SITE INVESTIGATION REPORT

STATE ROUTE 24
CALDECOTT TUNNEL IMPROVEMENTS
ALAMEDA COUNTY, CALIFORNIA

PREPARED FOR:
CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING
111 GRAND AVENUE
OAKLAND, CALIFORNIA

PREPARED BY:
GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CALIFORNIA

CALTRANS CONTRACT 04A1862
TASK ORDER NO. 83
EA No. 04-294901

GEOCON PROJECT NO. E8220-06-83

DECEMBER 2007

TABLE OF CONTENTS

SITE INVESTIGATION REPORT

Page

REPORT LIMITATIONS i

PROJECT TEAM ii

EXECUTIVE SUMMARY iii

1.0 INTRODUCTION 1

2.0 BACKGROUND 1
- 2.1 Potential ADL Impacts 1
- 2.2 Hazardous Waste Determination Criteria 1
- 2.3 DTSC Variance 2
- 2.4 Environmental Screening Levels 3

3.0 SCOPE OF SERVICES 3
- 3.1 Pre-Field Activities 3
- 3.2 Field Activities 4

4.0 INVESTIGATIVE METHODS 4
- 4.1 Sampling Procedures 4
- 4.2 Laboratory Analyses 6
- 4.3 Laboratory QA/QC 6

5.0 INVESTIGATIVE RESULTS 6

6.0 Statistical Evaluation for Lead Detected in Soil Samples 8
- 6.1 Calculating the UCLs for the Arithmetic Mean 9
- 6.2 Correlation of Total and Soluble Lead 15

7.0 CONCLUSIONS AND RECOMMENDATIONS 17
- 7.1 Sample Population A - Shoulder (Borings B1-B3, B5-B8, and MVP1-MVP6) 17
- 7.2 Sample Population B - Shoulder (Borings B4, and B9-B18) 17
- 7.3 Sample Population C - Median (Borings B19-B23) 18
- 7.4 Sample Population C1 - Median (Borings B27-B32, and B41) 18
- 7.5 Sample Population D - Shoulder (Borings B35-B39, MVP13-MVP18) 19
- 7.6 Sample Population E - Shoulder (Borings B33 and B34) 20
- 7.7 Sample Population F - Shoulder (Borings B53-B58, B113, B114, and MVP10-MVP12) 20
- 7.8 Sample Population F1 - Shoulder (Borings B59-B60A) 21
- 7.9 Sample Population G - Shoulder (Borings B105-B112) 21
- 7.10 Sample Population H - Shoulder (Borings B61-B74, and B91) 21
- 7.11 Sample Population I - Shoulder (Borings B75-B80, B92, B93, and MVP25-MVP27) 22
- 7.12 Sample Population I1 - Ramp Shoulder (Borings B94 and B95) 23
- 7.13 Sample Population J - Shoulder (Borings MVP19-MVP24) 23
- 7.14 Sample Population K - Median (Borings B42 and B43) 23
- 7.15 Sample Population L - Shoulder (Borings B96-B100) 23
- 7.16 Sample Population M - Shoulder (Borings MVP28-MVP30) 24
- 7.17 Sample Population N - Shoulder (Borings B82-B84) 25
- 7.18 Sample Population N1 - Gore Point (Boring B81) 26
- 7.19 Sample Population O - Median (Borings B85-B90 and B101-B104) 26
- 7.20 Sample Population P - Shoulder (Borings B24-B26) 26
- 7.21 Sample Population Q - Shoulder (Borings MVP34-MVP36) 27

7.22 Sample Population R - Shoulder (Borings MVP31-MVP33) 27
7.23 Sample Population S - Shoulder (Borings MVP7-MVP9).....27
7.24 Sample Population T - Shoulder (Borings MVP7-MVP9).....27
7.25 Other CAM17 Metals - Soil 28
7.26 Groundwater.....28
7.27 Worker Protection 29

TABLES

1. Boring Coordinates
2. Summary of Lead and pH Results – Soil
3. Summary of CAM 17 Metals Results – Soil
4. Summary of Organics Results – Groundwater
5. Summary of CAM 17 Metals Results – Groundwater
6A-T. Summary of Statistical Analysis

FIGURES

1. Vicinity Map
2a-2f. Site Plans

APPENDICES

A. Drilling Permits
B. Laboratory Analytical Reports and Chain-of-Custody Documentation
C. Lead Statistics and Regression Analysis Results

REPORT LIMITATIONS

This report has been prepared exclusively for the State of California Department of Transportation (Caltrans) District 4. The information contained herein is only valid as of the date of the report, and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

GEOCON CONSULTANTS, INC

Lauren Wincze
Senior Staff Geologist

Richard Day, CEG, CHG
Regional Manager

PROFESSIONAL GEOLOGIST
RICHARD W. DAY
No. 5479
Exp. 09-30-09
STATE OF CALIFORNIA

CALIFORNIA DEPARTMENT OF TRANSPORTATION – DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING

Reviewed By:	Recommended By:	Approved By:
Peter Altherr, P.E. Task Order Manager	Chris Wilson, P.E. District Branch Chief	Allen Baradar, P.E., REA District Office Chief

PROJECT TEAM

Contact	Affiliation	Responsibility
Peter Altherr, P.E. 510.286.4688 510.286.5639 fax peter_altherr@dot.ca.gov	Caltrans – District 4 111 Grand Avenue, MS 8C Oakland, California 94612	Task Order Manager
Chris Wilson, P.E. 510.286.5647 510.286.5639 fax chris_wilson@dot.ca.gov	Caltrans – District 4 Environmental Engineering 111 Grand Avenue, 14th Floor Oakland, California 94623	District Branch Chief
Richard Day, CEG, CHG David Watts, CAC Lauren Wincze 925.371.5900 925.371.5915 fax livermore@geoconinc.com	Geocon Consultants, Inc. 6671 Brisa Street Livermore, CA 94550 (*Caltrans Contractor*)	Project Management Sample Collection Field QA/QC Investigation Report
Doug Krause, CIH 530.758.6397 530.758.6506 fax dskrause@pacbell.net	Krause & Associates 216 F. Street Suite 162 Davis, CA 95616 (*Geocon Subcontractor*)	Health and Safety
John McAssey 510.568.7676 510.568.7679 fax jmcassey@vironex.com	Vironex 2110 Adams Avenue San Leandro, CA 94577 (*Geocon Subcontractor*)	Direct-Push Soil Boring
Karli Stroing 916-777-4100	V&W Drilling 100 Fifth Street Isleton, CA 95641 (*Geocon Subcontractor*)	Direct-Push Soil Boring
Diane Galvan 562.989.4045 562.989.4040 fax diane@atlglobal.com	Advanced Technology Laboratories 1510 E. 33rd Street Signal Hill, CA 90807 (*Geocon Subcontractor*)	Laboratory Analysis

EXECUTIVE SUMMARY

We prepared this Site Investigation Report for the State Route 24 Caldecott Tunnel Improvements Project. This report documents the investigation sampling methods, the laboratory analytical data, the statistical analysis of these data, and the recommended waste characterization of surface material generated from within the prescribed areas of excavation. The project consists of State Route (SR) 24 between SR 13 and Gateway Boulevard in Alameda and Contra Costa Counties, California. The Site location is depicted on the Vicinity Map, Figure 1. We understand that Caltrans proposes various freeway and tunnel improvements at the project location.

The primary objectives of our investigation were to 1) evaluate whether impacts due to metals exist in the soil within the project boundaries; and 2) evaluate for the presence of metals, total petroleum hydrocarbons as gasoline, diesel, and motor oil (TPHg, TPHd, and TPHmo), benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tertiary butyl ether (MTBE), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) in groundwater within the project boundaries. Caltrans will use the information obtained from this investigation to coordinate improvement activities, determine soil and groundwater disposal costs, determine appropriate abatement/disposal costs, and identify health and safety concerns during improvements.

The field investigation was performed between July 30 and September 28, 2007. The following field activities were performed during sampling efforts.

- Advanced 145 soil borings to depths ranging from the surface to 21 feet below ground surface (bgs) using hand auger and direct-push methods for the purpose of collecting soil and/or groundwater samples. (Copies of the drilling permits from Alameda and Contra Costa Counties are presented as Appendix A.)
- Collected groundwater samples at four locations.
- Collected soil samples in pre-cleaned containers and acetate liners.
- Collected groundwater samples in pre-cleaned, laboratory-supplied glass containers.
- Transported samples under standard chain-of-custody protocol to a California-certified environmental laboratory.

Soil samples were collected from 145 borings as shown on the Site Plans, Figures 2a through 2f. Soil borings B44 through B48 were postponed until the construction phase due to traffic safety concerns. During field activities, soil borings B40 and B52 were determined by the Caltrans Task Order Manager to be unnecessary. Boring locations were surveyed using Differential Global Positioning System (DGPS) equipment. Boring coordinates are presented on Table 1.

We attempted to advance a total of 96 soil borings (B10-B34, B41-B43, B49-B51, B53-B56, B75-B90, B96-B104, and MVP1-MVP36) to a maximum depth of approximately 4 feet bgs. (Three borings were advanced at each of the 12 Maintenance Vehicle Pullout [MVP] locations.) Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 3.5 to 4 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of 25 soil borings (B35-B39, B61-B74, B61A, and B91-B95) to a maximum depth of approximately 6 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 5.5 to 6 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of 14 soil borings (B1-B9, B57-B60, and B60A) to a maximum depth of approximately 9 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 8.5 to 9 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of eight soil borings (B105-B108 and B110-B113) to a maximum depth of approximately 16 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 3.5 to 4 feet, 9.5 to 10 feet, and 15.5 to 16 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of two soil borings (B109 and B114) to a maximum depth of approximately 21 feet bgs (in an attempt to encounter groundwater). Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 3.5 to 4 feet, and 15.5 to 16 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

Groundwater was encountered in only two borings (B59 and B82) during our investigation. We collected grab groundwater samples from the borings. At the direction of the Caltrans Task Order Manager, we collected grab groundwater samples from two monitoring wells (Well A and Well B) located within the Caltrans right-of-way (see Figure 2a).

We provided quality assurance/quality control (QA/QC) procedures during the field activities. These procedures included washing the sampling equipment with a Liqui-Nox® solution followed by a

double rinse with deionized water. Decontamination water was disposed to the ground surface within Caltrans right-of-way in a manner not to create runoff, away from drain inlets or potential water bodies.

Sample containers were sealed, labeled, and transported in chilled containers to a Caltrans-approved, certified environmental laboratory using standard chain-of-custody documentation. Laboratory analyses were requested under 48-hour turn-around-times.

The laboratory testing performed is summarized below:

- A total of 358 soil samples were analyzed for total lead using EPA Test Method 6010B.
- A total of 145 soil samples were analyzed for Title 22 (CAM 17) metals using EPA Test Methods 6010B/7471A.
- A total of 56 soil samples were analyzed for pH using EPA Test Method 9045C.
- A total of four groundwater samples were analyzed for CAM 17 metals using EPA Test Methods 6010B/7470A.
- A total of four groundwater samples were analyzed for TPHd, TPHmo, and TPHg using EPA Test Method 8015B.
- A total of four groundwater samples were analyzed for BTEX and MTBE using EPA Test Method 8021B.
- A total of four groundwater samples were analyzed for VOCs using EPA Test Method 8260B.
- A total of four groundwater samples were analyzed for SVOCs using EPA Test Method 8270C.

Soil Results

Summaries of the analytical laboratory test results for soil are presented on Tables 2 and 3. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix B.

The laboratory analyses indicated the following:

- Lead, chromium, and mercury were the only metals detected in soil at total concentrations greater than ten times their Soluble Threshold Limit Concentration (STLC) values of 5.0, 5.0, and 0.2 milligrams per liter (mg/l), respectively. Total lead concentrations ranged from less than the laboratory reporting limit (<) of 1 milligram per kilogram (mg/kg) to 2,000 mg/kg. Total chromium concentrations ranged from <1 mg/kg to 81 mg/kg. Total mercury concentrations ranged from < 0.10 mg/kg to 8.0 mg/kg.
- Soil pH values ranged from 3.8 to 11.
- A total of 93 soil samples that were further analyzed for soluble (WET) lead exhibited concentrations ranging from <1.0 mg/l to 150 mg/l.
- Concentrations for a total of 26 soil samples that were further analyzed for soluble (WET) chromium were <1.0 mg/l.

- A total of nine soil samples that were further analyzed for soluble (WET) mercury exhibited concentrations ranging from <1.0 micrograms per liter (ug/l) to 7.3 ug/l.
- A total of 56 soil samples that were further analyzed for soluble lead using the WET procedure with deionized water as the extractant (WET-DI) exhibited concentrations ranging from <0.25 mg/l to 7.2 mg/l.
- A total of 31 soil samples that were further analyzed for soluble lead using the Toxicity Characteristic Leaching Procedure (TCLP) exhibited concentrations ranging from <1 mg/l to 30 mg/l. (The laboratory reported that samples B49-1 and B51-2 had been consumed during previous analyses and therefore could not be further analyzed using the TCLP.)

The minimum, average, and maximum total CAM 17 metal concentrations are summarized at the end of Table 3 along with the residential and commercial ESLs.

Groundwater Results

Summaries of the analytical laboratory test results for groundwater are presented on Tables 4 and 5. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix B.

The laboratory analyses indicated the following:

- Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, and zinc were detected at or above the laboratory reporting limits in groundwater samples.
- Groundwater samples analyzed for TPHd exhibited concentrations ranging from <0.050 mg/l to 2.3 mg/l.
- Groundwater samples analyzed for TPHmo exhibited concentrations ranging from <0.050 mg/l to 0.58 mg/l.
- TPHg, BTEX, MTBE, VOCs, and SVOCs were not detected in groundwater samples.

Statistical Evaluation of Lead Detected in Soil Samples

The lead data were separated into 24 sample populations for statistical evaluation. Sample populations were separated as follows:

Sample Population	Location	Boring ID's
A	Ramp shoulder, western end of Site	B1-B3, B5-B8, and MVP1-MVP6
B	Ramp shoulder, western portion of Site	B4, and B9-B18
C	Median, western portion of Site	B19-B23
C1	Median, western portion of Site	B27-B32, and B41
D	Ramp shoulder, western-central portion of Site	B35-B39, and MVP13-MVP18
E	Ramp shoulder, western-central portion of Site	B33 and B34
F	Ramp shoulder, western-central portion of Site	B53-B58, B113, B114, and MVP10-MVP12

Sample Population	Location	Boring ID's
F1	Ramp shoulder, western-central portion of Site	B59-B60A
G	Ramp shoulder, western-central portion of Site	B105-B112
H	Ramp shoulder, eastern-central portion of Site.	B61-B74, and B91
I	Ramp shoulder, eastern-central portion of Site.	B75-B77, B80, B92, B93, and MVP25-MVP27
I1	Loop Ramp shoulder, eastern-central portion of Site.	B94 and B95
J	Ramp shoulder, eastern-central portion of Site.	MVP19-MVP24
K	Median, western-central portion of Site	B42 and B43
L	Shoulder, eastern portion of Site	B96-B100
M	Ramp shoulder, eastern portion of Site	MVP28-MVP30
N	Shoulder, eastern portion of Site	B82-B84
N1	Gore Point, eastern portion of Site	B81
O	Median, eastern portion of Site	B85-B90, and B101-B104
P	Shoulder, western portion of Site	B24-B26
Q	Ramp shoulder, eastern end of Site	MVP34-MVP36
R	Ramp shoulder, eastern portion of Site	MVP31-MVP33
S	Ramp shoulder, western portion of Site	MVP7-MVP9
T	Ramp shoulder, western-central portion of Site	B49-B51

Statistical methods were applied to the total lead data to evaluate: 1) the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each sampling depth; and 2) if an acceptable correlation between total and soluble lead concentrations exists that would allow the prediction of soluble lead concentrations based on calculated UCLs.

Based upon the calculated UCLs and statistical results, we drew the following conclusions with respect to soil reuse and disposal at the Site:

- Soil excavated from areas inclusive of Sample Populations A, I1, O, and Q could be reused or disposed as non-hazardous with respect to lead content, as reported total lead concentrations are less than ten times the STLC value of 5 mg/l.

- Soil excavated from areas inclusive of Sample Populations F1 and R could be reused or disposed as non-hazardous with respect to lead content, as reported soluble (WET) lead concentrations are less the STLC value of 5 mg/l

- Soil excavated from areas inclusive of Sample Populations C, E, G, H, J, and S could be reused or disposed as non-hazardous with respect to lead content, since the 90% UCL-predicted soluble (WET) lead concentrations are less than the lead STLC of 5.0 mg/l.

- Soil generated from excavations to a depth of 1 ft from areas inclusive of Sample Populations B, C1, D, F, I, L, M, N, and P would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance. Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure or clean fill. Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste. Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

- Soil generated from excavations to 2.5 ft from the area inclusive of Sample Populations K and T would be classified as a California hazardous waste since the soluble (TCLP) lead concentrations are greater than the lead TCLP of 5.0 mg/l. Consequently, the top 2.5 feet of excavated soil would require offsite disposal as a RCRA hazardous waste.

- Soil generated from excavations in the area inclusive of Sample Population N1 (Gore Point Boring B81) would be classified as a RCRA hazardous waste based on the soluble (TCLP) concentration of 8.2 mg/l. Consequently, excavated soil would require offsite disposal as a RCRA hazardous waste.

