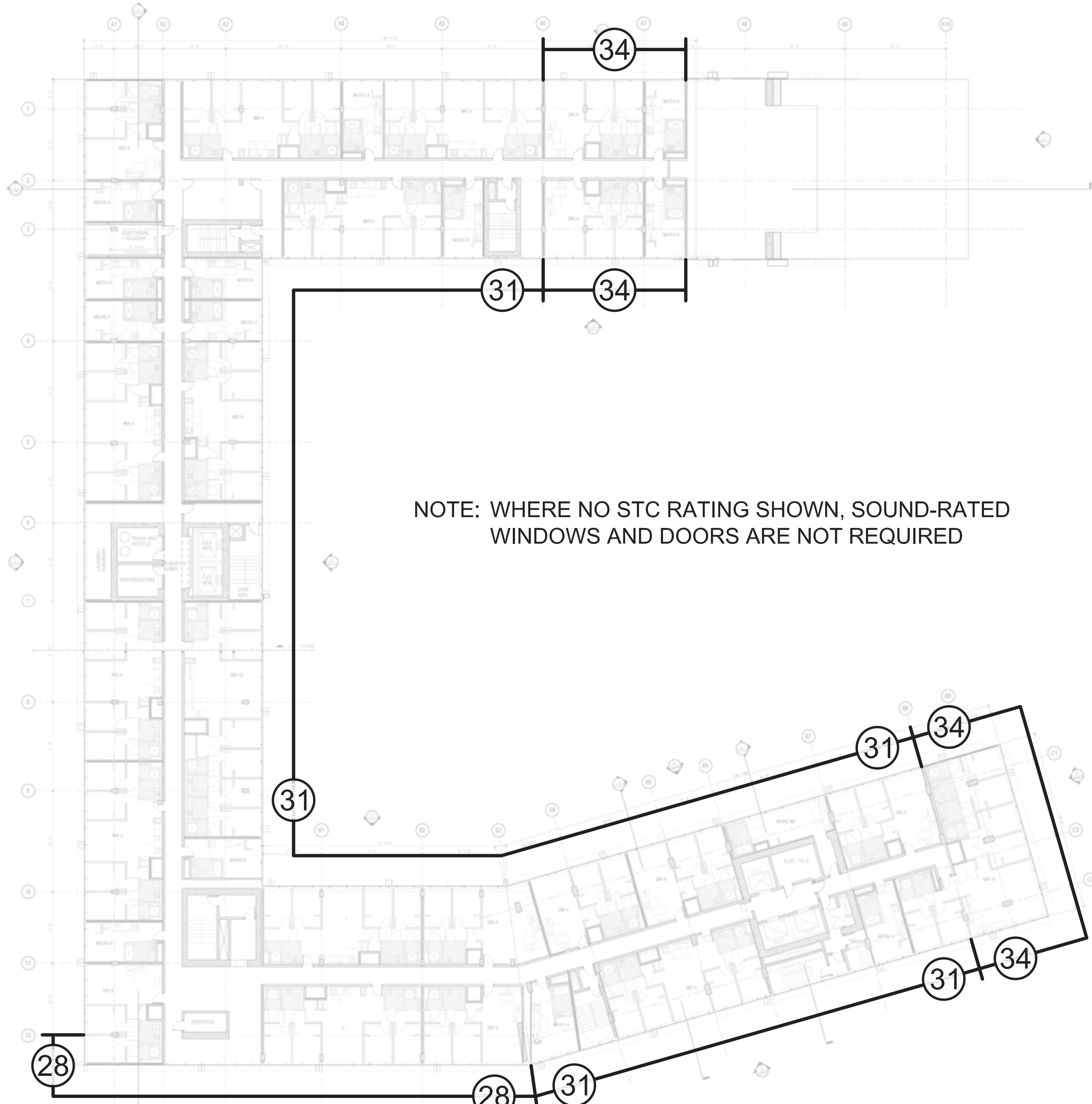

NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

UCSD PEPPER CANYON WEST HOUSING – NORTH MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 1 TO 8)

