Soil Management Plan, Revision 2

Riverwalk Project
5905 Friars Road and 1150 Fashion Valley Road,
San Diego, California
VAP Case Number DEH2019-LSAM-000585

Prepared for:

County of San Diego Department of Environmental Health
Attn: Mr. Ewan Moffat
Post Office Box 129261
San Diego, California 92112-9261

On behalf of:

SD Riverwalk LLC
c/o Mr. Pete Shearer, Hines Interests Limited Partnership
600 W. Broadway Suite 1150
San Diego, California 92101

SCS ENGINEERS

01210118.02 | July 21, 2020

8799 Balboa Avenue, Suite 290
San Diego, CA 92123
858-571-5500

July 21, 2020
Number: 01210118.01

Mr. Ewan Moffat
County of San Diego
Department of Environmental Health
Post Office Box 129261
San Diego, CA 92112-9261

Subject: **Soil Management Plan, Revision 2 (SMP)**
VAP Case Number DEH2019□LSAM□000585

Site: **Riverwalk Project**
Assessor's Parcel Numbers (APNs) 436-611-06, 29, & -30, 436-650-14, and 437-240-03, -26, -27, -28, & -29
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Dear Mr. Moffat:

SCS Engineers (SCS) is pleased to present this SMP for the above-described Site. The SMP summarizes the previous Phase I Environmental Site Assessment and subsurface environmental site assessment activities conducted by SCS and others. This SMP describes how soil impacted with elevated concentrations of arsenic, organochlorine pesticides, or other constituents of concern, if encountered during construction, will be properly segregated, managed, and reused within a Soil Management Zone and/or exported off-Site to a properly licensed facility during the construction of various land uses including residential, mixed use, open space, park, office, and retail. Note this revised SMP (Revision 2) report was completed to address comments from the Department of Environmental Health dated July 17, 2020, and supersedes the previous SMP issued on April 23, 2020, and also supersedes the SMP Revision 1 report dated July 16, 2020.

The work described in this SMP was performed by SCS in general accordance with the Consultant Agreement for Professional Services between SCS and SD Riverwalk LLC (Contract), dated January 3, 2020.

Should you have any questions regarding this Report, please do not hesitate to call the undersigned at (858) 571-5500.

Sincerely,

Luke Montague, MESM, PG 8071
Senior Project Manager
SCS ENGINEERS

Daniel E. Johnson
Vice President
SCS ENGINEERS

Table of Contents

Section Page

1 Executive Summary 6
2 SMP Objectives 8
3 Project Introduction 8
4 Project Information/Background 10
Site Description Summary 10
Site-Related Documents Reviewed by SCS 10
Historical Site Land Use 11
5 SCS' Summary of Existing Data 12
2014 - Phase II ESAs 12
Pesticides and Herbicides: Historical Agricultural Land Use 12
Maintenance Area – Inground Sump and Former USTs 13
Two Water Wells 14
Additional Soil Sampling in 2019 and 2020 15
Site Health and Safety Plan 15
Utility Search and Markout 16
Additional Sampling and Analysis – 2019 and 2020 16
Soil Sample Laboratory Results 17
Organochlorine Pesticides 17
Arsenic 17
Discussion of Data 17
6 Environmental Setting 18
Topography 18
Geology and Geotechnical Recommendations 18
Hydrogeology 20
Water Quality Survey 20
7 General Mitigation Criteria 20
Health Risk-Based Regulatory Screening Criteria 20
Arsenic 20
Organochlorine Pesticides 21
Petroleum Hydrocarbons 21
Site-Specific Mitigaton Criteria (SSMC) 21
Arsenic Evaluation Using 95 UCL and Derivation of SSMC 22
Pesticide Data Analysis and Comparison to Screening Criteria 23
Dieldrin Evaluation Using 95 UCL and Derivation of SSMC 23
Chlordane Evaluation Using 95 UCL and Derivation of SSMC 24
Summary of SSMC for OCPs 25
Petroleum Hydrocarbon SSMC 26
Soil Management Plan 27
Construction Excavation Envelope (CEE) 27

Volume Estimate of Arsenic-Bearing Soil to Be Reused Within the Soil Management Zone 28
Soil Management Zone (SMZ) 29
Reuse of CoC-Bearing Within Soil Management Zone 29
Confirmation Sampling and Field Screening 32
Arsenic-Bearing Soil Area Field Screening and Confirmation Soil Sampling 32
Organochlorine Pesticide Confirmation Soil Sampling 33
Petroleum Hydrocarbon Field Screening and Confirmation Soil Sampling 33
A Priori Confirmation Soil Sampling 34
"Clean" Fill Soil to be Imported to the Site 35
Possible "Clean" Fill Soil to be Exported from the Site 35
Unexpected Discovery of Releases During Mitigation/Construction 35
Field Observation and Monitoring 36
9 Health and Safety 36
Site Health and Safety Plan 36
Community Health and Safety Plan 37
Utility Search and Markout 37
10 Construction Excavation Monitoring 37
Dewatering 39
Permits 39
Construction Worker Protection 39
Land Use Covenant For Notification To Future Owner, Occupants, and Workers 39
Stormwater Controls 39
Soil, Groundwater, and Investigation-Derived Waste (IDW) Management 40
11 Property Closure Report 40
12 Report Usage and Future Site Conditions 40
13 Likelihood Statements 41

Figures

1 Four-Way Site Location Map
2 Proposed Conceptual Site Plan
3A Existing Site Plan with Soil Sample Locations and Analytical Results (Area 1)
3B Detailed Site Plan of Maintenance Area with Soil Sample Locations and Analytical Results (Area 1)
3C Detailed Site Plan with Soil Sample Locations and Analytical Results – Arsenic-Bearing Soil Area
3D Existing Site Plan with Soil Sample Locations and Analytical Results (Area 2)
3E Existing Site Plan with Soil Sample Locations and Analytical Results (Area 3)
4 Soil Excavation and Reuse Map for Arsenic-Bearing Soil – Area 1
5A Soil Management Zone Options for Constituent of Concern-Bearing Soil
5B-5D Soil Management Zone Cross Sections

Tables

1 Soil Sample Analytical Results for Arsenic and Organochlorine Pesticides
2 Soil Sample Analytical Results for TPH and VOCs

Appendices

A Construction Plans and Geotechnical Reports for the Proposed Development
B Analytical Laboratory Reports for 2019 and 2020 Soil Sampling and Analysis
C ProUCL Output for 95 Percent UCL for Arsenic
D ProUCL Output for 95 Percent UCL for Dieldrin
E ProUCL Output for 95 Percent UCL for Chlordane

1 EXECUTIVE SUMMARY

SCS Engineers (SCS) understands that 5905 Friars Road and 1150 Fashion Valley Road in San Diego, California consists of ten parcels (APNs 436-611-06, 29, & -30; 436-650-14; and 437-240-03, -26, -27, -28, & -29) comprising approximately 194.56 acres of land in San Diego, California (Site) (Figure 1). The Site is currently developed primarily with the Riverwalk Golf Course, as well as associated structures and amenities for the Riverwalk Golf Club. The Site is also currently occupied by a San Diego Gas & Electric Storage yard on the northeastern portion of the Site, and is transected by both a San Diego Metropolitan Transit System (MTS)/trolley right-of-way as well as by the San Diego River. The Site was historically used for agricultural purposes from approximately 1915 to 1945, and has been developed as a golf course since approximately 1953.

SCS understands that SD Riverwalk LLC is currently in the planning stages for the proposed development of the Site into various land uses including residential, mixed use, open space, park, office, and retail (Figure 2). The Project is currently proposing a mixed-use development with up to 4,300 residential units (including 10 percent as on-site affordable housing), approximately 1 million square feet of office space, approximately 152,000 square feet of community retail, and more than 100 acres of park and open space, as well as associated infrastructure improvements.

According to a Vesting Tentative Map prepared for the Site, approximately 1,028,000 cubic yards of fill soil is to be imported to the Site for soil balance purposes, and soil export is not proposed.

SCS has previously completed Phase I and II Environmental Site Assessment reports for the Site, as well as additional soil sampling in November of 2019 and March of 2020 to further assess the extent of arsenic- and pesticide-bearing soil. Soil sampling conducted by SCS indicates the presence of arsenic-bearing fill soil on the northeastern portion of the Site that exceeds residential human health risk screening levels as well as the typical background concentration ranges, which is interpreted to have been imported to the Site from an unknown location during the construction of the San Diego Metropolitan Transit System (MTS)/trolley right-of-way in the mid-1990s.

The known arsenic-bearing soil within the Construction Excavation Envelope that exceeds the SSMC that is to be properly managed during excavation and grading activities is estimated to amount to approximately 40,000 cubic yards. Pesticide-bearing soil that is generally below residential human health risk screening levels is also present in various areas throughout the area of the golf course portion of the Site. Further, one former 2,000-gallon gasoline underground storage tank (UST) and one former 550-gallon waste oil UST were reportedly removed from the Site on February 1, 1988, and remedial excavation and export of contaminated soil was conducted in 1989. Although soil sampling and analysis conducted by SCS in the area in 2014 indicates that soil samples collected were non-detect for total petroleum hydrocarbons and volatile organic compounds, petroleum hydrocarbon-bearing soil excavated as part of the proposed development will need to be properly managed during construction activities.

This SMP was prepared based on the proposed redevelopment of the Site into a mixed-use development to guide both the reuse of arsenic-bearing soil above SSMC, as well as the environmental oversight of the excavation of the former USTs on-Site for the possible presence of petroleum hydrocarbon-bearing soil that exceeds SSMC. This SMP presents the means and methods of how this material will be either excavated and disposed of off-Site, or alternatively it could be kept on-Site and buried within a Soil Management Zone that will be beneath a “clean” fill buffer and hardscape (e.g., buildings, pavement, etc.) to minimize the potential for contact/exposure. In

addition, this SMP describes confirmation soil sampling procedures, which will involve analysis for either arsenic, organochlorine pesticides (OCPs), and/or petroleum hydrocarbons.

The following Site-Specific Mitigation Criteria (SSMC) for the constituents of concern (CoCs) (i.e., arsenic, OCPs, and petroleum hydrocarbons) previously detected above laboratory reporting limits at the Site were developed as a part of this SMP and are based on existing regulatory criteria (as further described in the body of this SMP). The SSMC are based on health risk criteria assuming possible contact with the soil in a residential end use setting, and in the case of arsenic based on the upper bound background concentration ranges. The SSMP will be used to demonstrate whether soil is either acceptable for free reuse on-Site or must be reused within a Soil Management Zone (SMZ) on-Site beneath a soil cap, or be exported off-Site to an appropriately licensed facility:

Constituent of Concern/ Mitigation Measure	Analyte	Site-Specific Mitigation Criteria (SSMC)
Arsenic – Reuse within Soil Management Zone	Arsenic	14.5 mg/kg
Organochlorine Pesticides – Reuse within Soil Management Zone	Chlordane	1,435 µg/kg
	Alpha-chlordane	1,435 µg/kg
	Gamma-chlordane	1,435 µg/kg
	Dieldrin	50 µg/kg
	DDD	1,900 µg/kg
	DDE	2,000 µg/kg
	DDT	1,900 µg/kg
Petroleum Hydrocarbons – Reuse within Soil Management Zone	TPHg	100 mg/kg
	TPHd	260 mg/kg
	TPHo	1,600 mg/kg
Petroleum Hydrocarbons – Export to Permitted Facility	TPHg	1,000 mg/kg
	TPHd	2,300 mg/kg
	TPHo	5,100 mg/kg

Notes:
mg/kg: milligrams per kilogram
µg/kg: micrograms per kilogram
DDD: 4,4'-dichlorodiphenyldichloroethane
DDE: 4,4'-dichlorodiphenyldichloroethylene
DDT: 4,4'-dichlorodiphenyltrichloroethane
TPHg, TPHd, TPHo: Total petroleum hydrocarbons as gasoline, diesel, and oil

Based on a review of the available data for the Site and in comparison to the SSMC, the following mitigation measures are proposed in this SMP:

- A total of approximately 40,000 cubic yards or more of arsenic-bearing soil exceeds the SSMC for arsenic and is to be excavated, segregated, and reused within an on-Site Soil Management Zone.

- Pesticide-bearing soil that is below SSMC, and is present in various areas throughout the area of the golf course. It is considered acceptable for pesticide-bearing soil to be freely graded during mass grading activities. However, if pesticide-bearing soil is encountered

during construction that exceeds the SSMC for OCPs, procedures are also provided herein to properly manage this soil.

- Confirmation bottom soil samples for OCPs (EPA Method 8081A) are required to be collected beneath the slabs of the three maintenance buildings (i.e., 1 sample per building) on the northern portion of the Site at 5905 Friars Road, after demolition of the slabs during construction activities. Although previous soil sampling for OCPs was conducted in exterior areas in the immediate vicinity to the maintenance buildings, the samples below the slabs were requested by the DEH to assess for possible leakage of pesticides through old storage building slabs.

- Although soil sampling and analysis efforts conducted by SCS in the area of the former USTs did not indicate the presence of petroleum hydrocarbon-bearing soil, excavation activities in the area of the former USTs are proposed to be overseen by an environmental monitor. Soil samples will be collected during grading of this area if indications of petroleum hydrocarbons are observed, as indicated by staining, odors, elevated field readings, or free product.

Excavation monitoring is to be conducted by qualified professionals. Although none are known to exist at the Site, any releases of hazardous substances or petroleum products discovered during the course of mass excavation activities will be segregated, and either exported from the Site to a properly licensed facility or reused within a SMZ. Unless new and unforeseen conditions/releases of hazardous substances or petroleum products are discovered, no additional assessment or mitigation will be conducted at the Site beyond the proper handling and disposal of the soil within the construction excavation envelope that will be excavated as a part of mass grading activities.

2 SMP OBJECTIVES

The objectives of this SMP are to provide a dynamic strategy to properly manage CoC-bearing soil and to assess and mitigate, and document, as necessary, releases of CoCs in a manner that is protective of human health for the proposed future land use and the beneficial uses of water resources of the Site and Site vicinity.

3 PROJECT INTRODUCTION

SCS Engineers (SCS) understands that 5905 Friars Road and 1150 Fashion Valley Road in San Diego, California consists of ten parcels (APNs 436-611-06, 29, & -30, 436-650-14, and 437-240-03, -26, -27, -28, & -29) comprising approximately 194.56 acres of land developed primarily with the Riverwalk Golf Course, as well as associated structures and amenities for the Riverwalk Golf Club (Site) (Figure 1). The Site is also currently occupied by a San Diego Gas & Electric Storage yard, and is transected by both a San Diego MTS/trolley right-of-way as well as by the San Diego River. The Site was historically used for agricultural purposes from approximately 1915 to 1945, and has been developed as a golf course since approximately 1953.

Note that for organizational purposes and due to the large size of the Project, it is divided herein into the following three areas:

- Area 1 – Northern portion of the Site, north of the MTS/trolley right-of-way (APNs 437-240-03, -26, & -27)

- Area 2 – Central portion of the Site, south of the MTS/trolley right-of-way and north of the San Diego River (APNs 437-240-28 & -29)
- Area 3 – Southern portion of the Site, south of the San Diego River (APNs 436-611-06, -29, & -30, and 436-650-14)

SCS understands that the Client is proposing to purchase and develop the Site into various land uses including residential, mixed use, open space, park, office, and retail (Figure 2). The Project is currently proposing a mixed-use development with up to 4,300 residential units (including 10 percent as on-site affordable housing), approximately 1 million square feet of office space, approximately 152,000 square feet of community retail, more than 100 acres of park and open space, as well as associated infrastructure improvements.

According to a Vesting Tentative Map prepared for the Site, 1,028,000 cubic yards of fill soil is to be imported to the Site for soil balance purposes, and soil export is not proposed.

Soil sampling conducted at the Site by SCS have indicated the following:

- Approximately 40,000 cubic yards of arsenic-bearing fill soil is present on the northeastern portion of the Site that exceeds residential human health risk screening levels as well as typical background concentration ranges. Previous soil sampling discussed in the section below titled "SCS' Summary of Existing Data" indicates that arsenic-bearing soil excavated as part of the proposed development will need to be properly managed during construction activities.

- Pesticide-bearing soil that is generally below residential human health risk screening levels is also present in various areas throughout the area of the golf course.

- One former 2,000-gallon gasoline UST and one former 550-gallon waste oil UST were reportedly removed from the Site on February 1, 1988, and remedial excavation and export of contaminated soil was conducted in 1989. Although soil sampling and analysis efforts conducted by SCS in the area of the former USTs did not indicate the presence of petroleum hydrocarbon-bearing soil, excavation activities in the area of the former USTs are proposed to be overseen by an environmental monitor.

- For the two groundwater wells located on Site, if the water wells are not to be used for the proposed development at the Site, it is recommended that the groundwater wells be destroyed in accordance with DEH requirements prior to or during the proposed construction activities at the Site.

This SMP details how mass grading in the area of arsenic-bearing soil and the area of the former USTs will be monitored by an environmental professional. Soil containing arsenic above the SSMC will be reused on-Site under a clean soil cap within a Soil Management Zone. In addition, there are no pesticide-bearing soil or petroleum hydrocarbon-bearing soils that are known exceed human health risk screening criteria, when using average concentrations and upper confidence level statistics. However, SCS has designed procedures that are provided herein to properly manage this soil if encountered during construction.

4 PROJECT INFORMATION/BACKGROUND

SITE DESCRIPTION SUMMARY

Site Name	Riverwalk Project
Site APNs	436-611-06, 29, & -30, 436-650-14, and 437-240-03, -26, -27, -28, & -29
Site Address	5905 Friars Road and 1150 Fashion Valley Road, San Diego CA
Land Area	Approximately 194.56 acres
Site Land Use	Currently used as the Riverwalk Golf Club; in addition the northeast portion is currently occupied by an SDG&E storage lot, and the Site is transected by an MTS/trolley right-of-way as well as the San Diego River. The Client is proposing to purchase and develop the Site into various land uses including residential, mixed use, open space, park, office, and retail.
Occupant	Currently the Riverwalk Golf Club, SDG&E, and MTS.
Project Developer / Client	SD Riverwalk LLC c/o Hines Interests Limited Partnership 600 W. Broadway, Suite 1150 San Diego, California 92101 Contact: Ms. Pete Shearer Tel: 858-435-4000 pete.shearer@hines.com
Environmental Consultant	SCS Engineers 8799 Balboa Avenue, Suite 290 San Diego, California 92123 Contact: Mr. Luke Montague 858-571-5500 x2919 lmontague@scsengineers.com

SITE-RELATED DOCUMENTS REVIEWED BY SCS

The following documents pertaining to the Site were prepared by SCS and are referred to in this SMP:

- *Draft Phase I Environmental Site Assessment,* separate reports for Area 1, Area 2, and Area 3 (referred to as Phase IA, IB, and II, respectively), prepared by SCS Engineers and each dated September 9, 2014 (2014 Phase I ESAs)

- *Subsurface Assessment Report*, separate reports for Area 1, Area 2, and Area 3, prepared by SCS Engineers and each dated October 20, 2014, (Phase II ESAs)

- *Phase I Environmental Site Assessment,* separate reports for Area 1, Area 2, and Area 3, prepared by SCS Engineers and each dated January 20, 2017 (2017 Phase I ESAs)

The following construction plans and reports were provided to and reviewed by SCS, and are provided in Appendix A of this Report:

- *Vesting Tentative Map No. 2213361 for Riverwalk, San Diego, CA*, *Revision 4*, prepared by Project Design Consultants and dated October 4, 2019

- *Preliminary Geotechnical Investigation and Review of the Updated Grading Plan, Proposed Mixed-Use Redevelopment Project at Riverwalk Golf Course, City of San Diego, California*, prepared by NMG Geotechnical, Inc. (NMG) and dated November 27, 2019 (Geotechnical Investigation)

HISTORICAL SITE LAND USE

The Phase I and II ESAs provided a review of the historical land uses of the Site that is summarized below.

Interpreted Historical Site Land Use

Years	Interpreted Site Tenants	Interpreted Site Use
1915-1945	Cushman Family	Agricultural
1953-1994	The Mission Valley Country Club, Stardust Country Club, and Riverwalk Golf Course	Golf course, with associated maintenance buildings on the northern portion. Current eastern maintenance building has been present since at least 1953 – the current western maintenance building was constructed by 1966. A third structure (possibly a residence) was formerly present approximately 300 feet east of the maintenance buildings from at least 1953 until the 1990s. A former 2,000 gallon gasoline underground storage tank (UST) and former 550-gallon waste oil UST were removed from the maintenance area of the Site on February 1, 1988.
1996-2014	Riverwalk Golf Course with MTS/trolley line	Golf course, with associated maintenance buildings on the northern portion. MTS/trolley line installed circa 1996 – the northeastern portion of the Site in the area of the current San Diego Gas & Electric (SDG&E) equipment yard (situated north of the trolley tracks) was formerly a part of the golf course and based on a historical aerial photograph review is interpreted to have received fill material around that time, and appears to have been a vacant lot from approximately 1996 to 2014.

Years	Interpreted Site Tenants	Interpreted Site Use
2016-2020	Riverwalk Golf Course with MTS/trolley line and SDG&E equipment yard	Golf course, with associated maintenance buildings on the northern portion, and MTS/trolley lines transecting the Site. Northeastern portion of Site used as a SDG&E equipment yard.

5 SCS' SUMMARY OF EXISTING DATA

Below is a summary of the assessment activities conducted at the Site. Previous soil sample locations are presented on Figures 3A-3E, and the sample data are summarized on Figure 4, as well as in Tables 1 and 2.

2014 - PHASE II ESAS

The Phase II ESAs consisted of the advancement of soil borings and collection of one groundwater sample from an existing groundwater production well to address the following environmental concerns for the Site that were identified in the 2014 Phase I ESAs:

- Pesticides and Herbicides from Historical Agricultural Land Use
- Maintenance Area – Inground Sump and Former USTs
- Two Water Wells – Concern as Conduits to the Subsurface

Below is a more detailed summary of these environmental concerns and the subsurface assessment work carried out by SCS in 2014.

Pesticides and Herbicides: Historical Agricultural Land Use

Environmental Concern

- Historical and current use of pesticides and herbicides at the Site from the former agricultural land use and the former and current use as a golf course.

2014 Soil Sampling and Analysis

Soil borings SB1 through SB47 were advanced between August 18 and 19, 2020, with samples collected at depths of approximately 0.5, 1.5, and 3 feet below ground surface (bgs). The 0.5-foot bgs samples were analyzed for arsenic (EPA Method 6010B) and organochlorine pesticides (EPA Method 8081A), and select 0.5-foot bgs samples were also analyzed for chlorinated herbicides (EPA Method 8151A). Based on the results of the 0.5-foot bgs samples, additional deeper samples were analyzed for arsenic and organochlorine pesticides as needed.

The results of the soil sampling indicated that the following organochlorine pesticides were reported above laboratory reporting limits: chlordane, alpha chlordane, gamma chlordane, dieldrin, 4,4'-

dichlorodiphenyltrichloroethane (DDT), 4,4'-dichlorodiphenyldichloroethylene (DDE), and 4,4'-dichlorodiphenyldichloroethane (DDD). One sample (SB37-0.5) collected from the western portion of the Site was reported to exceed residential screening levels for chlordane and dieldrin. In addition, elevated concentrations of arsenic were reported, with a maximum concentration of 34.9 milligrams per kilogram (mg/kg). Chlorinated herbicides were reported to not be above laboratory reporting limits in any of the 5 samples analyzed for chlorinated herbicides.

SCS recommended in the 2014 Phase II ESA reports that based on the reported concentrations of arsenic and organochlorine pesticides at the Site, and in connection with the proposed redevelopment of the Site, additional shallow soil sampling should be conducted to assess for arsenic and organochlorine pesticides to increase sample density for adequate Site characterization. In addition, SCS recommended that a Site-specific soil management plan be prepared to account for Site development activities and integrate environmental issues into the Site development process.

Additional soil sampling efforts to further assess the extent and concentrations of arsenic and organochlorine pesticides were carried out in 2019 and 2020, as further discussed in the "Additional Soil Sampling in 2019 and 2020" section below.

Maintenance Area – Inground Sump and Former USTs

Environmental Concerns

- Inground wastewater sump/clarifier in the maintenance building area on the northern portion of the Site.

- One 2,000-gallon gasoline UST and one 550-gallon waste oil UST were reportedly removed from the Site on February 1, 1988. It was reported that the soil in the vicinity of the removed USTs was impacted with gasoline. A sample of groundwater collected from the open excavation reportedly contained high levels of hydrocarbon components. The County of San Diego, Department of Health Services (DHS) opened an unauthorized release case in May 1988. On March 9, 1989, DHS issued a letter indicating that remedial action took place and contaminated soil was removed from the excavation. Information regarding confirmation sampling was not included in the files reviewed. DHS requested that groundwater be monitored for 1 year. No additional information regarding groundwater monitoring was included in the files reviewed. This lack of information is considered a data gap, which could potentially be addressed by additional information or reports. Based on the information reviewed, SCS could not assess whether a recognized environmental condition existed at the Site as a result of the known release that occurred at the former USTs. In the absence of adequate information, SCS recommended that subsurface assessment activities be conducted (e.g., soil and/or groundwater sampling and analysis)(which is described below).

2014 Soil Sampling and Analysis

On August 18, 2014, SCS advanced soil borings B1 through B4 within representative areas of the reported former USTs excavation to maximum depths of 15 to 25 feet bgs. Groundwater was not encountered. Select samples were analyzed for TPH and VOCs. In addition, soil boring B5 was advanced in the immediate vicinity of the sump, with soil samples collected at 3 and 8 feet below grade and analyzed for total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs).

The results of the laboratory analysis indicated that no detectable concentrations of TPH or VOCs were reported in the soil samples collected in the vicinity of the former USTs excavation or in the area of the sump. Therefore, SCS concluded in the 2014 Phase II ESA for the USTs in the Maintenance Area portion of Area 1 that there is a low likelihood that significant residual petroleum hydrocarbons are left in place from the previous release reported at the Site.

The former USTs and sump are situated on Lot 5 of the proposed Riverwalk Project. Remedial grading of the area of Lot 5 is proposed to have a minimum of a 5-foot overexcavation and up to a 15-foot overexcavation for remedial removals of undocumented fill unsuitable alluvium, and excavation may extend to 2 to 3 feet above groundwater. Following overexcavation activities, a layer of approximately 13 feet of compacted fill is to be placed on Lot 5.

Overall, soil sampling and analysis efforts conducted by SCS in the area of the former USTs did not indicate the presence of petroleum hydrocarbon-bearing soil. However, prior soil sample data from the removal of the USTs and whether impacted left-in-place petroleum hydrocarbon-bearing soil is not available, and it is unknown if concentrations of petroleum hydrocarbons are present that could potentially exceed human health risk criteria or criteria for the protection of groundwater. Although a complete exposure pathway to potential petroleum hydrocarbon-bearing soil upon completion of construction is unlikely considering that approximately 13 feet of compacted fill is to be placed in this area following overexcavation, excavation activities in the area of the former USTs are proposed to be overseen by an environmental monitor. Soil samples will be collected during grading of this area if indications of petroleum hydrocarbons are observed, as indicated by staining, odors, elevated field readings, or free product. The environmental monitoring of the former USTs is further discussed in the "Petroleum Hydrocarbon Field Screening and Confirmation Soil Sampling" and "Field Observation and Monitoring" sections below.

Two Water Wells

Potential Environmental Concern

Two water wells are present at the southeast area of the Site (see Figure 3E for the approximate location of one of the wells – the location of the second well is east/southeast of the known-location well, but this well could not be located during the time of SCS' assessment). The possible environmental concerns with water wells are the direct access to groundwater they allow if they are improperly sealed or screened. Based on our experience, it is unlikely that any regulatory agency would require sampling based on the historical agricultural land use. However, because of the interpreted historical Site use for agriculture and the existence of two water wells with its ready access to groundwater, SCS collected one groundwater sample from a well head (sample GW1), and analyzed the sample for VOCs (EPA 8260B), TPH (EPA 8015B), and organochlorine pesticides (EPA 8081A).

Groundwater Sampling and Analysis

No detectable concentrations of TPH or organochlorine pesticides were reported in the groundwater sample collected from the on-Site groundwater production well. With the possible exception of cis-1,2 dichloroethene (1,2-DCE), no other VOCs were reported in the groundwater sample analyzed from the production well.

1,2-DCE is a chlorinated solvent used for degreasing and cleaning and is a breakdown product of other solvents. The 2014 Phase II ESA reported that while the reported concentration is low and is

less than the California Maximum Contaminant Levels (MCLs), the source of 1,2-DCE is not known. In addition, the details of the well construction are not known (e.g., seal length, well screen, production rates), so it is not clear whether this sample is representative of Site conditions. Additional research of the production well and possible additional groundwater sampling from these wells was recommended in the 2014 Phase II ESA.

Following completion of the 2014 Phase II ESA, SCS conducted additional research of the on-Site wells to better understand what the data are representative of. Although some initial planning documentation regarding the installation of the wells was found, well diagrams depicting the details of the well depths and screened intervals of each well was not located. Considering that the continued use of the existing wells is not proposed for the Riverwalk Project and the wells are proposed to be destroyed per County regulations, additional groundwater sampling was not considered warranted as a part of this SMP based on the relatively low concentrations of 1,2-DCE previously reported.

For the two groundwater wells located on Site and the low concentrations of 1,2-DCE reported in one of the groundwater monitoring wells on-Site, the following actions may need to be taken during Site redevelopment:

- If the water wells are not to be used for the proposed development at the Site, it is recommended that the groundwater wells be destroyed in accordance with County of San Diego Department of Environmental Health (DEH) requirements prior to or during the proposed construction activities at the Site.

- If dewatering activities need to be implemented during the excavation and construction activities, and if the groundwater to be dewatered contains detectable concentrations of constituents of concern such as 1,2-DCE, the groundwater may need to be filtered through appropriate media prior to discharging to the sanitary sewer system. Prior to dewatering activities, a National Pollutant Discharge Elimination System (NPDES) permit will need to be obtained from RWQCB. Additionally, as part of the discharge requirements, discharge water will need to be sampled on a predetermined basis to ensure compliance. When disposing of filtration media during media changes or at the end of dewatering activities, the filtration media need to be disposed of as regulated or hazardous wastes, depending on the results of laboratory analysis.

ADDITIONAL SOIL SAMPLING IN 2019 AND 2020

In order to further delineate the lateral and vertical extent of arsenic- and pesticide-bearing soil in connection with the proposed development, SCS conducted soil sampling at the Site on November 12, 2019 and January 13, 2020, as described below.

Site Health and Safety Plan

A Health and Safety Plan (HSP) was prepared prior to commencement of fieldwork. The HSP was required for work conducted by workers within the “exclusion zone” pursuant to the regulations in 29 Code of Federal Regulations Part 1910.120 and Title 8 California Code of Regulations (CCR) Section 5192. The HSP outlined the potential chemical and physical hazards that may be encountered during the drilling and sampling activities. The appropriate personal protective equipment and emergency response procedures for the Site-specific chemical and physical hazards were detailed in

the HSP. Field personnel were required to read and sign the document in order to encourage proper health and safety practices.

Utility Search and Markout

To minimize the likelihood of drilling into a subsurface utility for the soil sampling activities, SCS notified Underground Service Alert on both November 12, 2019 and January 3, 2020, as required by state law, and Ticket Numbers B193080115-00B and A200030759-00A, respectively, were issued.

Additional Sampling and Analysis – 2019 and 2020

On November 26, 2019, SCS collected additional soil samples from borings SB38 through SB62 in various areas throughout the Site to further characterize the lateral extent of arsenic- and pesticide-bearing soil based on the findings from the 2014 Phase II ESAs. These borings consisted of step-out soil borings to further delineate the elevated concentrations of organochlorine pesticides and arsenic reported in samples from borings SB17 and SB37, and the advancement of a limited number of borings in areas judged to have low sample density in order to further characterize organochlorine pesticides and arsenic in shallow soil at the Site. These soil borings were advanced with a direct-push rig to maximum depths of 3 feet bgs, with soil samples collected at depths of 0.5, 1.5, and 3 feet bgs, with the shallower 0.5-foot samples and select deeper samples analyzed for organochlorine pesticides and arsenic.

Additional soil sampling was conducted on January 13, 2020 (soil borings SB63 through SB69), since the results of the November 2019 soil sampling indicated the presence of a more extensive area of deeper arsenic-bearing soil. This arsenic-bearing soil area is present on the northeastern portion of the Site in the area of a vacant lot currently used by SDG&E for equipment storage, with elevated concentrations of arsenic reported in previous samples down to the maximum depth sampled (i.e., 3 feet bgs). Research of previous geotechnical soil boring logs from the Geotechnical Investigation report for this area indicated the presence of fill soils in that area with a thickness of up to 20 feet. Additionally, a review of historic aerial photographs indicated this northeastern portion of the Site was historically part of the golf course greens with water features until at least 1989, and circa 1996 during the installation of the trolley line, it appears that this area was filled in, likely with imported fill. Therefore, based on this additional information and findings of our research, the additional soil sampling consisted of the collection of soil samples at several depths from 1 to 20 feet bgs and analysis for arsenic.

The soil sampling for both events was conducted using a truck-mounted direct-push drill rig, and the soil samples were collected within an approximately 1.5-inch diameter acetate sleeve capped with Teflon tape and plastic caps. The acetate sleeves were labeled and placed in an ice-filled cooler for shipment to the laboratory. Chain-of-custody procedures were implemented for sample tracking.

Pursuant to SCS' standard operating procedures, the sampling equipment was decontaminated on Site between soil borings and soil samples to minimize the likelihood of cross-contaminating the samples and to minimize the potential for a false positive in the soil samples analyzed.

Soil samples were submitted to American Scientific Laboratories, LLC (ASL), a fixed-base, state-accredited laboratory for analysis of either organochlorine pesticides in accordance with EPA Method 8081A, and/or arsenic in accordance with EPA Method 6010B.

Soil Sample Laboratory Results

Organochlorine Pesticides

For the 25 additional borings (B38 through B62) advanced to further delineate pesticide-bearing soil, a total of 38 soil samples were analyzed for OCPs (EPA Method 8081), which included analysis of 0.5-foot bgs samples, and also select deeper samples collected at 1.5 and 3 feet bgs as needed based on the results of the 0.5-foot samples. OCPs reported above the detection levels included chlordane, alpha-chlordane, gamma-chlordane, dieldrin, DDD, DDE, and DDT. A copy of the laboratory analytical report is provided in Appendix B.

Arsenic

For the 32 additional borings (B38 through B69) advanced to further delineate the extent of arsenic-bearing soil, a total of 83 soil samples were analyzed for arsenic in accordance with EPA Method 6010B. Soil with elevated concentrations of arsenic above the Department of Toxic Substances Control (DTSC) maximum background concentration of 12 mg/kg were reported in 26 soil samples collected from the northeastern portion of the Site, in the general area of the current SDG&E equipment storage yard, at depths ranging from 0.5 to 10 feet bgs (with samples reported below 12 mg/kg at depths of 12.5 feet bgs and deeper). As indicated above, based on a review of historical aerial photographs, geotechnical boring logs, as well as the arsenic soil sampling data obtained by SCS, this area of the Site was previously at a lower elevation that was part of the golf course until approximately the early 1990s, and received up to approximately 20 feet of fill during the time that the trolley lines were constructed in the mid-1990s.

Arsenic-bearing soil is interpreted to have been used for at least a portion of the imported fill soils in this area, with arsenic concentrations reported as high as 53.3 mg/kg, and with arsenic concentrations exceeding the DTSC maximum background concentration of 12 mg/kg to depths of approximately 12.5 feet deep.

DISCUSSION OF DATA

Based on the available data, two soil samples (SB37-0.5 and SB61-0.5) were reported with the pesticide dieldrin exceeding residential human health risk screening criteria, and 29 soil samples were reported with concentrations of arsenic exceeding the DTSC maximum background concentration of 12 mg/kg. In connection with the proposed development at the Site, SSMC for arsenic and the organochlorine pesticides detected above laboratory reporting limits at the Site are recommended to be developed based on existing regulatory criteria and existing Site dataset. The SSMC should be used to demonstrate whether soil is either acceptable for free reuse on-Site, or must be properly excavated, segregated, and managed during construction.

For the former USTs on the northern portion of the Site in the maintenance area, soil sampling and analysis efforts conducted by SCS in this area did not indicate the presence of petroleum hydrocarbon-bearing soil. However, prior soil sample data from the removal of the USTs regarding whether impacted petroleum hydrocarbon-bearing soil was left-in-place is not available, and it is unknown if concentrations of petroleum hydrocarbons are present that could potentially exceed human health risk criteria or criteria for the protection of groundwater. Although a complete exposure pathway to potential petroleum hydrocarbon-bearing soil is unlikely upon completion of

construction, excavation activities in the area of the former USTs are proposed to be overseen by an environmental monitor.

For the two groundwater wells located on Site and the low concentrations of 1,2-DCE reported in one of the groundwater monitoring wells on-Site, it is recommended that the groundwater wells be destroyed in accordance with DEH requirements prior to or during the proposed construction activities at the Site if the use of these wells is to be discontinued. In addition, if dewatering activities need to be implemented during the excavation and construction activities, proper filtration and discharge permitting may be required as further discussed in the "Two Water Wells" section above.

In SCS' experience working with regulatory agencies such as the DEH, soils containing elevated concentrations of arsenic and pesticides that exceed human health risk screening criteria that are expected to be excavated can be reused on-Site, provided that these soils are covered by the placement of a clean soil cap 2- to 3-feet thick or more to reduce possible exposure pathways to the subsurface. The excavation, segregation, reuse, and recompaction of pesticide-bearing soil at the Site will need to be monitored by an environmental professional.

This SMP was developed to account for Site development activities and integrate environmental issues into the Site development process. This SMP provides procedures for the environmental monitoring of CoC-bearing soil during grading, including the appropriate handling, characterization, and on-Site reuse or burial of soil in a Soil Management Zone.

6 ENVIRONMENTAL SETTING

TOPOGRAPHY

Reported Elevation	Approximately 20 to 65 feet above mean sea level
Reported Slope Direction	Slopes down towards the center of the Site to the San Diego River, which transects the Site in northeast to west direction and flows to the west
Source	United States Geological Survey 7.5 Minute Topographic Map, La Jolla, California – San Diego County, 1967, photo-revised 1975

GEOLOGY AND GEOTECHNICAL RECOMMENDATIONS

The Geotechnical Investigation report (see Appendix A) prepared by NMG was reviewed by SCS. The geological information and a summary of geotechnical recommendations provided by NMG as they relate to general removal and recompaction and fill efforts required for grading are summarized in the following table:

Reported Formations	Artificial fill soils (afu), Alluvium (Qal), and River Terrace Deposits (Qtr)
Source	*Preliminary Geotechnical Investigation and Review of the Updated Grading Plan*, prepared by NMG and dated November 27, 2019 (Geotechnical Investigation)

Site-Specific Geology	Artificial Fill Soils – per NMG there are several different generations of artificial fills on Site, including undocumented fill and three generations of compacted fill. The golf course was reported to have been regraded several times over the past 70 years, and fill materials were placed on the Site for the construction of the trolley improvements. Shallow undocumented fills (Afu) on the order of 2 to 15 feet thick associated with the golf course contour grading exist within most of the site. Alluvium – is the most prevalent unit throughout the Site, and underlies the Site to elevations of 50 to 90 feet bgs. The alluvium consists of loose to medium dense fine-grained clayey sand, silty sand, and clean sand that is highly micaceous. Some alluvium on the western portion of the Site is composed of layers of dark gray sandy clay that have numerous gastropod shells. River Terrace Deposits (Qtr) are present throughout the northern central portion of the Site in areas with higher ground elevations. These deposits are generally dense to very dense and consisted of reddish-brown to yellowish-brown silty and clayey fine- to coarse-grained sand that was moist and very dense.
Geotechnical Recommendations	NMG indicated the following regarding removal and recompaction of Site soils and the placement of compacted fill: Unsuitable earth materials including undocumented fill, weathered compacted fills and river terrace materials, and loose and collapsible alluvium should be removed down to competent materials prior to the placement of compacted fill. Removal depths will vary from approximately 2 to 20 feet across the Site. Within the residential and commercial development areas, remedial removals will extend to just above the groundwater table. In areas underlain by alluvium, remedial removals should be made down to 2 to 3 feet above groundwater, or where the native soils under the scrapers start pumping on the removal bottom, and a layer of granular materials, gravel or geofabric may need to be placed in order to provide a workable condition prior to installation of ground improvements. In addition, ground improvements (such as geopiers, soil mixing, or stone columns) will be installed into the saturated alluvium below the proposed building areas. Import material will be needed to complete the grading at the Site. The thickness of compacted fill throughout most of the residential and commercial developments will be more than 5 feet thick. In the park areas, we understand that the proposed grading will level out the existing contoured mounds. The majority of the park grading will be cut with some fill areas, and will be considered non-structural.

HYDROGEOLOGY

Based on a review of a DEH Closure Letter in connection to the removal of USTs in the Site vicinity, *Unauthorized Release Case #H05129-002, ARCO Facility 3052, 6899 Friars Road, San Diego, California*, dated April 15, 2010, the depth to groundwater at this facility was reported to range from 20 to 37 feet below grade, and the groundwater flow direction was reported to be to the southwest. The actual depth to groundwater and flow direction at the Site may be different. Note groundwater was not encountered in previous borings advanced at the northern and northeastern portions of the Site during SCS' subsurface assessments in 2014 and 2020 to depths of approximately 20 feet below grade. However, groundwater depths are anticipated to be shallower in closer proximity to the San Diego River.

WATER QUALITY SURVEY

The following table summarizes the reported water quality in the Site vicinity.

Reported Hydrologic Subarea	Mission San Diego (907.11)
Reported Hydrologic Area	Lower San Diego (907.1)
Reported Hydrologic Unit	San Diego (907)
Reported Beneficial Use	Agricultural and industrial, and potentially municipal
Source	California RWQCB, San Diego Region, Water Quality Control Plan for the San Diego Basin, September 8, 1994, with amendments effective prior to April 25, 2007

7 GENERAL MITIGATION CRITERIA

There are two categories of mitigation work that will be required, and are principally based upon risk-based corrective action. These categories include:

- Risk-driven remediation required by future land uses and protection of workers, and
- Waste-based criteria in the event that soil is exported off Site, in which case soil may be considered regulated waste provided it contains detectable concentrations of pesticides, petroleum hydrocarbons, or elevated concentrations of the metal arsenic.

HEALTH RISK-BASED REGULATORY SCREENING CRITERIA

Arsenic

Arsenic is a naturally occurring metal that is typically present in soil within background concentration ranges. Based on a report prepared by the U.S. Geological Survey (USGS),[1] the background

[1] *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States*, by J.

concentrations of arsenic in the western United States range from 2.8 to 10.9 mg/kg. In another report prepared specifically for California soils,[2] the background concentrations of arsenic in California soil were found to range from 0.6 to 11.0 mg/kg. In an abstract presented by DTSC staff at the 2008 Society of Toxicology Annual Meeting,[3] it was reported that the upper-bound background concentration for arsenic in southern California soil is 12 mg/kg. Therefore, reported arsenic concentrations below 12 mg/kg are considered by SCS to be within the range of typical background concentrations and not indicative of a release of arsenic.

Using the DTSC staff maximum background concentration of 12 mg/kg, SCS also utilized a 95 percent upper confidence limit that was used on Site-specific data to derive an arsenic SSMC that is discussed in the "SSMC" section below.

Organochlorine Pesticides

For health risk-based criteria for pesticides, SCS used the DTSC Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note Number 3: April 2019 Residential Screening Levels (RSLs) for residential soil and the cancer endpoint values. Or, for chemicals not listed in HHRA Note 3, the EPA Regional Screening Levels (RSLs) for residential users (November 2019) can be used.

For the pesticide chlordane, per request of the DEH, SCS used the most conservative available regulatory value, which was established in the San Francisco Bay Regional Water Quality Control Board (SFRQCB) Tier 1 Environmental Screening Levels (ESLs) (2019, Revision 2). Note that the Tier 1 ESL for chlordane is 480 µg/kg (residential cancer risk value), and the DTSC RSL for chlordane is 1,700 µg/kg.

From these regulatory screening values, SCS developed SSMC, which also includes a 95 percent upper confidence limit that was used on Site-specific data to derive both the arsenic and dieldrin SSMC that is discussed in the "SSMC" section below.

Petroleum Hydrocarbons

For petroleum hydrocarbon-bearing soil, based on prior conversations with the DEH, SCS used the SFRQCB Tier 1 ESLs (2019, Revision 2), which provide conservative screening levels for impacted soil and groundwater. The ESLs are intended to help expedite the identification and evaluation of potential environmental concerns.

SITE-SPECIFIC MITIGATON CRITERIA (SSMC)

The discussion below presents the ranges of concentrations of known arsenic- and pesticide-bearing soils at the Site, and the mitigation criteria for arsenic and organochlorine pesticide to be excavated and either reused on Site and/or exported from the Site during grading. In addition, although soil sampling and analysis efforts conducted by SCS in the area of the former USTs did not indicate the

G. Boerngen and H. T. Shacklette, USGS Professional Paper No. 1270, 1984.

[2] *Background Concentrations of Trace and Major Elements in California Soils*, by G. R. Bradford, et al., Kearny Foundation of Soil Science Division of Agriculture and Natural Resources University of California, March 1996.

[3] *Determination of a Southern California Regional Background Arsenic Concentration in Soil, Chernoff, G., Bosan, W., Oudiz, D., and California Department of Toxic Substances Control, 2008 Society of Toxicology Annual Meeting.*

presence of petroleum hydrocarbon-bearing soil, SSMC are provided for TPH as well, since environmental oversight of the grading of the area of the former USTs is proposed.

Arsenic Evaluation Using 95 UCL and Derivation of SSMC

A total of 134 in situ soil samples from depths ranging from 0.5 to 20 feet bgs have been collected at the Site by SCS and analyzed for arsenic in accordance with EPA Method 6010B (Table 1; Figures 3A through 3E). Of the 134 soil samples considered representative of current Site conditions, 28 samples were reported with concentrations of arsenic that exceed the DTSC maximum background concentration of 12 mg/kg. A summary of the reported arsenic detections at the Site in comparison to the DTSC maximum background concentration is presented below:

Metal	Number of Samples Analyzed	Maximum Site Concentration (mg/kg)	DTSC Maximum Background Concentration (mg/kg)	Number of Site Samples Exceeding DTSC Maximum Background Concentration
Arsenic	134	53.3	12	28

A statistical analysis can be conducted of the arsenic sample population data to generate a range for the likely actual mean of the target population (e.g., arsenic concentration data from all or a subset of the soil samples collected at the Site can be used to generate a range for the likely actual mean lead concentration for all soil at the Site). Based on the sample population data, the statistical analysis provides a confidence (expressed as a percentage) that the actual mean of the target population is below an upper threshold known as the Upper Confidence Limit of the mean (UCL). It is used as a collective comparison of a sample population to infer attributes of the target population as a whole. It is not meant to describe or predict individual samples.

UCL statistics can be used to demonstrate that a dataset of arsenic concentrations representing soil intended for free reuse on-Site without restriction can have exceedances to the DTSC maximum background concentration. In other words, when taken as a whole, certain outliers or excursions are still part of a given sample distribution, but on average the upper bound of the mean is still within or below a given threshold.

In order to establish a dataset that is consistent with an with the accepted upper bound of the background concentration range, and in order to achieve a resulting 95 UCL for arsenic of 12 mg/kg or less, soil represented by soil samples with arsenic concentrations at or exceeding 14.5 mg/kg was removed from the dataset, and will be removed through excavation and either on-Site reuse under a clean soil cap or off-Site disposal.

The remainder of reported arsenic concentrations (i.e., below 14.5 mg/kg arsenic), which represent soil that would potentially be freely reused on-Site during grading activities, was used to calculate the 95 percent UCL (95 UCL). This was calculated at 3.962 mg/kg using the USEPA statistical software *ProUCL*[4] version 5.1 (Appendix C). Therefore, since the 95 UCL of 3.962 mg/kg arsenic is well below the DTSC maximum background concentration of 12 mg/kg, SCS set the SSMC for arsenic at 14.5

[4] ProUCL: USEPA. 2015. ProUCL Version 5.1 User Guide. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. EPA/600/R-07/041. Office of Research and Development. Washington, D.C.

mg/kg, which will conservatively result in a 95 UCL or arsenic concentration that is less than 12 mg/kg.

- The SSMC for arsenic will therefore be 14.5 mg/kg.

Pesticide Data Analysis and Comparison to Screening Criteria

A total of 79 in situ soil samples from depths ranging from 0.5 to 3 feet bgs have been collected at the Site by SCS and analyzed for organochlorine pesticides (Table 1; Figures 3A through 3E). Of the 79 soil samples considered representative of current Site conditions, 15 samples were reported with detectable concentrations of OCPs. A summary of the applicable risk-based and waste-based mitigation criteria for the detected OCPs is presented below:

OCP	Maximum Concentration Detected (µg/kg)	Risk-Based DTSC RSLs/EPA RSLs (µg/kg)	Waste-Based TTLC (µg/kg)
Chlordane	1,430	1,700	2,500
Alpha-chlordane	565	1,700*	2,500*
Gamma-chlordane	334	1,700*	2,500*
Dieldrin	49.6	34	8,000
DDD	363	1,900	1,000
DDE	363	2,000	1,000
DDT	23.4	1,900	1,000

Notes:
CoC: constituent of concern.
µg/kg: micrograms per kilogram.
DTSC RSLs: Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note Number: 3, April 2019, using the Recommended Screening Levels (RSLs) for residential soil and cancer endpoint.
EPA RSLs: United States Environmental Protection Agency (EPA) Regional Screening levels for residential soil, November 2019 used where DTSC RSLs not available.
TTLC: Total Threshold Limit Concentrations, California Code of Regulations, Title 22 Article 3, July 20, 2005.
DDD = 4,4'-dichlorodiphenyldichloroethane.
DDE = 4,4'-dichlorodiphenyldichloroethylene.
DDT = 4,4'-dichlorodiphenyltrichloroethane.
RED font indicates the maximum concentration reported at the Site exceeds DTSC RSLs/EPA RSLs.
ND: Non-detect above laboratory reporting limits.
NA: Not applicable.

Two of the 79 samples (samples SB37-0.5 and SB61-0.5) collected at the Site exceed the DTSC RSL for dieldrin of 34 micrograms per kilogram (µg/kg), indicating a potential human health risk for soil represented by these samples. These samples were further evaluated for potential human health risks using 95 percent UCL statistics, as further discussed below.

Dieldrin Evaluation Using 95 UCL and Derivation of SSMC

Two of the 79 samples collected at the Site exceed the DTSC RSL for dieldrin of 34 µg/kg: samples SB37-0.5 (49.6 µg/kg dieldrin) and SB61-0.5 (37.6 µg/kg). In following DTSC Risk Guidance,[5]

[5] DTSC Risk Guidance: DTSC. 2019. Human Health Risk Assessment Note Number 4. Issue Date: May 14, 2019. Issue: Guidance for Screening Level Human Health Risk Assessment. Sacramento.

potential health risks related to dieldrin were evaluated by comparing the Site-wide 95 UCL to the DTSC RSL for dieldrin of 34 µg/kg.

95 UCL statistics were used to demonstrate that the dataset of dieldrin concentrations representing soil intended for free reuse on-Site without restriction can have exceedances to the DTSC RSL. The 91 soil samples analyzed for dieldrin, which represent soil that would potentially be freely reused on-Site during grading activities, were used to calculate the 95 UCL, which was calculated at 6.449 µg/kg using the USEPA statistical software *ProUCL* version 5.1 (Appendix D), and is well below the DTSC RSL for dieldrin of 34 µg/kg. The highest reported dieldrin concentration in this dataset is sample SB37-0.5 (49.6 µg/kg dieldrin), which still result in the 95 UCL of 6.449 µg/kg that is below the DTSC RSL for dieldrin of 34 µg/kg. Therefore, SCS set the SSMC for dieldrin to 50 µg/kg, which would still result in a 95 UCL for dieldrin that is well below the DTSC RSL using dieldrin data collected from the Site.

- The SSMC for dieldrin will therefore be 50 µg/kg. For the remainder of OCPs detected at the Site (besides chlordane discussed below), the DTSC RSLs will be used, or if DTSC RSLs are not available, the EPA RSLs will be used.

