SFCTA Contract Number 06/07-29

SOUTH ACCESS TO THE GOLDEN GATE BRIDGE

DOYLE DRIVE

DOYLE DRIVE REPLACEMENT PROJECT

ENVIRONMENTAL SOIL INVESTIGATION

Caltrans EA 04-163741
Contract 4

August 2009

Prepared By:

BASELINE Environmental Consulting

ENVIRONMENTAL SOIL INVESTIGATION

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AUGUST 2009

DOYLE DRIVE REPLACEMENT
PROJECT
CONTRACT 4
SAN FRANCISCO, CALIFORNIA

For:

ARUP
San Francisco, California

Y0239-04.A3.01291

5900 Hollis Street, Suite D • Emeryville, CA 94608 • (510) 420-8686

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This *Environmental Soil Investigation* report, dated 25 August 2009, has been prepared by BASELINE Environmental Consulting as part of Caltrans contract EA 04-163741

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ENVIRONMENTAL SOIL INVESTIGATION
DOYLE DRIVE REPLACEMENT PROJECT CONTRACT 4
San Francisco, California

1 INTRODUCTION

This report has been prepared by BASELINE Environmental Consulting for ARUP. This report presents the results of environmental soil sampling along Doyle Drive near the Golden Gate Bridge in San Francisco, California.

1.1 Project Description

The Project is the Contract 4 area of the proposed Doyle Drive Replacement Project ("DDRP") in San Francisco, California, and is sponsored by the San Francisco County Transportation Authority and the State of California Department of Transportation ("Caltrans"). The Contract 4 area is located within Presidio Trust Lands. The DDRP will upgrade a portion of Doyle Drive within the Presidio to meet current design and safety standards. The Project is the second phase of the DDRP, and will upgrade some of the central portion of the DDRP between the intersection of Lincoln Boulevard with Crissy Field Avenue and east of the intersection of Lincoln Boulevard and Taylor Road, as shown on Figure 1. Construction is currently scheduled to begin in December 2009. This report includes both the north and south-bound portions of the central DDRP and therefore extends slightly beyond the Contract 4 boundary.

The Project will include excavation of soil ("cut areas") and possible filling in potential fill areas. Figure 2 shows cut areas within the Project; the areas not identified as cut areas could potentially receive fill. Limited excavation also may occur in areas not identified as cut areas prior to potential placement of fill (i.e., while readying the ground surface for placement of fill).

1.2 Investigation Objectives

The objectives of the environmental soil sampling discussed in this report were to: 1) pre-characterize soil for potential disposal off-site at a permitted facility or off-site reuse; 2) pre-characterize soil for potential reuse within the limits of the Project, in accordance with Presidio Trust reuse criteria,[1] 3) obtain chemical quality information of the soil and groundwater[2] for preparation of future worker health and safety plan(s).

2 SOIL SAMPLING WORKPLAN

Soil sampling was conducted in accordance with a Soil and Groundwater Sampling Work Plan ("Workplan") (Caltrans and ARUP PB Joint Venture, 2008). The Workplan was also reviewed and accepted by the Presidio Trust and they issued a License to Enter and Conduct Geotechnical

[1] Evaluation of whether the chemical quality of some or all excavated soil would meet Presidio Trust reuse criteria (EKI, 2002) will be evaluated in a separate report by BASELINE.

[2] Groundwater quality data collected in the Project was presented in Caltrans and ARUP PB Joint Venture, 2009a.

Investigations, Modification No. 2 (Presidio Trust, 2008). The Workplan and License to Enter are attached in Appendices A and B, respectively.

The Workplan was designed to meet the investigation objectives by: 1) collection of representative samples from soil to be excavated during Project construction in general accordance with U.S. Environmental Protection Agency ("EPA") SW-846 (EPA, 1986) guidance; 2) selection of an analytical approach for soil samples that would meet landfill requirements for pre-approval of soil disposal, and that would meet Presidio Trust analytical requirements for potential reuse of soil within the Project limits without additional characterization after excavation; 3) collection and analysis of representative samples to allow Caltrans to prepare project specifications addressing worker health and safety; and 4) to allow the contractor to prepare an appropriate health and safety plan for construction workers.

2.1 Soil Boring Locations and Depths

Soil samples were collected from 26 borings (E059 through E082, E077A, and E078A) drilled within the Project area, as shown on Figure 2. Two shallow hand auger borings (E077A and E078A) were advanced near the primary borings (E077 and E078). These shallow boring locations were the first choice for boring location; however, they were not accessible with the drill rig. Therefore, only shallow soil samples were collected at these two locations, and the deeper boring was located as close as possible to the original borings and in an area accessible with a drill rig.

The boring locations were selected using a systematic, random approach as described in EPA SW-846 guidance (EPA, 1986). An initial, random boring location was selected, and subsequent boring locations were identified approximately every 200 lateral feet along the north- and southbound portions of the Project alignment, as requested by Caltrans.

The majority of the borings (20) were located in proposed cut areas, and the remaining borings (6) were located within potential fill areas (Figure 2). Table 1 lists the borings drilled within the Project area and Table 1 and Figure 2 indicate their location in cut or potential fill areas.

Borings located in potential fill areas were drilled to a depth of 2.5 feet below ground surface ("bgs") to characterize only surficial soil, which may be removed to ready the area for potential surcharge materials (Table 1). With the exception of borings E077A and E078A, discussed above, borings located within proposed cut areas were drilled to a depth of approximately two feet below the proposed depth of cut, or five feet below top of bedrock, if bedrock was encountered. These borings ranged in depth from 7.5 to 40 feet bgs.

2.2 Soil Sampling and Analysis Approach

In general, soil samples were collected at depths of 0.5 to 1.0 and 2.0 to 2.5 feet bgs in every environmental boring and every five feet thereafter to the proposed depth of each boring. Discrete samples from the ground surface to a depth of 2.5 feet bgs were analyzed for lead. Samples collected below a depth of 2.5 feet bgs were composited and analyzed for multiple chemicals identified by Presidio Trust as potential contaminants of concern in the Presidio (EKI, 2002).

Borings within contiguous cut or potential fill areas were identified as a single composite area (Figure 2). Samples collected from borings within a given composite area were composited with samples from other borings within that composite area. The soil analysis approach is described in more detail below in Section 3.4.

3 METHODOLOGY

3.1 Field Preparations

Dig Permits were obtained from the Presidio Trust for all borings (Appendix B). Each boring location was marked in white paint, and locations not covered by asphalt or concrete were also identified using a wooden or metal stake. A private utility locator, Otis Haskin ("OHJ"), cleared all boring locations. Underground Service Alert ("USA") was then contacted for utility clearance, and the Dig Permit was requested from Presidio Trust. Presidio Trust reviewed and checked the borehole locations with their equipment, maps, and site knowledge before issuing the Dig Permit authorizing drilling to commence.

3.2 Drilling Activities

Drilling operations were performed in general accordance with the applicable Standard Operating Procedures ("SOPs") included in the Presidio Trust's Presidio-Wide Quality Assurance Project Plan ("QAPP") (Tetra Tech EM, Inc., 2001). Deviations from the QAPP SOPs are described in the Workplan (Appendix A). BASELINE staff performed fieldwork in accordance with BASELINE's site-specific Health and Site Safety Plan, included in the Workplan.

Drilling and hand augering activities were conducted by Gregg Drilling & Testing, Inc. ("Gregg Drilling") of Martinez, California, a C-57 licensed driller. Borings were drilled using direct-push equipment, a hollow-stem auger drill rig, or a hand auger (Table 1). Drilling augers and rods were cleaned between borings with a steam cleaner. Soil sampling equipment was decontaminated between samples by scrubbing with a laboratory-grade detergent solution and rinsing in two sequential pails of potable water.

A professional BASELINE geologist supervised all drilling activities and logged lithology using the Unified Soil Classification System. Boring logs are included in Appendix C.

Borings completed without encountering groundwater were backfilled with bentonite pellets or chips, hydrated in one-foot lifts, to within about one foot bgs. All borings with standing groundwater at the time of completion were backfilled with a neat cement grout to one foot bgs. The grout was placed using a tremie pipe. Surface completions matched existing conditions (e.g., soil or asphalt). After backfilling, each boring location was marked using a wooden stake, or white paint if the boring was located in concrete or asphalt, in preparation for surveying. A licensed surveyor, Chaudhary & Associates, located the borings after completion in accordance with the Presidio Trust QAPP. Survey coordinates are provided in both Project datum (NAD 83 and NAVD 88) and Presidio Trust datum (NAD27 and Presidio Low Low Water) on Table 1.

3.3 Soil Sampling and Handling Procedures

If asphalt or baserock was present at a boring location, the planned 0.5 to 1.0 foot bgs sample was collected from the first soil interval below the asphalt and baserock. Soil samples within proposed cut areas were also collected every five feet to the proposed depth of the cut. If bedrock was encountered within the planned depth of the boring, a sample was collected near the top of the bedrock and, if possible, five feet below the top of bedrock. Additional bedrock samples were not collected if bedrock was encountered, as it was assumed that the same type of bedrock was present at depth. Bedrock encountered included sandstone and shale. The sampling procedures for Colma Sand were the same as bedrock units because, although Colma Sand is not consolidated, BASELINE understands it will be used as a bearing formation for construction.

Soil samples were collected directly into clean six-inch long brass or stainless steel liners or micro-core tubes. The collected samples were capped with Teflon and plastic end caps, labeled, and immediately stored in ice-cooled chests.

Samples were labeled with the boring number (e.g., E082), soil type, and sample depth in feet bgs. Soil type categories included fill (F), alluvium (A), Colma Sand (C), or Bedrock (BR). Although Bay Mud and serpentinite bedrock were encountered during the previous investigation for the Contract 3 area (Caltrans and ARUP PB Joint Venture, 2009b), they were not encountered during this investigation. Alluvial and marine sediments were included in the "alluvium" category for the purpose of compositing chemically similar soil types. If serpentinite was observed in a sample, an "S" was added to the soil type descriptor (e.g., fill with serpentinite would be labeled "FS"). Sample depth indicated on the sample label was the bottom of the six-inch sample interval.

Composite sample instructions were provided to the laboratory within five days of the sample collection date. Composite samples were identified with "EC" indicating Environmental Composite, followed by the composite area number, the soil type descriptor, and the sample number. A list of composite samples and the discrete samples used to make up each composite sample is presented in Table 2. A total of four composite areas (9 through 12) were designated in the Project area.

The samples were either picked up in the field daily during drilling activities by Curtis & Tompkins, Ltd. of Berkeley, California, a state-certified laboratory, or were delivered by BASELINE directly to the laboratory. In both cases, the samples were handled under chain-of-custody procedures.

3.4 Soil Sample Analyses

All laboratory analyses were conducted by Curtis & Tompkins, Ltd. of Berkeley, California with the exception of asbestos and herbicides analyses, which were performed by Forensic Analytical of Hayward, California and APPL, Inc. of Fresno, California, respectively. These laboratories are state-certified for the analyses conducted. Laboratory analyses performed on each sample are summarized in Table 3. The analytical scheme for the collected samples is described below.

- Fill samples
  - Discrete samples from depths of 1.0 and 2.5 feet bgs were analyzed for total lead.

- Up to five discrete fill samples, collected within five days from the same composite area, were composited and analyzed for **Sampling Suite A.**[3]
- If any metal concentration was greater than 10 times the Soluble Threshold Limit Concentration ("STLC"), the sample was also analyzed for the soluble metal by the Waste Extraction Test ("WET"). If any sample contained greater than 20 times the Toxicity Characteristic Leaching Procedure ("TCLP"), the sample was analyzed for leachable metal contents by TCLP.
- Discrete fill samples observed in the field to contain serpentinite were also analyzed for asbestos using the California Air Resources Board ("CARB") Method.

- Alluvium/Marine and Bay Mud Sediment Samples

  - Up to five native alluvial/colluvial/marine deposit samples, collected within five days from the same composite area, were composited and analyzed for **Sampling Suite B**.[4]
  - Up to five Bay Mud samples collected within five days from the same composite area would have been composited and analyzed for **Sampling Suite B**. Bay Mud was not encountered during this investigation.

- Bedrock Samples

  - Up to five Colma Sand samples, collected within five days from the same composite area, were composited for analysis of **Sampling Suite B**.
  - Up to five bedrock samples, other than Colma Sand, collected within five days from the same composite area, were composited and analyzed for Title 22 metals.

    If any metal concentration was greater than 10 times the STLC, the sample was also analyzed for the soluble metal by WET. If any sample contained greater than 20 times the TCLP threshold, the sample was analyzed for leachable metal by TCLP.
  - Up to five bedrock samples, collected within five days from the same composite area were, composited and analyzed for cyanide, sulfide, and corrosivity ("pH"). The samples were analyzed for reactivity if cyanide was greater than or equal to 250 milligrams per kilogram (mg/kg), and/or sulfide was greater than or equal to 500 mg/kg. Ignitability was determined if total VOCs were greater than one percent.
  - Up to five bedrock samples consisting of serpentinite and collected within five days from the same composite area would have been composited and analyzed for asbestos. Serpentinite bedrock was not encountered during this investigation. However, three geotechnical borings previously drilled by ARUP (BTNB-R2, BTNB-R3, and BTSB-R2) in Composite Area 12 encountered serpentinite bedrock. These boring locations

[3] **Sampling Suite A** consists of Sampling Suite B, listed below, plus organochlorine pesticides by EPA Method 8081A and herbicides by EPA Method 8151A.

[4] **Sampling Suite B** consists of Title 22 metals by EPA Methods 6020/7000 series; volatile organic compounds ("VOCs") by EPA Method 8260B; semi-volatile organic compounds ("SVOCs") by EPA Method 8270C; total petroleum hydrocarbons ("TPH") as gasoline (g), diesel (d), and fuel oil (fo) by EPA Method 8015M/CA LUFT; silica gel cleanup on TPHd and TPHfo by EPA Method 3630; polycyclic aromatic hydrocarbons ("PAHs") by EPA Method 8310; polychlorinated biphenyls ("PCBs") by EPA Method 8082; cyanide by Standard Method 4500-CN-E; sulfide by EPA Method 9034; and corrosivity (pH) by EPA Method 9045D.

are shown on Figure 2. At the request of Caltrans, BASELINE collected six samples of serpentinite bedrock from the cores which had been stored since the borings were drilled in February, May, and July of 2008. These six samples were analyzed for asbestos, nickel, and chromium. Boring logs for these geotechnical borings were included in a previous report (Caltrans and ARUP PB Joint Venture, 2009c) and are also presented in this report in Appendix C.

3.5 Laboratory Quality Assurance

Curtis & Tompkins and APPL, Inc. performed laboratory analyses and quality assurance/quality control procedures in accordance with Presidio Trust's QAPP (Tetra Tech, 2001), with exceptions presented in the Responsibilities and Assumptions Document (BASELINE, 2008) attached as Appendix D. Presidio Trust reviewed the proposed QAPP deviations and did not request changes.

The field sample data were reviewed by Laboratory Data Consultants, Inc. ("LDC") of Sacramento, California for compliance with the Presidio Trust QAPP. Data were reviewed based on the appropriate EPA methods referenced (EPA, 1986), *National Functional Guidelines for Organic Data Review* (EPA, 1999), *National Functional Guidelines for Inorganic Data Review* (EPA, 2004), and the project-specific control limits provided in the QAPP or Presidio-approved variances requested by Curtis & Tompkins. Where specific guidance was not available, the data were evaluated in a conservative manner consistent with industry standards using professional experience.

Data review by LDC concluded that all soil sample analytical results were valid, as analytical methods and reporting were consistent with the Presidio Trust QAPP, National Functional Guidelines, or project-specific control limits. In addition, Level IV data validation packages were provided by Curtis & Tompkins and APPL, Inc., and reviewed by LDC, as required by the Presidio Trust QAPP. LDC's data validation reports are attached as Appendix E. Electronic data are also provided on CD in the Presidio Trust electronic data deliverable ("EDD") format with data qualifiers added by LDC (Appendix E).

3.6 Data Evaluation Methodology

Chemical data from the laboratory were loaded into a database. Soil quality data were screened against federal and state hazardous waste thresholds and California Regional Water Quality Control Board, San Francisco Bay Region ("Water Board") residential and commercial/industrial Environmental Screening Levels ("ESLs") (Water Board, 2008). Statistical analysis of subsets of data was performed, as needed, using guidelines and software developed by the EPA (EPA, 2009) and standard-industry practices. The results of the data evaluation are presented, below, in Section 6.

3.7 Investigation-Derived Waste Disposal

Drill cuttings (typically dry to wet soil or rock) were placed in approved U.S. Department of Transportation ("DOT") 55-gallon drums. Water, used to clean augers and soil sampling equipment, was collected in separate drums and sampled to evaluate disposal options. The drums were sealed, labeled, and stored for no longer than 90 days at the drum storage area along Mason Street. Drums were hauled off-site to an appropriate disposal facility as soon as possible

after laboratory results were available and pick-up by a licensed waste hauler could be scheduled.