FIGURE 2

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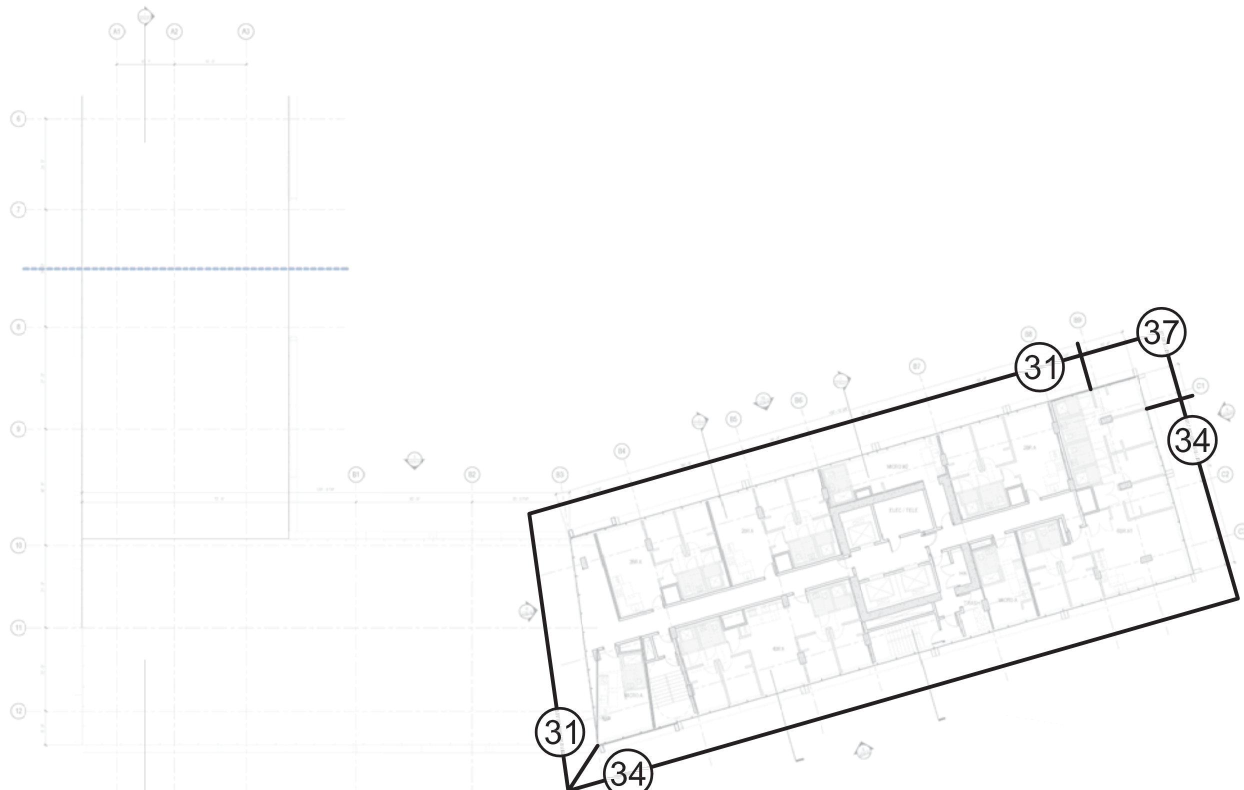

NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

UCSD PEPPER CANYON WEST HOUSING – NORTH MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 9 TO 22)