Other CAM17 Metals - Soil

Based on the total and soluble (WET) CAM17 metals concentrations, with the exception of lead, soil excavated from the project site should not be considered a hazardous waste.

Soil sample results were compared to Environmental Screening Levels (ESLs) for shallow and deep soils in areas where Groundwater is a Current or Potential Source of Drinking Water (San Francisco Regional Water Quality Control Board [SFRWQCB], Tables A and C). Reported concentrations of arsenic and zinc exceeded their respective residential and commercial/industrial land use ESLs. Reported concentrations of cadmium, mercury, vanadium exceeded their respective residential land use ESLs. Accordingly, offsite disposal of soil may be restricted depending on proposed use. Additionally, potential associated construction-worker health and safety concerns should be evaluated by an industrial hygienist.

The minimum, average, and maximum total CAM 17 metal concentrations are summarized at the end of Table 3 along with the residential and commercial ESLs.

Groundwater

Grab-groundwater sample results were compared to ESLs for Groundwater that is a Current or Potential Source of Drinking Water (SFRWQCB, Table A).

Organics

Organics were not reported in the grab-groundwater samples above ESLs, with the exception of TPHd and TPHmo, which were detected in the samples collected from Well A and Well B at concentrations exceeding the residential land use ESL of 0.1 mg/l (SFBRWQCB, Table A).

CAM17 Metals

Concentrations of CAM17 metals in the grab-groundwater samples did not exceed their respective ESLs, with the exception of zinc, which was reported at 3.2 mg/l in the sample collected from Well B. This result is greater than the residential land use ESL of 2.0 mg/l for zinc.

Therefore, additional groundwater sampling and analysis may be needed, or treatment of groundwater prior to discharge to the storm sewer system or directly to the San Francisco Bay may be necessary.

Per Caltrans requirements, contractor(s) should prepare a project-specific Health and Safety Plan to prevent or minimize worker exposure to the chemical of concern observed within the soil and groundwater at this project site. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other appropriate health and safety protocols and procedures for the handling of metal-impacted soil.

SITE INVESTIGATION REPORT

1.0 INTRODUCTION

We prepared this Site Investigation Report for the State Route 24 Caldecott Tunnel Improvement project. The project consists of State Route (SR) 24 between SR 13 and Gateway Boulevard in Alameda and Contra Costa Counties, California. The Site location is depicted on the Vicinity Map, Figure 1. We understand that Caltrans proposes various freeway and tunnel improvements at the project location.

The primary objectives of our investigation were to 1) evaluate whether impacts due to metals exist in the soil within the project boundaries; and 2) evaluate for the presence of metals, total petroleum hydrocarbons as gasoline, diesel, and motor oil (TPHg, TPHd, and TPHmo), benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tertiary butyl ether (MTBE), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) in groundwater within the project boundaries. Caltrans will use the information obtained from this investigation to coordinate improvement activities, determine soil and groundwater disposal costs, determine appropriate abatement/disposal costs, and identify health and safety concerns during improvements.

The investigation also included an asbestos and deteriorated lead paint survey of the Caldecott Tunnel Office Building. The results of the asbestos and lead paint survey are reported under separate cover in the Geocon report entitled *Asbestos and Deteriorated Lead Paint Survey, Caldecott Tunnel Offices, Alameda County, California*, dated October 9, 2007.

2.0 BACKGROUND

2.1 Potential ADL Impacts

Testing by Caltrans has indicated that aerially deposited lead (ADL) exists along major freeway routes due to past emissions from vehicles powered by leaded gasoline. The ADL is generally limited to the upper 2 feet of soil material within the unpaved median and shoulder areas.

2.2 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as California hazardous for handling and disposal purposes are contained in the CCR, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as Resource, Conservation, and Recovery Act (RCRA) hazardous are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), Section 261.

For waste containing metals, the waste is classified as California hazardous when: 1) the total metal content equals or exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the soluble metal content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste has the potential of exceeding

the STLC when the waste's total metal content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the soluble metal content equals or exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

State and Federal regulatory levels have also been established for other compounds such as total petroleum hydrocarbons, chlorinated herbicides, and organochlorine pesticides. Currently, regulatory criteria for the classification of wastes based solely on total petroleum hydrocarbon concentrations have not yet been promulgated.

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., metal concentration) is the primary factor considered for waste classification since waste generated during the roadway excavation activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

2.3 DTSC Variance

The California Department of Toxic Substances Control (DTSC) issued Variance No. 00-H-VAR-01 on September 22, 2000 to Caltrans District 4 regarding the disposition of ADL-impacted soils within Caltrans projects. Review of the variance, as modified by DTSC on December 13, 2002, indicates the following conditions regarding reuse and management of ADL-impacted soil as fill material for construction and maintenance operations in Caltrans right-of-way.

<u>Category 1:</u>
Soil exhibiting soluble lead concentrations less than or equal to 0.5 milligrams per liter (mg/l) [based on a modified waste extraction test using deionized water as the extractant (WET-DI)] and total lead concentrations of 1,411 mg/kg or less may be used as fill provided that the lead-impacted soil is placed a minimum of 1.5 meters (5 feet) above the maximum water table elevation and covered with at least 0.3 meter (1 foot) of clean soil.

<u>Category 2:</u>
Soil exhibiting soluble lead concentrations greater than 0.5 mg/l and less than 50 mg/l (based on the WET-DI) and total lead concentrations greater than 1,411 mg/kg and less than 3,397 mg/kg may be used as fill provided that the lead-impacted soil is placed a minimum of 1.5 meters (5 feet) above the maximum water table elevation and protected from infiltration by a pavement structure maintained by Caltrans.

Category 3:
Lead-impacted soil with a pH less than 5.0 shall only be used as fill material under the paved portion of the roadway.

If the excavated soil is not intended to be reused within the Caltrans right-of-way, then hazardous waste determination of the soil is based the criterion summarized in Section 2.2.

DTSC has extended the expiration date of the District 4 variance on an annual basis since September 22, 2005. The current variance extension, and any corresponding soil reuse recommendations provided in this report, may expire on June 30, 2009.

2.4 Environmental Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has prepared a technical report entitled *Screening For Environmental Concerns At Sites With Contaminated Soil and Groundwater, Interim Final* (November 2007), which presents Environmental Screening Levels (ESLs) for soil, groundwater, soil gas, and surface water, to assist in evaluating sites impacted by releases of hazardous chemicals The ESLs are conservative values for more than 100 commonly detected contaminants, which may be used to compare with environmental data collected at a site. ESLs are strictly risk assessment tools and "not regulatory clean up standards." The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is or "may be" warranted (SFRWQCB, 2007).

The most restrictive ESL table was used for this characterization: Table A – Shallow Soil (≤3 meters below ground surface; bgs) – Groundwater is a Current or Potential Source of Drinking Water. The respective ESLs are listed at the end of Tables 3, 4, and 5 for comparative purposes.

3.0 SCOPE OF SERVICES

The following scope of services was performed:

3.1 Pre-Field Activities

- Prepared the Workplan, dated August 9, 2007, to summarize the scope of services to be performed by Geocon.
- Prepared the Health and Safety Plan, dated August 13, 2007, to provide guidelines on the use of personal protective equipment (PPE) during the field activities. The Health and Safety Plan also provided guidelines on the use of onsite monitoring equipment and action levels for upgrades to higher PPE.
- Retained the services of Vironex and V&W Drilling and Testing, Inc. to provide hollow-stem auger drilling operations.

- Retained the services of Advanced Technology Laboratories (ATL), a California-licensed and Caltrans-approved laboratory, to perform the soil and groundwater analyses.
- Obtained Well Permit No. W2007-0942 from Alameda County Public Works Agency. A copy of the permit is included in Appendix A.
- Obtained Well Permit No. WP0008468 from Contra Costa Environmental Health Division. A copy of the permit is included in Appendix A.

3.2 Field Activities

The field investigation was performed between July 30 and September 28, 2007. The following field activities were performed during sampling efforts.

- Advanced 145 soil borings to depths ranging from the surface to 21 feet below ground surface (bgs) using hand auger and direct-push methods for the purpose of collecting soil and/or groundwater samples.
- Collected groundwater samples at four locations.
- Collected soil samples in pre-cleaned containers and acetate liners.
- Collected groundwater samples in pre-cleaned, laboratory-supplied glass containers.
- Transported samples under standard chain-of-custody protocol to a California-certified environmental laboratory.

4.0 INVESTIGATIVE METHODS

4.1 Sampling Procedures

Soil samples were collected from 145 borings as shown on the Site Plans, Figures 2a through 2f. Soil borings B44 through B48 were not collected due to traffic safety concerns. During field activities, soil borings B40 and B52 were determined by the Caltrans Task Order Manager to be unnecessary. Boring locations were surveyed using Differential Global Positioning System (DGPS) equipment. Boring coordinates are presented on Table 1.

We attempted to advance a total of 96 soil borings (B10-B34, B41-B43, B49-B51, B53-B56, B75-B90, B96-B104, and MVP1-MVP36) to a maximum depth of approximately 4 feet bgs. (Three borings were advanced at each of the 12 Maintenance Vehicle Pullout [MVP] locations.) Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 3.5 to 4 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of 25 soil borings (B35-B39, B61-B74, B61A, and B91-B95) to a maximum depth of approximately 6 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 5.5 to 6 feet. Refusal was encountered at

depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of 14 soil borings (B1-B9, B57-B60, and B60A) to a maximum depth of approximately 9 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 2.5 to 3 feet, and 8.5 to 9 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of eight soil borings (B105-B108 and B110-B113) to a maximum depth of approximately 16 feet bgs. Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 3.5 to 4 feet, 9.5 to 10 feet, and 15.5 to 16 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

We attempted to advance a total of two soil borings (B109 and B114) to a maximum depth of approximately 21 feet bgs (in an attempt to encounter groundwater). Soil samples were collected at approximate depth intervals of 0 to 0.5 foot, 1 to 1.5 feet, 3.5 to 4 feet, and 15.5 to 16 feet. Refusal was encountered at depths indicated on the chain-of-custody forms. Hand auger boreholes were backfilled to the surface with soil cuttings. Direct-push boreholes were backfilled to surface with the cement grout.

Groundwater was encountered in only two borings (B59 and B82) during our investigation. We collected grab groundwater samples from the borings. At the direction of the Caltrans Task Order Manager, we collected grab groundwater samples from two monitoring wells (Well A and Well B) located within the Caltrans right-of-way (see Figure 2a).

We provided quality assurance/quality control (QA/QC) procedures during the field activities. These procedures included washing the sampling equipment with a Liqui-Nox® solution followed by a double rinse with deionized water. Decontamination water was disposed to the ground surface within Caltrans right-of-way in a manner not to create runoff, away from drain inlets or potential water bodies.

Sample containers were sealed, labeled, and transported in chilled containers to a Caltrans-approved, certified environmental laboratory using standard chain-of-custody documentation. Laboratory analyses were requested under 48-hour turn-around-times.

4.2 Laboratory Analyses

The laboratory testing performed is summarized below:

- A total of 358 soil samples were analyzed for total lead using EPA Test Method 6010B.
- A total of 145 soil samples were analyzed for Title 22 (CAM 17) metals using EPA Test Methods 6010B/7471A.
- A total of 56 soil samples were analyzed for pH using EPA Test Method 9045C.
- A total of four groundwater samples were analyzed for CAM 17 metals using EPA Test Methods 6010B/7470A.
- A total of four groundwater samples were analyzed for TPHd, TPHmo, and TPHg using EPA Test Method 8015B.
- A total of four groundwater samples were analyzed for BTEX and MTBE using EPA Test Method 8021B.
- A total of four groundwater samples were analyzed for VOCs using EPA Test Method 8260B.
- A total of four groundwater samples were analyzed for SVOCs using EPA Test Method 8270C.

4.3 Laboratory QA/QC

QA/QC procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever was more frequent, with spike made at ten times the detection limit or at the analyte level.

5.0 INVESTIGATIVE RESULTS

<u>Soil Results</u>

Summaries of the analytical laboratory test results for soil are presented on Tables 2 and 3. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix B.

The laboratory analyses indicated the following:

- Lead, chromium, and mercury were the only metals detected in soil at total concentrations greater than ten times their STLC values of 5.0, 5.0, and 0.2 mg/l, respectively. Total lead concentrations ranged from less than the laboratory reporting limit (<) of 1 mg/kg to 2,000 mg/kg. Total chromium concentrations ranged from <1 mg/kg to 81 mg/kg. Total mercury concentrations ranged from < 0.10 mg/kg to 8.0 mg/kg.
- Soil pH values ranged from 3.8 to 11.
- A total of 93 soil samples that were further analyzed for soluble (WET) lead exhibited concentrations ranging from <1.0 mg/l to 150 mg/l.
- Concentrations for a total of 26 soil samples that were further analyzed for soluble (WET) chromium were <1.0 mg/l.
- A total of nine soil samples that were further analyzed for soluble (WET) mercury exhibited concentrations ranging from <1.0 micrograms per liter (ug/l) to 7.3 ug/l.
- A total of 56 soil samples that were further analyzed for soluble lead using the WET-DI exhibited concentrations ranging from <0.25 mg/l to 7.2 mg/l.
- A total of 31 soil samples that were further analyzed for soluble lead using the TCLP exhibited concentrations ranging from <1 mg/l to 30 mg/l. (The laboratory reported that samples B49-1 and B51-2 had been consumed during previous analyses and therefore could not be further analyzed using the TCLP.)

The minimum, average, and maximum total CAM 17 metal concentrations are summarized at the end of Table 3 along with the residential and commercial ESLs.

Groundwater Results

Summaries of the analytical laboratory test results for groundwater are presented on Tables 4 and 5. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix B.

The laboratory analyses indicated the following:

- Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, and zinc were detected at or above the laboratory reporting limits in groundwater samples.
- Groundwater samples analyzed for TPHd exhibited concentrations ranging from <0.050 mg/l to 2.3 mg/l.
- Groundwater samples analyzed for TPHmo exhibited concentrations ranging from <0.050 mg/l to 0.58 mg/l.
- TPHg, BTEX, MTBE, VOCs, and SVOCs were not detected in groundwater samples.

6.0 STATISTICAL EVALUATION FOR LEAD DETECTED IN SOIL SAMPLES

The lead data were separated into 24 sample populations for statistical evaluation. Sample populations were separated as follows:

Sample Population	Location	Boring ID's
A	Ramp shoulder, western end of Site (Caltrans Project No. 04-29492 "Gore Area")	B1-B3, B5-B8, and MVP1-MVP6
B	Ramp shoulder, western portion of Site (Caltrans Project No. 04-29492 "Shoulder")	B4, and B9-B18
C	Median, western portion of Site	B19-B23
C1	Median, western portion of Site	B27-B32, and B41
D	Ramp shoulder, western-central portion of Site	B35-B39, and MVP13-MVP18
E	Ramp shoulder, western-central portion of Site	B33 and B34
F	Ramp shoulder, western-central portion of Site	B49-B51, B53-B58, B113, B114, and MVP10-MVP12
F1	Ramp shoulder, western-central portion of Site	B59-B60A
G	Ramp shoulder, western-central portion of Site	B105-B112
H	Ramp shoulder, eastern-central portion of Site.	B61-B74, and B91
I	Ramp shoulder, eastern-central portion of Site.	B75-B77, B80, B92, B93, and MVP25-MVP27
I1	Loop Ramp shoulder, eastern-central portion of Site.	B94 and B95
J	Ramp shoulder, eastern-central portion of Site.	MVP19-MVP24
K	Median, western-central portion of Site	B42 and B43
L	Shoulder, eastern portion of Site	B96-B100
M	Ramp shoulder, eastern portion of Site	MVP28-MVP30
N	Shoulder, eastern portion of Site	B82-B84
N1	Gore Point, eastern portion of Site	B81
O	Median, eastern portion of Site	B85-B90, and B101-B104
P	Shoulder, western portion of Site (Caltrans Project No. 04-29493 "Turn Pocket")	B24-B26
Q	Ramp shoulder, eastern end of Site	MVP34-MVP36
R	Ramp shoulder, eastern portion of Site	MVP31-MVP33
S	Ramp shoulder, western portion of Site	MVP7-MVP9
T	Ramp shoulder, western-central portion of Site	B49-B51

Statistical methods were applied to the total lead data to evaluate: 1) the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each sampling depth; and 2) if an acceptable correlation between total and soluble lead concentrations exists that would allow the

prediction of soluble lead concentrations based on calculated UCLs. The statistical methods used are discussed in a book entitled *Statistical Methods for Environmental Pollution Monitoring,* by Richard Gilbert; in an EPA *Technology Support Center Issue* document entitled, *The Lognormal Distribution in Environmental Applications,* by Ashok Singh et. al., dated December 1997; and in a book entitled *An Introduction to the Bootstrap,* by Bradley Efron and Robert J. Tibshirani.

6.1 Calculating the UCLs for the Arithmetic Mean

The upper one-sided 90% and 95% UCLs of the arithmetic mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as the mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from a site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease, and the UCLs move closer to the true mean.

Non-parametric bootstrap techniques used to calculate the UCLs are discussed in the previously referenced EPA document and in *An Introduction to the Bootstrap.* For those samples in which total lead was not detected at concentrations exceeding the laboratory MRL, a value equal to one-half of the detection limit was used in the UCL calculation. The bootstrap results are included in Appendix C.