Thirty drums of soil and groundwater generated during drilling activities conducted between 12 January 2009 and 18 February 2009 were picked up on 15 April 2009 by Clearwater Environmental of Union City, California. Five drums of liquid and 21 soil drums were disposed of as non-hazardous waste at Alviso Independent Oil of Alviso, California. Four drums of soil were disposed of as non-RCRA hazardous waste within 90 days of generation at Siemens Water Technologies Corporation ("Siemens") in Vernon, California. BASELINE understands that Siemens forwards the waste to Kettleman Hills Hazardous Waste Facility in Kettleman, California after re-packaging. Waste disposal manifests are in Appendix F.

4 SOIL REUSE OR DISPOSAL FRAMEWORK

4.1 Criteria for Federal and California Hazardous and Non-Hazardous Waste

A soil, once excavated, may be classified as a federal hazardous waste, a California hazardous waste, or a non-hazardous waste depending on its characteristics. A soil is considered a federal hazardous waste if it contains leachable concentrations of select chemicals, determined by TCLP, equal to or greater than the thresholds established in Title 40 of the Code of Federal Regulations ("CFR"), Section 261.24. The TCLP method uses a dilution ratio of 20:1 in the extraction process; therefore, a waste with a total concentration equal to or greater than 20 times the TCLP threshold could potentially be a federal hazardous waste, depending on the fraction of the total concentration that is soluble. There are no thresholds for total concentrations of compounds for federal hazardous wastes.

In California, a waste is considered hazardous if the total concentration of a chemical is equal to or greater than the Total Threshold Limit Concentration ("TTLC") and/or if the soluble concentration of a chemical, determined by the WET, is greater than or equal to the STLC. The WET method uses a dilution ratio of 10:1 in the extraction process; therefore, a waste with a total concentration equal to or greater than ten times the STLC value could potentially be a California hazardous waste, depending on the fraction of the total concentration that is soluble. The TTLC and STLC values are established in Title 22 of the California Code of Regulations, Section 66261.24.

A waste that does not exceed the federal and the California hazardous waste criteria is a non-hazardous waste. Federal hazardous wastes are only accepted for disposal at a Class I-permitted landfill. A nonfederal, California hazardous waste may be disposed of at a Class I-permitted landfill or an out-of-state landfill permitted to accept such waste. Non-hazardous wastes are generally accepted at Class II and Class III landfills, depending on the individual landfill's permit.

4.2 ESLs

Soil excavated during Project construction demonstrated to be a non-hazardous waste may be transported offsite and reused for other Caltrans projects and/or become the property of the contractor. The Water Board has developed ESLs (Water Board, 2008) for the protection of

residential and commercial land uses and construction workers for chemical compounds commonly found on contaminated sites. The ESLs are chemical-specific concentrations that, if not exceeded, would not be expected to present a significant threat to human health and/or the environment. The screening values were developed by the Water Board using conservative (worst-case) exposure assumptions. Since it is unknown where soils from the Project may be reused, ESLs for shallow soils for residential and commercial/industrial land uses where groundwater is considered an actual or potential drinking water source were used for screening purposes.

5 INVESTIGATION RESULTS

5.1 Lithologic Units and Potential Waste Streams

Lithologic units encountered during drilling included fill (F), alluvium (A), Colma Sand (C), and Bedrock (BR). These lithologic units were considered potential waste streams for the purpose of compositing chemically similar soil types. Alluvial and marine sediments were included in the "alluvium" category. Lithologic units encountered within each composite area are summarized below. Boring logs are included in Appendix C.

5.1.1 Composite Area 9

Fill was present in two of the three borings in this composite area (E059 and E060) to depths of 7.5 and 10.0 feet bgs, the maximum extent of these borings. Fill was present to a depth of 1.0 feet bgs in the other boring (E061) and was underlain by Colma Sand to a depth of 12.5 feet bgs, the maximum depth of the boring. The fill in boring E060 included serpentinite clasts from approximately 0.5 to 2.5 feet bgs.

5.1.2 Composite Area 10

In this composite area fill was encountered in three of the five borings (E067, E069, and E071) to depths of 5.0 to 11.0 feet bgs, and was underlain by alluvium to depths of 16 to 21 ft bgs. Below the alluvium, Colma Sand was encountered to depths of 22.5 to 27.5 feet bgs, the maximum depth of the borings.

Fill was encountered in the other two borings (E065 and E063) to a depth of 22.5 feet bgs, the maximum depth of the borings. Serpentinite clasts were included in the fill from boring E063 at depths of 20.0 to 22.5 feet bgs.

5.1.3 Composite Area 11

Fill was encountered in all six borings in this composite area to a depth of 2.5 feet bgs, the maximum depth of the borings.

5.1.4 Composite Area 12

Fill was encountered in eight of the twelve borings in this composite area (E074 through E081) to depths of 1.0 to 7.0 feet bgs. Fill was encountered in boring E073 to a depth of 13.0 feet bgs. The fill was underlain by alluvium in most of the borings to depths of 18 to 31 feet bgs. Fill was not present in borings E077A, E078A, or E082, and the alluvium extended to 11.0 feet bgs (E082). Bedrock was encountered below the fill or alluvium at depths from 7.0 feet (E081) to 31 feet bgs (E079). Bedrock consisted of sandstone, shale, or Colma Sand.

Serpentinite bedrock was not encountered in the environmental borings. However, serpentinite bedrock was encountered in one geotechnical boring within the depth of the proposed Battery Tunnel in Composite Area 12 (BTNB-R2) and below the depth of the tunnel in two geotechnical borings just east of the tunnel (BTNB-R3 and BTSB-R2).

5.2 Analytical Results

5.2.1 Chemical Compounds

Analytical results for all the soil samples are summarized in Tables 4 through 12. Only compounds that were identified above laboratory reporting limits in at least one sample are presented on the tables. Semi-volatile organic compounds (analyzed by EPA Method 8270C) and herbicides (analyzed by EPA Method 8151A) were not reported above laboratory reporting limits; therefore, the results are not tabulated.

Hazardous waste thresholds and ESLs are also listed in the tables for compounds with established values. Concentrations that exceed any of the thresholds or ESLs are shaded in the tables.

5.2.2 Asbestos

Asbestos was analyzed for two fill samples in Composite Areas 9 and 10 (E060FS-2.5 and E063FS-22.5, respectively) due to the presence of serpentinite clasts in fill material. Asbestos was not reported in these samples above 0.25 percent (Table 11 and Appendix C). Material containing friable asbestos equal to or greater than one percent is classified as a California hazardous waste. An asbestos dust mitigation plan is required by the California Code of Regulations, Title 17 and the Bay Area Air Quality Management District before grading in areas where asbestos has been reported above 0.25 percent.[5] Based on the results of these two samples, fill material containing serpentinite in Composite Areas 9 and 10 are not hazardous, and a dust mitigation plan is not required before grading. Serpentinite was not encountered in fill materials in Composite Areas 11 and 12.

Asbestos was analyzed for six serpentinite bedrock samples collected from cores of three previously drilled geotechnical borings (BTNB-R2, BTNB-R3, and BTSB-R2) in Composite Area 12 (Table 11 and Figure 2). Asbestos was reported in these samples at concentrations ranging from 0.75 to 2.5%, above the California Code of Regulations, Title 17 limit of 0.25%, indicating a dust mitigation plan is required during excavation of serpentinite bedrock in Composite Area 12 (California Code of Regulations, 2002). The serpentinite bedrock in Composite Area 12 is a California hazardous waste due to asbestos and nickel, as discussed below in Section 6.1.6.

6 WASTE CLASSIFICATION AND SOIL MANAGEMENT

Data evaluation was conducted in two phases. The initial phase was to identify soil types and/or locations where the soil would be classified as a hazardous waste. The second phase was to screen those soils that were determined to be non-hazardous wastes for disposal purposes against

[5] California Code of Regulations, 2002, Title 17, Section 93105, Final Regulation Order, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations, July 22.

ESLs established by the Water Board for residential and commercial/industrial land uses where the groundwater is considered a current or potential source of drinking water (Table A, Water Board, 2008), and against ESLs for construction/trench worker direct exposure (Table K-3, Water Board, 2008). Screening against ESLs was performed to provide information for Caltrans and/or the contractor use to assess health and safety concerns and possible soil reuse options either within the Project or at other locations.

Evaluation of possible reuse of soils within the Project area in accordance with Presidio Trust reuse criteria may be presented in a separate report to be prepared by BASELINE. BASELINE understands the contractor will be preparing a Soil Management Plan based on recommendations of this report and Presidio Trust's response to our request for soil reuse.

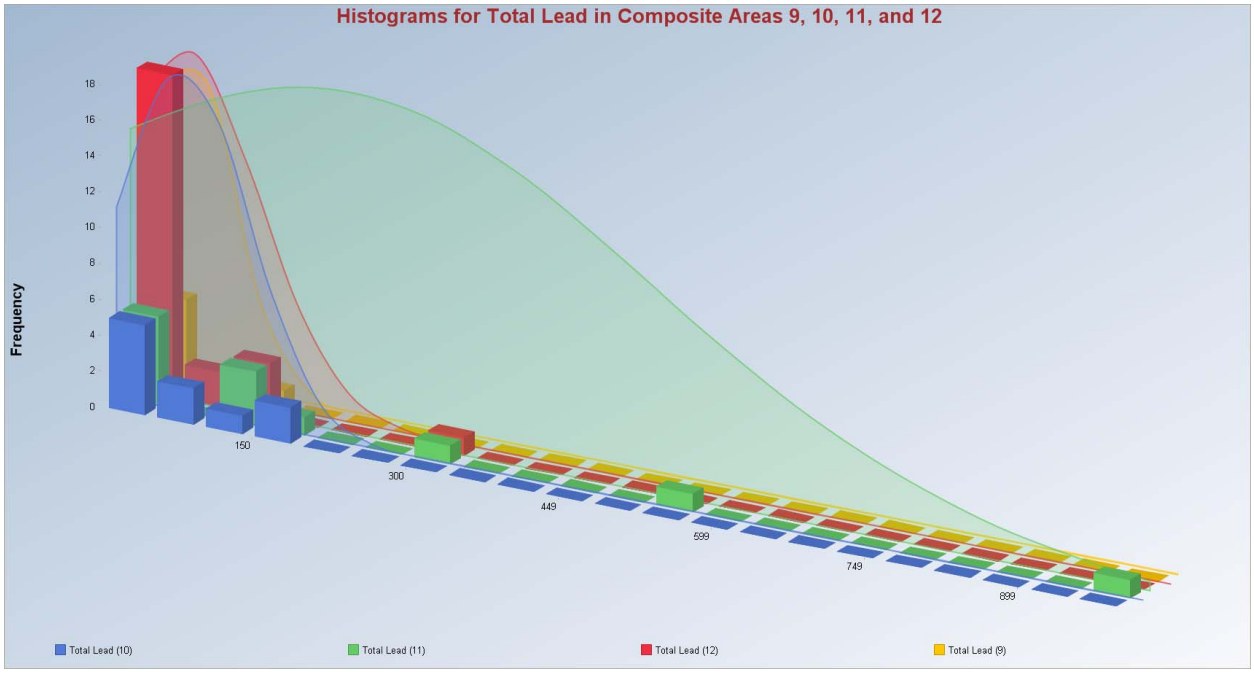
6.1 Evaluation for Waste Classification

The first step in the data evaluation process to determine whether soil may be considered a California or federal hazardous waste was to systematically explore all the soil quality data to identify compounds that may exceed hazardous waste thresholds. The only chemical that had one or more concentrations exceeding hazardous waste thresholds was lead (Table 5). The following discussion regarding hazardous waste thresholds is therefore limited to evaluation of lead.

None of the soil quality data collected during this investigation exceeded any federal TCLP hazardous waste thresholds. All samples with total lead concentrations that exceeded 100 mg/kg (20 times the TCLP threshold) were analyzed for soluble TCLP lead, and all the results were below the federal TCLP hazardous waste threshold of 5 mg/L (Table 5). Therefore, all the soils are not considered federal hazardous wastes.

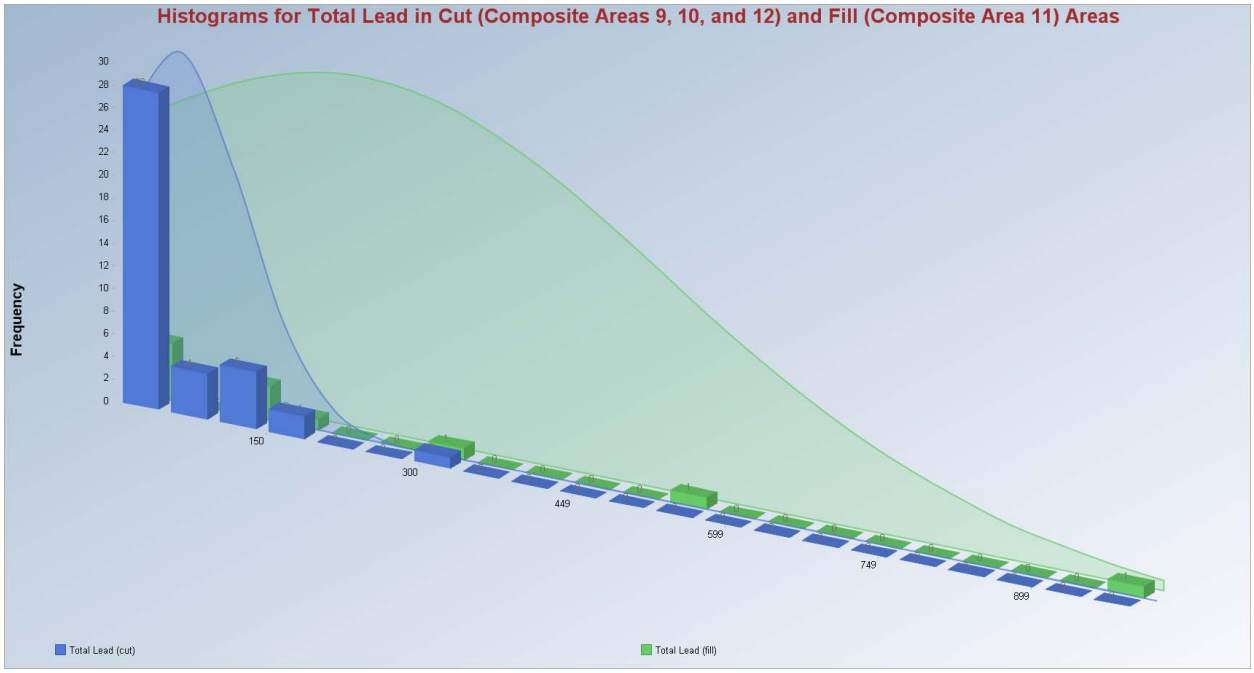
6.1.1 Top 2.5 Feet of Soil in All Composite Areas (9 to 12)

In general, soil samples were collected from 0.5-1.0 and 2.0-2.5 feet bgs and analyzed discretely for total lead. Initial examination of the data revealed that the total lead concentration in Composite Area 11 appeared to be different than in the other Composite Areas, as can be seen in the histograms below.



The histogram for Composite Area 11 (in green) has a much longer tail toward higher concentrations, whereas the histograms for the other Composite Areas appear similar. Therefore, the data for the 40 samples collected from 0-2.5 feet bgs in the proposed cut areas (Composite Areas 9, 10, and 12) were initially considered one subset and data for the 12 samples collected from 0-2.5 feet bgs in the proposed fill area (Composite Area 11) were considered a second subset.

Histograms of the total lead concentrations in the two subsets are shown below. The histograms illustrate that the lead concentrations in the subset of samples from Composite Area 11, which is a potential fill area (charge area), have a significantly longer tail toward higher concentrations, whereas total histogram for Composite Areas 9, 10, and 12, which are proposed excavation areas (cut areas), falls relatively steeply at lower concentrations.



The total lead concentrations in the two subsets were also statistically evaluated using the Wilcoxon-Mann-Whitney test, which is a nonparametric (i.e., no assumption on data distribution) statistical test, to determine whether a difference exists in the two subsets.[6] Using the null hypothesis that the total lead concentrations in the shallow soil from the proposed fill area subset (Composite Area 11) are greater than or equal to those in the proposed cut area subset (Composite Areas 9, 10, and 12) (Form 2), the test found that the null hypothesis should not be rejected at an alpha value of 0.05. Using the null hypothesis that the lead concentrations in soil from the proposed cut area subset are greater than or equal to those in the proposed fill area subset (Form 2), the test found that the null hypothesis should be rejected at an alpha value of 0.05. These results indicate that the lead concentrations in the two subsets were sufficiently different that they should be evaluated separately. The ProUCL outputs for this test are provided in Appendix H.

The majority of the samples collected from the top 2.5 feet of soil in Contract 4 were of fill. Alluvium in shallow soils was encountered sporadically in the western half of Composite Area 12. Separation of shallow fill and alluvium would likely be impractical given that fill and alluvium appeared to be intermixed in this area. Therefore, no attempt was made to classify alluvium separately from fill in the top 2.5 feet of soil.

While all the discrete samples in the two subsets (fill versus cut areas) were analyzed for total lead, only those samples with total lead concentrations greater than 50 mg/kg (ten times the STLC) were analyzed for WET lead. Therefore, to conservatively estimate WET lead

[6] The Wilcoxon-Mann-Whitney test was performed on total lead concentrations, rather than on WET lead concentrations, because only 19 of the 52 discrete samples collected in the top 2.5 feet of soil across all the Composite Areas were actually analyzed for WET lead. The WET lead data set would have been biased because only samples with total lead concentrations above 50 mg/kg would have been analyzed for WET lead.

concentrations for the samples not actually analyzed for WET lead, the WET lead concentrations were assumed to be 10 percent of the total lead concentrations.