Chlordane Evaluation Using 95 UCL and Derivation of SSMC

Although none of the soil samples collected at the Site were reported to exceed the DTSC RSL for chlordane of 1,700 µg/kg, in developing the SSMC and at request of the DEH, SCS used the more conservative SFRWQCB Tier 1 ESL for chlordane of 480 µg/kg (residential cancer risk value).

Two of the 79 samples collected at the Site exceed the Tier 1 ESL for chlordane of 480 µg/kg: samples SB37-0.5 (1,430 µg/kg chlordane) and SB61-0.5 (566 µg/kg chlordane). In following DTSC Risk Guidance, potential health risks related to chlordane were evaluated by comparing the Site-wide 95 UCL to the Tier 1 ESL for chlordane of 480 µg/kg.

95 UCL statistics were used to demonstrate that the dataset of chlordane concentrations representing soil intended for free reuse on-Site without restriction can have exceedances to the Tier 1 ESL. The 79 soil samples analyzed for chlordane, which represent soil that would potentially be freely reused on-Site during grading activities, were used to calculate the 95 UCL using the USEPA statistical software *ProUCL* version 5.1 (Appendix E). The 95 UCL value was calculated at 430.8 µg/kg, which is the Kaplan Meier Upper Tolerance Limit (UTL) assuming normal distribution, which is the most conservative calculated value for non-background datasets, and is below the Tier 1 ESL for chlordane of 480 µg/kg. The highest reported chlordane concentration in this dataset is sample SB37-0.5 (1,430 µg/kg chlordane), which still results in the 95 UCL of 430.8 µg/kg that is below the Tier 1 ESL for chlordane of 480 µg/kg. Therefore, SCS set the SSMC for chlordane to 1,435 µg/kg, which,based on the statistical evaluation, would still result in a 95 UCL for chlordane that is well below the Tier 1 ESL using chlordane data collected from the Site.

- The SSMC for chlordane will therefore be 1,435 µg/kg. Since regulatory thresholds for alpha-chlordane and gamma-chlordane are not published, the SSMC for chlordane of 1,435 ug/kg will be used for these constituents. For the remainder of OCPs detected at the Site (besides dieldrin discussed above), the DTSC RSLs will be used, or if DTSC RSLs are not available, the EPA RSLs will be used.

Note that for the two soil samples reported with chlordane above Tier 1 ESLs (sample B37-0.5 at 1,430 µg/kg chlordane, and sample SB61-0.5 at 566 µg/kg chlordane), although the 95 UCL for

chlordane was below the Tier 1 ESL as discussed above, the DEH requested in an email dated July 17, 2020 that the reuse of soil represented by these two soil samples not be in areas of direct exposure or contact by future occupants of the Site. Below is a summary of the proposed land use, grading, excavation and development in the areas of these two samples, based on a review of the Vesting Tentative Map and recommendations presented in the Geotechnical Investigation and our conversations with SD Riverwalk LLC. The results of SCS' review indicate there will be a low likelihood of direct exposure or contact by future occupants of the Site to soil represented by these samples (i.e., SB37-0.5 and SB61-0.5):

- Soil represented by sample B37-0.5 is in the area of the proposed Multiple Habitat Protection Area (MHPA), which will be off limits to human access after grading is complete. According to SD Riverwalk LLC, during grading operations, approximately 10 feet thick of soil from this general area of the MHPA will be excavated and re-used as on-site building fill pad material, which subsequently may be covered with imported fill material. Building pads will then be covered with a building foundation, hardscape, and limited landscaping areas. Therefore, in addition to this soil material being acceptable when using a 95 UCL with respect to the reported chlordane concentrations at the Site, it will also be mixed into building pad material, and subsequently covered with surface improvements.

- Soil represented by sample SB61-0.5 is in an area in the southeast portion of the Site proposed with office buildings and parking structures. This area is to have existing soils removed down to 13 to 17 feet deep, recompacted, and covered with several feet of imported impacted fill, and will then be developed with buildings, parking structures, and other surface improvements. Therefore, there is a low likelihood of exposure to this material by occupants of the Site after construction is complete.

Summary of SSMC for OCPs

The table below summarizes the SSMC for OCPs that have been detected at the Site.

OCP	SSMC (µg/kg)
Chlordane	1,435
Alpha-chlordane	1,435
Gamma-chlordane	1,435
Dieldrin	50
DDD	1,900
DDE	2,000
DDT	1,900

In comparing the available soil sample data collected for the Site to the above SSMC for OCPs, with the possible exceptions described below, there are no reported exceedances. As indicated above, there are two reported exceedances to the DTSC RSL for dieldrin of 34 µg/kg (samples SB37-0.5 [49.6 µg/kg dieldrin] and SB61-0.5 [37.6 µg/kg]). The 95 UCL for dieldrin was calculated at 6.449 µg/kg, which is well below the DTSC RSL using dieldrin data collected from the Site. In addition, there are two reported exceedances to the SFRWQCB Tier 1 ESL for chlordane of 480 µg/kg (samples SB37-0.5 [1,430 µg/kg chlordane] and SB61-0.5 [566 µg/kg chlordane]). The 95 UCL for

chlordane was calculated at 430.8 µg/kg, which is below the Tier 1 ESL using chlordane data collected from the Site.

Petroleum Hydrocarbon SSMC

Although soil sampling and analysis efforts conducted by SCS in the area of the former USTs did not indicate the presence of petroleum hydrocarbon-bearing soil, excavation activities in the area of the former USTs are proposed to be overseen by an environmental monitor. Soil samples will be collected during grading of this area if indications of petroleum hydrocarbons are observed, as indicated by staining, odors, elevated field readings, or free product.

As indicated above, the SSMC for petroleum hydrocarbon-bearing soil will be the SFRWQCB Tier 1 ESLs (2019, Revision 2), which provide conservative screening levels for impacted soil and groundwater. The SSMC established for petroleum hydrocarbon-bearing soils is described below. Soil samples will be collected in the area of the former USTs, as well as in other areas of the Site during grading, if indications of petroleum hydrocarbons are observed, as indicated by staining, odors, elevated field readings, or free product. The confirmation soil sampling would involve analysis for TPH in accordance with EPA Method 8015M. The confirmation soil sampling is further discussed in the "Confirmation Sampling" section below.

- **The Mitigation Criterion for Petroleum Hydrocarbon-Bearing Soil to be freely reused on the Site: Less than 100 mg/kg TPHg (TPH as gasoline), 260 mg/kg TPHd (TPH as diesel), and 1,600 mg/kg TPHo (TPH as oil)**. SCS used the Tier 1 ESLs for total petroleum hydrocarbons. Soil that is proposed to be graded as part of the project that is found during soil sampling that is less than the ESL for TPH can be freely graded and reused on Site.

- **Mitigation Criteria for On-Site Reuse in Soil Management Zone (SMZ):** TPH-bearing soil with concentrations of petroleum hydrocarbons **greater than 100 mg/kg TPHg, 260 mg/kg TPHd, and 1,600 mg/kg TPHo**, but **less than 1,000 mg/kg for TPHg, 2,300 mg/kg for TPHd, and 5,100 mg/kg for TPHo** (the ESL for soil related to leaching to groundwater [Table S-3]). TPH-bearing soil meeting this criterion will be reused on Site in the SMZ. The SMZ will consist of excavated and segregated soil placed beneath a minimum 2-foot-thick clean soil cap in a designated area that is free of utilities and a minimum of 5 feet above the reported groundwater elevation.

- **Mitigation Criteria for Protection of Groundwater: 1,000 mg/kg TPHg, 2,300 mg/kg TPHd, and 5,100 mg/kg TPHo** – Maximum concentration of petroleum hydrocarbon-bearing soil to be reused on Site. These concentrations are the SWRCB ESLs for soil related to leaching to groundwater (Table S-3). If soil to be excavated as a part of planned grading activities is reported at or exceeding these concentrations, soil represented by these exceedances must be excavated and exported from the Site in order to be protective of groundwater.

From our experience, for petroleum hydrocarbon releases, TPH is an acceptable criterion or surrogate for possible presence of VOCs; therefore, only TPH will be used as a mitigation criterion for known areas of TPH-bearing soil.

SOIL MANAGEMENT PLAN

This section describes the means and methods for the proper segregation, characterization, and management of CoC-bearing soil to be reused on-Site and/or exported to properly licensed facilities during construction activities.

CONSTRUCTION EXCAVATION ENVELOPE (CEE)

The construction excavation envelope is defined as the total depth(s), width(s), and length(s) of excavation(s) required to build a project including any and all excavations for footings, foundations, and other below-grade improvements (e.g., retention basins, utilities, etc.).

The development plans indicate the construction of a mixed-use development with up to 4,300 residential units (including 10 percent as on-site affordable housing), approximately 1 million square feet of office space, approximately 152,000 square feet of community retail, more than 100 acres of park and open space, as well as associated infrastructure improvements. Buildings to be constructed will either consist of slab-on-grade pads, or podium subterranean parking garages. Note that development plans have not been finalized for the Site at this time, although remedial grading depths and quantities have been tabulated as presented in the Vesting Tentative Map.

SCS understands that the recommendations[6] provided in the Geotechnical Investigation report by NMG require the removal and recompaction of the unsuitable earth materials including undocumented fill, weathered compacted fills and river terrace materials, and loose and collapsible alluvium, which should be removed down to competent materials prior to the placement of compacted fill. Removal depths will vary from approximately 2 to 20 feet across the Site. The resulting undercuts are to be replaced with engineered fill. The Geotechnical Investigation reports that overall grading will consist primarily of the placement of fill soils of up to 25 feet above existing topography to create pads.

There are design cuts within the North and Central Districts (Areas 1 and 2), both in the areas of proposed buildings and for the pads below Friars Road and the Trolley. These design cuts will be up to 13 feet deep. Design cuts up to 21 feet and fills up to 4 feet are proposed for the parks. The preliminary grading plan shows a 2:1 fill slope extending down to existing elevations along the river that is up to 20 feet high. There will likely be some cut slopes or retaining walls in the cut areas. The building pads will be graded to minimum elevations of 31 feet above mean sea level (msl) in the Central District (Area 1), and 32 feet msl in the South District (Area 3) in order to bring the pads above the flood levels. In addition, there will be cuts made in the park near the river. This grading will allow the river to be contained in the park area below the proposed development during rainy periods.

In general, soils removed during remedial grading were reported by NMG to be suitable for reuse in compacted fills; however, import material will be needed to complete the grading at the Site. The thickness of compacted fill throughout most of the residential and commercial developments will be

[6] The summary of geotechnical recommendations provided herein is a summary of select geotechnical engineering recommendations that relate to the excavation of potentially impacts soils. The summary provided is our understanding based on our review of the reports, and any information provided by SCS is a summary for convenience purposes. Please see the geotechnical report for further information.

more than 5 feet. In the park areas, we understand that the proposed grading will level out the existing contoured mounds. The majority of the park grading will be cut with some fill areas, and will be considered non-structural.

According to the Vesting Tentative Map, the following quantities were tabulated for the Site:

- 176.5 acres or 90.4 percent of the Site area is to be graded
- Approximately 1,506,700 cubic yards of alluvium is to be removed and recompacted
- Approximately 426,400 cubic yards of cut will be excavated, with a maximum depth of 24 feet
- Approximately 1,454,000 cubic yards of fill are required, with a maximum depth of fill of 32 feet
- Approximately 1,028,000 cubic yards of fill soil is to be imported to the Site for soil balance purposes

During the excavation of the known areas of CoC-bearing soils that exceed the SSMC, as well as during excavation of the former USTs on the northern portion of the Site, SCS will be on-Site to screen and segregate the CoC-bearing soils for placement within SMZ(s), or export if required, and to collect confirmation bottom soil samples as needed, as discussed in the "Confirmation Soil Sampling" section below.

Volume Estimate of Arsenic-Bearing Soil to Be Reused Within the Soil Management Zone

In order to derive an estimate of the volume of the arsenic-bearing soil that is suitable to be excavated and reused within an on-Site Soil Management Zone during the proposed grading activities, the available soil data obtained by SCS was reviewed. This data is summarized on Table 1 and on Figures 3A through 3E, and the excavation areas and depths are depicted on Figure 4.

The known arsenic-bearing soil within the CEE that exceeds the SSMC that will be excavated, segregated, and reused within the Soil Management Zone is estimated to be approximately 40,000 cubic yards or more. This soil is present in the areas of the following soil borings as represented by the following soil samples:

Arsenic-Bearing Soil Zone Soil Borings	Estimated Depth of Arsenic-Bearing Soil (feet bgs)	Depths of Samples Exceeding Arsenic SSMC (feet bgs)	Depth of Sample Below Arsenic SSMC (feet bgs)
SB44	4' plus*	0.5' to 3'	NA*
SB17, SB40, SB43, SB64	10'	0.5' to 7.5'	10' (sample SB64-10)
SB41, SB45, SB65, SB67	5'	0.5' to 3'	5' (samples SB65-5, SB67-5)
SB42, SB66	12.5'	0.5' to 10'	12.5' (sample SB66-12.5)

Note:
* - Additional soil samples below 3 feet bgs were not collected and the depth of arsenic-bearing soil in this zone is estimated to be 4 feet deep or deeper. Soil screening and associated confirmation bottom soil sampling is

required in this zone to establish a bottom depth with arsenic concentrations that are below the SSMC, as discussed in the "Confirmation Sampling" section below.

The estimate of 40,000 cubic yards or more was derived using the following assumptions:

- The vertical extent of the soil represented by soil samples that exceed the SSMC is assumed to extend to the depth of a sample that is below the SSMC. Soil samples SB64-10, SB65-5, SB66-12.5, and SB67-5 provide these bottom depths, and are shown in the table above. A confirmation bottom soil sample is still required to be collected at 4 feet bgs or deeper in the zone represented by soil boring SB44.

- The horizontal extent of this soil was assumed to extend half the distance to nearby samples that were either:

    - Below the SSMC - in this case samples from borings SB18, SB46, SB63, and SB68; or

    - Different estimated thickness of arsenic-bearing soil based on representative soil samples, as grouped by arsenic-bearing soil zones in the table above.

The procedures for excavation, screening, and placement of arsenic-bearing soil within the Soil Management Zone are further discussed in the "Soil Management Zone (SMZ)" and "Confirmation Sampling and Field Screening" sections below.

SOIL MANAGEMENT ZONE (SMZ)

Based on the presence of arsenic-bearing soil that exceeds the SSMC, as well as the possible presence of petroleum hydrocarbon-bearing soil in the area of the former USTs, the proper excavation, segregation, management, and reuse of CoC-bearing soil within a SMZ are proposed to support the proposed construction and redevelopment plans for the Site as a mixed-use development. Our evaluation of the data collected indicates that a total of approximately 40,000 cubic yards or more of known arsenic-bearing soil exceed the SSMC (Figure 4). Note however that this volume may increase (or decrease) during grading efforts based upon the results of screening of the arsenic-bearing soil with an X-ray fluorescence (XRF) meter as well as confirmation soil sampling, due to the possible presence of petroleum hydrocarbon-bearing soil in the area of the former USTs, and due to the discovery of other possible CoC-bearing soil as well.

Reuse of CoC-Bearing Within Soil Management Zone

CoC-bearing soil at the Site that exceeds the SSMC will be reused within a SMZ that is covered with 2- to 3-feet or more of soil that is known to be below the SSMC.

Although several possible different SMZ locations have been selected based on conversations with the Client and design team (Figure 5a), SCS proposes that the exact location of the SMZ(s) will be selected sometime during the preconstruction process and/or during grading operations. Figure 5a presents the locations of various areas that have been selected for possible SMZ locations (with cross-sections of the various SMZ options presented as Figures 5B to 5D), based on the following general selection criteria:

- SMZ locations depicted are on development lots and/or park areas and do not extend onto roads.
- The bottom of CoC-bearing soil will be 5 feet above (or more) the highest reported groundwater elevations.
- The top of the CoC-bearing soil will be covered with at least a 2- to 3-foot-thick or more cap of "clean" soil that is below the SSMC for CoCs. Based on conversations with the DEH, a 2-foot thick minimum clean soil cap is to be used in areas proposed with concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap is to be used in areas proposed without hardscape (e.g., landscape or park areas)
- If any subsurface features (e.g., building footings, utilities, etc.) are proposed to extend into CoC-bearing soil of the SMZ, then excavation activities will be required to ensure that there is a 3-foot "clean" soil buffer (both laterally and vertically) around the subsurface feature.

The various SMZ location options have a total capacity of up to approximately 268,300 bank cubic yards. Volume estimates for known CoC-bearing soil is 40,000 cubic yards or more that is to be reused within the SMZ. The following table summarizes the general soil reuse criteria logistics of the various SMZ alternatives (Figure 5a):

SMZ Logistics	
Locations of SMZ	The various SMZ alternatives include: Lots 1-8; Lots 20-28; Lots 30-33; Lot TT Park; Lot VV; Lots 46-52. Lots are proposed to either be built with a slab-on-grade building or building with one subterranean podium parking level, or are proposed for park use (Figure x).
Dimensions and capacities of various SMZ alternatives	Each SMZ alternative confined to a lot; each lot has different dimensions/capacities as depicted on Figure 5a. Approximate total capacity for soil management is up to 268,300 cubic yards.
Capping of SMZ	Approximately 2-feet thick (for lots/areas proposed with hardscape) to 3-feet thick (non-hardscape lots/areas) of "clean" soil (i.e., soil with known concentrations of CoCs below SSMC)
Freeboard to groundwater	At least 5 feet or more. Note it is possible that shallower localized aquifers/perched groundwater exist.

SCS anticipates the following general program will be followed (subject to input from the grading contractor concerning their means and methods):

- Approximately 40,000 cubic yards of more of CoC-bearing soil will be excavated, segregated, and placed and compacted as fill material in the SMZ within a 2- to 10-foot-thick layer, and covered with at least a 2- to 3-foot-thick cap of "clean" soil that is below the SSMC for CoCs (Figures 5a to 5d). Based on conversations with the DEH, a 2-foot thick minimum clean soil cap is to be used in areas proposed with concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap is to be used in areas proposed without hardscape (e.g., landscape or park areas).

- A permeable demarcating layer, such as perforated orange plastic construction fencing, shall be placed on top of the CoC-bearing soil. This is to serve as a physical marker to alert future

workers to the location of the CoC-bearing soils, in the event this soil needs to be excavated in the future (e.g. utility/sewer installation or other redevelopment activities).

- This soil will be compacted per geotechnical recommendations.

- The various SMZ options presented on Figure 5a will hold up to approximately 268,300 cubic yards of soil. The actual location(s) of the SMZ are to be selected based on correspondence between SCS, the Client, design team, general contractor, and/or grading contractor prior to placement.

- The outer perimeter and top and bottom of the CoC-bearing soil within the SMZs be surveyed by the Client or the grading contractor and these coordinates be provided to the Project civil engineer for the creation of as-built plans.

SMZ locations and depth intervals will be placed in general areas that have little to no utilities. However, if any subsurface features (e.g., building footings, utilities, etc.) are proposed to extend into CoC-bearing soil, then excavation activities will be required to ensure that there is a 3-foot "clean" buffer (both laterally and vertically) around the subsurface feature. The purpose of this is to eliminate a complete exposure pathway to CoC-bearing soil.

- The groundwater elevations at the Site have been reported by NMG to range from approximately 8 to 15 feet above msl (see Figure 5b to 5d for cross sections depicting the estimated water table elevation in relation to the various soil management zone alternative elevations). According to NMG, groundwater elevations have been reported in multiple geotechnical investigations that have been performed at the Site between the years 1975 to 2019, and the groundwater levels have varied by approximately 3 to 4 feet over this time. Further, NMG reported that based on review of available GeoTracker data, groundwater levels near Friars Road and Fashion Valley Road were found to fluctuate up to 3 feet, as recorded quarterly between 2003 and 2009. The bottom elevation of the SMZ(s) is proposed to be at an elevation that is 5 feet above the highest reported groundwater elevations from soil borings representative of a particular area. These highest reported groundwater elevations are depicted on the cross sections, and should be verified during grading activities by either the surveyors and/or grade checkers to verify elevations.

- NMG also indicated that the current golf course operator at the Site has stated that approximately 500,000 gallons of water are applied to the golf course per day during non-raining periods. After golf course operations cease for the proposed new land uses at the Site, the water table is anticipated to lower over time due to the decrease in water infiltrating through Site soils. In addition, the use of infiltration best management practices (BMPs) is reportedly not planned for the Site at this time, and irrigation for the proposed land use is to be primarily collected into water quality filtration BMPs and outletted into the storm drain system. Therefore, CoC-bearing soils are proposed to be placed at least 5 feet above the water table or more, and the water table is estimated to lower over time, which would further increase the freeboard to groundwater.

An SCS representative will be on Site during the excavation and soil reuse activities. SCS will be empowered by the Client with sufficient Project authority to monitor the placement of the material for conformance with environmental components of this document as well as for health and safety compliance.

The Project civil and geotechnical engineers will be responsible for ensuring that the soil meets the appropriate design requirements and parameters from a geotechnical, civil, and structural engineering perspective. They will also be responsible for conformance with these standards when the soil is being placed by the general contractor or subcontractors.

Upon completion of the placement of CoC-bearing soil into the SMZ(s), the limits and depths of this area will be presented in a Property Closure Report (PCR), which will be prepared after construction and mitigation activities have ended. The PCR is further discussed in the "Property Closure Report" section below.

CONFIRMATION SAMPLING AND FIELD SCREENING

Arsenic-Bearing Soil Area Field Screening and Confirmation Soil Sampling

The known areas of arsenic-bearing soil as depicted on Figure 4 will be excavated during mass grading activities. Field screening using an XRF meter is proposed to be used to aid in excavation of arsenic-bearing soils. Once arsenic concentrations are reported to be below the Site-Specific Mitigation Criterion for arsenic of 15 mg/kg, a confirmation soil sample will be collected at the bottom of the excavation for submittal to a fixed-base laboratory for analysis of arsenic in accordance with EPA Method 6010B. Confirmation bottom soil samples will be collected at a frequency of one sample per 5,000 square feet. The table below summarizes the various arsenic-bearing soil zones and associated depths, and the approximate amount of confirmation bottom soil samples proposed for each zone.

Arsenic-Bearing Soil Zone Soil Borings	Estimated Depth of Arsenic-Bearing Soil (feet bgs)	Approximate Area of Arsenic-Bearing Soil Zone (square feet)	Estimated number of confirmation bottom samples (one sample per 5,000 square feet)
SB44	4' plus	15,835	3
SB17, SB40, SB43, SB64	10'	32,855	7
SB41, SB45, SB65, SB67	5'	67,935	14
SB42, SB66	12.5'	25,844	5
ESTIMATED TOTAL OF CONFIRMATION BOTTOM SAMPLES			**29**

Excavated arsenic-bearing soil will be reused within an on-Site SMZ(s) as discussed above. Provided that arsenic concentrations reported by the laboratory are below the SSMC, the depth of this sample will establish the excavation depth in this zone.

Sidewalls are to be screened using the XRF meter. Sidewall confirmation soil samples are not proposed to be collected, since the XRF meter will be used to provide further lateral control of arsenic-bearing soil. Additionally, in SCS' opinion there is sufficient prior data that is still considered representative of Site conditions that will be relied upon to provide lateral control for the proposed arsenic-bearing soil excavations. As discussed in the "Construction Excavation Envelope" section above, the horizontal extent of arsenic-bearing soil is assumed to extend to half the distance to nearby samples that were previously reported to be below the SSMC.

Excavated arsenic-bearing soil will be placed within the on-Site Soil Management Zone as discussed above.

Organochlorine Pesticide Confirmation Soil Sampling

Although previous soil sampling for OCPs was conducted in accessible exterior portions of possible pesticide storage and mixing areas, additional confirmation soil samples below the maintenance building slabs were requested by the DEH to assess for possible leakage of pesticides through old building slabs. Previous soil samples collected for OCPs in potential storage/mixing areas included three samples (SB1, SB2, and SB3) as depicted on Figure 3B, which were reported to be below SSMC for OCPs.

- For further assessment of possible storage/mixing areas, confirmation bottom soil samples for OCPs are required to be collected be beneath the slabs of the three maintenance buildings (i.e., 1 sample per building) on the northern portion of the Site at 5905 Friars Road, after demolition of the slabs during construction activities. Samples from approximately 6-inches below the concrete slabs are to be analyzed for OCPs in accordance with EPA Method 8081A.

The SSMC for OCPs are summarized in the table below, and are further discussed in the "Summary of SSMC for OCPs" section above:

OCP	SSMC (µg/kg)
Chlordane	1,435
Alpha-chlordane	1,435
Gamma-chlordane	1,435
Dieldrin	50
DDD	1,900
DDE	2,000
DDT	1,900

Petroleum Hydrocarbon Field Screening and Confirmation Soil Sampling

For the area of the former USTs in the northern portion of the Site on the proposed Lot 5 of the Riverwalk Project (Figure 3B), remedial grading (i.e. removal and recompaction) of existing undocumented fill and alluvial soils are proposed to be observed by a competent environmental consultant[7] (Environmental Monitor) to assess for obvious indications of petroleum hydrocarbon-bearing soil. Note that previous soil sampling and analysis efforts conducted by SCS in the area of

[7] A "competent environmental consultant" is person having demonstrated knowledge of and professional experience in the observation and documentation of environmental excavating activities, environmental and geologic conditions, including petroleum hydrocarbons and releases of petroleum hydrocarbon-containing materials in the Site, and recognition of and testing for hazardous materials and conditions. A competent person also must have current Occupational Safety and Health Administration (OSHA) training and certificates pertinent to this type of work, and the delegated authority to respond to changed conditions. A competent environmental consultant will be a state-licensed geologist or engineer with sufficient knowledge of local conditions and environmental regulations, or a person working under the direct supervision of such a professional geologist or engineer.

the former USTs did not indicate the presence of petroleum hydrocarbon-bearing soil, and a complete exposure pathway to potential petroleum hydrocarbon-bearing soil upon completion of grading and placement of fill soils is unlikely. However, the excavation of this soil is proposed to be observed and screening by an Environmental Monitor to assess for the presence of potential petroleum hydrocarbon-bearing soil that may be encountered in order to protect construction workers and assess for possible impacts from this material to groundwater.

Environmental oversight efforts will consist of visual observations for staining or odors, and screening with a photoionization detector (PID). Provided that suspect soil is encountered, representative soil samples of either the stockpiled soil or in-situ samples will be collected for characterization purposes and analyzed for TPH (EPA Method 8015B) at a minimum of one sample per 1,000 square feet or one sample per 50 cubic yards of stockpiled soil. If excavations extend 5 vertical feet or deeper in assessing petroleum hydrocarbons, soil samples will be collected from the sidewalls of the excavation every 5 vertical feet. If in the unlikely event that a larger volume or area of impacted soil is encountered, the DEH will be contacted to discuss sampling requirements.

Excavated petroleum hydrocarbon-bearing soil that exceeds the SSMC for Free On-Site Reuse and is below the SSMC for Protection of Groundwater will be segregated and reused within the on-Site SMZ. Petroleum hydrocarbon-bearing soil that is reused on Site will be handled according to the procedures described below in the "On-Site Soil Reuse Procedures" section.

Petroleum hydrocarbon-bearing soil that exceeds the SSMC for Protection of Groundwater will be exported off Site as regulated waste.

The SSMC for petroleum hydrocarbons are summarized in the table below, and are further discussed in the "Petroleum Hydrocarbon SSMC" section above:

Constituent of Concern/ Mitigation Measure	Analyte	Site-Specific Mitigation Criteria (SSMC)
Petroleum Hydrocarbons – Reuse within Soil Management Zone	TPHg	100 mg/kg
	TPHd	260 mg/kg
	TPHo	1,600 mg/kg
Petroleum Hydrocarbons – Export to Permitted Facility	TPHg	1,000 mg/kg
	TPHd	2,300 mg/kg
	TPHo	5,100 mg/kg

A Priori Confirmation Soil Sampling

Note that the Client may elect to "pre" collect confirmation soil samples, also referred to as *a priori* confirmation soil sampling, in order to expedite the excavation and construction schedule. *A priori* confirmation soil sampling will follow the same confirmation sampling procedures as described in the SMP, by collecting bottom samples within the minimum sample area and depth frequencies and per the same screening criteria as specified above.

A priori samples will guide the excavation for the respective area, and additional confirmation bottom samples will not be considered necessary unless other localized portions of the area are observed/screened via XRF meter and/or PID during grading to extend significantly deeper than the *a priori* confirmation sample depth. SCS will still be on-Site during grading to observe for indications

of fill (i.e., glass, brick, or other debris) and/or burn ash, and to observe/screen for fill soils below the depth of the *a priori* samples.

"CLEAN" FILL SOIL TO BE IMPORTED TO THE SITE

According to the Vesting Tentative Map, up to approximately 1,028,000 cubic yards of fill soil is to be imported to the Site for soil balance purposes.

For potential import material for which the Client requests review by SCS, SCS will provide the following as-needed environmental services for the various export sites: document review, property investigation, soil sampling and laboratory analytical testing, and review and comparison of laboratory analytical results to applicable regulatory standards and naturally occurring background concentration ranges.

Applicable local regulations for soil import for unrestricted free reuse soil are established by the Regional Water Quality Control Board (RWQCB) in the Waiver.[8] Depending on the available soil sample dataset that is available for potential export sites, applicable regulatory guidance that can also be used for this Project includes the California Department of Toxic Substances Control (DTSC) *Information Advisory, Clean Imported Fill Material*, dated October 2001 (DTSC Fill Guidance).

The Tier 1 Soil Screening Levels (SSLs) are presented in the Waiver, which are intended to be the criteria by which soils are judged to be inert waste soils that can be reused without restriction, and will be used as the criteria for acceptance for imported soil material to the Site. Per the Waiver, all soil containing any detectable concentrations of CoCs not including metals (e.g., petroleum hydrocarbons, OCPs, VOCs) that is proposed for import will not be eligible per the Tier 1 SSLs. Tier 1 SSL threshold concentration values are also available for arsenic, lead, and all of the other Title 22 metals, and the 95 percent upper confidence interval of the respective metal concentrations are to be below the Tier 1 SSL thresholds to be eligible for import to the Site.

POSSIBLE "CLEAN" FILL SOIL TO BE EXPORTED FROM THE SITE

Although soil export is not proposed as part of the planned grading activities at the Site, in the event that "clean"[9]/inert fill soil will be transported off-Site, it will be taken to a permitted landfill or will be transported off-Site for unrestricted off-Site reuse pursuant to the requirements of the RWQCB Waiver.

Unexpected Discovery of Releases During Mitigation/Construction

Due to the inherent uncertainty associated with the assessment of subsurface conditions, it is anticipated that the extent and expected concentrations of contaminants will vary from what is described in this SMP. This condition is not unusual in soil investigation and remediation efforts. The mitigation efforts will, therefore, be iterative in nature and be adjusted as excavation or other remediation efforts proceed. Additional assessment and confirmation samples will be collected and analyzed, as necessary, to evaluate the significance of any discovered releases and the need to mitigate the condition beyond the actions described in this SMP. Should conditions be encountered

---

8 California RWQCB, San Diego Region, *Order No. R9-2019-0005, Conditional Waivers of Waste Discharge Requirements for Low Threat Discharges in the San Diego Region*, issued May 8, 2019.

9 "Clean" soil - For the purposes of this SMP, "clean" is defined as soil that does not contain detectable concentrations of organic compounds such as organochlorine pesticides, petroleum hydrocarbons, or volatile organic compounds, or elevated concentrations of metals (in excess of the range of naturally occurring or background concentrations).

that vary significantly from those described or that cannot be addressed by the mitigation criteria proposed herein, the DEH will be contacted and consulted regarding assessment and/or mitigation.

FIELD OBSERVATION AND MONITORING

Any previously unidentified CoC-impacted soil that is observed during grading operations that has obvious indications of staining and/or odors will be segregated from non-impacted soil by field screening with a photoionization detector (PID) and/or X-ray fluorescence meter (XRF), visual and olfactory observations, and ultimately by confirmation sampling. The existing data from previous assessments will assist us in identifying the initial areas and depths to excavate CoC-bearing soil.

If the results of the prior soil samples and confirmation sampling indicate the CoC-impacted soil has been removed or is demonstrated to be below the SSMC, then the remaining soil in that area will be considered non-impacted. If the confirmation sampling indicates CoC-impacted soil is still present, then additional rounds of excavation and confirmation sampling will be conducted until all the CoC-impacted soil has been removed. Excavation of non-impacted soil will continue to be monitored in case isolated pockets of CoCs not previously identified are present.

9 HEALTH AND SAFETY

SITE HEALTH AND SAFETY PLAN

The area surrounding the Site is anticipated to be in active use, so traffic and associated Site access controls will be of primary importance. It is anticipated that the Site will be secured by chain-link/construction fences, and access to the Site will be restricted to authorized personnel only.

Based on an analysis of the CoCs, it would appear that the principal health and safety issue associated with the implementation of this SMP is the proper control of dust during excavation and stockpiling. Excavations greater than 4 feet in depth also potentially represent a confined space and should not be entered by unqualified personnel. The presence of CoC-bearing soil may present a potential hazard to the on-Site construction workers through inhalation of dust or ingestion through direct contact with the impacted soil. Although not known to be present at the Site, if gasoline or other volatile compounds are present in soil, a flammable or explosive hazard could exist. SCS will prepare a Site-specific health and safety plan (HSP) to address these issues for SCS personnel and our subcontractors. Other contractors not working directly for SCS will be required to have and follow their own HSP.

A health and safety plan for work conducted at the Site and workers within the “exclusion zone” will be prepared pursuant to the regulations found in 29 Code of Federal Regulations Part 1910.120 and California Code of Regulations, Title 8, Section 5192. The plan will outline the potential chemical and physical hazards that may be encountered during the excavation, loading, sampling, and handling of soils containing hazardous substances. The appropriate personal protective equipment and emergency response procedures for the anticipated Site-specific chemical and physical hazards will be detailed in this plan. SCS and our contracted personnel involved with the proposed fieldwork will be required to sign this document in order to encourage proper health and safety practices. SCS’s HSP will be available for agency review during Site mitigation activities.

COMMUNITY HEALTH AND SAFETY PLAN

The primary community health and safety concern for the Site is the potential generation of petroleum hydrocarbon vapor and CoC-bearing dust. Vapors and dust will be controlled through the frequent spraying of water for suppression and the Site will be surrounded by a secure fence before excavation activities begin. A Site-specific Community Health and Safety Plan will be prepared by SCS and submitted for review and approval by the DEH. Adjacent properties will be notified of the excavation activities by distribution of a Public Notice and a Public Notice will be posted on the construction fence on the perimeter of the Site.

UTILITY SEARCH AND MARKOUT

It is our understanding that all subsurface utilities at the Site will be disconnected from the Site and Underground Service Alert will be notified by the general contractor and/or its subcontractors, as required by state law.

10 CONSTRUCTION EXCAVATION MONITORING

It is anticipated that SCS will be the environmental consultant performing the monitoring of the construction excavation activities. During construction excavation activities, a competent environmental consultant (Environmental Monitor) working on behalf of the developer or the general contractor will observe the construction excavation activities of the known CoC-bearing soil areas at the Site. The environmental consultant performing these activities will be referred to as the Environmental Monitor. Although soil export is not planned for this project, if soil is exported, it is the responsibility of the Environmental Monitor to judge which soils can be exported off Site as "clean" on the basis of the history of the Site, the available environmental assessment and mitigation data, and the removal of any previously unknown releases of hazardous substances discovered during the monitoring of the construction excavation activities.

The extent and nature of the environmental monitoring to be conducted shall be based on the Environmental Monitor's knowledge of the Site being excavated. The Environmental Monitor shall be responsible for reviewing all available information for the Site including Phase I and Phase II reports, mitigation plans, and closure reports, when available. Different locations within the Site have been the subject of assessment performed by different parties. Based on the information known about the Site, the Environmental Monitor will use his/her best reasonable professional judgment to determine the necessary extent and nature of the environmental monitoring.

For example, visual monitoring of soils during excavation may be the appropriate level of monitoring for certain areas that have had extensive assessment versus areas with less assessment that may need field screening and additional sampling. The Environmental Monitor will document the monitoring activities identifying those soils judged to be below the mitigation criteria, based on the results of the monitoring.

The general contractor and the grading subcontractor (Contractor) for the project will have the primary responsibility of supervising all on-Site activities related to the construction activities. In addition to an Environmental Monitor being present to monitor suspect CoC-bearing soils excavated during construction activities, the Contractor will assist the Environmental Monitor by advising the construction workers involved in earthwork activities on recognizing subsurface conditions indicative of releases of hazardous substances and reporting such indications to the construction site supervisor or manager. These conditions may include evidence of contaminated soil (staining, odors,

burn ash, etc.) and underground fuel storage tanks/piping or similar structures/vessels that may contain hazardous substances.

If hazardous conditions that present an immediate threat of injury to construction workers, human health, or the environment are encountered, then "9-1-1" shall be called by the appropriate Contractor's personnel to summon the County's Hazardous Incident Response Team. The Contractor's Site supervisor or manager shall then notify the DEH, the developer, the Environmental Monitor, and SCS.

If suspected hazardous substances that do not present an immediate health threat are encountered at the Site during construction activities, construction workers will immediately notify the Contractor's Site supervisor or manager and cease work in the area potentially affected by such substances. The Contractor's Site supervisor or manager will redirect or halt construction activities in that area and immediately notify the Environmental Monitor. The construction activities in the area of the suspected release of hazardous substances shall remain undisturbed, until an initial environmental assessment can be performed by the Environmental Monitor (construction activities may continue as long as the affected area is not disturbed). If the Environmental Monitor believes that the suspect soil needs further assessment, attempts will be made to segregate the soil so that construction activities in the affected area can resume as soon as possible.

Confirmation sampling of the surrounding soils must be conducted after segregation of suspect soils to confirm that all soils containing hazardous substance in excess of the free reuse standard have been removed from the construction excavation envelope and that any residual soil containing hazardous substances is mitigated to the extent necessary to protect human health and water resources. Any such confirmation sampling must be conducted either by or with the approval of the Environmental Monitor and shall be conducted in accordance with the applicable DEH guidelines.

Once suspect soil or materials have been identified, at his/her discretion, the Environmental Monitor may use a PID, XRF meter, or other applicable field-screening techniques to screen for indications of potentially hazardous substances. If immediate determination of the material cannot be made using on-Site screening methods, the Environmental Monitor will collect material samples and have them analyzed by a state-certified laboratory. Mobile laboratories may be employed for expedited analysis, as necessary. Upon completion of the initial environmental assessment or immediately upon confirmation of a release of a potentially hazardous substance, the Environmental Monitor will notify the DEH, the Contractor, and the developer.

If, during these monitoring efforts, soil that initially was suspected to contain hazardous substances but later, through subsequent field screening or laboratory analysis, is determined by the Environmental Monitor not to contain detectable concentrations of hazardous substances or metals above the mitigation criteria detailed in the SMP and, therefore, is not considered waste, the Environmental Monitor will notify the Contractor's site supervisor or manager and release the soil for continued construction activity, export, or on-Site reuse. The observations and results of the initial environmental assessment will be documented by the Environmental Monitor and submitted to the Contractor and the developer.

After the soil has been monitored as described above, judged to not have any obvious indications of a release of hazardous substances and shown to meet the criteria for off-Site reuse, it can be exported off Site or reused at another location on Site as "clean" without further characterization.

DEWATERING

It is SCS' understanding that dewatering is not currently anticipated in order to complete this Project.

If dewatering becomes necessary, the water will be treated as necessary and the discharge will need to be properly permitted. Since residual concentrations of 1,2-DCE were detected in groundwater at the Site in a previous assessment (see the "Two Water Wells – Concern as Conduits to the Subsurface" section above), during dewatering activities the groundwater may need to be filtered through appropriate media prior to discharging to the sanitary sewer system. Prior to dewatering activities, a National Pollution Discharge Elimination System (NPDES) Storm Drain General Discharge Permit will need to be obtained from RWQCB in addition to a discharge permit from the City of San Diego Metropolitan Wastewater Department's Industrial Wastewater Control Program. Additionally, as part of the discharge requirements, discharge water will need to be sampled on a predetermined basis to ensure compliance. When disposing of filtration media during change-outs or at the end of dewatering activities, the filtration media may need to be disposed of as a regulated or hazardous waste, depending on the results of laboratory analysis.

PERMITS

Any required traffic control and encroachment permits will be obtained by the appropriate contractors for activities to be completed at the Site. If underground storage tanks (USTs) are encountered, the appropriate DEH and City of San Diego Fire Department permits will be obtained prior to proceeding with their removal.

CONSTRUCTION WORKER PROTECTION

The mitigation to be conducted is designed to protect the health and safety of construction workers and other personnel (personnel without Occupational Safety and Health Administration 40-hour Hazardous Waste Operations and Emergency Response [HAZWOPER] training) present during construction from the potentially significant exposure to hazardous substances or nuisance conditions.

LAND USE COVENANT FOR NOTIFICATION TO FUTURE OWNER, OCCUPANTS, AND WORKERS

The DEH is requiring that a deed restriction, in the form of a Land Use Covenant or similar document (LUC), be recorded with the County of San Diego Assessor's Office to ensure that future owners, occupants and workers are notified of the presence and location of CoC-bearing soil buried in one or more SMZs at the Site. Following implementation of the proposed remedial activities, a LUC shall be prepared that includes a map of the surveyed location(s) of impacted material placed within the SMZ(s), in accordance with the approved Soil Management Plan. A LUC shall be required only on the specific parcels where an SMZ is located.

STORMWATER CONTROLS

As required, a Stormwater Pollution Prevention Plan will be prepared for the Site-specific grading and development activities. Stormwater control measures will be implemented and maintained by the Site general contractor during the mitigation and subsequent stockpile maintenance program. Any CoC-bearing soil stockpiles generated during the mitigation process will be stored on and covered with plastic sheeting, which will be secured with sandbags. In addition, appropriate best

management practices will be placed along the Site boundary. Any generated stockpiles will be maintained by the Site grading contractor representatives, unless they are being added to or loaded for off-Site disposal.

SOIL, GROUNDWATER, AND INVESTIGATION-DERIVED WASTE (IDW) MANAGEMENT

Since the majority of the Site mitigation effort consists of the grading and excavation of soil, it is not likely that investigation-derived waste (IDW) (i.e., CoC-bearing soil) will be generated. If IDW is generated, they will either be placed in Department of Transportation (DOT)-approved drums or appropriately stockpiled on-Site, pending characterization and disposal at an appropriate facility.

11 PROPERTY CLOSURE REPORT

Based on the findings of the field investigation and laboratory results from the above scope of services, a Property Closure Report (PCR) will be prepared. The PCR will cover the various areas investigated at the Site including field observations, soil sampling, excavation, field screening, sampling activities, soil waste characterization, and soil reuse activities. Unanticipated discovery of hazardous substances during mass excavation will also be reported, if encountered, and mitigated prior to the completion of the PCR. The PCR will include any laboratory reports, chain-of-custody records, soil sample locations, tabulated analytical results, any waste manifests, and appropriate support documentation. The PCR will be peer reviewed and signed by appropriately licensed professionals. The work conducted at the Site will be overseen by a professional geologist as required by the state.

12 REPORT USAGE AND FUTURE SITE CONDITIONS

This SMP is intended for the sole usage of the Client and other parties designated by SCS. The methodology used during the referenced assessments by SCS was in general conformance with the requirements of the Client and the specifications and limitations presented in the agreement between the Client and SCS. This SMP contains information from a variety of public and other sources, and SCS makes no representation or warranty about the accuracy, reliability, suitability, or completeness of the information. Any use of this Report, whether by the Client or by a third party, shall be subject to the provisions of the agreement between the Client and SCS. Any misuse of or reliance upon the SMP shall be without risk or liability to SCS.

Subsurface assessments and soil management plans are not comprehensive in nature and may not identify all environmental problems or eliminate all risk. For every property, especially for properties in older downtown or urban areas, it is possible for there to be unknown, unreported recognized environmental conditions, underground storage tanks, or other features of concern that might become apparent through demolition, construction, or excavation activities, etc. In addition, the scope of services for this project was limited to those items specifically named in the scope of services for this SMP. Environmental issues not specifically addressed in the scope of services for this project are not included in this SMP.

Land use, condition of the properties within the Site, and other factors may change over time. The information and conclusions of this SMP are judged to be relevant at the time the work described in this SMP was conducted. This SMP should not be relied upon to represent future Site conditions

unless a qualified consultant familiar with the practice of Phase II Environmental Site Assessments in San Diego County is consulted to assess the necessity of updating this SMP.

The property owners of the Site are solely responsible for notifying all governmental agencies and the public of the existence, release, or disposal of any hazardous materials/wastes or petroleum products at the Site, whether before, during, or after the performance of SCS' services. SCS assumes no responsibility or liability for any claim, loss of property value, damage, or injury that results from hazardous materials/wastes or petroleum products being present or encountered within the Site.

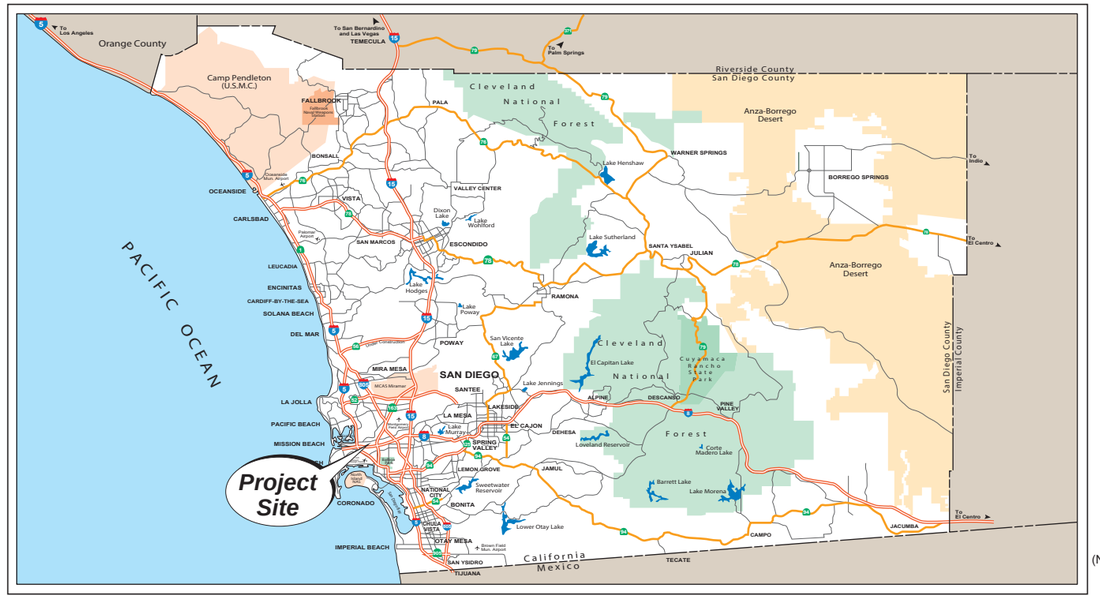
Although this SMP has attempted to assess the likelihood that the Site has been impacted by a hazardous material/waste release, potential sources of impact may have escaped detection for reasons that include, but are not limited to: 1) inadequate or inaccurate information rightfully provided to SCS by third parties, such as public agencies and other outside sources; 2) the limited scope of this SMP; and 3) the presence of undetected, unknown, or unreported environmental releases.

13 LIKELIHOOD STATEMENTS

Statements of "likelihood" have been made in this report. Likelihood statements are based on professional judgments of SCS. The term "likelihood," as used herein, pertains to the probability of a match between the prediction for an event and its actual occurrence. The likelihood statement assigns a measure for a "degree of belief" for the match between the prediction for the event and the actual occurrence of the event.

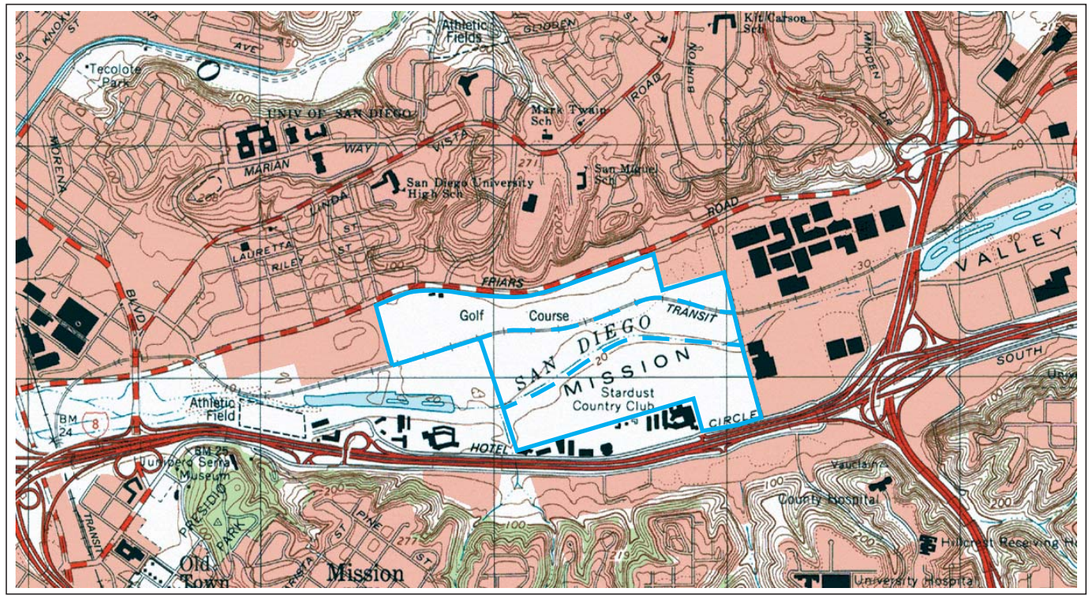
The likelihood statements in this SMP are made qualitatively (expressed in words). The qualitative terms can be approximately related to quantitative percentages. The term "low likelihood" is used by SCS to approximate a percentage range of 10 to 20 percent; the term "moderate likelihood" refers to an approximate percentage range of 40 to 60 percent; and the term "high likelihood" refers to an approximate percentage range of 80 to 90 percent.

FIGURES



North
(Not to scale)

REGIONAL SITE LOCATION



North

Reference:
U.S.G.S. 7.5 Minute Quadrangle Map
La Jolla, California

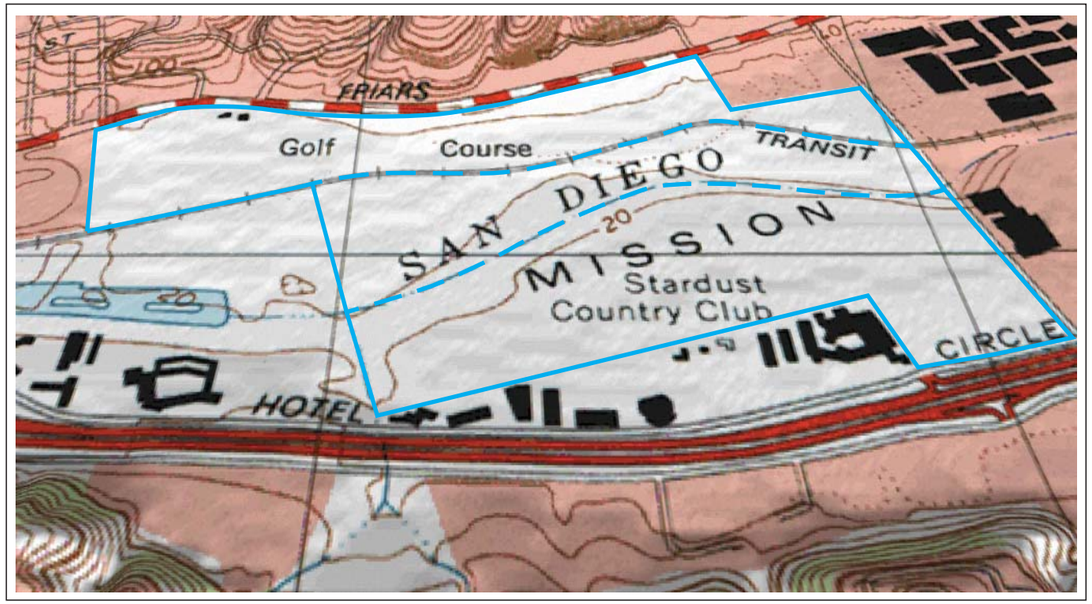
2-DIMENSIONAL SITE LOCATION

0 1,000 2,000 3,000
Approximate Graphic Scale in Feet

North
(Not to scale)

Reference:
Google Earth Aerial Photograph
San Diego, California - November 2018

SITE AERIAL PHOTOGRAPH



North
(Not to scale)

Reference:
U.S.G.S. 7.5 Minute Quadrangle Map
La Jolla, California

3-DIMENSIONAL SITE LOCATION

Approximate Site boundary

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

FOUR-WAY SITE LOCATION MAP
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 1

Date Drafted: 12/13/19

North
Not to Scale

Disclaimer: This figure is based on an "Illustrative Site Plan" dated April 12, 2019 provided by Hines. Actual conditions may differ. All locations and dimensions are approximate.