The calculated UCLs and statistical results are summarized in the tables below:

Sample Population A

Shoulder (Borings B1-B3, B5-B8, and MVP1-MVP6)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	18.4	18.9	16.6	9.1	26
1.0 to 2.0	18.8	19.9	15.0	2.5	34
2.0 to 3.0	19.0	20.2	14.2	2.5	27
3.5 to 4.0	Not Calculated	Not Calculated	4.4	2.5	8.1

Sample Population B

Shoulder (Borings B4 and B9-B18)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	352.2	374.8	266.9	9.9	850
1.0 to 1.5	14.0	14.7	11.5	2.5	22
2.5 to 3.0	13.9	14.7	11.4	7.3	29
3.5 to 4.0	7.9	8.3	6.6	2.5	11

Sample Population C

Median (Borings B19-B23)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	54.4	57.2	44.6	20	64
1.0 to 1.5	Not Calculated	Not Calculated	2.5	2.5	2.5
2.5 to 3.0	12.1	12.8	10.0	5.2	15
3.5 to 4.0	11.0	11.2	10.5	9.8	12

Sample Population C1

Median (Borings B27-B32, and B41)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	97.9	103.5	76.4	21	160
1.0 to 1.5	Not Calculated	Not Calculated	2.5	2.5	2.5
2.5 to 3.0	7.9	8.3	6.8	2.5	10
3.5 to 4.0	21.4	23.0	14.7	2.5	47

Sample Population D

Shoulder (Borings B35-B39 and MVP13-MVP18)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	275.9	296.8	204.8	18	690
1.0 to 1.5	24.3	26.2	15.5	5.7	87
2.5 to 3.0	8.4	8.8	7.4	2.5	10
3.5 to 4.0	8.1	8.5	7.0	2.5	9.9

Sample Population E

Shoulder (Borings B33 and B34)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	47.5	33	62
1.0 to 1.5	Not Calculated	Not Calculated	17.5	17	18

Sample Population F

Shoulder (Borings B53-B58, B113, B114, and MVP10-MVP12)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	88.3	93.9	67.2	9.6	170
1.0 to 2.5	13.2	13.8	11.1	2.5	23
2.5 to 3.0	19.7	21.5	13.7	7.3	54
3.5 to 4.0	13.5	14.7	10.2	2.5	32

Sample Population F1

Shoulder (Borings B59-B60A)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	105.7	19	220
1.0 to 1.5	Not Calculated	Not Calculated	30.7	6.8	78
2.0 to 3.0	Not Calculated	Not Calculated	2.5	2.5	2.5
3.5 to 4.0	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population G

Shoulder (Borings B105-B112)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	63.4	65.4	51.5	42	94
1.0 to 2.5	9.0	9.2	8.6	7.5	10
2.5 to 3.0	9.0	9.0	9.0	9.0	9.0
3.5 to 4.0	16.7	18.0	13.2	8.3	34

Sample Population H

Shoulder (Borings B61A, B61-B74, and B91)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 1.0	56.7	60.7	42.1	0.5	180
1.0 to 1.5	35.2	39.3	17.7	2.5	200
1.5 to 2.5	Not Calculated	Not Calculated	3.1	2.5	5.5
2.5 to 3.0	Not Calculated	Not Calculated	27.2	2.5	69
4.5 to 5..5	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population I

Shoulder (Borings B75-B80, B92, B93, and MVP25-MVP27)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 1.0	660.4	702.4	511.7	22	1,500
1.0 to 2.5	153.9	172	91.8	2.5	470
2.5 to 3.0	Not Calculated	Not Calculated	30.4	7.1	62
3.5 to 4.0	Not Calculated	Not Calculated	22	22	22

Sample Population I1

Loop Ramp Shoulder (Borings B94 and B95)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	32	26	3838
1.0 to 1.5	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population J

Shoulder (Borings MVP19-MVP24)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 1.0	33.0	35.6	24.7	6.3	59
1.0 to 1.5	5.4	5.7	4.4	2.5	7.1
2.0 to 2.5	Not Calculated	Not Calculated	4.5	2.5	6.4
2.5 to 3.0	Not Calculated	Not Calculated	3.6	2.5	6.7
3.5 to 4.0	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population K

Median (Borings B42 and B43)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	885	170	1600
1.0 to 1.5	Not Calculated	Not Calculated	514	28	1000
2.5 to 3.0	Not Calculated	Not Calculated	4.6	2.5	6.7
3.5 to 4.0	Not Calculated	Not Calculated	6.3	6.3	6.3

Sample Population L

Shoulder (Borings B96-B100)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	77.3	84.2	54.6	8.8	110
1.0 to 2.0	20.8	22.7	14.5	2.5	37
2.0 to 3.0	Not Calculated	Not Calculated	3.4	2.5	6.8
3.5 to 4.0	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population M

Shoulder (Borings MVP28-MVP30)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	93.3	57	150
1.0 to 1.5	Not Calculated	Not Calculated	19.8	5.7	48
2.0 to 3.0	Not Calculated	Not Calculated	12.9	6.2	26
3.5 to 4.0	Not Calculated	Not Calculated	5.5	5.5	5.5

Sample Population N

Shoulder (Borings B82-B84)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	329.3	18	860
1.0 to 1.5	Not Calculated	Not Calculated	4.0	2.5	6.9
2.0 to 3.0	Not Calculated	Not Calculated	4.4	2.5	8.3
3.5 to 4.0	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population N1

Gore Point (Boring B81)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	2000
1.0 to 1.5	Not Calculated	Not Calculated	83
2.5 to 3.0	Not Calculated	Not Calculated	11

Sample Population O

Median (Borings B85-B90, and B101-B104)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	17.0	18.5	12.5	1.1	36
1.0 to 1.5	Not Calculated	Not Calculated	5.5	2.5	24
2.5 to 3.0	8.6	9.3	5.7	2.5	25
3.5 to 4.0	6.4	6.9	4.7	2.5	17

Sample Population P

Shoulder (Borings B24-B26)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	104.0	15	270
1.0 to 1.5	Not Calculated	Not Calculated	8.5	6.7	11
2.5 to 3.0	Not Calculated	Not Calculated	9.0	8.5	9.6
3.5 to 4.0	Not Calculated	Not Calculated	9.5	6.6	11

Sample Population Q

Shoulder (Borings MVP34-MVP36)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	23.7	20	28
1.0 to 1.5	Not Calculated	Not Calculated	5.8	2.5	8.2
1.5 to 3.0	Not Calculated	Not Calculated	3.9	2.5	6.7
3.5 to 4.0	Not Calculated	Not Calculated	2.5	2.5	2.5

Sample Population R

Shoulder (Borings MVP31-MVP33)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	51.9	3.8	84
0..5 to 1.5	Not Calculated	Not Calculated	8.5	2.5	16
2.5 to 3.0	Not Calculated	Not Calculated	9.9	9.9	9.9
3.5 to 4.0	Not Calculated	Not Calculated	11	11	11

Sample Population S

Shoulder (Borings MVP7-MVP9)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	36.3	13	59
1.0 to 1.5	Not Calculated	Not Calculated	7.8	6.7	9.3
2.5 to 3.0	Not Calculated	Not Calculated	7.3	7.0	7.7
3.5 to 4.0	Not Calculated	Not Calculated	8.2	7.3	9.7

Sample Population T

Shoulder (Borings B49-B51)

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	246.7	100	440
1.0 to 1.5	Not Calculated	Not Calculated	330	100	590
1.5 to 2.0	Not Calculated	Not Calculated	234.3	73	450

6.2 Correlation of Total and Soluble Lead

Total and corresponding soluble (WET) lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of soluble lead (WET) concentrations based on the UCLs calculated in Section 6.1.

To estimate the degree of interrelation between total and corresponding soluble (WET) lead values (x and y, respectively), the *correlation coefficient [r]* is used. The correlation coefficient is a ratio that ranges from +1 to –1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of –1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all. The *correlation coefficients* for the entire sample set was calculated for the (x, y) data points (i.e., soil samples

analyzed for both total lead [*x*] and soluble [WET] lead [*y*]). A *correlation coefficient* greater than or equal to 0.8 is an acceptable indicator that a correlation exists.

The *correlation coefficient* for the 93 soil samples analyzed for total and soluble (WET) lead equaled 0.901.

For the *correlation coefficient* that indicates a linear relationship between total and soluble (WET) lead concentrations, it is possible to compute the line of dependence or a best-fit line between the two variables. A least squares method was used to find the equation of a best-fit line (regression line) by forcing the y-intercept equal to zero since that is a known point. The equation of the regression line for the data set was determined to be $y = 0.070(x)$, where x represents total lead concentrations and y represents predicted soluble lead (WET) concentrations.

This equation was used to estimate the expected WET soluble lead concentrations for the UCLs calculated in Section 6.1. Regression analysis results and a scatter plot depicting the (x, y) data points along with the regression line are included in Appendix C.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Geocon understands that some of the project areas will be covered with imported fill. Caltrans has confirmed on other projects that impacted soil may be scarified and cut into to develop keys. According to Caltrans, the DTSC allows for this under the "Area of Contamination Policy." Caltrans also confirmed on similar projects that fill material may be placed over impacted soil. If impacted soil will not be reused onsite, the soil may be classified as a California hazardous waste and will require disposal at a Class I landfill.

Waste classifications are evaluated based on the 90% UCL of the lead content for the relevant excavation depths; this has historically been considered sufficient to satisfy a good faith effort by the EPA as discussed in SW-846. Risk assessment characterization is based on the 95% UCL of the lead content in the waste for the relevant depths; this is in accordance with the Risk Assessment Guidance for Superfund (RAGS) Volume 1 Documentation for Exposure Assessment.

Caltrans informed Geocon, after the soil sampling work had been completed, that many of the maintenance vehicle pullout (MVP) locations had to be relocated; therefore, some of the sample data identified by the "MVP" prefix may not be representative of soil conditions at an actual MVP location. The orphaned MVP data were included with adjacent decision units when appropriate.

7.1 Sample Population A - Shoulder (Borings B1-B3, B5-B8, and MVP1-MVP6)

Based on the highest total lead concentration of 34 mg/kg, soil generated from excavations would not be classified as a California hazardous waste (Table 6A). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.2 Sample Population B - Shoulder (Borings B4, and B9-B18)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6B.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**
0 to 1 ft	352.2	**24.7**	374.8	**Hazardous**
Underlying soil (1 to 4 ft)	*9.7*	*0.7*	*10.2*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.3 Sample Population C - Median (Borings B19-B23)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6C.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**
0 to 1 ft	54.4	3.8	57.2	Non-Hazardous
Underlying soil (1 to 4 ft)	*5.3*	*0.4*	*5.5*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Total lead was detected at concentrations above ten times the applicable STLC value of 5.0 mg/l; however, the predicted soluble (WET) lead concentration is below the STLC. Therefore, soil generated from excavations to 4 ft would be not be classified as a California hazardous waste. Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.4 Sample Population C1 - Median (Borings B27-B32, and B41)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6C1.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1 ft	97.9	**6.9**	103.5	**Hazardous**
Underlying soil (1 to 4 ft)	*5.6*	*0.4*	*5.9*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure or clean fill.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.5 Sample Population D - Shoulder (Borings B35-B39, MVP13-MVP18)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6D.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1 ft	275.9	**19.3**	296.8	**Hazardous**
Underlying soil (1 to 4 ft)	*12.2*	*0.9*	*13.1*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.6 Sample Population E - Shoulder (Borings B33 and B34)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6E.

Excavation Depth	**Total Lead (mg/kg) Maximum**	**Predicted WET Lead (mg/l)**	**Waste Classification**
0 to 1 ft	62	4.3	Non-hazardous
Underlying soil (1 to 1.5 ft)	*18*	*1.3*	*Non-hazardous*

Total lead was detected at concentrations above ten times the applicable STLC value of 5.0 mg/l; however, the predicted soluble (WET) lead concentration is below the STLC. Therefore, soil generated from excavations to 1 ft would be not be classified as a California hazardous waste. Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.7 Sample Population F - Shoulder (Borings B53-B58, B113, B114, and MVP10-MVP12)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6F.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**
0 to 1 ft	88.3	**6.2**	93.9	**Hazardous**
Underlying soil (1 to 4 ft)	*11.6*	*0.8*	*12.4*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the

lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.8 Sample Population F1 - Shoulder (Borings B59-B60A)

Based on the highest total lead concentration of 220 mg/kg and the highest soluble (WET) lead concentration of 3.2 mg/l, soil generated from excavations would not be classified as a California hazardous waste (Table 6F1). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.9 Sample Population G - Shoulder (Borings B105-B112)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6G.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**
0 to 1 ft	63.4	4.4	65.4	Non-hazardous
Underlying soil (1 to 4 ft)	*7.7*	*0.5*	*8.0*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Total lead was detected at concentrations above ten times the applicable STLC value of 5.0 mg/l; however, the predicted soluble (WET) lead concentration is below the STLC. Therefore, soil generated from excavations to 1 ft would be not be classified as a California hazardous waste. Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.10 Sample Population H - Shoulder (Borings B61-B74, and B91)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6H.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1 ft	56.7	4.0	60.7	Non-hazardous
Underlying soil (1 to 4 ft)	*40.6*	*2.8*	*41.1*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Total lead was detected at concentrations above ten times the applicable STLC value of 5.0 mg/l; however, the predicted soluble (WET) lead concentration is below the STLC. Therefore, soil generated from excavations to 1 ft would be not be classified as a California hazardous waste. Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.11 Sample Population I - Shoulder (Borings B75-B80, B92, B93, and MVP25-MVP27)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6I.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1 ft	660.4	**46.2**	702.4	**Hazardous**
Underlying soil (1 to 4 ft)	*52.8*	*3.7*	*55.8*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.12 Sample Population I1 - Ramp Shoulder (Borings B94 and B95)

Based on the highest total lead concentration of 38 mg/kg, soil generated from excavations would not be classified as a California hazardous waste (Table 6I1). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.13 Sample Population J - Shoulder (Borings MVP19-MVP24)

Based on the highest total lead 95% UCL of 35.6 mg/kg, soil generated from excavations would not be classified as a California hazardous waste (Table 6J). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.14 Sample Population K - Median (Borings B42 and B43)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6K.

Excavation Depth	**Total Lead (mg/kg) Maximum**	**Predicted WET Lead (mg/l)**	**TCLP Lead (mg/l) Maximum**	**Waste Classification**
0 to 2.5 ft	**1,600**	**112**	**30**	**RCRA Hazardous**
Underlying soil (2.5 to 4 ft)	*6.6*	*0.5*	---	*Non-hazardous*

Based on the above table, soil generated from excavations to 2.5 ft would be classified as a California hazardous waste since the predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Based on the soluble (TCLP) results, the top 2.5 feet of soil would be considered a RCRA hazardous waste. Consequently, the top 2.5 feet of excavated soil would require offsite disposal as a RCRA hazardous waste.

Underlying soil (i.e., deeper than 2.5 feet bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.15 Sample Population L - Shoulder (Borings B96-B100)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the calculated total lead UCLs and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6L.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**

0 to 1 ft	77.3	**5.4**	84.2	**Hazardous**
Underlying soil (1 to 4 ft)	*8.1*	*0.6*	*8.5*	*Non-hazardous*

90% UCL applicable for waste classification; 95% UCL applicable for risk assessment

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure or clean fill.

Based on the soluble (TCLP) results, the top 1 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

If excavations are at least 2 ft deep and excavated material is managed as a whole, excavated soil might not be classified as a California hazardous waste because the predicted soluble (WET) lead concentration is less than 5 mg/l (see Table 6L).

7.16 Sample Population M - Shoulder (Borings MVP28-MVP30)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6M.

Excavation Depth	Total Lead (mg/kg) Maximum	Predicted WET Lead (mg/l)	Waste Classification
0 to 1 ft	150	**10.5**	**Hazardous**
Underlying soil (1 to 4 ft)	*22.4*	*1.6*	*Non-hazardous*

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1.0 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1.0 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

If excavations are at least 3.5 ft deep and excavated material is managed as a whole, excavated soil might not be classified as a California hazardous waste because the predicted soluble (WET) lead concentration is less than 5 mg/l (see Table 6M).

7.17 Sample Population N - Shoulder (Borings B82-B84)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6N.

Excavation Depth	Total Lead (mg/kg) Maximum	Predicted WET Lead (mg/l)	Waste Classification
0 to 1 ft	860	**60.2**	**Hazardous**
Underlying soil (1 to 4 ft)	*5.2*	*0.4*	*Non-hazardous*

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure or clean fill.

Based on the soluble (TCLP) results, the top 1.0 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1.0 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.18 Sample Population N1 - Gore Point (Boring B81)

Based on the total lead concentration of 2,000 mg/kg, the soluble (WET) lead concentration of 71 mg/l, and the soluble (TCLP) concentration of 8.2 mg/l, soil generated from excavations would be classified as a California and RCRA hazardous waste (Table 6N1). Consequently, excavated soil would require offsite disposal as a RCRA hazardous waste.

7.19 Sample Population O - Median (Borings B85-B90 and B101-B104)

Based on the highest total lead concentration of 36 mg/kg, soil generated from excavations would not be classified as a California hazardous waste (Table 6O). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.20 Sample Population P - Shoulder (Borings B24-B26)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6P.