The basic statistics for total and WET lead (analyzed and estimated) concentrations in samples collected in the top 2.5 feet from the proposed cut and fill areas are summarized below.

	No. of Samples	**Minimum**	**Maximum**	**Mean**	**Median**	**Variance**	**Standard Deviation**
Total Lead (fill) (mg/kg)	12	8.6	1,000	218	125	86,910	294.8
Total Lead (cut (mg/kg)	40	1.6	320	46	13	4,393	66.28
WET Lead (fill) (mg/L)	12	0.86	23	6.9	4.9	41.85	6.469
WET Lead (cut)) (mg/L)	40	0.16	15	1.9	1.2	7.068	2.659

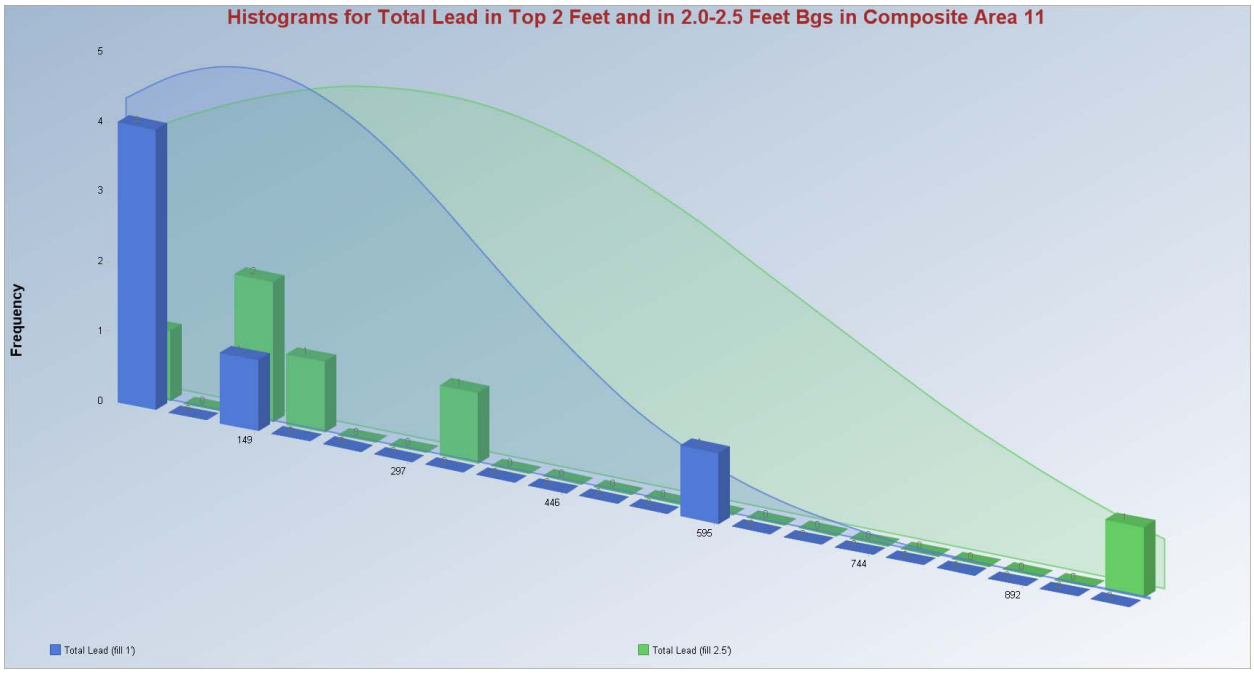
Since the maximum total lead concentration in the proposed fill area subset equaled the TTLC of 1,000 mg/kg, and the maximum WET lead concentrations in both the fill and cut subsets exceeded the STLC of 5 mg/L, these parameters were evaluated further to determine whether representative concentrations exceed California hazardous waste thresholds.

Guidance in the EPA SW-846 specifies that the one-tailed 90 percent upper confidence limit ("UCL") on the mean (which is equivalent to the two-tailed 80 percent UCL) should be calculated and compared to hazardous waste thresholds. If the calculated 90 percent UCL is less than the hazardous waste threshold, then the chemical is not considered to be present in the waste above the threshold, and the waste represented by the data is not considered a hazardous waste due to that chemical (EPA, 1986).

Using ProUCL version 4.00.04 software, estimates of the 90 percent UCL for WET lead concentrations in the less than 2.0 feet bgs subset were calculated (the data and UCL output file is provided in Appendix H). The software tests the data to determine if it is consistent with a normal, lognormal, or gamma distributions, and also calculates UCLs assuming these three distributions as well using nonparametric methods.

6.1.1.1 Total and Soluble WET Lead in Top 2.5 Feet of Soil in Proposed Fill Area (Composite Area 11)

The total and WET lead concentrations in the shallow soil samples collected from Composite Area 11 were higher than from other areas, as discussed in Section 6.1.1, above. Six soil samples were collected from 0.5-1.0 feet bgs and and six samples were collected from 2.0-2.5 feet bgs in Composite Area 11. The total lead concentrations in the two subsets of data were compared using the Wilcoxon-Mann-Whitney test, and test results were inclusive (neither one of the opposite null hypotheses could be rejected). Histograms of the two subsets are shown below.



Therefore, all 12 samples from the top 2.5 feet in Composite Area 11 were considered one group. The basic statistics for total and WET lead concentrations were presented in 6.1.1, above. One of the total lead concentrations equaled the TTLC of 1,000 mg/kg. The seven samples that had total lead concentrations greater than ten times the STLC were analyzed for soluble WET lead, and six of the WET lead concentrations exceeded the STLC of 5 mg/L.

ProUCL was used to estimate the 90 percent UCL for WET lead concentrations in this subset, assuming WET lead concentrations equal to ten percent of the total lead concentration for those samples not actually analyzed for WET lead. The data and UCL output file are provided in Appendix H.

The WET lead concentrations are not normal but are consistent with lognormal and gamma distributions at a five percent significance level. The estimated 90 percent UCLs calculated assuming lognormal and gamma distributions are:

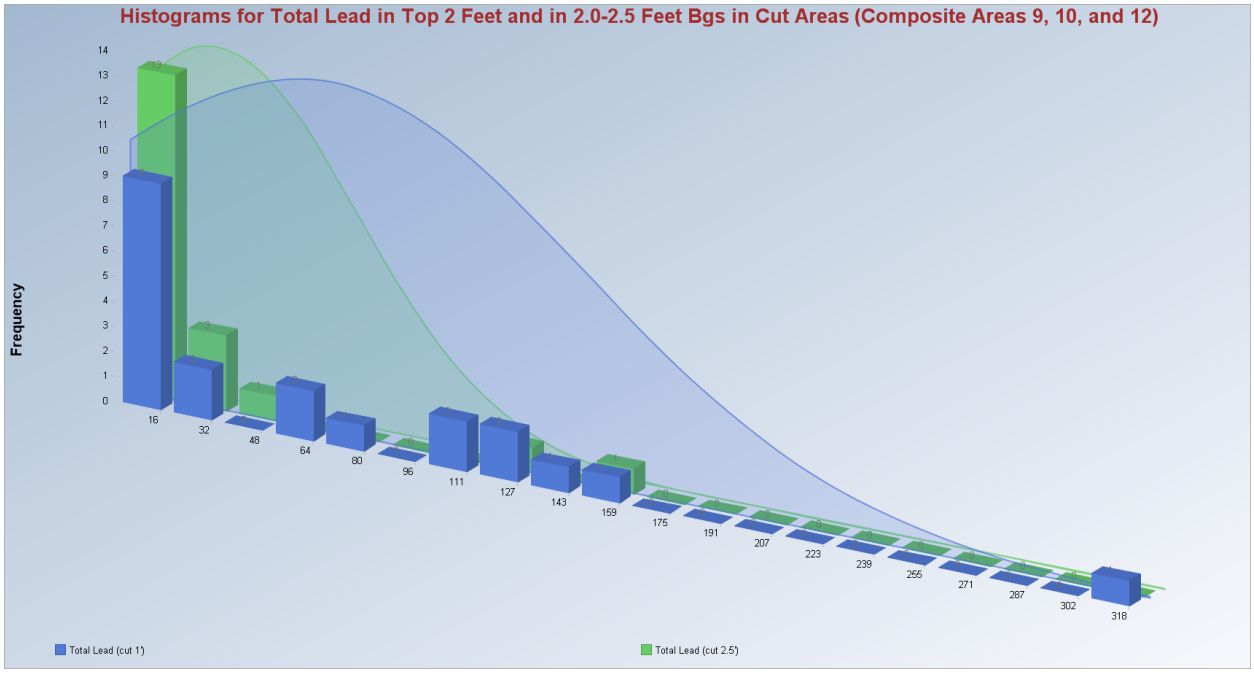
- Gamma Distribution Methods
  - 90% Approximate Gamma UCL =11 mg/L
  - 90% Adjusted Gamma UCL = 11 mg/L
- Lognormal Distribution Methods
  - 90% H-UCL = 15 mg/L
  - 90% Chebyshev (MVUE) UCL = 14 mg/L

The 90% UCL estimates are all greater than the STLC for WET lead of 5 mg/L. Therefore, the representative WET lead concentration in the top 2.5 feet of soil in the proposed fill area (Composite Area 11) would cause the shallow soil above 2.5 feet bgs to be considered a

California hazardous waste. Because this subset is already considered hazardous due to WET lead concentrations, further evaluation of total lead concentrations in this subset is not necessary.

6.1.1.2 Total and Soluble WET Lead in Top 2.5 Feet of Soil in Proposed Cut Areas (Composite Areas 9, 10, and 12)

Twenty-one soil samples were collected from 0.5-2.0 feet bgs and nineteen samples were collected from 2.0-2.5 feet bgs in the proposed cut areas (Composite Areas 9, 10, and 12). Histograms of the total lead concentrations in the two subsets are shown below.



The total lead concentrations in the two subsets of data were compared using the Wilcoxon-Mann-Whitney test, and test results indicate that the two subsets were different at an alpha level of 0.5, and therefore, should be evaluated separately. The outputs from ProUCL are provided in Appendix H.

6.1.1.2.1 Total and Soluble WET Lead in Soil in Top Two Feet Subset in Proposed Cut Areas

The basic statistics on total and WET concentrations in the 21 samples collected from 0.5-2.0 feet bgs are presented below.

	No. of Samples	Minimum	Maximum	Mean	Median	Variance	Standard Deviation
Tot Lead (cut1)	21	2.2	320	65	20	6,075	77.94
WET Lead (cut1)	21	0.22	15	2.6	1.4	11.3	3.362

The maximum total lead concentration was 320 mg/kg, below the TTLC. The maximum WET lead concentration was 15 mg/L, which exceeded the STLC. Using the ten actual soluble WET

lead concentrations and ten estimated WET lead concentrations (assuming ten percent of total lead concentrations) in the less than 2 feet bgs subset, 90 percent UCLs were calculated using ProUCL. The data and ProUCL output are provided in Appendix H. The data do not follow a normal distribution, but are consistent with both a lognormal and gamma distribution at a five percent significance level. The estimated 90 percent UCLs, assuming lognormal and gamma distributions, are:

- Gamma Distribution Methods
  - 90% Approximate Gamma UCL = 3.6 mg/L
  - 90% Adjusted Gamma UCL = 3.6 mg/L
- Lognormal Distribution Methods
  - 90% H-UCL = 4.0 mg/L
  - 90% Chebyshev (MVUE) UCL = 4.4 mg/L

The 90% UCL estimates are all less than the STLC for WET lead of 5 mg/L. Therefore, the representative WET lead concentration in the less than 2 feet bgs subset in the proposed cut areas (Composite Areas 9, 10, and 12) would not cause the shallow soil to be considered a California hazardous waste.

6.1.1.2.2 Total and Soluble WET Lead in Soil in 2.0-2.5 Feet bgs Subset in Proposed Cut Areas (Composite Areas 9, 10, and 12)

The total and soluble WET lead concentrations in the 19 samples collected from 2.0-2.5 feet bgs in the proposed cut areas are presented below.

Sample ID	Sample Depth (feet bgs)	Lead (mg/kg)	WET Lead (mg/L)
E059F-2.5	2.5	120	1.1
E060FS-2.5	2.5	21	Not analyzed
E061C-2.5	2.5	2.5	Not analyzed
E063F-2.5	2.5	160	1.9
E065F-2.5	2.5	23	Not analyzed
E067F-2.5	2.5	13	Not analyzed
E069F-2.5	2.5	4	Not analyzed
E073F-2.5	2.5	3	Not analyzed
E074F-2.5	2.5	4.6	Not analyzed
E075F-2.5	2.5	30	Not analyzed
E076F-2.5	2.5	2.4	Not analyzed
E077A-2.5	2.5	1.8	Not analyzed
E077AA-2.5	2.5	6.9	Not analyzed
E078A-2.5	2.5	1.9	Not analyzed
E078AA-2.5	2.5	2.8	Not analyzed
E079F-2.5	2.5	49	Not analyzed
E080A-2.5	2.5	1.6	Not analyzed
E081F-2.5	2.5	13	Not analyzed
E082A-2.5	2.5	5.1	Not analyzed

The maximum total lead concentration was 160 mg/kg, less than the TTLC. The two samples that had total lead concentrations greater than ten times the STLC were analyzed for soluble WET lead, and none of the WET lead concentrations exceeded the STLC of 5 mg/L. Therefore, neither the total nor soluble WET lead concentrations in the proposed cut areas (Composite Areas 9, 10, and 12) would cause the soil in the 2.0-2.5 feet bgs subset to be considered a California hazardous waste.

6.1.2 Fill Deeper than 2.5 Feet bgs in Proposed Cut Areas (Composite Areas 9, 10, and 12)

During the field investigation, a total of 11 composite samples of fill were analyzed from the proposed cut areas (Composite Areas 9, 10, and 12).[7] All but one of the composite samples were made up of one or more discrete samples collected from shallower than 2.5 feet bgs.[8] Since the shallow soils are known to have higher lead concentrations, the composite sample results were not considered representative of the deeper fill. To obtain representative lead concentrations in the deeper fill, three new composite samples, made up of all the discrete fill samples collected from deeper than 2.5 feet bgs that was not already appropriately composited to characterize deeper fill, were analyzed. One new composite sample was analyzed for each of Composite Areas 9, 10, and 12. Lead concentrations in the three additional and one original composite samples of discrete samples of fill collected from deeper than 2.5 feet bgs are presented below.

Sample ID	Sample Depth (feet bgs)	Lead (mg/kg)	WET Lead (mg/L)
EC09-F005	7.5-12.5	7.3	Not analyzed
EC10-F004	7.5-22.5	21	Not analyzed
EC10-F005	7.5-22.0	18	Not analyzed
EC12-F006	7.5-12.5	3.1	Not analyzed

Total lead concentrations ranged from 3.1 to 21 mg/kg, which are below the TTLC. None of the samples contained total lead above 50 mg/kg so none was analyzed for WET lead. Therefore, fill deeper than 2.5 feet bgs in Composite Areas 9, 10, and 12 would not be considered a California hazardous waste due to lead.

6.1.3 Alluvium Deeper than 2.5 Feet bgs in Composite Areas 10 and 12

Alluvium deeper than 2.5 feet bgs was only encountered in Composite Areas 10 and 12[8] during the investigation. Lead concentrations from nine composite samples of alluvium from Composite Areas 10, and 12 are presented below.[9]

[7] Soil samples were not collected below a depth of 2.5 feet in the proposed fill area (Composite Area 11) since excavation was not planned in that area.

[8] The primary purpose for the composite sample analyses was for the analysis of the Title 22 metals other than lead and organic constituents.

[9] Note that four of the composite samples included discrete samples collected from 2.5 feet bgs and above.

Sample ID	Sample Depth (feet bgs)	Lead (mg/kg)	WET Lead (mg/L)
EC10-A001	7.0-17.5	5.5	Not analyzed
EC10-A002	7.5-17.0	4.1	Not analyzed
EC12-A001	7.5-17.0	5.2	Not analyzed
EC12-A002	1.0-7.5	5.9	Not analyzed
EC12-A003	7.5-27.5	2.7	Not analyzed
EC12-A004	2.5-22.5	2	Not analyzed
EC12-A005	1.0-27.5	4.5	Not analyzed
EC12-F006	1.0-17.5	4.9	Not analyzed
EC12-A007	12.5-22.5	4.4	Not analyzed

Total lead concentrations ranged from 2 to 5.5 mg/kg, which are below the TTLC. None of the samples contained total lead above 50 mg/kg so none was analyzed for WET lead. Therefore, alluvium deeper than 2.5 feet bgs in Composite Areas 10 and 12 would not be considered a California hazardous waste due to lead.