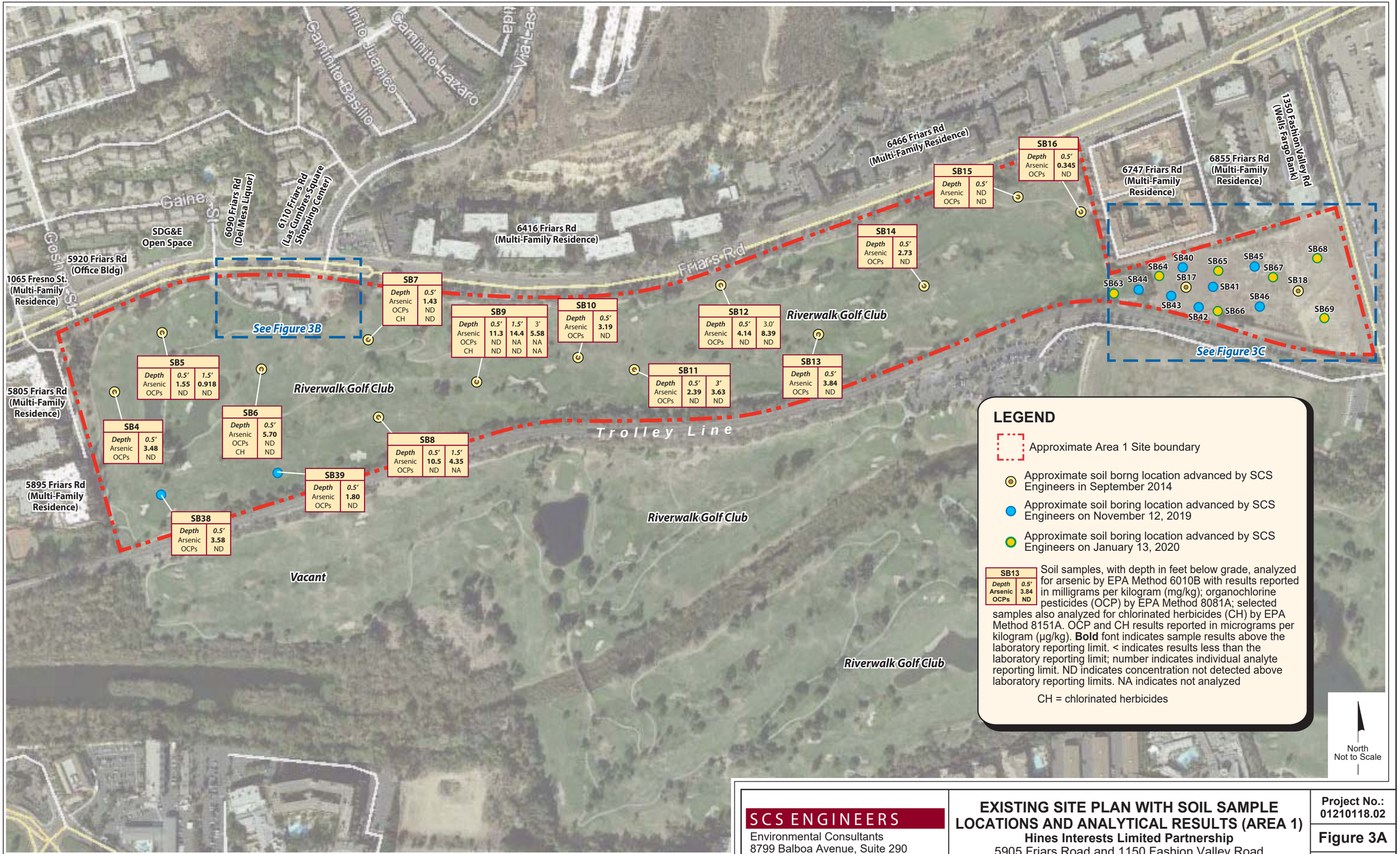
SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

PROPOSED CONCEPTUAL SITE PLAN
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 2

Date Drafted: 3/23/20



LEGEND

- Approximate Area 1 Site boundary
- Approximate soil borng location advanced by SCS Engineers in September 2014
- Approximate soil boring location advanced by SCS Engineers on November 12, 2019
- Approximate soil boring location advanced by SCS Engineers on January 13, 2020

SB13	
Depth	*0.5′*
Arsenic	3.84
OCPs	ND

Soil samples, with depth in feet below grade, analyzed for arsenic by EPA Method 6010B with results reported in milligrams per kilogram (mg/kg); organochlorine pesticides (OCP) by EPA Method 8081A; selected samples also analyzed for chlorinated herbicides (CH) by EPA Method 8151A. OCP and CH results reported in micrograms per kilogram (µg/kg). **Bold** font indicates sample results above the laboratory reporting limit. < indicates results less than the laboratory reporting limit; number indicates individual analyte reporting limit. ND indicates concentration not detected above laboratory reporting limits. NA indicates not analyzed

CH = chlorinated herbicides

North
Not to Scale

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

EXISTING SITE PLAN WITH SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS (AREA 1)

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 3A

Date Drafted: 3/23/20

B5		
Depth	*3′*	*8′*
TPHg	ND	ND
TPHd	ND	ND
TPHo	ND	ND
VOCs	ND	ND

SB2		
Depth	*0.5′*	*1.5′*
Arsenic	**5.12**	**7.37**
GC	**3.81**	<2
AC	**3.50**	<2
4,4-DDD	**12.2**	<4
Dieldrin	**4.23**	<4
Other OCPs	ND	ND

B4			
Depth	*5′*	*10′*	*15′*
TPHg	ND	ND	ND
TPHd	ND	ND	ND
TPHo	ND	ND	ND
VOCs	ND	ND	ND

SB1		
Depth	*0.5′*	*1.5′*
Arsenic	**9.79**	NA
GC	**9.44**	<2
AC	**14.8**	<2
4,4-DDE	**16.3**	<4
4,4-DDT	**23.4**	<4
Other OCPs	ND	ND
CH	NA	NA

B2			
Depth	*0.5′*	*15′*	*25′*
TPHg	ND	ND	ND
TPHd	ND	ND	ND
TPHo	ND	ND	ND
VOCs	ND	ND	ND

B3			
Depth	*5′*	*10′*	*15′*
TPHg	ND	ND	ND
TPHd	ND	ND	ND
TPHo	ND	ND	ND
VOCs	ND	ND	ND

SB3		
Depth	*0.5′*	*3′*
Arsenic	**3.50**	**6.36**
OCPs	ND	ND

B1			
Depth	*0.5′*	*15′*	*19.5′*
TPHg	ND	ND	ND
TPHd	ND	ND	ND
TPHo	ND	ND	ND
VOCs	ND	ND	ND

LEGEND

Approximate excavation of former underground storage tanks

Approximate soil sample location collected by SCS Engineers on September 18, 2014

B2			
Depth	*0.5′*	*15′*	*25′*
TPHg	ND	ND	ND
TPHd	ND	ND	ND
TPHo	ND	ND	ND
VOCs	ND	ND	ND

SB1		
Depth	*0.5′*	*1.5′*
Arsenic	**9.79**	NA
GC	**9.44**	<2
AC	**14.8**	<2
4,4-DDE	**16.3**	<4
4,4-DDT	**23.4**	<4
Other OCPs	ND	ND
CH	NA	NA

Soil samples, with depth in feet below grade, analyzed for gasoline-, diesel-, and oil-range total petroleum hydrocarbons (TPHg, TPHd, TPHo, respectively) by EPA Method 8015B; volatile organic compounds (VOCs) by EPA Method 8260B; arsenic by EPA Method 6010B; and organochlorine pesticides (OCP) by EPA Method 8081A; selected samples also analyzed for chlorinated herbicides (CH) by EPA Method 8151A. Results for TPH and arsenic reported in milligrams per kilogram (mg/kg). Results for VOCs, OCP, and CH reported in micrograms per kilogram (µg/kg). **Bold** font indicates sample results above the laboratory reporting limit. < indicates results less than the laboratory reporting limit; number indicates individual analyte reporting limit. ND indicates concentration not detected above laboratory reporting limits.

GC = gamma chlordane
AC = alpha chlordane
4,4′-DDD = 4,4-dichlorodiphenyldichloroethane
4,4′-DDT = 4,4-dichlorodiphenyltrichloroethane
CH = chlorinated herbicides

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

0 20 40 60
Approximate Graphic Scale in Feet
1 inch = 40 feet

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

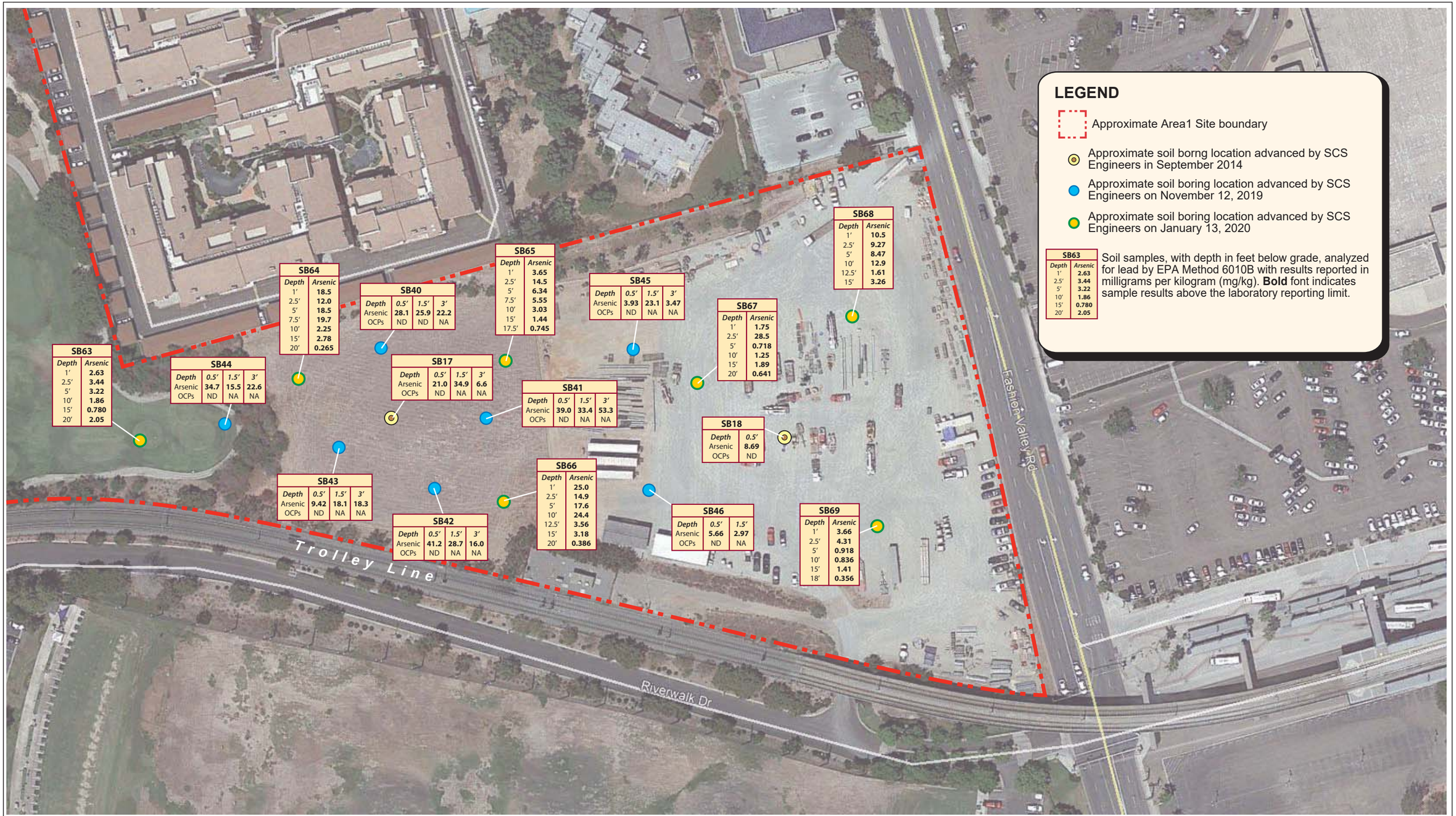
DETAILED SITE PLAN OF MAINTENANCE AREA WITH SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS (AREA 1)

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 3B

Date Drafted: 4/21/20



Reference: Google Earth Aerial Photograph
San Diego, California - November 2018

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

0 50 100 150
Approximate Graphic Scale in Feet
1 inch = 100 feet

North

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

DETAILED SITE PLAN WITH SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS - ARSENIC-BEARING SOIL AREA

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 3C

Date Drafted: 4/21/20

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

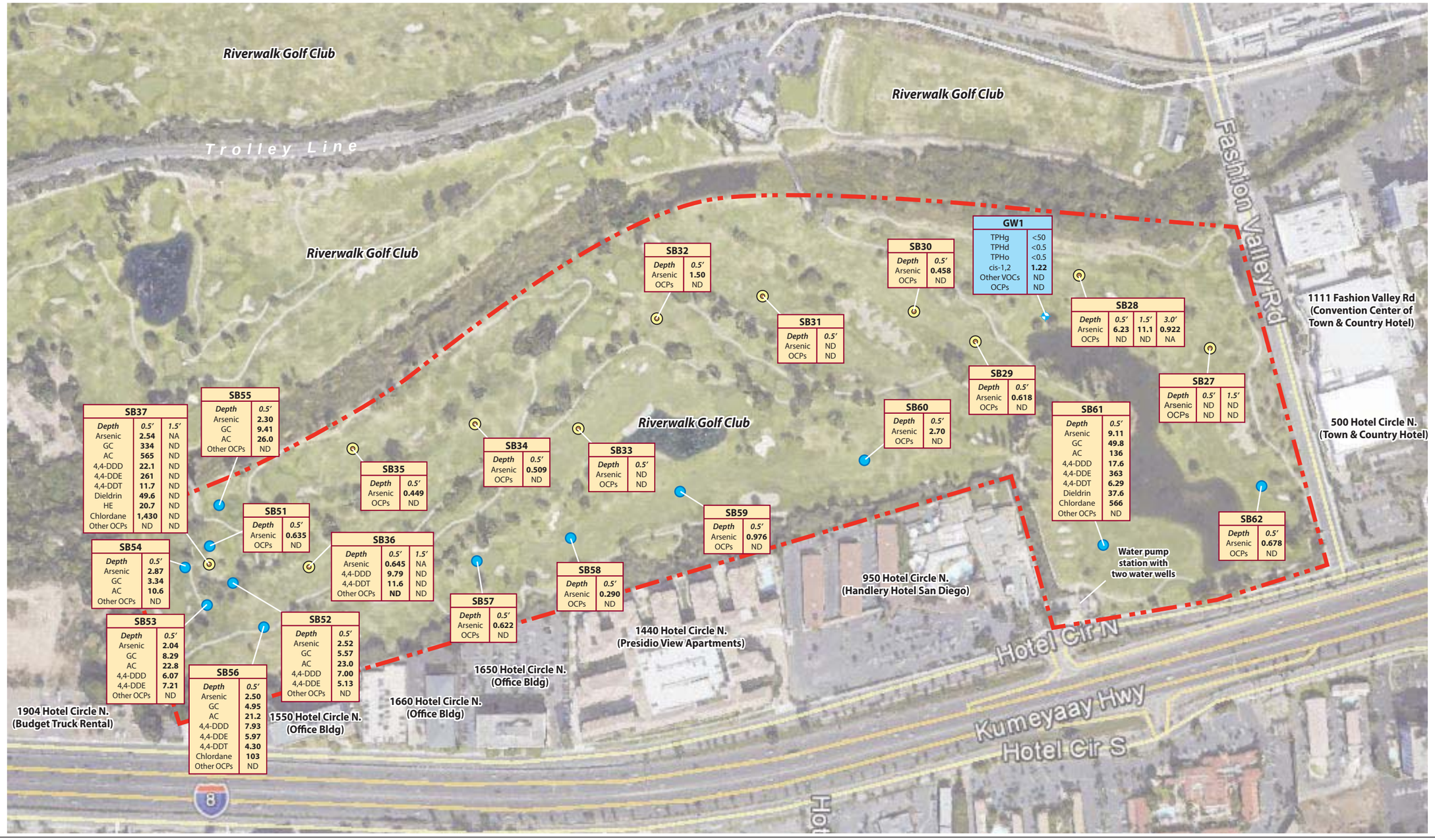
EXISTING SITE PLAN WITH SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS (AREA 2)

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 3D

Date Drafted: 4/21/20



SB37		
Depth	*0.5′*	*1.5′*
Arsenic	**2.54**	NA
GC	**334**	ND
AC	**565**	ND
4,4-DDD	**22.1**	ND
4,4-DDE	**261**	ND
4,4-DDT	**11.7**	ND
Dieldrin	**49.6**	ND
HE	**20.7**	ND
Chlordane	**1,430**	ND
Other OCPs	ND	ND

SB55	
Depth	*0.5′*
Arsenic	**2.30**
GC	**9.41**
AC	**26.0**
Other OCPs	ND

SB54	
Depth	*0.5′*
Arsenic	**2.87**
GC	**3.34**
AC	**10.6**
Other OCPs	ND

SB53	
Depth	*0.5′*
Arsenic	**2.04**
GC	**8.29**
AC	**22.8**
4,4-DDD	**6.07**
4,4-DDE	**7.21**
Other OCPs	ND

SB56	
Depth	*0.5′*
Arsenic	**2.50**
GC	**4.95**
AC	**21.2**
4,4-DDD	**7.93**
4,4-DDE	**5.97**
4,4-DDT	**4.30**
Chlordane	**103**
Other OCPs	ND

SB51	
Depth	*0.5′*
Arsenic	**0.635**
OCPs	ND

SB35	
Depth	*0.5′*
Arsenic	**0.449**
OCPs	ND

SB34	
Depth	*0.5′*
Arsenic	**0.509**
OCPs	ND

SB36		
Depth	*0.5′*	*1.5′*
Arsenic	**0.645**	NA
4,4-DDD	**9.79**	ND
4,4-DDT	**11.6**	ND
Other OCPs	**ND**	ND

SB52	
Depth	*0.5′*
Arsenic	**2.52**
GC	**5.57**
AC	**23.0**
4,4-DDD	**7.00**
4,4-DDE	**5.13**
Other OCPs	ND

SB57	
Depth	*0.5′*
Arsenic	**0.622**
OCPs	ND

SB32	
Depth	*0.5′*
Arsenic	**1.50**
OCPs	ND

SB31	
Depth	*0.5′*
Arsenic	ND
OCPs	ND

SB33	
Depth	*0.5′*
Arsenic	ND
OCPs	ND

SB58	
Depth	*0.5′*
Arsenic	**0.290**
OCPs	ND

SB30	
Depth	*0.5′*
Arsenic	**0.458**
OCPs	ND

SB60	
Depth	*0.5′*
Arsenic	**2.70**
OCPs	ND

SB59	
Depth	*0.5′*
Arsenic	**0.976**
OCPs	ND

GW1	
TPHg	<50
TPHd	<0.5
TPHo	<0.5
cis-1,2	**1.22**
Other VOCs	ND
OCPs	ND

SB29	
Depth	*0.5′*
Arsenic	**0.618**
OCPs	ND

SB28			
Depth	*0.5′*	*1.5′*	*3.0′*
Arsenic	**6.23**	**11.1**	**0.922**
OCPs	ND	ND	NA

SB61	
Depth	*0.5′*
Arsenic	**9.11**
GC	**49.8**
AC	**136**
4,4-DDD	**17.6**
4,4-DDE	**363**
4,4-DDT	**6.29**
Dieldrin	**37.6**
Chlordane	**566**
Other OCPs	ND

SB27		
Depth	*0.5′*	*1.5′*
Arsenic	ND	ND
OCPs	ND	ND

SB62	
Depth	*0.5′*
Arsenic	**0.678**
OCPs	ND

North
Not to Scale

LEGEND

- Approximate Area 3 Site boundary
- Approximate soil boring location advanced by SCS Engineers in September 2014
- Approximate soil boring location advanced by SCS Engineers on November 12, 2019
- Approximate location of groundwater production well

SB37

Depth	*0.5′*	*1.5′*
Arsenic	**2.54**	NA
GC	**334**	NA
AC	**565**	ND
4,4-DDD	**22.1**	ND
4,4-DDE	**261**	ND
4,4-DDT	**11.7**	ND
Dieldrin	**49.6**	ND
HE	**20.7**	ND
Chlordane	**1,430**	ND
Other OCPs	ND	ND

Soil samples, with depth in feet below grade, analyzed for arsenic by EPA Method 6010B with results reported in milligrams per kilogram (mg/kg); organochlorine pesticides (OCPs) by EPA Method 8081A with results reported in micrograms per kilogram (µg/kg). **Bold** font indicates sample results above the laboratory reporting limit. < indicates results less than the laboratory reporting limit; number indicates individual analyte reporting limit. ND indicates concentration not detected above laboratory reporting limits. NA indicates sample not analyzed.

GC = gamma chlordane
AC = alpha chlordane
4,4'-DDD = 4,4-dichlorodiphenyldichloroethane
4,4'-DDE = 4,4-dichlorodiphenyldichloroethylene
4,4'-DDT = 4,4-dichlorodiphenyltrichloroethane
HE = heptachlor epoxide

GW1

TPHg	ND
TPHd	ND
TPHo	ND
cis-1,2	**1.22**
Other VOCs	ND
OCPs	ND

Groundwater sample analyzed for gasoline-, diesel-, and oil-range total petroleum hydrocarbons (TPHg, TPHd, TPHo, respectively) by EPA Method 8015B; volatile organic compounds (VOCs) by EPA Method 8260B; and OCPs by EPA Method 8081A. All results reported in micrograms per liter (µg/L). **Bold** font indicates sample results above the laboratory reporting limit. < indicates results less than the laboratory reporting limit; number indicates individual analyte reporting limit. ND indicates concentration not detected above laboratory reporting limits. cis-1,2 = cis-1,2-dichloroethene

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

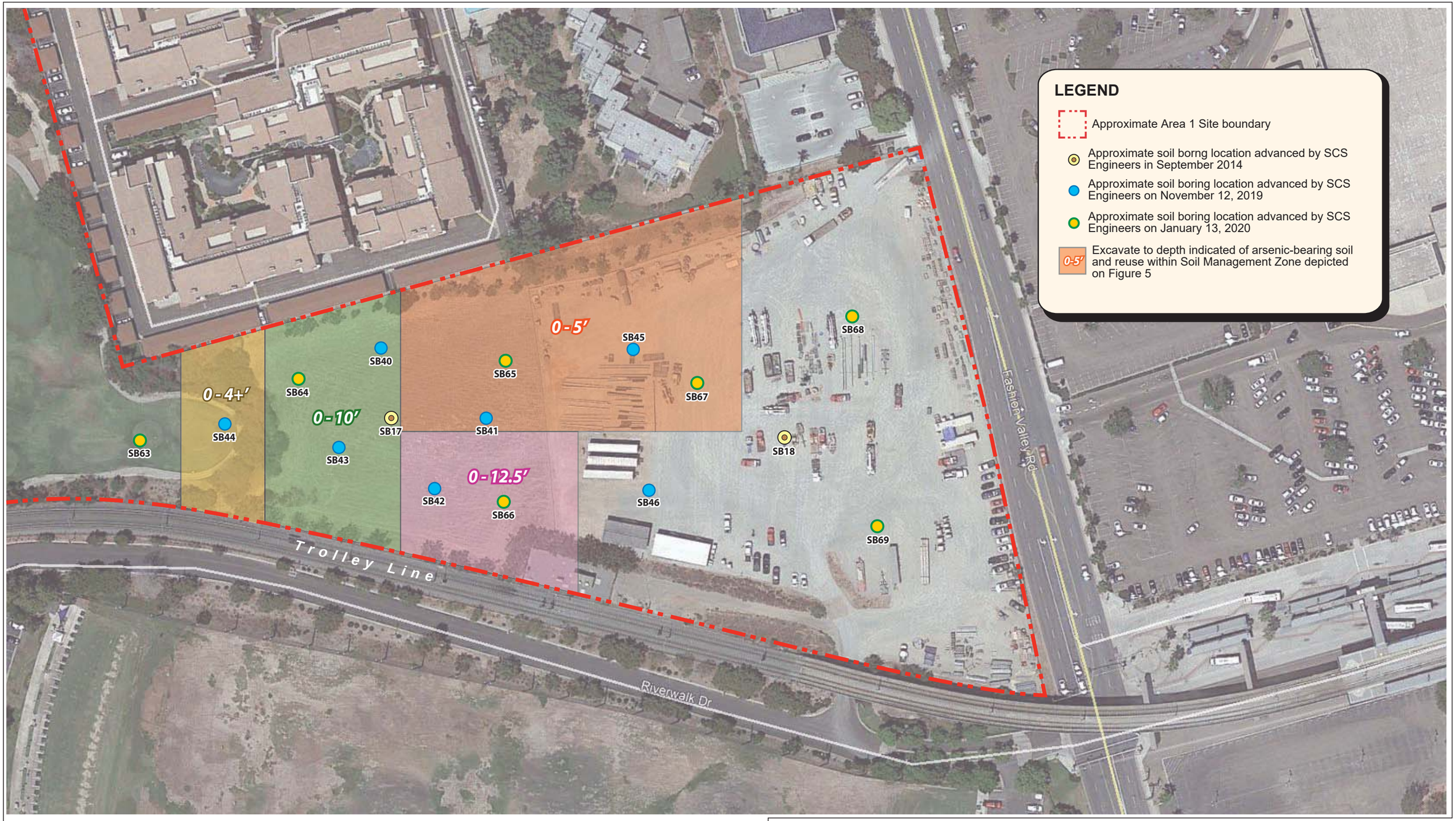
EXISTING SITE PLAN WITH SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS (AREA 3)

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 3E

Date Drafted: 4/21/20



0 50 100 150
Approximate Graphic Scale in Feet
1 inch = 100 feet

North

Reference: Google Earth Aerial Photograph
San Diego, California - November 2018

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

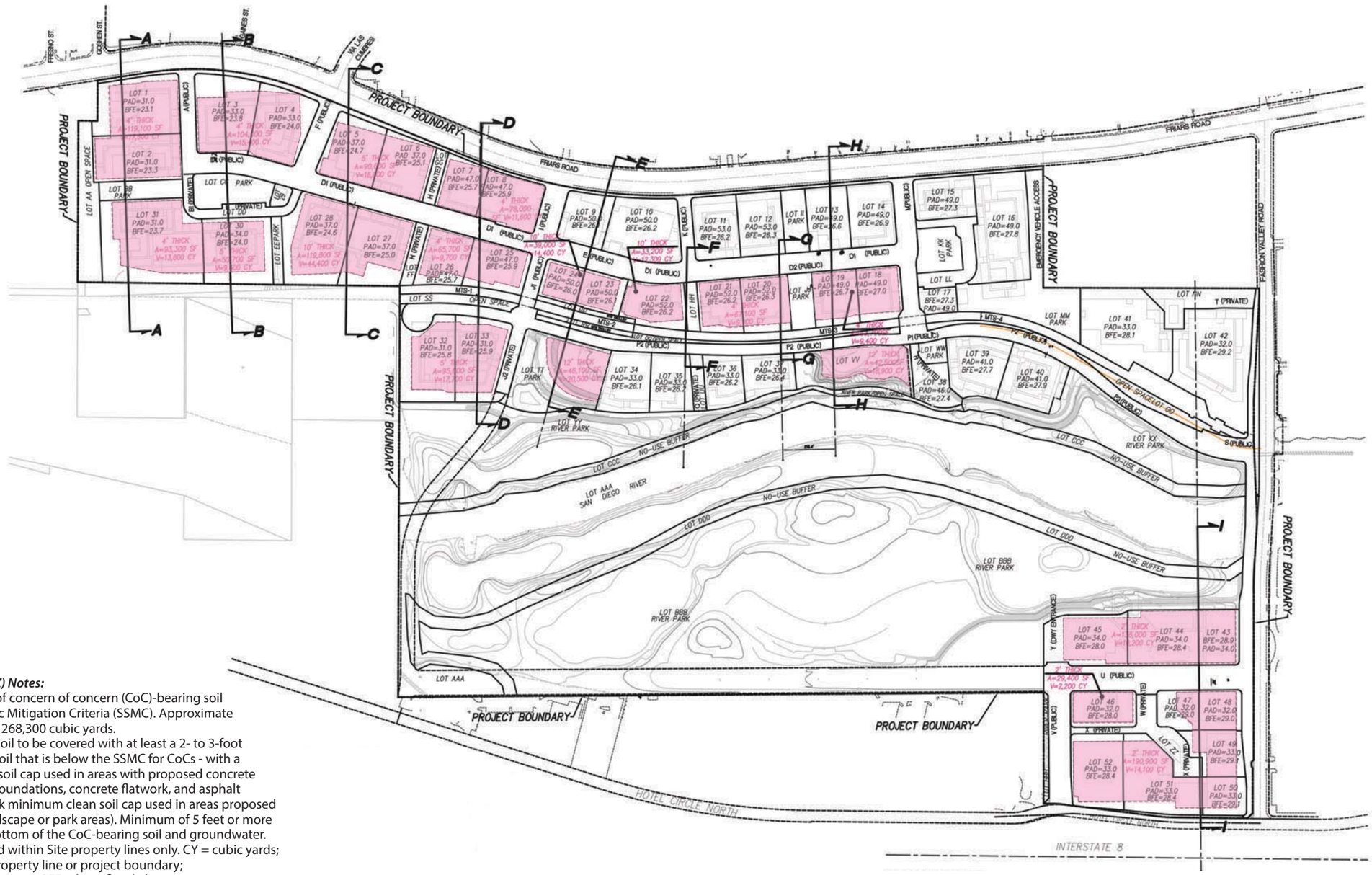
SOIL EXCAVATION AND REUSE MAP FOR ARSENIC-BEARING SOIL (AREA 1)

Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02

Figure 4

Date Drafted: 4/21/20



Soil Management Zone (SMZ) Notes:

SMZ to contain constituent of concern of concern (CoC)-bearing soil that exceeds the Site-Specific Mitigation Criteria (SSMC). Approximate total SMZ volume available - 268,300 cubic yards.

The top of the CoC-bearing soil to be covered with at least a 2- to 3-foot thick or more cap of "clean" soil that is below the SSMC for CoCs - with a 2-foot thick minimum clean soil cap used in areas with proposed concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap used in areas proposed without hardscape (e.g., landscape or park areas). Minimum of 5 feet or more of freeboard between the bottom of the CoC-bearing soil and groundwater.

CoC-bearing soil to be placed within Site property lines only. CY = cubic yards; SF = square footage; P/L = property line or project boundary; Pad = proposed finish lot elevation; BFE = base flood elevation.

LEGEND

Approximate locations of proposed Soil Management Zone options for the reuse of constituent of concern-bearing soil

North
Not to Scale

Disclaimer: This figure is based on drawings provided by Project Design Consultants from the Soil Management Plan, dated 4/6/2020. Actual conditions may differ. All locations and dimensions are approximate.

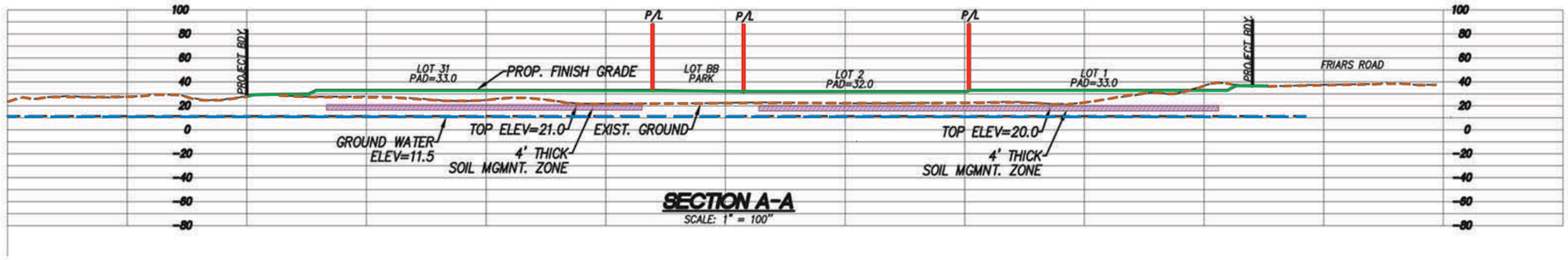
SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SOIL MANAGEMENT ZONE OPTIONS FOR CONSTITUENT OF CONCERN-BEARING SOIL
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

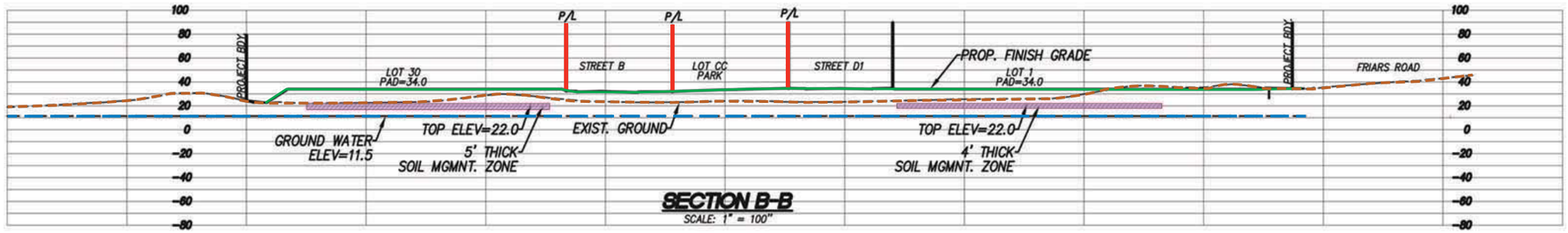
Project No.: 01210118.02

Figure 5A

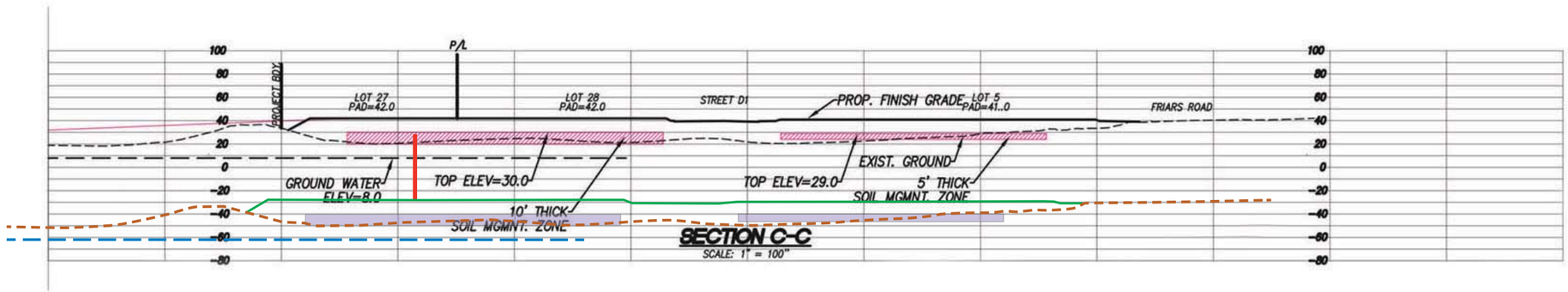
Date Drafted: 4/24/20



SECTION A-A
SCALE: 1" = 100'



SECTION B-B
SCALE: 1" = 100'



SECTION C-C
SCALE: 1" = 100'

LEGEND

Cross-sectional view of constituent of concern-bearing soil within a potential Soil Management Zone location

Soil Management Zone (SMZ) Notes:
SMZ to contain constituent of concern of concern (CoC)-bearing soil that exceeds the Site-Specific Mitigation Criteria (SSMC). Approximate total SMZ volume available - 268,300 cubic yards.
The top of the CoC-bearing soil to be covered with at least a 2- to 3-foot thick or more cap of "clean" soil that is below the SSMC for CoCs - with a 2-foot thick minimum clean soil cap used in areas with proposed concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap used in areas proposed without hardscape (e.g., landscape or park areas). Minimum of 5 feet or more of freeboard between the bottom of the CoC-bearing soil and groundwater. CoC-bearing soil to be placed within Site property lines only. CY = cubic yards; SF = square footage; P/L = property line or project boundary; Pad = proposed finish lot elevation; BFE = base flood elevation.

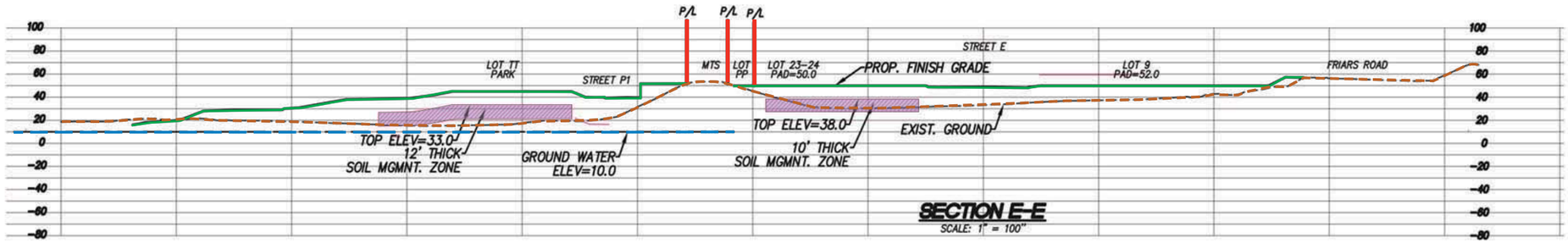
Disclaimer: This figure is based on drawings provided by Project Design Consultants from the Soil Management Plan, dated 4/6/2020. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

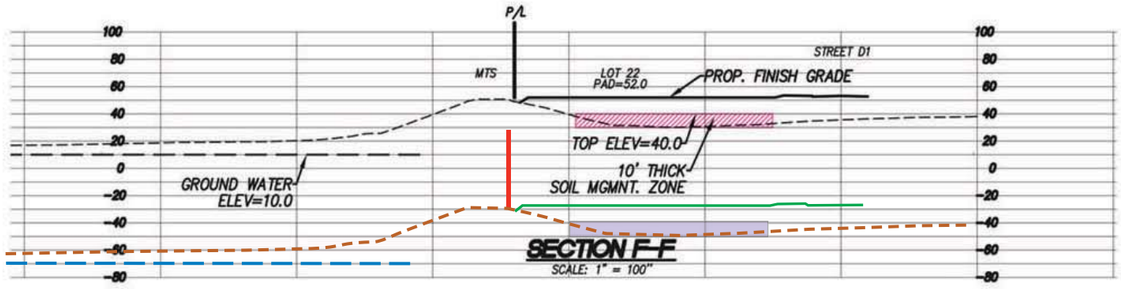
SOIL MANAGEMENT ZONE CROSS-SECTIONS A-A, B-B, AND C-C
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02
Figure 5B
Date Drafted: 4/24/20

SECTION D-D
SCALE: 1" = 100'



SECTION E-E
SCALE: 1" = 100'



SECTION F-F
SCALE: 1" = 100'

LEGEND

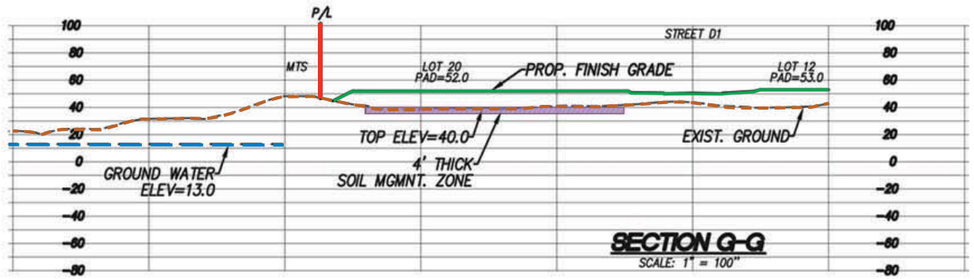
Cross-sectional view of constituent of concern-bearing soil within a potential Soil Management Zone location

Soil Management Zone (SMZ) Notes:
SMZ to contain constituent of concern of concern (CoC)-bearing soil that exceeds the Site-Specific Mitigation Criteria (SSMC). Approximate total SMZ volume available - 268,300 cubic yards.
The top of the CoC-bearing soil to be covered with at least a 2- to 3-foot thick or more cap of "clean" soil that is below the SSMC for CoCs - with a 2-foot thick minimum clean soil cap used in areas with proposed concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap used in areas proposed without hardscape (e.g., landscape or park areas). Minimum of 5 feet or more of freeboard between the bottom of the CoC-bearing soil and groundwater. CoC-bearing soil to be placed within Site property lines only. CY = cubic yards; SF = square footage; P/L = property line or project boundary; Pad = proposed finish lot elevation; BFE = base flood elevation.

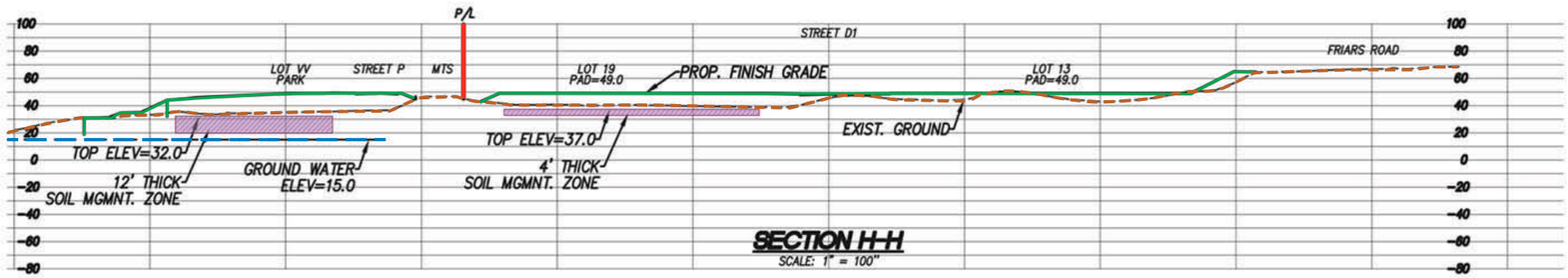
SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SOIL MANAGEMENT ZONE CROSS-SECTIONS D-D, E-E, AND F-F
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

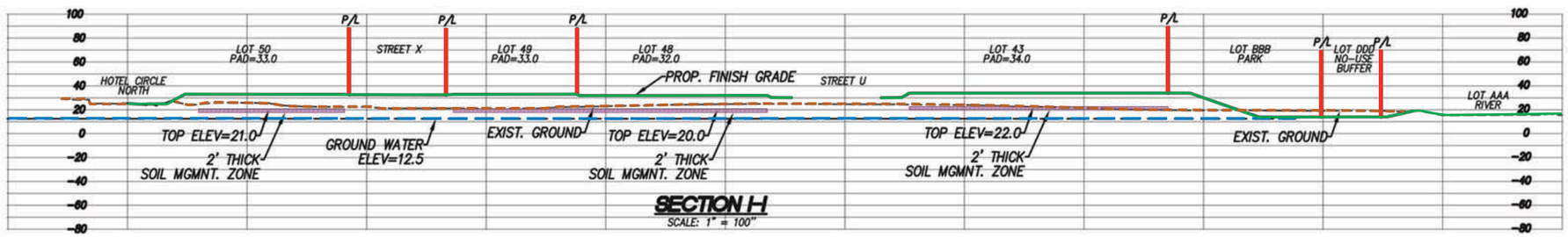
Project No.: 01210118.02
Figure 5C
Date Drafted: 4/24/20



SECTION G-G
SCALE: 1" = 100'



SECTION H-H
SCALE: 1" = 100'



SECTION I-I
SCALE: 1" = 100'

LEGEND

Cross-sectional view of constituent of concern-bearing soil within a potential Soil Management Zone location

Soil Management Zone (SMZ) Notes:
SMZ to contain constituent of concern of concern (CoC)-bearing soil that exceeds the Site-Specific Mitigation Criteria (SSMC). Approximate total SMZ volume available - 268,300 cubic yards.
The top of the CoC-bearing soil to be covered with at least a 2- to 3-foot thick or more cap of "clean" soil that is below the SSMC for CoCs - with a 2-foot thick minimum clean soil cap used in areas with proposed concrete or hardscape (e.g., building foundations, concrete flatwork, and asphalt pavement), and a 3-foot thick minimum clean soil cap used in areas proposed without hardscape (e.g., landscape or park areas). Minimum of 5 feet or more of freeboard between the bottom of the CoC-bearing soil and groundwater. CoC-bearing soil to be placed within Site property lines only. CY = cubic yards; SF = square footage; P/L = property line or project boundary; Pad = proposed finish lot elevation; BFE = base flood elevation.

Disclaimer: This figure is based on drawings provided by Project Design Consultants from the Soil Management Plan, dated 4/6/2020. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS
Environmental Consultants
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SOIL MANAGEMENT ZONE CROSS-SECTIONS G-G, H-H, AND I-I
Hines Interests Limited Partnership
5905 Friars Road and 1150 Fashion Valley Road
San Diego, California

Project No.: 01210118.02
Figure 5D
Date Drafted: 4/24/20

TABLES

Table 1
Soil Sample Analytical Results for Arsenic and Organochlorine Pesticides
Riverwalk Golf Course
San Diego, California

Sample ID	Depth (feet bgs)	Date Collected	Arsenic	Organochlorine Pesticides								Chlorinated Herbicides
				Total Chlordane*	alpha-Chlordane	gamma-Chlordane	Dieldrin	DDD	DDE	DDT	Other OCPs	
			(mg/kg)	(µg/kg)								
SB1-0.5	0.5	9/18/2014	**9.790**	<100	**14.8**	**9.4**	<4.00	<4.00	**16.3**	**23.4**	ND	NA
SB1-1.5	1.5	9/18/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB2-0.5	0.5	9/18/2014	**5.12**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB2-1.5	1.5	9/18/2014	**7.37**	NA	NA	NA	NA	NA	NA	NA	NA	NA
B2-0.5	0.5	9/18/2014	NA	<100	**3.5**	**3.8**	**4.23**	<4.00	**12.2**	<4.00	ND	NA
B2-1.5	1.5	9/18/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB3-0.5	0.5	9/18/2014	**3.50**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB3-3.0	3	9/18/2014	**6.36**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB4-0.5	0.5	9/18/2014	**3.48**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB5-0.5	0.5	9/18/2014	**1.55**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB5-1.5	1.5	9/18/2014	**0.92**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB6-0.5	0.5	9/18/2014	**5.70**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	ND
SB7-0.5	0.5	9/18/2014	**1.43**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	ND
SB8-0.5	0.5	9/18/2014	**10.50**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB8-1.5	1.5	9/18/2014	**4.35**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB9-0.5	0.5	9/18/2014	**11.30**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	ND
SB9-1.5	1.5	9/18/2014	**14.40**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB9-3.0	3	9/18/2014	**5.58**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB10-0.5	0.5	9/18/2014	**3.19**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB11-0.5	0.5	9/18/2014	**2.39**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB11-3.0	3	9/18/2014	**3.63**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB12-0.5	0.5	9/18/2014	**4.14**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB12-3.0	3	9/18/2014	**8.39**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB13-0.5	0.5	9/19/2014	**3.84**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB14-0.5	0.5	9/19/2014	**2.73**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB-15-0.5	0.5	9/19/2014	<0.25	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB16-0.5	0.5	9/19/2014	**0.35**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB17-0.5	0.5	9/19/2014	**21.00**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB17-1.5	1.5	9/19/2014	**34.90**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB18-0.5	0.5	9/19/2014	**8.69**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB19-0.5	0.5	9/19/2014	**0.569**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	ND
SB19-1.5	1.5	9/19/2014	**0.475**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB20-0.5	0.5	9/19/2014	**7.96**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB21-0.5	0.5	9/19/2014	**0.572**	<100	**4.5**	**3.0**	<4.00	<4.00	<4.00	<4.00	ND	NA
SB21-1.5	1.5	9/19/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB22-0.5	0.5	9/19/2014	**0.806**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB23-0.5	0.5	9/19/2014	**0.294**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB24-0.5	0.5	9/19/2014	**1.99**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB25-0.5	0.5	9/19/2014	**0.987**	<100	**4.5**	**3.1**	<4.00	<4.00	<4.00	<4.00	ND	NA
SB25-1.5	1.5	9/19/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB26-0.5	0.5	9/19/2014	**0.960**	<100	**4.5**	**2.7**	<4.00	<4.00	<4.00	<4.00	ND	NA
SB26-1.5	1.5	9/19/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB26-3.0	3	9/19/2014	**1.78**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	ND
SB27-0.5	0.5	9/19/2014	<0.25	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB27-1.5	1.5	9/19/2014	<0.25	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB28-0.5	0.5	9/19/2014	**6.23**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB28-1.5	1.5	9/19/2014	**11.10**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB28-3	3	9/19/2014	**0.92**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB29-0.5	0.5	9/19/2014	**0.618**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA

Table 1
Soil Sample Analytical Results for Arsenic and Organochlorine Pesticides
Riverwalk Golf Course
San Diego, California

Sample ID	Depth (feet bgs)	Date Collected	Arsenic	Organochlorine Pesticides								Chlorinated Herbicides
				Total Chlordane*	alpha-Chlordane	gamma-Chlordane	Dieldrin	DDD	DDE	DDT	Other OCPs	
			(mg/kg)	(µg/kg)								
SB30-0.5	0.5	9/19/2014	**0.458**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB31-0.5	0.5	9/19/2014	<0.25	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB32-0.5	0.5	9/19/2014	**1.50**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB33-0.5	0.5	9/19/2014	<0.25	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB34-0.5	0.5	9/19/2014	**0.509**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB35-0.5	0.5	9/19/2014	**0.449**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB36-0.5	0.5	9/19/2014	**0.645**	<100	<2.00	<2.00	<4.00	**9.8**	<4.00	**11.6**	ND	NA
SB36-1.5	1.5	9/19/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB37-0.5**	0.5	9/19/2014	**2.54**	**1,430**	**565.0**	**334.0**	**49.6**	**22.1**	**261.0**	**11.7**	ND	NA
SB37-1.5	1.5	9/19/2014	NA	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB38-0.5	0.5	11/12/2019	**3.58**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB39-0.5	0.5	11/12/2019	**1.80**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB40-0.5	0.5	11/12/2019	**28.1**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB40-1.5	1.5	11/12/2019	**25.9**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB40-3	3	11/12/2019	**22.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB41-0.5	0.5	11/12/2019	**39.0**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB41-1.5	1.5	11/12/2019	**33.4**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB41-3	3	11/12/2019	**53.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB42-0.5	0.5	11/12/2019	**41.2**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB42-1.5	1.5	11/12/2019	**28.7**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB42-3	3	11/12/2019	**16.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB43-0.5	0.5	11/12/2019	**9.42**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB43-1.5	1.5	11/12/2019	**18.1**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB43-3	3	11/12/2019	**18.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB44-0.5	0.5	11/12/2019	**34.7**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB44-1.5	1.5	11/12/2019	**15.5**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB44-3	3	11/12/2019	**22.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB45-0.5	0.5	11/12/2019	**3.93**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB45-1.5	1.5	11/12/2019	**23.1**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB45-3	3	11/12/2019	**3.47**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB46-0.5	0.5	11/12/2019	**5.66**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB46-1.5	1.5	11/12/2019	**2.97**	NA	NA	NA	NA	NA	NA	NA	ND	NA
SB47-0.5	0.5	11/12/2019	**1.24**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB48-0.5	0.5	11/12/2019	**2.28**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB49-0.5	0.5	11/12/2019	**2.08**	<100	**16.6**	**10.0**	<4.00	<4.00	**21.1**	<4.00	ND	NA
SB50-0.5	0.5	11/12/2019	**1.09**	<100	**2.85**	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB51-0.5	0.5	11/12/2019	**0.635**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB52-0.5	0.5	11/12/2019	**2.52**	<100	**23.0**	**5.57**	<4.00	**7.0**	**5.13**	<4.00	ND	NA
SB53-0.5	0.5	11/12/2019	**2.04**	<100	**22.8**	**8.29**	<4.00	**6.07**	**7.21**	<4.00	ND	NA
SB54-0.5	0.5	11/12/2019	**2.87**	<100	**10.6**	**3.34**	<4.00	<4.00	<4.00	<4.00	ND	NA
SB55-0.5	0.5	11/12/2019	**2.30**	<100	**26.0**	**9.41**	<4.00	<4.00	<4.00	<4.00	ND	NA
SB56-0.5	0.5	11/12/2019	**2.50**	**103**	**21.2**	**4.95**	<4.00	**7.93**	**5.97**	**4.30**	ND	NA
SB57-0.5	0.5	11/12/2019	**0.622**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB58-0.5	0.5	11/12/2019	**0.290**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB59-0.5	0.5	11/12/2019	**0.976**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB60-0.5	0.5	11/12/2019	**2.70**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB61-0.5	0.5	11/12/2019	**9.11**	**566**	**136.0**	**49.8**	**37.6**	**17.6**	**363.0**	**6.29**	ND	NA
SB62-0.5	0.5	11/12/2019	**0.678**	<100	<2.00	<2.00	<4.00	<4.00	<4.00	<4.00	ND	NA
SB63-1	1	1/13/2020	**2.63**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB63-2.5	2.5	1/13/2020	**3.44**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB63-5	5	1/13/2020	**3.22**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB63-10	10	1/13/2020	**1.86**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB63-15	15	1/13/2020	**0.780**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB63-20	20	1/13/2020	**2.05**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-1	1	1/13/2020	**18.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-2.5	2.5	1/13/2020	**12.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-5	5	1/13/2020	**18.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-7.5	7.5	1/13/2020	**19.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-10	10	1/13/2020	**2.25**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB64-15	15	1/13/2020	**2.78**	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1
Soil Sample Analytical Results for Arsenic and Organochlorine Pesticides
Riverwalk Golf Course
San Diego, California

Sample ID	Depth (feet bgs)	Date Collected	Arsenic	Organochlorine Pesticides								Chlorinated Herbicides
				Total Chlordane*	alpha-Chlordane	gamma-Chlordane	Dieldrin	DDD	DDE	DDT	Other OCPs	
			(mg/kg)	(µg/kg)								
SB64-20	20	1/13/2020	**0.265**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-1	1	1/13/2020	**3.65**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-2.5	2.5	1/13/2020	**14.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-5	5	1/13/2020	**6.34**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-7.5	7.5	1/13/2020	**5.55**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-10	10	1/13/2020	**3.03**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-15	15	1/13/2020	**1.44**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB65-17.5	17.5	1/13/2020	**0.745**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-1	1	1/13/2020	**25.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-2.5	2.5	1/13/2020	**14.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-5	5	1/13/2020	**17.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-10	10	1/13/2020	**24.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-12.5	12.5	1/13/2020	**3.56**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-15	15	1/13/2020	**3.18**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB66-20	20	1/13/2020	**0.386**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-1	1	1/13/2020	**1.75**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-2.5	2.5	1/13/2020	**28.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-5	5	1/13/2020	**0.718**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-10	10	1/13/2020	**1.25**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-15	15	1/13/2020	**1.89**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB67-20	20	1/13/2020	**0.641**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-1	1	1/13/2020	**10.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-2.5	2.5	1/13/2020	**9.27**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-5	5	1/13/2020	**8.47**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-10	10	1/13/2020	**12.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-12.5	12.5	1/13/2020	**1.61**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB68-15	15	1/13/2020	**3.26**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-1	1	1/13/2020	**3.66**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-2.5	2.5	1/13/2020	**4.31**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-5	5	1/13/2020	**0.918**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-10	10	1/13/2020	**0.836**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-15	15	1/13/2020	**1.41**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB69-18	18	1/13/2020	**0.356**	NA	NA	NA	NA	NA	NA	NA	NA	NA
US EPA RSLs			**0.68**	**1,700**	**--**	**--**	**34**	**1,900**	**2,000**	**1,900**	**--**	
DTSC SLs			**150**	**1,700**	**--**	**--**	**32**	**2,300**	**2,000**	**1,900**	**--**	
TTLCs			**50**	**2,500**	**--**	**--**	**8,000**	**1,000**	**1,000**	**1,000**	**--**	
Site-Specific Mitigation Criteria [1]			**14.5**	**1,700**	**1,700***	**1,700***	**50**	**2,300**	**2,000**	**1,900**	**--**	**--**

Table 1
Soil Sample Analytical Results for Arsenic and Organochlorine Pesticides
Riverwalk Golf Course
San Diego, California

Sample ID	Depth (feet bgs)	Date Collected	Arsenic	Organochlorine Pesticides								Chlorinated Herbicides
				Total Chlordane*	alpha-Chlordane	gamma-Chlordane	Dieldrin	DDD	DDE	DDT	Other OCPs	
			(mg/kg)	(µg/kg)								

Notes:

Samples collected by SCS Engineers on September 18 and 19, 2014 and November 12, 2019, and analyzed for organochlorine pesticides (OCPs), chlorinated herbicides and arsenic in accordance with EPA Method 8081A, EPA Method 8151A and EPA Method 6010B, respectively.