Excavation Depth	**Total Lead (mg/kg) Maximum**	**Predicted WET Lead (mg/l)**	**Waste Classification**
0 to 1 ft	270	**18.9**	**Hazardous**
Underlying soil (1 to 4 ft)	*10.3*	*0.7*	*Non-hazardous*

Based on the above table, soil generated from excavations to 1 ft would be classified as a California hazardous waste since the predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 1 foot of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 1 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1.0 foot of soil would not be considered a RCRA hazardous waste.

Underlying soil (i.e., deeper than 1.0 foot bgs) could be reused or disposed as non-hazardous with respect to lead content.

7.21 Sample Population Q - Shoulder (Borings MVP34-MVP36)

Based on the highest total lead concentration of 28 mg/kg, soil generated from excavations would not be classified as a California hazardous waste (Table 6Q). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.22 Sample Population R - Shoulder (Borings MVP31-MVP33)

Based on the highest total lead concentration of 84 mg/kg and the highest soluble (WET) lead concentration of 3.8 mg/l, soil generated from excavations would not be classified as a California hazardous waste (Table 6R). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.23 Sample Population S - Shoulder (Borings MVP7-MVP9)

Based on the highest total lead concentration of 59 mg/kg and highest predicted soluble (WET) lead concentration of 4.1 mg/l, soil generated from excavations would not be classified as a California hazardous waste (Table 6S). Consequently, excavated soil could be reused or disposed as non-hazardous with respect to lead content.

7.24 Sample Population T - Shoulder (Borings MVP7-MVP9)

The following table summarizes the predicted soluble (WET) lead concentrations and the waste classification for excavated soil based on the maximum total lead concentrations and the relationship between total and soluble (WET) lead. The soluble (WET) lead calculations are summarized in Table 6T.

Excavation Depth	**Total Lead (mg/kg) Maximum**	**Predicted WET Lead (mg/l)**	**Waste Classification**
0 to 2.5 ft	474	**33.2**	**Hazardous**

Based on the above table, soil generated from excavations to 2.5 ft would be classified as a California hazardous waste since the predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 2.5 feet of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance.

Based on the soluble (WET-DI) lead results, the top 2.5 foot of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under a pavement structure.

Based on the soluble (TCLP) results, the top 1.0 foot of soil would not be considered a RCRA hazardous waste.

7.25 Other CAM17 Metals - Soil

The total CAM17 metal results for soil samples are summarized in Table 3. Based on the total and soluble (WET) CAM17 metals concentrations, with the exception of lead, soil excavated from the project site should not be considered a hazardous waste.

Soil sample results were compared to ESLs for shallow and deep soils in areas where Groundwater is a Current or Potential Source of Drinking Water (SFRWQCB, Tables A and C). Reported arsenic concentrations were between <1.0 mg/kg and 36 mg/kg, which exceed the residential and commercial/industrial land use ESLs of 0.38 mg/kg and 1.5 mg/kg, respectively. Cadmium was reported at concentrations between <1.0 mg/kg and 2.7 mg/kg, with six sample results above the residential land use ESL of 1.7 mg/kg. In addition, the method reporting limit (MRL) for two of the samples was 2.0 mg/kg. Reported mercury concentrations were between 0.1 mg/kg and 8.0 mg/kg, with 15 samples exceeding the residential land use ESL of 1.0 mg/kg. Reported vanadium concentrations were between 22 mg/kg and 120 mg/kg, exceeding the residential land use ESL of 15 mg/kg. Zinc was reported at concentrations between 23 mg/kg and 2,800 mg/kg, with three samples exceeding the residential and commercial/industrial land use ESLs of 600 mg/kg. Accordingly, offsite disposal of soil may be restricted depending on proposed use.

The minimum, average, and maximum total CAM 17 metal concentrations are summarized at the end of Table 3 along with the residential and commercial ESLs.

7.26 Groundwater

The analytical results for grab-groundwater samples are summarized in Tables 4 and 5 and are discussed below. Grab-groundwater sample results were compared to ESLs for Groundwater that is a Current or Potential Source of Drinking Water (SFRWQCB, Table A).

<u>Organics</u>

Organics were not reported in the grab-groundwater samples above ESLs, with the exception of TPHd and TPHmo, which were detected in the samples collected from Well A and Well B at concentrations exceeding the residential land use ESL of 0.1 mg/l (SFBRWQCB, Table A).

CAM17 Metals

Concentrations of CAM17 metals in the grab-groundwater samples did not exceed their respective ESLs, with the exception of zinc, which was reported at 3.2 mg/l in the sample collected from Well B. This result is greater than the residential land use ESL of 2.0 mg/l for zinc.

Therefore, additional groundwater sampling and analysis may be needed, or treatment of groundwater prior to discharge to the storm sewer system or directly to the San Francisco Bay may be necessary.

7.27 Worker Protection

Per Caltrans requirements, contractor(s) should prepare a project-specific Health and Safety Plan to prevent or minimize worker exposure to the chemical of concern observed within the soil and groundwater at this project site. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other appropriate health and safety protocols and procedures for the handling of metal-impacted soil.

TABLE 1
BORING COORDINATES
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Boring	Easting	Northing
B1	6,062,788.589	2,136,308.240
B2	6,062,905.536	2,136,263.133
B3	6,063,096.973	2,136,219.297
B4	6,063,254.441	2,136,167.156
B5	6,063,127.205	2,136,182.544
B6	6,062,979.589	2,136,205.784
B7	6,062,875.206	2,136,201.447
B8	6,063,035.387	2,136,173.232
B9	6,063,189.915	2,136,157.841
B10	6,063,109.171	2,136,153.067
B11	6,063,239.233	2,136,156.914
B12	6,063,371.750	2,136,175.029
B13	6,063,509.192	2,136,212.863
B14	6,063,660.929	2,136,275.918
B15	6,063,863.750	2,136,419.706
B16	6,063,993.034	2,136,600.330
B17	6,064,076.391	2,136,749.240
B18	6,064,165.614	2,136,937.291
B19	6,064,257.899	2,136,884.206
B20	6,064,201.827	2,136,735.058
B21	6,064,125.790	2,136,599.649
B22	6,064,031.432	2,136,471.914
B23	6,063,881.964	2,136,317.813
B24	6,063,999.567	2,136,776.026
B25	6,064,017.181	2,136,795.239
B26	6,064,029.088	2,136,812.367
B27	6,064,317.394	2,137,070.173
B28	6,064,374.434	2,137,246.164
B29	6,064,451.446	2,137,463.584
B30	6,064,555.967	2,137,656.261
B31	6,064,680.553	2,137,810.320
B32	6,064,804.311	2,137,920.547
B33	6,064,824.821	2,137,649.880
B34	6,064,870.703	2,137,642.626
B35	6,064,880.420	2,137,744.014
B36	6,064,922.545	2,137,843.285
B37	6,065,014.930	2,137,939.548
B38	6,065,091.261	2,137,973.213
B39	6,065,134.497	2,138,008.430
B41	6,064,941.909	2,138,010.523
B42	6,065,067.388	2,138,068.844
B43	6,065,208.956	2,138,119.726

TABLE 1
BORING COORDINATES
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Boring	Easting	Northing
B49	6,065,622.682	2,138,283.317
B50	6,065,632.732	2,138,241.289
B51	6,065,449.891	2,138,211.676
B53	6,064,749.711	2,138,003.926
B54	6,064,912.034	2,138,107.867
B55	6,065,029.386	2,138,164.791
B56	6,065,160.299	2,138,206.560
B57	6,065,265.046	2,138,275.191
B58	6,065,287.300	2,138,262.495
B59	6,065,372.716	2,138,301.578
B60	6,065,449.622	2,138,301.786
B60A	6,065,432.127	2,138,333.807
B61	6,067,737.205	2,140,695.825
B61A	6,067,800.941	2,140,803.950
B62	6,067,879.520	2,140,866.398
B63	6,067,965.435	2,140,955.012
B64	6,068,057.706	2,141,087.137
B65	6,068,158.506	2,141,285.587
B66	6,068,214.772	2,141,500.922
B67	6,067,989.646	2,140,767.919
B68	6,067,970.222	2,140,807.712
B69	6,068,021.730	2,140,838.680
B70	6,068,060.357	2,140,954.948
B71	6,068,089.807	2,141,012.342
B72	6,068,136.662	2,141,069.686
B73	6,068,153.225	2,141,156.873
B74	6,068,184.575	2,141,239.658
B75	6,068,041.481	2,140,754.630
B76	6,068,079.977	2,140,830.645
B77	6,068,144.737	2,140,977.039
B78	6,068,197.775	2,141,191.860
B79	6,068,225.504	2,141,331.086
B80	6,068,252.588	2,141,463.025
B81	6,068,260.338	2,141,248.882
B82	6,068,199.747	2,141,035.393
B83	6,068,127.456	2,140,856.114
B84	6,068,062.919	2,140,721.869
B85	6,068,321.468	2,141,477.226
B86	6,068,376.067	2,141,660.781
B87	6,068,422.686	2,141,770.166
B88	6,068,469.802	2,141,848.216
B89	6,068,529.804	2,141,937.956

TABLE 1
BORING COORDINATES
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Boring	Easting	Northing
B90	6,068,600.112	2,142,021.171
B91	6,068,187.973	2,141,616.782
B92	6,068,279.940	2,141,629.457
B93	6,068,304.312	2,141,733.767
B94	6,068,382.951	2,141,889.554
B95	6,068,336.778	2,141,969.635
B96	6,068,764.962	2,142,051.874
B97	6,068,866.192	2,142,127.651
B98	6,068,949.754	2,142,179.178
B99	6,069,037.115	2,142,220.443
B100	6,069,120.128	2,142,257.626
B101	6,069,068.530	2,142,331.768
B102	6,068,885.517	2,142,249.625
B103	6,068,770.720	2,142,174.801
B104	6,068,677.313	2,142,099.951
B105	6,064,443.906	2,137,865.495
B106	6,064,457.702	2,137,930.623
B107	6,064,553.206	2,138,006.913
B108	6,064,600.682	2,138,067.142
B109	6,064,710.349	2,138,141.705
B110	6,064,841.197	2,138,192.321
B111	6,064,956.078	2,138,231.421
B112	6,065,019.279	2,138,263.679
B113	6,065,211.762	2,138,286.653
B114	6,065,293.335	2,138,306.007
MVP1	6,062,846.195	2,136,232.258
MVP2	6,062,870.456	2,136,203.089
MVP3	6,062,886.412	2,136,221.249
MVP4	6,063,161.795	2,136,197.070
MVP5	6,063,184.642	2,136,191.479
MVP6	6,063,200.879	2,136,184.256
MVP7	6,064,320.853	2,137,414.810
MVP8	6,064,320.234	2,137,457.167
MVP9	6,064,344.141	2,137,491.741
MVP10	6,064,548.455	2,137,852.075
MVP11	6,064,570.970	2,137,876.234
MVP12	6,064,594.320	2,137,888.555
MVP13	6,064,759.804	2,137,765.068
MVP14	6,064,786.841	2,137,778.745
MVP15	6,064,791.913	2,137,803.365
MVP16	6,065,156.168	2,138,020.641
MVP17	6,065,192.787	2,138,030.776

TABLE 1
BORING COORDINATES
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Boring	Easting	Northing
MVP18	6,065,233.120	2,138,044.284
MVP19	6,068,400.985	2,141,337.125
MVP20	6,068,416.020	2,141,334.209
MVP21	6,068,422.933	2,141,359.935
MVP22	6,068,515.563	2,141,581.572
MVP23	6,068,509.771	2,141,609.577
MVP24	6,068,516.681	2,141,623.528
MVP25	6,068,506.058	2,142,015.989
MVP26	6,068,520.353	2,142,073.918
MVP27	6,068,551.066	2,142,092.783
MVP28	6,070,750.434	2,142,933.030
MVP29	6,070,768.769	2,142,934.952
MVP30	6,070,789.178	2,142,939.732
MVP31	6,071,476.921	2,142,588.290
MVP32	6,071,487.098	2,142,570.545
MVP33	6,071,492.963	2,142,575.842
MVP34	6,071,905.863	2,142,608.562
MVP35	6,071,931.193	2,142,638.900
MVP36	6,071,941.559	2,142,631.007
WELL A	6,062,722.809	2,136,308.519
WELL B	6,062,851.312	2,136,345.954

Notes:
Easting and Northing shown in feet, NAD 83 (Zone 3)