6.1.4 Colma Sand Deeper than 2.5 Feet bgs in Proposed Cut Areas (Composite Areas 9, 10, and 12)

Lead concentrations of five composite samples of Colma Sand collected from deeper than 2.5 feet bgs in the proposed cut areas (Composite Areas 9, 10, and 12) are presented below.[10]

Sample ID	Sample Depth (feet bgs)	Lead (mg/kg)	WET Lead (mg/L)
EC09-C001	2.5-12.5	2.5	Not analyzed
EC10-C001	17.5-27.5	2.7	Not analyzed
EC12-C001	17.5-32.5	3.3	Not analyzed
EC12-C002	12.5-37.5	2.9	Not analyzed
EC12-C003	22.5-32.5	2.9	Not analyzed

Total lead concentrations ranged from 2.5 to 3.3 mg/kg, which are below the TTLC. None of the samples contained total lead above 50 mg/kg so WET lead was not analyzed. Therefore, Colma Sand deeper than 2.5 feet bgs in Composite Areas 9, 10, and 12 would not be considered a California hazardous waste due to lead.

6.1.5 Non-Serpentinite Bedrock in Composite Area 12

Non-serpentinite bedrock was only encountered in Composite Area 12 during the investigation. Lead concentrations from the two composite samples of bedrock collected from Composite Area 12 are presented below.

Sample ID	Sample Depth (feet bgs)	Lead (mg/kg)	WET Lead (mg/L)
EC12-BR001	7.5-22.5	9.2	Not analyzed
EC12-BR002	23.0-38.0	7.3	Not analyzed

[10] Soil samples were not collected below a depth of 2.5 feet in the proposed fill area (Composite Area 11) since excavation was not planned in that area.

Total lead concentrations were 7.3 and 9.2 mg/kg, which are below the TTLC. Neither of the samples contained total lead above 50 mg/kg so they were not analyzed for WET lead. Therefore, the non-serpentinite bedrock encountered in Composite Area 12 would not be considered a California hazardous waste due to lead.

6.1.6 Serpentinite Bedrock in Composite Area 12

Six discrete samples from geotechnical borings BTNB-R3, BTNB-R2, and BTSB-R2 of serpentinite bedrock were analyzed for nickel and chromium. The total chromium concentrations in these samples ranged from 220 to 1,200 mg/kg. The total nickel concentrations in these samples ranged from 1,900 to 3,100 mg/kg and the average was 2,300 mg/kg, which is greater than the TTLC of 2,000 mg/kg (Table 4). Therefore, serpentinite bedrock in Composite Area 12 should be considered a California hazardous waste due to nickel.

Asbestos was analyzed for six serpentinite bedrock samples collected from cores of three previously drilled geotechnical borings (BTNB-R2, BTNB-R3, and BTSB-R2) in Composite Area 12 (Table 11 and Figure 2). Asbestos was reported in these samples at concentrations ranging from 0.75 to 2.5%, indicating a dust mitigation plan is required during excavation of serpentinite bedrock in Composite Area 12. The mean concentration of asbestos in these six samples was 1.78%, above the TTLC of 1%, and the asbestos was identified as chrysotile, a friable form of serpentine. Therefore, the serpentinite bedrock in Composite Area 12 is a California hazardous waste due to asbestos.

6.2 Screening against ESLs

Chemical concentrations quantified above laboratory reporting limits associated with soils that were classified as non-hazardous wastes were screened against ESLs established by the Water Board for residential and commercial/industrial land uses where the groundwater is considered a current or potential source of drinking water (Table A, Water Board, 2008), and against ESLs for construction/trench worker direct exposure (Table K-3, Water Board, 2008). The ESLs are listed in Tables 4 through 10. The compounds that exceeded one or more ESLs in the different soil types that were determined to be non-hazardous wastes are summarized below.

Soil Type	Compound	ESL(s) Exceeded
Alluvium in Composite Areas 9, 10, and 12	Arsenic	Residential and commercial/industrial land uses
	Vanadium	Residential land use
Bedrock (not serpentinite) in Composite Area 12	Arsenic	Residential and commercial/industrial land uses
	Vanadium	Residential land use
Colma Sand in Composite Areas 9, 10, and 12	Arsenic	Residential and commercial/industrial land uses
	Vanadium	Residential land use
Fill in Composite Areas 9, 10, and 12	Arsenic	Residential and commercial/industrial land uses
	Lead	Residential land use
	Vanadium	Residential land use
	Benzo(a)anthracene	Residential and commercial/industrial land uses

Soil Type	Compound	ESL(s) Exceeded
	Benzo(a)pyrene	Residential and commercial/industrial land uses, and construction worker direct contact
	Benzo(b)fluoranthene	Residential and commercial/industrial land uses
	Benzo(k)fluoranthene	Residential land use
	Dibenz(a,h)anthracene	Residential and commercial/industrial land uses
	Indeno(1,2,3-c,d) pyrene	Residential land use
	TPH as diesel	Residential and commercial/industrial land uses
	TPH as motor oil	Residential land use

The information summarized above should be considered a preliminary screening only, and more detailed evaluation may be needed for specific scenarios. The following issues should be considered when reviewing the information:

- Even if only one of numerous samples contained a compound that exceeded an ESL, that compound is listed in the above table. For example, only one out of the 11 samples of fill that were analyzed for PAHs contain benzo(b)fluoranthene above the ESL for residential land use.

- Arsenic ESLs are based on human health risk concerns. Background concentrations for arsenic established by the Lawrence Berkeley National Laboratory ("LBNL") are substantially higher than the ESLs for residential and commercial/industrial land uses. The 95th percentile for arsenic determined by the LBNL is 17 mg/kg (LBNL, 2009), whereas the residential and commercial/industrial ESLs are 0.39 and 1.6 mg/kg, respectively. Background concentrations for arsenic established by Presidio Trust are also higher than the ESLs for residential and commercial/industrial land uses and range from 3.2 to 6.2 mg/kg, depending on lithology (EKI, 2002).

7 CONCLUSIONS

A systematic investigation of the quality of soils that are expected to be excavated within the Project has provided data to support waste classification of the soils for disposal purposes and preliminary screening against ESLs established by the Water Board.

The results of the waste classification are summarized in Table 13. The following soil group or soil types are classified as California hazardous wastes:

- All soil in the top 2.5 feet in Composite Area 11, which consisted of only fill. Excavation was not planned in Composite Area 11, and therefore, no samples were collected from deeper than 2.5 feet bgs during this investigation. Additional characterization of soils below 2.5 feet bgs should be performed if excavation below 2.5 feet were to occur.

- Serpentinite bedrock in Composite Area 12.

The following soil types are classified as non-hazardous wastes:

- Soil in the top 2.5 feet in Composite Areas 9, 10, and 12.
- Fill deeper than 2.5 feet bgs in Composite Areas 9, 10, and 12.
- Alluvium deeper than 2.5 feet bgs in Composite Areas 10 and 12. Alluvium was not encountered in Composite Area 9.
- Colma Sand deeper than 2.5 feet bgs in Composite Areas 9, 10, and 12.
- Bedrock (not serpentinite) in Composite Area 12. Bedrock was not encountered in Composite Areas 9 or 10.

A preliminary screening of chemical constituents against ESLs in shallow soils for residential and commercial/industrial land uses where groundwater is a current or potential drinking water source, and against ESLs for construction/trench workers, indicates that one or more samples of each soil group classified as a non-hazardous waste exceeds one or more ESLs. A more detailed evaluation should be performed to assess specific scenarios of possible soil reuse.

8 LIMITATIONS

BASELINE's objective is to perform our work with care, exercising the customary thoroughness and competence of earth science, environmental, and engineering consulting professionals, in accordance with the standard for professional services for a consulting firm at the time these services were provided. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental conditions and potential liability at a particular site. Therefore, BASELINE cannot act as insurers and cannot "certify or underwrite" that a site is free of environmental contamination, and no expressed or implied representation or warranty is included or intended in this report except that the work was performed within the limits prescribed with the customary thoroughness and competence of our profession.

The passage of time, manifestation of latent conditions, or occurrence of future events may require further exploration at the project site, analysis of the data, and re-evaluation of the findings, observations, conclusions, and recommendations expressed in the report.

The findings, observations, conclusions, and recommendations expressed by BASELINE in this report are limited by the scope of services and should not be considered an opinion concerning the compliance of any past or current owner or operator of the site with any federal, state, or local law or regulation. No warranty or guarantee, whether expressed or implied is made with respect to the data reported or findings, observations, conclusions, and recommendations expressed in this report.

9 REFERENCES

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FIGURES

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	sf	101,1	9.2/9.8, 6.8/7.1		

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

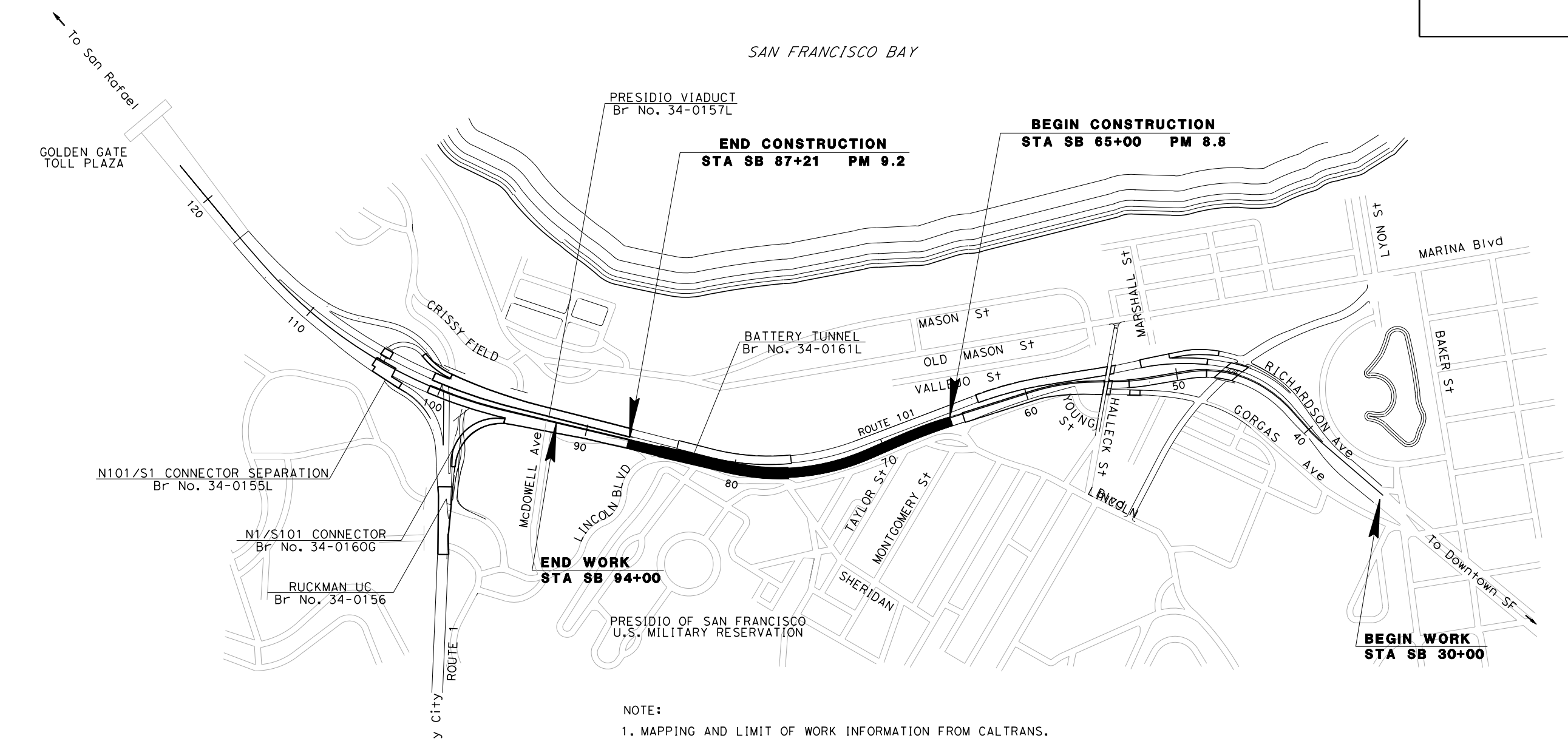
PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

IN THE CITY AND COUNTY OF SAN FRANCISCO
0.4 MILE SOUTH OF THE
ROUTE 101/1 SEPARATION

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

LOCATION MAP



NOTE:

1. MAPPING AND LIMIT OF WORK INFORMATION FROM CALTRANS.

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

Caltrans

ARUP PB joint venture

CONTRACT 4 AREA & REGIONAL PLAN
FIGURE 1 - JULY 24, 2009

0 250 500 1000
FEET

LAST REVISION 00-00-00

DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

LEGEND:

Symbol	Description
E062 (10)	ENVIROMENTAL BORING LOCATION COMPOSITE AREA
BNTB-R21 (12)	GEOTECHNICAL BORING LOCATION COMPOSITE AREA (Only Serpertine Bedrock Samples Analyzed at These Locations)
Red dashed box	TEMPORARY CONSTRUCTION EASEMENT (Caltrans 06 April 2009)
Blue hatched box	PROPOSED CUT (Caltrans 02 July 2008)
Orange dashed box	LOCATION OF POSSIBLE CONTAMINATION AND POTENTIAL LAND USE CONTROL BOUNDARY UNLESS NOTED OTHERWISE
12	COMPOSITE AREA BOUNDARY

San Francisco County Transportation Authority

Caltrans

ARUP PB joint venture

DOYLE DRIVE REPLACEMENT PROJECT - CONTRACT 4

Environmental Boring Locations and Composite Areas

FIGURE 2 - August 21, 2009 - Rev 02

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2009-07-13 Contract 4 Soil Investigation Report - Boring Locations and Composite Areas - Figure 2.r02.dgn

TABLES

TABLE 1: Soil Boring Survey Data
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Cut or Fill[3]	Drilling Method	Boring Depth	Installatior Date	Project Survey Coordinates[1]			Presidio Trust Survey Coordinates[2]		
						Northing	Easting	Elevation	Northing	Easting	Elevation
9	E059	Cut	HSA	7.5	1/23/2009	2120693.59	5996425.58	12.80	480286.36	1435057.51	13.17
9	E060	Cut	HSA	10.0	1/23/2009	2120739.75	5996360.83	12.56	480332.51	1434992.77	12.93
9	E061	Cut	HSA	12.5	1/22/2009	2120616.78	5996246.58	15.52	480209.54	1434878.52	15.89
11	E062	Fill	DPT	2.5	1/16/2009	2120662.25	5996129.77	12.87	480255.01	1434761.71	13.24
10	E063	Cut	HSA	22.5	1/22/2009	2120538.33	5996051.58	40.10	480131.09	1434683.52	40.47
11	E064	Fill	DPT	2.5	1/16/2009	2120599.62	5995929.49	12.28	480192.38	1434561.42	12.65
10	E065	Cut	HSA	22.5	1/22/2009	2120481.62	5995875.60	44.70	480074.37	1434507.53	45.07
11	E066	Fill	DPT	2.5	1/16/2009	2120535.26	5995742.86	12.15	480128.02	1434374.79	12.52
10	E067	Cut	HSA	22.5	1/21/2009	2120369.57	5995667.73	54.48	479962.32	1434299.67	54.85
11	E068	Fill	DPT	2.5	1/16/2009	2120472.18	5995546.01	11.89	480064.93	1434177.94	12.26
10	E069	Cut	HSA	22.5	1/21/2009	2120296.79	5995517.29	63.84	479889.53	1434149.22	64.21
11	E070	Fill	DPT	2.5	1/16/2009	2120408.33	5995346.36	12.60	480001.08	1433978.29	12.97
10	E071	Cut	HSA	27.5	1/21/2009	2120266.36	5995354.58	70.97	479859.11	1433986.51	71.34
11	E072	Fill	DPT	2.5	1/16/2009	2120370.68	5995187.76	17.65	479963.42	1433819.69	18.02
12	E073	Cut	HSA	33.0	1/15/2009	2120198.80	5995091.71	85.14	479791.54	1433723.64	85.51
12	E074	Cut	HSA	40.0	1/12/2009	2120363.70	5994997.01	70.22	479956.44	1433628.94	70.59
12	E075	Cut	HSA	28.0	1/15/2009	2120249.73	5994867.92	91.49	479842.47	1433499.85	91.86
12	E076	Cut	HSA	33.5	1/12/2009	2120379.69	5994828.09	78.03	479972.43	1433460.01	78.40
12	E077	Cut	HSA	28.0	1/15/2009	2120247.25	5994588.54	96.81	479839.98	1433220.46	97.18
12	E077A	Cut	HA	2.5	1/14/2009	2120282.34	5994595.25	90.26	479875.08	1433227.17	90.63
12	E078	Cut	HSA	27.5	1/14/2009	2120286.41	5994479.35	98.96	479879.14	1433111.27	99.33
12	E078A	Cut	HA	2.5	1/14/2009	2120314.56	5994495.61	91.68	479907.29	1433127.52	92.05
12	E079	Cut	HSA	38.0	1/16/2009	2120337.14	5994394.43	100.25	479929.87	1433026.34	100.62
12	E080	Cut	HSA	18.0	1/14/2009	2120326.29	5994301.86	103.84	479919.02	1432933.77	104.21
12	E081	Cut	HSA	8.5	1/13/2009	2120394.42	5994256.59	105.56	479987.15	1432888.51	105.93
12	E082	Cut	HSA	23.0	1/13/2009	2120380.24	5994109.87	108.44	479972.97	1432741.78	108.81
12	BTNB-R2 [4]	Cut	MR	71.5	6/1/2008	2120407.63	5994505.43	89.42	480000.36	1433137.35	89.79
12	BTNB-R3 [4]	Fill	MR	100	7/26/2008	2120351.99	5994725.98	86.29	479944.72	1433357.90	86.66
12	BTSB-R2 [4]	Fill	MR	115	2/29/2008	2120218.26	5994858.34	92.12	479811.00	1433490.27	92.49

Notes:

bgs = below ground surface.
Drilling Methods:
HA=Hand Auger
HSA= Hollow Stem Auger
DPT= Direct Push Technology
MR = Mud Rotary

1 Project survey coordinates and vertical datum in NAD83 (State Plane System, California Zone III) and NAVD 88, respectively. Borings surveyed at ground elevation by Chaudhary & Associates.