Depth in feet below ground surface (bgs).

DDD: 4,4'-dichlorodiphenyldichloroethane

DDE: 4,4'-dichlorodiphenyldichloroethylene

DDT: 4,4'-dichlorodiphenyltrichloroethane

Arsenic results reported in milligrams per kilogram (mg/kg); OCP results reported in micrograms per kilogram (µg/kg).

< Indicates results less than the indicated laboratory reporting limit.

ND: Group of constituents not detected above each respective laboratory reporting limit. Please refer to the laboratory report for a full listing of analytes and their respective reporting limits.

NA: Not analyzed

RSLs: Regional Screening levels for residential soil, United States Environmental Protection Agency (EPA), November 2019.

DTSC SLs: DTSC-Modified Screening Levels, presented in Human Health Risk Assessment Note 3, Table 3 - Screening Levels for Ambient Air, Residential. April 2019 Update.

TTLCs: California Title 22 Total Threshold Limit Concentration.

1) Site-Specific Mitigation Criteria - Based on Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note Number: 3, April 2019, using the Recommended Screening Levels for residential soil and cancer endpoint, or, for chemicals not listed in HHRA Note (i.e., Alpha BHC, Beta BHC), Regional Screening levels for residential soil, provided by the United States Environmental Protection Agency (EPA) and updated as of November 2019. Note a 95% Upper Confidence Interval was used on Site-specific data to derive the dieldrin Site-Specific Mitigation Criteria.

*RSL for alpha-chlordane and gamma-chlordane were not provided, therefore, the RSL for total chlordane was used for comparison.

**: In addition, a concentration of heptachlor epoxide (20.7 µg/kg) was reported in sample SB37-0.5

--: no screening criteria provided

Bold font indicates samples with reported concentrations avove the laboratory reporting limit.

Red Font indicates samples with reported concentrations above either the DTSC SLs, EPA RSLs, or the maximum background concentration for arsenic of 12 mg/kg.

Highlighted red font indicates samples with reported concentrations above Mitigation Criteria established for Soil Management Plan.

Table 2
Soil Sample Analytical Results for TPH and VOCs
Riverwalk Golf Course
San Diego, California

Sample ID	Depth (feet bgs)	Date Collected	VOCs	Total Petroleum Hydrocarbons (TPH)		
				TPH-Diesel	TPH-Oil	TPH-Gasoline
			(µg/kg)	(mg/kg)		
B1-5	5	9/18/2014	ND	ND	ND	ND
B1-15	15	9/18/2014	ND	ND	ND	ND
B1-19.5	19.5	9/18/2014	ND	ND	ND	ND
B2-5	5	9/18/2014	ND	ND	ND	ND
B2-15	15	9/18/2014	ND	ND	ND	ND
B2-25	25	9/18/2014	ND	ND	ND	ND
B3-5	5	9/18/2014	ND	ND	ND	ND
B3-10	10	9/18/2014	ND	ND	ND	ND
B3-15	15	9/18/2014	ND	ND	ND	ND
B4-5	5	9/18/2014	ND	ND	ND	ND
B4-10	10	9/18/2014	ND	ND	ND	ND
B4-15	15	9/18/2014	ND	ND	ND	ND
B5-3	3	9/18/2014	ND	ND	ND	ND
B5-8	8	9/18/2014	ND	ND	ND	ND

Notes:

Samples collected by SCS Engineers on September 18, 2014 and analyzed for TPH and VOCs by EPA Methods 8015B and 8260B respectively.
mg/kg: milligrams per kilogram
µg/kg: micrograms per kilogram
ND: Not detected above the respective laboratory reporting limit

APPENDIX A

Plans and Geotechnical Report for the Proposed Development

VESTING TENTATIVE MAP NO. 2213361
FOR
RIVERWALK
SAN DIEGO, CA

APPLICANT/OWNER

SD RIVERWALK LLC
C/O: LYNNE LYONS
4747 EXECUTIVE DRIVE, SUITE 410
SAN DIEGO, CA 92121
P: (858) 435-4000
F: (858) 435-4001

ASSESSOR'S PARCEL NUMBERS:

PARCEL 1: 437-240-03, 26 & 27
PARCEL 2: 437-240-28 & 29
PARCEL 3: 436-611-06, 29 & 30; 436-650-14

PROPERTY ADDRESS

1150 FASHION VALLEY ROAD
SAN DIEGO, CA 92108

PROPERTY AREA

GROSS= 194.56 ACRES

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS MAP IS THE CALIFORNIA COORDINATE SYSTEM, CCS 83, ZONE 6. TRAVERSE MEASUREMENTS TO POINTS 'A' AND 'B' ARE SHOWN ON SHEET C-9 AND C-10. THE CCS 83 COORDINATES OF POINTS 'A' AND 'B' ARE ESTABLISHED FROM G.P.S. STATION 946 AND G.P.S. STATION 951 PER RECORD OF SURVEY NO. 14492. THE BEARING FROM POINT 'A' (WHICH IS SAID STATION 946) TO POINT 'B' IS S14°45'23"E.

QUOTED BEARINGS FROM REFERENCED MAPS OR DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM. THE COMBINED SCALE FACTOR AT POINT 'A' IS 1.00000962 PER RECORD OF SURVEY NO. 14492. GRID DISTANCE = GROUND DISTANCE x COMBINED SCALE FACTOR. ELEVATION AT POINT 'A' IS 41.59 PER RECORD OF SURVEY NO. 14492.

TOPOGRAPHY NOTES

1. THIS TOPOGRAPHIC SURVEY IS BASED ON AN AERIAL SURVEY FURNISHED BY SANLO AERIAL SURVEYS ON 10-27-14 WITH ADDITIONAL DATA 11-21-14 AND 11-25-14 AND SUPPLEMENTED BY FIELD SURVEY MEASUREMENTS MADE BY WILLIAM A. STEEN & ASSOCIATES ON 10-30-14 AND FIELD REVIEW 12-3-14, WITH SUPPLEMENTAL FIELD WORK ON 4-17-17 AND 4-18-17 BY STEEN & ASSOCIATES & SUPPLEMENTAL FIELD WORK BY PDC ON JULY 2018.
2. THE LOCATIONS OF UNDERGROUND UTILITIES ON THIS SURVEY HAVE BEEN ESTIMATED BY PHYSICAL SURFACE FEATURES AND BY INFORMATION SUPPLIED BY SAN DIEGO GAS AND ELECTRIC COMPANY, COX CABLE SAN DIEGO, PACIFIC BELL AND THE CITY OF SAN DIEGO ENGINEERING DEPARTMENT. ADDITIONAL UNDERGROUND UTILITIES EXIST OFFSITE AND ONSITE BUT CANNOT BE LOCATED FROM FIELD CONDITIONS.
3. ACCORDING TO THE RECORDS OF THE CITY OF SAN DIEGO FLOOD CONTROL DEPARTMENT, THERE IS A MAPPED FLOODPLAIN WITHIN THE PROPERTY AS SHOWN ON THE FEMA FLOOD INSURANCE RATE MAP FOR SAN DIEGO COUNTY, CA AND INCORPORATED MAP NO. 06073C1618G, REVISED MAY 16, 2012.
4. A BELOW STREET GRADE BASEMENT EXISTS ON THIS PROPERTY UNDER THE GOLF COURSE CLUBHOUSE AND WAS NOT SURVEYED OR SHOWN HEREON.

GRADING TABULATION

TOTAL AMOUNT OF ON-SITE TO BE GRADED AREA 176.5 AC.; OR 90.4% OF TOTAL PROJECT SITE.
TOTAL AMOUNT OF OFF-SITE GRADED AREA 0.65 AC.
AMOUNT OF REMEDIAL (ALLUVIUM REMOVAL AND RE-COMPACT): 1,506,700 CY
AMOUNT OF CUT (GEOMETRIC): 426,400 CY AND MAXIMUM DEPTH OF CUT: 24 FT
AMOUNT OF FILL (GEOMETRIC): 1,454,000 CY AND MAXIMUM DEPTH OF FILL: 32 FT
AMOUNT OF IMPORT: 1,028,000 CY

RETAINING WALLS LENGTH: 1,730 FT MAXIMUM HEIGHT: 18 FT (MAXIMUM EXPOSED HEIGHT).

PROPOSED ZONES

CC-3-9; OF-1-1; OP-1-1; OC-1-1; RM-4-10

FLOODPLAIN NOTE

100-YEAR FLOODPLAIN AND ZONING INFORMATION PER FEMA MAP 06073C1618G, REVISED 05/16/2012.

BENCHMARK

SEBP FRIARS ROAD AND FASHION VALLEY ROAD PER CITY OF SAN DIEGO VERTICAL CONTROL BOOK. I.E. 61.802 M.S.L. (NGVD 29)

MAPPING NOTE

A FINAL MAP SHALL BE FILED AT THE COUNTY RECORDER'S OFFICE PRIOR THE EXPIRATION OF THE TENTATIVE MAP, IF APPROVED. A DETAILED PROCEDURE OF SURVEY SHALL BE SHOWN ON THE FINAL MAP AND ALL PROPERTY CORNERS SHALL BE MARKED WITH DURABLE SURVEY MONUMENTS.

A MAXIMUM OF 20 FINAL MAPS IS PROPOSED TO FILED FOR THIS PROJECT.

NOTE

1. PORTIONS OF LOTS "LEGAL LOT" STATUS WILL BE SATISFIED BY APPROVAL OF VESTING TENTATIVE MAP AND SUBSEQUENT MAP ACTION.
2. PAD ELEVATIONS SHOWN ON THIS VESTING TENTATIVE MAP MAY BE REVISED DURING PREPARATION OF CONSTRUCTION/ GRADING PLANS AND SUBTERRANEAN GARAGES MAY BE BUILT ON INDIVIDUAL LOTS.
3. NO OBSTRUCTION INCLUDING SOLID WALLS IN THE VISIBILITY AREA SHALL EXCEED 3 FEET IN HEIGHT. PLANT MATERIAL, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN VISIBILITY AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB PER SAN DIEGO MUNICIPAL CODE DIAGRAM 113-02SS.

PROJECT DESCRIPTION

MIXED-USE DEVELOPMENT OF UP TO 4,300 RESIDENTIAL UNITS, APPROXIMATELY 1-MILLION SQUARE-FEET OF OFFICE SPACE, APPROXIMATELY 152,000 SQUARE-FEET OF COMMUNITY RETAIL, MORE THAN 100-ACRES OF PARK AND OPEN SPACE, AND ASSOCIATED INFRASTRUCTURE IMPROVEMENTS. THE PROJECT INCLUDES THE FOLLOWING ACTIONS: GENERAL PLAN, COMMUNITY PLAN, AND SPECIFIC PLAN AMENDMENTS; REZONES; A VESTING TENTATIVE MAP (VTM); A PLANNED DEVELOPMENT PERMIT (PDP); A SITE DEVELOPMENT PERMIT (SDP); EASEMENT AND RIGHT-OF-WAY VACATIONS; AND AN AMENDMENT TO THE EXISTING RIVERWALK GOLF COURSE CONDITIONAL USE PERMIT (CUP). THE PROJECT WILL INCLUDE THE PROVISION OF 10-PERCENT ON-SITE AFFORDABLE HOUSING. DEVIATIONS FROM DEVELOPMENT STANDARDS ARE REQUIRED FOR SETBACK, FLOOR AREA RATIO, LOT FRONTAGE, AND RESIDENTIAL USE REQUIREMENTS IN A COMMERCIAL ZONE.

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AND IS DESCRIBED IN THE CHICAGO TITLE COMPANY COMMITMENT FOR TITLE INSURANCE ORDER NO. 00095555-994-X49-DB DATED NOVEMBER 5, 2018 AND AMENDED NOVEMBER 13, 2018 AS FOLLOWS:

PARCEL 1: 437-240-03, 26 & 27

THAT PORTION OF PUEBLO LOT 1104 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MISCELLANEOUS MAP NO. 36, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY NOVEMBER 14, 1921, LYING SOUTHERLY OF THE SOUTHERLY BOUNDARY OF THOSE PORTIONS OF FRIARS ROAD AS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED DECEMBER 12, 1968 AS FILE NO. 217429 OF OFFICIAL RECORDS.

PARCEL 2: 437-240-28 & 29

LOT 1 OF PUEBLO LOT 1105, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO REFEREE'S PARTITION MAP THEREOF MADE IN THE ACTION ENTITLED "THOMAS J. DALEY VS. ARPAD HARASZTHY, ET AL" UNDER SUPERIOR COURT CIVIL CASE NO. 1029 ON FILE IN THE OFFICE OF THE COUNTY CLERK OF SAN DIEGO COUNTY.

EXCEPTING THEREFROM THAT PORTION LYING SOUTHERLY OF THE NORTHERLY BOUNDARY OF LAND DESCRIBED IN DEED TO THE STATE OF CALIFORNIA RECORDED OCTOBER 27, 1955 IN BOOK 5846, PAGE 414 OF OFFICIAL RECORDS.

PARCEL 3: 436-611-06, 29 & 30 & 436-650-14

TEN ACRE LOTS 3 AND 4 OF THE SUBDIVISION OF PUEBLO LOT 1103, ACCORDING TO THE PLAN OF LOTS IN MISSION VALLEY BELONGING TO JOSEPH REINER AND RECORDED JANUARY 28, 1858 IN BOOK 1, PAGE 184 OF DEEDS OF SAN DIEGO COUNTY AND THAT PORTION OF PUEBLO LOT 1103 OF THE PUEBLO LANDS OF SAN DIEGO ACCORDING TO MISCELLANEOUS MAP NO. 36, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY NOVEMBER 14, 1921 LYING NORTHERLY OF SAID 10 ACRE LOTS 3 AND 4 AND LYING EASTERLY OF THE EASTERLY LINE OF WHAT IS NOW KNOWN AS GOSHEN STREET AS SHOWN ON BAYVIEW ADDITION, ACCORDING TO MAP THEREOF NO. 271, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 23, 1887.

EXCEPTING THEREFROM THOSE PORTIONS LYING NORTHERLY OF THE SOUTHERLY BOUNDARY OF FRIARS ROAD AS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED DECEMBER 12, 1968 AS FILE NO. 217429 OF OFFICIAL RECORDS.

CONDOMINIUM NOTE

THIS IS A MAP OF A CONDOMINIUM PROJECT AS DEFINED IN SECTION 4125 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT. WITHIN THE LOTS SHOWN ON THIS VESTING TENTATIVE MAP, THE MAXIMUM NUMBER OF RESIDENTIAL CONDOMINIUM UNITS IS 4,300 AND THE MAXIMUM NUMBER OF COMMERCIAL CONDOMINIUM UNITS IS 500.

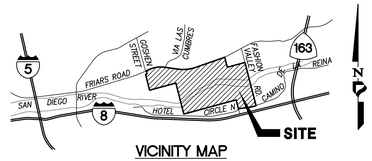
DECLARATION OF RESPONSIBLE CHARGE

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 IN MY PROFESSIONAL OPINION THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITY FOR PROJECT DESIGN.

GREGORY M. SHIELDS, RCE 42951 DATE

REGISTERED PROFESSIONAL ENGINEER — GREGORY M. SHIELDS — No. 42951 — Exp. 03-31-20 — CIVIL — STATE OF CALIFORNIA



VICINITY MAP
NOT TO SCALE

LEGEND

ITEM	SYMBOL
PROJECT BOUNDARY	
MTS RIGHT OF WAY (OFFSITE)	
EXIST. RIGHT OF WAY	
PROP. PROPERTY LINE/ MTS RIGHT OF WAY (ONSITE)	
PROP. CENTERLINE	
PROP. CURB & GUTTER	
PROP. RIGHT OF WAY	
PROP. SEWER	
PROP. WATER	
PROP. STORM DRAIN (PUBLIC STREET FLOW)	
PROP. STORM DRAIN (BYPASS-TREATED)	
PROP. SEWER SERVICE LATERAL	
PROP. WATER SERVICE LATERAL	
PROP. BACKFLOW PREVENTION DEVICE	B
PROP. SIDEWALK	
EXISTING WETLAND/RIPARIAN COMMUNITIES	
MULTI-HABITAT PLANNING AREA (MHPA)	
PASSIVE PARK/WETLAND BUFFER	
EXISTING 100-YEAR FLOODPLAIN	
EXISTING 100-YEAR FLOODWAY	
PROPOSED 100-YEAR FLOODPLAIN PENDING FEMA APPROVAL	
PROPOSED 100-YEAR FLOODWAY PENDING FEMA APPROVAL	
BIKE PATH	
SHEET NUMBER	3
PROP. STREET LIGHT	
PROP. TRAFFIC SIGNAL	
EXIST. STREET LIGHT	
VISIBILITY AREA	
FOUND MONUMENTS	
MONUMENTS TO BE SET	

LIST OF ABBREVIATIONS

BFE	BASE FLOOD ELEVATION
BVC	BEGIN VERTICAL CURVE
C/L	CENTERLINE
C&G	CURB AND GUTTER
EOP	EDGE OF PAVEMENT
EVC	END VERTICAL CURVE
EXIST.	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
HP	HIGH POINT
IE	INVERT ELEVATION
LP	LOW POINT
LT.	LEFT
NTS	NOT TO SCALE
PRC	POINT OF REVERSE CURVE
PROP.	PROPOSED
PVI	POINT OF VERTICAL INTERSECTION
R/W	RIGHT OF WAY
RIM	MANHOLE RIM ELEVATION
RCP	REINFORCED CONCRETE PIPE
RT.	RIGHT
SD	STORM DRAIN
TC	TOP OF CURB
TOR	TOP OF RIM

LUMINARIES

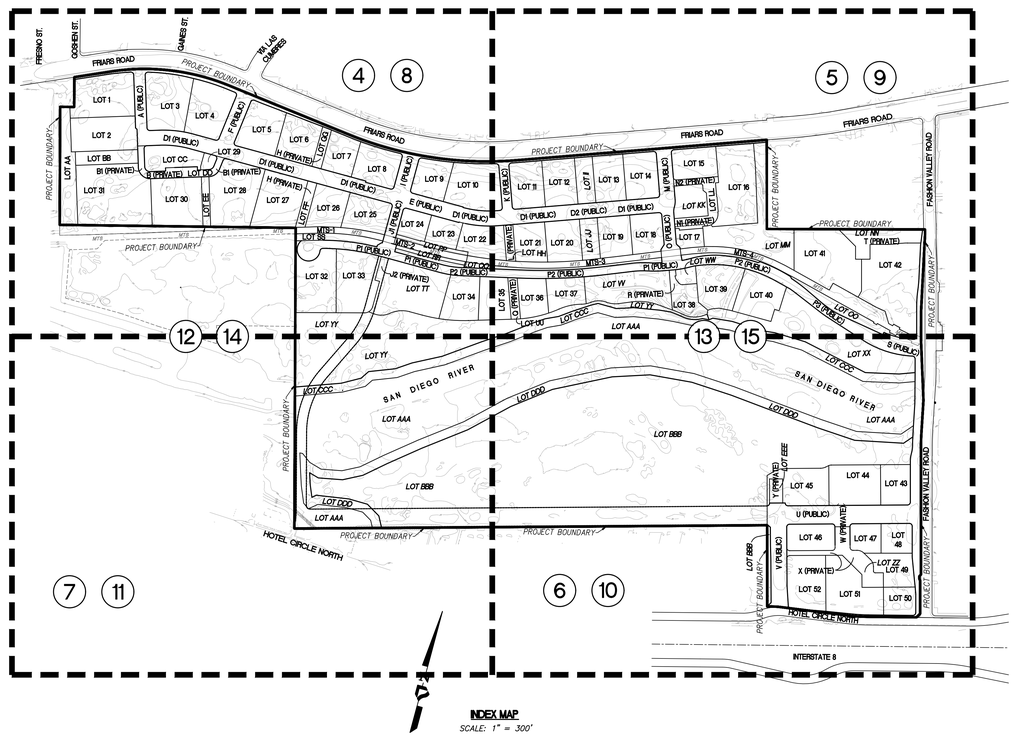
TYPE Y-MID	– FRIARS ROAD, FASHION VALLEY ROAD, HOTEL CIRCLE NORTH STREETS A, B, J, K, O, P1, P2, P3, P4, R
TYPE Z-MID	– STREETS D1, D2, E, F, I, M, S, U, V
TYPE Y-INT	– STREET G, P3

STORMWATER STRUCTURAL POLLUTANT CONTROL BMPs

BMP ID*	LOT. NO.	BMP DESCRIPTION	BASIN AREA, SF
1	1	BIOFILTRATION	1,388
2	2	BIOFILTRATION	1,347
3	3	BIOFILTRATION	1,475
4	4	BIOFILTRATION	1,333
5	5	BIOFILTRATION	1,087
6	6	BIOFILTRATION	1,290
7	7	BIOFILTRATION	665
8	8	BIOFILTRATION	928
9	9	BIOFILTRATION	762
10	10	BIOFILTRATION	1,395
11	11	BIOFILTRATION	905
12	12	BIOFILTRATION	917
13	13	BIOFILTRATION	855
14	14	BIOFILTRATION	901
15	15	BIOFILTRATION	806
16	16	BIOFILTRATION	2,060
17	17	BIOFILTRATION	240
18	18	BIOFILTRATION	635
19	19	BIOFILTRATION	707
20	20	BIOFILTRATION	787
21	21	BIOFILTRATION	793
22	22	BIOFILTRATION	969
23	23	BIOFILTRATION	679
24	24	BIOFILTRATION	651
25	25	BIOFILTRATION	1,004
26	26	BIOFILTRATION	738
27	27	BIOFILTRATION	1,622
28	28	BIOFILTRATION	1,455
29	29	BIOFILTRATION	113
30	30	BIOFILTRATION	1,238
31	31	BIOFILTRATION	2,882
32	32	BIOFILTRATION	1,355
33	33	BIOFILTRATION	1,494
34	34	BIOFILTRATION	922
35	35	BIOFILTRATION	915
36	36	BIOFILTRATION	841
37	37	BIOFILTRATION	757
38	38	BIOFILTRATION	881
39	39	BIOFILTRATION	1,148
40	40	BIOFILTRATION	1,030
41	41	BIOFILTRATION	2,200
42	42	BIOFILTRATION	1,923
43	43	BIOFILTRATION	779
44	44	BIOFILTRATION	1,494
45	45	BIOFILTRATION	1,622
46	46	BIOFILTRATION	782
47	47	BIOFILTRATION	556
48	48	BIOFILTRATION	564
49	49	BIOFILTRATION	764
50	50	BIOFILTRATION	499
51	51	BIOFILTRATION	1,577
52	52	BIOFILTRATION	1,258
53	AA	BIOFILTRATION	4,908
54	CC	BIOFILTRATION	306
55	YY	BIOFILTRATION	5,431
56	II	BIOFILTRATION	197
57	VV	BIOFILTRATION	1,080
58	WW	BIOFILTRATION	557
59	KK	BIOFILTRATION	247
60	MM	BIOFILTRATION	4,482
61	42	BIOFILTRATION	841

BMP ID*	ST. NAME	BMP DESCRIPTION	MODEL NO.
62	P	MODULAR WETLAND SYSTEM	MWS-L-8-16
63	P	MODULAR WETLAND SYSTEM	MWS-L-4-15
64	T	MODULAR WETLAND SYSTEM	MWS-L-4-6
65	T	MODULAR WETLAND SYSTEM	MWS-L-4-6
66	S	MODULAR WETLAND SYSTEM	MWS-L-8-12
67	S	MODULAR WETLAND SYSTEM	MWS-L-8-12
68	U	MODULAR WETLAND SYSTEM	MWS-L-4-8
69	U	MODULAR WETLAND SYSTEM	MWS-L-4-6
70	U	MODULAR WETLAND SYSTEM	MWS-L-4-8
71	U	MODULAR WETLAND SYSTEM	MWS-L-4-8
72	V	MODULAR WETLAND SYSTEM	MWS-L-4-6
73	V	MODULAR WETLAND SYSTEM	MWS-L-4-15
74	W	MODULAR WETLAND SYSTEM	MWS-L-4-8
75	W	MODULAR WETLAND SYSTEM	MWS-L-4-6
76	X	MODULAR WETLAND SYSTEM	MWS-L-4-8
77	X	MODULAR WETLAND SYSTEM	MWS-L-4-6

* PER CHANG'S REPORT



INDEX MAP
SCALE: 1" = 300'

STREET DEVIATION TABLE

SECTION	CLASSIFICATION (PUBLIC ROADS)	DEVIATIONS	REMARKS
E	TWO-LANE COLLECTOR W/2-WAY LEFT TURN LANE	INCREASED TRAVEL LANE WIDTH FROM 10' TO 11' MODIFIED PARKING FROM PARALLEL TO DIAGONAL (BACK-IN)	
F	FOUR-LANE URBAN COLLECTOR	10' TURN LANE REMOVED	INTERSECTION AT FRIARS ROAD
I	FOUR-LANE URBAN COLLECTOR	ADDED 6' MEDIAN FOR TRAFFIC SEPARATION REDUCED DESIGN SPEED FROM 35 MPH TO 30 MPH NO PARKING	INTERSECTION AT FRIARS ROAD
J1	TWO-LANE MAJOR COLLECTOR	INCLUDED 6' WIDE BIKE LANE ON BOTH SIDES INSTEAD OF PARALLEL PARKING ADDED 6' MEDIAN, REDUCED WESTERLY PARKWAY FROM 14' TO 6' REMOVED EASTERLY PARKWAY REDUCED DESIGN SPEED FROM 30 MPH TO 25 MPH	
K	TWO-LANE COLLECTOR	N/B LANE WIDTH REDUCED FROM 11' TO 10' 7' PARALLEL PARKING ONLY ON EAST SIDE	INTERSECTION AT FRIARS ROAD
M	TWO-LANE COLLECTOR	ADDED 7' MEDIAN ADDED 6' BIKE LANE ON BOTH SIDES ADDED 10' WIDE N/B LEFT TURN LANE NO PARKING LESS THAN 200' INTERSECTION DISTANCE BETWEEN STREET 'D' AND DRIVEWAY "N2"	INTERSECTION AT FRIARS ROAD
O	TWO-LANE COLLECTOR	INCLUDED 6' WIDE BIKE LANE ON BOTH SIDES INSTEAD OF PARALLEL PARKING LESS THAN 200' INTERSECTION DISTANCE BETWEEN STREET 'D' AND DRIVEWAY "N1"	
P1	TWO-LANE COLLECTOR	NO PARKWAY PROVIDED ON THE NORTH SIDE NO PARKING ON THE NORTH SIDE INCREASED LANE WIDTH FROM 11' TO 12' 7' PARKING IS REPLACED WITH NO PARKING/FIRE LANE	ADJACENT TO MTS
P2	TWO-LANE COLLECTOR	NO PARKWAY PROVIDED ON THE NORTH SIDE NO PARKING ON THE NORTH SIDE INCREASED LANE WIDTH FROM 11' TO 12'	ADJACENT TO MTS
P3	TWO-LANE COLLECTOR	NO PARKWAY PROVIDED ON THE NORTH SIDE REMOVE 7' WIDE PARKING ON BOTH SIDES INCREASED LANE WIDTH FROM 11' TO 12'	ADJACENT TO MTS
S	FOUR-LANE MAJOR	REMOVED 6' BIKE LANE AND 2' BUFFER REDUCED MEDIAN FROM 16' TO 14' ADDED 10' WIDE E/B LEFT TURN LANE REDUCED DESIGN SPEED FROM 45 MPH TO 30 MPH ADDED 10' BIKE PATH ON PARKWAY	ADJACENT TO MTS INTERSECTION AT FASHION VALLEY ROAD
U	FOUR-LANE URBAN COLLECTOR	ADDED 6-16' MEDIAN NO PARKING ADDED A 12' TWO-WAY CYCLE TRACK WITH 4' BUFFER ON THE NORTH SIDE	INTERSECTION AT FASHION VALLEY ROAD
V	FOUR-LANE URBAN COLLECTOR	ADDED 4' MEDIAN INCREASED LANE WIDTHS BY 1' NO PARKING REDUCED PARKWAY WIDTH ON ONE SIDE	
FVR	FOUR-LANE URBAN MAJOR	REDUCED PARKWAY WIDTH FROM 22' TO 15'	

STORM DRAIN AND SEWER SEPARATION DEVIATION

STORM DRAIN AND SEWER EDGE TO EDGE SEPARATION ARE LESS THAN TEN FEET (10') ON PUBLIC STREETS A, D1, E, O, P1, P3, S AND ON PRIVATE DRIVEWAYS B1, N1 AND J2 APPROVED DEVIATION TO A MINIMUM OF FIVE FEET (5') EDGE TO EDGE SEPARATION BETWEEN STORM DRAIN AND SEWER.

NOTES:

1. DEVELOPMENT OF EACH LOT IS SUBJECT TO THE FIRE DEPARTMENT SAFETY STANDARDS AT THE TIME OF BUILDING PERMIT APPLICATION.3
2. POPULATION-BASED PARKS WILL BE DESIGNED PER County Policy 600-33 AND THE POPULATION-BASED PARKS WILL BE RECORDED WITH A RECREATION EASEMENT FOR PUBLIC USE.
3. SPECIFIC LOADING ZONE LOCATIONS MEETING CITY OF SAN DIEGO LOADING ZONE REQUIREMENTS WILL BE PROVIDED DURING FINAL ENGINEERING.

NOTES:

A. EMRA WILL BE PROVIDED FOR ALL PRIVATE STORM DRAINS WITHIN PUBLIC RIGHT-OF-WAY, AND PRIVATE STORM DRAINS CONNECTING TO PUBLIC STORM DRAIN.
B. EDGE TO EDGE SEPARATION OF LESS THAN 10' BETWEEN SEWER AND STORM DRAIN PER PROJECT WIDE DESIGN DEVIATION.
C. PRIVATE DRIVEWAY ENTRANCES FROM PUBLIC STREET ARE TO BE DELINEATED BY ENHANCED PAVEMENT AND/OR CROSSWALK AND SIGNAGE TO THE SATISFACTION OF CITY ENGINEER.

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2	TYPICAL STREET CROSS-SECTIONS
SHEET 3	LOT AND STREET AREA TABLES, ALIGNMENTS AND GRADES
SHEET 4-7	LOTS, STREETS, SEWER AND WATER PLAN
SHEET 8-11	GRADING AND DRAINAGE PLAN
SHEET 12-13	BOUNDARY AND TOPOGRAPHIC MAP
SHEET 14-15	NON-TITLE INFORMATION
SHEET 16	FIRE ACCESS PLAN
SHEET 17-18	LANDSCAPE PLANS
SHEET 19-20	BRIDGE PLAN

VESTING TENTATIVE MAP FOR RIVERWALK

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey
701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

PROJECT ENGINEER: GREGORY M. SHIELDS RCE: 42951
DESIGN BY: SC/JD DRAWN BY: KO/RF CHECKED BY: DR

Prepared By:
Name: PROJECT DESIGN CONSULTANTS
Address: 701 B STREET, SUITE 800
SAN DIEGO, CA 92101
Phone #: (619) 235-6471 Fax #: (619) 234-0349
Project Address:
1150 FASHION VALLEY ROAD
SAN DIEGO, CA 92108
Project Name:
RIVERWALK

Revision 10:
Revision 9:
Revision 8:
Revision 7:
Revision 6:
Revision 5:
Revision 4: 10-04-19
Revision 3: 07-17-19
Revision 2: 04-22-19
Revision 1: 11-06-18
Original Date: 02-28-18
Sheet 1 of 20
PTS # 581984

Sheet Title:
TITLE SHEET

1856-6271 CCS83 COORDINATES
216-1711 LAMBERT COORDINATES

NMG Geotechnical, Inc.

November 27, 2019

Project No. 11077-02

To: SD Riverwalk, LLC
4747 Executive Drive, Suite 410
San Diego, California 92121

Attention: Mr. Pete Shearer

Subject: Preliminary Geotechnical Investigation and Review of the Updated Grading Plan, Proposed Mixed-Use Redevelopment Project at Riverwalk Golf Course, City of San Diego, California

In accordance with your authorization, NMG Geotechnical, Inc. (NMG) has prepared this updated report for use in preparation of the project Environmental Impact Report (EIR) for the proposed mixed-use redevelopment at the Riverwalk Golf Course, in the city of San Diego, California. We have reviewed the grading plan in light of the geotechnical conditions at the site to provide geotechnical recommendations for the proposed grading and development. This report is essentially the same as the prior geotechnical report by NMG, dated April 12, 2019 which was recently approved by the City. The only update includes the project description, as shown in the first two paragraphs of Section 2.4, for consistency with the other technical documents. The geotechnical findings, conclusions and recommendations have not been revised and remain valid for the proposed development.

NMG previously prepared two reports (2017 and 2018) that were submitted to the City of San Diego during the Mandatory Initial Review (MIR) process. Those reports were reviewed and approved by the City. This report combines the two prior reports and provides our geotechnical review of the updated grading plan and supplemental exploration data. This report will serve as the technical appendix for the EIR.

We have reviewed the updated grading plan by Project Design Consultants (PDC), received by NMG on April 5, 2019. We have performed an additional geotechnical investigation to address this updated plan. The additional investigation included excavation of two hollow-stem auger borings and advancement of four Cone Penetrometer Test (CPT) probes in the western portion of the golf course, south of the trolley line, in an area where an additional building and trolley bridge are proposed.

The updated 60-scale grading plan was used as the base map to present the boring and CPT locations and the geotechnical mapping for the site on the Updated Geotechnical Map (Plates 1 through 4). This plan was also used as a base for the 100-scale Preliminary Remedial Measures

and Ground Improvement Map (Plate 5). Plates 6 through 8 include the updated geotechnical cross-sections.

This report presents the findings of our studies and provides alternatives for remedial grading and foundation design for the proposed development concept. Based on our findings, we conclude that the proposed mixed-use development is feasible provided it is designed, graded and constructed in accordance with the preliminary geotechnical recommendations in this report. Additional geotechnical review and investigation will need to be performed as the design level plans become available. The recommendations provided herein will then be confirmed and/or updated as necessary based on our findings. NMG will work with the project team to review design level plans and determine the ultimate remedial solutions.

If you have any questions regarding this report, please contact our office. We appreciate the opportunity to provide our services.

Respectfully submitted,

NMG GEOTECHNICAL, INC.

Anthony Zepeda, CEG 2681
Project Geologist

Reza Saberi, GE 3071
Principal Engineer

Terri Wright, CEG 1342
Principal Geologist

TW/AZ/RS/grd

Distribution: (1) Addressee (E-Mail)
(1) Ms. Debby Reece, PDC (E-Mail)
(1) Ms. Karen Ruggins, KLR (E-Mail)
(3) Mr. Ted Shaw, Atlantis Group (2 hard copies and 1 E-Mail)

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1

2.0 INTRODUCTION 5

2.1 Purpose and Scope of Work 5
2.2 Site Location and Description 6
2.3 Site History and Prior Investigations/Grading 8
2.4 Proposed Conceptual Development and Grading 9
2.5 Field Investigation 11
2.6 Laboratory Testing 12

3.0 GEOTECHNICAL FINDINGS 13

3.1 Geologic Setting and Soil Mapping 13
3.2 Earth Units 13
3.3 Groundwater and Surface Water/Flood Potential 15
3.4 Regional Faulting and Seismicity 16
3.5 Laboratory Testing and Soil Properties 17
3.6 Slope Stability 19
3.7 Liquefaction Analysis and Seismic Settlement/Lateral Spread 20
3.8 Settlement and Foundation Considerations 22
3.9 Erosion Potential 24
3.10 Rippability 25
3.11 Infiltration Feasibility 25

4.0 CONCLUSION AND PRELIMINARY RECOMMENDATIONS 28

4.1 General Conclusion and Recommendation 28
4.2 Earthwork and Grading Specifications 28
4.3 Remedial Grading and Slope Stabilization 29
4.3.1 Removals in Structural Areas 29
4.3.2 General Grading for the Park 30
4.3.3 Limits of Remedial Grading for Structural and Park Areas 31
4.3.4 Staged Grading and Ground Improvements 31
4.3.5 Temporary Slope Excavations 32
4.3.6 Slope Stabilization 32
4.4 Ground Improvement Alternatives 32
4.5 Groundwater Conditions 33
4.6 Static and Seismic Settlement 34
4.6.1 Structural Areas 34
4.6.2 78-Inch Trunk Sewer and Trolley Line 35

4.7 Foundation Design 35
4.8 Storm Water Infiltration Feasibility 37
4.9 Construction Dewatering....38
4.10 Trench Excavations and Backfill 38
4.11 Lateral Earth Pressures for Permanent Retaining Structures 39
4.12 Temporary Shoring Design/Construction 40
4.13 Garage Concrete Slab-on-Grade 41
4.14 Proposed Bridges....41
4.15 Preliminary Pavement Design....42
4.16 Structural Setbacks....42
4.17 Seismic Design Guidelines....43
4.18 Permanent Subdrains for Retaining Walls and Subterranean Buildings....43
4.19 Expansion Potential....44
4.20 Cement Type and Corrosivity 44
4.21 Exterior Concrete 44
4.22 Surface Drainage and Irrigation 46
4.23 Additional Geotechnical Investigation and Plan Reviews 47
4.24 Geotechnical Observation and Testing During Grading and Construction....47
5.0 LIMITATIONS 49

Appendices

Appendix A – References
Appendix B – Boring and CPT Logs
Appendix C – Laboratory Test Results
Appendix D – Slope Stability Analysis
Appendix E – Seismic Parameters
Appendix F – Liquefaction Analysis
Appendix G – General Earthwork and Grading Specifications

Figures and Plates

Figure 1 – Site Location Map – Rear of Text
Figure 2A – Geologic Map (Kennedy, 1975) – Rear of Text
Figure 2B – Geologic Map (Kennedy and Tan, 2008) – Rear of Text
Figure 3 – Regional Fault Map – Rear of Text
Figure 4 – City of San Diego Geohazard Map – Rear of Text
Figure 5 – Retaining Wall Drainage Detail – Rear of Text

Plates 1 through 4 – Updated Geotechnical Map – In Pocket
Plate 5 – Preliminary Remedial Measures and Ground Improvement Map – In Pocket
Plates 6 through 8 – Updated Cross-Sections 1-1' through 18-18' – In Pocket

1.0 EXECUTIVE SUMMARY

The proposed development is separated into three districts, which include the following:

- The North District, located between Friars Road and the trolley rail line, which includes multi-family residential, neighborhood retail, and a trolley station development.
- The Central District, located between the trolley and the San Diego River, which includes multi-family residential, reuse of the clubhouse for a community amenity, and park.
- The South District, located south of the river, which includes commercial development in the southeast corner and park development for the remainder of the area.

The development will include:

- Buildings that may have either at-grade structures or have one subterranean level for parking below the pad grades shown, which will be determined during the design phase. Residential buildings will be 3 to 7 stories and the commercial buildings may be up to 15 stories.
- Two vehicular trolley crossings; one at-grade crossing to the east near the clubhouse and one bridge to the west where a grade-separation underpass of the trolley tracks is planned.
- One vehicular culvert/bridge crossing on Fashion Valley Road, where it crosses the San Diego River.
- A large river park within the Central and South Districts and several recreational areas and parks throughout the development.

The geotechnical conditions and constraints for the proposed development are as follows:

- Multiple earth units were encountered at the site during our exploration, including up to 15 feet of undocumented golf course fill overlying older river terrace deposits to the north, and alluvium below the remainder of the site. The alluvium extends to depths of up to 80± feet below existing ground surface (bgs). The central portion of the North District is underlain by dense terrace deposits. The westerly and easterly ends of the North District are underlain by alluvium. The Central District is mostly underlain by alluvium except near the existing clubhouse parking lot, which is underlain by terrace deposits. The South District is entirely underlain by alluvium.

- The alluvium is potentially liquefiable during a future large earthquake event. Preliminary seismic settlements are estimated up to 3.5 inches within the proposed development areas and up to 8.0 inches within the proposed river park. There is also potential for lateral spread and flow liquefaction for the proposed fill slopes next to the river in the Central and South Districts. The designed structural slopes will need to have additional remediation to address the potential for lateral spread or flow.

- A major geotechnical and hydrologic issue for the site is the flood potential of the San Diego River. We understand that the proposed residential and commercial developments are being raised above flood levels. The majority of the park will also be lowered during grading. Portions of the park will remain within the mapped potential flood zone. Proposed structural slopes below these elevations will need to be protected from future flood flows and scour.

- Shallow groundwater was encountered in areas underlain by alluvium at depths between 5 and 15 feet bgs. Groundwater is deeper in the river terrace deposits, largely due to the higher ground elevations in this area. Groundwater was not encountered in Borings B-6, B-7 or B-8, drilled to depths of up to 26.5 feet into the terrace deposits, where refusal was encountered. Boring B-5 was drilled through terrace deposits and into bedrock where groundwater was encountered at a depth of 47 feet bgs. Borings B-2 and B-4 are located within mapped terrace deposits, near the alluvial contact, and encountered groundwater at depths of 11 and 25.6 feet bgs.

- Installation of deeper utilities or structures (i.e., elevator shafts, etc.) may extend into the groundwater table and will need to be evaluated during the design phase to determine the need for dewatering.

- Excavations into the dense terrace deposits will likely require ripping with large bulldozers (D-9 and D-10 dozers) prior to picking up with scrapers. Some layers within the terrace deposits are difficult to excavate with a backhoe and/or drilling rig due to the hard cobbles and cementation.

- The alluvium has a potential for static settlements on the order of 1 inch or less, after remedial removals and fill placement to finish grades.

- Preliminary settlement analysis indicates that potential impacts to the trolley and the 78-inch trunk sewer are minimal, on the order of 0.35 to 0.75 inches, respectively.

- Impacts to the existing improvements (i.e., the perimeter streets and developments, the trolley rail line, the clubhouse, etc.) were analyzed and the temporary slopes for remedial grading are recommended to be 1.5H:1V where they will expose alluvium and 1H:1V in terrace and fill materials. Where constrained by property lines or other improvements, shoring or other methods of slope stabilization should be evaluated.

- There are no major or active faults mapped at the site. However, the seismically active Rose Canyon Fault is mapped approximately one mile to the west of the site. The site is subject to high seismic ground shaking during future earthquakes on this or other regionally active faults.

- The site is not suitable for Water Quality Management Plan (WQMP) infiltration BMPs due to the shallow groundwater and the recommendation for remedial removals to near the groundwater table. Infiltration is not recommended into compacted fill and requires a minimum 10-foot separation between the bottom of the BMP and the groundwater table. Infiltration rates into river terrace deposits is expected to be very low due to the high density and cementation.

- Expansion potential of the site soils varies between "very low" and "medium." As a result, we anticipate that the proposed buildings may need to be designed with post tensioned or wire reinforced slab/foundations. This will need to be further evaluated during the design phase of the project.

The following includes the geotechnical conditions and constraints for each area.

North District: This district has the most favorable geotechnical conditions, since the majority of this area is underlain by dense river terrace deposits that are not liquefiable and have static and seismic settlement potential of less than 1 inch. The development pads proposed at the eastern and western ends of the North District are underlain by alluvium that is potentially liquefiable.

Remedial grading for the pads underlain by river terrace deposits should remove the undocumented fill and the upper 5 to 10 feet of weathered terrace deposits in design fill areas, and a minimum of a 3-foot overexcavation/lot capping in the design cut areas. Where proposed building foundations or utilities are deeper than 3 feet, deeper overexcavation should be considered.

Remedial grading in the areas underlain by alluvium may extend 2 to 3 feet above the groundwater (5 to 20 feet bgs) in order to reduce the amount and/or depths of ground improvements. After this grading, the static and seismic settlements in areas underlain by alluvium are expected to be on the order of 3.0 to 4.0 inches with differential settlements on the order of 1.75 to 2.0 inches over a span of 40 feet. In order to reduce the total and differential settlement to 1 inch over a span of 40 feet, respectively, and also to provide higher foundation bearing capacity in the areas underlain by alluvium, ground improvement should be performed below the removal bottom. The recommended depths of ground improvement are 10 feet below the removal bottom on the western end and 20 feet below the removal bottom on the eastern end. Alternatively, the buildings could be designed to accommodate the higher settlements in lieu of the ground improvements.

There is also an abandoned sewer line that crosses the North District. This pipeline and associated backfill material will need to be removed and the trench backfilled with compacted fill during grading.

Structural Portions of Central and South Districts: The Central District is mostly underlain by alluvium with some river terrace in the central portion near the clubhouse parking lot, while the South District is entirely underlain by alluvium. In the areas underlain by terrace deposits, a minimum 3-foot overexcavation/fill cap is recommended in cut areas, and where proposed building foundations or utilities are deeper than 3 feet, deeper overexcavation should be considered.

Building or structural portions of the Central and South Districts that are underlain by alluvium should have remedial grading performed to 2 to 3 feet above the groundwater table. This will result in a fill cap below the pads that is 5 to 30 feet thick. After the proposed remedial grading, the static and seismic settlements in areas underlain by alluvium are expected to be on the order of 2.0 to 4.5 inches, with differential settlements on the order of 1.0 to 2.25 inches over a span of 40 feet. In order to reduce the total and differential settlement to 1 inch over a span of 40 feet and also to provide higher foundation bearing capacity in the areas underlain by alluvium, ground improvement should be performed below the removal bottom. The recommended depths of ground improvement are 20 feet below the removal bottom in the Central District and 15 feet below the removal bottom in the South District. Alternatively, the buildings could be designed to accommodate the higher settlements in lieu of the ground improvements. Please note that lowering

the design grades could adversely impact the amount of potential near-surface/shallow seismic settlement.

We understand that the commercial buildings proposed in the South District may be up to 15 stories high and constructed of steel, concrete or wood frame. These buildings are anticipated to have higher loads and therefore, may require deep foundations and/or a combination of thicker mat slabs, deeper ground improvement and pile foundations.

There is a potential for lateral spread adjacent to the river in the Central District and the South District. Deeper ground improvements will be required under the structural fill slopes next to the river in order to address the potential for seismically induced lateral spread and flow liquefaction. Based on our review of the CPT and boring data, we anticipate the ground improvement will need to extend on the order of 50 feet below the toe of the design fill slopes. The ground improvement should at minimum, consist of 3 to 4 rows of stone columns, geopiers or deep soil-cement mix columns. This will need to be further evaluated during the design-level study.

Parks in the Central and South Districts: In the non-structural portions of the proposed river park, remedial grading will be limited to removal of the turf, vegetation, rootballs, heavy roots and topsoil to expose less weathered fill or alluvium. There is high static and seismic-induced settlement potential in the river park, at the location of CPT-20, -21, -22, -28 through -31, -39 and -40. With the design cuts into the alluvium, there are areas that will encounter groundwater. The park is subject to flooding during a heavy rainfall event. There is also a potential for ground manifestations due to liquefaction during a future earthquake event. Planting with landscape and vegetation soon after grading will help reduce the erosion potential.

The proposed park and associated improvements are considered non-habitable. Thus, ground improvements are not recommended in those areas. Where structures are planned in the park (if any), remedial grading/removals may be necessary for proposed non-habitable structures, which will need to be determined as the park plans are developed. We also understand that the existing clubhouse and bridges are founded on piles and will remain in place.

Two parks were added in the Central District between existing building pads. The eastern park near the clubhouse is underlain by dense cobbly terrace deposits. Where the cut extends into terrace deposits, the area may be overexcavated 3 feet and replaced with compacted fill without cobbles to facilitate irrigation and planting.