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B1-0	0.0	11	---	---	---	---
B1-1	1.0	<5.0	---	---	---	---
B2-0	0.0	11	---	---	---	---
B2-1	1.0	12	---	---	---	---
B3-0	0.0	11	---	---	---	---
B3-1	1.0	12	---	---	---	---
B4-0	0.0	46	---	---	---	---
B4-1	1.0	7.7	---	---	---	6.4
B4-2.5	2.5	7.3	---	---	---	---
B4-8.5	8.5	7.4	---	---	---	---
B5-0	0.0	21	---	---	---	---
B5-1	1.0	12	---	---	---	7.8
B5-2.5	2.5	25	---	---	---	---
B5-8.5	8.5	14	---	---	---	---
B6-0	0.0	9.1	---	---	---	---
B7-0	0.0	21	---	---	---	---
B7-1	1.0	19	---	---	---	---
B8-0	0.0	19	---	---	---	---
B9-0	0.0	160	7.0	<0.25	---	---
B9-1	1.0	22	---	---	---	---
B9-2.5	2.5	15	---	---	---	---
B10-0	0.0	190	16	<0.25	---	---
B10-1	1.0	<5.0	---	---	---	---
B10-2.5	2.5	29	---	---	---	---
B10-3.5	3.5	5.5	---	---	---	6.8
B11-0	0.0	850	29	2.5	3.8	---
B11-1	1.0	15	---	---	---	---
B11-2.5	2.5	8.3	---	---	---	---
B11-3.5	3.5	6.8	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B12-0	0.0	110	8.0	0.27	---	---
B12-1	1.0	9.2	---	---	---	---
B12-2.5	2.5	7.9	---	---	---	---
B12-3.5	3.5	10	---	---	---	---
B13-0	0.0	270	24	3.2	1.0	---
B13-1	1.0	14	---	---	---	---
B13-2.5	2.5	10	---	---	---	---
B13-3.5	3.5	<5.0	---	---	---	---
B14-0	0.0	440	21	<0.25	<1.0	---
B14-1	1.0	9.6	---	---	---	7.5
B14-2.5	2.5	10	---	---	---	---
B14-3.5	3.5	6.8	---	---	---	---
B15-0	0.0	9.9	---	---	---	---
B15-1	1.0	<5.0	---	---	---	---
B15-2.5	2.5	8.8	---	---	---	---
B15-3.5	3.5	<5.0	---	---	---	---
B16-0	0.0	210	14	1.2	<1.0	---
B16-1	1.0	21	---	---	---	---
B16-2.5	2.5	9.9	---	---	---	---
B16-3.5	3.5	11	---	---	---	---
B17-0	0.0	230	16	1.5	<1.0	---
B17-1	1.0	7.4	---	---	---	---
B17-2.5	2.5	8.2	---	---	---	---
B17-3.5	3.5	7.8	---	---	---	---
B18-0	0.0	420	25	0.69	<1.0	---
B18-1	1.0	16	---	---	---	---
B19-0	0.0	48	---	---	---	---
B19-1	1.0	<5.0	---	---	---	---
B19-2.5	2.5	14	---	---	---	---
B19-3.5	3.5	11	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B20-0	0.0	64	3.3	---	---	---
B20-1	1.0	<5.0	---	---	---	---
B20-2.5	2.5	7.6	---	---	---	7.7
B20-3.5	3.5	9.8	---	---	---	---
B21-0	0.0	20	---	---	---	---
B21-1	1.0	<5.0	---	---	---	---
B21-2.5	2.5	8.0	---	---	---	---
B21-3.5	3.5	12	---	---	---	---
B22-0	0.0	61	4.8	---	---	---
B22-1	1.0	<5.0	---	---	---	---
B22-2.5	2.5	5.2	---	---	---	---
B22-3.5	3.5	10	---	---	---	---
B23-0	0.0	30	---	---	---	---
B23-1	1.0	<5.0	---	---	---	8.1
B23-2.5	2.5	15	---	---	---	---
B23-3.5	3.5	9.9	---	---	---	---
B24-0	0.0	27	---	---	---	7.1
B24-1	1.0	6.7	---	---	---	---
B24-2.5	2.5	8.5	---	---	---	---
B24-3.5	3.5	6.6	---	---	---	---
B25-0	0.0	15	---	---	---	---
B25-1	1.0	11	---	---	---	---
B25-2.5	2.5	9.0	---	---	---	---
B25-3.5	3.5	11	---	---	---	3.8
B26-0	0.0	270	16	2.8	<1.0	---
B26-1	1.0	7.8	---	---	---	---
B26-2.5	2.5	9.6	---	---	---	4.1
B26-3.5	3.5	11	---	---	---	---
B27-0	0.0	21	---	---	---	---
B27-1	1.0	<5.0	---	---	---	---
B27-2.5	2.5	8.7	---	---	---	---
B27-3.5	3.5	47	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B28-0	0.0	160	4.9	---	---	---
B28-1	1.0	<5.0	---	---	---	---
B28-2.5	2.5	5.4	---	---	---	---
B28-3.5	3.5	9.6	---	---	---	7.7
B29-0	0.0	87	3.0	---	---	8.4
B29-1	1.0	<5.0	---	---	---	---
B29-2.5	2.5	<5.0	---	---	---	---
B29-3.5	3.5	6.1	---	---	---	---
B30-0	0.0	98	5.0	---	---	---
B30-1	1.0	<5.0	---	---	---	---
B30-2.5	2.5	7.9	---	---	---	---
B30-3.5	3.5	9.0	---	---	---	---
B31-0	0.0	76	2.6	---	---	---
B31-1	1.0	<5.0	---	---	---	---
B31-2.5	2.5	5.3	---	---	---	---
B31-3.5	3.5	<5.0	---	---	---	---
B32-0	0.0	68	1.5	---	---	---
B32-1	1.0	<5.0	---	---	---	8.0
B32-2.5	2.5	8.0	---	---	---	---
B32-3.5	3.5	15	---	---	---	---
B33-0	0.0	33	---	---	---	---
B33-1	1.0	17	---	---	---	---
B34-0	0.0	62	3.0	---	---	---
B34-1	1.0	18	---	---	---	---
B35-0	0.0	160	9.6	<0.25	---	---
B35-1	1.0	7.7	---	---	---	---
B35-2.5	2.5	<5.0	---	---	---	---
B36-0	0.0	51	3.5	---	---	---
B36-1	1.0	9.7	---	---	---	---
B36-2.5	2.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B37-0	0.0	18	---	---	---	---
B37-1	1.0	9.6	---	---	---	---
B37-2.5	2.5	9.8	---	---	---	---
B38-0	0.0	43	---	---	---	---
B38-1	1.0	5.7	---	---	---	---
B38-2.5	2.5	9.9	---	---	---	6.8
B39-0	0.0	360	27	<0.25	<1.0	---
B39-1	1.0	8.9	---	---	---	---
B39-2.5	2.5	6.9	---	---	---	---
B39-5	5.0	9.4	---	---	---	---
B41-0	0.0	25	---	---	---	---
B41-1	1.0	<5.0	---	---	---	---
B41-2.5	2.5	10	---	---	---	---
B41-3.5	3.5	14	---	---	---	---
B42-0	0.0	170	4.1	---	---	---
B42-1	1.0	28	---	---	---	---
B42-2.5	2.5	<5.0	---	---	---	---
B42-3.5	3.5	6.3	---	---	---	---
B43-0	0.0	1,600	120	<0.25	30	---
B43-1	1.0	1,000	100	<0.25	26	---
B43-2.5	2.5	6.7	---	---	---	8.8
B43-3.5	3.5	6.3	---	---	---	---
B49-0	0.0	440	37	1.3	<1.0	---
B49-1	1.0	590	59	<0.25	---	---
B49-1.5	1.5	450	49	2.9	1.8	---
B50-0	0.0	100	7.3	0.54	---	---
B50-1	1.0	100	3.4	---	---	7.3
B50-1.5	1.5	73	5.2	1.7	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B51-0	0.0	200	9.9	<0.25	<1.0	---
B51-1	1.0	300	30	0.78	1.1	---
B51-2	2.0	180	11	<0.25	---	7.7
B53-0	0.0	16	---	---	---	---
B53-1	1.0	8.5	---	---	---	7.6
B53-2.5	2.5	7.3	---	---	---	---
B53-3.5	3.5	7.4	---	---	---	---
B54-0	0.0	80	5.9	<0.25	---	---
B54-1	1.0	8.9	---	---	---	---
B54-2.5	2.5	54	3.7	---	---	---
B54-3.5	3.5	7.8	---	---	---	---
B55-0	0.0	14	---	---	---	---
B55-1	1.0	23	---	---	---	---
B55-2.5	2.5	8.9	---	---	---	---
B55-3.5	3.5	9.1	---	---	---	---
B56-0	0.0	20	---	---	---	---
B56-1	1.0	20	---	---	---	---
B56-2.5	2.5	9.1	---	---	---	7.9
B56-3.5	3.5	32	---	---	---	---
B57-0	0.0	110	7.8	<0.25	---	---
B57-1	1.0	10	---	---	---	---
B57-2.5	2.5	8.9	---	---	---	---
B57-8.5	8.5	12	---	---	---	---
B58-0	0.0	85	4.7	---	---	---
B58-1	1.0	10	---	---	---	---
B58-2.5	2.5	9.3	---	---	---	---
B58-8.5	8.5	33	---	---	---	6.4
B59-0	0.0	19	---	---	---	---
B59-1	1.0	6.8	---	---	---	---
B59-2.5	2.5	<5.0	---	---	---	---
B59-5.5	5.5	5.8	---	---	---	---
B59-8.5	8.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B60-0	0.0	220	3.2	---	---	---
B60-1	1.0	7.2	---	---	---	---
B60-2.5	2.5	<5.0	---	---	---	---
B60-3.5	3.5	<5.0	---	---	---	---
B60A-0	0.0	78	<1.0	---	---	4.6
B60A-1	1.0	78	<1.0	---	---	---
B60A-2.5	2.5	<5.0	---	---	---	4.3
B60A-3.5	3.5	<5.0	---	---	---	---
B61-0	0.0	1.1	---	---	---	---
B61-1	1.0	<5.0	---	---	---	---
B61-2.5	2.0	5.5	---	---	---	---
B61-5.5	2.5	<5.0	---	---	---	---
B61A-0	0.0	1.2	---	---	---	---
B61A-0.5	0.5	<5.0	---	---	---	11
B62-0	0.0	<1.0	---	---	---	---
B62-1	1.0	<5.0	---	---	---	---
B62-2.5	2.5	<5.0	---	---	---	---
B62-4.5	4.5	<5.0	---	---	---	---
B63-0	0.0	27	---	---	---	---
B63-1	1.0	9.1	---	---	---	---
B64-0	0.0	9.8	---	---	---	---
B64-1	1.0	<5.0	---	---	---	---
B65-0	0.0	57	2.4	---	---	---
B65-1	1.0	<5.0	---	---	---	7.8
B65-2.5	2.5	<5.0	---	---	---	---
B65-5.5	5.5	<5.0	---	---	---	---
B66-0	0.0	180	6.4	<0.25	---	6.1
B66-1	1.0	200	8.5	<0.25	<1.0	---
B66-2.5	2.5	69	<1.0	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B67-0	0.0	45	---	---	---	7.1
B67-1	1.0	8.5	---	---	---	8.1
B67-1.5	1.5	<5.0	---	---	---	---
B68-0	0.0	16	---	---	---	---
B68-1	1.0	<5.0	---	---	---	---
B68-2.5	2.5	<5.0	---	---	---	---
B68-4.5	4.5	<5.0	---	---	---	---
B69-0	0.0	18	---	---	---	---
B69-1	1.0	<5.0	---	---	---	---
B69-2.5	2.5	<5.0	---	---	---	---
B70-0	0.0	32	---	---	---	---
B70-1	1.0	<5.0	---	---	---	---
B70-2	2.0	<5.0	---	---	---	---
B71-0	0.0	64	2.6	---	---	---
B71-1	1.0	<5.0	---	---	---	---
B72-0	0.0	78	3.6	---	---	---
B72-1	1.0	<5.0	---	---	---	---
B72-1.5	1.5	<5.0	---	---	---	9.1
B73-0	0.0	91	3.7	---	---	---
B73-1	1.0	<5.0	---	---	---	---
B73-1.5	1.5	<5.0	---	---	---	---
B74-0	0.0	120	4.0	---	---	---
B74-1	1.0	5.3	---	---	---	---
B75-0	0.0	22	---	---	---	8.0
B75-1	1.0	6.0	---	---	---	---
B75-1.5	1.5	<5.0	---	---	---	---
B76-0	0.0	130	8.7	<0.25	---	---
B76-1	1.0	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B77-0	0.0	390	33	<0.25	1.4	---
B77-1	1.0	130	14	<0.25	---	---
B77-1.5	1.5	8.3	---	---	---	---
B78-0	0.0	1,100	67	0.26	4.0	---
B78-0.5	0.5	1,500	150	<0.25	3.2	---
B79-0	0.0	650	48	<0.25	<1.0	---
B79-0.5	0.5	760	82	<0.25	2.4	7.4
B80-0	0.0	840	84	<0.25	2.1	---
B80-1	1.0	470	32	<0.25	1.9	---
B81-0	0.0	2,000	71	8.2	8.2	7.4
B81-1	1.0	83	9.2	0.53	---	---
B81-2.5	2.5	11	---	---	---	---
B82-0	0.0	110	6.2	<0.25	---	---
B82-1	1.0	<5.0	---	---	---	---
B82-2.5	2.5	<5.0	---	---	---	---
B82-3.5	3.5	<5.0	---	---	---	---
B83-0	0.0	860	76	3.4	2.8	---
B83-1	1.0	6.9	---	---	---	---
B83-2	2.0	8.3	---	---	---	---
B84-0	0.0	18	---	---	---	---
B84-1	1.0	<5.0	---	---	---	---
B84-2	2.0	<5.0	---	---	---	---
B85-0	0.0	36	---	---	---	---
B85-1	1.0	24	---	---	---	---
B85-2.5	2.5	25	---	---	---	---
B85-3.5	3.5	17	---	---	---	8.2
B86-0	0.0	15	---	---	---	---
B86-1	1.0	11	---	---	---	---
B86-2.5	2.5	11	---	---	---	---
B86-3.5	3.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B87-0	0.0	1.6	---	---	---	---
B87-1	1.0	<5.0	---	---	---	---
B87-2.5	2.5	5.1	---	---	---	---
B87-3.5	3.5	<5.0	---	---	---	---
B88-0	0.0	1.1	---	---	---	---
B88-1	1.0	<5.0	---	---	---	---
B88-2.5	2.5	<5.0	---	---	---	8.3
B88-3.5	3.5	5.2	---	---	---	---
B89-0	0.0	3.3	---	---	---	---
B89-1	1.0	<5.0	---	---	---	---
B89-2.5	2.5	<5.0	---	---	---	---
B89-3.5	3.5	7.0	---	---	---	---
B90-0	0.0	3.2	---	---	---	---
B90-1	1.0	<5.0	---	---	---	---
B90-2.5	2.5	<5.0	---	---	---	---
B90-3.5	3.5	<5.0	---	---	---	---
B91-0	0.0	6.8	---	---	---	---
B91-0.5	0.5	7.8	---	---	---	---
B92-0	0.0	340	2.2	---	---	---
B92-1	1.0	17	---	---	---	---
B92-2.5	2.5	22	---	---	---	---
B92-5.5	5.5	47	---	---	---	---
B93-0	0.0	60	13	<0.25	---	---
B93-1	1.0	14	---	---	---	---
B93-2.5	2.5	7.1	---	---	---	---
B93-5.5	5.5	<5.0	---	---	---	---
B94-0	0.0	38	---	---	---	---
B94-1	1.0	<5.0	---	---	---	8.8
B94-2.5	2.5	<5.0	---	---	---	---
B94-5.5	5.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B95-0	0.0	26	---	---	---	---
B95-1	1.0	<5.0	---	---	---	---
B96-0	0.0	8.8	---	---	---	---
B96-1	1.0	10	---	---	---	---
B96-1.5	1.5	7.7	---	---	---	---
B97-0	0.0	12	---	---	---	---
B97-1	1.0	5.9	---	---	---	---
B98-0	0.0	110	3.4	---	---	---
B98-1	1.0	37	---	---	---	---
B98-2	2.0	6.8	---	---	---	8.4
B99-0	0.0	61	13	<0.25	---	---
B99-1	1.0	<5.0	---	---	---	---
B99-2.5	2.5	<5.0	---	---	---	---
B99-3.5	3.5	<5.0	---	---	---	7.8
B100-0	0.0	81	2.7	---	---	---
B100-1	1.0	24	---	---	---	---
B100-2.5	2.5	<5.0	---	---	---	---
B100-3.5	3.5	<5.0	---	---	---	---
B101-0	0.0	29	---	---	---	---
B101-1	1.0	<5.0	---	---	---	---
B101-2.5	2.5	<5.0	---	---	---	---
B101-3.5	3.5	<5.0	---	---	---	---
B102-0	0.0	7.6	---	---	---	---
B102-1	1.0	<5.0	---	---	---	---
B102-2.5	2.5	<5.0	---	---	---	---
B102-3.5	3.5	<5.0	---	---	---	---
B103-0	0.0	12	---	---	---	7.7
B103-1	1.0	<5.0	---	---	---	---
B103-2.5	2.5	<5.0	---	---	---	---
B103-3.5	3.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B104-0	0.0	16	---	---	---	---
B104-1	1.0	<5.0	---	---	---	11
B104-2.5	2.5	<5.0	---	---	---	---
B104-3.5	3.5	<5.0	---	---	---	---
B105-0	0.0	51	1.9	---	---	6.2
B105-1	1.0	10	---	---	---	---
B105-3.5	3.5	11	---	---	---	---
B105-9.5	9.5	19	---	---	---	---
B105-15.5	15.5	<5.0	---	---	---	7.8
B106-0	0.0	45	---	---	---	---
B106-1	1.0	7.9	---	---	---	---
B106-3.5	3.5	11	---	---	---	---
B106-9.5	9.5	18	---	---	---	---
B106-15.5	15.5	<5.0	---	---	---	---
B107-0	0.0	94	5.5	<0.25	---	---
B107-1	1.0	10	---	---	---	---
B107-3.5	3.5	11	---	---	---	6.8
B107-4	4.0	34	---	---	---	---
B108-0	0.0	52	2.1	---	---	---
B108-1	1.0	8.6	---	---	---	---
B108-3.5	3.5	11	---	---	---	---
B108-9.5	9.5	<5.0	---	---	---	---
B108-12.5	12.5	5.9	---	---	---	---
B109-0	0.0	55	2.2	---	---	---
B109-1	1.0	7.5	---	---	---	---
B109-3.5	3.5	9.2	---	---	---	---
B109-15.5	15.5	<5.0	---	---	---	---
B110-0	0.0	48	---	---	---	---
B110-1	1.0	8.9	---	---	---	---
B110-3.5	3.5	10	---	---	---	---
B110-9.5	9.5	8.4	---	---	---	---
B110-15.5	15.5	11	---	---	---	7.7

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
B111-0	0.0	42	---	---	---	---
B111-1	1.0	7.6	---	---	---	---
B111-3.5	3.5	8.3	---	---	---	---
B111-9.5	9.5	10	---	---	---	---
B111-14.5	14.5	9.6	---	---	---	7.8
B112-0	0.0	63	2.4	---	---	---
B112-1	1.0	8.5	---	---	---	---
B112-2.5	2.5	9.0	---	---	---	---
B113-0	0.0	130	7.5	<0.25	---	---
B113-1	1.0	9.1	---	---	---	---
B113-3.5	3.5	11	---	---	---	---
B113-8	8.0	13	---	---	---	---
B114-0	0.0	92	4.5	---	---	---
B114-1	1.0	12	---	---	---	---
B114-3.5	3.5	<5.0	---	---	---	7.1
B114-15.5	15.5	5.4	---	---	---	---
MVP1-0	0.0	26	---	---	---	---
MVP1-1	1.0	32	---	---	---	---
MVP1-2.5	2.5	27	---	---	---	---
MVP2-1	1.0	15	---	---	---	---
MVP2-2	2.0	9.2	---	---	---	---
MVP3-0	0.0	18	---	---	---	---
MVP3-1.5	1.0	13	---	---	---	---
MVP3-1.5	1.5	<5.0	---	---	---	5.8
MVP4-0	0.0	18	---	---	---	---
MVP4-1	1.0	24	---	---	---	---
MVP4-2.5	2.5	14	---	---	---	7.9
MVP4-3.5	3.5	8.1	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
MVP5-0	0.0	16	---	---	---	---
MVP5-1	1.0	<5.0	---	---	---	---
MVP5-2.5	2.5	<5.0	---	---	---	---
MVP5-3.5	3.5	<5.0	---	---	---	---
MVP6-0	0.0	18	---	---	---	---
MVP6-1	1.0	34	---	---	---	---
MVP6-2.5	2.5	7.2	---	---	---	---
MVP6-3.5	3.5	<5.0	---	---	---	---
MVP7-0	0.0	59	3.9	---	---	---
MVP7-1	1.0	9.3	---	---	---	---
MVP7-2.5	2.5	7.7	---	---	---	---
MVP7-3.5	3.5	9.7	---	---	---	7.3
MVP8-0	0.0	13	---	---	---	---
MVP8-1	1.0	7.3	---	---	---	---
MVP8-2.5	2.5	7.0	---	---	---	---
MVP8-3.5	3.5	7.7	---	---	---	---
MVP9-0	0.0	37	---	---	---	---
MVP9-1	1.0	6.7	---	---	---	---
MVP9-2.5	2.5	7.1	---	---	---	---
MVP9-3.5	3.5	7.3	---	---	---	---
MVP10-0	0.0	9.6	---	---	---	---
MVP10-1	1.0	8.6	---	---	---	---
MVP10-2.5	2.5	8.0	---	---	---	---
MVP10-3.5	3.5	7.2	---	---	---	---
MVP11-0	0.0	13	---	---	---	---
MVP11-1	1.0	9.5	---	---	---	---
MVP11-2.5	2.5	9.8	---	---	---	---
MVP11-3.5	3.5	7.5	---	---	---	---
MVP12-0	0.0	170	9.0	<0.25	---	---
MVP12-1	1.0	<5.0	---	---	---	---
MVP12-2.5	2.5	8.2	---	---	---	6.8
MVP12-3.5	3.5	7.1	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
MVP13-0	0.0	270	14	<0.25	<1.0	---
MVP13-1	1.0	87	6.5	<0.25	---	---
MVP13-2.5	2.5	10	---	---	---	7.5
MVP13-3.5	3.5	9.9	---	---	---	---
MVP14-0	0.0	180	20	<0.25	<1.0	---
MVP14-1	1.0	8.4	---	---	---	---
MVP14-2.5	2.5	10	---	---	---	---
MVP14-3.5	3.5	6.6	---	---	---	---
MVP15-0	0.0	290	25	<0.25	<1.0	7.1
MVP15-1	1.0	8.6	---	---	---	---
MVP15-2.5	2.5	5.0	---	---	---	---
MVP15-3.5	3.5	7.8	---	---	---	---
MVP16-0	0.0	110	5.4	<0.25	---	---
MVP16-1	1.0	9.6	---	---	---	---
MVP16-2.5	2.5	10	---	---	---	---
MVP16-3.5	3.5	7.5	---	---	---	---
MVP17-0	0.0	81	4.5	---	---	---
MVP17-1	1.0	7.5	---	---	---	---
MVP17-2.5	2.5	7.0	---	---	---	---
MVP17-3.5	3.5	<5.0	---	---	---	---
MVP18-0	0.0	690	52	<0.25	<1.0	---
MVP18-1	1.0	7.4	---	---	---	4.2
MVP18-2.5	2.5	7.4	---	---	---	---
MVP18-3.5	3.5	7.5	---	---	---	---
MVP19-0	0.0	59	8.0	<0.25	---	---
MVP19-1	1.0	<5.0	---	---	---	---
MVP19-2.5	2.5	<5.0	---	---	---	---
MVP19-3.5	3.5	<5.0	---	---	---	---
MVP20-0	0.0	21	---	---	---	---
MVP20-1	1.0	<5.0	---	---	---	---
MVP20-2.5	2.5	<5.0	---	---	---	---
MVP20-3.5	3.5	<5.0	---	---	---	---