FIGURE 3

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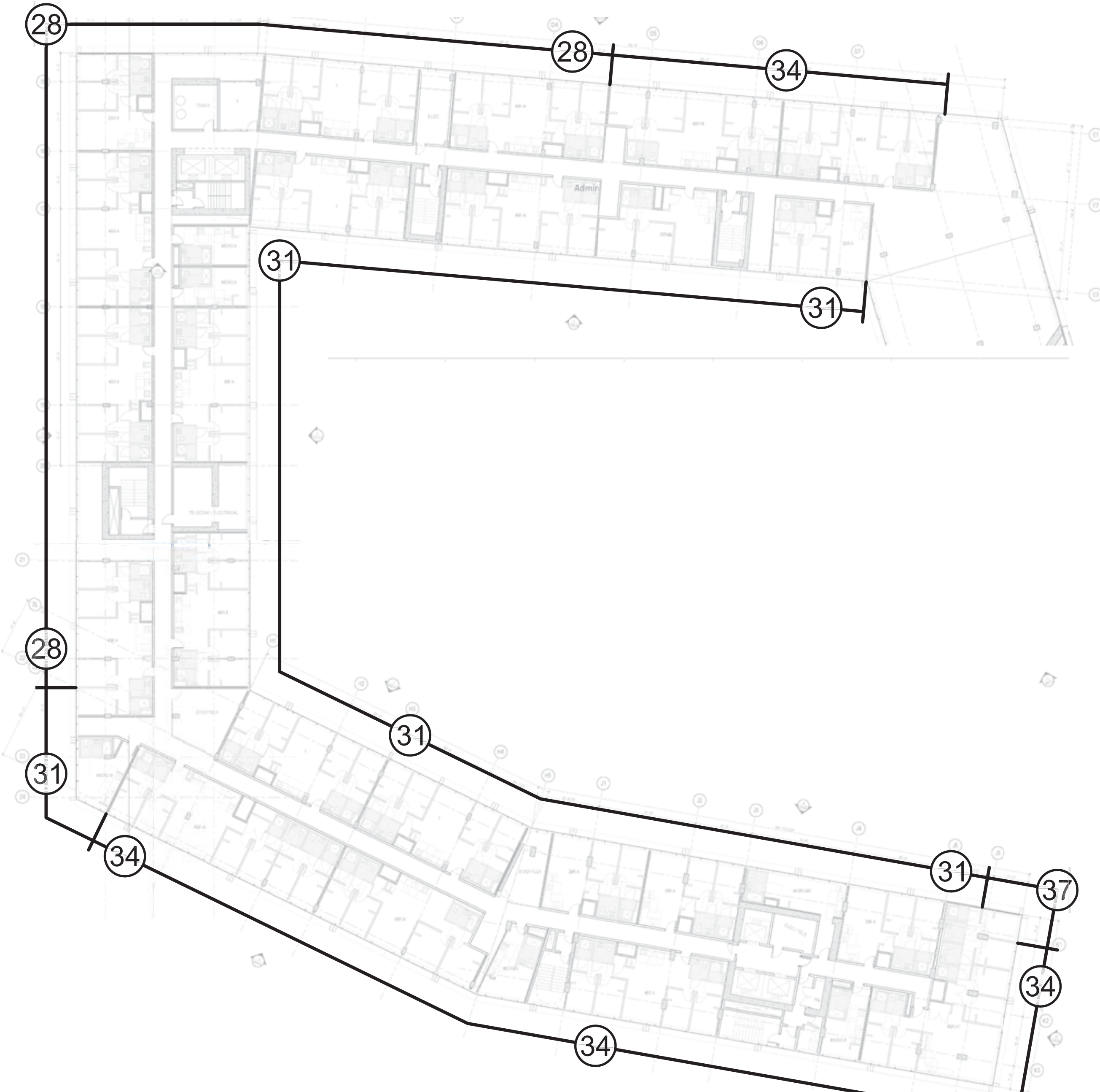

NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

UCSD PEPPER CANYON WEST HOUSING – SOUTH MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 1 TO 7)