2.0 INTRODUCTION

2.1 Purpose and Scope of Work

NMG Geotechnical, Inc. (NMG) has prepared this report of preliminary geotechnical investigation and review of the updated grading plan for the proposed mixed-use development at the existing Riverwalk Golf Course in the city of San Diego, California. We have reviewed the updated grading plan in light of the geotechnical conditions at the site in order to provide geotechnical recommendations for the proposed grading and development.

NMG previously prepared two reports (2017 and 2018) that were submitted to the City of San Diego during the Mandatory Initial Review (MIR) process. These reports were reviewed and approved by the City. This report combines the two prior reports and provides our geotechnical review of the updated grading plan. In addition, we have performed a supplemental geotechnical investigation to address this updated grading plan. This report will serve as the technical appendix for the EIR.

We have reviewed the updated grading plan prepared by Project Design Consultants (PDC), received by NMG on April 5, 2019. The updated 60-scale grading plan was used as the base map to present the boring and CPT locations and the geotechnical mapping for the site on the Updated Geotechnical Map (Plates 1 through 4). The updated grading plan was also used as a base for the 100-scale Preliminary Remedial Measures and Ground Improvement Map (Plate 5). We have prepared four vertically exaggerated cross-sections to illustrate the general geotechnical conditions at the site, and fourteen 40-scale cross-sections to show details along the trolley, river and around the perimeter of the site (Plates 6 through 8).

Our scope of work was as follows:

- Acquisition, review and compilation of available geotechnical reports and maps for the subject site and surrounding area. A list of references is included in Appendix A. The Updated Geotechnical Map (Plates 1 through 4) provide a compilation of the boring and CPT locations at and adjacent to the site from this and previous geotechnical studies.

- Review of historic aerial photographs dating back to the late 1940s. A list of reviewed photographs is included in Appendix A.

- Review of the recently published (January 2018) City of San Diego Storm Water Standards. This document provided updates to geotechnical and groundwater investigation requirements and approved infiltration rate assessment methods for planning and design level selection.

- Site reconnaissance to identify the existing site conditions and mark boring and CPT locations prior to excavation. Notification and coordination with the onsite management and Underground Service Alert to identify and locate any underground utilities was performed prior to the field exploration. Drilling permits were also acquired through the County of San Diego for geotechnical borings and CPTs below the groundwater table. Based on conversations with the City of San Diego, a City permit was not required to drill.

- Drilling, sampling and logging of 31 hollow-stem auger borings (B-1 through B-29, P-1 and P-2) to depths of 16.5 to 81.5 feet. The borings were geotechnically logged and sampled. The approximate locations of our borings are provided on the Updated Geotechnical Map (Plates 1 through 4) and the logs are included in Appendix B.

- Advancement of CPTs at 43 locations throughout the golf course (CPT-1 through CPT-18 and CPT-20 through CPT-44). CPT-19 was not performed due to steep terrain and utility conflicts. Shear wave velocities were measured through four CPTs at 10-foot intervals to determine the seismic site class per 2016 California Building Code (CBC). The CPT depths varied from 6 to 86.4 feet bgs. The approximate locations of our borings are provided on the Updated Geotechnical Map (Plates 1 through 4) and the logs are included in the Appendix B.

- Laboratory testing of selected samples to classify the onsite soils, including grain size distribution, Atterberg limits, direct shear, consolidation, maximum density and optimum moisture content, hydraulic conductivity (permeability), R-value, expansion index, and soluble sulfate content. Laboratory test results by NMG and others are included in Appendix C, and the moisture density test results are included on the boring logs in Appendix B.

- Evaluation of faulting and seismicity in accordance with the 2016 CBC and the current standard of practice.

- Geotechnical review of the updated grading plan. The cross-sections (Plates 6 through 8) were updated to highlight the planned grading and the recommended remedial grading and ground improvement. The map and cross-sections were also updated to show the Limits of Remedial Grading.

- Geotechnical evaluation and analysis of the compiled data with respect to the proposed development and anticipated improvements. Geologic analysis included preparation of an updated geotechnical map and cross-sections. Prior data was compiled and boring logs for the recent exploration were prepared for inclusion in this report. Geotechnical evaluation included liquefaction and settlement analysis, groundwater conditions, slope stability analysis, preliminary grading recommendations, and alternatives for foundation and ground improvements. In addition, the potential for utilization of infiltration BMPs were evaluated based on the site conditions and the City of San Diego Storm Water Standard (2018). Slope stability analysis results are included in Appendix D, the seismic data in Appendix E, the liquefaction analysis in Appendix F and the General Earthwork and Grading Specifications in Appendix G.

- Preparation of this report with our findings, conclusions, and recommendations for the subject development. This report includes pertinent geotechnical maps, figures and appendices.

2.2 Site Location and Description

The project site encompasses the approximately 195-acre Riverwalk Golf Course, situated in the western portion of Mission Valley. The project site abuts Friars Road on the north; Fashion Valley Road on the east; a portion of Hotel Circle North and privately-owned developed property to the south; and Metropolitan Transit System and other privately-owned undeveloped property to the

west. The San Diego River and a segment of Green Line Trolley traverse the central and northern portions of the project site in an east-west direction.

The site lies between 4 and 5 miles inland from the ocean. The golf course ground surface slopes gently toward the river, which curves through the central portion of the site. Elevations vary between 67 feet above msl along the northern side of the project, to a low of near 16 feet msl near the western river edge. The average (non-flood) river water level varies from 12 feet msl in the west to 15 feet msl in the east. The drainage sheet flows over the land surface toward the river, which flows to the west emptying into the ocean.

The site may currently be accessed at four locations:

- The maintenance facility in the northwest portion, off of Friars Road;
- Riverwalk Drive off of Fashion Valley Road that extends to the central portion of the site with the clubhouse and associated parking lot;
- Through a pump station site off of Hotel Circle North; and
- Through an equipment yard entrance off of Fashion Valley Road, north of Riverwalk Drive, that is a leased gravel covered lot.

There may be other entrances that we did not use during our investigation. The majority of the site is fenced with both chain link, and locally, with a higher netting fence for errant golf balls.

The San Diego Metro Green Line Trolley crosses the site subparallel to the river, approximately 400 to 800 feet north of the river. The trolley rail line was constructed on a raised berm across the site and is powered by overhead electric lines. There are two small existing under-crossing/tunnels large enough for two golf carts or landscape equipment carts. There are two bridges over the river which also can support golf carts and light weight vehicles.

The golf course is covered with turf and local trees and brush. There are three nine-hole courses, including the Friars Course in the north, the Presidio Course in the middle-western area, and the Mission Course in the south. There are numerous sand traps, water features, irrigation pipes and sprinklers throughout the course. We understand that in the past, the majority of the irrigation water has come from two wells onsite, with supplement from domestic water. Both of these wells may no longer be in service due to brackish conditions of the groundwater. We also understand that approximately 500,000 gallons of water is used to irrigate the course daily during dry months and less during winter.

There are numerous existing utilities at the site. There is an abandoned sewer line that crosses the North District in an east-west direction, and several electric and water lines that cross the site. There are also several sewer and water lines that run along Riverwalk Drive into the site, and an active 78-inch trunk sewer line that parallels the trolley on the south.

2.3 Site History and Prior Investigations/Grading

Based on historic aerial photographs dating back to the 1930s and historic topographic maps dating back to the early 1900s, the following site history can be detailed:

- The earliest topographic map obtained was from 1903. The natural river channel appears in roughly the same location as it is today. A two-lane road was in place near the current location of Interstate 8 (I-8), and a second two-lane road was in place near Friars Road. There were two structures along the south side of Friars Road, in the northern portion of the site.

- In 1941, the site appears to be in its natural condition, with the main river channel in its present location. The channel appeared wider with several small meanders. The area north of the river up to Friars Road is higher in elevation, and the limits of the river terrace materials can be mapped from the difference in relief.

- In 1946, the site looked roughly plowed with several small circular features, which were in similar locations of the golf course greens in the later photos. There was a structure to the south, near the present day Handlery Hotel. There were also several small bridge crossings over the river channel.

- By 1953, the I-8 freeway appears to have been constructed to the south of the site. The site had a hummocky appearance in the photos, with several different water features. The 1953 topographic map shows a channel of the river in the southwest corner of the site, extending subparallel to the four-lane I-8 freeway.

- By 1958, a portion of the golf course was constructed and the river was channelized.

- In 1964, the Stardust Hotel was constructed and there was a graded golf course in the vicinity of the Presidio and Mission Courses (the Central and South Districts), with some holes in the Friars Course (North District). There were a couple of buildings near the present-day maintenance facility off of Friars Road. Hotel Circle North was also constructed.

- In 1974, Friars Road was widened and locally realigned along the northern property boundary. The small retail and apartment development in the northeast and the apartments in the south were constructed.

- In 1994, the trolley was not yet constructed; however, the 1996 topographic map shows the trolley rail line in-place across the site. In 1996, there was a new large water feature to the north of the Stardust hotel and the golf course remained similar to the 1964 to 1974 conditions.

- By 2005, the golf course was re-graded to near the existing conditions, with the river and water features in the existing conditions. The golf clubhouse, associated parking lot and Riverwalk Drive were constructed. The golf course was graded with cut and fill depths typically about 5 to 15 feet. The Presidio Apartments along the southern boundary were under construction.

We have compiled and reviewed the data from numerous geotechnical studies performed at and near the site. A summary of the reports obtained and the investigations performed is presented below. A complete reference list is provided in Appendix A. The boring and CPT logs by others

are included in Appendix B of this report and the laboratory data by others is included in Appendix C.

- Woodward Clyde Consultants (1975) performed a geotechnical investigation for the Friars Village Condominiums (now Mission Greens) to the northeast of the site. They drilled seven flight-auger borings to depths of 6 to 34 feet. A supplemental investigation was prepared in 1977 (WCC, 1977a); however, the boring logs from this investigation were not available for our review.

- Woodward Clyde Consultants (1977b, and 1977c) also performed geotechnical observation and testing during grading for the same condominiums, known as Mission Greens. They recommended a mat of compacted fill under the buildings and spread footings for the foundations.

- In 1995 and 1997, there were two investigations by Leighton and Associates, including two borings for the golf clubhouse and four borings for the pedestrian bridge additions. The borings were drilled to depths of between 18.5 and 83 feet deep. Their final as graded report (2001) indicates the areas were graded, and the building and bridge structures were supported on pile foundations.

- Geocon, Inc. (1998) performed a geotechnical investigation for the Handlery Hotel and Proposed Apartment Complex along Hotel Circle North. Their preliminary investigation included drilling of three rotary wash borings to depths of 52 to 56 feet.

- Geocon, Inc. (2003) performed additional investigation for the Presidio View Apartments next to the Handlery Hotel. This investigation included drilling of four additional rotary wash borings to depths of 21.5 to 36.5 feet.

- Between 1998 through 2003, Shepardson Engineering Associates, Inc. performed an investigation for a commercial development within the northeast portion of the site, in the area of the currently leased equipment yard. They drilled eight hollow-stem borings to depths of between 5.5 and 90.5 feet at two different times. Their compaction report (2001) indicates the upper portion of the alluvium was removed down to 2 feet above the groundwater or near elevation of 15 feet msl and compacted fill was place to near existing grade.

- Group Delta (2014a) performed a preliminary geotechnical investigation for the Riverwalk Development that covered the area north of the San Diego River, North and Central Districts. They drilled five rotary wash borings (23 to 56.5 feet deep) and ten CPTs (11 to 74 feet deep) throughout the northern portion of the site.

- Group Delta (2015) later performed a more detailed investigation for the western portion of the North District, north of the trolley line. In this area, they drilled another five rotary wash borings (23 to 51.5 feet deep) and 10 CPTs (11 to 81 feet deep).

2.4 Proposed Conceptual Development and Grading

The Riverwalk project proposes an amendment to the existing Levi-Cushman Specific Plan to replace the 195-acre Riverwalk property with the Riverwalk Specific Plan and redevelop the existing golf course as a walkable, transit-centric, and modern live-work-play mixed-use

neighborhood that features an expansive River Park along the San Diego River. The mix and quantity of land uses would change from what is approved in the existing Levi-Cushman Specific Plan to include 4,300 multi-family residential dwelling units; 152,000 square feet of commercial retail space; 1,000,000 square feet of office and non-retail commercial; approximately 95 acres of park, open space, and trails; adaptive reuse of the existing golf clubhouse into a community amenity; and a new Green Line Trolley stop within the development. Improvements to surrounding public infrastructure and roadways would be implemented as part of the Riverwalk project, including improvements to the Fashion Valley Road crossing of the San Diego River as a 10- to 15-year storm event crossing. The project would also include a habitat restoration effort on-site to create and/or enhance 25.16 acres of native habitats along the San Diego River, within and adjacent to the MHPA, and setting aside area for establishing a future wetland habitat mitigation bank.

The project would establish Irrevocable Offers of Dedication (IODs) for two Community Plan Circulation Element roadways envisioned in the Mission Valley Community Plan Update: future Riverwalk Street "J," which would cross the San Diego River in a north-south direction; and future Riverwalk Street "U," which would travel approximately east-west along the southern project site boundary and connect to future Street "J." Street "J" would be an elevated roadway crossing the river valley. Per the City's Planning Department, these roads are regional facilities with uncertain funding, design, and construction timing. While these improvements would not be constructed as part of the project, the project would grant the City IODs for the required rights-of-way to construct these roads in the future.

The mixed-use residential buildings in the North and Central Districts will typically consist of large, three- to seven-story wood-framed buildings, with either separate internal parking structures (wrap product) or built over two levels of concrete parking structure (podium product). We understand that several pools, spas and landscape areas are planned around the multi-family buildings. There are also areas of neighborhood retail and a trolley station in the central portion of the site that may include smaller wood-framed structures or retail below multi-family housing. Per the current plan, there are two trolley crossings, one at-grade to the east and one bridge to the west. The existing Riverwalk Drive will be slightly realigned and extended to the western property line. Access to the North and Central Districts will be from Friars Road and Fashion Valley Road.

We understand the commercial buildings in the South District are planned to be 6 to 15 stories, constructed of concrete, steel and/or wood-framed structures, with two large parking structure and at-grade parking lots. Access to the South District site will be from Fashion Valley Road and Hotel Circle North.

The proposed trolley bridge will consist of a prefabricated bridge supported on four cast-in-drilled-hole (CIDH) piles. We understand that after the bridge is constructed the opening below the bridge will be excavated to planned street grades. The abutments are proposed to be formed utilizing soil nail walls or tieback anchors using shotcrete and top-down construction.

The proposed park will include a network of trails and non-habitable structures, such as parking lots, trellis/shade structures, picnic areas, restroom buildings, etc. The actual layout of structures in the park area is not finalized at this time. However, we understand the two existing bridge/ river crossings will remain as part of the park development. Access to the park will be from Fashion

Valley Road. The existing clubhouse building will also remain as a community building. The two bridges and the clubhouse building are supported on pile foundations.

The overall grading will consist primarily of design fill of up to 25 feet above existing topography to create pads. There are design cuts within the North and Central Districts, both in the buildings and for the pads below Friars Road and the Trolley. These design cuts will be up to 13 feet deep. Design cuts up to 21 feet and fills up to 4 feet are proposed for the parks. The preliminary grading plan shows a fill slope extending down to existing elevations at an inclination of 2H:1V along the river that is up to 20 feet high. There will likely be some cut slopes or retaining walls in the cut areas.

The building pads will be graded to minimum elevations of 31 feet above msl in the Central District, and 32 feet msl in the South District in order to bring the pads above the flood levels. In addition, there will be cuts made in the park near the river. This grading will allow the river to be contained in the park area below the proposed development during rainy periods.

The Fashion Valley Road culvert/bridge crossing over the San Diego River is anticipated to consist of a precast concrete arch. The arch will provide a long-span, low-rise, open bottom river crossing and will likely be supported on ground improvements.

The main changes to the plan since our addendum report (NMG, 2018) include:

- The addition of the park grading to the grading plan in the Central and South Districts;
- Addition of a trolley bridge with a road undercrossing, connecting the North District to the western portion of the Central District;
- Addition of a bridge/culvert at Fashion Valley Road, where it crosses the San Diego River;
- Minor changes to the pads and parks in the North District;
- Shifting of the building pads and the addition of two parks to the Central District; and
- Modification to the building layouts in the commercial area.

2.5 Field Investigation

Our field investigation performed at three different times (in 2014, 2017 and 2019) consisted of excavation of thirty-one 8-inch-diameter, hollow-stem auger borings to depths of 16.5 to 81.5 feet bgs. The borings were geotechnically logged, and samples were taken at selected intervals. Relatively undisturbed soil ring samples were obtained from the exploratory borings with a 2.5-inch-inside-diameter, split-barrel sampler. The samplers were driven into the soil with a 140-pound automatic safety hammer, free-falling 30 inches. The drive samples were also used to obtain a measure of resistance of the soil to penetration (recorded as blows-per-foot on our geotechnical boring logs). Representative bulk samples of onsite soil were collected from the drill cuttings and used for additional soil identification purposes. The approximate locations of the borings are shown on Plates 1 through 4 and the logs are presented in Appendix B.

NMG also advanced 43 CPT soundings (CPT-1 through CPT-18, and CPT-20 through CPT-44) to depths of up to 86.4 feet bgs. CPT-19 was not performed due to access restrictions and existing utility conflict. NMG used the continuous CPT data for identifying the soil stratigraphy and for

evaluating liquefaction, and seismic and static settlement potential. Seismic cones were used on CPT-7, CPT-17, CPT-32, and CPT-41 to collect shear-wave velocities at 10-foot intervals down to 67, 86, 67, and 76 feet, respectively. We were planning to measure the shear wave velocities to depths of 100 feet, but were not able to due to shallower refusal. The approximate locations of the CPT soundings are shown on Plates 1 through 4. CPT logs and shear wave velocity measurements are presented in Appendix B.

The borings and CPTs were backfilled with bentonite grout and/or neat cement. The only exceptions are in a few shallow borings where groundwater was not encountered, these borings were backfilled with cuttings. The borings and CPTs in the parking lot were capped with an asphalt patch where drilled within pavement areas.

2.6 Laboratory Testing

We performed laboratory testing on representative samples of onsite soils collected during our field exploration to characterize their engineering properties. Laboratory tests performed on selected relatively undisturbed and bulk soil samples included:

- Moisture content and dry density;
- Grain-size distribution;
- Atterberg limits;
- Direct shear (undisturbed and remolded samples);
- Consolidation;
- Soluble Sulfate;
- Expansion Index;
- R-Value;
- Permeability testing; and
- Maximum dry density and optimum moisture content.

Laboratory tests were conducted in general conformance with applicable American Society for Testing and Materials (ASTM) standard test methods. Laboratory test results for this study are provided in Appendix C. In-situ moisture content and dry density data are included on the geotechnical boring logs (Appendix B).

3.0 GEOTECHNICAL FINDINGS

3.1 Geologic Setting and Soil Mapping

The site is located within the Peninsular Range Geomorphic Provence of southern California. This province is characterized by a series of northwest trending mountain ranges, separated by northwest trending faults. The area is underlain by sedimentary deposits of Eocene-, Pliocene-, Pleistocene-, and Holocene- age. The site is located near the San Diego embayment, which is characterized by marine, lagoonal and non-marine deposits.

The golf course is located in a wide alluvial valley referred to as Mission Valley, along the lower reaches of the San Diego River, approximately 4 miles inland from the coastline (Pacific Ocean). The river valley is broad in this location with hillsides to the north and south extending up to higher mesas. The valley was down cut significantly in the past during a time of low sea level, as evidenced by the deep alluvium to elevations of nearly minus 80 feet (below current day sea level). As sea level has fluctuated during the late Quaternary era, several levels of alluvium have been deposited and then eroded so that there is older alluvium underlying the younger Holocene-age alluvium and there are older river terrace deposits remaining along the northern side of the canyon.

Based on soil mapping by the U.S. Department of Agriculture (USDA), the near-surface soils over the low-lying portions of the site are comprised of Tujunga sand. This material is generally granular and subject to erosion. Soils along the northern, higher elevations of the site are mapped as the Huerhuero-Urban land complex. These soils are formed on marine terraces and consist primarily of clayey loam and sandy loam.

3.2 Earth Units

The earth units encountered in our borings include young alluvium, older alluvium, river terrace deposits and bedrock, which is believed to be the Scripps Formation. Artificial fill associated with golf course use overlies these native deposits. The earth units that were encountered are described below, in the order of oldest to youngest. The approximate limits of these earth units are shown on the Updated Geotechnical Map (Plates 1 through 4) and Cross-Sections (Plates 6 through 8).

Bedrock: Our original report (NMG, 2017) included the older geologic mapping by Kennedy (1975) and is included herein as Figure 2A. We have reviewed the more recent mapping by California Geological Survey (CGS) and the U.S. Geological Survey (Kennedy and Tan, 2008). This new mapping is presented on Figure 2B. The 2008 map shows the onsite geology essentially the same as the prior mapping by Kennedy (1975). However, some of the geologic mapping has changed to the north of Friars Road. The bedding attitudes to the north of the site were modified, but the bedding still generally strikes north and dips 5 to 7 degrees east.

The previously mapped Bay Point Formation, as shown on Kennedy (1975) to the northwest of the site, is now mapped as the Nestor marine terrace deposit (Qop6), which also indicates this unit is about 120,000 years old with basal elevations of 33 to 72 feet msl. Therefore, we conclude that a different bedrock formation, other than the Bay Point Formation (NMG, 2017), underlies the site at depth. The very dense sandstone bedrock encountered in some of the borings may be another bedrock unit, such as the Scripps Formation (Tsc). The previously published boring logs in

Appendix B may indicate the Bay Point Formation and the newer boring (B-29), the Scripps Formation. This bedrock will not be encountered during future grading or construction. The change in formation name does not impact our geotechnical evaluation and analysis.

Bedrock was encountered at depth below the terrace deposits or alluvium in borings drilled by NMG, including B-5 drilled near Friars Road, B-24 drilled near the clubhouse, and B-29 drilled in the western portion of the Central District. Borings SB-4 and SB-102 drilled by others in the northeast portion of the site were also excavated deep and encountered bedrock below the alluvium. The bedrock consists of yellow brown to dark gray silty fine to medium sandstone that is very moist and dense. The bedrock in our Boring B-5 had abundant bivalve shell fossils.

River Terrace Deposits (Qtr) were encountered throughout the northern central portion of the site within much of the North District and a portion of the Central District and were encountered in Borings B-2, B-4, B-5, B-6, B-7, B-8, B-20, B-23 and B-24. The limits of these deposits are shown on Plates 1 and 2 and were defined by the density and composition of the materials, higher ground elevations, and review of historic aerial photographs prior to development in the area. Others have identified this earth unit as older alluvium. This earth unit is mapped as general alluvium by CGS (Figures 2A and 2B). However, due to the density and the cemented and/or cobbly nature of the materials, we opted to designate these materials as river terrace deposits. However, due to the proximity to the ocean, the terrace deposits are likely a mixture of terrestrial and shallow marine sourced material.

The river terrace deposits were typically dense to very dense and consisted of reddish-brown to yellowish-brown silty and clayey fine to coarse-grained sand that was moist and very dense. Fine to coarse subrounded gravels and cobbles were present throughout this unit. The drill and CPT rigs had refusal in most borings in the terrace deposits at depths of 12 to 30 feet deep. We were able to drill one boring (B-5) to a depth of 61 feet; however, the auger was broken from the drilling stem and the rig was down for four days to repair. This deeper boring encountered bedrock below the river terrace deposits. Bedrock is believed to underlie the river terrace deposits throughout most of this mapped unit.

Older Alluvium (Qalo) was encountered at depth (between 50 and 75 feet deep) in several of our borings (B-3, B-12, B-13, B-14, B-15, B-17, B-21, B-22 and B-28) below the younger alluvium (see cross-sections on Plates 6 through 8). This older material varied in composition from sandy silt, silty sand, and gravelly sand that was generally denser than the overlying younger alluvium.

Alluvium (Qal) was the most prevalent earth unit throughout the site. Alluvium was encountered to the bottom of Borings B-1, B-3, B-9 through B-27, P-1 and P-2. Alluvium underlies the majority of the site to depths of 50 to 90± feet bgs. The alluvium consists of loose to medium dense fine-grained clayey sand, silty sand and clean sand that is highly micaceous. In the western portions of the North and South Districts (Borings B-1 and B-15), there are layers of dark gray sandy clay near and below sea level elevation (-5 to -35 feet msl), that have numerous gastropod shells. These interlayers are believed to be estuary muds that were deposited during ancient times of low sea level. There are also few local layers of gravelly sand in the alluvium. The younger alluvium is underlain by older alluvium, terrace deposits and/or bedrock.

Artificial Fills: There are several different generations of artificial fills on site, including the undocumented fill and three generations of compacted fill. Shallow undocumented fills **(Afu)** on the order of 2 to 15 feet thick associated with the golf course contour grading exists within most of the site. We understand that the golf course has been regraded several times over the past 70 years. During grading of the golf course clubhouse, parking lot, entry street and bridges, compacted fill **(Af_L)** was placed under the observation and testing of Leighton and Associates (2001). We obtained the report for this grading, but it did not have a map showing the limits of fill, and therefore, the limits shown on Plate 1 are considered approximate. Around the same time period, fill materials **(Aft)** were placed across the site for construction of the trolley improvements. The report documenting the trolley grading was not obtained, this fill was mapped based on contours and appears to be a compacted fill berm with slopes up to 25 feet high along the sides of the tracks. The fills generally consist of medium dense silty or clayey sand, with significant amounts of gravel and cobble, locally.

The compacted fill encountered in the northeast portion of the site **(Af)** and within the eastern pad on the North District (encountered in Borings B-9, P-2, CPT-15 through CPT-18), consisted of silty and clayey sand with local gravel and cobbles. This fill was compacted to a minimum 90 percent relative compaction under the geotechnical observation and testing of Shepardson Engineering (2001). This fill extended to depths of up to 20 feet and was generally dense, except for the upper 1 to 2 feet that was weathered and dry.

3.3 Groundwater and Surface Water/Flood Potential

Groundwater: The subject site lies within the Mission Valley Groundwater Basin, in the east-west trending valley drained by the San Diego River. The primary source of groundwater recharge to this basin is the infiltration of the river flow and golf course irrigation. There are two groundwater wells located in the eastern portion of the site, Well-1 and Well-2, just south of the river, which have been historically used for irrigation of the golf course. Based on prior studies, Well-1 was being pumped at rates of 575 gallons per minute (Worley Parsons, 2013) and is slightly brackish. This water is supplemented by cleaner domestic water. Approximately 500,000 gallons of water per day is reportedly used for irrigation of the golf course during dry periods.

Groundwater was encountered during drilling of borings into the alluvium. Groundwater was encountered at depths of 5 to 10 feet bgs near the river and between 10 and 25 feet bgs away from the river. Across the site, groundwater varied in elevation from approximately 6.0 feet msl to 15.0 feet msl in the alluvium.

Borings B-6, B-7 and B-8 drilled into the dense river terrace deposits to depths of up to 26.5 feet did not encounter groundwater. This is most likely due to the higher ground elevations and shallow refusal depths. Boring B-5 was drilled through the terrace deposits in which the groundwater was encountered at 47 feet bgs, at an elevation of 11 feet msl. Groundwater was also encountered in Borings B-2 and B-4 drilled into the terrace deposits at depths of 11 and 25.6 feet (elevations of 14 and 6 feet msl), respectively.

The groundwater table fluctuates both seasonally and annually. Based on review of available GeoTracker data along Friars Road, groundwater levels have been monitored over the past several years and were found to fluctuate depending upon the season and annual rainfall. Groundwater

ranges from 22 to 35 feet deep to the east, near the intersection of Friars Road and Fashion Valley Road. Groundwater was found to fluctuate up to 3 feet, recorded quarterly between 2003 and 2009. Also, based on review of onsite boring data drilled over the years, the groundwater appears to vary 3 to 4 feet from high to low levels.

Surface Water and Flood Potential: Based on U.S. Federal Emergency Management Agency mapping (USFEMA, 2012), a large portion of the site is delineated as a Special Flood Hazard zone and is subject to inundation. This zone is subject to 1 percent annual chance flood (100-year flood), also known as the base flood. This zone covers small portions of the North District, large portions of the Central District except those underlain by river terrace deposits, and all of the South District. Development in these zoned areas are planned to be raised above flood level elevations of 24 feet msl at the west end of the site, to nearly 30 feet msl near the east end.

There are numerous accounts of the area being flooded dating back to the 1800s. Coastal San Diego County is subject to sudden and severe floods. Mean seasonal precipitation varies with elevation from about 10 inches along the coast to 35 inches in the mountains. As recently as 2010, there was a 100-year flood event that covered most of the golf course south of the trolley line. This flood was well documented with photographs.

During our most recent investigation in 2019, there were several heavy rain events during which the San Diego River overtopped the river bank, flooding the lower elevation portions of the golf course and creating temporary water features in the western portion of the site.

3.4 Regional Faulting and Seismicity

Faulting: There are no major or active faults mapped at the subject site by NMG or others. The site is not located within a fault-rupture hazard zone as defined by the Alquist-Priolo Special Studies Zones Act (CGS, 2018) or within an active or potentially active fault zone defined by the City of San Diego (2008).

There are several regionally active faults that could produce an earthquake that results in ground shaking at the site. The closest seismically active faults are the north-south trending Rose Canyon Fault located 1.75 km (approximately 1 mile) to the west and the Coronado Bank Fault located 22 km west (offshore), as shown on Figure 3 (Jennings and Bryan, 2010). Based on the USGS Deaggregation program (USGS, 2017), the Rose Canyon Fault is the controlling fault for seismic design. The Rose Canyon Fault is mapped within a Fault Rupture Hazard zone as defined by CGS, to the north and south of Mission Valley, but not across Mission Valley. The other regionally active, more distant faults that could produce ground shaking at the site include, but are not limited to, the Elsinore, San Jacinto, and San Andreas Faults.

Seismicity: Properties in southern California are subject to seismic hazards of varying degrees depending upon the proximity, degree of activity, and capability of nearby faults. These hazards can be primary (i.e., directly related to the energy release of an earthquake such as surface rupture and ground shaking) or secondary (i.e., related to the effect of earthquake energy on the physical world, which can cause phenomena such as liquefaction and ground lurching). Since there are no active faults at the site, the potential for primary ground rupture is considered very low. The

primary seismic hazard for this site is ground shaking due to a future earthquake on one of the major regional active faults listed above.

Using the USGS computer program (USGS, 2017) and the site coordinates of 32.7653 degrees north latitude and -117.1794 degrees west longitude, the controlling fault for the site is the Rose Canyon Fault, with the maximum moment magnitude of 6.8 M_W.

Based on CPTs by NMG and others, the average shear wave velocity of the underlying soils up to 87 feet bgs varies from 600 to 800 feet per second (ft/sec) in alluvium, and up to 1,400 ft/sec in the dense river terrace deposits. Per the 2016 CBC, the underlying soils may be classified as Site Class D.

Secondary Seismic Hazards: The City of San Diego Seismic Safety Study, Geologic Hazards and Faults dated April 3, 2008 (City of San Diego, 2008) has mapped the alluvium in the valley as having a high potential for liquefaction, based on "shallow groundwater" in "major drainages" (Figure 4). Based on this document, a geotechnical investigation is required to evaluate the potential for liquefaction in accordance with California Building Code and State Guidelines. Liquefaction is discussed in detail in Section 3.7.

The potential for other secondary seismic hazards, such as tsunami and seiche, are considered very low, as the site is located away from the ocean and is at an elevation of 16 feet or higher above msl. The project is located outside of the mapped tsunami inundation zones (CGS, 2009). The site is not located adjacent to a confined body of water; therefore, the potential for seismic hazard of a seiche (an oscillation of a body of water in an enclosed basin) is considered very low.

3.5 Laboratory Testing and Soil Properties

Laboratory tests performed on selected relatively undisturbed soil samples include in-situ moisture content and dry density, grain-size distribution, Atterberg limits, consolidation and direct shear. Laboratory tests performed on selected bulk samples include maximum density and optimum moisture content, grain size distribution, Atterberg limits, permeability, R-value, expansion index and soluble sulfate content. Laboratory tests were conducted in general conformance with applicable ASTM International standards and the results are presented in Appendix C. In-situ moisture and dry density results are included on the geotechnical boring logs (Appendix B).

The onsite alluvium predominantly consisted of silty, clayey and clean sands with moisture contents and dry densities ranging from 3.4 to 54.5 percent and 76.2 to 123.7 pounds-per-cubic-foot (pcf), respectively. Blow counts in this material varied from 5 to 100+ blows per foot. Interlayers of sandy silt and silty clay were also encountered in the borings, with moisture contents and dry densities ranging from 16.6 to 48.0 percent and 71.9 to 111.0 pcf, respectively, with blow counts in the range of 2 to 42 blows per foot. Both the sandy and fine-grained material encountered were generally moist to wet above the groundwater table, and saturated below.

The older alluvium and river terrace deposit materials generally consisted of gravelly, silty and clayey sands that have higher density and lower moisture than the younger alluvium. Moisture contents and dry densities varied from 3.4 to 54.5 percent and 71.6 to 144.5 pcf, respectively, with

blow counts varying between 19 to 100+ blows per foot. These materials were generally moist to very moist above and saturated below the groundwater table.

Moisture contents within bedrock ranged from 15.6 to 32.6 percent and dry densities ranged from 101.4 to 110.4 pcf, with blow counts between 75 and 100+ blows per foot.

Grain Size Distribution: Grain-size distribution tests were conducted on 64 bulk and/or ring samples. Of these samples, 32 samples were classified as poorly or well-graded sands with fines contents (passing Sieve No. 200) of 12 percent or less (USCS classification of SW, SP, SW-SM, or SP-SM). Twenty-four of the samples were classified as silty or clayey sands with fines contents in the range of 16 to 44 percent (USCS classification of SM or SC). Eight of the samples were classified as sandy silts and clays (USCS classification of ML, CL, and CH) with fines contents in the range of 59 to 82 percent.

The Atterberg limits test was performed on 17 samples. The samples had liquid limits in the range of 29 to 53 percent and plasticity indices in the range of 14 to 35. Eight samples were non-plastic.

Maximum Density and Optimum Moisture Content: The results of the maximum dry density testing indicate that the near-surface soils, at depths of 0 to 5 feet, have maximum dry densities ranging from 107.0 to 129.0 pcf with optimum moisture contents of 9 to 14.0 percent.

Consolidation: The consolidation test results indicate relatively low consolidation potential for the onsite native silty sand and sandy soils. Some of the more clayey and silty layers had moderate consolidation potential; however, these layers are relatively thin and not continuous. Also, the soils had collapse potential of less than 0.67 percent and swell potential of less than 0.1 percent upon addition of water at 1.6 and 3.2 kilo pounds per square foot (ksf).

Shear Strength: Direct shear testing was conducted on five relatively undisturbed ring samples and two remolded samples in order to evaluate the strength properties of the subsurface materials at the site. The direct shear test results on the undisturbed sandy soil samples indicate ultimate internal friction angles of 28 to 32 degrees with cohesions of 0 to 100 pounds-per-square-foot (psf). The samples have peak internal friction angles of 31 to 42 degrees with cohesions of 0 to 300 psf. The direct shear test results on the remolded poorly graded sand samples indicate ultimate internal friction angle of 28 and 29 degrees with a cohesion of 100 and 50 psf, respectively. The remolded samples had peak internal friction angles of 27 and 28 degrees with cohesions of 200 and 100 psf, respectively.

R-Value: One sample collected near-surface in Boring B-1 had an R-value of 6. Laboratory testing by others (Geocon, 2003 and Group Delta, 2014a and 2015) had R-values ranging from 11 to 75.

Expansion Potential: Our laboratory test on near-surface soil samples indicates expansion indices varying from 0 to 54, which indicates an expansion potential in the "Very Low" to "Medium" range. Prior laboratory testing (Geocon, 2003, and Group Delta, 2014a and 2015) on soil samples taken at the subject site, obtained expansion index values that varied from 0 to 23, which indicate expansion potential in the "Very Low" to "Low" range in accordance with ASTM D4829 test method.

Soluble Sulfate: Laboratory testing of the soil samples by NMG and others (Geocon, 2003 and Group Delta, 2014a and 2015), indicates that the soluble sulfate exposure of onsite soils are classified as "S0" to "S1" per Table 19.3.1.1 of ACI-318-14. Also, based on review of the previous laboratory test data by others (Leighton, 1997, Geocon, 2003 and Group Delta, 2014a and 2015), the onsite soils are considered to be corrosive to severely corrosive to ferrous metals.

Shrinkage and Bulking: Based on the laboratory test results, we anticipate that the river terrace deposits will bulk on the order of 1 to 5 percent and the alluvium will shrink on the order of 5 to 15 percent when excavated and recompacted to 90 percent relative compaction. Excavation and recompaction of the existing fills are anticipated to vary from 2 percent shrinkage to 2 percent bulking. The amounts are preliminary at this point and should be further evaluated during future investigations and earthwork studies.

Permeability Testing: As part of the permeability evaluation, grain-size distribution tests were conducted on seven selected samples collected within the relatively sandy alluvium. The fines content (passing No. 200 sieve) varied from 4 to 64 percent.

Maximum density and optimum moisture content testing was performed on three near-surface (upper 5 feet) bulk samples in order to remold samples to 90 percent relative compaction, representative of the future compacted fill. The samples had maximum dry density and optimum moisture contents ranging from 107 to 127.5 pcf and 10 to 14 percent, respectively.

These three bulk samples were compacted to approximately 90 percent of the maximum dry density to simulate compacted fill. Permeability testing was then performed on these three compacted samples for evaluation of shallow fill materials with respect to storm water infiltration. One sample (Boring B-27, Sample B-1) was tested per ASTM D-2434, due to its low fines content. Two additional samples (Boring B-19, Sample B-1 and Boring B-26, Sample B-1) were over the 10 percent fines criteria (per ASTM D-2434) and were tested per ASTM D-5084. Based on the results of these tests, the hydraulic conductivity (permeability) was found to range from 0.027 to 1.01 inches per hour.

Available laboratory test results from reports of previous investigations by others are also included in Appendix C, including Woodward Clyde (1975), Leighton and Associates, Inc. (1995 and 1997), Shepardson (1998 and 2003), Geocon (1998 and 2003), and Group Delta (2014a and 2015).

3.6 Slope Stability

Permanent Structural Slopes: There are planned 2H:1V fill slopes up to 20 feet high in the Central and South Districts. These slopes are underlain by alluvium and shallow groundwater. The alluvium is potentially liquefiable and is subject to lateral spread. We have performed preliminary slope stability analysis considering static, seismic induced liquefaction (strength loss), and liquefaction-induced post-seismic flow conditions. The proposed slopes are considered stable under static conditions, with a factor-of-safety greater than 1.5, provided the remedial grading recommendations included in this report are implemented during grading of the site. However, as discussed previously, ground improvement will need to be performed for these structural slopes in order to address the seismic induced lateral spread and flow conditions as a result of liquefaction. Using a design peak ground acceleration of 0.37g (2/3 of Mapped MCE Geometric Mean Peak

Ground Acceleration) and considering the layers with strength loss as a result of liquefaction, our preliminary assessment is that ground improvement on the order of 50 feet below the toe of the slopes will be necessary to provide adequate factor of safety (greater than 1.0) under a strong shaking event. Ground improvement is anticipated to significantly reduce the potential lateral spread at the site and provide stable conditions and address the flow liquefaction. Our analysis was performed using the data presented on Cross-Section 7-7'. A more detailed evaluation and additional analysis will need to be performed at the design level study.

Permanent Park Slopes: There are minor slopes planned in the river park, generally less than 15 feet high and at inclination of 3H:1V or flatter. These slopes are considered grossly stable. The slopes are subject to erosion during flooding; however, we understand they will be landscaped or planted with vegetation for protection.

Temporary Slopes: Temporary excavations will expose varying earth materials, including compacted fill, undocumented golf course fill, alluvium and terrace deposits. Many of the planned excavations will be made during remedial grading and are anticipated to be up to 20 feet high and most will extend down to near the groundwater table. The temporary slopes exposing compacted fill or river terrace are anticipated to be more stable and may be cut at angles of 1H:1V. Temporary slopes in alluvium are anticipated to be subject to slope failure especially if groundwater and/or clean sands are encountered. Several 40-scale cross-sections were prepared around the perimeter of the site and next to the trolley line to show the existing conditions and the temporary slopes needed during remedial grading. We have analyzed the temporary slope stability associated with the remedial removals and grading as shown on Cross-Section 15-15'. This cross-section represents the highest temporary cut slope below the trolley line. Our analysis indicates that for the temporary conditions, the slopes associated with grading and remedial removals next to the trolley line will have a minimum factor-of-safety of 1.37. The slope stability analysis is included in Appendix D of this report.

Temporary slopes should be excavated at slope angles as shown on the cross-sections. The excavations for remedial grading below the trolley fill embankments, including the ones for the proposed bridge and Friars Road, will need to be evaluated closely prior to and during grading. Shoring and other methods of slope stabilizations should be evaluated at the design level study.

Some of the building excavations are anticipated to expose compacted fill, trolley fill and lesser amounts of native soils (terrace and alluvium). These excavations are believed to be above the groundwater table. Where the perimeter building excavations cannot be laid back to 1H:1V in the terrace and fill or 1.5H:1V in the alluvium, the excavations will need to be shored. Some of these excavations are close to the existing roads, trolley, utilities, and other existing improvements. Shoring should be designed for minimal lateral movements. Monitoring of the adjacent improvements should be considered prior, during, and at the completion of excavation and backfill.

3.7 Liquefaction Analysis and Seismic Settlement/Lateral Spread

General Discussion: Liquefaction is a phenomenon in which earthquake-induced cyclic stresses generate excess pore-water pressure in low density (loose), saturated, sandy soils and soft silts below the water table. This causes a loss of shear strength and, in many cases, ground settlement. For liquefaction to occur, all of the following four conditions must be present:

- There must be severe ground shaking, such as occurs during a strong earthquake.
- The soil material must be saturated or nearly saturated, generally below the water table.
- The corrected normalized standard penetration test (SPT) blow counts (N_1) or the CPT tip resistance (Q) must be relatively low.
- The soil material must be granular (usually sands or silts) with, at most, only low plasticity. Clayey soils and silts of relatively high plasticity are generally not subject to liquefaction.

There are four possible adverse consequences of liquefaction of sandy soil layers that are addressed below:

- Liquefaction-induced settlements;
- Loss of bearing and other disruptions of the ground surface (sand boils);
- Lateral spreading; and
- Global slope instability due to flow liquefaction or lateral spread.

Based on the County of San Diego Guidelines for Determining Significance of Geologic Hazards (2007), liquefaction is not known to have occurred historically in San Diego County, although has occurred in the Imperial Valley in response to earthquakes with a magnitude of 6 or higher. Historically, seismic shaking levels within the County have not been sufficient to trigger liquefaction. Based on mapping by the City of San Diego, the site lies within a potential liquefaction area (Figure 4).

Investigation and Analysis: The liquefaction potential at the site was assessed based on 43 CPTs (CPT-1 through CPT-18 and CPT-20 through CPT-44). The nearby hollow-stem auger borings as well as the prior data included in the reports by others were utilized to verify the empirical soil material descriptions presented on the CPT logs.

Our liquefaction potential assessment was performed using the computer program CLiq version 2.2.0.18 developed by Geologismiki which provides results and plots of the calculations. The liquefaction potential analysis is performed using the Robertson (2009) method. We also implemented the depth weighting factor for calculation of the equivalent volumetric strain of the soil profile included in the program and per the study by Cetin, et. Al. (Cetin, 2009). The program provides the basic CPT data interpretation through final plots of factor of safety, liquefaction potential index and post-earthquake displacements including vertical settlement. The design groundwater levels used are shown on the liquefaction analysis included in Appendix F.

Laboratory testing consisting of grain size distribution and Atterberg limits was performed to verify the classification of soil materials at locations where misclassification of soil types from CPTs was suspected. Soil materials were collected through hollow-stem auger borings. The liquefaction potential of the onsite soils was estimated based on a site peak ground acceleration of 0.55g and a maximum earthquake magnitude of 6.8, as determined in our site seismicity analysis discussed in Sections 3.4 and 4.17.

Based on the results of our analysis, the liquefaction potential at the site is considered moderate. In general, the potentially liquefiable soil layers consist of younger alluvial soils that were

deposited at the site during the meandering of the San Diego River and during the flooding events as discussed in Section 3.3. The liquefiable layers generally range from 0.5 to 2.5 feet thick and locally up to 10 feet thick. The shallower liquefiable layers at the site have lower shear strength loss from liquefaction. Our analysis will need to be updated at the design level investigation and once the project plans are available. In general, lowering the design elevations (less fill thickness) may result in higher seismic settlements near-surface.

Seismic Settlement: The results of our analysis indicate that the liquefiable layers in the alluvium, when subjected to the high ground accelerations of a large earthquake event near the site, will be subject to settlement. Based on our calculations included in Appendix F and discussed further in Section 3.8, the settlement due to liquefaction is anticipated to range from less than one inch to greater than 4.5 inches in the alluvium. Liquefaction settlement of up to 8.0 inches was estimated at the CPT-21 location, which is located in the park in the Central District. Seismic settlement is not anticipated in the river terrace materials, older alluvium, or bedrock.

Loss of Bearing: The potential for loss of bearing was reviewed based on the thickness of the liquefiable layers that will be left-in-place, versus the amount of fill and non-liquefiable alluvium that will overlie the liquefiable soils. Local surface disruptions and loss of bearing strength at the surface are unlikely at the completion of the project since the potentially liquefiable layers will be overlain by thicker, non-liquefiable fill material within the building sites. The recommended ground improvement below the remedial removals will further reduce the potential impacts of seismic induced liquefaction at the site.

Lateral Spread: There is a moderate potential for lateral spread for the design 2H:1V fill slope along the river. With the recommended remedial removals and ground improvements along the proposed design slopes and building pads, we anticipate that the potential for lateral spread will be reduced to an acceptable level.

Flow Liquefaction: The potential for local flow-type failures adjacent to the San Diego River, due to loss of liquefied soil strengths following a large seismic event near the site, cannot be ruled out. Based on our evaluation and analysis, the potential for flow liquefaction at the site is considered to be minor for the structural development once the recommended remedial removals and ground improvements are performed at the site, including the proposed slope areas. This is further discussed in Sections 3.6 and 4.3.6. The proposed ground improvement areas and depths are presented on Plate 5.

3.8 Settlement and Foundation Considerations

The site is generally underlain by three earth units, including the river terrace deposits, alluvium and artificial fill materials that are primarily silty and clayey sand, clean sand and some clay and silt layers.

The computer programs Unisettle by Unisoft Geotechnical Solutions Ltd. (Version 4.0) and CPet-it by Geologismiki (Version 2.0.1.61) were used to calculate the static settlement of the onsite soils under the foundation loads. We calculate less than one inch of consolidation settlement for foundation loads of up to 800 kips and bearing capacity of 2,500 psf for areas underlain by alluvial deposits with no ground improvement, and 4,500 psf for areas underlain by river terrace deposits.

Also, one inch of consolidation settlement is anticipated for the foundation loads of up to 800 kips and bearing capacity of 4,500 psf within alluvial deposits considering ground improvement will be performed as recommended in Section 4.4 of this report.

As discussed previously, the potential for seismically induced settlement as a result of liquefaction was evaluated using Cliq program. Using a peak ground acceleration of 0.55g, a maximum earthquake magnitude of 6.8 Mw, and considering the preliminary design grades, the potential for seismic settlement for various areas, as well as the recommended foundation type for buildings and parking structures, is as follows:

North District: The potential for seismic settlements within the North District are anticipated to vary from 0 within the river terrace deposit area, to up to 3.0 inches within the eastern areas underlain by alluvial deposits with no ground improvement. In the western portion of the North District, the seismic settlement is estimated to be up to 2.0 inches with no ground improvement. With the implementation of ground improvements, as recommended in Section 4.4 of this report, the liquefaction induced settlement is anticipated to be reduced to less than 1 inch throughout the North District.

Central District: The potential for seismic settlement within the Central District is anticipated to vary from 0 within areas of the river terrace deposit, to generally up to 3.5 inches within the areas underlain by alluvial deposits with no ground improvement. Larger seismic settlements, up to 8.0 inches, were calculated at CPT-21 location and the surrounding park areas (CPT-20 through -22). Per our review of the updated grading plan, the proposed building pads are not located within the area with higher seismic settlement potential. When ground improvement is performed as recommended in Section 4.4 of this report, the liquefaction induced settlement is anticipated to be less than 1 inch.

South District: The potential for seismic settlement within the South District is anticipated to generally vary from 2.3 to 3.5 inches with no ground improvement. Larger seismic settlements, up to 7.1 inches, were calculated at CPT-30 within the park area. Per our review of the preliminary grading plan, the proposed building pads are not located within the area with higher seismic settlement potential. When ground improvement is performed, as recommended in Section 4.4 of this report, the liquefaction induced settlement is anticipated to be less than 1 inch.

The amount of expected settlement will also depend partly upon the type of foundation(s) selected. Additional evaluation will need to be performed once the actual design grades, foundation type, foundation loads and layouts are known. The recommended total and differential settlement that should be used for design of building foundations and slabs are discussed in Section 4.6 of this report. In general, post-tensioned or mat foundations should be considered for residential buildings for the areas underlain by alluvium and ground improvement. The parking structures, commercial buildings, hotels, etc., up to seven stories, may be founded on conventional shallow foundations in these areas; however, this should be further evaluated based on actual design loads. Buildings with eight or more stories, or those with large foundation loads, may need to be provided with a combination of mat slab, deeper ground improvements and/or pile foundations.

If no ground improvement is performed in the areas underlain by alluvial deposits, stiffened post-tensioned and mat foundations should be used for residential buildings and parking/commercial structures that have six stories or less, respectively. The foundations should be designed to tolerate the total and differential settlements discussed in Section 4.6 of this report.

Consideration should also be given to ground improvement below the utility lines. Otherwise, the utility lines and connections should be designed to tolerate the higher total settlement discussed in Section 4.6.

Settlement of Existing Sewer, Trolley Line and Perimeter Roads: We have prepared eighteen 40-scale cross-sections for this report, 13 of which involve grading over the 78-inch-diameter trunk sewer line. Cross-Sections 1-1', 4-4', 5-5', and 6-6', and 16-16' do not have any design fill placed over the sewer line, and Cross-Sections 2-2' and 15-15' show design cuts of 12 to 18 feet over the pipeline. Cross-Sections 3-3', 9-9', 10-10' and 11-11' show between 1 to 12 feet of fill planned over the pipeline; however, the pipe is underlain by dense terrace deposits and/or bedrock. Cross-Section 8-8' shows 13 feet of planned fill over the pipeline, with between 23 to 40 feet of alluvium under the pipeline.

Cross-Section 8-8' shows 13 feet of fill over the pipeline and 40 feet of saturated alluvium underlying the pipeline. For purposes of preliminary analysis, up to 60 feet of alluvium was assumed under the pipeline (rather than 40 feet) and the potential total settlement was calculated to be less than 0.75 inches below the sewer pipeline. Please note that this represents a relatively conservative value for settlement and will be refined during the design phase.

The design fills on the north side of the trolley line generally vary between 0 and 15 feet thick within 30 horizontal feet of the trolley easement. Cross-section 7-7' shows the most planned fill next to the northern side of the trolley line. The potential settlement below the existing trolley line associated with this proposed fill is considered minor (0.35 inches under the trolley line). The settlement associated with the proposed trolley line bridge is also anticipated to be minor since the structure will have deep footings. However, the settlement should be evaluated once the plans are prepared and the actual loads are calculated.

Settlement potential of perimeter roads and adjacent buildings is also anticipated to be minor as a result of the proposed grading. The impact to adjacent properties will need to be evaluated during the design phase and once the foundation loads from the proposed structures are calculated. Based on our review of the current project plans, we anticipate little to no settlement impacts to the adjacent properties.

3.9 Erosion Potential

The alluvium at the site is considered highly erodible in cuts exposing sandy soils. The compacted fill and river terrace deposits are subject to less erosion. Sandy fill slopes along the river for the structural development will require additional measures to reduce the erosion and scour potential. See recommendations for ground improvement for these fill slopes in Section 4.4.

Minor cut slopes and excavations are planned in the park areas next to the river that are anticipated to expose fill and/or alluvium. We understand these slopes will be planted with wetlands vegetation and/or turf which will help reduce the erosion potential.