2 Presidio Trust survey coordinates and vertical datum are in NAD27 and Presidio Low Low Water (PLLW), respectively. Survey data calculated by Chaudhary & Associates from NAD 83 and NAVD 88.

3 Proposed cut and potential fill areas are shown on Figure 2. Borings BTNB-R2, E067, E069, E073, E076, and E077 are located immediately outside the proposed cut area due to drill rig access limitations. These borings are intended to represent soil that will be encountered during excavation activities.

4 The Battery Tunnel Northbound (BTNB) and Battery Tunnel Southbound (BTSB) borings were drilled by ARUP in 2008 for geotechnical purposes on behalf of ARUP/PB Joint Venture.

TABLE 2: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project

Composite Area	Composite Sample ID	Discrete Sample ID	Lithology
9	EC09-C001	E061C-12.5	C
		E061C-2.5	
		E061C-7.5	
9	EC09-F001	E057F-1.0	F
		E059F-1.0	
		E059F-2.5	
		E059F-7.5	
		E061F-1.0	
9	EC09-F003	E055F-12.5	F/FS
		E055F-7.5	
		E060F-1.0	
		E060FS-2.5	
9	EC09-F004	E058F-1.0	F
		E058F-2.5	
		E058F-7.5	
		E060F-7.5	
9	EC09-F005	E055F-7.5	F
		E055F-12.5	
		E058F-7.5	
		E059F-7.5	
		E060F-7.5	
10	EC10-A001	E069A-12.5	A
		E069A-7.0	
		E071A-12.5	
		E071A-17.5	
10	EC10-A002	E067A-12.5	A
		E067A-7.5	
		E069A-17.5	
10	EC10-C001	E067C-17.5	C
		E067C-22.5	
		E069C-22.5	
		E071C-22.5	
		E071C-27.5	
10	EC10-F001	E069F-1.0	F
		E069F-2.5	
		E071F-1.0	
		E071F-2.0	
		E071F-7.5	
10	EC10-F002	E065F-1.0	F
		E065F-2.5	
		E065F-7.5	
		E067F-1.0	
		E067F-2.5	
10	EC10-F003	E063F-1.0	F
		E063F-2.5	
		E065F-12.5	
		E065F-17.5	
		E065F-22.0	
10	EC10-F004	E063F-11.5[1]	F/FS
		E063F-17.5	
		E063F-7.5	
		E063FS-22.5	

TABLE 2: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project

Composite Area	Composite Sample ID	Discrete Sample ID	Lithology
10	EC10-F005	E065F-7.5	F
		E065F-12.5	
		E065F-17.5	
		E065F-22.0	
		E071F-7.5	
11	EC11-F001	E070F-1.0	F
		E070F-2.5	
		E072F-1.0	
		E072F-2.5[2]	
11	EC11-F002	E066F-1.0	F
		E066F-2.5	
		E068F-1.0	
		E068F-2.5	
11	EC11-F003	E062F-1.0	F
		E062F-2.5	
		E064F-1.0	
		E064F-2.5	
12	EC12-A001	E074A-12.5	A
		E074A-7.5	
		E076A-12.5	
		E076A-17.5	
		E076A-7.5	
12	EC12-A002	E080A-2.5	A
		E080A-7.5	
		E082A-1.0	
		E082A-2.5	
		E082A-7.5	
12	EC12-A003	E079A-12.5	A
		E079A-17.5	
		E079A-22.5	
		E079A-27.5	
		E079A-7.5	
12	EC12-A004	E078A-12.5	A
		E078A-17.5	
		E078A-2.5	
		E078A-22.5	
		E078A-7.5	
12	EC12-A005	E077A-2.5	A
		E077A-7.5	
		E078A-27.5	
		E078AA-1.0	
		E078AA-2.5	
12	EC12-A006	E075A-7.5	A
		E077A-12.5	
		E077A-17.5	
		E077AA-1.0	
		E077AA-2.0	
12	EC12-A007	E073A-17.5	A
		E073A-22.5	
		E075A-12.5	
		E075A-17.5	
12	EC12-BR001	E080BR-12.5	BR

TABLE 2: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project

Composite Area	Composite Sample ID	Discrete Sample ID	Lithology
		E080BR-17.5	
		E081BR-7.5	
		E082BR-17.5	
		E082BR-22.5	
12	EC12-BR002	E077BR-23.0	BR
		E077BR-28.0	
		E079BR-33.0	
		E079BR-38.0	
12	EC12-C001	E074C-17.5	C
		E074C-22.5	
		E076C-22.5	
		E076C-27.5	
		E076C-32.5	
12	EC12-C002	E074C-27.5	C
		E074C-32.5	
		E074C-37.5	
		E082C-12.5	
12	EC12-C003	E073C-27.5	C
		E073C-32.5	
		E075C-22.5	
		E075C-27.5	
12	EC12-F002	E078F-1.0	F
		E079F-1.0	
		E079F-2.5	
		E081F-1.0	
		E081F-2.5	
12	EC12-F003	E073F-1.0	F
		E075F-1.0	
		E075F-2.5	
		E077F-1.0	
12	EC12-F004	E073F-12.5	F
		E073F-2.5	
		E073F-7.5	
12	EC12-F005	E074F-1.0	F
		E074F-2.5	
		E076F-1.0	
		E076F-2.5	
		E080F-1.0	
12	EC12-F006	E073F-7.5	F
		E073F-12.5	

Notes:
Boring locations are shown on Figure 2.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
bgs = below ground surface.

[1] The laboratory sample identification was E063F-12.5. BASELINE changed the sample identification to E063F-11.5 based on review of the boring log.
[2] The laboratory sample identification was E072F-2.0. BASELINE changed the sample identification to E072F-2.5 based on review of the boring log.

TABLE 3: Summary of Soil Sample Analyses
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Lithology	Title 22 Metals	Total Lead (Only)	Soluble Chromium	Soluble Lead	Total Petroleum Hydrocarbons	Volatile Organic Compounds	Semi-Volatile Organic Compounds	Polycyclic Aromatic Hydrocarbons	Pesticides	Herbicides	Polychlorinated Biphenyls	Asbestos	Cyanide	Sulfide	Ignitability	pH	Moisture
					Table Location:	**4,5**	**5**	**5**	**5**	**6**	**7**	**NT**	**8**	**9**	**NT**	**10**	**11**	**12**	**12**	**12**	**12**	**12**
9	E059	E059F-1.0	1.0	1/23/2009	F		X															
9	E059	E059F-2.5	2.5	1/23/2009	F		X		X													
9	E060	E060F-1.0	1.0	1/23/2009	F		X															
9	E060	E060FS-2.5	2.5	1/23/2009	FS		X										X					
9	E061	E061C-2.5	2.5	1/22/2009	C		X															
9	E061	E061F-1.0	1.0	1/22/2009	F		X															
11	E062	E062F-1.0	1.0	1/16/2009	F		X															X
11	E062	E062F-2.5	2.5	1/16/2009	F		X															X
10	E063	E063F-1.0	1.0	1/22/2009	F		X		X													
10	E063	E063F-2.5	2.5	1/22/2009	F		X		X													
10	E063	E063FS-22.5	22.5	1/22/2009	FS												X					
11	E064	E064F-1.0	1.0	1/16/2009	F		X		X													X
11	E064	E064F-2.5	2.5	1/16/2009	F		X		X													X
10	E065	E065F-1.0	1.0	1/22/2009	F		X		X													
10	E065	E065F-2.5	2.5	1/22/2009	F		X															
11	E066	E066F-1.0	1.0	1/16/2009	F		X		X													X
11	E066	E066F-2.5	2.5	1/16/2009	F		X		X													X
10	E067	E067F-1.0	1.0	1/21/2009	F		X		X													
10	E067	E067F-2.5	2.5	1/21/2009	F		X															
11	E068	E068F-1.0	1.0	1/16/2009	F		X															X
11	E068	E068F-2.5	2.5	1/16/2009	F		X		X													X
10	E069	E069F-1.0	1.0	1/21/2009	F		X															
10	E069	E069F-2.5	2.5	1/21/2009	F		X															
11	E070	E070F-1.0	1.0	1/16/2009	F		X															X
11	E070	E070F-2.5	2.5	1/16/2009	F		X		X													X

TABLE 3: Summary of Soil Sample Analyses
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Lithology	Title 22 Metals	Total Lead (Only)	Soluble Chromium	Soluble Lead	Total Petroleum Hydrocarbons	Volatile Organic Compounds	Semi-Volatile Organic Compounds	Polycyclic Aromatic Hydrocarbons	Pesticides	Herbicides	Polychlorinated Biphenyls	Asbestos	Cyanide	Sulfide	Ignitability	pH	Moisture
					Table Location:	**4,5**	**5**	**5**	**5**	**6**	**7**	**NT**	**8**	**9**	**NT**	**10**	**11**	**12**	**12**	**12**	**12**	**12**
10	E071	E071F-1.0	1.0	1/21/2009	F		X		X													
10	E071	E071F-2.0	2.0	1/21/2009	F		X															
11	E072	E072F-1.0	1.0	1/16/2009	F		X															X
11	E072	E072F-2.5 [1]	2.5	1/16/2009	F		X		X													X
12	E073	E073F-1.0	1.0	1/15/2009	F		X		X													
12	E073	E073F-2.5	2.5	1/15/2009	F		X															
12	E074	E074F-1.0	1.0	1/12/2009	F		X		X													
12	E074	E074F-2.5	2.5	1/12/2009	F		X															
12	E075	E075F-1.0	1.0	1/15/2009	F		X		X													X
12	E075	E075F-2.5	2.5	1/15/2009	F		X															X
12	E076	E076F-1.0	1.0	1/12/2009	F		X		X													
12	E076	E076F-2.5	2.5	1/12/2009	F		X															
12	E077	E077A-2.5	2.5	1/15/2009	A		X															X
12	E077A	E077AA-1.0	1.0	1/14/2009	A		X															
12	E077A	E077AA-2.5	2.5	1/14/2009	A		X															
12	E077	E077F-1.0	1.0	1/15/2009	F		X															X
12	E078	E078A-2.5	2.5	1/14/2009	A		X															
12	E078A	E078AA-1.0	1.0	1/14/2009	A		X															
12	E078A	E078AA-2.5	2.5	1/14/2009	A		X															
12	E078	E078F-1.0	1.0	1/14/2009	F		X															
12	E079	E079F-1.0	1.0	1/16/2009	F		X		X													X
12	E079	E079F-2.5	2.5	1/16/2009	F		X															X
12	E080	E080A-2.5	2.5	1/14/2009	A		X															
12	E080	E080F-1.0	1.0	1/14/2009	F		X		X													
12	E081	E081F-1.0	1.0	1/13/2009	F		X															X

TABLE 3: Summary of Soil Sample Analyses
Contract 4 of Doyle Drive Replacement Project

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					Table Location:	**4,5**	**5**	**5**	**5**	**6**	**7**	**NT**	**8**	**9**	**NT**	**10**	**11**	**12**	**12**	**12**	**12**	**12**
12	E081	E081F-2.5	2.5	1/13/2009	F		X															X
12	E082	E082A-1.0	1.0	1/13/2009	A		X															X
12	E082	E082A-2.5	2.5	1/13/2009	A		X															X
12	BTNB-R2	BTNB-R2-27.0-27.5 [2]	27.0-27.5	8/14/2009	BRS	X											X					
12	BTNB-R2	BTNB-R2-29.5-30.0 [2]	29.5-30.0	8/14/2009	BRS	X											X					
12	BTSB-R2	BTSB-R2-51.0-51.5 [2]	51.0-51.5	8/14/2009	BRS	X											X					
12	BTSB-R2	BTSB-R2-53.5-54.0 [2]	53.5-54.0	8/14/2009	BRS	X											X					
12	BTNB-R3	BTNB-R3-48.5-49.0 [2]	48.5-49.0	8/14/2009	BRS	X											X					
12	BTNB-R3	BTNB-R3-51.0-51.5 [2]	51.0-51.5	8/14/2009	BRS	X											X					
9	--	EC09-C001	2.5-12.5	1/22/2009	C	X		X		X	X	X	X			X		X	X		X	X
9	--	EC09-F001	1.0-7.5	1/22/2009	F	X		X		X	X	X	X	X	X	X		X	X		X	X
9	--	EC09-F003	1.0-12.5	1/23/2009	F	X		X		X	X	X	X	X	X	X		X	X		X	X
9	--	EC09-F004	1.0-7.5	1/23/2009	F	X			X	X	X	X	X	X	X	X		X	X		X	X
9	--	EC09-F005	7.5-12.5	1/23/2009	F		X															X
10	--	EC10-A001	7.0-17.5	1/21/2009	A	X		X		X	X	X	X			X		X	X		X	X
10	--	EC10-A002	7.5-17.5	1/21/2009	A	X		X		X	X	X	X			X		X	X		X	X
10	--	EC10-C001	17.5-27.5	1/21/2009	C	X		X		X	X	X	X			X		X	X		X	X
10	--	EC10-F001	1.0-7.5	1/21/2009	F	X		X		X	X	X	X	X	X	X		X	X		X	X
10	--	EC10-F002	1.0-7.5	1/21/2009	F	X		X	X	X	X	X	X	X	X	X		X	X		X	X
10	--	EC10-F003	1.0-22.0	1/22/2009	F	X		X	X	X	X	X	X	X	X	X		X	X		X	X
10	--	EC10-F004	7.5-22.5	1/22/2009	F	X		X		X	X	X	X	X	X	X		X	X		X	X
10	--	EC10-F005	7.5-22.0	1/22/2009	F		X															X
11	--	EC11-F001	1.0-2.5	1/16/2009	F	X				X	X	X	X	X		X		X	X		X	X
11	--	EC11-F002	1.0-2.5	1/16/2009	F	X			X	X	X	X	X	X		X		X	X		X	X

TABLE 3: Summary of Soil Sample Analyses
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Lithology	Title 22 Metals	Total Lead (Only)	Soluble Chromium	Soluble Lead	Total Petroleum Hydrocarbons	Volatile Organic Compounds	Semi-Volatile Organic Compounds	Polycyclic Aromatic Hydrocarbons	Pesticides	Herbicides	Polychlorinated Biphenyls	Asbestos	Cyanide	Sulfide	Ignitability	pH	Moisture
					Table Location:	**4,5**	**5**	**5**	**5**	**6**	**7**	**NT**	**8**	**9**	**NT**	**10**	**11**	**12**	**12**	**12**	**12**	**12**
11	--	EC11-F003	1.0-2.5	1/16/2009	F	X			X	X	X	X	X	X		X		X	X		X	X
12	--	EC12-A001	7.5-17.5	1/12/2009	A	X		X		X	X	X	X			X		X	X		X	X
12	--	EC12-A002	1.0-7.5	1/13/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-A003	7.5-27.5	1/16/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-A004	2.5-22.5	1/14/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-A005	1.0-27.5	1/14/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-A006	1.0-17.5	1/14/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-A007	12.5-22.5	1/15/2009	A	X				X	X	X	X			X		X	X		X	X
12	--	EC12-BR001	7.5-22.5	1/13/2009	BR	X												X	X	X	X	X
12	--	EC12-BR002	23.0-38.0	1/15/2009	BR	X		X										X	X	X	X	X
12	--	EC12-C001	17.5-32.5	1/12/2009	C	X		X		X	X	X	X			X		X	X		X	X
12	--	EC12-C001-RE	17.5-32.5	1/12/2009	C								X									
12	--	EC12-C002	12.5-37.5	1/12/2009	C	X		X		X	X	X	X			X		X	X		X	X
12	--	EC12-C002-RE	12.5-37.5	1/12/2009	C								X									
12	--	EC12-C003	22.5-32.5	1/15/2009	C	X		X		X	X	X	X			X		X	X		X	X
12	--	EC12-F002	1.0-2.5	1/13/2009	F	X				X	X	X	X	X		X		X	X		X	X
12	--	EC12-F003	1.0-2.5	1/15/2009	F	X			X	X	X	X	X	X		X		X	X		X	X
12	--	EC12-F004	2.5-12.5	1/15/2009	F	X				X	X	X	X	X		X		X	X		X	X
12	--	EC12-F005	1.0-2.5	1/12/2009	F	X		X	X	X	X	X	X	X		X		X	X		X	X
12	--	EC12-F006	7.5-12.5	1/15/2009	F		X															X

TABLE 3: Summary of Soil Sample Analyses
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
"RE" at the end of a Sample ID indicates the sample was re-extracted for quality assurance reasons and was analyzed outside the method sample hold time. Both original and re-extraction results are included in this table.
Title 22 Metals analyzed by Environmental Protection Agency ("EPA") Methods 6020, 6010B, and 7471A (Mercury).
Total chromium and lead analyzed by EPA Methods 6010B and 6020.
Soluble chromium and lead by Waste Extraction Test ("WET") and Toxicity Characteristic Leaching Procedure ("TCLP") methods.
Total Petroleum Hydrocarbons analyzed by EPA Method 8015B.
Volatile Organic Compounds analyzed by EPA Method 8260B.
Semi-Volatile Organic Compounds analyzed by EPA Method 8270C.
Polycyclic Aromatic Hydrocarbons analyzed by EPA Method 8310.
Pesticides analyzed by EPA Method 8081A.
Herbicides analyzed by EPA Method 8151A.
Polychlorinated Biphenyls analyzed by EPA Method 8082.
Asbestos analyzed by California Air Resource Board Method 435 with reporting limit of 0.25 percent.
Cyanide analyzed by Standard Method 4500-CN-E.
Sulfide analyzed by EPA Method 9034.
Ignitability analyzed by EPA Method 1030.
pH analyzed by EPA Method 9045D.
Moisture analyzed by ASTM Method D2216/CLP.
bgs = below ground surface.
NT = No table (constituents were not detected above laboratory reporting limits).