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
MVP21-0	0.0	16	---	---	---	---
MVP21-1	1.0	7.1	---	---	---	---
MVP21-2.5	2.5	6.7	---	---	---	---
MVP21-3.5	3.5	<5.0	---	---	---	---
MVP22-0	0.0	20	---	---	---	---
MVP22-1	1.0	5.7	---	---	---	7.9
MVP22-2	2.0	6.4	---	---	---	---
MVP23-0	0.0	6.3	---	---	---	---
MVP23-1	1.0	<5.0	---	---	---	---
MVP23-2.5	2.5	<5.0	---	---	---	---
MVP23-3.5	3.5	<5.0	---	---	---	---
MVP24-0	0.0	26	---	---	---	---
MVP24-1	1.0	6.2	---	---	---	---
MVP24-2	2.0	<5.0	---	---	---	---
MVP25-0	0.0	280	22	0.37	<1.0	---
MVP25-1	1.0	150	14	1.8	---	---
MVP25-2.5	2.5	62	4.3	---	---	---
MVP25-3.5	3.5	22	---	---	---	---
MVP26-0	0.0	460	36	1.3	<1.0	---
MVP26-1	1.0	14	---	---	---	---
MVP27-0	0.0	120	7.6	0.47	---	---
MVP27-1	1.0	23	---	---	---	---
MVP27-1.5	1.5	5.4	---	---	---	---
MVP28-0	0.0	57	3.8	---	---	---
MVP28-1	1.0	5.7	---	---	---	8.4
MVP28-2.5	2.5	6.2	---	---	---	---
MVP29-0	0.0	73	4.2	---	---	---
MVP29-1	1.0	48	---	---	---	---
MVP29-2.5	2.5	26	---	---	---	---
MVP29-3.5	3.5	5.5	---	---	---	8.4

TABLE 2
SUMMARY OF LEAD AND pH RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Total Lead (mg/kg)	WET (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH
MVP30-0	0.0	150	12	0.72	<1.0	---
MVP30-1	1.0	5.7	---	---	---	---
MVP30-2	2.0	6.4	---	---	---	---
MVP31-0	0.0	68	3.2	---	---	6.4
MVP31-0.5	0.5	7.0	---	---	---	---
MVP32-0	0.0	3.8	---	---	---	---
MVP32-1	1.0	<5.0	---	---	---	---
MVP32-2.5	2.5	9.9	---	---	---	---
MVP32-3.5	3.5	11	---	---	---	---
MVP33-0	0.0	84	3.8	---	---	---
MVP33-1	1.0	16	---	---	---	---
MVP34-0	0.0	20	---	---	---	---
MVP34-1	1.0	8.2	---	---	---	---
MVP34-2	2.0	<5.0	---	---	---	---
MVP35-0	0.0	28	---	---	---	---
MVP35-1	1.0	<5.0	---	---	---	---
MVP35-2.5	2.5	<5.0	---	---	---	8.9
MVP35-3.5	3.5	<5.0	---	---	---	---
MVP36-0	0.0	23	---	---	---	---
MVP36-1	1.0	6.6	---	---	---	---
MVP36-1.5	1.5	6.7	---	---	---	8.1

Notes:

WET = Waste Extraction Test using citric acid as the extraction fluid
WET-DI = Waste Extraction Test using deionized water as the extraction fluid
TCLP = Toxicity Characteristic Leaching Procedure
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
--- = Not analyzed
< = Analyte was not detected at or above the stated detection limit

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B1-0	0	<2.0	**3.0**	30	<1.0	1.2	14	7.9	37	11	<1.0	8.8	<1.0	<1.0	<1.0	**34**	80	**5.3**/*<1.0*
B2-0	0	<2.0	**1.5**	53	<1.0	<1.0	9.6	8.2	28	11	<1.0	12	<1.0	<1.0	<1.0	**38**	84	**1.0**
B3-0	0	<2.0	**5.8**	28	<1.0	<1.0	3.1	5.2	26	11	<1.0	2.8	<1.0	<1.0	<1.0	**22**	140	0.86
B4-0	0	<2.0	**1.8**	54	<1.0	<1.0	31	14	49	46	<1.0	46	<1.0	<1.0	<1.0	**62**	100	**2.8**/*<1.0*
B5-0	0	<2.0	**2.2**	43	<1.0	<1.0	14	11	37	21	<1.0	17	<1.0	<1.0	<1.0	**56**	110	**3.8**/*<1.0*
B6-0	0	<2.0	**1.7**	36	<1.0	<1.0	6.3	6.6	20	9.1	<1.0	7.4	<1.0	<1.0	<1.0	**27**	110	**8.0**/*<1.0*
B7-0	0	<2.0	**36**	27	<1.0	<1.0	<1.0	2.9	63	21	3.2	<1.0	<1.0	<1.0	<1.0	**93**	60	**5.6**/*7.3*
B8-0	0	<2.0	**3.6**	40	<1.0	<1.0	12	10	37	19	<1.0	14	<1.0	<1.0	<1.0	**45**	110	0.69
B9-0	0	<2.0	**2.2**	80	<1.0	1.4	36	10	48	160	1.3	45	<1.0	<1.0	<1.0	**38**	240	0.97
B10-0	0	<2.0	**8.4**	44	<1.0	<1.0	13	9.7	37	190	<1.0	14	<1.0	<1.0	<1.0	**47**	140	**1.5**
B11-0	0	<2.0	**21**	89	<1.0	1.2	22	9.3	60	**850**	1.2	22	<1.0	<1.0	<1.0	**38**	230	0.38
B12-0	0	<2.0	**5.4**	82	<1.0	<1.0	16	8.9	41	110	<1.0	21	<1.0	<1.0	<1.0	**35**	210	0.48
B13-0	0	<2.0	**4.8**	98	<1.0	<1.0	35	13	44	**270**	<1.0	40	<1.0	<1.0	<1.0	**56**	200	0.52
B14-0	0	2.0	**15**	160	<1.0	<1.0	36	13	62	**440**	3.0	30	<1.0	<1.0	<1.0	**49**	360	0.51
B15-0	0	<2.0	**1.9**	20	<1.0	<1.0	9.0	9.0	20	9.9	<1.0	14	<1.0	<1.0	<1.0	**46**	44	**1.1**
B16-0	0	<2.0	**9.9**	120	<1.0	<1.0	46	15	53	**210**	<1.0	52	<1.0	<1.0	<1.0	**50**	170	0.76

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B17-0	0	<2.0	**6.3**	110	<1.0	<1.0	21	10	39	**230**	<1.0	22	<1.0	<1.0	<1.0	**42**	170	0.48
B18-0	0	<2.0	**6.8**	110	<1.0	<1.0	26	9.5	42	**420**	<1.0	28	<1.0	<1.0	<1.0	**37**	200	0.39
B19-0	0	<2.0	**<1.0**	72	<1.0	<1.0	22	8.8	18	48	<1.0	39	<1.0	<1.0	<1.0	**32**	35	<0.10
B20-0	0	<2.0	**<1.0**	86	<1.0	<1.0	21	7.7	19	64	<1.0	35	<1.0	<1.0	<1.0	**25**	35	<0.10
B21-0	0	<2.0	**<1.0**	110	<1.0	1.0	28	11	23	20	<1.0	48	<1.0	<1.0	<1.0	**41**	38	<0.10
B22-0	0	<2.0	**<1.0**	94	<1.0	<1.0	24	9.4	20	61	<1.0	39	<1.0	<1.0	<1.0	**32**	39	<0.10
B23-0	0	<2.0	**<1.0**	80	<1.0	1.6	25	18	35	30	<1.0	45	<1.0	<1.0	<1.0	**66**	36	0.11
B24-0	0	<2.0	**7.9**	95	<1.0	<1.0	33	12	34	27	<1.0	37	<1.0	<1.0	<1.0	**46**	85	0.14
B25-0	0	<2.0	**6.8**	88	<1.0	<1.0	20	9.0	29	15	<1.0	26	<1.0	<1.0	<1.0	**33**	66	0.13
B26-0	0	<2.0	**7.8**	90	<1.0	<1.0	25	9.5	29	**270**	<1.0	22	<1.0	<1.0	<1.0	**44**	140	<0.10
B27-0	0	<2.0	**<1.0**	54	<1.0	<1.0	20	9.0	16	21	<1.0	29	<1.0	<1.0	<1.0	**34**	28	<0.10
B28-0	0	<2.0	**<1.0**	94	<1.0	1.0	32	11	20	160	<1.0	48	<1.0	<1.0	<1.0	**33**	53	<0.10
B29-0	0	<2.0	**<1.0**	110	<1.0	<1.0	32	10	27	87	<1.0	47	<1.0	<1.0	<1.0	**32**	42	<0.10
B30-0	0	<2.0	**<1.0**	54	<1.0	<1.0	18	6.7	13	98	<1.0	27	<1.0	<1.0	<1.0	**26**	32	<0.10
B31-0	0	<2.0	**<1.0**	110	<1.0	<1.0	26	9.8	18	76	<1.0	45	<1.0	<1.0	<1.0	**32**	46	<0.10
B32-0	0	<2.0	**<1.0**	49	<1.0	1.5	26	17	29	68	<1.0	27	<1.0	<1.0	<1.0	**64**	35	0.17

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B33-0	0	<2.0	**<1.0**	28	<1.0	<1.0	28	30	75	33	<1.0	21	<1.0	<1.0	<1.0	**120**	64	0.23
B34-0	0	<2.0	**7.4**	110	<1.0	<1.0	35	12	36	62	<1.0	34	<1.0	<1.0	<1.0	**40**	150	<0.10
B35-0	0	<2.0	**3.8**	110	<1.0	<1.0	22	7.2	39	160	<1.0	24	<1.0	<1.0	<1.0	**31**	210	0.12
B36-0	0	<2.0	**5.1**	74	<1.0	<1.0	19	6.9	21	51	<1.0	22	<1.0	<1.0	<1.0	**29**	56	<0.10
B37-0	0	<2.0	**7.1**	66	<1.0	<1.0	21	9.4	26	18	<1.0	26	<1.0	<1.0	<1.0	**37**	70	<0.10
B38-0	0	<2.0	**7.5**	110	<1.0	<1.0	29	8.1	32	43	<1.0	24	<1.0	<1.0	<1.0	**52**	74	<0.10
B39-0	0	<4.0	**7.4**	100	<2.0	<2.0	23	22	33	**360**	<2.0	81	<2.0	<2.0	<2.0	**33**	130	<0.10
B41-0	0	<2.0	**<1.0**	120	<1.0	1.2	29	16	30	25	<1.0	46	<1.0	<1.0	<1.0	**48**	36	0.11
B42-0	0	<2.0	**<1.0**	52	<1.0	<1.0	25	10	36	170	<1.0	28	<1.0	<1.0	<1.0	**46**	65	0.13
B43-0	0	<2.0	**<1.0**	53	<1.0	**2.2**	27	24	50	**1,600**	<1.0	25	<1.0	<1.0	<1.0	**65**	110	0.18
B49-0	0	<2.0	**3.4**	120	<1.0	<1.0	28	8.3	35	**440**	1.7	37	<1.0	<1.0	<1.0	**32**	220	0.24
B50-0	0	<2.0	**3.4**	97	<1.0	<1.0	24	9.5	26	100	<1.0	28	<1.0	<1.0	<1.0	**35**	110	0.16
B51-0	0	<2.0	**3.0**	130	<1.0	<1.0	37	11	77	**200**	2.3	32	<1.0	<1.0	<1.0	**41**	190	0.22
B53-0	0	<2.0	**7.0**	96	<1.0	<1.0	21	8.9	29	16	<1.0	27	<1.0	<1.0	<1.0	**36**	70	<0.10
B54-0	0	<2.0	**<1.0**	55	<1.0	<1.0	25	12	27	80	<1.0	27	<1.0	<1.0	<1.0	**44**	79	0.11
B55-0	0	<2.0	**<1.0**	30	<1.0	<1.0	22	8.2	26	14	<1.0	28	<1.0	<1.0	<1.0	**24**	27	<0.10

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B56-0	0	<2.0	**<1.0**	26	<1.0	<1.0	20	16	48	20	<1.0	17	<1.0	<1.0	<1.0	**68**	27	0.25
B57-0	0	<2.0	**2.2**	86	<1.0	1.1	15	7.5	26	110	<1.0	19	<1.0	<1.0	<1.0	**32**	120	<0.50
B58-0	0	<2.0	**6.2**	110	<1.0	1.3	24	9.0	33	85	<1.0	28	<1.0	<1.0	<1.0	**33**	86	0.17
B59-0	0	<2.0	**1.7**	170	<1.0	**2.5**	30	6.1	20	19	3.4	63	<1.0	<1.0	<1.0	**23**	120	<0.10
B60-0	0	<2.0	**4.6**	130	<1.0	1.0	26	12	27	**220**	1.0	34	<1.0	<1.0	<1.0	**22**	74	0.13
B60A-0	0	<2.0	**3.5**	140	<1.0	1.2	27	6.0	23	78	1.5	29	<1.0	<1.0	<1.0	**22**	83	0.17
B61-0	0	<2.0	**<1.0**	10	<1.0	<1.0	30	27	210	1.1	<1.0	27	<1.0	<1.0	<1.0	**99**	30	0.51
B61A-0	0	<2.0	**<1.0**	39	<1.0	<1.0	17	13	19	1.2	<1.0	24	<1.0	<1.0	<1.0	**51**	23	0.10
B62-0	0	<2.0	**<1.0**	18	<1.0	<1.0	22	19	48	**<1.0**	<1.0	20	<1.0	<1.0	<1.0	**78**	26	0.40
B63-0	0	<2.0	**2.6**	150	<1.0	<1.0	52/*<1.0*	12	25	27	<1.0	74	<1.0	<1.0	<1.0	**32**	170	<0.10
B64-0	0	<2.0	**2.7**	220	<1.0	<1.0	81/*<1.0*	19	34	9.8	<1.0	110	<1.0	<1.0	<1.0	**48**	130	<0.10
B65-0	0	<2.0	**3.2**	130	<1.0	<1.0	64/*<1.0*	14	32	57	<1.0	91	<1.0	<1.0	<1.0	**41**	**2,800**	<0.10
B66-0	0	<2.0	**1.2**	120	<1.0	<1.0	48	14	35	180	<1.0	47	<1.0	<1.0	<1.0	**47**	**710**	<0.10
B67-0	0	<2.0	**6.2**	75	<1.0	1.2	43	9.9	21	45	<1.0	62	<1.0	<1.0	<1.0	**26**	59	<0.10
B68-0	0	<2.0	**2.2**	120	<1.0	1.2	55/*<1.0*	12	26	16	<1.0	83	<1.0	<1.0	<1.0	**28**	56	<0.10
B69-0	0	<2.0	**1.8**	110	<1.0	1.3	36	9.4	21	18	<1.0	49	<1.0	<1.0	<1.0	**27**	45	<0.10