3.10 Rippability

The onsite earth units are anticipated to be rippable with conventional earthmoving equipment. The alluvium is anticipated to be excavatable with scrapers, excavators and backhoes. The river terrace deposits and some of the compacted fills are generally very dense. Terrace deposits may be difficult to rip with bulldozers (D-9 and D-10) and will likely require heavy ripping prior to loading with scrapers.

Test pits could be made with a backhoe/excavator during grading to determine if hard/cemented layers are difficult to excavate. Consideration should then be given to overexcavation of streets to the depths of the deepest utilities in the areas underlain by terrace deposits. Deep overexcavation would help reduce the excavation efforts needed for the utility construction after grading is completed.

3.11 Infiltration Feasibility

General: NMG has performed a planning level evaluation of storm water infiltration feasibility in accordance with the City of San Diego Storm Water Standards (Part 1: BMP Design Manual, City of San Diego, 2017b). The simple feasibility criteria presented in the design manual document state that Full and Partial Infiltration BMPs:

- Shall not be placed at a site with existing fill materials greater than 5 feet thick;
- Shall not be proposed within 10 feet of utilities, structures or retaining walls;
- Shall not be proposed within 50 feet of natural slopes or a distance of 1.5H from graded fill slopes where H is the height of slope;
- Shall not be proposed within 100 feet of contaminated soil or groundwater; or
- Where there are other impairments.

In addition, the design manual indicates that infiltration should not be proposed where the following conditions occur:

- Less than a 10-foot separation between the bottom of the infiltration BMP and the groundwater table or where groundwater mounding could occur;
- The near-surface soils mapped by the USDA have a Hydrologic Group C or D type soil;
- The site has a geotechnical factor where infiltration may increase adverse effects, such as consolidation/collapse, expansive soils, liquefaction, adverse slope stability, potential soil piping, etc.;
- Where infiltration could damage underground utilities and vaults, wires/conduit and above-ground wiring, etc.; and
- Several other issues as listed in Section C.2 of the Design Manual.

The following discussion includes our assessment of infiltration feasibility for areas underlain by different earth units and per the above guidelines.

Areas Underlain by Compacted Fill: For the evaluation of compacted fill, NMG performed the above laboratory testing and the results are included in Appendix C. Hydraulic conductivity was estimated directly from laboratory testing of remolded samples representing future compacted fill. The BMP Design Manual indicates that for purposes of infiltration assessment, saturated hydraulic conductivity and infiltration rate can be assumed to be equal. The laboratory tests indicate that the hydraulic conductivity ranges from 0.027 to 1.01 inches per hour for silty sandy fill compacted to approximately 90 percent relative compaction. Applying a minimum factor of safety of 2, as required, the infiltration rates will be in the range 0.01 to 0.50 inches per hour. In addition, based on our experience with sandy soils, we anticipate the actual relative compaction of the fill (after grading of the site) will be somewhat higher and typically in the range of 90 to 95 percent. The higher relative compaction will result in lower infiltration rates. These infiltration values are below the reliable rates for Full Infiltration BMPs, as discussed in the guideline. Partial Infiltration BMPs would be allowed if there were no other factors. However, other constraints exist and are discussed below:

- The thickness of compacted fill throughout most of the residential and commercial developments will be more than 5 feet;
- Fill will generally be placed to within 2 to 3 feet of the groundwater table in areas of alluvium;
- The buildings and/or lower level parking may be subterranean and potential infiltration near these buildings could produce long-term seepage and drainage problems; and
- There may be numerous retaining walls and utilities placed around and beneath the buildings and roadways.

Areas Underlain by River Terrace Deposits: The terrace materials in the northern portion of the site are dense, consolidated/cemented, and a mixture of cobbles and fine-grained matrix. During drilling, it was difficult to drive a sampler to collect in-situ samples and samples typically had high blow counts for only a few inches of recovery. The drill rig often encountered refusal at shallow depths (10 to 20 feet deep). Infiltration rates in these types of material are anticipated to be very low.

The USDA soil mapping for the topsoil overlying the terrace deposits is also the Huerhuero-Urban land complex, which is classified as hydrologic group Type D (USDA, 1973). Our field exploration confirms that this unit generally consists of silty and clayey sandy matrix around river cobbles.

Grading and construction issues regarding potential infiltration in areas underlain by terrace deposits include:

- The thickness of compacted fill overlying the terrace deposits will typically be more than 5 feet thick.
- The buildings and/or lower level parking may be subterranean and potential infiltration near these buildings could produce long-term seepage and drainage problems.

- There may be numerous retaining walls and utilities placed around and beneath the buildings and roadways.
- Due to the difficulty of drilling into the terrace deposits, field testing and installation of dry well infiltration BMPs would be very difficult to implement.

Areas Underlain by Alluvium: The natural soils overlying the alluvium throughout the remainder of the site are mapped as the Tujunga sand and are classified as hydrologic group Type A (USDA, 1973). Grain size test results indicate that the material may be permeable and potentially acceptable for infiltration BMPs. We understand that during the mid-1990s, fill was imported during regrading of the golf course. Throughout much of the golf course, the upper 1 to 10 feet is composed of imported compacted fill from off-site sources (University of San Diego and I-15 near University Drive). This material is generally finer grained and is believed to reduce the overall infiltration of the native soils.

Within the residential and commercial development areas, remedial removals will extend to just above the groundwater table. In addition, ground improvements (such as geopiers, soil mixing or stone columns) will be installed into the saturated alluvium below the proposed building areas (see Plates 5 through 8).

There is also a significant potential for liquefaction of the alluvium throughout the site. Infiltration into the alluvium may raise the groundwater table locally, which may increase the potential for liquefaction and seismically induced settlements.

In the park areas, we understand that the proposed grading will level out the existing contoured mounds, resulting in approximately 4 to 8 feet of fill over the park site. Since groundwater is shallow in this area, potential infiltration BMPs would have less than the required 10 feet of separation between the bottom of the BMP and the groundwater table. We anticipate that the majority of the park area will continue to be irrigated and some of the applied water will infiltrate down through the shallow fill and into the alluvium.

4.0 CONCLUSION AND PRELIMINARY RECOMMENDATIONS

4.1 General Conclusion and Recommendation

Based on our study, the site is considered geotechnically suitable for the proposed mixed-use development provided the preliminary geotechnical recommendations in this report are implemented during design, grading and construction. The information and recommendations provided herein merge those of the prior geotechnical reports (NMG, 2017 and 2018) and also address the geotechnical review comments prepared by the City of San Diego during the MIR process. This report should serve as the geotechnical appendix for the project EIR.

The majority of the recommendations below are based on development in the three areas per the updated grading plan. The recommendations for ground improvement are depicted on the Preliminary Remedial Measures and Ground Improvement Map (Plate 5). Geotechnical observation/testing and mapping during grading is essential to verify the anticipated conditions and evaluate the recommended remedial design measures. The recommendations in this report are considered minimum and may be superseded by more restrictive requirements of others. These preliminary recommendations will need to be confirmed and updated as necessary during the design phase and through additional geotechnical investigation, testing and analysis.

4.2 Earthwork and Grading Specifications

General: Grading and excavations should be performed in accordance with the City of San Diego Grading Procedures and Regulations and the General Earthwork and Grading Specifications in Appendix G. Clearing and grubbing of the site should include removal of pavement and concrete, turf, landscaping, miscellaneous trash and debris, and disposal of this deleterious material offsite. After removals and overexcavation, the bottoms should be scarified and moisture-conditioned prior to placement of fill. The fill should be placed in nearly horizontal loose lifts less than 8 inches in thickness, moisture-conditioned and compacted to a minimum relative compaction of 90 percent (per ASTM D1557). The fills placed against ground sloping more than 5H:1V should be keyed and benched into competent material as the new fill is placed. Heavy benching is recommended into the existing slopes to expose competent materials prior to placement of new fill.

Onsite soil materials are considered suitable to be used as fill materials below the building slabs and footings. The soils should be mixed to provide a uniform blend of material.

We understand that import material will be needed for grading of the site. The soil engineering properties of imported soil should be evaluated to determine if any of the recommendations provided herein will need modification.

Fill Compaction within the Flood Zone: A comment by the City reviewer stated that the fill placed to create building pads within a Special Flood Hazard Area must be compacted to 95 percent of the maximum density obtained with the Standard Proctor Test fill method, per the ASTM D-698.

Fill placed and compacted to 90 percent relative compaction per ASTM D-1557 (Modified Proctor) as recommended, is considered equivalent to, if not denser, than fill compacted to 95

percent of the maximum density obtained with the Standard Proctor Test (ASTM D-698) considering the nature of the onsite soils. Also, since the park will be in the flood zone, the removal bottom should be scarified and recompacted prior to placement of fill and the surface of the cut areas should also be scarified, moisture-conditioned and recompacted. Thus, it is our geotechnical opinion that fills placed in accordance with our recommendations (NMG, 2017) is suitable for the intended use in the flood zones. Structural fill slopes within the flood zone will also be provided with erosion protection that will satisfy the applicable agency(s). Please note that these recommendations were approved by the City previously.

4.3 Remedial Grading and Slope Stabilization

4.3.1 Removals in Structural Areas

Unsuitable earth materials should be removed prior to placement of compacted fill. Unsuitable materials at the site include undocumented fills, weathered compacted fill, loose and collapsible alluvium, and weathered river terrace materials. In general, estimated removal depths vary from 2 to 20 feet across the site. The minimum removals would be in areas of existing compacted fill that is degraded and has dried out near-surface. The undocumented golf course fills are estimated at 3 to 15 feet thick and should be entirely removed. The weathered compacted fill, native alluvium and river terrace materials should be removed down to competent native materials prior to fill placement.

In order to reduce the depths of ground improvements in areas underlain by alluvium, remedial removals should be made down to 2 to 3 feet above the groundwater, or where the native soils under the scrapers start pumping on the removal bottom. If the removal bottom exposes disturbed, soft and saturated alluvium, a layer of granular materials, gravel or geofabric may need to be placed in order to provide a workable condition prior to installation of ground improvements (Section 4.4) or placement of compacted fill. The Preliminary Remedial Measures and Ground Improvement Map (Plate 5) shows the anticipated elevations of removal bottoms extending to near the groundwater table. These grading recommendations are based on the understanding that a grading alternative is usually more cost effective than additional depths of ground improvement. The depths of the removals and ground improvements are consistent with the recommendations in our prior reports (NMG, 2017 and 2018) and as shown on the Preliminary Remedial Measures and Ground Improvement Map (Plate 5); however, they may be subject to revision once the building size, type, and location are determined.

Rough grading in areas underlain by river terrace deposits should remove the overlying undocumented fill and weathered terrace deposits. The undocumented golf course fill should be completely removed. The upper 5 to 10 feet of the weathered terrace deposits should be removed prior to placement of compacted fill. In areas of planned cut where river terrace is exposed, there should be a minimum 3-foot overexcavation below finish pad/floor grade to provide a uniform fill cap under the lots and building slabs. Where proposed building foundations or utilities are deeper than 3 feet, deeper overexcavation should be considered in order to facilitate foundation and utility excavations with a backhoe.

The eastern-most portion of the North District has 12 to 20 feet of compacted fill that was placed between 1998 and 2000 (Shepardson, 2001). At minimum, the upper 2 feet of this fill material is dry and degraded and should be removed and replaced as compacted fill prior to placing additional fill. Within the building footprints, this fill will be removed to install the ground improvements, unless the buildings are designed to accommodate the potential settlement.

The central portion of the Central District also has existing compacted fill associated with the golf course clubhouse and parking lot that was placed over terrace deposit and alluvium. This fill should be removed down to competent native materials within the proposed structural area. Where alluvium is encountered, the removals should be made to 2 to 3 feet above the groundwater table. Where terrace deposits are encountered, the removals should extend to competent materials. The clubhouse will be protected in-place and removals around this area should be performed with care, protecting the building and its pile foundations.

There is an abandoned sewer line that crosses the North District, as shown on the cross-sections (Plates 6 through 8). In proposed structural and roadway areas, this pipe and associated undocumented backfill materials should be removed and the trench excavation should be backfilled with compacted fill during grading. NMG will review the conditions during grading and provide recommendations for the remaining areas, as needed.

4.3.2 General Grading for the Park

The river park grading will be a general reshaping of the existing golf course, with leveling of many existing mounds to create a natural-looking landscaped area with a network of trails. The majority of the park grading will be cut with some fill areas. Planned slopes within the park are generally low inclination, between 3.5H:1V to 5H:1V and less than 15 feet high. The majority of the park will be considered non-structural, and therefore, remedial grading and ground improvements are not shown for this area (Plate 5). Prior to grading in the park, the turf and vegetation should be removed. In cut areas, the surface should be reprocessed (scarified to a depth of 6 to 8 inches, moisture-conditioned and recompacted). In fill areas, the exposed surface should also be reprocessed prior to placement of additional fill. The reworked fill will need to be compacted to a minimum of 90 percent relative compaction per ASTM D-1557.

Some of the park design grades near the river will extend down to or below the groundwater table. This design cut into undocumented fill and alluvium will be saturated and it is likely that grading in these areas will require specialized equipment/handling (i.e., swamp cats, excavators with top loading, etc.). The excavated materials will need to be dried back or mixed with drier materials prior to placement as compacted fill. We understand these areas will be replanted with wetlands type vegetation or landscaping to help with the erosion potential along the river.

Once the locations of structures within the park are determined, the areas will need to be reviewed and geotechnical recommendations for remedial grading and ground

improvements will be provided at that time. Where concrete trails are recommended, there should be at least 2 feet of compacted fill below the pavement. Where non-habitable structures (such as restrooms) are planned, remedial removals will need to be performed; however, ground improvement may not be needed. Where habitable structures are planned, ground improvement or other mitigation measures should be anticipated.

4.3.3 Limits of Remedial Grading for Structural and Park Areas

The Limits of Remedial Grading are shown on Plates 1 through 5 of this report. The limits extend to the perimeter property lines, street right-of-way lines, and to the trolley easement lines. In the park areas, the limit of remedial grading coincides with the grading daylight line. Locally, the limits extend between 10 and 20 feet (measured horizontally) outside the toe of the structural fill slopes. The cross-sections were updated to highlight the general grading and remedial grading conditions, including the design fill (in green), the recommended remedial removals that will be replaced with compacted fill (in yellow), and the approximate areas of recommended ground improvement (in red).

4.3.4 Staged Grading and Ground Improvements

There are a few areas in the northwest portion of the site where buildings are planned close to the adjacent roadways and trolley line. In these areas, the recommended temporary slopes cannot be excavated to the elevations indicated on Plate 5, to allow the installation of the ground improvements (see Section 4.4) under the buildings. The grading and ground improvements in these areas will need to be installed with staged construction, or shoring would be needed. The ground improvements are shown on the cross-sections (Plates 6 through 8) to be under the building areas, extending to a minimum of 5 feet outside the building edge, and to the recommended elevations shown on Plate 5. The temporary slope excavations will need an additional 5 to 10 feet of horizontal work space at the bottom (toe of slope) to install the ground improvements.

The remedial grading and ground improvement operations may be staged with an increased thickness of ground improvements along the perimeter of the lots as shown on Cross-Sections 1-1', 7-7', 8-8' and 16-16'. Excavations should be made down to a temporary level bench in order to install the ground improvements. Upon the installation of the longer ground improvements, the grading contractor may excavate down to the removal elevation shown on Plate 5, at the recommended slope angles, in order to complete the ground improvements. This staged grading is anticipated to be needed in the northwestern portion of the site and locally below the trolley line easement.

Alternatively, these areas would need temporary shoring installed to complete the remedial grading and installation of the ground improvement. Shoring recommendations are provided in Section 4.12.

4.3.5 Temporary Slope Excavations

In general, temporary slopes needed to perform remedial grading and ground improvement should be excavated as follows:

- Within the compacted fill and terrace deposits, the temporary slopes may be excavated at 1H:1V inclination, as shown on the cross-sections.
- For slopes adjacent to the trolley easement, existing structures, or those within alluvium, the inclination should not be steeper than 1.5H:1V.

Based on our review, the highest temporary slope at 1.5H:1V inclination will be on the order of 40 feet. Slope stability analysis for this condition shows a minimum factor-of-safety of 1.37, which is considered geotechnically acceptable. The temporary slope stability should also be reviewed and approved by the Metropolitan Transit System (MTS) prior to excavation and grading.

These temporary slopes should be mapped by the geotechnical consultant as they are being excavated. They will be open for a period of time in order to install the ground improvements and should also be monitored periodically during that time.

The excavations for remedial grading below the trolley fill embankments, especially those exposing alluvium with shallow groundwater, will need to be evaluated closely prior to and during grading. Excavations located adjacent to existing structures (roadways and utilities) should be reviewed by the geotechnical consultant to evaluate the potential for failure/distress. If evidence of instability (such as ground cracks or failures) is observed, recommendations for additional shoring or other appropriate measures will be provided.

4.3.6 Slope Stabilization

As discussed previously, the proposed slopes, as shown on the preliminary grading plan, are anticipated to be grossly stable under static and pseudo-static loading conditions, provided the remedial removals recommended in this report are performed and the slopes are adequately compacted.

In order to mitigate the potential for flow liquefaction and lateral spread as a result of seismic shaking and seismic liquefaction, ground improvement on the order of 50 feet below the toe of slope will be needed for structural fill slopes adjacent to the river (Plate 5). The ground improvement should, at minimum, consist of 3 to 4 rows of stone columns, geopiers or deep soil-cement mix columns. This will need to be further evaluated during the design level study. Based on conversations with Hayward Baker, deep soil-cement mixing will also provide scour protection along the river.

4.4 Ground Improvement Alternatives

In order to reduce seismic settlement potential within alluvial deposits to approximately 1 inch or less, we recommend that ground improvement be performed below the remedial removal bottoms.

Alternatively, if the slabs and foundation are designed to tolerate the estimated settlement values provided in Section 4.6, ground improvement would not be needed. Ground improvement will need to be provided for the proposed slopes in order to reduce the potential for lateral spread or flow conditions during a strong seismic shaking, and as a result of liquefaction.

The ground improvement recommendations are presented below. Plate 5 shows the depths of improvements below the removal bottom elevations, by area. Ground improvement for the proposed structural slopes is discussed in Section 4.3.6.

North District: The majority of this area is underlain by dense terrace deposits that will not need ground improvement. Remedial grading should be performed as discussed in Section 4.3 and shown on Plate 5. The ground improvements could consist of geopiers, stone columns, drilled displacement columns, deep soil-cement mix or other similar methods. These ground improvements should, at minimum, be performed under the building footprints and extended 5 feet laterally outside the building footprints. The combination of compacted fill and ground improvement will provide an approximately 30-foot-thick zone of compacted and densified materials under the finish grades. Alternatively, if the buildings in the eastern pad have subterranean levels supported on exterior and interior column footings, the ground improvement may be placed directly under the footings. However, this will need to be evaluated during the design phase.

Central District: Ground improvement is recommended below the removal bottoms in alluvium to depths of 20 feet or refusal, whichever is shallower (Plate 5). These ground improvements should be performed under the building footprints and extended 5 feet laterally outside the building footprints. The fill slope near the river will need to have additional ground improvement to mitigate the potential for lateral spread (see Section 4.3.6). No ground improvement will be needed in areas underlain by the river terrace deposits.

South District: Ground improvement is recommended below the removal bottoms in alluvium to depths of 15 feet (Plate 5). These ground improvements should be performed under the building footprints and extended 5 feet laterally outside the building footprints. Commercial buildings that have eight stories or more or those with large foundation loads may need to be founded on piles or provided with a combination of deeper ground improvements and mat foundations. This will need to be assessed as the building plans are developed. The fill slope near the river will need to have additional ground improvement to mitigate the potential for lateral spread (see Section 4.3.6).

Please also note that if the utility lines and connections cannot tolerate the settlements discussed in Section 4.6, the ground improvement should be extended to these areas. This includes the utility lines in all three areas.

4.5 Groundwater Conditions

As discussed previously, the groundwater table across the site is believed to vary in elevation from approximately 6 feet msl to 15 feet msl in alluvial areas. These elevations are based on boring data between 1975, 2015, 2017 and 2019. Groundwater levels are believed to vary 3 to 4 feet both seasonally and annually.

The structural development is being raised above existing ground surface elevations. As a result, the potential finish floor elevations are anticipated to be more than five feet above the groundwater table. Subdrains are recommended below the subterranean finish floor elevations as a precaution and recommendations will be provided during the future design phases.

Groundwater may be encountered during remedial grading in areas underlain by alluvium. We recommend that the golf course irrigation be stopped prior to grading in order to potentially lower the groundwater table. The type of ground improvements utilized should also take into account the groundwater depths and should plan for wet conditions.

Deep utilities or deep excavations for building structures, such as elevator pits, may extend into the groundwater table. Temporary construction dewatering may be needed in these areas and should be evaluated prior to excavation.

Groundwater is anticipated to be encountered during grading in the park areas near the river. Finish grades are locally 2 to 3 feet below the groundwater table. Grading within these areas are discussed in Section 4.3.2.

4.6 Static and Seismic Settlement

4.6.1 Structural Areas

As discussed in Section 3.8, the settlement as a result of fill placement in the areas underlain by river terrace deposits is calculated to be less than ½-inch. Based on our review of the updated grading plan, up to 20 feet of fill may be placed over alluvium. Per our analysis and calculations, we anticipate a total settlement on the order of less than 1 inch as a result of fill placement over alluvium material. The differential settlement is anticipated to be minor and less than half of the total settlements discussed here, over a span of 40-feet.

Using a foundation load of 800 kips, design allowable bearing capacity of 4,500 psf, considering that the remedial removals discussed in Section 4.3 and ground improvement discussed in Section 4.4 are performed, we anticipate that the total and differential settlement combining both static and seismic conditions for the entire site to be on the order of 1 inch and ½-inch over a span of 40-foot, respectively. The foundation and slabs should be designed to tolerate these settlements. Buildings with eight stories or more or those with high foundation loads will need to be founded on piles or, alternatively, a combination of deeper ground improvement, and mat foundations should be provided. The type of foundations will need to be further evaluated at the design level study and once the building plans are developed and the structural loads are calculated.

The following table includes the design total and differential settlements for various areas within the site considering the recommended remedial removals discussed in Section 4.3 are performed with no ground improvement measures. The foundations and slabs for proposed residential, commercial buildings, parking structures, etc. should be designed to tolerate the total and differential settlements shown in the following table, if ground improvement alternative is not performed. The following table does not apply to high rise buildings or those with foundation loads greater than 800 kips, as discussed above.

Foundation Design Settlement with Remedial Removals and No Ground Improvement							
District	Underlying Geologic Unit	Maximum Foundation Load	Maximum Allowable Bearing Capacity	Total Static Settlement	Total Seismic Settlement	Total Design Settlement	Design Differential Settlement (over a 40-foot span)
North	River Terrace	800 kips	4,500 psf	≤ 1"	~ 0	1"	½"
	Alluvium	800 kips	2,500 psf	≤ 1"	≤ 2.0"	3.0"	1.5"
	Fill over Alluvium (eastern pad)	800 kips	2,500 psf	≤ 1"	≤ 3"	4"	2"
Central	River Terrace	800 kips	4,500 psf	≤ 1"	~ 0	1"	½"
	Alluvium	800 kips	2,500 psf	≤ 1"	1.0 to 3.5"	4.5"	2.25"
South	Alluvium	800 kips	2,500 psf	≤ 1"	2.3 to 3.5"	4.5"	2.25"

As discussed previously, the amount of anticipated settlement will also depend on the type of foundation(s) selected. Additional evaluation will need to be performed once the actual design grades, foundation type, foundation loads and layouts are known.

4.6.2 78-Inch Trunk Sewer and Trolley Line

Based on our settlement analysis and as discussed previously, the maximum potential total settlement under the sewer pipeline is on the order of 0.75 inches and below the trolley line is 0.35 inches. The existing sewer line and trolley line are anticipated to tolerate these amounts of settlement. However, this should be reviewed and approved by the pipeline owner and MTS prior to grading and construction.

4.7 Foundation Design

The design of foundation and slabs is the purview of the project structural engineer. The recommendations provided herein apply to structures that are up to seven stories in height. For higher structures, additional recommendations will be provided at a later time based on the structural loads and layouts. A combination of pile foundation and/or deeper ground improvements with mat slabs will need to be evaluated for such structures. Expansive soil conditions, and settlement (discussed in Section 4.6.1) are expected to govern foundation and slab-on-grade design from a geotechnical standpoint.

The sizing of foundations may be based on the following equation:

$$q = 200 + 400B + 900D \leq \text{to values discussed in Section 4.6}$$

where, D = Embedment Depth and B = Width

The design is based on a soil unit weight of 120 pcf, an internal friction angle of 30 degrees and cohesion of 25 psf. The maximum allowable bearing capacity is limited by the total and differential settlements included in the previous section (Section 4.6).

The allowable bearing pressure may be increased by one-third for wind and seismic loading. The allowable bearing pressure may also be applied to post-tensioned and mat slabs if needed for design. The footings of freestanding structures (including walls and pilasters) should have a minimum embedment depth of 24 inches into approved soils.

For lateral resistance against sliding, a friction coefficient of 0.38 may be used at the soil-foundation interface. This value may be increase by one-third for wind and seismic loading.

The following table provides our general guidelines and recommendations for design of post-tensioned foundations and slabs on expansive soil in accordance with the 2016 CBC and Post-Tension Institute (PTI) DC 10.5 Edition provisions. The parameters may also be used for design of mat slabs and foundations for commercial, hotel and parking structures.

GEOTECHNICAL GUIDELINES FOR DESIGN OF POST-TENSIONED SLABS* AND MAT FOUNDATIONS

Parameter	***Recommendation***
Center Lift	
* Edge Moisture Variation Distance, e_m	9.0 feet
* Center Lift, y_m	0.60 inches
Edge Lift	
* Edge Moisture Variation Distance, e_m	4.9 feet
* Edge Lift, y_m	0.80 inch
Subgrade Modulus, k	75 pci
Modulus of Elasticity of Soils, Es	1,500 psi
Presaturation, as needed, to obtain the minimum moisture down to the minimum depth	1.2 x optimum down to 12 inches
****Based on method in CBC 2016***	

For uniform-thickness post-tensioned slabs, we recommend that the slabs have a thickened edge such that the slab is embedded a minimum of 12 inches below the lowest adjacent grade. The thickened edge should be tapered and have a minimum width of 12 inches. If non-uniform (ribbed) post-tensioned slabs are used, we recommend minimum embedment of 18 inches below adjacent grades for the thickened edges.

For non-post-tensioned slabs-on-grade and foundations, in accordance with Wire Reinforcement Institute (WRI) method (per the 2016 California Building Code), an effective Plasticity Index of 20 is considered appropriate for the upper 15 feet of soil. For such slabs, we recommend a minimum embedment of 18 inches below the lowest adjacent grade for the perimeter footings.

The slabs should also be designed to satisfy the settlement criteria presented in Section 4.6 of these recommendations. We anticipate that stiffened post-tensioned slabs and mat foundations will need to be designed if no ground improvement is performed at the site.

4.8 Storm Water Infiltration Feasibility

Based on the results obtained from the laboratory hydraulic conductivity testing of proposed fill material, design infiltration rates for the compacted fill are between 0.01 and 0.50 inches per hour. Per the design manual, these infiltration values are below the reliable rates for Full Infiltration BMPs, but would be allowed for Partial Infiltration BMPs if there were no other constraints at the site, as discussed previously (Section 3.11) and summarized below.

The anticipated remedial grading for the majority of the residential and commercial development will include remedial removals down to saturated alluvium. This will result in less than 3 to 4 feet separation between the bottom of the fill and the groundwater table. Also, the fill thicknesses will generally be greater than 5 feet. Both the fill thickness and separation between the BMP and groundwater table will not meet the requirements of the design manual.

The planned development may include podium-type buildings with subterranean parking levels, retaining walls, and underground utilities. Infiltration is not recommended in these areas per the design manual. There is also a potential for long-term seepage and drainage problems in the subterranean levels if infiltration BMPs were implemented next to the buildings.

Our prior experience in consolidated terrace materials, with respect to infiltration, has resulted in generally very low infiltration rates that are not reliable and typically the result of fracture permeability. The soils overlying the terrace materials are also classified as Type D (USDA, 1973), and confirmed to be generally silty and clayey sands during prior exploration. In addition, drilling was very difficult in the terrace materials and slow drilling rates and refusal was encountered in most of the borings drilled into these deposits.

Based on review of available groundwater data presented in our prior report (NMG, 2017), maintaining the minimum 10-foot vertical separation from the bottom of a proposed infiltration system to the groundwater table, even in the areas with less than 5 feet of planned fill, is not feasible given the existing site conditions (i.e., topography, existing golf course undocumented fill).

More importantly, the alluvium at the site is potentially liquefiable and mitigation measures to reduce the potential adverse impacts are significant. Installation of infiltration BMPs can raise the groundwater table or result in mounding, locally, which will negatively impact this geotechnical hazard.

Based on the above, the use of Full or Partial Infiltration BMPs at the site is not considered geotechnically acceptable or suitable.

4.9 Construction Dewatering

As previously mentioned, the remedial grading operations should stop 2 to 3 feet above the groundwater table. Therefore, dewatering is not anticipated to be needed during grading, except possibly along the river if graded in the rainy season or if removals extend deeper than anticipated. The ground improvement alternatives discussed in this report are methods we anticipate could be performed below the groundwater table without construction dewatering.

If there are deep utilities or structures (i.e., elevator shafts, etc.) that extend below the groundwater table, construction dewatering may be necessary. The need for dewatering will be further evaluated during the design phase.

Based on prior studies by others, the groundwater is anticipated to be brackish. The Worley Parsons report gives some information about the water quality onsite. Permitting for discharge of this water will be an issue, with testing requirements that will need to be further explored by the project team, unless it can be reused onsite. If dewatering is needed, the produced water could be used onsite for grading and/or will need to be discharged into the river downstream of the site. As a result of the high permeability of the alluvial soils, the amount of discharged water is anticipated to be a high volume. Based on prior studies onsite, groundwater Well-1 used by the golf course is 105 feet deep and produces 575 gallons per minute (Worley Parsons, 2013).

4.10 Trench Excavations and Backfill

Excavations should conform to all applicable safety requirements. Trench excavations are anticipated to vary between 3 and 20 feet deep and will expose varying earth units and local seepage.

Where these excavations expose alluvium they are considered Type C soils per Cal/OSHA regulations and should be excavated at 1.5H:1V or flatter, with no vertical excavation near the bottom. If the excavations cannot be made within the subject site, temporary shoring would be needed. The shoring would likely require shields or lagging for potential running sands. Locally, especially in the deeper excavations extending into the alluvium, Type C soils (running sands and/or groundwater) may be encountered. Some zones of relatively clean sands were encountered in our investigation (see boring logs). Where excavations extend below the groundwater table in the alluvium, dewatering is anticipated (see Section 4.9).

The compacted fill and river terrace deposits may be classified as Type B for CalOSHA trench excavation requirements. Temporary removal slopes could be excavated at 1H:1V where they expose compacted fill or river terrace deposits.

Native soils should be suitable for use as trench backfill. The cobbly materials may be difficult to use without mixing with cleaner sands. Cobbles larger than 3 inches in size should not be placed within the pipe zone. Trenches, including interior utility lines, should be either backfilled with native soil and compacted to 90 percent relative compaction, or backfilled with clean sand (SE 30 or better),

which can be densified with water jetting and flooding. Trenches excavated next to structures and foundations should also be properly backfilled and compacted to provide full lateral support and reduce settlement potential.

4.11 Lateral Earth Pressures for Permanent Retaining Structures

The recommended lateral earth pressures for the drained onsite materials are as follows:

Equivalent Fluid Pressure (psf/ft)		
Conditions	***Level***	***2:1 Sloping***
Active	40	65
At-Rest	60	85
Passive	360	180 sloping down

These parameters are based on a soil internal friction angle of 30 degrees and soil unit weight of 120 pcf. The above parameters do not apply for backfill that is highly expansive.

To design an unrestrained retaining wall, such as a cantilever wall, the active earth pressure may be used. For a restrained retaining wall, such as a vault, basement or at restrained wall corners, the at-rest pressure should be used. Passive pressure is used to compute lateral soils resistance developed against lateral structural movement. Passive pressure may be increased by one-third for wind and seismic loading. Future landscaping/planting and improvements adjacent to retaining walls should also be taken into account in the design of the retaining walls. Excessive soil disturbance, trenches (excavation and backfill), future landscaping adjacent to footings, and over-saturation can adversely impact retaining structures and result in reduced lateral resistance.

For sliding resistance, the friction coefficient of 0.38 may be used at the concrete and soil interface. This value may be increased by one-third for wind and seismic loading. The passive resistance is taken into account only if it is ensured that the soil against embedded structure will remain intact with time. The retaining walls will also need to be designed for additional lateral loads if other structures or walls are planned within a 1H:1V projection.

The seismic lateral earth pressure for walls retaining more than 6 feet of soil may be estimated to be an additional 15 pcf for active and at-rest conditions. The earthquake soil pressure has a triangular distribution and is added to the static pressures. For the active and at-rest conditions, the additional earthquake loading is zero at the top and maximum at the base. The seismic lateral earth pressure does not apply to walls retaining less than 6 feet of soil (2016 CBC Section 1803.5.12).

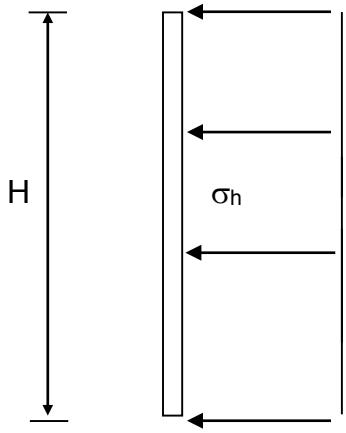
The retaining structures should be waterproofed and provided with suitable backdrain systems to reduce the potential hydrostatic pressure on the walls. Figure 5 presents alternatives for wall-backdrain systems. Specific drainage connections, outlets and avoiding open joints should be considered for the retaining wall design.

4.12 Temporary Shoring Design/Construction

Temporary excavations exposing alluvium should not be sloped steeper than 1.5H:1V (Horizontal to Vertical). Where slope laybacks are limited by property lines and/or adjacent improvements that are to be protected in-place, shoring will likely be needed for construction. Where shoring is required, it should be designed by a structural engineer with expertise in shoring design.

For soldier piles with no more than one level of tiebacks, a triangular stress distribution may be used for the soil loading with the equivalent fluid pressures (psf/ft) provided in Section 4.11 of this report. These values may be adjusted depending on the shoring height and location at the design level study.

For braced or tie-back shoring (with two or more levels of tie-back), the pressure diagram below may be used. For design, an equivalent fluid pressure (EFP) of 360 psf/ft for passive pressure and considering level conditions (in front) may be used for above groundwater conditions. The passive pressure below groundwater should be reduced to 240 psf/ft. The passive earth pressure may be doubled in value, provided that the soldier piles are approximately three pile diameters or more apart from one another. In addition, the depth at which the passive resistance will be mobilized may be assumed to be approximately 3 feet for level ground in front of the soldier piles; however, the soil materials above 3 feet may be assumed as surcharge load in front of the piles.



PRESSURE DIAGRAM

Where σ_h is equal to:

- 26H for level and drained conditions;
- 54H for level and undrained conditions;
- 42H for 2H:1V sloping above the shoring and drained conditions; and
- 61H for 2H:1V sloping above the shoring and undrained conditions.

For design of wood lagging, the above applied pressures may be reduced by 40 percent.

When designing the shoring in areas with sloping ground on top, the active earth pressure for the sloping ground should be used. Where a slope behind the shoring is small in comparison to the height of the shoring, the sloped soil may be considered as a surcharge with the level ground condition. In addition to the above lateral forces due to retained earth, the influence of surcharge

due to other loads such as vehicular traffic or stockpile material should be considered during the design of shoring.

As mentioned above, clean sands and localized layers of gravel will be exposed between the shoring as the vertical excavations are made into alluvial deposits. The materials will have the tendency to fail in the vertical condition. As a result, lagging between the shores is recommended in areas of saturated and clean sandy soils. Care should be taken at all times by personnel and/or equipment operators working adjacent to these excavations.

During grading and construction, the deep excavation slopes located adjacent to existing structures (roadways and utilities) should be reviewed closely by the geotechnical consultant to evaluate the potential for failure. If evidence of instability (such as ground cracks or failures) is observed, then recommendations for additional shoring or other appropriate measures should be provided by the geotechnical consultant.

4.13 Garage Concrete Slab-on-Grade

The design of the lower garage concrete slab-on-grade is the purview of the structural engineer. At minimum, the concrete slab should be a minimum of 5 inches thick and reinforced with No. 4 bars at 18 inches on-center both ways. The garage slab should be underlain with a minimum of 6 inches of crushed rock or pea gravel placed over compacted subgrade. A subdrain system, as discussed in Section 4.18, is also recommended below the subgrade of the lower subterranean garages. The subgrade soils should be pre-saturated to a minimum of 120 percent of the optimum moisture content to a minimum depth of 12 inches below the granular layer of the slab. Please note that these recommendations are not valid for slabs below the groundwater table. Recommendations for slabs below the groundwater table will be provided during the design phases and as needed.

4.14 Proposed Bridges

We understand the proposed trolley bridge will be a prefabricated bridge and the general construction of the bridge and roadway undercrossing will be performed as follows:

- Four CIDH piles will be installed at the corners of the abutments, two on each side of the trolley line.
- The bridge will be installed over a short period of time.
- After the bridge is in place, the opening below the bridge will be excavated to planned street grade.
- The abutments or sides of the undercrossing are proposed to be formed utilizing soil nail walls or tieback anchors using shotcrete and top-down construction.

We also understand that this type of bridge construction has been performed at other locations along railway lines successfully.

An additional bridge/culvert is proposed for Fashion Valley Road where it crosses the San Diego River. The proposed bridge is anticipated to consist of a precast concrete arch that will provide a long-span, low-rise, open bottom channel crossing. The ends of the arch will be fitted with precast

concrete headwalls supporting the soil/roadway above. The arch culvert unit footings are anticipated to be supported on ground improvement.

The geotechnical design parameters for the bridges will be provided during the future design phases of the project, and as the plans are developed. We anticipate that the construction of the proposed bridge is feasible provided that the design and construction are performed in accordance with the geotechnical recommendations, which will be provided during the design phase.

4.15 Preliminary Pavement Design

A preliminary pavement section consisting of 5 inches of asphalt concrete over 10 inches of aggregate base may be assumed for the main drive areas and roadways. For the private courts, and parking lots, a pavement section consisting of 4 inches of asphalt concrete over 6 inches of aggregate base may be assumed. The final pavement section recommendations should be based on the anticipated Traffic Index (TI) of the roadways and the R-value of the subgrade soils. Pavement design and construction should be performed in accordance with the requirements of the City of San Diego and the Greenbook.

4.16 Structural Setbacks

The footings of structures (including retaining walls) located above descending slopes should be setback from the slope face. The setback distance is measured from the outside edge of the footing bottom along a horizontal line to the face of the slope. The table below summarizes the minimum setback criteria for structures above descending slopes.

Structural Setback Requirements for Footings Above Descending Slopes

Slope Height [H] (feet)	Minimum Setback from Slope Face (feet)
Less than 10	5
10 to 20	½ * H
20 to 30	10
30 to 120	⅓ * H
More than 120	40

If retaining walls are planned next to the river, the foundations will need to be evaluated for liquefaction/lateral spread and shallow groundwater conditions. These walls, if any, will need to be reviewed on an individual basis during the design phase. Deep foundations and/or ground improvement may be necessary.

4.17 Seismic Design Guidelines

The following table summarizes the seismic design criteria for the subject site. The seismic design parameters are developed in accordance with ASCE 7-10 and 2016 CBC.

Selected Seismic Design Parameters from 2016 CBC/ASCE 7-10	***Seismic Design Values***	***Reference***
Latitude	32.7634 North	
Longitude	117.1794 West	
Controlling Seismic Source	Rose Canyon Fault	USGS, 2017
Distance to Nearest Seismic Source	1 mi (1.75 km)	USGS, 2017
Site Class per Table 20.3-1 of ASCE 7-10	D	SEA/OSHPD, 2019
Spectral Acceleration for Short Periods (Ss)	1.23 g	SEA/OSHPD, 2019
Spectral Accelerations for 1-Second Periods (S1)	0.48 g	SEA/OSHPD, 2019
Site Coefficient F_a, Table 11.4-1 of ASCE 7-10	1.009	SEA/OSHPD, 2019
Site Coefficient F_v, Table 11.4-2 of ASCE 7-10	1.526	SEA/OSHPD, 2019
Design Spectral Response Acceleration at Short Periods (S_{DS}) from Equation 11.4-3 of ASCE 7-10	0.83 g	SEA/OSHPD, 2019
Design Spectral Response Acceleration at 1-Second Period (S_{D1}) from Equation 11.4-4 of ASCE 7-10	0.48 g	SEA/OSHPD, 2019
Peak Ground Acceleration (PGA_M) Corrected for Site Class Effects from Equation 11.8-1 of ASCE 7-10	0.55 g	SEA/OSHPD, 2019
Seismic Design Category, Section 11.6 of ASCE 7-10	D	SEA/OSHPD, 2019

4.18 Permanent Subdrains for Retaining Walls and Subterranean Buildings

A typical retaining wall drainage detail is included as Figure 5 (rear of text). Proper surface drainage, such as a concrete V-ditch, should also be provided along the top of walls. Down drains (outlets) for surface drainage should not be tied into the subdrain system for walls. (They should be outlet separately.)

The use of the drainage composite with the bottom-flow collector is anticipated to be utilized behind subterranean building walls at the subject site. The above-mentioned drainage system is considered suitable, provided the drainage composite core is in direct contact with the bottom-flow collector core and the fabrics are glued or heat-bonded to one another such that no soil materials may enter the cores of the drainage system or the bottom-flow collector. Proper surface drainage, such as a concrete V-ditch, should also be provided along the top of walls. Down drains (outlets) for surface drainage should not be tied into the subdrain system for walls (they should be outlet separately).

Subdrains should also be placed below the lower-level subterranean garage and building slabs where the groundwater is within 10 feet of the subgrade. Our review of the preliminary grading plan indicates this condition may occur in the eastern pad of the North District. These subdrains,

as designed by the civil engineer, should consist of trenches excavated to 3 feet below subgrade and should outlet into the sump areas. The subdrain trenches should be backfilled with granular material up to its connection with the crushed rock or pea gravel material below the slab. The subdrains should consist of 4-inch perforated pipe in at least 1 cubic foot per lineal foot of Class 2 permeable material or ¾- to 1½-inch gravel wrapped in filter fabric (Mirafi 140N or equivalent). The collector pipe should be installed with the perforations down and have a minimum 1 percent gradient, with the low end of the trench to outlet into the sump areas.

4.19 Expansion Potential

Based on laboratory testing, the expansion potential of onsite soils is anticipated to generally range from "Very Low" to "Medium". Additional laboratory testing should be performed following completion of grading operations around the building to determine the expansion potential of the near-surface soils.

4.20 Cement Type and Corrosivity

Based on our laboratory testing, soluble sulfates exposure in the onsite soils are classified as "S0" to "S1" per Table 19.3.1.1 of ACI-318-14. Structural concrete elements in contact with soil include footings and building slabs-on-grade. Concrete mix for these elements should be based on the "**S1**" soluble sulfate exposure class of Table 19.3.2.1 in ACI-318-14. Other ACI guidelines for structural concrete are recommended.

Also, the site soils are corrosive to very corrosive to ferrous metals and may also be deleterious to copper. Where metals will be in contact with onsite soils for a long period of time (such as buried iron or steel pipe), corrosion-control measures should be taken to prolong their life.

Additional laboratory testing should be performed following completion of grading operations to determine the corrosion potential of onsite soils and to provide recommendations for corrosion protection.

4.21 Exterior Concrete

Exterior concrete elements, such as curb and gutter, driveways, sidewalks and patios, are susceptible to lifting and cracking when constructed over expansive soils. With expansive soils, the impacts to flatwork/hardscape can be significant, generally requiring removal and replacement of the affected improvements. Please also note that reducing concrete problems is often a function of proper slab design, concrete mix design, placement, and curing/finishing practices. Adherence to guidelines of the American Concrete Institute (ACI) is recommended. Also, the amount of post-construction watering, or lack thereof, can have a very significant impact on the adjacent concrete flatwork.

For reducing the potential effects of expansive soils, we recommend a combination of presaturation of subgrade soils; reinforcement; moisture barriers/drains; and a sublayer of granular material. Though these types of measures may not completely eliminate adverse impacts, application of these measures can significantly reduce the impacts from post-construction expansion of soil. The degrees and combinations of these measures will depend upon:

- The expansion potential of the subgrade soils;
- The potential for moisture migration to the subgrade;
- The feasibility of the measures (especially presaturation); and
- The economics of these measures versus the benefits.

These factors should be weighed by the project owner determining the measures to be applied on a project-by-project basis, subject to the requirements of the local building/grading department.

The following table provides our recommendations for varying expansion characteristics of subgrade soils. Additional considerations are also provided after the table. We recommend that the "**Medium**" category be used during design and construction.

TYPICAL RECOMMENDATIONS FOR CONCRETE FLATWORK/HARDSCAPE

Recommendations	Expansion Potential (Index)				
	Very Low (< 20)	*Low (20 – 50)*	***Medium (51 – 90)***	*High (91 – 130)*	*Very High (> 130)*
***Slab Thickness (Min.)**:* Nominal thickness except where noted.	4"	4"	**4"**	4"	4" Full
Subbase: Thickness of sand or gravel layer below concrete	N/A	N/A	**Optional**	2" – 4"	2" – 4"
Presaturation: Degree of optimum moisture content (opt.) and depth of saturation	Pre-wet Only	1.1 x opt. to 6"	**1.2 x opt. to 12"**	1.3 x opt. to 18"	1.4 x opt. to 24"
Joints: Maximum spacing of control joints. Joint should be ¼ of total thickness	10'	10'	**8'**	6'	6'
Reinforcement**:** Rebar or equivalent welded wire mesh placed near mid-height of slab	N/A	N/A	**Optional (WWF 6 x 6 – W1.4xW1.4)**	No. 3 rebar, 24" O.C. both ways or equivalent wire mesh	No. 3 rebar, 24" O.C. both ways
Restraint**:** Slip dowels across cold joints; between sidewalk and curb	N/A	N/A	**Optional**	Across cold joints	Across cold joints (and into curb)

The more expansive soils, because they are clayey, can take significantly longer to achieve recommended presaturation levels. Therefore, the procedure and timing should be carefully planned in advance of construction. For exterior slabs, the use of a granular sublayer is primarily intended to facilitate presaturation and subsequent construction by providing a better working surface over the saturated soil. It also helps retain the added moisture in the native soil in the event that the slab is not placed immediately. Where these factors are not significant, the layer may be omitted.

On projects with highly expansive soils, additional measures such as thickened concrete edges/footings, subdrains and/or moisture barriers should be considered where planter or natural areas with irrigation are located adjacent to the concrete improvements. Design and maintenance of proper surface drainage is also very important. If the concrete will be subject to heavy loading from cars/trucks or other heavy objects, thicker slabs should be used.

The above recommendations typically are not applied to curb and gutter, but should be considered in areas with highly expansive soils.

4.22 Surface Drainage and Irrigation

Inadequate control of run-off water, heavy irrigation after development of the site, or regional groundwater level changes may result in shallow groundwater conditions where previously none existed. Maintaining adequate surface drainage, proper disposal of run-off water, and control of irrigation will help reduce the potential for future moisture-related problems and differential movements from soil heave/settlement.

Surface drainage should be carefully taken into consideration during grading, landscaping, and building construction. Positive surface drainage should be provided to direct surface water away from structures and slopes and toward the street or suitable drainage devices. Ponding of water adjacent to the structures should not be allowed. Buildings should have roof gutter systems and the run-off should be directed to parking lot/street gutters by area drain pipes or by sheet flow over paved areas. Paved areas should be provided with adequate drainage devices, gradients, and curbing to prevent run-off flowing from paved areas onto adjacent unpaved areas.

Foundation performance is also dependent upon maintaining adequate surface drainage away from structures. The minimum gradient within 10 feet of the building will depend upon surface landscaping. In general, we suggest that unpaved lawn and landscape areas have a minimum gradient of 2 percent away from structures. This also applies to concrete flatwork construction adjacent to the building.

Construction of planter areas immediately adjacent to structures should be avoided if possible. If planter boxes are constructed adjacent to or near buildings, the planters should be provided with controls to prevent excessive penetration of the irrigation water into the foundation and flatwork subgrades. Provisions should be made to drain excess irrigation water from the planters without saturating the subgrade below or adjacent to the planters. Raised planter boxes may be drained with weepholes. Deep planters (such as palm tree planters) should be drained with below-ground, water-tight drainage lines connected to a suitable outlet. Moisture barriers should also be considered.

It is also important to maintain a consistent level of soil moisture, not allowing the subgrade soils to become overly dry or overly wet. Properly designed landscaping and irrigation systems can help in that regard.

4.23 Additional Geotechnical Investigation and Plan Reviews

Additional geotechnical evaluation and investigation are recommended during the design phase of work. This additional analysis and investigation would occur after entitlement, when grading and building plans are in progress or finalized, and before obtaining grading permits. The general areas that may need more evaluation/investigation include the following:

- Along the north side of the trolley line in the area of Lots 23 through 28, in order to further evaluate the contact between alluvium and bedrock and to determine the extent of ground improvement needed below the proposed building areas. We will attempt to acquire the geologic data collected during the grading operations for the trolley embankment to better determine the fill conditions and the alluvium/bedrock contact. Excavation of additional borings may be necessary during the design phase of work to supplement the collected data and/or if the prior reports and information are not available.
- Along the northwest side of Lot 1, in order to evaluate the alluvium and terrace contact and to better determine the extent of ground improvement needed in this area.
- In the bridge area, to evaluate the compacted fill under the trolley and provide geotechnical design parameters for soil nails/tie backs.
- Along Fashion Valley Road, in order to evaluate the alluvium within the vicinity of the proposed culvert/bridge.
- Within the park areas, where/if structures are planned. This will be determined once the park plan becomes available.

NMG should also review the project plans during the design phase including but not limited to the following:

- Grading plans, including rough and precise grading plans;
- Foundation and structural plans;
- Ground improvement plans;
- Bridge plans, including the foundation and walls;
- Shoring and retaining wall plans; and
- Street and utility plans.

Geotechnical review reports will be prepared for these plan reviews, which will be submitted to the City for review and approval.

4.24 Geotechnical Observation and Testing During Grading and Construction

Geotechnical observation and testing should be performed by the geotechnical consultant during the following phases of grading and construction:

- During site demolition, preparation and clearing;
- During earthwork operations, including remedial removals and pad overexcavation;
- During all fill placement;
- During construction of temporary excavations and slope stabilization measures;
- During trolley bridge and caisson construction;
- During Fashion Valley Road culvert/bridge/headwalls construction;

- During construction of ground improvements;
- During installation of subdrains;
- Upon completion of any excavation for buildings or retaining walls prior to pouring concrete;
- During slab and pavement subgrade preparation (including presoaking), prior to pouring of concrete;
- During and after installation of subdrains for retaining walls and building subgrade;
- During placement of backfill for utility trenches and retaining walls; and
- When any unusual soil conditions are encountered.

5.0 LIMITATIONS

This report has been prepared for the exclusive use of our client, SD Riverwalk, LLC, within the specific scope of services requested by our client for the planning study discussed in this report. This report or its contents should not be used or relied upon for other projects or purposes or by other parties without the written consent of NMG. Our methodology for this study is based on local geotechnical standards of practice, care, and requirements of governing agencies. No warranty or guarantee, express or implied is given.

The findings, conclusions, and recommendations are professional opinions based on interpretations and inferences made from geologic and engineering data from specific locations and depths, observed or collected at a given time. By nature, geologic conditions can be very different in between points, and can also change over time. Our conclusions and recommendations are subject to verification and/or modification with more exploration and/or during grading and construction when more subsurface conditions are exposed.

NMG's expertise and scope of services did not include assessment of potential subsurface environmental contaminants or environmental health hazards.