[1] The laboratory sample identification was E072F-2.0. BASELINE changed the sample identification to E072F-2.5 based on review of the boring log.
[2] Samples were collected from cores of geotechnical borings previously drilled by ARUP in 2008. Metals analyses were limited to total nickel and chromium.

TABLE 4: Total Metal Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
9	EC09-C001	2.5-12.5	1/22/2009	<0.29	1.6	30	0.19	<0.29	80	8.4	8	2.5	<0.024	<0.29	50	<0.29	<0.29	<0.29	44	27
9	EC09-F001	1.0-7.5	1/22/2009	0.08	2	53	0.18	0.063	72	9.1	18	12	0.072	0.16	51	0.19	0.082	<0.28	46	38
9	EC09-F003	1.0-12.5	1/23/2009	0.2	3.1	90	0.3	0.087	79	8.1	33	6.5	<0.024	0.16	44	0.11	<0.29	<0.29	42	33
9	EC09-F004	1.0-7.5	1/23/2009	0.22	2.9	80	0.22	0.35	45	6.5	21	140	0.043	0.28	31	<0.29	<0.29	<0.29	38	76
10	EC10-A001	7.0-17.5	1/21/2009	0.19	5.3	83	0.54	<0.29	77	14	21	5.5	0.023	0.55	55	0.11	<0.29	0.076	68	49
10	EC10-A002	7.5-17.5	1/21/2009	0.11	4.9	45	0.34	0.092	110	14	16	4.1	<0.024	0.32	73	<0.28	<0.28	0.036	67	39
10	EC10-C001	17.5-27.5	1/21/2009	0.056	3.7	39	0.23	<0.28	82	12	13	2.7	<0.023	0.17	71	<0.28	<0.28	<0.28	61	32
10	EC10-F001	1.0-7.5	1/21/2009	0.18	3.4	58	0.29	0.072	62	6.5	15	24	<0.022	0.31	35	0.19	<0.27	0.034	46	41
10	EC10-F002	1.0-7.5	1/21/2009	0.35	4.4	110	0.41	0.14	63	12	28	96	0.17	0.34	72	0.16	0.078	0.037	45	94
10	EC10-F003	1.0-22.0	1/22/2009	0.24	3.6	140	0.26	0.2	69	12	23	90	0.13	0.33	65	0.11	0.12	<0.27	49	150
10	EC10-F004	7.5-22.5	1/22/2009	0.16	4.5	180	0.4	<0.3	78	13	20	21	0.059	0.47	53	0.19	<0.3	0.06	57	45
11	EC11-F001	1.0-2.5	1/16/2009	0.02	0.33	7.3	0.019	0.028	3.7	0.7	1.7	9.1	0.21	0.014	3.6	0.0096	0.012	<0.27	3	7.5
11	EC11-F002	1.0-2.5	1/16/2009	0.37	3.7	97	0.25	0.2	47	10	31	110	0.14	0.3	54	0.12	<0.28	<0.28	36	81
11	EC11-F003	1.0-2.5	1/16/2009	0.22	3.4	140	0.26	0.28	37	7.2	31	150	0.21	0.23	40	0.11	0.11	<0.28	33	130
12	EC12-A001	7.5-17.5	1/12/2009	0.13	4.5	110	0.38	<0.29	68	15	25	5.2	0.055	0.4	50	0.15	<0.29	<0.29	58	73
12	EC12-A002	1.0-7.5	1/13/2009	0.092	4	84	0.3	<0.27	48	13	12	5.9	<0.023	0.27	35	0.2	<0.27	<0.27	43	38
12	EC12-A003	7.5-27.5	1/16/2009	<0.27	3.4	58	0.22	<0.27	43	9.1	15	2.7	0.038	0.17	30	0.1	<0.27	<0.27	35	36
12	EC12-A004	2.5-22.5	1/14/2009	<0.26	2.6	30	0.12	<0.26	42	6.2	9.3	2	<0.022	0.066	25	<0.26	<0.26	<0.26	33	23
12	EC12-A005	1.0-27.5	1/14/2009	<0.26	2.9	29	0.1	<0.26	35	5.3	9	4.5	<0.021	0.075	29	<0.26	<0.26	<0.26	29	22
12	EC12-A006	1.0-17.5	1/14/2009	<0.27	2.9	37	0.12	<0.27	44	7.1	34	4.9	<0.022	0.072	37	<0.27	<0.27	<0.27	33	43
12	EC12-A007	12.5-22.5	1/15/2009	0.073	3.5	120	0.31	<0.29	69	8.9	19	4.4	0.1	0.26	39	0.13	<0.29	<0.29	48	45
12	EC12-BR001	7.5-22.5	1/13/2009	0.27	6.7	140	0.53	<0.3	36	12	45	9.2	0.056	0.52	68	0.095	<0.3	<0.3	38	77
12	EC12-BR002	23.0-38.0	1/15/2009	0.27	7	130	0.53	<0.29	64	12	36	7.3	0.088	0.29	71	0.2	<0.29	<0.29	64	65
12	EC12-C001	17.5-32.5	1/12/2009	<0.29	5.7	75	0.21	<0.29	70	22	9.6	3.3	<0.026	0.11	86	<0.29	<0.29	<0.29	53	45
12	EC12-C002	12.5-37.5	1/12/2009	<0.3	3.5	52	0.2	<0.3	55	13	27	2.9	<0.025	0.092	71	<0.3	<0.3	<0.3	42	50
12	EC12-C003	22.5-32.5	1/15/2009	<0.29	4.3	50	0.22	<0.29	75	12	12	2.9	<0.024	0.13	62	<0.29	<0.29	<0.29	56	36
12	EC12-F002	1.0-2.5	1/13/2009	0.14	3.1	180	0.23	0.097	43	9.2	39	34	0.2	0.58	38	0.15	<0.27	<0.27	37	61
12	EC12-F003	1.0-2.5	1/15/2009	0.22	2.6	120	0.22	0.24	39	8.9	34	120	0.092	0.28	41	0.12	<0.28	<0.28	30	94
12	EC12-F004	2.5-12.5	1/15/2009	<0.27	3	87	0.22	<0.27	45	7.4	14	3.6	<0.021	0.23	27	0.19	<0.27	<0.27	39	31
12	EC12-F005	1.0-2.5	1/12/2009	0.41	3.6	170	0.36	0.22	60	11	28	50	0.18	0.59	35	0.23	0.14	0.13	46	65
12	BTNB-R2-27.0-27.5 [1]	27.0-27.5	8/14/2009	--	--	--	--	--	420	--	--	--	--	--	2,400	--	--	--	--	--
12	BTNB-R2-29.5-30.0 [1]	29.5-30.0	8/14/2009	--	--	--	--	--	220	--	--	--	--	--	3,100	--	--	--	--	--
12	BTSB-R2-51.0-51.5 [1]	51.0-51.5	8/14/2009	--	--	--	--	--	860	--	--	--	--	--	2,300	--	--	--	--	--
12	BTSB-R2-53.5-54.0 [1]	53.5-54.0	8/14/2009	--	--	--	--	--	1,200	--	--	--	--	--	1,900	--	--	--	--	--
12	BTNB-R3-48.5-49.0 [1]	48.5-49.0	8/14/2009	--	--	--	--	--	610	--	--	--	--	--	1,900	--	--	--	--	--
12	BTNB-R3-51.0-51.5 [1]	51.0-51.5	8/14/2009	--	--	--	--	--	880	--	--	--	--	--	2,200	--	--	--	--	--
California Hazardous Waste Criteria - TTLC (mg/kg) [2]				500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
California Hazardous Waste Criteria - STLC (mg/L) [2]				15	5	100	0.75	1	560	80	25	5	0.2	350	20	1	5	7	24	250
RCRA Hazardous Waste Criteria - TCLP (mg/L) [3]				NV	5	100	NV	1	5	NV	NV	5	0.2	NV	NV	1	5	NV	NV	NV
ESL for Residential Land Use (mg/kg) [4]				6.3	0.39	750	4	1.7	750	40	230	200	1.3	40	150	10	20	1.3	16	600
ESL for Commercial/Industrial Land Use (mg/kg) [5]				40	1.6	1500	8	7.4	750	80	230	750	10	40	150	10	40	16	200	600
ESL for Construction/Trench Worker Exposure (mg/kg) [6]				310	15	2,600	98	39	1,200,000	94	310,000	750	58	3,900	260	3,900	3,900	62	770	230,000

TABLE 4: Total Metal Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Shaded cells indicate concentrations were greater than or equal to hazardous waste criteria or Environmental Screening Levels ("ESLs").
Additional samples that were analyzed for lead only are included in Table 5.
Title 22 Metals analyzed by Environmental Protection Agency ("EPA") Methods 6020, 6010B, and 7471A (Mercury).
bgs = below ground surface.
mg/kg = milligram per kilogram.
mg/L = milligram per liter.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
-- = Not analyzed or not applicable.
NV = No Value.

[1] Samples were collected from cores of geotechnical borings previously drilled by ARUP in 2008.
[2] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[3] Code of Federal Regulations, Title 40, Chapter 1, Section 261.24.
[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.
[5] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.
[6] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 5: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Chromium	Chromium, TCLP	Chromium, WET	Lead	Lead, TCLP	Lead, WET
				Units	mg/kg	mg/L	mg/L	mg/kg	mg/L	mg/L
9	E059	E059F-1.0	1.0	1/23/2009	--	--	--	**2.2**	--	--
9	E059	E059F-2.5	2.5	1/23/2009	--	--	--	**120**	<0.03	**1.1**
9	E060	E060F-1.0	1.0	1/23/2009	--	--	--	**9.9**	--	--
9	E060	E060FS-2.5	2.5	1/23/2009	--	--	--	**21**	--	--
9	E061	E061C-2.5	2.5	1/22/2009	--	--	--	**2.5**	--	--
9	E061	E061F-1.0	1.0	1/22/2009	--	--	--	**8.2**	--	--
11	E062	E062F-1.0	1.0	1/16/2009	--	--	--	**34**	--	--
11	E062	E062F-2.5	2.5	1/16/2009	--	--	--	**27**	--	--
10	E063	E063F-1.0	1.0	1/22/2009	--	--	--	**110**	**0.071**	**7.8**
10	E063	E063F-2.5	2.5	1/22/2009	--	--	--	**160**	<0.03	**1.9**
11	E064	E064F-1.0	1.0	1/16/2009	--	--	--	**570**	**0.038**	**5.1**
11	E064	E064F-2.5	2.5	1/16/2009	--	--	--	**1,000**	**0.031**	**7.5**
10	E065	E065F-1.0	1.0	1/22/2009	--	--	--	**100**	**0.23**	**15**
10	E065	E065F-2.5	2.5	1/22/2009	--	--	--	**23**	--	--
11	E066	E066F-1.0	1.0	1/16/2009	--	--	--	**140**	<0.03	**7.9**
11	E066	E066F-2.5	2.5	1/16/2009	--	--	--	**130**	**1.3**	**13**
10	E067	E067F-1.0	1.0	1/21/2009	--	--	--	**160**	<0.03	**2.9**
10	E067	E067F-2.5	2.5	1/21/2009	--	--	--	**13**	--	--
11	E068	E068F-1.0	1.0	1/16/2009	--	--	--	**47**	--	--
11	E068	E068F-2.5	2.5	1/16/2009	--	--	--	**120**	**0.57**	**23**
10	E069	E069F-1.0	1.0	1/21/2009	--	--	--	**20**	--	--
10	E069	E069F-2.5	2.5	1/21/2009	--	--	--	**4**	--	--
11	E070	E070F-1.0	1.0	1/16/2009	--	--	--	**8.6**	--	--
11	E070	E070F-2.5	2.5	1/16/2009	--	--	--	**190**	<0.03	**0.98**
10	E071	E071F-1.0	1.0	1/21/2009	--	--	--	**79**	--	**1.9**
10	E071	E071F-2.0	2.0	1/21/2009	--	--	--	**12**	--	--
11	E072	E072F-1.0	1.0	1/16/2009	--	--	--	**17**	--	--
11	E072	E072F-2.5[1]	2.5	1/16/2009	--	--	--	**330**	**0.7**	**12**
12	E073	E073F-1.0	1.0	1/15/2009	--	--	--	**120**	**0.056**	**4.9**
12	E073	E073F-2.5	2.5	1/15/2009	--	--	--	**3**	--	--
12	E074	E074F-1.0	1.0	1/12/2009	--	--	--	**59**	--	**1.2**
12	E074	E074F-2.5	2.5	1/12/2009	--	--	--	**4.6**	--	--
12	E075	E075F-1.0	1.0	1/15/2009	--	--	--	**320**	**0.063**	**2.7**
12	E075	E075F-2.5	2.5	1/15/2009	--	--	--	**30**	--	--
12	E076	E076F-1.0	1.0	1/12/2009	--	--	--	**130**	<0.03	**2**
12	E076	E076F-2.5	2.5	1/12/2009	--	--	--	**2.4**	--	--
12	E077	E077A-2.5	2.5	1/15/2009	--	--	--	**1.8**	--	--
12	E077A	E077AA-1.0	1.0	1/14/2009	--	--	--	**20**	--	--
12	E077A	E077AA-2.5	2.5	1/14/2009	--	--	--	**6.9**	--	--
12	E077	E077F-1.0	1.0	1/15/2009	--	--	--	**14**	--	--
12	E078	E078A-2.5	2.5	1/14/2009	--	--	--	**1.9**	--	--
12	E078A	E078AA-1.0	1.0	1/14/2009	--	--	--	**7.4**	--	--
12	E078A	E078AA-2.5	2.5	1/14/2009	--	--	--	**2.8**	--	--
12	E078	E078F-1.0	1.0	1/14/2009	--	--	--	**8.2**	--	--
12	E079	E079F-1.0	1.0	1/16/2009	--	--	--	**120**	**0.033**	**4.3**
12	E079	E079F-2.5	2.5	1/16/2009	--	--	--	**49**	--	--
12	E080	E080A-2.5	2.5	1/14/2009	--	--	--	**1.6**	--	--
12	E080	E080F-1.0	1.0	1/14/2009	--	--	--	**60**	--	**1.1**