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B70-0	0	<2.0	**4.3**	99	<1.0	1.1	44	11	27	32	<1.0	70	<1.0	<1.0	<1.0	**28**	56	<0.10
B71-0	0	<2.0	**3.9**	73	<1.0	<1.0	39	9.8	19	64	<1.0	61	<1.0	<1.0	<1.0	**24**	58	<0.10
B72-0	0	<2.0	**2.8**	89	<1.0	1.2	42	11	33	78	<1.0	60	<1.0	<1.0	<1.0	**28**	77	<0.10
B73-0	0	<2.0	**2.6**	100	<1.0	1.2	43	10	29	91	1.0	63	<1.0	<1.0	<1.0	**28**	97	<0.10
B74-0	0	<2.0	**6.4**	61	<1.0	<1.0	41	9.7	27	120	<1.0	59	<1.0	<1.0	<1.0	**27**	75	<0.10
B75-0	0	<2.0	**2.5**	100	<1.0	1.0	44	12	25	22	<1.0	70	<1.0	<1.0	<1.0	**29**	58	<0.10
B76-0	0	<2.0	**2.3**	69	<1.0	<1.0	31	9.2	19	130	<1.0	46	<1.0	<1.0	<1.0	**22**	70	<0.10
B77-0	0	<2.0	**<1.0**	58	<1.0	**1.8**	30	17	86	**390**	<1.0	29	<1.0	<1.0	<1.0	**54**	210	0.44
B78-0	0	<2.0	**1.6**	110	<1.0	1.6	31	9.7	46	**1,100**	<1.0	37	<1.0	<1.0	<1.0	**36**	250	0.15
B79-0	0	2.5	**<1.0**	170	<1.0	**2.0**	39	9.9	110	**650**	4.6	38	<1.0	<1.0	<1.0	**30**	**720**	0.19
B80-0	0	<2.0	**3.3**	120	<1.0	**2.0**	47	11	97	**840**	2.5	52	<1.0	<1.0	<1.0	**28**	470	0.16
B81-0	0	<2.0	**2.7**	120	<1.0	**2.7**	44	16	96	**2,000**	1.6	48	<1.0	<1.0	<1.0	**58**	570	0.32
B82-0	0	<2.0	**5.2**	93	<1.0	<1.0	37	9.8	24	110	<1.0	50	<1.0	<1.0	<1.0	**31**	84	**2.0**/*<1.0*
B83-0	0	<2.0	**4.9**	110	<1.0	1.0	49	11	58	**860**	2.0	57	<1.0	<1.0	<1.0	**38**	350	0.11
B84-0	0	<2.0	**5.1**	170	<1.0	<1.0	73/*<1.0*	15	36	18	<1.0	100	<1.0	<1.0	<1.0	**44**	78	<0.10
B85-0	0	<2.0	**<1.0**	53	<1.0	<1.0	22	11	46	36	<1.0	26	<1.0	<1.0	<1.0	**38**	78	0.24

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B86-0	0	<2.0	**<1.0**	48	<1.0	<1.0	30	19	65	15	<1.0	35	<1.0	<1.0	<1.0	**88**	44	0.39
B87-0	0	<2.0	**<1.0**	19	<1.0	<1.0	23	18	45	1.6	<1.0	20	<1.0	<1.0	<1.0	**83**	38	0.24
B88-0	0	<2.0	**<1.0**	23	<1.0	<1.0	24	16	31	1.1	<1.0	23	<1.0	<1.0	<1.0	**86**	24	0.39
B89-0	0	<2.0	**<1.0**	25	<1.0	<1.0	20	9.2	36	3.3	<1.0	21	<1.0	<1.0	<1.0	**50**	25	0.39
B90-0	0	<2.0	**<1.0**	42	<1.0	<1.0	21	13	34	3.2	<1.0	30	<1.0	<1.0	<1.0	**39**	25	0.28
B91-0	0	<2.0	**2.0**	95	<1.0	<1.0	42	13	27	6.8	<1.0	56	<1.0	<1.0	<1.0	**34**	42	<0.10
B92-0	0	<2.0	**8.0**	140	<1.0	<1.0	56/*<1.0*	16	47	**340**	<1.0	68	<1.0	<1.0	<1.0	**48**	190	<0.10
B93-0	0	<2.0	**3.1**	110	<1.0	<1.0	46	15	45	60	<1.0	57	<1.0	<1.0	<1.0	**39**	110	0.11
B94-0	0	<2.0	**4.7**	150	<1.0	<1.0	57/*<1.0*	16	37	38	<1.0	66	<1.0	<1.0	<1.0	**46**	75	<0.10
B95-0	0	<2.0	**2.1**	94	<1.0	<1.0	37	14	52	26	<1.0	47	<1.0	<1.0	<1.0	**45**	90	0.27
B96-0	0	<2.0	**2.0**	150	<1.0	1.2	42	14	36	8.8	<1.0	55	<1.0	<1.0	<1.0	**33**	62	<0.10
B97-0	0	<2.0	**3.2**	130	<1.0	1.3	53/*<1.0*	15	36	12	<1.0	61	<1.0	<1.0	<1.0	**43**	110	<0.10
B98-0	0	5.4	**2.6**	230	<1.0	1.4	62/*<1.0*	17	44	110	<1.0	80	<1.0	<1.0	<1.0	**46**	88	<0.10
B99-0	0	<2.0	**<1.0**	70	<1.0	1.3	37	12	57	61	<1.0	30	<1.0	<1.0	<1.0	**41**	150	0.16
B100-0	0	<2.0	**<1.0**	64	<1.0	1.3	29	16	61	81	<1.0	35	<1.0	<1.0	<1.0	**45**	100	<0.10
B101-0	0	<2.0	**<1.0**	83	<1.0	<1.0	20	9.8	27	29	<1.0	28	<1.0	<1.0	<1.0	**35**	31	0.16

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B102-0	0	<2.0	**3.1**	61	<1.0	<1.0	41	12	51	7.6	<1.0	47	<1.0	<1.0	<1.0	**57**	40	0.30
B103-0	0	<2.0	**<1.0**	42	<1.0	<1.0	19	11	43	12	<1.0	28	<1.0	<1.0	<1.0	**46**	35	0.38
B104-0	0	<2.0	**<1.0**	38	<1.0	<1.0	18	11	30	16	<1.0	26	<1.0	<1.0	<1.0	**48**	57	0.30
B105-0	0	<2.0	**5.4**	130	<1.0	<1.0	24	7.4	28	51	<1.0	29	<1.0	<1.0	<1.0	**27**	86	<0.10
B106-0	0	<2.0	**7.5**	86	<1.0	<1.0	19	7.4	27	45	<1.0	21	<1.0	<1.0	<1.0	**31**	86	0.10
B107-0	0	<2.0	**5.1**	110	<1.0	<1.0	20	7.6	30	94	<1.0	26	<1.0	<1.0	<1.0	**30**	110	0.11
B108-0	0	<2.0	**12**	110	<1.0	<1.0	23	9.7	29	52	<1.0	28	<1.0	<1.0	<1.0	**39**	90	<0.10
B109-0	0	<2.0	**5.9**	92	<1.0	<1.0	23	9.6	26	55	<1.0	32	<1.0	<1.0	<1.0	**34**	91	<0.10
B110-0	0	<2.0	**6.4**	110	<1.0	<1.0	29	10	29	48	<1.0	29	<1.0	<1.0	<1.0	**45**	94	<0.10
B111-0	0	<2.0	**6.8**	98	<1.0	<1.0	26	9.9	30	42	<1.0	28	<1.0	<1.0	<1.0	**41**	85	<0.10
B112-0	0	<2.0	**5.6**	95	<1.0	<1.0	22	7.9	26	63	<1.0	25	<1.0	<1.0	<1.0	**32**	92	<0.10
B113-0	0	<2.0	**6.0**	120	<1.0	<1.0	33	10	49	130	<1.0	40	<1.0	<1.0	<1.0	**41**	290	**2.0**/*<1.0*
B114-0	0	<2.0	**6.1**	100	<1.0	<1.0	27	11	33	92	<1.0	32	<1.0	<1.0	<1.0	**38**	100	0.15
MVP1-0	0	<2.0	**19**	42	<1.0	<1.0	6.3	7.6	51	26	<1.0	8.1	<1.0	<1.0	<1.0	**30**	140	0.87
MVP2-0	0	<2.0	**13**	50	<1.0	<1.0	5.6	7.7	38	18	<1.0	8.4	<1.0	<1.0	<1.0	**28**	170	**1.7**
MVP3-0	0	<2.0	**7.3**	49	<1.0	<1.0	6.9	7.7	32	18	<1.0	8.9	<1.0	<1.0	<1.0	**30**	120	0.64

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
MVP4-0	0	<2.0	**5.3**	40	<1.0	<1.0	12	12	37	18	<1.0	14	<1.0	<1.0	<1.0	**63**	120	**1.6**
MVP5-0	0	<2.0	**1.6**	41	<1.0	<1.0	12	13	31	16	<1.0	14	<1.0	<1.0	<1.0	**75**	99	**3.7**/*<1.0*
MVP6-0	0	<2.0	**2.5**	54	<1.0	<1.0	13	14	43	18	<1.0	15	<1.0	<1.0	<1.0	**81**	100	**2.0**/*<1.0*
MVP7-0	0	<2.0	**5.1**	110	<1.0	<1.0	29	14	32	59	<1.0	46	<1.0	<1.0	<1.0	**45**	68	0.18
MVP8-0	0	<2.0	**5.5**	110	<1.0	<1.0	29	14	32	13	<1.0	34	<1.0	<1.0	<1.0	**47**	60	<0.10
MVP9-0	0	<2.0	**2.6**	77	<1.0	<1.0	26	15	32	37	<1.0	29	<1.0	<1.0	<1.0	**60**	50	0.24
MVP10-0	0	<2.0	**6.4**	86	<1.0	<1.0	16	9.2	19	9.6	2.0	24	<1.0	<1.0	<1.0	**30**	57	<0.10
MVP11-0	0	<2.0	**2.9**	92	<1.0	<1.0	17	6.9	19	13	2.4	26	<1.0	<1.0	<1.0	**27**	53	0.11
MVP12-0	0	<2.0	**6.0**	97	<1.0	<1.0	20	7.4	25	170	1.6	22	<1.0	<1.0	<1.0	**33**	80	<0.10
MVP13-0	0	<2.0	**5.3**	130	<1.0	<1.0	46	12	52	**270**	<1.0	49	<1.0	<1.0	<1.0	**42**	140	0.53
MVP14-0	0	<2.0	**1.7**	50	<1.0	<1.0	21	9.7	33	180	<1.0	21	<1.0	<1.0	<1.0	**33**	87	0.38
MVP15-0	0	<2.0	**7.3**	72	<1.0	<1.0	26	11	32	**290**	<1.0	27	<1.0	<1.0	<1.0	**44**	86	0.22
MVP16-0	0	<4.0	**5.2**	81	<2.0	<2.0	23	22	33	110	<2.0	75	<2.0	<2.0	<2.0	**36**	98	0.13
MVP17-0	0	<2.0	**5.6**	140	<1.0	<1.0	24	8.7	26	81	1.2	34	<1.0	<1.0	<1.0	**26**	110	<0.10
MVP18-0	0	<2.0	**6.9**	140	<1.0	<1.0	26	6.2	38	**690**	1.9	36	<1.0	<1.0	<1.0	**23**	240	0.11

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
MVP19-0	0	2.3	**2.8**	150	<1.0	<1.0	66/*<1.0*	14	46	59	<1.0	71	<1.0	<1.0	<1.0	**47**	140	0.11
MVP20-0	0	<2.0	**2.7**	190	<1.0	1.5	62	16	44	21	<1.0	84	<1.0	<1.0	<1.0	**47**	72	<0.10
MVP21-0	0	<2.0	**2.6**	120	<1.0	<1.0	49/*<1.0*	13	34	16	<1.0	61	<1.0	<1.0	<1.0	**44**	60	<0.10
MVP22-0	0	<2.0	**3.0**	120	<1.0	<1.0	61/*<1.0*	16	31	20	<1.0	71	<1.0	<1.0	<1.0	**50**	59	<0.10
MVP23-0	0	<2.0	**1.7**	90	<1.0	<1.0	38	10	25	6.3	<1.0	49	<1.0	<1.0	<1.0	**28**	38	<0.10
MVP24-0	0	<2.0	**3.0**	120	<1.0	<1.0	61/*<1.0*	16	31	26	<1.0	69	<1.0	<1.0	<1.0	**51**	59	0.10
MVP25-0	0	<2.0	**3.7**	120	<1.0	<1.0	51/*<1.0*	13	50	**280**	<1.0	53	<1.0	<1.0	<1.0	**45**	300	0.13
MVP26-0	0	<2.0	**7.5**	110	<1.0	<1.0	52/*<1.0*	13	49	**460**	<1.0	68	<1.0	<1.0	<1.0	**39**	260	0.18
MVP27-0	0	<2.0	**3.2**	93	<1.0	<1.0	51/*<1.0*	16	44	120	<1.0	55	<1.0	<1.0	<1.0	**53**	140	0.46
MVP28-0	0	<2.0	**2.8**	100	<1.0	<1.0	51/*<1.0*	17	55	57	<1.0	53	<1.0	<1.0	<1.0	**55**	120	0.14
MVP29-0	0	<2.0	**2.7**	130	<1.0	<1.0	66/*<1.0*	19	90	73	<1.0	72	<1.0	<1.0	<1.0	**55**	88	0.23
MVP30-0	0	<2.0	**2.8**	99	<1.0	<1.0	54/*<1.0*	16	33	150	<1.0	60	<1.0	<1.0	<1.0	**46**	110	0.11
MVP31-0	0	<2.0	**1.6**	84	<1.0	<1.0	52/*<1.0*	17	69	68	<1.0	49	<1.0	<1.0	<1.0	**55**	69	<0.10
MVP32-0	0	<2.0	**2.7**	130	<1.0	<1.0	42	12	27	3.8	<1.0	54	<1.0	<1.0	<1.0	**35**	41	<0.10
MVP33-0	0	<2.0	**1.6**	84	<1.0	<1.0	57/*<1.0*	17	47	84	<1.0	55	<1.0	<1.0	<1.0	**53**	81	<0.10

TABLE 3
SUMMARY OF CAM 17 METALS RESULTS - SOIL
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
MVP34-0	0	<2.0	**2.6**	88	<1.0	<1.0	53/*<1.0*	15	28	20	<1.0	58	<1.0	<1.0	<1.0	**52**	60	0.14
MVP35-0	0	<2.0	**3.7**	88	<1.0	<1.0	54/*<1.0*	17	36	28	<1.0	63	<1.0	<1.0	<1.0	**65**	65	<0.10
MVP36-0	0	<2.0	**1.5**	80	<1.0	<1.0	52/*<1.0*	16	29	23	<1.0	57	<1.0	<1.0	<1.0	**55**	71	<0.10
CAM 17 Metals Analyses																		
Number of Samples		145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Number of Detections		4	111	145	0	33	144	145	145	144	19	144	0	0	0	145	145	85
Minimum Detection		2.0	**1.2**	10	---	1.0	3.1	2.9	13	1.1	1.0	2.8	---	---	---	**22**	23	0.1
Mean Detection		3.1	**5.0**	90.6	---	1.4	32.1	12.0	38.5	138.5	2.1	40.0	---	---	---	**42.9**	132.1	0.7
Maximum Detection		5.4	**36**	230	---	**2.7**	81	30	210	**2,000**	4.6	110	---	---	---	**120**	**2,800**	**8.0**
ESLs																		
Shallow Soils (≤3 m bgs)																		
Residential Land Use		6.1	0.38	750	4.0	1.7	750*	40	230	200	40	150	10	20	1.2	15	600	1.0
Comm/Indust Land Use		40	1.5	1,500	8.0	7.4	750*	80	230	750	40	150	10	40	15	190	600	100
Deep Soils (≥3 m bgs)																		
Residential Land Use		280	14	2,500	98	39	2,500	94	2,500	750	2,500	260	2,500	2,500	57	710	2,500	33
Comm/Indust Land Use		280	14	2,600	98	39	5,000	94	5,000	750	3,600	260	3,600	3,600	57	710	5,000	33

Notes:

Results are shown in milligrams per kilogram (mg/kg)

Results in italics are soluble metal concentrations in milligrams per liter (mg/l) analyzed using the Waste Extraction Test (WET)

Mercury WET results are reported in micrograms per liter (ug/l)

< Analyte was not detected at or above the stated detection limit

ESLs = Environmental Screening Levels, SFRWQCB, November 2007, Tables A and C.

* = Value is for Chromium III, no standard for total chromium

BOLD = Value exceeds one or more applicable standards

TABLE 4
SUMMARY OF ORGANICS RESULTS - GROUNDWATER
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Sample I.D.	TPHd (mg/l)	TPHmo (mg/l)	TPHg (mg/l)	Benzene (ug/l)	Ethylbenzene (ug/l)	m,p-Xylene (ug/l)	MTBE (ug/l)	o-Xylene (ug/l)	Toluene (ug/l)	VOCs (ug/l)	SVOCs (ug/l)
GRAB GW WELL A	**2.3**	**0.58**	<0.050	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	ND	ND
GRAB GW WELL B	**0.37**	**0.19**	<0.050	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	ND	ND
B59 GRAB GW	<0.050	<0.050	<0.050	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	ND	ND
B82 GRAB GW	0.092	0.091	<0.050	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	ND	ND
ESLs											
GW IS Current/Potential Source of Drinking Water	0.1	0.1	0.1	1.0	30	20	5.0	20	40	NA	NA

Notes:

TPHd = Total Petroleum Hydrocarbons as diesel
TPHmo = Total Petroleum Hydrocarbons as motor oil
TPHg = Total Petroleum Hydrocarbons as gasoline
MTBE = Methyl tertiary-butyl ether
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
mg/l = milligrams per liter
ug/l = micrograms per liter
< = Analyte was not detected at or above the stated detection limit
ND = No analytes detected at or above the method detection limit
NA = Not Applicable
ESLs = Environmental Screening Levels, SFRWQCB, November 2007, Table A.
ESL values for xylenes are for individual or sum of all isomers.
BOLD = Value exceeds ESL value.