Removal Bottom El.
13-15' MSL
Ground Improvement 10'
Below Removal Bottom

Removal Bottom El.
11-14' MSL
Ground Improvement 20'
Below Removal Bottom

Removal Bottom El.
11-14' MSL
Ground Improvement 20'
Below Removal Bottom

Removal Bottom El.
15-16' MSL
Ground Improvement 20'
Below Removal Bottom

Removal Bottom El.
13-17' MSL
Ground Improvement 15'
Below Removal Bottom

Remove Abandoned
Sewer Pipe & Backfill

Remove Abandoned
Sewer Pipe & Backfill

Removals of 5' to 15'
or Minimum
Overexcavation
of 5 Feet

Limits of Remedial Grading

FRIARS ROAD

VIA LAS CUMBRES

TROLLEY

RIVER

FASHION VALLEY ROAD

HOTEL CIRCLE NORTH

LOT 1 PAD = 350
LOT 2 PAD = 320
LOT 3 PAD = 340
LOT 4 PAD = 340
LOT 5 PAD = 41
LOT 6 PAD = 41
LOT 7 PAD = 42
LOT 8 PAD = 42
LOT 9 PAD = 50
LOT 10 PAD = 50
LOT 11 PAD = 49
LOT 12 PAD = 50
LOT 13
LOT 14 PAD = 49
LOT 15 PAD = 48
LOT 16 PAD = 48
LOT 17 PAD = 48
LOT 18 PAD = 48
LOT 19 PAD = 49
LOT 20 PAD = 50
LOT 21 PAD = 50
LOT 22
LOT 23 PAD = 45
LOT 24
LOT 25 PAD = 42
LOT 26
LOT 27
LOT 28 PAD = 42
LOT 29
LOT 30 PAD = 340
LOT 31 PAD = 350
LOT 32 PAD = 350
LOT 33 PAD = 350
LOT 34 PAD = 355
LOT 35 PAD = 352
LOT 36 PAD = 355
LOT 37 PAD = 359
LOT 38
LOT 39 PAD = 400
LOT 40 PAD = 400
LOT 41 PAD = 35
LOT 42 PAD = 52
LOT 43 PAD = 340
LOT 44 PAD = 340
LOT 45 PAD = 342
LOT 46 PAD = 322
LOT 47 PAD = 329
LOT 48 PAD = 320
LOT 49 PAD = 382

LEGEND

EARTH UNITS - CIRCLED WHERE BURIED

- NO GROUND IMPROVEMENT NEEDED, REMOVALS OF 5 TO 15 FEET DEEP NEEDED IN FILL AREAS OR OVERECAVATION 5 FEET BELOW BUILDING SUBGRADE OR FINISH GRADE IN CUT AREAS
- REMEDIAL REMOVALS TO ELEVATIONS OF 13 TO 15 FEET MSL, GROUND IMPROVEMENT NEEDED 10 FEET BELOW REMOVAL BOTTOM WITHIN BUILDING FOOTPRINT AND 5 FEET OUTSIDE FOOTPRINT
- REMEDIAL REMOVALS TO ELEVATIONS OF 13 TO 17 FEET MSL, GROUND IMPROVEMENT NEEDED 15 FEET BELOW REMOVAL BOTTOM WITHIN BUILDING FOOTPRINT AND 5 FEET OUTSIDE FOOTPRINT
- REMEDIAL REMOVALS TO ELEVATIONS OF 11 TO 16 FEET MSL, GROUND IMPROVEMENT NEEDED 20 FEET BELOW REMOVAL BOTTOM WITHIN BUILDING FOOTPRINT AND 5 FEET OUTSIDE FOOTPRINT
- DESIGN FILL SLOPE NEXT TO RIVER THAT WILL NEED DEEPER GROUND IMPROVEMENT TO MITIGATE POTENTIAL LATERAL SPREAD
- LIMITS OF REMEDIAL GRADING

18 — 18' CROSS-SECTION

GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.

PLATE 5

PRELIMINARY REMEDIAL MEASURES AND GROUND IMPROVEMENT MAP
FOR PROPOSED MIXED USE DEVELOPMENT
RIVERWALK GOLF COURSE
SAN DIEGO, CALIFORNIA

Project No.: 11077-02
Project Name:Riverwalk
Date: 11/27/19

By: RS/TW
SCALE: 1" = 100'

NMG Geotechnical, Inc.

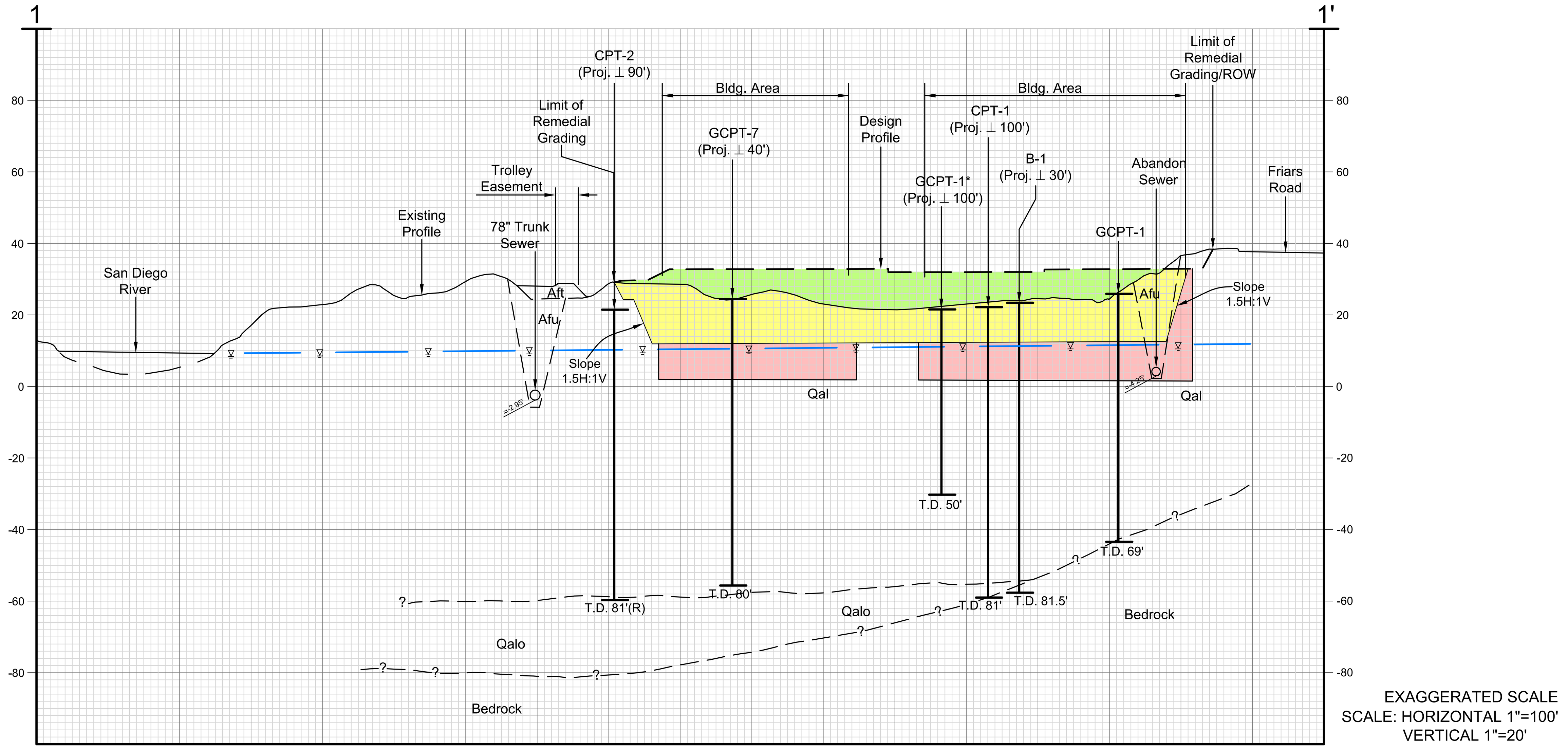
LEGEND

PROPOSED COMPACTED FILL

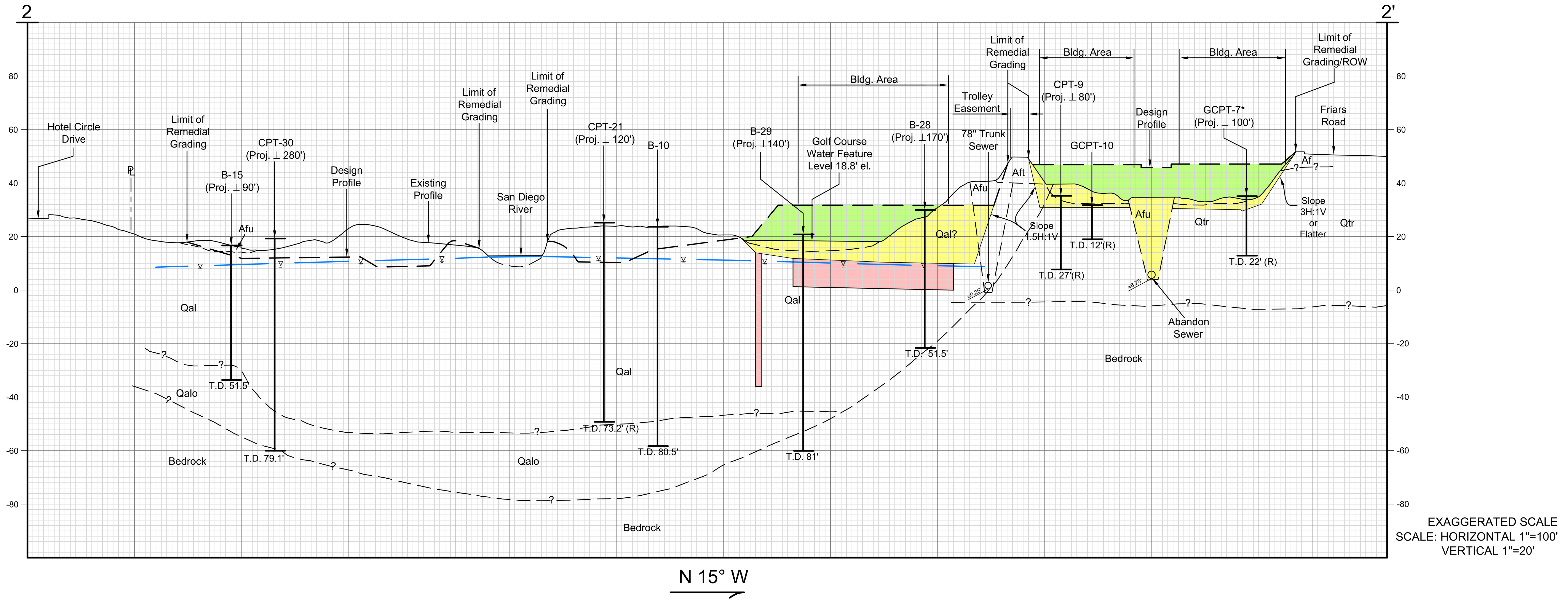
RECOMMENDED REMEDIAL REMOVAL TO BE REPLACED WITH COMPACTED FILL

RECOMMENDED ZONE OF GROUND IMPROVEMENT

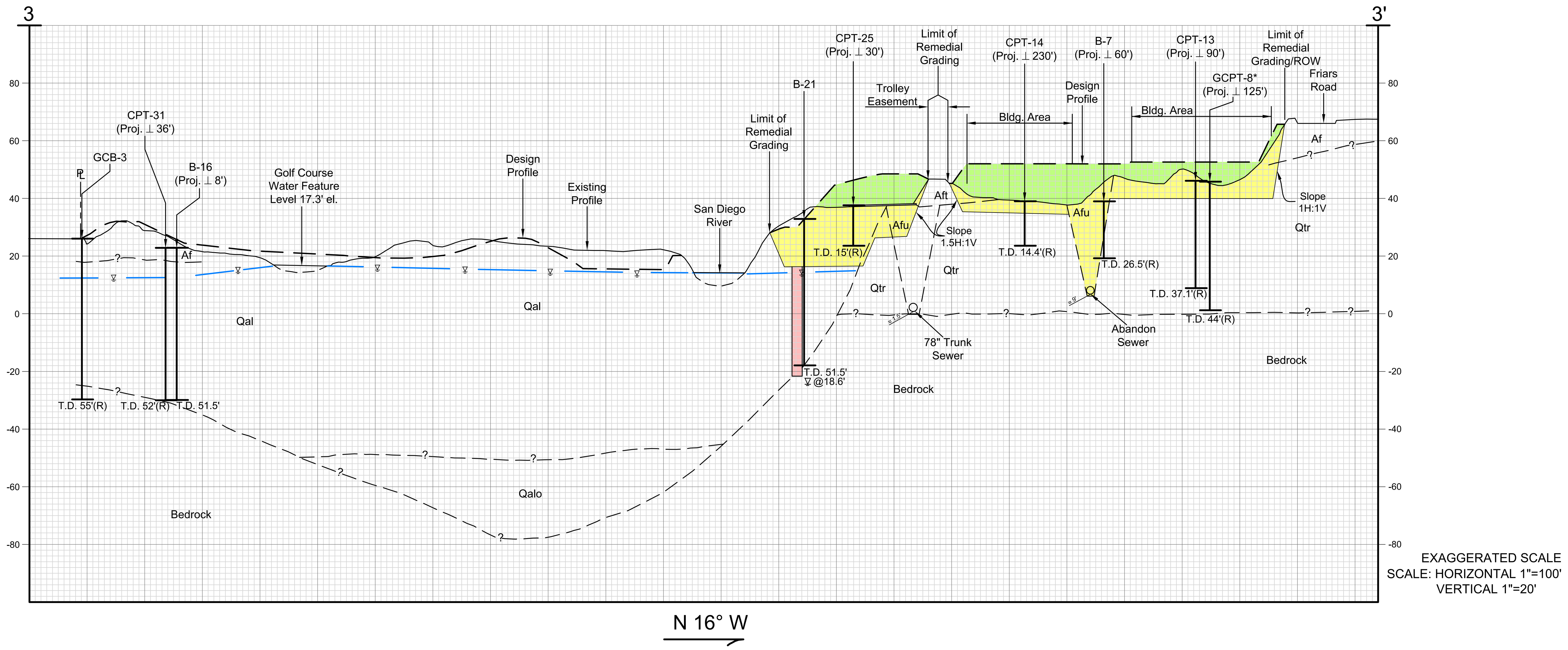
EXISTING GROUNDWATER TABLE



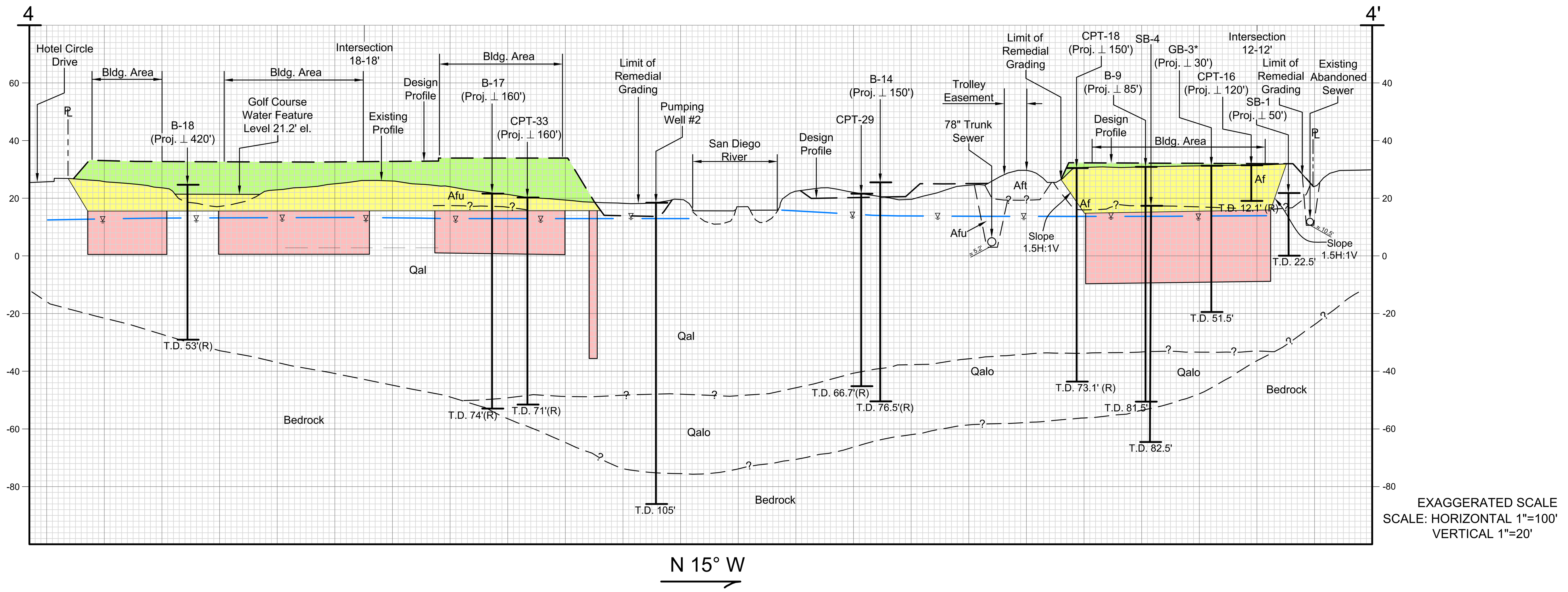
1
1'
San Diego River
Existing Profile
Trolley Easement
78" Trunk Sewer
Limit of Remedial Grading
CPT-2 (Proj. ⊥ 90')
Bldg. Area
GCPT-7 (Proj. ⊥ 40')
Design Profile
CPT-1 (Proj. ⊥ 100')
GCPT-1* (Proj. ⊥ 100')
B-1 (Proj. ⊥ 30')
Abandon Sewer
GCPT-1
Limit of Remedial Grading/ROW
Friars Road
Slope 1.5H:1V
Afu
Qal
Qalo
Bedrock
T.D. 50'
T.D. 81'(R)
T.D. 80'
T.D. 81'
T.D. 81.5'
T.D. 69'
EXAGGERATED SCALE
SCALE: HORIZONTAL 1"=100'
VERTICAL 1"=20'



2
2'
Hotel Circle Drive
Limit of Remedial Grading
B-15 (Proj. ⊥ 90')
CPT-30 (Proj. ⊥ 280')
Design Profile
Existing Profile
San Diego River
CPT-21 (Proj. ⊥ 120')
B-10
B-29 (Proj. ⊥140')
Golf Course Water Feature Level 18.8' el.
B-28 (Proj. ⊥170')
Bldg. Area
Trolley Easement
78" Trunk Sewer
CPT-9 (Proj. ⊥ 80')
GCPT-10
GCPT-7* (Proj. ⊥ 100')
Limit of Remedial Grading/ROW
Friars Road
Slope 3H:1V or Flatter
Abandon Sewer
Afu
Aft
Af
Qal
Qal?
Qtr
Qalo
Bedrock
T.D. 51.5'
T.D. 79.1'
T.D. 73.2' (R)
T.D. 80.5'
T.D. 81'
T.D. 27'(R)
T.D. 12'(R)
T.D. 22' (R)
EXAGGERATED SCALE
SCALE: HORIZONTAL 1"=100'
VERTICAL 1"=20'
N 15° W



3
3'
CPT-31 (Proj. ⊥ 36')
GCB-3
B-16 (Proj. ⊥ 8')
Golf Course Water Feature Level 17.3' el.
Design Profile
Existing Profile
San Diego River
B-21
Limit of Remedial Grading
CPT-25 (Proj. ⊥ 30')
Trolley Easement
CPT-14 (Proj. ⊥ 230')
B-7 (Proj. ⊥ 60')
CPT-13 (Proj. ⊥ 90')
GCPT-8* (Proj. ⊥ 125')
Limit of Remedial Grading/ROW
Friars Road
Bldg. Area
78" Trunk Sewer
Abandon Sewer
Slope 1.5H:1V
Slope 1H:1V
Afu
Aft
Af
Qal
Qtr
Qalo
Bedrock
T.D. 55'(R)
T.D. 52'(R)
T.D. 51.5'
T.D. 15'(R)
T.D. 14.4'(R)
T.D. 26.5'(R)
T.D. 37.1'(R)
T.D. 44'(R)
EXAGGERATED SCALE
SCALE: HORIZONTAL 1"=100'
VERTICAL 1"=20'
N 16° W



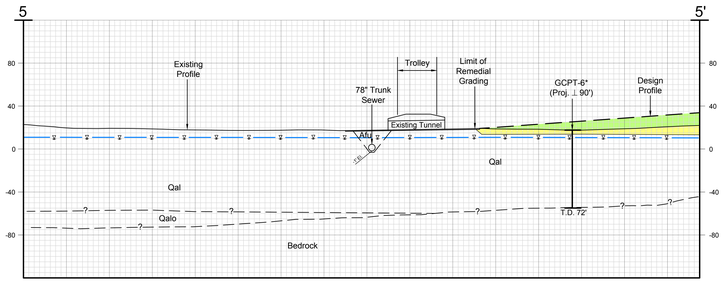
4
4'
Hotel Circle Drive
Bldg. Area
B-18 (Proj. ⊥ 420')
Golf Course Water Feature Level 21.2' el.
Intersection 18-18'
Design Profile
Existing Profile
B-17 (Proj. ⊥ 160')
CPT-33 (Proj. ⊥ 160')
Limit of Remedial Grading
Pumping Well #2
San Diego River
Design Profile
CPT-29
B-14 (Proj. ⊥ 150')
Trolley Easement
78" Trunk Sewer
CPT-18 (Proj. ⊥ 150')
SB-4
GB-3* (Proj. ⊥ 30')
B-9 (Proj. ⊥ 85')
CPT-16 (Proj. ⊥ 120')
SB-1 (Proj. ⊥ 50')
Intersection 12-12'
Limit of Remedial Grading
Existing Abandoned Sewer
Slope 1.5H:1V
Afu
Aft
Af
Qal
Qalo
Bedrock
T.D. 53'(R)
T.D. 74'(R)
T.D. 71'(R)
T.D. 105'
T.D. 66.7'(R)
T.D. 76.5'(R)
T.D. 73.1' (R)
T.D. 81.5'
T.D. 82.5'
T.D. 51.5'
T.D. 22.5'
T.D. 12.1' (R)
EXAGGERATED SCALE
SCALE: HORIZONTAL 1"=100'
VERTICAL 1"=20'
N 15° W

PLATE 6

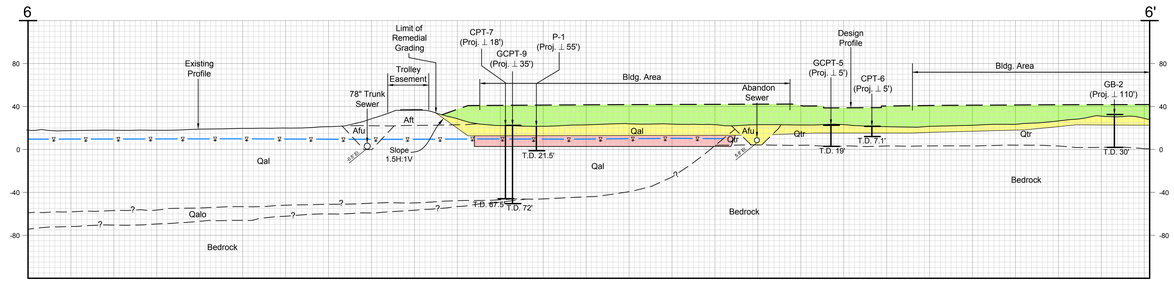
Project No.: 11077-02
Project Name: Riverwalk
Date: 11/27/19
By: RS/TW
SCALE: AS NOTED
NMG Geotechnical, Inc.

LEGEND

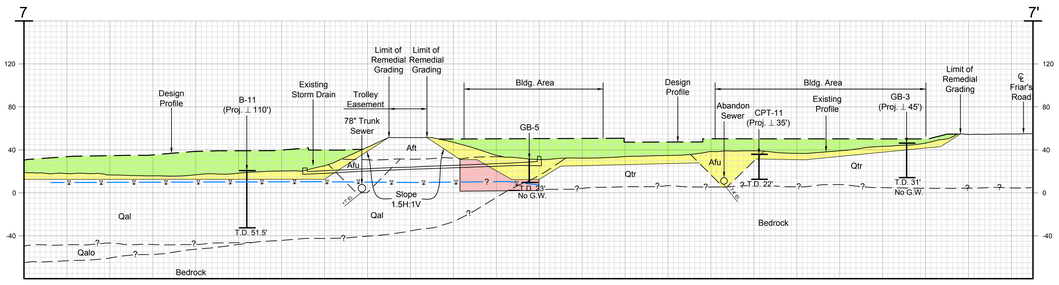
- PROPOSED COMPACTED FILL
- RECOMMENDED REMEDIAL REMOVAL TO BE REPLACED WITH COMPACTED FILL
- RECOMMENDED ZONE OF GROUND IMPROVEMENT
- EXISTING GROUNDWATER TABLE



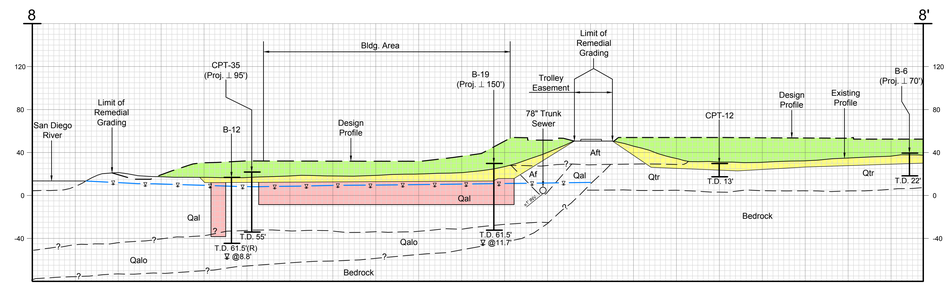
N 19° W



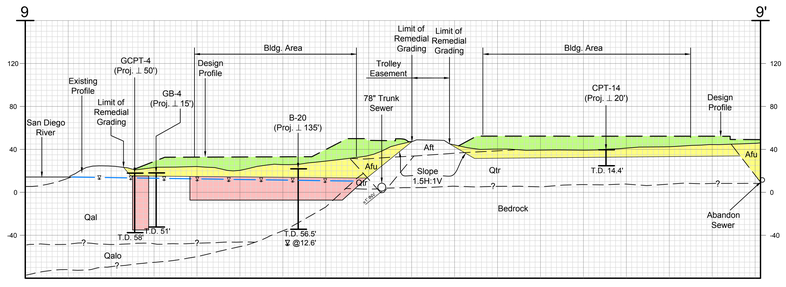
N 18° W



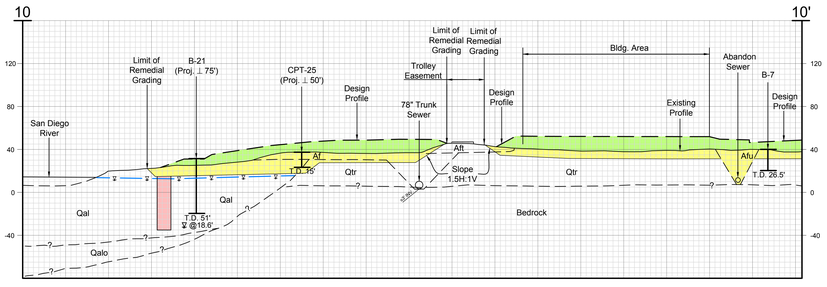
North



N 16° W



N 18° W



N 16° W

PLATE 7

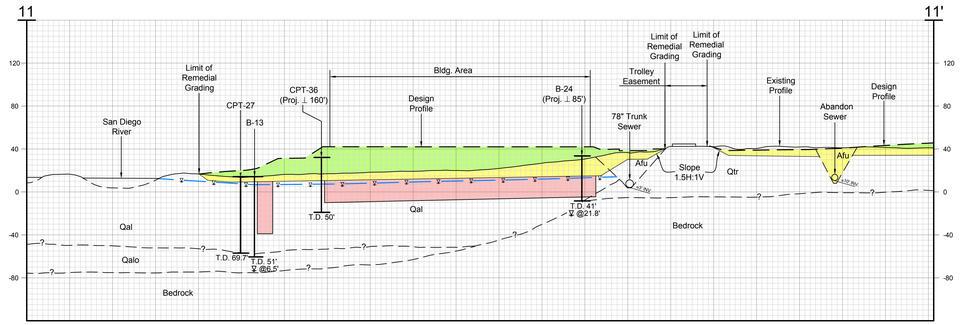
Project No.: 11077-02
Project Name:Riverwalk
Date: 11/27/19

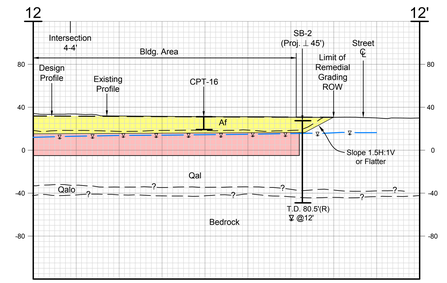
By: RS/TW
SCALE: 1" = 40'

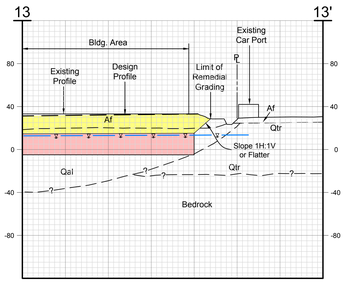
NMG Geotechnical, Inc.

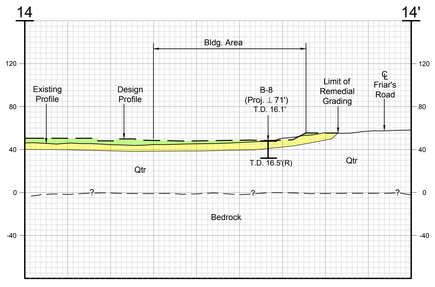
LEGEND

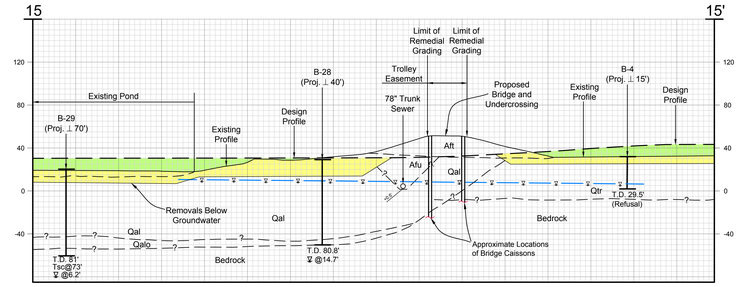
- PROPOSED COMPACTED FILL
- RECOMMENDED REMEDIAL REMOVAL TO BE REPLACED WITH COMPACTED FILL
- RECOMMENDED ZONE OF GROUND IMPROVEMENT
- EXISTING GROUNDWATER TABLE

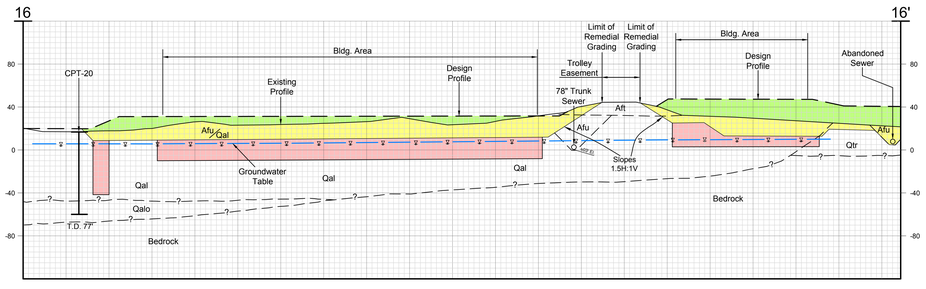


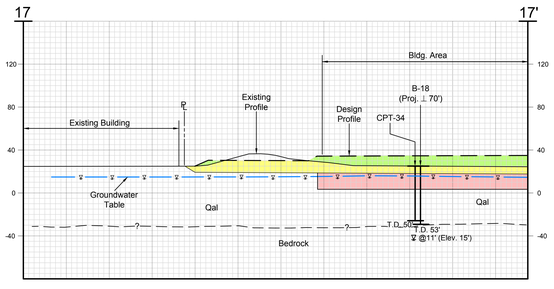












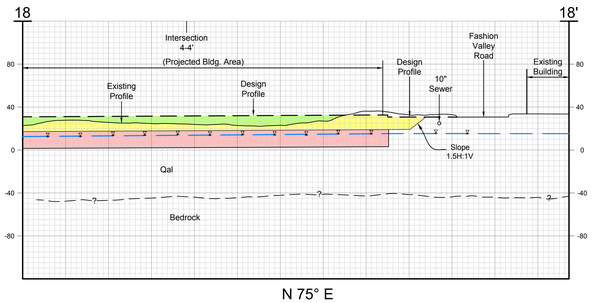


PLATE 8

Project No.: 11077-02	By: RS/TW	NMG Geotechnical, Inc.
Project Name:Riverwalk		
Date: 11/27/19	SCALE: 1" = 40'	

APPENDIX B

Analytical Laboratory Reports for 2019 and 2020 Soil Sampling and Analysis

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

21 November 2019

Luke Montague

SCS Engineers

8799 Balboa Avenue, Suite 290

San Diego, CA 92123

Work Order #: 1911070

Project Name: Riverwalk

Project ID: 01210118.02

Site Address: 5905 Fraiors Road San Diego, CA

Enclosed are the results of analyses for samples received by the laboratory on November 13, 2019. If you have any questions concerning this report, please feel free to contact us.

Rojert G. Araghi

Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 48547 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

CHAIN OF CUSTODY RECORD

Company: SCS Engineers		Report To:	ANALYSIS REQUESTED
Address: 3799 Balboa Ave St 290	Project Name: Riverwalk	Address:	
San Diego, CA 92123	Site Address: 5905 Friars Road	Invoice To:	
Telephone: 858-571-5500 Fax:	San Diego, CA	Address:	
Special Instruction:	Project ID: 01210118.02		
E-mail: toverton@scsengineers.com lmontague@scsengineers.com	Project Manager: Luke Montague	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	8081A OCPs (8270SIM)	AS (6010B)	Archive	Remarks
	1911070-01	SB50-0.5	11/12/19	740	1	Acetate Sleeve	soil	none	X	X		
		SB50-1-5		741							X	
		SB50-3		742							X	
	1911070-02	SB49-0.5		0758					X	X		
		SB49-1-5		759							X	
		SB49-3		800							X	
	1911070-03	SB40-0.5		825					X	X		
	1911070-04	SB40-1-5		826						X		
		SB40-3		827							X	
3	1911070-05	SB41-0.5		836					X	X		

Collected By: Wtyler Overton WTO	Date 11/12/19	Time 740	Relinquished By: Date Time
Relinquished By: Wtyler Overton WTO	Date 11/12/19	Time 1700	Received For Laboratory Janet Chin Date 11-13-19 Time 10:10
Received By: Date Time			Condition of Sample: via GSO

TAT ☑ Normal ☐ Rush

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 48548 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

Company: ← same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	8081A	OCPs (8260B)	AS (6010B)	Archive	Remarks
1	1911070-06	SB41-1.5	11/12/19	837	1	Acetate sleeve	soil	none			X		
		SB41-3		838								X	
5	1911070-07	SB42-0.5		844						X	X		
6	1911070-08	SB42-1.5		845							X		
		SB42-3		846								X	
8	1911070-09	SB43-0.5		852						X	X		
9	1911070-10	SB43-1.5		853							X		
		SB43-3		854								X	
11	1911070-11	SB44-0.5		900						X	X		
12	1911070-12	SB44-1.5		901							X		

Collected By: Tyler Overton cmo	Date 11/12/19 Time 740	Relinquished By:	Date Time
Relinquished By: Tyler Overton cmo	Date 11/12/19 Time 1700	Received For Laboratory Janet Chin	Date 11-13-19 Time 10:10
Received By:	Date Time	Condition of Sample:	

TAT ☑ Normal ☐ Rush

CHAIN OF CUSTODY RECORD

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 48549 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

CHAIN OF CUSTODY RECORD

Company: ← same as pg 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	8081A OCPs (8260B)	ATS (6010B)	Archive	Remarks
		SB44-3	11/12/19	0902	1	Acetate sleeve	Soil	none			X	
	1911070-13	SB45-0.5		916					X	X		
	1911070-14	SB45-1.5		917						X		
		SB45-3		918							X	
	1911070-15	SB46-0.5		925					X	X		
	1911070-16	SB46-1.5		926						X		
		SB46-3		927							X	
	1911070-17	SB48-0.5		1022					X	X		
		SB48-1.5		1023							X	
		SB48-3		1024							X	

Collected By: W Tyler Overton WTO	Date 11/12/19 Time 740	Relinquished By:	Date Time
Relinquished By: W Tyler Overton WTO	Date 11/12/19 Time 1700	Received For Laboratory Janet Chen	Date 11-13-19 Time 10:10
Received By:	Date Time	Condition of Sample:	

TAT ☑ Normal ☐ Rush

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 47017 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

Company: ← same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	8081A OCPs (8260B)	45 (6010B)	Archive	Remarks
1	1911070-18	SB47-0.5	11/12/19	1032	1	acetate sleeve	soil	none	X	X		
		SB47-1.5		1033							X	
		SB47-3		1034							X	
1	1911070-19	SB62-0.5		1140					X	X		
		SB62-1.5		1141							X	
		SB62-3		1142							X	
1	1911070-20	SB61-0.5		1156					X	X		
		SB61-1.5		1157							X	
		SB61-3		1158							X	
1	1911070-21	SB60-0.5		1212					X	X		

Collected By: W Tyler Overton cwo	Date 11/12/19	Time 740	Relinquished By: Date Time
Relinquished By: W Tyler Overton cwo	Date 11/12/19	Time 1700	Received For Laboratory Janet Chen Date 11-13-19 Time 10:10
Received By: Date Time			Condition of Sample:

TAT ☑ Normal ☐ Rush

CHAIN OF CUSTODY RECORD

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 48550 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

Company: ← same as page →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	8081A OCPs (8260B)	AS (6010B)	Archive	Remarks
		SB60-1.5	11/12/19	1213	1	Acetate sleeve	soil	none			X	
		SB60-3		W/O 1214							X	
	1911070-22	SB59-0.5		1231					X	X		
		SB59-1.5		1232							X	
		SB59-3		1233							X	
	1911070-23	SB58-0.5		1243					X	X		
		SB58-1.5		1244							X	
		SB58-3		1245							X	
	1911070-24	SB57-0.5		1254					X	X		
		SB57-1.5		1255							X	

Collected By: W Tyler Overton CWO	Date 11/12/19	Time 740	Relinquished By: Date Time
Relinquished By: W Tyler Overton CWO	Date 11/12/19	Time 1700	Received For Laboratory Janet Chen Date 11-13-19 Time 10:10
Received By: Date Time			Condition of Sample:

TAT ☐ Normal ☐ Rush

CHAIN OF CUSTODY RECORD

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 42373 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

CHAIN OF CUSTODY RECORD

Company: ← same as page 1 →		Report To:	ANALYSIS REQUESTED
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	OCPs (8260B)	AS (6010B)	Arsenic	Remarks
		SB57-3	11/12/19	1256	1	Acetate sleeve	soil	none	LMW	LMW	X	
	1911070-25	SB56-0.5		1313					X	X	LMW	
		SB56-1.5		1314							X	
		SB56-3		1315					LMW	LMW	X	
	1911070-26	SB53-0.5		1320					X	X	LMW	
		SB53-1.5		1321							X	
		SB53-3		1322							X	
	1911070-27	SB54-0.5		1328					X	X		
		SB54-1.5		1329							X	
		SB54-3		1330							X	

Collected By: Wtyler Peterson LMW	Date 11/12/19	Time 740	Relinquished By: Date Time
Relinquished By: Wtyler Peterson LMW	Date 11/12/19	Time 1700	Received For Laboratory Janet Chen Date 11-13-19 Time 10:10
Received By: Date Time			Condition of Sample:

TAT ☑ Normal ☐ Rush

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 47019 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

Company: ← same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED: OCPs (8260B); AS (6010B); Archive

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	OCPs (8260B)	AS (6010B)	Archive	Remarks
	1911070-28	SB51-0.5	11/12/19	1335	1	Acetate Sleeve	soil	None	X	X		
		SB51-1.5		1336							X	
		SB51-3		CUTO 1337							X	
	1911070-29	SB52-0.5		1343					X	X		
		SB52-1.5		1344							X	
		SB52-3		1345							X	
	1911070-30	SB55-0.5		1350					X	X		
		SB55-1.5		1351							X	
		SB55-3		1352							X	
	1911070-31	SB39-0.5		1425					X	X		

Collected By: W Tyler Overton CUTO	Date 11/12/19	Time 740	Relinquished By:	Date	Time
Relinquished By: W Tyler Overton CUTO	Date 11/12/19	Time 1700	Received For Laboratory Janet Chen	Date 11-13-19	Time 10:10
Received By:	Date	Time	Condition of Sample:		

TAT: ☑ Normal ☐ Rush

CHAIN OF CUSTODY RECORD

White - Report Yellow - Laboratory Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# Nº 47266 GLOBAL ID _____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 1911070

Company: ← Same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	SDBIA	CAM's (8260B)	AS (Lab108)	Archive	Remarks
		SB39-1.5	11/12/19	1426	1	acetate sleeve	soil	none				X	
		SB39-3	↓	1427	↓	↓	↓	↓				X	
	1911070-32	SB38-0.5		1434						X	X		
		SB38-1.5		1435								X	
		SB38-3		1436								X	

Collected By: W Tyler Overton LWO	Date 11/12/19 Time 740	Relinquished By:	Date Time
Relinquished By: W Tyler Overton LWO	Date 11/12/19 Time 1700	Received For Laboratory Janet Chen	Date 11-13-19 Time 10:10
Received By:	Date Time	Condition of Sample:	

TAT ☑ Normal ☐ Rush

CHAIN OF CUSTODY RECORD

White - Report Yellow - Laboratory Pink - Client

Job# 1911070

ASL Sample Receipt Form

Client: SCS Engineers

Date: 11-13-19

Sample Information:

Temperature: 5.9 °C

☐ Blank ☒ Sample

Custody Seal:

☐ Yes ☒ No ☐ Not Available

Received Within Holding Time:

☒ Yes ☐ No

Container:

Proper Containers and Sufficient Volume:

☒ Yes ☐ No

Soil: ☐ 4oz ☐ 8oz ☒ Sleeve ☐ VOA

Water: ☐ 500AG ☐ 1AG ☐ 125PB ☐ 250PB ☐ 500PB ☐ VOA ☐ Other _____

Air: ☐ Tedlar®

Sample Containers Intact:

☒ Yes ☐ No

Trip Blank

☐ Yes ☒ No

Chain-of-Custody (COC):

Received:

☒ Yes ☐ No

Samplers Name:

☒ Yes ☐ No

Container Labels match COC:

☒ Yes ☐ No

COC documents received complete:

☒ Yes ☐ No

Proper Preservation Noted:

☒ Yes ☐ No

Completed By: Janet Chin

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB50-0.5	1911070-01	Solid	11/12/2019 07:40	11/13/2019 10:10
SB49-0.5	1911070-02	Solid	11/12/2019 07:58	11/13/2019 10:10
SB40-0.5	1911070-03	Solid	11/12/2019 08:25	11/13/2019 10:10
SB40-1.5	1911070-04	Solid	11/12/2019 08:26	11/13/2019 10:10
SB41-0.5	1911070-05	Solid	11/12/2019 08:36	11/13/2019 10:10
SB41-1.5	1911070-06	Solid	11/12/2019 08:37	11/13/2019 10:10
SB42-0.5	1911070-07	Solid	11/12/2019 08:44	11/13/2019 10:10
SB42-1.5	1911070-08	Solid	11/12/2019 08:45	11/13/2019 10:10
SB43-0.5	1911070-09	Solid	11/12/2019 08:52	11/13/2019 10:10
SB43-1.5	1911070-10	Solid	11/12/2019 08:53	11/13/2019 10:10
SB44-0.5	1911070-11	Solid	11/12/2019 09:00	11/13/2019 10:10
SB44-1.5	1911070-12	Solid	11/12/2019 09:01	11/13/2019 10:10
SB45-0.5	1911070-13	Solid	11/12/2019 09:16	11/13/2019 10:10
SB45-1.5	1911070-14	Solid	11/12/2019 09:17	11/13/2019 10:10
SB46-0.5	1911070-15	Solid	11/12/2019 09:25	11/13/2019 10:10
SB46-1.5	1911070-16	Solid	11/12/2019 09:26	11/13/2019 10:10
SB48-0.5	1911070-17	Solid	11/12/2019 10:22	11/13/2019 10:10
SB47-0.5	1911070-18	Solid	11/12/2019 10:32	11/13/2019 10:10
SB62-0.5	1911070-19	Solid	11/12/2019 11:40	11/13/2019 10:10
SB61-0.5	1911070-20	Solid	11/12/2019 11:56	11/13/2019 10:10
SB60-0.5	1911070-21	Solid	11/12/2019 12:12	11/13/2019 10:10
SB59-0.5	1911070-22	Solid	11/12/2019 12:31	11/13/2019 10:10
SB58-0.5	1911070-23	Solid	11/12/2019 12:43	11/13/2019 10:10
SB57-0.5	1911070-24	Solid	11/12/2019 12:54	11/13/2019 10:10
SB56-0.5	1911070-25	Solid	11/12/2019 13:13	11/13/2019 10:10
SB53-0.5	1911070-26	Solid	11/12/2019 13:20	11/13/2019 10:10
SB54-0.5	1911070-27	Solid	11/12/2019 13:28	11/13/2019 10:10
SB51-0.5	1911070-28	Solid	11/12/2019 13:35	11/13/2019 10:10
SB52-0.5	1911070-29	Solid	11/12/2019 13:43	11/13/2019 10:10

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB55-0.5	1911070-30	Solid	11/12/2019 13:50	11/13/2019 10:10
SB39-0.5	1911070-31	Solid	11/12/2019 14:25	11/13/2019 10:10
SB38-0.5	1911070-32	Solid	11/12/2019 14:34	11/13/2019 10:10

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB50-0.5

Laboratory Sample ID: 1911070-01 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**1.09**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
alpha-Chlordane	**2.85**		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 16:17	AY	8081A
Surrogate: Decachlorobiphenyl			*105 %*	*43-169*		3545	11/14/2019 16:17	AY	*8081A*

Analytical Results

Client Sample ID: SB49-0.5

Laboratory Sample ID: 1911070-02 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**2.08**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
gamma-Chlordane	**10.0**		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB49-0.5

Laboratory Sample ID: 1911070-02 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
alpha-Chlordane	**16.6**		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
4,4´-DDE	**21.1**		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 16:36	AY	8081A
Surrogate: Decachlorobiphenyl			*110 %*		*43-169*	3545	11/14/2019 16:36	AY	*8081A*

Analytical Results

Client Sample ID: SB40-0.5

Laboratory Sample ID: 1911070-03 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**28.1**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB40-0.5

Laboratory Sample ID: 1911070-03 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 16:55	AY	8081A
Surrogate: Decachlorobiphenyl			*116 %*		*43-169*	3545	11/14/2019 16:55	AY	*8081A*

Analytical Results

Client Sample ID: SB40-1.5

Laboratory Sample ID: 1911070-04 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**25.9**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB41-0.5

Laboratory Sample ID: 1911070-05 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**39.0**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB41-0.5

Laboratory Sample ID: 1911070-05 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 17:14	AY	8081A
Surrogate: Decachlorobiphenyl			*118 %*		*43-169*	3545	11/14/2019 17:14	AY	*8081A*

Analytical Results

Client Sample ID: SB41-1.5

Laboratory Sample ID: 1911070-06 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**33.4**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB42-0.5

Laboratory Sample ID: 1911070-07 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**41.2**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB42-0.5

Laboratory Sample ID: 1911070-07 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 17:33	AY	8081A
Surrogate: Decachlorobiphenyl			*113 %*		*43-169*	3545	11/14/2019 17:33	AY	*8081A*

Analytical Results

Client Sample ID: SB42-1.5

Laboratory Sample ID: 1911070-08 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**28.7**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB43-0.5

Laboratory Sample ID: 1911070-09 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**9.42**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB43-0.5

Laboratory Sample ID: 1911070-09 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 17:52	AY	8081A
Surrogate: Decachlorobiphenyl			*92.9 %*		*43-169*	3545	11/14/2019 17:52	AY	*8081A*

Analytical Results

Client Sample ID: SB43-1.5

Laboratory Sample ID: 1911070-10 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**18.1**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB44-0.5

Laboratory Sample ID: 1911070-11 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**34.7**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB44-0.5

Laboratory Sample ID: 1911070-11 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 18:12	AY	8081A
Surrogate: Decachlorobiphenyl			*109 %*	*43-169*		3545	11/14/2019 18:12	AY	*8081A*

Analytical Results

Client Sample ID: SB44-1.5

Laboratory Sample ID: 1911070-12 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**15.5**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB45-0.5

Laboratory Sample ID: 1911070-13 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**3.93**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB45-0.5

Laboratory Sample ID: 1911070-13 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 18:31	AY	8081A
Surrogate: Decachlorobiphenyl			*97.3 %*		*43-169*	3545	11/14/2019 18:31	AY	*8081A*

Analytical Results

Client Sample ID: SB45-1.5

Laboratory Sample ID: 1911070-14 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**23.1**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB46-0.5

Laboratory Sample ID: 1911070-15 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB46-0.5

Laboratory Sample ID: 1911070-15 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90404		Prepared: 11/14/2019 10:23		
Arsenic	**5.66**		0.250	mg/kg	1	3050B	11/15/2019 15:26	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 18:50	AY	8081A
Surrogate: Decachlorobiphenyl			*84.0 %*		*43-169*	3545	11/14/2019 18:50	AY	*8081A*

Analytical Results

Client Sample ID: SB46-1.5

Laboratory Sample ID: 1911070-16 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.97**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB48-0.5

Laboratory Sample ID: 1911070-17 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.28**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 19:09	AY	8081A
Surrogate: Decachlorobiphenyl			*102 %*	*43-169*		3545	11/14/2019 19:09	AY	*8081A*

Analytical Results

Client Sample ID: SB47-0.5

Laboratory Sample ID: 1911070-18 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**1.24**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB47-0.5

Laboratory Sample ID: 1911070-18 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 19:47	AY	8081A
Surrogate: Decachlorobiphenyl			*108 %*	*43-169*		3545	11/14/2019 19:47	AY	*8081A*

Analytical Results

Client Sample ID: SB62-0.5

Laboratory Sample ID: 1911070-19 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**0.678**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB62-0.5

Laboratory Sample ID: 1911070-19 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 20:06	AY	8081A
Surrogate: Decachlorobiphenyl			*96.4 %*		*43-169*	3545	11/14/2019 20:06	AY	*8081A*

Analytical Results

Client Sample ID: SB61-0.5

Laboratory Sample ID: 1911070-20 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**9.11**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
gamma-Chlordane	**49.8**		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
alpha-Chlordane	**136**		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
4,4´-DDD	**17.6**		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
4,4´-DDE	**363**		40.0	ug/kg	10	3545	11/14/2019 20:26	AY	8081A
4,4´-DDT	**6.29**		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Dieldrin	**37.6**		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB61-0.5

Laboratory Sample ID: 1911070-20 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Chlordane (total)	**566**		100	ug/kg	1	3545	11/14/2019 20:26	AY	8081A
Surrogate: Decachlorobiphenyl			*104 %*		*43-169*	3545	11/14/2019 20:26	AY	*8081A*

Analytical Results

Client Sample ID: SB60-0.5

Laboratory Sample ID: 1911070-21 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.70**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 20:45	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 20:45	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB60-0.5

Laboratory Sample ID: 1911070-21 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Surrogate: Decachlorobiphenyl			*115 %*	*43-169*		3545	11/14/2019 20:45	AY	*8081A*

Analytical Results

Client Sample ID: SB59-0.5

Laboratory Sample ID: 1911070-22 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**0.976**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 21:04	AY	8081A
Surrogate: Decachlorobiphenyl			*94.8 %*	*43-169*		3545	11/14/2019 21:04	AY	*8081A*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB58-0.5

Laboratory Sample ID: 1911070-23 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**0.290**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 21:23	AY	8081A
Surrogate: Decachlorobiphenyl			*113 %*	*43-169*		3545	11/14/2019 21:23	AY	*8081A*

Analytical Results

Client Sample ID: SB57-0.5

Laboratory Sample ID: 1911070-24 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**0.622**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
Aldrin	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB57-0.5