TABLE 5: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Chromium	Chromium, TCLP	Chromium, WET	Lead	Lead, TCLP	Lead, WET
				Units	mg/kg	mg/L	mg/L	mg/kg	mg/L	mg/L
12	E081	E081F-1.0	1.0	1/13/2009	--	--	--	**3.7**	--	--
12	E081	E081F-2.5	2.5	1/13/2009	--	--	--	**13**	--	--
12	E082	E082A-1.0	1.0	1/13/2009	--	--	--	**4.1**	--	--
12	E082	E082A-2.5	2.5	1/13/2009	--	--	--	**5.1**	--	--
9	--	EC09-C001	2.5-12.5	1/22/2009	**80**	--	<0.25	**2.5**	--	--
9	--	EC09-F001	1.0-7.5	1/22/2009	**72**	--	<0.25	**12**	--	--
9	--	EC09-F003	1.0-12.5	1/23/2009	**79**	--	<0.25	**6.5**	--	--
9	--	EC09-F004	1.0-7.5	1/23/2009	**45**	--	--	**140**	**0.32**	**3.7**
9	--	EC09-F005	7.5-12.5	1/23/2009	--	--	--	**7.3**	--	--
10	--	EC10-A001	7.0-17.5	1/21/2009	**77**	--	<0.25	**5.5**	--	--
10	--	EC10-A002	7.5-17.5	1/21/2009	**110**	<0.05	<0.25	**4.1**	--	--
10	--	EC10-C001	17.5-27.5	1/21/2009	**82**	--	<0.25	**2.7**	--	--
10	--	EC10-F001	1.0-7.5	1/21/2009	**62**	--	<0.25	**24**	--	--
10	--	EC10-F002	1.0-7.5	1/21/2009	**63**	--	<0.25	**96**	--	**6.7**
10	--	EC10-F003	1.0-22.0	1/22/2009	**69**	--	<0.25	**90**	--	**1.1**
10	--	EC10-F004	7.5-22.5	1/22/2009	**78**	--	**0.45**	**21**	--	--
10	--	EC10-F005	7.5-22.0	1/22/2009	--	--	--	**18**	--	--
11	--	EC11-F001	1.0-2.5	1/16/2009	**3.7**	--	--	**9.1**	--	--
11	--	EC11-F002	1.0-2.5	1/16/2009	**47**	--	--	**110**	**0.28**	**9**
11	--	EC11-F003	1.0-2.5	1/16/2009	**37**	--	--	**150**	**0.031**	**4.4**
12	--	EC12-A001	7.5-17.5	1/12/2009	**68**	--	<0.25	**5.2**	--	--
12	--	EC12-A002	1.0-7.5	1/13/2009	**48**	--	--	**5.9**	--	--
12	--	EC12-A003	7.5-27.5	1/16/2009	**43**	--	--	**2.7**	--	--
12	--	EC12-A004	2.5-22.5	1/14/2009	**42**	--	--	**2**	--	--
12	--	EC12-A005	1.0-27.5	1/14/2009	**35**	--	--	**4.5**	--	--
12	--	EC12-A006	1.0-17.5	1/14/2009	**44**	--	--	**4.9**	--	--
12	--	EC12-A007	12.5-22.5	1/15/2009	**69**	--	--	**4.4**	--	--
12	--	EC12-BR001	7.5-22.5	1/13/2009	**36**	--	--	**9.2**	--	--
12	--	EC12-BR002	23.0-38.0	1/15/2009	**64**	--	<0.25	**7.3**	--	--
12	--	EC12-C001	17.5-32.5	1/12/2009	**70**	--	<0.25	**3.3**	--	--
12	--	EC12-C002	12.5-37.5	1/12/2009	**55**	--	<0.25	**2.9**	--	--
12	--	EC12-C003	22.5-32.5	1/15/2009	**75**	--	<0.25	**2.9**	--	--
12	--	EC12-F002	1.0-2.5	1/13/2009	**43**	--	--	**34**	--	--
12	--	EC12-F003	1.0-2.5	1/15/2009	**39**	--	--	**120**	**0.14**	**1.2**
12	--	EC12-F004	2.5-12.5	1/15/2009	**45**	--	--	**3.6**	--	--
12	--	EC12-F005	1.0-2.5	1/12/2009	**60**	--	**0.28**	**50**	--	**0.67**
12	--	EC12-F006	7.5-12.5	1/15/2009	--	--	--	**3.1**	--	--
12	BTNB-R2	BTNB-R2-27.0-27.5 [1]	27.0-27.5	8/14/2009	**420**	--	--	--	--	--
12	BTNB-R2	BTNB-R2-29.5-30.0 [1]	29.5-30.0	8/14/2009	**220**	--	--	--	--	--
12	BTSB-R2	BTSB-R2-51.0-51.5 [1]	51.0-51.5	8/14/2009	**860**	--	--	--	--	--
12	BTSB-R2	BTSB-R2-53.5-54.0 [1]	53.5-54.0	8/14/2009	**1200**	--	--	--	--	--
12	BTNB-R3	BTNB-R3-48.5-49.0 [1]	48.5-49.0	8/14/2009	**610**	--	--	--	--	--
12	BTNB-R3	BTNB-R3-51.0-51.5 [1]	51.0-51.5	8/14/2009	**880**	--	--	--	--	--
California Hazardous Waste Criteria - TTLC (mg/kg) [2]					2,500	NV	NV	1,000	NV	NV
California Hazardous Waste Criteria - STLC (mg/L) [2]					NV	NV	560	NV	NV	5
RCRA Hazardous Waste Criteria - TCLP (mg/L) [3]					NV	5	NV	NV	5	NV
ESL for Residential Land Use (mg/kg) [4]					750	NV	NV	200	NV	NV
ESL for Commerical/Industrial Land Use (mg/kg) [5]					750	NV	NV	750	NV	NV
ESL for Construction/Trench Worker Exposure (mg/kg) [6]					1.2E+06	NV	NV	750	NV	NV

TABLE 5: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Shaded cells indicate concentrations were greater than or equal to hazardous waste criteria or Environmental Screening Levels ("ESLs").
Title 22 Metals analyzed by Environmental Protection Agency ("EPA") Methods 6020, 6010B, and 7471A (Mercury).
Total chromium and lead analyzed by EPA Methods 6010B and 6020.
Soluble chromium and lead by Waste Extraction Test ("WET") and Toxicity Characteristic Leaching Procedure ("TCLP") methods.
Total chromium and lead reported in milligrams per kilogram ("mg/kg").
Soluble chromium and lead report in milligrams per liter ("mg/L").
bgs = below ground surface.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
-- = Not analyzed or not applicable.
NV = No Value.

[1] The laboratory sample identification was E072F-2.0. BASELINE changed the sample identification to E072F-2.5 based on review of the boring log.
[2] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[3] Code of Federal Regulations, Title 40, Chapter 1, Section 261.24.
[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.
[5] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.
[6] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 6: Total Petroleum Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	TPH as Gasoline C7-C12	TPH as Diesel C12-C24	TPH as Motor Oil C24-C36
9	EC09-C001	2.5-12.5	1/22/2009	<1.1	<1.2	<5.9
9	EC09-F001	1.0-7.5	1/22/2009	<1.2	**22**	**94**
9	EC09-F003	1.0-12.5	1/23/2009	<1.1	**24**	**240**
9	EC09-F004	1.0-7.5	1/23/2009	<1.1	**29**	**260**
10	EC10-A001	7.0-17.5	1/21/2009	<1.1	<1.1	<5.7
10	EC10-A002	7.5-17.5	1/21/2009	<1.2	<1.1	<5.7
10	EC10-C001	17.5-27.5	1/21/2009	<1.2	<1.1	<5.7
10	EC10-F001	1.0-7.5	1/21/2009	<1.1	**5.4**	**32**
10	EC10-F002	1.0-7.5	1/21/2009	<1	**11**	**49**
10	EC10-F003	1.0-22.0	1/22/2009	<1.1	**19**	**74**
10	EC10-F004	7.5-22.5	1/22/2009	<1.2	**20**	**66**
11	EC11-F001	1.0-2.5	1/16/2009	<1.1	**19**	**120**
11	EC11-F002	1.0-2.5	1/16/2009	<1.1	**25**	**99**
11	EC11-F003	1.0-2.5	1/16/2009	<1.1	**100**	**580**
12	EC12-A001	7.5-17.5	1/12/2009	<1.2	<1.2	<5.8
12	EC12-A002	1.0-7.5	1/13/2009	<1.2	**3.8**	<5.5
12	EC12-A003	7.5-27.5	1/16/2009	<1	**1.4**	<5.4
12	EC12-A004	2.5-22.5	1/14/2009	<0.97	<1	<5.2
12	EC12-A005	1.0-27.5	1/14/2009	<0.96	<1	<5.2
12	EC12-A006	1.0-17.5	1/14/2009	<1.2	<1.1	<5.4
12	EC12-A007	12.5-22.5	1/15/2009	<1.2	<1.2	<5.9
12	EC12-C001	17.5-32.5	1/12/2009	<1.2	<1.2	<5.9
12	EC12-C002	12.5-37.5	1/12/2009	<1.3	<1.2	<5.9
12	EC12-C003	22.5-32.5	1/15/2009	<1.2	<1.2	<5.8
12	EC12-F002	1.0-2.5	1/13/2009	<1.1	**7.7**	**19**
12	EC12-F003	1.0-2.5	1/15/2009	<1.1	**8.1**	**49**
12	EC12-F004	2.5-12.5	1/15/2009	<1.1	**7.8**	<5.3
12	EC12-F005	1.0-2.5	1/12/2009	<1.1	**10**	**49**
California Hazardous Waste Criteria (mg/kg) [1]				NV	NV	NV
ESL for Residential Land Use (mg/kg) [2]				83	83	370
ESL for Commerical/Industrial Land Use (mg/kg) [3]				83	83	2500
ESL for Construction/Trench Worker Exposure (mg/kg) [4]				4200	4200	12000

TABLE 6: Total Petroleum Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Shaded cells indicate concentrations were greater than or equal to hazardous waste criteria or Environmental Screening Levels ("ESLs").
Total Petroleum Hydrocarbons analyzed by EPA Method 8015B.
bgs = below ground surface.
mg/kg = milligram per kilogram.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
NV = No Value.

[1] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[2] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.
[3] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.
[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 7: Volatile Organic Compound Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Acetone	Methylene Chloride
9	EC09-C001	2.5-12.5	1/22/2009	<0.022	<0.022
9	EC09-F001	1.0-7.5	1/22/2009	**0.031**	<0.021
9	EC09-F003	1.0-12.5	1/23/2009	<0.022	**0.0047**
9	EC09-F004	1.0-7.5	1/23/2009	<0.021	<0.021
10	EC10-A001	7.0-17.5	1/21/2009	<0.023	<0.023
10	EC10-A002	7.5-17.5	1/21/2009	<0.022	<0.022
10	EC10-C001	17.5-27.5	1/21/2009	<0.022	<0.022
10	EC10-F001	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F002	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F003	1.0-22.0	1/22/2009	<0.022	**0.0028**
10	EC10-F004	7.5-22.5	1/22/2009	**0.029**	**0.0032**
11	EC11-F001	1.0-2.5	1/16/2009	**0.019**	**0.0024**
11	EC11-F002	1.0-2.5	1/16/2009	<0.021	<0.021
11	EC11-F003	1.0-2.5	1/16/2009	<0.021	**0.0025**
12	EC12-A001	7.5-17.5	1/12/2009	<0.019	<0.019
12	EC12-A002	1.0-7.5	1/13/2009	<0.022	<0.022
12	EC12-A003	7.5-27.5	1/16/2009	**0.011**	<0.021
12	EC12-A004	2.5-22.5	1/14/2009	**0.0022**	<0.019
12	EC12-A005	1.0-27.5	1/14/2009	<0.021	<0.021
12	EC12-A006	1.0-17.5	1/14/2009	<0.021	<0.021
12	EC12-A007	12.5-22.5	1/15/2009	**0.0031**	<0.023
12	EC12-C001	17.5-32.5	1/12/2009	<0.023	<0.023
12	EC12-C002	12.5-37.5	1/12/2009	<0.024	<0.024
12	EC12-C003	22.5-32.5	1/15/2009	**0.0042**	<0.022
12	EC12-F002	1.0-2.5	1/13/2009	<0.02	<0.02
12	EC12-F003	1.0-2.5	1/15/2009	<0.021	<0.021
12	EC12-F004	2.5-12.5	1/15/2009	**0.0085**	<0.021
12	EC12-F005	1.0-2.5	1/12/2009	<0.023	<0.023
California Hazardous Waste Criteria (mg/kg) [1]				NV	NV
ESL for Residential Land Use (mg/kg) [2]				0.5	0.077
ESL for Commerical/Industrial Land Use (mg/kg) [3]				0.5	0.077
ESL for Construction/Trench Worker Exposure (mg/kg) [4]				100,000	630

TABLE 7: Volatile Organic Compound Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Only compounds that were identified above laboratory reporting limits in at least one sample are presented.
Volatile Organic Compounds analyzed by EPA Method 8260B.
bgs = below ground surface.
mg/kg = milligram per kilogram.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
NV = No Value.

[1] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[2] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.
[3] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.
[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 8: Polycyclic Aromatic Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Analysis Method	Sample Depth (feet bgs)	Sample Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
9	EC09-C001	EPA 8310	2.5-12.5	1/22/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
9	EC09-F001	EPA 8310	1.0-7.5	1/22/2009	<0.074	**0.0015**	**0.0058**	**0.011**	**0.012**	**0.012**	**0.0046**	**0.017**	**0.0065**	**0.075**	<0.0074	**0.0045**	**0.016**	**0.016**
9	EC09-F003	EPA 8310	1.0-12.5	1/23/2009	<0.076	**0.0065**	**0.028**	**0.0027**	**0.024**	**0.049**	**0.0039**	**0.057**	<0.0076	**0.032**	<0.0076	<0.0038	**0.0095**	**0.013**
9	EC09-F004	EPA 8310	1.0-7.5	1/23/2009	<0.076	**0.0054**	**0.009**	**0.016**	**0.024**	**0.033**	**0.01**	**0.039**	**0.0052**	**0.076**	<0.0076	**0.011**	**0.052**	**0.037**
10	EC10-A001	EPA 8310	7.0-17.5	1/21/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
10	EC10-A002	EPA 8310	7.5-17.5	1/21/2009	<0.075	<0.0038	<0.0038	<0.0038	<0.0075	<0.0075	<0.0038	<0.0038	<0.0075	<0.0075	<0.0075	<0.0038	<0.0038	<0.0038
10	EC10-C001	EPA 8310	17.5-27.5	1/21/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
10	EC10-F001	EPA 8310	1.0-7.5	1/21/2009	<0.072	**0.00099**	**0.0048**	**0.0062**	**0.0049**	<0.0072	<0.0036	**0.0082**	**0.0046**	**0.011**	<0.0072	**0.0019**	**0.0079**	**0.009**
10	EC10-F002	EPA 8310	1.0-7.5	1/21/2009	<0.071	**0.0012**	**0.0063**	**0.011**	**0.0092**	**0.02**	**0.0039**	**0.013**	**0.0074**	**0.027**	<0.0071	**0.0021**	**0.016**	**0.014**
10	EC10-F003	EPA 8310	1.0-22.0	1/22/2009	**0.12**	**0.0084**	**0.049**	**0.063**	**0.049**	**0.066**	**0.023**	**0.068**	**0.058**	**0.14**	<0.0073	**0.026**	**0.093**	**0.14**
10	EC10-F004	EPA 8310	7.5-22.5	1/22/2009	<0.079	**0.0011**	**0.0057**	**0.011**	**0.0061**	**0.01**	**0.017**	**0.0082**	**0.0091**	**0.017**	**0.0095**	**0.0033**	**0.0076**	**0.011**
11	EC11-F001	EPA 8310	1.0-2.5	1/16/2009	<0.074	**0.0012**	**0.027**	**0.062**	**0.031**	**0.13**	**0.014**	**0.073**	**0.025**	**0.12**	**0.011**	**0.011**	**0.042**	**0.029**
11	EC11-F002	EPA 8310	1.0-2.5	1/16/2009	<0.075	**0.0027**	**0.01**	**0.027**	**0.023**	<0.0075	**0.0095**	**0.045**	<0.0075	**0.064**	<0.0075	**0.0051**	**0.03**	**0.039**
11	EC11-F003	EPA 8310	1.0-2.5	1/16/2009	<0.076	**0.013**	**0.027**	**0.047**	**0.056**	**0.048**	**0.023**	**0.14**	**0.025**	**0.1**	<0.0076	**0.0056**	**0.069**	**0.075**
12	EC12-A001	EPA 8310	7.5-17.5	1/12/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
12	EC12-A002	EPA 8310	1.0-7.5	1/13/2009	<0.073	<0.0037	**0.0016**	**0.0016**	**0.0017**	**0.0042**	<0.0037	**0.0032**	<0.0073	**0.0053**	<0.0073	**0.00053**	**0.0023**	**0.0012**
12	EC12-A003	EPA 8310	7.5-27.5	1/16/2009	<0.071	<0.0036	<0.0036	<0.0036	<0.0071	<0.0071	<0.0036	<0.0036	<0.0071	<0.0071	<0.0071	<0.0036	<0.0036	<0.0036
12	EC12-A004	EPA 8310	2.5-22.5	1/14/2009	<0.07	<0.0035	<0.0035	<0.0035	<0.007	<0.007	<0.0035	<0.0035	<0.007	<0.007	<0.007	<0.0035	<0.0035	<0.0035
12	EC12-A005	EPA 8310	1.0-27.5	1/14/2009	<0.07	**0.0011**	**0.0032**	**0.0029**	**0.0023**	<0.007	**0.0013**	**0.0035**	**0.0023**	**0.0086**	<0.007	**0.0011**	**0.0093**	**0.0076**
12	EC12-A006	EPA 8310	1.0-17.5	1/14/2009	<0.072	**0.008**	**0.013**	**0.012**	**0.0092**	**0.019**	**0.0054**	**0.015**	**0.0087**	**0.049**	<0.0072	**0.0061**	**0.026**	**0.041**
12	EC12-A007	EPA 8310	12.5-22.5	1/15/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
12	EC12-C001	EPA 8310	17.5-32.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C001-RE	EPA 8310	17.5-32.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C002	EPA 8310	12.5-37.5	1/12/2009	<0.079	<0.004	<0.004	<0.004	<0.0079	<0.0079	<0.004	<0.004	<0.0079	<0.0079	<0.0079	<0.004	<0.004	<0.004
12	EC12-C002-RE	EPA 8310	12.5-37.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C003	EPA 8310	22.5-32.5	1/15/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
12	EC12-F002	EPA 8310	1.0-2.5	1/13/2009	<0.071	**0.02**	**0.084**	**0.089**	**0.066**	**0.14**	**0.04**	**0.11**	**0.058**	**0.26**	<0.0071	**0.043**	**0.078**	**0.23**
12	EC12-F002	EPA 8270C[1]	1.0-2.5	1/13/2009	**0.53**	**1.7**	**2.9**	**2.3**	**2.3**	**1.2**	**0.98**	**3.1**	**0.3**	**5.8**	**0.52**	**1.1**	**4.5**	**5.8**
12	EC12-F003	EPA 8310	1.0-2.5	1/15/2009	<0.074	**0.0015**	**0.0085**	**0.013**	**0.015**	**0.031**	**0.0056**	**0.027**	**0.01**	**0.043**	<0.0074	**0.0072**	**0.018**	**0.022**
12	EC12-F004	EPA 8310	2.5-12.5	1/15/2009	<0.071	<0.0036	<0.0036	<0.0036	<0.0071	<0.0071	<0.0036	<0.0036	<0.0071	<0.0071	<0.0071	<0.0036	<0.0036	<0.0036
12	EC12-F005	EPA 8310	1.0-2.5	1/12/2009	<0.077	**0.0017**	**0.017**	**0.023**	**0.019**	**0.046**	**0.0065**	**0.049**	**0.0066**	**0.15**	<0.0077	**0.0041**	<0.0039	**0.015**
California Hazardous Waste Criteria (mg/kg) [2]					NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
ESL for Residential Land Use (mg/kg) [3]					13	2.8	0.38	0.038	0.38	27	0.38	23	0.062	40	8.9	0.62	11	85
ESL for Commerical/Industrial Land Use (mg/kg) [4]					13	2.8	1.3	0.13	1.3	27	1.3	23	0.21	40	8.9	2.1	11	85
ESL for Construction/Trench Worker Exposure (mg/kg) [5]					11000	100000	15	1.5	15	11000	15	2400	2.4	14000	12000	24	11000	21000