FIGURE 4

Salter # 19–0270

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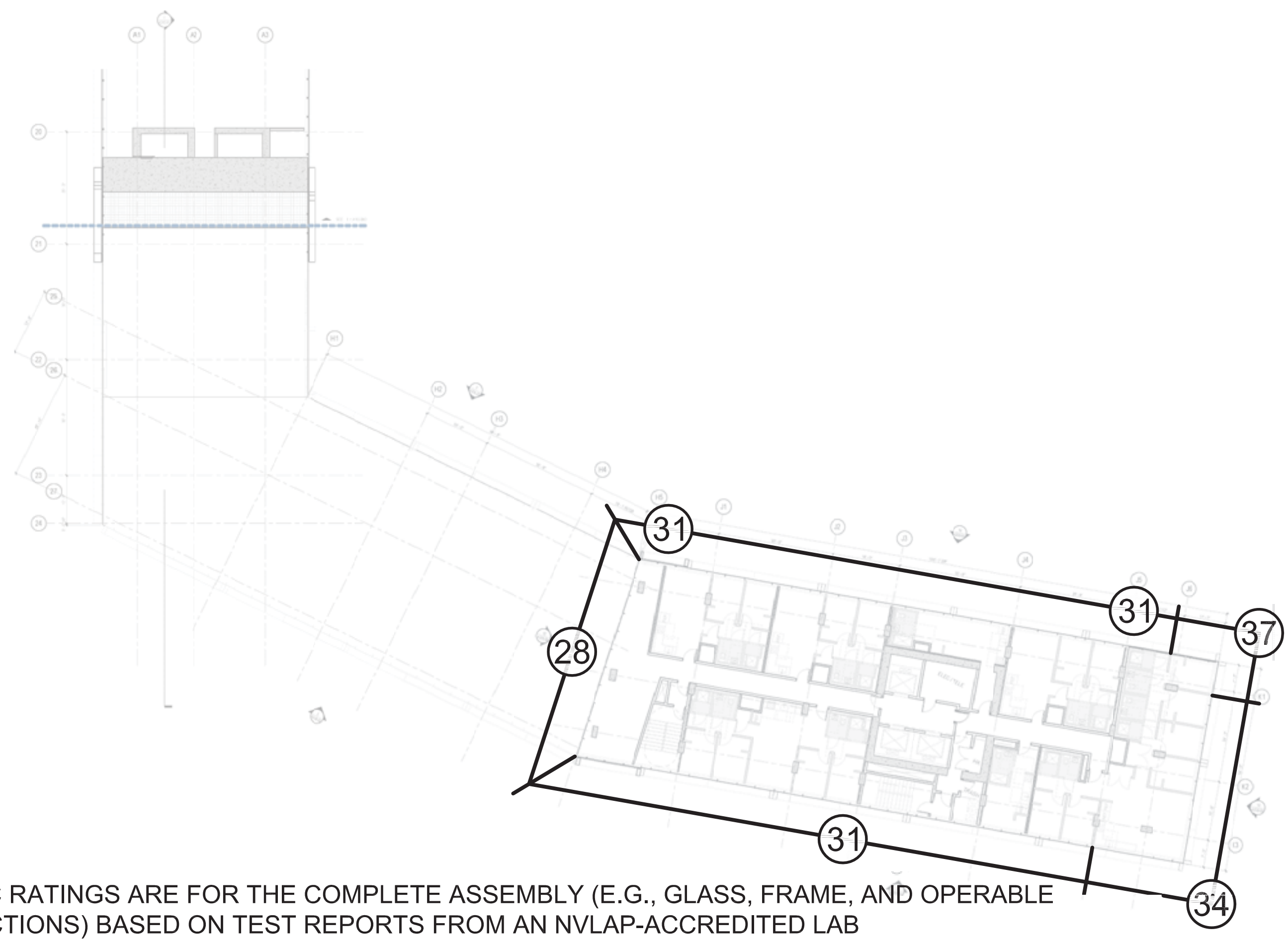

NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

UCSD PEPPER CANYON WEST HOUSING – SOUTH MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 8 TO 21)

FIGURE 5

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