Laboratory Sample ID: 1911070-24 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90412		Prepared: 11/14/2019 09:01		
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/14/2019 21:42	AY	8081A
Surrogate: Decachlorobiphenyl			*112 %*		*43-169*	3545	11/14/2019 21:42	AY	*8081A*

Analytical Results

Client Sample ID: SB56-0.5

Laboratory Sample ID: 1911070-25 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.50**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
gamma-Chlordane	**4.95**		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
alpha-Chlordane	**21.2**		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
4,4´-DDD	**7.93**		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
4,4´-DDE	**5.97**		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
4,4´-DDT	**4.30**		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB56-0.5

Laboratory Sample ID: 1911070-25 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Chlordane (total)	**103**		100	ug/kg	1	3545	11/15/2019 16:15	AY	8081A
Surrogate: Decachlorobiphenyl			*108 %*		*43-169*	3545	11/15/2019 16:15	AY	*8081A*

Analytical Results

Client Sample ID: SB53-0.5

Laboratory Sample ID: 1911070-26 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.04**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
gamma-Chlordane	**8.29**		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
alpha-Chlordane	**22.8**		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
4,4´-DDD	**6.07**		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
4,4´-DDE	**7.21**		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB53-0.5

Laboratory Sample ID: 1911070-26 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 16:31	AY	8081A
Surrogate: Decachlorobiphenyl			*117 %*		*43-169*	3545	11/15/2019 16:31	AY	*8081A*

Analytical Results

Client Sample ID: SB54-0.5

Laboratory Sample ID: 1911070-27 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.87**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
gamma-Chlordane	**3.34**		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
alpha-Chlordane	**10.6**		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 16:47	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 16:47	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB54-0.5

Laboratory Sample ID: 1911070-27 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Surrogate: Decachlorobiphenyl			*116 %*	*43-169*		3545	11/15/2019 16:47	AY	*8081A*

Analytical Results

Client Sample ID: SB51-0.5

Laboratory Sample ID: 1911070-28 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**0.635**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 17:04	AY	8081A
Surrogate: Decachlorobiphenyl			*115 %*	*43-169*		3545	11/15/2019 17:04	AY	*8081A*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB52-0.5

Laboratory Sample ID: 1911070-29 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.52**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
gamma-Chlordane	**5.57**		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
alpha-Chlordane	**23.0**		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
4,4´-DDD	**7.00**		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
4,4´-DDE	**5.13**		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 17:20	AY	8081A
Surrogate: Decachlorobiphenyl			*114 %*	*43-169*		3545	11/15/2019 17:20	AY	*8081A*

Analytical Results

Client Sample ID: SB55-0.5

Laboratory Sample ID: 1911070-30 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**2.30**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
gamma-Chlordane	**9.41**		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB55-0.5

Laboratory Sample ID: 1911070-30 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
alpha-Chlordane	**26.0**		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 17:36	AY	8081A
Surrogate: Decachlorobiphenyl			*136 %*		*43-169*	3545	11/15/2019 17:36	AY	*8081A*

Analytical Results

Client Sample ID: SB39-0.5

Laboratory Sample ID: 1911070-31 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**1.80**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
4,4´-DDD	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
4,4´-DDE	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
4,4´-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB39-0.5

Laboratory Sample ID: 1911070-31 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 17:52	AY	8081A
Surrogate: Decachlorobiphenyl			*94.7 %*		*43-169*	3545	11/15/2019 17:52	AY	*8081A*

Analytical Results

Client Sample ID: SB38-0.5

Laboratory Sample ID: 1911070-32 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BK90406		Prepared: 11/14/2019 10:27		
Arsenic	**3.58**		0.250	mg/kg	1	3050B	11/15/2019 16:23	LVE	SW846 6010B
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
Aldrin	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
alpha-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
beta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
gamma-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
alpha-Chlordane	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
4,4′-DDD	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
4,4′-DDE	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
4,4′-DDT	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
delta-BHC	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Dieldrin	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endosulfan I	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endosulfan II	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endosulfan sulfate	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endrin	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endrin aldehyde	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Endrin ketone	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Analytical Results

Client Sample ID: SB38-0.5

Laboratory Sample ID: 1911070-32 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Organochlorine Pesticides				Batch ID:	BK90414		Prepared: 11/15/2019 09:37		
gamma-BHC, Lindane	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Heptachlor	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Heptachlor Epoxide	ND		2.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Methoxychlor	ND		4.00	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Toxaphene	ND		170	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Chlordane (total)	ND		100	ug/kg	1	3545	11/15/2019 18:08	AY	8081A
Surrogate: Decachlorobiphenyl			*107 %*		*43-169*	3545	11/15/2019 18:08	AY	*8081A*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Total ICP Metals - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BK90404 - 3050B - SW846 6010B										
Blank (BK90404-BLK1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	ND	0.250	mg/kg							
LCS (BK90404-BS1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	103	0.500	mg/kg	100		103	80-120			
LCS Dup (BK90404-BSD1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	102	0.500	mg/kg	100		102	80-120	0.0634	20	
Batch BK90406 - 3050B - SW846 6010B										
Blank (BK90406-BLK1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	ND	0.250	mg/kg							
LCS (BK90406-BS1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	103	0.500	mg/kg	100		103	80-120			
LCS Dup (BK90406-BSD1)				Prepared: 11/14/201 Analyzed: 11/15/201						
Arsenic	103	0.500	mg/kg	100		103	80-120	0.278	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Organochlorine Pesticides - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BK90412 - 3545 - 8081A										
Blank (BK90412-BLK1)				Prepared & Analyzed: 11/14/201						
Aldrin	ND	2.00	ug/kg							
alpha-BHC	ND	2.00	"							
beta-BHC	ND	2.00	"							
gamma-Chlordane	ND	2.00	"							
alpha-Chlordane	ND	2.00	"							
4,4´-DDD	ND	4.00	"							
4,4´-DDE	ND	4.00	"							
4,4´-DDT	ND	4.00	"							
delta-BHC	ND	2.00	"							
Dieldrin	ND	4.00	"							
Endosulfan I	ND	2.00	"							
Endosulfan II	ND	4.00	"							
Endosulfan sulfate	ND	4.00	"							
Endrin	ND	4.00	"							
Endrin aldehyde	ND	4.00	"							
Endrin ketone	ND	4.00	"							
gamma-BHC, Lindane	ND	2.00	"							
Heptachlor	ND	2.00	"							
Heptachlor Epoxide	ND	2.00	"							
Methoxychlor	ND	4.00	"							
Toxaphene	ND	170	"							
Chlordane (total)	ND	100	"							
Surrogate: Decachlorobiphenyl	*19.5*		*"*	*16.7*		*117*	*43-169*			
LCS (BK90412-BS1)				Prepared & Analyzed: 11/14/201						
Aldrin	14.6	2.00	ug/kg	16.7		87.9	42-122			
4,4´-DDT	13.2	4.00	"	16.7		79.2	25-160			
Dieldrin	15.6	4.00	"	16.7		93.8	36-146			
Endrin	12.9	4.00	"	16.7		77.4	30-147			
gamma-BHC, Lindane	13.6	2.00	"	16.7		81.6	32-127			
Heptachlor	11.9	2.00	"	16.7		71.4	34-111			
Surrogate: Decachlorobiphenyl	*18.2*		*"*	*16.7*		*109*	*43-169*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Organochlorine Pesticides - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BK90412 - 3545 - 8081A										
LCS Dup (BK90412-BSD1)				Prepared & Analyzed: 11/14/201						
Aldrin	18.0	2.00	ug/kg	16.7		108	42-122	20.8	30	
4,4´-DDT	16.1	4.00	"	16.7		96.5	25-160	19.7	30	
Dieldrin	18.5	4.00	"	16.7		111	36-146	16.8	30	
Endrin	15.7	4.00	"	16.7		94.3	30-147	19.7	30	
gamma-BHC, Lindane	15.0	2.00	"	16.7		90.0	32-127	9.82	30	
Heptachlor	13.3	2.00	"	16.7		80.0	34-111	11.4	30	
Surrogate: Decachlorobiphenyl	*20.5*		*"*	*16.7*		*123*	*43-169*			
Batch BK90414 - 3545 - 8081A										
Blank (BK90414-BLK1)				Prepared & Analyzed: 11/15/201						
Aldrin	ND	2.00	ug/kg							
alpha-BHC	ND	2.00	"							
beta-BHC	ND	2.00	"							
gamma-Chlordane	ND	2.00	"							
alpha-Chlordane	ND	2.00	"							
4,4´-DDD	ND	4.00	"							
4,4´-DDE	ND	4.00	"							
4,4´-DDT	ND	4.00	"							
delta-BHC	ND	2.00	"							
Dieldrin	ND	4.00	"							
Endosulfan I	ND	2.00	"							
Endosulfan II	ND	4.00	"							
Endosulfan sulfate	ND	4.00	"							
Endrin	ND	4.00	"							
Endrin aldehyde	ND	4.00	"							
Endrin ketone	ND	4.00	"							
gamma-BHC, Lindane	ND	2.00	"							
Heptachlor	ND	2.00	"							
Heptachlor Epoxide	ND	2.00	"							
Methoxychlor	ND	4.00	"							
Toxaphene	ND	170	"							
Chlordane (total)	ND	100	"							
Surrogate: Decachlorobiphenyl	*19.7*		*"*	*16.7*		*118*	*43-169*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Organochlorine Pesticides - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BK90414 - 3545 - 8081A										
LCS (BK90414-BS1)				Prepared & Analyzed: 11/15/201						
Aldrin	14.0	2.00	ug/kg	16.7		83.9	42-122			
4,4´-DDT	16.4	4.00	"	16.7		98.2	25-160			
Dieldrin	16.3	4.00	"	16.7		97.7	36-146			
Endrin	14.9	4.00	"	16.7		89.1	30-147			
gamma-BHC, Lindane	14.3	2.00	"	16.7		85.7	32-127			
Heptachlor	15.4	2.00	"	16.7		92.2	34-111			
Surrogate: Decachlorobiphenyl	*19.7*		*"*	*16.7*		*118*	*43-169*			
LCS Dup (BK90414-BSD1)				Prepared & Analyzed: 11/15/201						
Aldrin	13.8	2.00	ug/kg	16.7		82.9	42-122	1.14	30	
4,4´-DDT	20.8	4.00	"	16.7		125	25-160	23.8	30	
Dieldrin	19.2	4.00	"	16.7		115	36-146	16.3	30	
Endrin	18.6	4.00	"	16.7		111	30-147	22.2	30	
gamma-BHC, Lindane	15.8	2.00	"	16.7		94.8	32-127	10.1	30	
Heptachlor	16.7	2.00	"	16.7		100	34-111	8.58	30	
Surrogate: Decachlorobiphenyl	*19.1*		*"*	*16.7*		*115*	*43-169*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911070
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	11/21/2019 14:27

Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the practical quantitation limit (PQL)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

03 December 2019

Luke Montague

SCS Engineers

8799 Balboa Avenue, Suite 290

San Diego, CA 92123

Work Order #: 1911204

Project Name: Riverwalk

Project ID: 01210118.02

Site Address: 5905 Friars Road San Diego, CA

Enclosed are the results of analyses for samples received by the laboratory on November 22, 2019. If you have any questions concerning this report, please feel free to contact us.

Rojert G. Araghi

Laboratory Director

American Scientific Labs.
2520 N. San Fernando Road
Los Angeles, CA 90065
Phone # 323-223-9700
Project Contact : Andre Balanji

SCS Engineers

Project :Rivervalle

Additional Test Request **11/22/2019**

Standard TAT Report Due **12/2/2019**

Project Contact : Luke Montague

ASL JOB # 1911204

	Sample ID	Soil	Date	Analysis	LAB ID
1	**SB40-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-01**
2	**SB41-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-02**
3	**SB42-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-03**
4	**SB43-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-04**
5	**SB44-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-05**
6	**SB45-3**	Soil	11/12/2019	**Arsenic (6010B)**	**1911204-06**

Initial Job # 1911070

Janet Chin

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911204
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	12/03/2019 15:50

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB40-3	1911204-01	Solid	11/12/2019 08:27	11/22/2019 10:16
SB41-3	1911204-02	Solid	11/12/2019 08:38	11/22/2019 10:16
SB42-3	1911204-03	Solid	11/12/2019 08:46	11/22/2019 10:16
SB43-3	1911204-04	Solid	11/12/2019 08:54	11/22/2019 10:16
SB44-3	1911204-05	Solid	11/12/2019 09:02	11/22/2019 10:16
SB45-3	1911204-06	Solid	11/12/2019 09:18	11/22/2019 10:16

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911204
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	12/03/2019 15:50

Analytical Results

Client Sample ID: SB40-3

Laboratory Sample ID: 1911204-01 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**22.2**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB41-3

Laboratory Sample ID: 1911204-02 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**53.3**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB42-3

Laboratory Sample ID: 1911204-03 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**16.0**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB43-3

Laboratory Sample ID: 1911204-04 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**18.3**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB44-3

Laboratory Sample ID: 1911204-05 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**22.6**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911204
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	12/03/2019 15:50

Analytical Results

Client Sample ID: SB45-3

Laboratory Sample ID: 1911204-06 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BL90066		Prepared: 12/03/2019 11:37		
Arsenic	**3.47**		0.250	mg/kg	1	3050B	12/03/2019 12:48	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911204
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	12/03/2019 15:50

Total ICP Metals - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BL90066 - 3050B - SW846 6010B										
Blank (BL90066-BLK1)				Prepared & Analyzed: 12/03/201						
Arsenic	ND	0.250	mg/kg							
LCS (BL90066-BS1)				Prepared & Analyzed: 12/03/201						
Arsenic	106	0.500	mg/kg	100		106	80-120			
LCS Dup (BL90066-BSD1)				Prepared & Analyzed: 12/03/201						
Arsenic	108	0.500	mg/kg	100		108	80-120	1.66	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 1911204
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	12/03/2019 15:50

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the practical quantitation limit (PQL)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

22 January 2020

Luke Montague

SCS Engineers

8799 Balboa Avenue, Suite 290

San Diego, CA 92123

Work Order #: 2001079

Project Name: Riverwalk

Project ID: 01210118.02

Site Address: 5905 Friars Road San Diego, CA

Enclosed are the results of analyses for samples received by the laboratory on January 14, 2020. If you have any questions concerning this report, please feel free to contact us.

Rojert G. Araghi

Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 85065 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY RECORD

Company: SCS Engineers		Report To: Same	ANALYSIS REQUESTED
Address:	Project Name: Riverwalk	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID: 01210118.02		
E-mail: lmontague@scsengineers.com	Project Manager: LukeMontague	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	Arsenic (6010B)	Archive	Remarks
1	2001079-01	SB63-1	1/13/18	903	1	Acetate sleeve	soil	none	X		
2	2001079-02	SB63-2.5		904					X		
3	2001079-03	SB63-5		910					X		
		SB63-7.5		925						archive	
4	2001079-04	SB63-10		913					X		
		SB63-12.5		930						X	
5	2001079-05	SB63-15		931					X		
		SB63-17.5		936						X	
6	2001079-06	SB63-20		935					X		
7	2001079-07	SB65-1		1003					X		

Collected By: Wyler Overton COTO	Date 1/13/19	Time 903	Relinquished By:	Date	Time
Relinquished By: Wyler Overton COTO	Date 1/13/19	Time 1630	Received For Laboratory: A Nataneyan	Date 1-14-20	Time 10:00 am
Received By:	Date	Time	Condition of Sample:		

TAT: ☑ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 85066 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY RECORD

Company: ← same as page 1 →		Report To:	ANALYSIS REQUESTED
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	Arsenic (6010B)	Archive	Remarks
8	2001079-08	SB65-2.5	1/13/20	1003	1	Acetate sleeve	soil	none	X		
9	2001079-09	SB65-5		1007					X		
		SB65-7.5		1007						X	
10	2001079-10	SB65-10		1013					X		
		SB65-12.5		1007						X	
11	2001079-11	SB65-15		1025					X		
12	2001079-12	SB65-17.5		1035					X	X	please analyze
13	2001079-13	~~SB65-20~~ SB66-1		1102					X		
14	2001079-14	SB66-2.5		1102					X		
15	2001079-15	SB66-5		1106					X		

Collected By: W Tyler Overton CTO Date 1/13/19 Time 903

Relinquished By: W Tyler Overton CTO Date 1/13/19 Time 1630

Received By: Date Time

Relinquished By: Date Time

Received For Laboratory: A Montanez Date 1-14-20 Time 10:00

Condition of Sample:

TAT: ☑ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 84247 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY RECORD

Company: ← same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ANALYSIS REQUESTED: Arsenic (6010B); Archive

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	Arsenic (6010B)	Archive	Remarks
		SB66-7.5	1/13/20	1106	1	Acetate sleeve	soil	none		X	
16	2001079-16	SB66-10		1110					X		
		SB66-12.5		1113						X	
17	2001079-17	SB66-15		1113					X		
		SB66-17.5		1118						X	
18	2001079-18	SB66-20		1118					X		
19	2001079-19	SB64-1		1137					X		
20	2001079-20	SB64-2.5		1138					X		
21	2001079-21	SB64-5		1142					X		
		SB64-7.5		1141						X	

Collected By: WTyler Overton CMO	Date 1/13/20 Time 903	Relinquished By:	Date Time
Relinquished By: WTyler Overton CMO	Date 1/13/20 Time 1630	Received For Laboratory A Malakyan	Date 01-14-20 Time 10:00a
Received By:	Date Time	Condition of Sample:	

TAT: ☑ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 84248 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY RECORD

Company: ← same as page 1 →		Report To:	ANALYSIS REQUESTED
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	Arsenic (6010B)	Archive	Remarks
22	2001079-22	SB64-10	1/13/20	1144	1	Acetate sleeve	Soil	none	X		
		SB64-12.5		1145						X	
23	2001079-23	SB64-15		1146					X		
		SB64-17.5		1146						X	
24	2001079-24	SB64-20		1148					X		
25	2001079-25	SB67-1		1246					X		
26	2001079-26	SB67-2.5		1246					X		
27	2001079-27	SB67-5		1249					X		
		SB67-7.5		1249						X	
28	2001079-28	SB67-10		1253					X		

Collected By: WTyler Overton WTO Date 1/13/20 Time 903	Relinquished By:	Date	Time
Relinquished By: WTyler Overton WTO Date 1/13/20 Time 1630	Received For Laboratory: [signature] Matamoros Date 01-14-20 Time 10:00 am		TAT ☑ Normal ☐ Rush
Received By:	Date	Time	Condition of Sample:

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 84249 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY FORM

Company: SCS ← Same as page 1 →		Report To:	ANALYSIS REQUESTED
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	Arsenic (6010B)	Archive	Remarks
		SB67-12.5	1/13/20	1256	1	Acetate sleeve	soil	none		X	
29	2001079-29	SB67-15		1256					X		
		SB67-17.5		1300						X	
30	2001079-30	SB67-20		1300					X		
31	2001079-31	SB68-1		1325					X		
32	2001079-32	SB68-2.5		1325					X		
33	2001079-33	SB68-5		1328					X		
		SB68-7.5		1328						X	
34	2001079-34	SB68-10		1330					X		
		SB68-12.5								X	

Collected By: W Tyler Overton USD	Date 1/13/20	Time 903	Relinquished By:	Date	Time
Relinquished By: W Tyler Overton USD	Date 1/13/20	Time 1630	Received For Laboratory: J Natanyan	Date 01-14-20	Time 10:00 am
Received By:	Date	Time	Condition of Sample:		

TAT ☑ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

COC# № 84250 GLOBAL ID _____ E REPORT: ☑ PDF ☐ EDF ☐ EDD ASL JOB# 2001079

CHAIN OF CUSTODY RECORD

Company: ← Same as page 1 →		Report To:	
Address:	Project Name:	Address:	
	Site Address:	Invoice To:	
Telephone: / Fax:		Address:	
Special Instruction:	Project ID:		
E-mail:	Project Manager:	P.O.#:	

ITEM	LAB USE ONLY Lab ID	SAMPLE DESCRIPTION Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	ANALYSIS REQUESTED Arsenic (6010B)	Archive	Remarks
35	2001079-35	SB68-15	1/13/20	1334	1	Acetate sleeve	soil	none	X		
36	2001079-36	SB69-1		~~1410~~ 1432 ~~1355~~					X		
37	2001079-37	SB69-2.5		~~1410~~ 1432 ~~1355~~					X		
		SB69-5		~~1415~~ 1434						X	
38	2001079-38	SB69-7.5		~~1415~~ 1436					X		
39	2001079-39	SB69-10		1446					X		
		SB69-12.5		1454						X	
40	2001079-40	SB69-15		1454					X		
		SB69-17.5		1502						X	
41	2001079-41	SB69-18		1504					X		

Collected By: W Tyler Overton LUO	Date 1/13/20	Time 903	Relinquished By: Date Time
Relinquished By: W Tyler Overton LUO	Date 1/13/20	Time 1630	Received For Laboratory: A Matamoros Date 01-14-20 Time 10:00 a.m.
Received By:	Date	Time	Condition of Sample:

TAT: ☑ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

Job# 2001079

ASL Sample Receipt Form

Client: SCS Engineers

Date: 1-14-2020

Sample Information:

Temperature: 4.8 °C ☐ Blank ☒ Sample

Custody Seal: ☐ Yes ☒ No ☐ Not Available

Received Within Holding Time: ☒ Yes ☐ No

Container:

Proper Containers and Sufficient Volume: ☒ Yes ☐ No

Soil: ☐ 4oz ☐ 8oz ☒ Sleeve ☐ VOA

Water: ☐ 500AG ☐ 1AG ☐ 125PB ☐ 250PB ☐ 500PB ☐ VOA ☐ Other _____

Air: ☐ Tedlar®

Sample Containers Intact: ☒ Yes ☐ No

Trip Blank ☐ Yes ☒ No

Chain-of-Custody (COC):

Received: ☒ Yes ☐ No

Samplers Name: ☒ Yes ☐ No

Container Labels match COC: ☒ Yes ☐ No

COC documents received complete: ☒ Yes ☐ No

Proper Preservation Noted: ☒ Yes ☐ No

Completed By: Janet Chin

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB63-1	2001079-01	Solid	01/13/2020 09:03	01/14/2020 10:00
SB63-2.5	2001079-02	Solid	01/13/2020 09:04	01/14/2020 10:00
SB63-5	2001079-03	Solid	01/13/2020 09:10	01/14/2020 10:00
SB63-10	2001079-04	Solid	01/13/2020 09:13	01/14/2020 10:00
SB63-15	2001079-05	Solid	01/13/2020 09:31	01/14/2020 10:00
SB63-20	2001079-06	Solid	01/13/2020 09:35	01/14/2020 10:00
SB65-1	2001079-07	Solid	01/13/2020 10:03	01/14/2020 10:00
SB65-2.5	2001079-08	Solid	01/13/2020 10:03	01/14/2020 10:00
SB65-5	2001079-09	Solid	01/13/2020 10:07	01/14/2020 10:00
SB65-10	2001079-10	Solid	01/13/2020 10:13	01/14/2020 10:00
SB65-15	2001079-11	Solid	01/13/2020 10:25	01/14/2020 10:00
SB65-17.5	2001079-12	Solid	01/13/2020 10:35	01/14/2020 10:00
SB66-1	2001079-13	Solid	01/13/2020 11:02	01/14/2020 10:00
SB66-2.5	2001079-14	Solid	01/13/2020 11:02	01/14/2020 10:00
SB66-5	2001079-15	Solid	01/13/2020 11:06	01/14/2020 10:00
SB66-10	2001079-16	Solid	01/13/2020 11:10	01/14/2020 10:00
SB66-15	2001079-17	Solid	01/13/2020 11:13	01/14/2020 10:00
SB66-20	2001079-18	Solid	01/13/2020 11:18	01/14/2020 10:00
SB64-1	2001079-19	Solid	01/13/2020 11:37	01/14/2020 10:00
SB64-2.5	2001079-20	Solid	01/13/2020 11:38	01/14/2020 10:00
SB64-5	2001079-21	Solid	01/13/2020 11:42	01/14/2020 10:00
SB64-10	2001079-22	Solid	01/13/2020 11:44	01/14/2020 10:00
SB64-15	2001079-23	Solid	01/13/2020 11:46	01/14/2020 10:00
SB64-20	2001079-24	Solid	01/13/2020 11:48	01/14/2020 10:00
SB67-1	2001079-25	Solid	01/13/2020 12:46	01/14/2020 10:00
SB67-2.5	2001079-26	Solid	01/13/2020 12:46	01/14/2020 10:00
SB67-5	2001079-27	Solid	01/13/2020 12:49	01/14/2020 10:00
SB67-10	2001079-28	Solid	01/13/2020 12:53	01/14/2020 10:00
SB67-15	2001079-29	Solid	01/13/2020 12:56	01/14/2020 10:00

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB67-20	2001079-30	Solid	01/13/2020 13:00	01/14/2020 10:00
SB68-1	2001079-31	Solid	01/13/2020 13:25	01/14/2020 10:00
SB68-2.5	2001079-32	Solid	01/13/2020 13:25	01/14/2020 10:00
SB68-5	2001079-33	Solid	01/13/2020 13:28	01/14/2020 10:00
SB68-10	2001079-34	Solid	01/13/2020 13:30	01/14/2020 10:00
SB68-15	2001079-35	Solid	01/13/2020 13:34	01/14/2020 10:00
SB69-1	2001079-36	Solid	01/13/2020 14:32	01/14/2020 10:00
SB69-2.5	2001079-37	Solid	01/13/2020 14:32	01/14/2020 10:00
SB69-7.5	2001079-38	Solid	01/13/2020 14:36	01/14/2020 10:00
SB69-10	2001079-39	Solid	01/13/2020 14:46	01/14/2020 10:00
SB69-15	2001079-40	Solid	01/13/2020 14:54	01/14/2020 10:00
SB69-18	2001079-41	Solid	01/13/2020 15:04	01/14/2020 10:00

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB63-1

Laboratory Sample ID: 2001079-01 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**2.63**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB63-2.5

Laboratory Sample ID: 2001079-02 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**3.44**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB63-5

Laboratory Sample ID: 2001079-03 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**3.22**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB63-10

Laboratory Sample ID: 2001079-04 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**1.86**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB63-15

Laboratory Sample ID: 2001079-05 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**0.780**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB63-20

Laboratory Sample ID: 2001079-06 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**2.05**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-1

Laboratory Sample ID: 2001079-07 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**3.65**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-2.5

Laboratory Sample ID: 2001079-08 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**14.5**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-5

Laboratory Sample ID: 2001079-09 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**6.34**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-10

Laboratory Sample ID: 2001079-10 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**3.03**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB65-15

Laboratory Sample ID: 2001079-11 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**1.44**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-17.5

Laboratory Sample ID: 2001079-12 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**0.745**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-1

Laboratory Sample ID: 2001079-13 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**25.0**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-2.5

Laboratory Sample ID: 2001079-14 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**14.9**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-5

Laboratory Sample ID: 2001079-15 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00506		Prepared: 01/20/2020 10:42		
Arsenic	**17.6**		0.250	mg/kg	1	3050B	01/20/2020 17:35	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB66-10

Laboratory Sample ID: 2001079-16 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**24.4**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-15

Laboratory Sample ID: 2001079-17 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**3.18**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-20

Laboratory Sample ID: 2001079-18 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**0.386**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB64-1

Laboratory Sample ID: 2001079-19 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**18.5**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB64-2.5

Laboratory Sample ID: 2001079-20 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**12.0**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB64-5

Laboratory Sample ID: 2001079-21 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**18.5**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB64-10

Laboratory Sample ID: 2001079-22 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**2.25**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB64-15

Laboratory Sample ID: 2001079-23 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**2.78**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB64-20

Laboratory Sample ID: 2001079-24 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**0.265**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB67-1

Laboratory Sample ID: 2001079-25 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**1.75**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB67-2.5

Laboratory Sample ID: 2001079-26 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**28.2**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB67-5

Laboratory Sample ID: 2001079-27 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**0.718**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB67-10

Laboratory Sample ID: 2001079-28 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**1.25**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB67-15

Laboratory Sample ID: 2001079-29 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**1.89**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB67-20

Laboratory Sample ID: 2001079-30 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00507		Prepared: 01/20/2020 11:46		
Arsenic	**0.641**		0.250	mg/kg	1	3050B	01/20/2020 18:30	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB68-1

Laboratory Sample ID: 2001079-31 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**10.5**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB68-2.5

Laboratory Sample ID: 2001079-32 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**9.27**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB68-5

Laboratory Sample ID: 2001079-33 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**8.47**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB68-10

Laboratory Sample ID: 2001079-34 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**12.9**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB68-15

Laboratory Sample ID: 2001079-35 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**3.26**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB69-1

Laboratory Sample ID: 2001079-36 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**3.66**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB69-2.5

Laboratory Sample ID: 2001079-37 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**4.31**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB69-7.5

Laboratory Sample ID: 2001079-38 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**0.918**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB69-10

Laboratory Sample ID: 2001079-39 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**0.836**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB69-15

Laboratory Sample ID: 2001079-40 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**1.41**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Analytical Results

Client Sample ID: SB69-18

Laboratory Sample ID: 2001079-41 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00508		Prepared: 01/20/2020 11:50		
Arsenic	**0.356**		0.250	mg/kg	1	3050B	01/20/2020 19:14	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Total ICP Metals - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BA00506 - 3050B - SW846 6010B										
Blank (BA00506-BLK1)				Prepared & Analyzed: 01/20/202						
Arsenic	ND	0.250	mg/kg							
LCS (BA00506-BS1)				Prepared & Analyzed: 01/20/202						
Arsenic	103	0.500	mg/kg	100		103	80-120			
LCS Dup (BA00506-BSD1)				Prepared & Analyzed: 01/20/202						
Arsenic	103	0.500	mg/kg	100		103	80-120	0.398	20	
Batch BA00507 - 3050B - SW846 6010B										
Blank (BA00507-BLK1)				Prepared & Analyzed: 01/20/202						
Arsenic	ND	0.250	mg/kg							
LCS (BA00507-BS1)				Prepared & Analyzed: 01/20/202						
Arsenic	103	0.500	mg/kg	100		103	80-120			
LCS Dup (BA00507-BSD1)				Prepared & Analyzed: 01/20/202						
Arsenic	102	0.500	mg/kg	100		102	80-120	1.10	20	
Batch BA00508 - 3050B - SW846 6010B										
Blank (BA00508-BLK1)				Prepared & Analyzed: 01/20/202						
Arsenic	ND	0.250	mg/kg							
LCS (BA00508-BS1)				Prepared & Analyzed: 01/20/202						
Arsenic	99.5	0.500	mg/kg	100		99.5	80-120			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Total ICP Metals - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BA00508 - 3050B - SW846 6010B										
LCS Dup (BA00508-BSD1)				Prepared & Analyzed: 01/20/202						
Arsenic	102	0.500	mg/kg	100		102	80-120	2.64	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001079
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/22/2020 13:09

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the practical quantitation limit (PQL)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

American Scientific Laboratories, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

29 January 2020

Luke Montague

SCS Engineers

8799 Balboa Avenue, Suite 290

San Diego, CA 92123

Work Order #: 2001141

Project Name: Riverwalk

Project ID: 01210118.02

Site Address: 5905 Friars Road San Diego, CA

Enclosed are the results of analyses for samples received by the laboratory on January 22, 2020. If you have any questions concerning this report, please feel free to contact us.

Rojert G. Araghi

Laboratory Director

American Scientific Labs.
2520 N. San Fernando Road
Los Angeles, CA 90065
Phone # 323-223-9700
Project Contact : Andre Balanji

SCS Engineers
Project : River Walk
Additional Test Request : 1/22/2020
Standard TAT Report Due: 1/29/2020

Project Contact : Luke Montague

ASL JOB # 2001141

	Sample ID	Soil	Date	Analysis	LAB ID
1	**SB64-7.5**	Soil	1/13/2020	**Arsenic (6010B)**	**2001141-01**
2	**SB65-7.5**	Soil	1/13/2020	**Arsenic (6010B)**	**2001141-02**
3	**SB66-12.5**	Soil	1/13/2020	**Arsenic (6010B)**	**2001141-03**
4	**SB68-12.5**	Soil	1/13/2020	**Arsenic (6010B)**	**2001141-04**

Initial JOB # 2001079

Janet Chin

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001141
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/29/2020 16:54

ANALYTICAL SUMMARY REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB64-7.5	2001141-01	Solid	01/13/2020 11:41	01/22/2020 14:51
SB65-7.5	2001141-02	Solid	01/13/2020 10:07	01/22/2020 14:51
SB66-12.5	2001141-03	Solid	01/13/2020 11:13	01/22/2020 14:51
SB68-12.5	2001141-04	Solid	01/13/2020 13:34	01/22/2020 14:51

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001141
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/29/2020 16:54

Analytical Results

Client Sample ID: SB64-7.5

Laboratory Sample ID: 2001141-01 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00695		Prepared: 01/23/2020 10:47		
Arsenic	**19.7**		0.250	mg/kg	1	3050B	01/23/2020 18:38	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB65-7.5

Laboratory Sample ID: 2001141-02 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00695		Prepared: 01/23/2020 10:47		
Arsenic	**5.55**		0.250	mg/kg	1	3050B	01/23/2020 18:38	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB66-12.5

Laboratory Sample ID: 2001141-03 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00695		Prepared: 01/23/2020 10:47		
Arsenic	**3.56**		0.250	mg/kg	1	3050B	01/23/2020 18:38	LVE	SW846 6010B

Analytical Results

Client Sample ID: SB68-12.5

Laboratory Sample ID: 2001141-04 (Solid)

Analyte	Result	Notes	PQL	Units	Dilution	Prep Method	Analyzed	Analyst	Method
Total ICP Metals				Batch ID:	BA00695		Prepared: 01/23/2020 10:47		
Arsenic	**1.61**		0.250	mg/kg	1	3050B	01/23/2020 18:38	LVE	SW846 6010B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001141
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/29/2020 16:54

Total ICP Metals - Quality Control Report

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BA00695 - 3050B - SW846 6010B										
Blank (BA00695-BLK1)				Prepared & Analyzed: 01/23/202						
Arsenic	ND	0.250	mg/kg							
LCS (BA00695-BS1)				Prepared & Analyzed: 01/23/202						
Arsenic	103	0.500	mg/kg	100		103	80-120			
LCS Dup (BA00695-BSD1)				Prepared & Analyzed: 01/23/202						
Arsenic	105	0.500	mg/kg	100		105	80-120	1.27	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Rojert G. Araghi, President/Lab Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

SCS Engineers	Project: Riverwalk	Work Order No: 2001141
8799 Balboa Avenue, Suite 290	Project Number: 01210118.02	**Reported:**
San Diego CA, 92123	Project Manager: Luke Montague	01/29/2020 16:54

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the practical quantitation limit (PQL)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

APPENDIX C

ProUCL Output for 95 Percent UCL for Arsenic

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.13/23/2020 12:52:08 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Total Number of Observations	108	Number of Distinct Observations	102
Number of Detects	103	Number of Non-Detects	5
Number of Distinct Detects	101	Number of Distinct Non-Detects	1
Minimum Detect	0.265	Minimum Non-Detect	0.25
Maximum Detect	14.4	Maximum Non-Detect	0.25
Variance Detects	10.86	Percent Non-Detects	4.63%
Mean Detects	3.473	SD Detects	3.295
Median Detects	2.5	CV Detects	0.949
Skewness Detects	1.415	Kurtosis Detects	1.278
Mean of Logged Detects	0.784	SD of Logged Detects	1.02

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.816	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0876	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.324	KM Standard Error of Mean	0.316
KM SD	3.273	95% KM (BCA) UCL	3.85
95% KM (t) UCL	3.849	95% KM (Percentile Bootstrap) UCL	3.847
95% KM (z) UCL	3.844	95% KM Bootstrap t UCL	3.895
90% KM Chebyshev UCL	4.273	95% KM Chebyshev UCL	4.703
97.5% KM Chebyshev UCL	5.3	99% KM Chebyshev UCL	6.473

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.917	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.777	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0777	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0909	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.225	k star (bias corrected MLE)	1.196
Theta hat (MLE)	2.836	Theta star (bias corrected MLE)	2.905
nu hat (MLE)	252.3	nu star (bias corrected)	246.3
Mean (detects)	3.473		

Gamma ROS Statistics using Imputed Non-Detects

	A	B	C	D	E	F	G	H	I	J	K	L
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	0.01				Mean		3.313
59					Maximum	14.4				Median		2.29
60					SD	3.299				CV		0.996
61					k hat (MLE)	0.884				k star (bias corrected MLE)		0.865
62					Theta hat (MLE)	3.749				Theta star (bias corrected MLE)		3.829
63					nu hat (MLE)	190.9				nu star (bias corrected)		186.9
64					Adjusted Level of Significance (β)	0.0478						
65					Approximate Chi Square Value (186.90, α)	156.3				Adjusted Chi Square Value (186.90, β)		155.9
66					95% Gamma Approximate UCL (use when n>=50)	3.962				95% Gamma Adjusted UCL (use when n<50)		3.971
67												
68					Estimates of Gamma Parameters using KM Estimates							
69					Mean (KM)	3.324				SD (KM)		3.273
70					Variance (KM)	10.71				SE of Mean (KM)		0.316
71					k hat (KM)	1.031				k star (KM)		1.009
72					nu hat (KM)	222.8				nu star (KM)		217.9
73					theta hat (KM)	3.222				theta star (KM)		3.294
74					80% gamma percentile (KM)	5.346				90% gamma percentile (KM)		7.637
75					95% gamma percentile (KM)	9.926				99% gamma percentile (KM)		15.24
76												
77					Gamma Kaplan-Meier (KM) Statistics							
78					Approximate Chi Square Value (217.94, α)	184.8				Adjusted Chi Square Value (217.94, β)		184.4
79					95% Gamma Approximate KM-UCL (use when n>=50)	3.92				95% Gamma Adjusted KM-UCL (use when n<50)		3.929
80												
81					Lognormal GOF Test on Detected Observations Only							
82					Shapiro Wilk Approximate Test Statistic	0.955				Shapiro Wilk GOF Test		
83					5% Shapiro Wilk P Value	0.00697				Detected Data Not Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.0644				Lilliefors GOF Test		
85					5% Lilliefors Critical Value	0.0876				Detected Data appear Lognormal at 5% Significance Level		
86					Detected Data appear Approximate Lognormal at 5% Significance Level							
87												
88					Lognormal ROS Statistics Using Imputed Non-Detects							
89					Mean in Original Scale	3.321				Mean in Log Scale		0.671
90					SD in Original Scale	3.29				SD in Log Scale		1.123
91					95% t UCL (assumes normality of ROS data)	3.847				95% Percentile Bootstrap UCL		3.852
92					95% BCA Bootstrap UCL	3.926				95% Bootstrap t UCL		3.896
93					95% H-UCL (Log ROS)	4.731						
94												
95					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
96					KM Mean (logged)	0.684				KM Geo Mean		1.981
97					KM SD (logged)	1.091				95% Critical H Value (KM-Log)		2.297
98					KM Standard Error of Mean (logged)	0.105				95% H-UCL (KM -Log)		4.577
99					KM SD (logged)	1.091				95% Critical H Value (KM-Log)		2.297
100					KM Standard Error of Mean (logged)	0.105						
101												
102					DL/2 Statistics							
103					DL/2 Normal					DL/2 Log-Transformed		
104					Mean in Original Scale	3.318				Mean in Log Scale		0.652

	A	B	C	D	E	F	G	H	I	J	K	L
105				SD in Original Scale		3.294				SD in Log Scale		1.165
106				95% t UCL (Assumes normality)		3.844				95% H-Stat UCL		4.938
107	DL/2 is not a recommended method, provided for comparisons and historical reasons											
108												
109	Nonparametric Distribution Free UCL Statistics											
110	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
111												
112	Suggested UCL to Use											
113				95% KM Approximate Gamma UCL		3.92				95% GROS Approximate Gamma UCL		3.962
114												
115	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
116	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
117												
118	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
119	Recommendations are based upon data size, data distribution, and skewness.											
120	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
121	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
122												

APPENDIX D

ProUCL Output for 95 Percent UCL for Dieldrin

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.112/6/2019 10:24:02 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Dieldrin

General Statistics

Total Number of Observations	79	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	76
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	4.23	Minimum Non-Detect	4
Maximum Detect	49.6	Maximum Non-Detect	4
Variance Detects	552.7	Percent Non-Detects	96.2%
Mean Detects	30.48	SD Detects	23.51
Median Detects	37.6	CV Detects	0.771
Skewness Detects	-1.238	Kurtosis Detects	N/A
Mean of Logged Detects	2.991	SD of Logged Detects	1.348

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.286	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.005	KM Standard Error of Mean	0.867
KM SD	6.293	95% KM (BCA) UCL	N/A
95% KM (t) UCL	6.449	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	6.432	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	7.607	95% KM Chebyshev UCL	8.785
97.5% KM Chebyshev UCL	10.42	99% KM Chebyshev UCL	13.63

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.316	k star (bias corrected MLE)	N/A
Theta hat (MLE)	23.16	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.894	nu star (bias corrected)	N/A
Mean (detects)	30.48		

Gamma ROS Statistics using Imputed Non-Detects

53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	0.01				Mean	1.167	
59					Maximum	49.6				Median	0.01	
60					SD	6.965				CV	5.969	
61					k hat (MLE)	0.169				k star (bias corrected MLE)	0.171	
62					Theta hat (MLE)	6.909				Theta star (bias corrected MLE)	6.827	
63					nu hat (MLE)	26.69				nu star (bias corrected)	27.01	
64					Adjusted Level of Significance (β)	0.047						
65					Approximate Chi Square Value (27.01, α)	16.16				Adjusted Chi Square Value (27.01, β)	16	
66					95% Gamma Approximate UCL (use when n>=50)	1.951				95% Gamma Adjusted UCL (use when n<50)	N/A	
67												
68					**Estimates of Gamma Parameters using KM Estimates**							
69					Mean (KM)	5.005				SD (KM)	6.293	
70					Variance (KM)	39.6				SE of Mean (KM)	0.867	
71					k hat (KM)	0.633				k star (KM)	0.617	
72					nu hat (KM)	99.96				nu star (KM)	97.5	
73					theta hat (KM)	7.912				theta star (KM)	8.112	
74					80% gamma percentile (KM)	8.249				90% gamma percentile (KM)	12.94	
75					95% gamma percentile (KM)	17.83				99% gamma percentile (KM)	29.64	
76												
77					**Gamma Kaplan-Meier (KM) Statistics**							
78					Approximate Chi Square Value (97.50, α)	75.72				Adjusted Chi Square Value (97.50, β)	75.37	
79					95% Gamma Approximate KM-UCL (use when n>=50)	6.445				95% Gamma Adjusted KM-UCL (use when n<50)	6.475	
80												
81					**Lognormal GOF Test on Detected Observations Only**							
82					Shapiro Wilk Test Statistic	0.833				**Shapiro Wilk GOF Test**		
83					5% Shapiro Wilk Critical Value	0.767				Detected Data appear Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.348				**Lilliefors GOF Test**		
85					5% Lilliefors Critical Value	0.425				Detected Data appear Lognormal at 5% Significance Level		
86	Detected Data appear Lognormal at 5% Significance Level											
87												
88					**Lognormal ROS Statistics Using Imputed Non-Detects**							
89					Mean in Original Scale	1.22				Mean in Log Scale	-7.866	
90					SD in Original Scale	6.961				SD in Log Scale	4.992	
91					95% t UCL (assumes normality of ROS data)	2.523				95% Percentile Bootstrap UCL	2.527	
92					95% BCA Bootstrap UCL	3.21				95% Bootstrap t UCL	17.62	
93					95% H-UCL (Log ROS)	7507						
94												
95					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
96					KM Mean (logged)	1.447				KM Geo Mean	4.251	
97					KM SD (logged)	0.374				95% Critical H Value (KM-Log)	1.786	
98					KM Standard Error of Mean (logged)	0.0516				95% H-UCL (KM -Log)	4.918	
99					KM SD (logged)	0.374				95% Critical H Value (KM-Log)	1.786	
100					KM Standard Error of Mean (logged)	0.0516						
101												
102					**DL/2 Statistics**							
103					**DL/2 Normal**					**DL/2 Log-Transformed**		
104					Mean in Original Scale	3.081				Mean in Log Scale	0.78	

	A	B	C	D	E	F	G	H	I	J	K	L
105					SD in Original Scale	6.646					SD in Log Scale	0.492
106				95% t UCL (Assumes normality)		4.326					95% H-Stat UCL	2.731
107	DL/2 is not a recommended method, provided for comparisons and historical reasons											
108												
109	**Nonparametric Distribution Free UCL Statistics**											
110	**Detected Data appear Normal Distributed at 5% Significance Level**											
111												
112	**Suggested UCL to Use**											
113					95% KM (t) UCL	6.449						
114												
115	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
116	Recommendations are based upon data size, data distribution, and skewness.											
117	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
118	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
119												

APPENDIX E

ProUCL Output for 95 Percent UCL for Chlordane

1				Background Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3		Date/Time of Computation		ProUCL 5.14/30/2020 3:17:39 PM								
4		From File		WorkSheet.xls								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		)ifferent or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	Chlordane											
12												
13					General Statistics							
14			Total Number of Observations	79			Number of Missing Observations	0				
15			Number of Distinct Observations	4								
16			Number of Detects	3			Number of Non-Detects	76				
17			Number of Distinct Detects	3			Number of Distinct Non-Detects	1				
18			Minimum Detect	103			Minimum Non-Detect	100				
19			Maximum Detect	1430			Maximum Non-Detect	100				
20			Variance Detected	453632			Percent Non-Detects	96.2%				
21			Mean Detected	699.7			SD Detected	673.5				
22			Mean of Detected Logged Data	6.08			SD of Detected Logged Data	1.334				
23												
24					Warning: Data set has only 3 Detected Values.							
25					This is not enough to compute meaningful or reliable statistics and estimates.							
26												
27												
28					Critical Values for Background Threshold Values (BTVs)							
29			Tolerance Factor K (For UTL)	1.963			d2max (for USL)	3.127				
30												
31					Normal GOF Test on Detects Only							
32			Shapiro Wilk Test Statistic	0.97			Shapiro Wilk GOF Test					
33			5% Shapiro Wilk Critical Value	0.767			Detected Data appear Normal at 5% Significance Level					
34			Lilliefors Test Statistic	0.245			Lilliefors GOF Test					
35			5% Lilliefors Critical Value	0.425			Detected Data appear Normal at 5% Significance Level					
36					Detected Data appear Normal at 5% Significance Level							
37												
38					Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							
39			KM Mean	122.8			KM SD	156.9				
40			95% UTL95% Coverage	430.8			95% KM UPL (t)	385.6				
41			90% KM Percentile (z)	323.9			95% KM Percentile (z)	380.9				
42			99% KM Percentile (z)	487.8			95% KM USL	613.5				
43												
44					DL/2 Substitution Background Statistics Assuming Normal Distribution							
45			Mean	74.67			SD	165.1				
46			95% UTL95% Coverage	398.7			95% UPL (t)	351.2				
47			90% Percentile (z)	286.2			95% Percentile (z)	346.2				
48			99% Percentile (z)	458.7			95% USL	590.9				
49					DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons							
50												
51					Gamma GOF Tests on Detected Observations Only							
52					Not Enough Data to Perform GOF Test							

53												
54	Gamma Statistics on Detected Data Only											
55					k hat (MLE)	1.201			k star (bias corrected MLE)	N/A		
56					Theta hat (MLE)	582.7			Theta star (bias corrected MLE)	N/A		
57					nu hat (MLE)	7.205			nu star (bias corrected)	N/A		
58					MLE Mean (bias corrected)	N/A						
59					MLE Sd (bias corrected)	N/A			95% Percentile of Chisquare (2kstar)	N/A		
60												
61	Gamma ROS Statistics using Imputed Non-Detects											
62	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
63	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
64	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
65	This is especially true when the sample size is small.											
66	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
67					Minimum	0.01			Mean	26.58		
68					Maximum	1430			Median	0.01		
69					SD	172.5			CV	6.489		
70					k hat (MLE)	0.108			k star (bias corrected MLE)	0.112		
71					Theta hat (MLE)	247.1			Theta star (bias corrected MLE)	237.5		
72					nu hat (MLE)	17			nu star (bias corrected)	17.68		
73					MLE Mean (bias corrected)	26.58			MLE Sd (bias corrected)	79.45		
74					95% Percentile of Chisquare (2kstar)	1.288			90% Percentile	73.75		
75					95% Percentile	152.9			99% Percentile	398.8		
76	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
77	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
78						WH	HW			WH	HW	
79				95% Approx. Gamma UTL with 95% Coverage		48.9	24.18		95% Approx. Gamma UPL	32.65	14.87	
80				95% Gamma USL		168.4	111					
81												
82	Estimates of Gamma Parameters using KM Estimates											
83					Mean (KM)	122.8			SD (KM)	156.9		
84					Variance (KM)	24621			SE of Mean (KM)	21.62		
85					k hat (KM)	0.612			k star (KM)	0.597		
86					nu hat (KM)	96.73			nu star (KM)	94.39		
87					theta hat (KM)	200.5			theta star (KM)	205.5		
88					80% gamma percentile (KM)	202.4			90% gamma percentile (KM)	319.6		
89					95% gamma percentile (KM)	442.5			99% gamma percentile (KM)	739.7		
90												
91	The following statistics are computed using gamma distribution and KM estimates											
92	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
93						WH	HW			WH	HW	
94				95% Approx. Gamma UTL with 95% Coverage		264.7	249.3		95% Approx. Gamma UPL	235.9	222.8	
95				95% KM Gamma Percentile		233	220.1		95% Gamma USL	405	381.5	
96												
97	Lognormal GOF Test on Detected Observations Only											
98					Shapiro Wilk Test Statistic	0.972			Shapiro Wilk GOF Test			
99					5% Shapiro Wilk Critical Value	0.767			Detected Data appear Lognormal at 5% Significance Level			
100					Lilliefors Test Statistic	0.244			Lilliefors GOF Test			
101					5% Lilliefors Critical Value	0.425			Detected Data appear Lognormal at 5% Significance Level			
102	Detected Data appear Lognormal at 5% Significance Level											
103												
104	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											

105				Mean in Original Scale	27.52					Mean in Log Scale	-5.964	
106				SD in Original Scale	172.4					SD in Log Scale	5.537	
107				95% UTL95% Coverage	134.8					95% BCA UTL95% Coverage	149.3	
108				95% Bootstrap (%) UTL95% Coverage	170					95% UPL (t)	27.41	
109				90% Percentile (z)	3.101					95% Percentile (z)	23.18	
110				99% Percentile (z)	1009					95% USL	85156	
111												
112				Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution								
113				KM Mean of Logged Data	4.661					95% KM UTL (Lognormal)95% Coverage	211.4	
114				KM SD of Logged Data	0.353					95% KM UPL (Lognormal)	191	
115				95% KM Percentile Lognormal (z)	189					95% KM USL (Lognormal)	318.8	
116												
117				Background DL/2 Statistics Assuming Lognormal Distribution								
118				Mean in Original Scale	74.67					Mean in Log Scale	3.994	
119				SD in Original Scale	165.1					SD in Log Scale	0.469	
120				95% UTL95% Coverage	136.2					95% UPL (t)	119	
121				90% Percentile (z)	98.96					95% Percentile (z)	117.3	
122				99% Percentile (z)	161.5					95% USL	235	
123				DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.								
124												
125				Nonparametric Distribution Free Background Statistics								
126				Data appear to follow a Discernible Distribution at 5% Significance Level								
127												
128				Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)								
129				Order of Statistic, r	78					95% UTL with95% Coverage	566	
130				Approx, f used to compute achieved CC	2.053					pproximate Actual Confidence Coefficient achieved by UTL	0.91	
131				Approximate Sample Size needed to achieve specified CC	93					95% UPL	100	
132				95% USL	1430					95% KM Chebyshev UPL	811.1	
133												
134				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.								
135				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers								
136				and consists of observations collected from clean unimpacted locations.								
137				The use of USL tends to provide a balance between false positives and false negatives provided the data								
138				represents a background data set and when many onsite observations need to be compared with the BTV.								
139												

APPENDIX A

Construction Plans and Geotechnical Reports for the Proposed Development

APPENDIX B

Analytical Laboratory Reports for 2019 and 2020 Soil Sampling and Analysis

APPENDIX C

ProUCL Output for 95 Percent UCL for Arsenic

APPENDIX D

ProUCL Output for 95 Percent UCL for Dieldrin

APPENDIX E

ProUCL Output for 95 Percent UCL for Chlordane