TABLE 8: Polycyclic Aromatic Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
"RE" at the end of a Sample ID indicates the sample was re-extracted for quality assurance reasons and was analyzed outside the method sample hold time. Both original and re-extraction results are included in this table.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Shaded cells indicate concentrations were greater than or equal to hazardous waste criteria or Environmental Screening Levels ("ESLs").
Only compounds that were identified above laboratory reporting limits in at least one sample are presented.
bgs = below ground surface.
mg/kg = milligram per kilogram.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
NV = No Value.
EPA = Environmental Protection Agency

[1] Analytical results for this composite sample by EPA Methods 8310 and 8270C were significantly different, and are likely due to lab composite sample non-homogeneity. Results for all quality assurance samples for both methods were acceptable. The five subsamples for this composite sample were composited by the laboratory, and unique aliquots were collected for each analysis. One of the five subsamples was collected immediately below an asphalt road. Asphalt particles, which contain polycyclic aromatic hydrocarbons, may have been present in the EPA Method 8270C sample aliquot.

[2] California Code of Regulations, Title 22, Division 4.5, Chapter 11.

[3] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.

[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.

[5] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 9: Pesticide Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	4,4'-DDD	4,4'-DDT	alpha-Chlordane	gamma-Chlordane
9	EC09-F001	1.0-7.5	1/22/2009	<0.0037	<0.0037	<0.0019	<0.0019
9	EC09-F003	1.0-12.5	1/23/2009	<0.019	<0.019	<0.0099	<0.0099
9	EC09-F004	1.0-7.5	1/23/2009	**0.027**	**0.026**	**0.14**	**0.12**
10	EC10-F001	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F002	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F003	1.0-22.0	1/22/2009	<0.036	<0.036	<0.019	<0.019
10	EC10-F004	7.5-22.5	1/22/2009	<0.0039	<0.0039	<0.002	<0.002
11	EC11-F001	1.0-2.5	1/16/2009	<0.0036	<0.0036	<0.0019	<0.0019
11	EC11-F002	1.0-2.5	1/16/2009	<0.0037	<0.0037	**0.014**	**0.011**
11	EC11-F003	1.0-2.5	1/16/2009	<0.038	<0.038	<0.019	<0.019
12	EC12-F002	1.0-2.5	1/13/2009	<0.0036	<0.0036	<0.0018	<0.0018
12	EC12-F003	1.0-2.5	1/15/2009	<0.0037	**0.0091**	<0.0019	<0.0019
12	EC12-F004	2.5-12.5	1/15/2009	<0.0035	<0.0035	<0.0018	<0.0018
12	EC12-F005	1.0-2.5	1/12/2009	<0.0038	<0.0038	<0.002	<0.002
California Hazardous Waste Criteria (mg/kg) [1]				1	1	2.5	2.5
ESL for Residential Land Use (mg/kg) [2]				2.4	1.7	0.44	0.44
ESL for Commerical/Industrial Land Use (mg/kg) [3]				10	4	1.7	1.7
ESL for Construction/Trench Worker Exposure (mg/kg) [4]				120	87	21	21

Notes:

Boring locations are shown on Figure 2.

Laboratory reports are included in Appendix G.

Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Only compounds that were identified above laboratory reporting limits in at least one sample are presented.

Pesticides analyzed by EPA Method 8081A.

bgs = below ground surface.

mg/kg = milligram per kilogram.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

-- = Not analyzed or not applicable.

NV = No Value.

[1] California Code of Regulations, Title 22, Division 4.5, Chapter 11.

[2] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.

[3] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.

[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 10: Polychlorinated Biphenyl Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Aroclor-1254	Aroclor-1260
12	EC12-F005	1.0-2.5	1/12/2009	<0.014	<0.014
12	EC12-F004	2.5-12.5	1/15/2009	<0.013	<0.013
12	EC12-F003	1.0-2.5	1/15/2009	**0.046**	**0.018**
12	EC12-F002	1.0-2.5	1/13/2009	<0.013	<0.013
12	EC12-C003	22.5-32.5	1/15/2009	<0.014	<0.014
12	EC12-C002	12.5-37.5	1/12/2009	<0.014	<0.014
12	EC12-C001	17.5-32.5	1/12/2009	<0.014	<0.014
12	EC12-A007	12.5-22.5	1/15/2009	<0.014	<0.014
12	EC12-A006	1.0-17.5	1/14/2009	<0.013	<0.013
12	EC12-A005	1.0-27.5	1/14/2009	<0.013	<0.013
12	EC12-A004	2.5-22.5	1/14/2009	<0.013	<0.013
12	EC12-A003	7.5-27.5	1/16/2009	<0.013	<0.013
12	EC12-A002	1.0-7.5	1/13/2009	<0.013	<0.013
12	EC12-A001	7.5-17.5	1/12/2009	<0.014	<0.014
11	EC11-F003	1.0-2.5	1/16/2009	<0.014	**0.042**
11	EC11-F002	1.0-2.5	1/16/2009	<0.013	**0.028**
11	EC11-F001	1.0-2.5	1/16/2009	**0.025**	**0.034**
10	EC10-F004	7.5-22.5	1/22/2009	<0.014	<0.014
10	EC10-F003	1.0-22.0	1/22/2009	<0.013	<0.013
10	EC10-F002	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-F001	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-C001	17.5-27.5	1/21/2009	<0.014	<0.014
10	EC10-A002	7.5-17.5	1/21/2009	<0.014	<0.014
10	EC10-A001	7.0-17.5	1/21/2009	<0.014	<0.014
9	EC09-F004	1.0-7.5	1/23/2009	<0.014	**0.04**
9	EC09-F003	1.0-12.5	1/23/2009	<0.014	<0.014
9	EC09-F001	1.0-7.5	1/22/2009	<0.013	<0.013
9	EC09-C001	2.5-12.5	1/22/2009	<0.014	<0.014
California Hazardous Waste Criteria (mg/kg) [1]				50	50
ESL for Residential Land Use (mg/kg) [2]				0.22	0.22
ESL for Commerical/Industrial Land Use (mg/kg) [3]				0.74	0.74
ESL for Construction/Trench Worker Exposure (mg/kg) [4]				6.7	6.7

TABLE 10: Polychlorinated Biphenyl Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Only compounds that were identified above laboratory reporting limits in at least one sample are presented.
Polychlorinated Biphenyls analyzed by EPA Method 8082.
bgs = below ground surface.
mg/kg = milligram per kilogram.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
NV = No Value.

[1] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[2] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use.
[3] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use.
[4] California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

TABLE 11: Asbestos in Soil (percent)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Percent Asbestos	Asbestos Type
9	E060	E060FS-2.5	2.5	1/23/2009	<0.25	
10	E063	E063FS-22.5	22.5	1/22/2009	<0.25	
12	BTNB-R2	BTNB-R2-27.0-27.5 [1]	27.0-27.5	8/14/2009	**1.8**	Chrysotile
12	BTNB-R2	BTNB-R2-29.5-30.0 [1]	29.5-30.0	8/14/2009	**2.5**	Chrysotile
12	BTSB-R2	BTSB-R2-51.0-51.5 [1]	51.0-51.5	8/14/2009	**0.75**	Chrysotile
12	BTSB-R2	BTSB-R2-53.5-54.0 [1]	53.5-54.0	8/14/2009	**2.3**	Chrysotile
12	BTNB-R3	BTNB-R3-48.5-49.0 [1]	48.5-49.0	8/14/2009	**1.3**	Chrysotile
12	BTNB-R3	BTNB-R3-51.0-51.5 [1]	51.0-51.5	8/14/2009	**2.0**	Chrysotile
California Hazardous Waste Criteria (TTLC) [2]					1%	
CARB Asbestos Dust Mitigation Plan Action Level [3]					0.25%	

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.
Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Shaded cells indicate concentrations were greater than or equal to the California hazardous waste criteria.
Asbestos analyzed by California Air Resource Board Method 435 with reporting limit of 0.25 percent.
bgs = below ground surface.
<x.x = Compound was not identified above laboratory reporting limit of x.x.

[1] Samples were collected from cores of geotechnical borings previously drilled by ARUP in 2008.
[2] California Code of Regulations, Title 22, Division 4.5, Chapter 11.
[3] California Air Resources Board (CARB) Asbestos Toxic Control Measure, California Code of Regulations, Title 17, Section 93105.

TABLE 12: Miscellaneous Parameters in Soil
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Cyanide	Sulfide	Ignitability	pH	Moisture
				Units	mg/kg	mg/kg	°F	SU	%
11	E062	E062F-1.0	1.0	1/16/2009	--	--	--	--	5
11	E062	E062F-2.5	2.5	1/16/2009	--	--	--	--	11
11	E064	E064F-1.0	1.0	1/16/2009	--	--	--	--	10
11	E064	E064F-2.5	2.5	1/16/2009	--	--	--	--	21
11	E066	E066F-1.0	1.0	1/16/2009	--	--	--	--	7
11	E066	E066F-2.5	2.5	1/16/2009	--	--	--	--	16
11	E068	E068F-1.0	1.0	1/16/2009	--	--	--	--	10
11	E068	E068F-2.5	2.5	1/16/2009	--	--	--	--	11
11	E070	E070F-1.0	1.0	1/16/2009	--	--	--	--	5
11	E070	E070F-2.5	2.5	1/16/2009	--	--	--	--	20
11	E072	E072F-1.0	1.0	1/16/2009	--	--	--	--	10
11	E072	E072F-2.5[1]	2.5	1/16/2009	--	--	--	--	17
12	E075	E075F-1.0	1.0	1/15/2009	--	--	--	--	13
12	E075	E075F-2.5	2.5	1/15/2009	--	--	--	--	6
12	E077	E077A-2.5	2.5	1/15/2009	--	--	--	--	2
12	E077	E077F-1.0	1.0	1/15/2009	--	--	--	--	7
12	E079	E079F-1.0	1.0	1/16/2009	--	--	--	--	8
12	E079	E079F-2.5	2.5	1/16/2009	--	--	--	--	9
12	E081	E081F-1.0	1.0	1/13/2009	--	--	--	--	6
12	E081	E081F-2.5	2.5	1/13/2009	--	--	--	--	8
12	E082	E082A-1.0	1.0	1/13/2009	--	--	--	--	10
12	E082	E082A-2.5	2.5	1/13/2009	--	--	--	--	10
9	--	EC09-C001	2.5-12.5	1/22/2009	<1.2	<12	--	7.5	15
9	--	EC09-F001	1.0-7.5	1/22/2009	<1.1	<11	--	7.6	11
9	--	EC09-F003	1.0-12.5	1/23/2009	<1.1	<11	--	7.9	13
9	--	EC09-F004	1.0-7.5	1/23/2009	<1.1	<11	--	7.3	13
9	--	EC09-F005	7.5-12.5	1/23/2009	--	--	--	--	18
10	--	EC10-A001	7.0-17.5	1/21/2009	<1.1	<11	--	7.1	13
10	--	EC10-A002	7.5-17.5	1/21/2009	<1.1	<11	--	6.2	12
10	--	EC10-C001	17.5-27.5	1/21/2009	<1.1	<11	--	6.9	12
10	--	EC10-F001	1.0-7.5	1/21/2009	<1.1	<11	--	6.9	8
10	--	EC10-F002	1.0-7.5	1/21/2009	<1.1	<11	--	7	8
10	--	EC10-F003	1.0-22.0	1/22/2009	<1.1	<11	--	7.8	9
10	--	EC10-F004	7.5-22.5	1/22/2009	<1.2	<12	--	7.3	16
10	--	EC10-F005	7.5-22.0	1/22/2009	--	--	--	--	7
11	--	EC11-F001	1.0-2.5	1/16/2009	<1.1	<11	--	7.2	9
11	--	EC11-F002	1.0-2.5	1/16/2009	<1.1	<11	--	7.9	11
11	--	EC11-F003	1.0-2.5	1/16/2009	<1.1	<11	--	8.1	12
12	--	EC12-A001	7.5-17.5	1/12/2009	<1.1	<11	--	7.2	13
12	--	EC12-A002	1.0-7.5	1/13/2009	<1.1	<11	--	5.6	9
12	--	EC12-A003	7.5-27.5	1/16/2009	<1.1	<11	--	6.8	7
12	--	EC12-A004	2.5-22.5	1/14/2009	<1	<10	--	5.9	4
12	--	EC12-A005	1.0-27.5	1/14/2009	<1	<10	--	6	4
12	--	EC12-A006	1.0-17.5	1/14/2009	<1.1	<11	--	6.2	7
12	--	EC12-A007	12.5-22.5	1/15/2009	<1.2	<12	--	6.5	15

TABLE 12: Miscellaneous Parameters in Soil
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Cyanide	Sulfide	Ignitability	pH	Moisture
				Units	mg/kg	mg/kg	°F	SU	%
12	--	EC12-BR001	7.5-22.5	1/13/2009	<1.2	<12	>1000	6.5	16
12	--	EC12-BR002	23.0-38.0	1/15/2009	<1.2	<12	>1000	7	14
12	--	EC12-C001	17.5-32.5	1/12/2009	<1.2	<12	--	6.8	15
12	--	EC12-C002	12.5-37.5	1/12/2009	<1.2	<12	--	7.6	16
12	--	EC12-C003	22.5-32.5	1/15/2009	<1.2	<12	--	6.8	14
12	--	EC12-F002	1.0-2.5	1/13/2009	<1.1	<11	--	5.8	7
12	--	EC12-F003	1.0-2.5	1/15/2009	<1.1	<11	--	6	10
12	--	EC12-F004	2.5-12.5	1/15/2009	<1.1	<11	--	6	6
12	--	EC12-F005	1.0-2.5	1/12/2009	<1.2	<12	--	6.4	14
12	--	EC12-F006	7.5-12.5	1/15/2009	--	--	--	--	5

Notes:
Boring locations are shown on Figure 2.
Laboratory reports are included in Appendix G.

Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma sand (C=Colma sand), and sample depth is 2.0 to 2.5 feet bgs.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma sand (C=Colma sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results for cyanide and sulfide are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).
Cyanide analyzed by Standard Method 4500-CN-E.
Sulfide analyzed by EPA Method 9034.
Ignitability analyzed by EPA Method 1030.
pH analyzed by EPA Method 9045D.
Moisture analyzed by ASTM Method D2216/CLP.
bgs = below ground surface.
mg/kg = milligram per kilogram.
°F = degrees fahrenheit
SU = standard units
% = percent
<x.x = Compound was not identified above laboratory reporting limit of x.x.
-- = Not analyzed or not applicable.

[1] The laboratory sample identification was E072F-2.0. BASELINE changed the sample identification to E072F-2.5 based on review of the boring log.

TABLE 13: Summary of Waste Classification Results by Composite Area
Contract 4 of Doyle Drive Replacement Project

	COMPOSITE AREA			
	9	**10**	**11**	**12**
Top 2.5 Feet of Soil	Non-hw	Non-hw	**CA hw**	Non-hw
Fill Deeper than 2.5 Feet bgs	Non-hw	Non-hw	NE	Non-hw
Alluvium Deeper than 2.5 Feet bgs	NE	Non-hw	NE	Non-hw
Colma Sand Deeper than 2.5 Feet bgs	Non-hw	Non-hw	NE	Non-hw
Non-Serpentinite Bedrock	NE	NE	NE	Non-hw
Serpentinite Bedrock	NE	NE	NE	**CA hw**

Notes:
CA hw = California hazardous waste.
Non-hw = Nonhazardous waste.
NE = Not encountered during investigation.
See Figure 2 for location of composite areas.

APPENDICES

(IN PDF ON CD ROM)