TABLE 5
SUMMARY OF CAM 17 METALS RESULTS - GROUNDWATER
Caldecott Tunnel
Alameda and Contra Costa Counties, California

Sample I.D.	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
GRAB GW WELL A	<0.0050	<0.010	0.028	<0.0030	<0.0030	<0.0030	<0.0030	0.080	<0.0050	<0.20	0.0083	<0.0050	0.053	<0.0030	<0.015	0.0031	1.5
GRAB GW WELL B	<0.0050	<0.010	0.014	<0.0030	<0.0030	0.0073	<0.0030	<0.0050	<0.0050	<0.20	<0.0050	<0.0050	0.022	<0.0030	<0.015	0.0063	**3.2**
B59 GRAB GW	<0.025	<0.050	0.66	<0.015	0.041	0.19	0.21	0.31	0.033	<0.20	<0.025	1.9	0.16	<0.015	<0.075	0.22	1.7
B82 GRAB GW	0.0086	0.042	10	0.015	0.011	0.79	0.62	0.62	0.37	0.0028	<0.0050	1.4	<0.010	<0.0030	<0.015	1.2	1.3
ESLs																	
Table A	6.0	50	1,000	4.0	5.0	50	140	1,000	15	35	100	50	35	2.0	15	5,000	2.0
Table B	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000

Notes:

Results are shown in units of milligrams per liter (mg/l)

< = Analyte was not detected at or above the stated detection limit

ESLs = Environmental Screening Levels, Screening for Environmental Concerns at Contaminated Sites, San Francisco Bay Reqional Water Quality Control Board, November 2007.

Table A: Groundwater Is Current or Potential Source of Drinking Water

Table B: Groundwater Is NOT Current or Potential Source of Drinking Water

TABLE 6A
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B1-B3, B5-B8, and MVP1-MVP6

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	18.4	18.9
1 to 2 ft	18.8	19.9
2 to 3 ft	19.0	20.2
	Maximum	
3.5 to 4 ft.	8.1	

EXCAVATION SCENARIOS

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Soluble (WET) Lead* (mg/l)	95% UCL Total Lead (mg/kg)
0 to 1 ft.	18.4	1.3	18.9
Underlying Soil (1 to 4 ft.) [1]	*17.1*	*1.2*	*18.1*
0 to 2 ft.	18.6	1.3	19.4
Underlying Soil (2 to 4 ft.) [1]	*16.2*	*1.1*	*17.2*
0 to 3.5 ft.[1]	18.7	1.3	19.7
Underlying Soil (3.5 to 4 ft.) [1]	*8.1*	*0.6*	*8.1*
0 to 4 ft.[1]	17.4	1.2	18.3

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6B
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B4, and B9-B18

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	352.2	374.8
1 to 1.5 ft	14.0	14.7
2.5 to 3 ft	13.9	14.7
3.5 to 4 ft	7.9	8.3

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	352.2	24.7	374.8
Underlying Soil (1 to 4 ft.)	*9.7*	*0.7*	*10.2*
0 to 2.5 ft.	149.3	10.5	158.7
Underlying Soil (2.5 to 4 ft.)	*11.9*	*0.8*	12.5
0 to 3.5 ft.	110.6	7.7	117.6
Underlying Soil (3.5 to 4 ft.)	*7.9*	*0.6*	*8.3*
0 to 4 ft.	97.8	6.8	103.9

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6C
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B19-B23

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	54.4	57.2
1 to 1.5 ft[1]	2.5	2.5
2.5 to 3 ft	12.1	12.8
3.5 to 4 ft	11.0	11.2

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	54.4	3.8	57.2
Underlying Soil (1 to 4 ft.)	*5.3*	*0.4*	*5.5*
0 to 2.5 ft.	23.3	1.6	24.4
Underlying Soil (2.5 to 4 ft.)	*11.7*	*0.8*	12.3
0 to 3.5 ft.	20.1	1.4	21.1
Underlying Soil (3.5 to 4 ft.)	*11.0*	*0.8*	*11.2*
0 to 4 ft.	18.9	1.3	19.8

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1]= Sample results for 1 ft interval were all non-detect, therefore one half the detection limit value was used in calculations
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6C1
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B27-B32, B41

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft	97.9	103.5
1 to 1.5 ft[1]	2.5	2.5
2.5 to 3 ft	7.9	8.3
3.5 to 4 ft	21.4	23.0

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1 ft.	97.9	6.9	103.5
Underlying Soil (1 to 4 ft.)	*5.6*	*0.4*	*5.9*
0 to 2.5 ft.	40.7	2.8	42.9
Underlying Soil (2.5 to 4 ft.)	*12.4*	*0.9*	13.2
0 to 3.5 ft.	31.3	2.2	33.0
Underlying Soil (3.5 to 4 ft.)	*21.4*	*1.5*	*23.0*
0 to 4 ft.	30.1	2.1	31.8

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1]= Sample results for 1 ft interval were all non-detect, therefore one half the detection limit value was used in calculations
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6D
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B35-B39 and MVP13-MVP18

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	275.9	296.8
1 to 1.5 ft	24.3	26.2
2.5 to 3 ft	8.4	8.8
3.5 to 4 ft	8.1	8.5

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	275.9	19.3	296.8
Underlying Soil (1 to 4 ft.)	*12.2*	*0.9*	*13.1*
0 to 2.5 ft.	124.9	8.7	134.4
Underlying Soil (2.5 to 4 ft.)	*8.3*	*0.6*	8.7
0 to 3.5 ft.	91.6	6.4	98.5
Underlying Soil (3.5 to 4 ft.)	*8.1*	*0.6*	*8.5*
0 to 4 ft.	81.2	5.7	87.3

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6E
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B33 and B34

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	62
1 to 1.5 ft	18

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	62	4.3
Underlying Soil (1 to 1.5 ft.) [1]	*18*	*1.3*
0 to 1.5 ft.	47.3	3.3

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6F
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B53-B58, B113, B114, MVP10-MVP12

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	88.3	93.9
1 to 1.5 ft	13.2	13.8
2.5 to 3 ft	19.7	21.5
3.5 to 4 ft	13.5	14.7

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	88.3	6.2	93.9
Underlying Soil (1 to 4 ft.)	*11.6*	*0.8*	*12.4*
0 to 2.5 ft.	43.3	3.0	45.8
Underlying Soil (2.5 to 4 ft.)	*17.6*	*1.2*	19.2
0 to 3.5 ft.	36.5	2.6	38.9
Underlying Soil (3.5 to 4 ft.)	*13.5*	*0.9*	*14.7*
0 to 4 ft.	33.7	2.4	35.8

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6F1
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B59-B60A

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum	WET Lead (mg/l) Maximum
0 to 0.5 ft	220	3.2
1 to 1.5 ft	78	<1.0
2.5 to 3 ft[1]	2.5	---
3.5 to 4 ft[1]	2.5	---

mg/kg = milligrams per kilogram
mg/l = milligrams per liter
[1] = Sample results for 2.5-ft and 3.5-ft intervals were all non-detect, therefore one half the detection limit value was used in calculations
--- = Not analyzed

TABLE 6G
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B105-B112

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	63.4	65.4
1 to 1.5 ft	9.0	9.2
2.5 to 3 ft[1]	9.0	9.0
3.5 to 4 ft	16.7	18.0

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	63.4	4.4	65.4
Underlying Soil (1 to 4 ft.)	*7.7*	*0.5*	*8.0*
0 to 2.5 ft.	30.8	2.2	31.7
Underlying Soil (2.5 to 4 ft.)	*11.6*	*0.8*	12.0
0 to 3.5 ft.	24.5	1.7	25.2
Underlying Soil (3.5 to 4 ft.)	*16.7*	*1.2*	*18.0*
0 to 4 ft.	23.6	1.6	24.3

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1]= UCL not calculated due to an insufficient number of unique sample results
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6H
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B61-B74, and B91

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	95% UCL
0 to 1 ft	56.7	60.7
1 to 1.5 ft	35.2	39.3
	Maximum	
1.5 to 2.5 ft	5.5	
2.5 to 3 ft	69	
4.5 to 5.5 ft	2.5	

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	56.7	4.0	60.7
Underlying Soil (1 to 6 ft.)	*40.6*	*2.8*	*41.1*
0 to 1.5 ft.	49.5	3.5	53.6
Underlying Soil (1.5 to 6 ft.)	*41.4*	*2.9*	*41.4*
0 to 2.5 ft.	31.9	2.2	34.4
Underlying Soil (2.5 to 6 ft.)	*55.7*	*3.9*	55.7
0 to 4.5 ft.	48.4	3.4	49.8
Underlying Soil (4.5 to 5 ft.)	*2.5*	*0.2*	2.5
0 to 5 ft.	43.8	3.1	45.0

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6I
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B75-80, B92-93, and MVP25-27

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 1 ft	660.4	702.4
1 to 1.5 ft	153.9	172.0
	Maximum	
1.5 to 2 ft	8.3	
2.5 to 3 ft	62	
3.5 to 4 ft	22	

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	660.4	46.2	702.4
Underlying Soil (1 to 4 ft.)	*52.8*	*3.7*	*55.8*
0 to 1.5 ft.	491.6	34.4	525.6
Underlying Soil (1.5 to 4 ft.)	*32.5*	*2.3*	*32.5*
0 to 2.5 ft.	298.3	20.9	318.7
Underlying Soil (2.5 to 4 ft.)	*48.7*	*3.4*	*48.7*
0 to 3.5 ft.	230.8	16.2	245.3
Underlying Soil (3.5 to 4 ft.)	*22*	*1.5*	*22*
0 to 4 ft.	*204.7*	14.3	217.4

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6I1
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B94-95

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	38
1 to 1.5 ft	2.5
2.5 to 3 ft	2.5

mg/kg = milligrams per kilogram
mg/l = milligrams per liter
(1)= Sample results for 1 ft and 2.5 ft intervals were all non-detect, therefore one half the detection limit value shown

TABLE 6J
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings MVP19-MVP24

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft	33.0	35.6
1 to 1.5 ft	5.4	5.7
	Maximum	
2 to 2.5 ft	6.4	
2.5 to 3 ft	6.7	
3.5 to 4 ft	2.5	

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1 ft.	33.0	2.3	35.6
Underlying Soil (1 to 4 ft.)	*5.5*	*0.4*	*5.6*
0 to 2 ft.	19.2	1.3	20.7
Underlying Soil (2 to 4 ft.)	*5.7*	*0.4*	*5.7*
0 to 2.5 ft.	12.6	0.9	*13.3*
Underlying Soil (2.5 to 4 ft.)	*5.3*	*0.4*	*5.3*
0 to 3.5 ft.	13.8	1.0	14.6
Underlying Soil (3.5 to 4 ft.)	*2.5*	*0.2*	2.5
0 to 4 ft.	*12.4*	0.9	13.1

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.07 \quad x$

TABLE 6K
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B42 & B43

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	1,600
1 to 1.5 ft	1,000
2.5 to 3 ft	6.7
3.5 to 4 ft.	6.3

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	1,600	112
Underlying Soil (1 to 4 ft.) [1]	*503.3*	*35.2*
0 to 2.5 ft.	1,240	86.8
Underlying Soil (2.5 to 4 ft.) [1]	*6.6*	*0.5*
0 to 3.5 ft.[1]	887.6	62.1
Underlying Soil (3.5 to 4 ft.) [1]	*6.3*	*0.4*
0 to 4 ft.[1]	777.5	54.4

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6L
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B96-B100

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	77.3	84.2
1 to 2 ft	20.8	22.7
	Maximum	
2 to 3 ft	6.8	
3.5 to 4 ft.	2.5	

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	77.3	5.4	84.2
Underlying Soil (1 to 4 ft.) [1]	*8.1*	*0.6*	*8.5*
0 to 2 ft.	49.1	3.4	53.4
Underlying Soil (2 to 4 ft.) [1]	*5.7*	*0.4*	*5.7*
0 to 3.5 ft.[1]	30.9	2.2	33.5
Underlying Soil (3.5 to 4 ft.) [1]	*2.5*	*0.2*	*2.5*
0 to 4 ft.[1]	27.4	1.9	29.6

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6M
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings MVP28-MVP30

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	150
1 to 1.5 ft	48
2 to 3 ft	26
3.5 to 4 ft.	5.5

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	150	10.5
Underlying Soil (1 to 4 ft.) [1]	*22.4*	*1.6*
0 to 2 ft.	99.0	6.9
Underlying Soil (2 to 4 ft.) [1]	*20.9*	*1.5*
0 to 3.5 ft.[1]	67.7	4.7
Underlying Soil (3.5 to 4 ft.) [1]	*5.5*	*0.4*
0 to 4 ft.[1]	59.9	4.2

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6N
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B82-B84

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	860
1 to 1.5 ft	6.9
2 to 3 ft	8.3
3.5 to 4 ft	2.5

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	860	60.2
Underlying Soil (1 to 4 ft.) [1]	*5.2*	*0.4*
0 to 2 ft.	433	30.3
Underlying Soil (2 to 4 ft.) [1]	*6.9*	*0.5*
0 to 3.5 ft.[1]	251.2	17.6
Underlying Soil (3.5 to 4 ft.) [1]	*2.5*	*0.2*
0 to 4 ft.[1]	220.2	15.4

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6N1
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Boring B81

TOTAL LEAD UCLs

	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)
0 to 0.5 ft	2,000	71	8.2
1 to 1.5 ft	83	9.2	---
2.5 to 3 ft	11	---	---

mg/kg = milligrams per kilogram
mg/l = milligrams per liter
--- = Not analyzed

TABLE 6O
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B85-B90, and B101-B104

TOTAL LEAD UCLs

	Total Lead (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	17.0	18.5
2.5 to 3 ft	8.6	9.3
3.5 to 4 ft	6.4	6.9
	Maximum	
1 to 1.5 ft[1]	24	

EXCAVATION SCENARIOS

	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft.	17.0	*1.2*	18.5
Underlying Soil (1 to 4 ft.)	*11.9*	*0.8*	*12.2*
0 to 2.5 ft.	21.2	*1.5*	21.8
Underlying Soil (2.5 to 4 ft.)	*7.8*	*0.5*	*8.5*
0 to 3.5 ft.	17.6	*1.2*	18.2
Underlying Soil (3.5 to 4 ft.)	*6.4*	*0.4*	*6.9*
0 to 4 ft.	16.2	1.1	16.8

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1]= UCL not calculated due to an insufficient number of unique sample results
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6P
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B24-B26

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	270
1 to 1.5 ft	11
2 to 3 ft	9.6
3.5 to 4 ft.	11

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	270	18.9
Underlying Soil (1 to 4 ft.) [1]	*10.3*	*0.7*
0 to 2 ft.	140.5	9.8
Underlying Soil (2 to 4 ft.) [1]	*10.0*	*0.7*
0 to 3.5 ft.[1]	84.4	5.9
Underlying Soil (3.5 to 4 ft.) [1]	*11*	*0.8*
0 to 4 ft.[1]	75.2	5.3

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6Q
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings MVP34-MVP36

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	28
1 to 1.5 ft	8.2
1.5 to 3 ft	6.7
3.5 to 4 ft.	2.5

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	28.0	2.0
Underlying Soil (1 to 4 ft.) [1]	*6.3*	*0.4*
0 to 1.5 ft.	21.4	1.5
Underlying Soil (1.5 to 4 ft.) [1]	*5.9*	*0.4*
0 to 3 ft.[1]	13.0	0.9
Underlying Soil (3 to 4 ft.) [1]	*2.5*	*0.2*
0 to 4 ft.[1]	11.7	0.8

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6R
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings MVP31-MVP33

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum	WET Lead (mg/l) Maximum
0 to 0.5 ft	84	3.8
0.5 to 1.5 ft	16	---
2.5 to 3 ft	9.9	---
3.5 to 4 ft.	11.0	---

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter

TABLE 6S
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings MVP7-MVP9

TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	59
1 to 1.5 ft	9.3
2.5 to 3 ft	7.7
3.5 to 4 ft.	9.7

EXCAVATION SCENARIOS

Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	59	4.1
Underlying Soil (1 to 4 ft.) [1]	*8.8*	*0.6*
0 to 2.5 ft.	29.2	2.0
Underlying Soil (2.5 to 4 ft.) [1]	*8.4*	*0.6*
0 to 3.5 ft.[1]	23.0	1.6
Underlying Soil (3.5 to 4 ft.) [1]	*9.7*	*0.7*
0 to 4 ft.[1]	21.4	1.5

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using UCLs and/or maximum values.
Regression Line Slope: $y = 0.07 \quad x$

TABLE 6T
Summary of Statistical Analysis
Caldecott Tunnel Improvements
Alameda and Contra Costa Counties, California

Borings B49-51

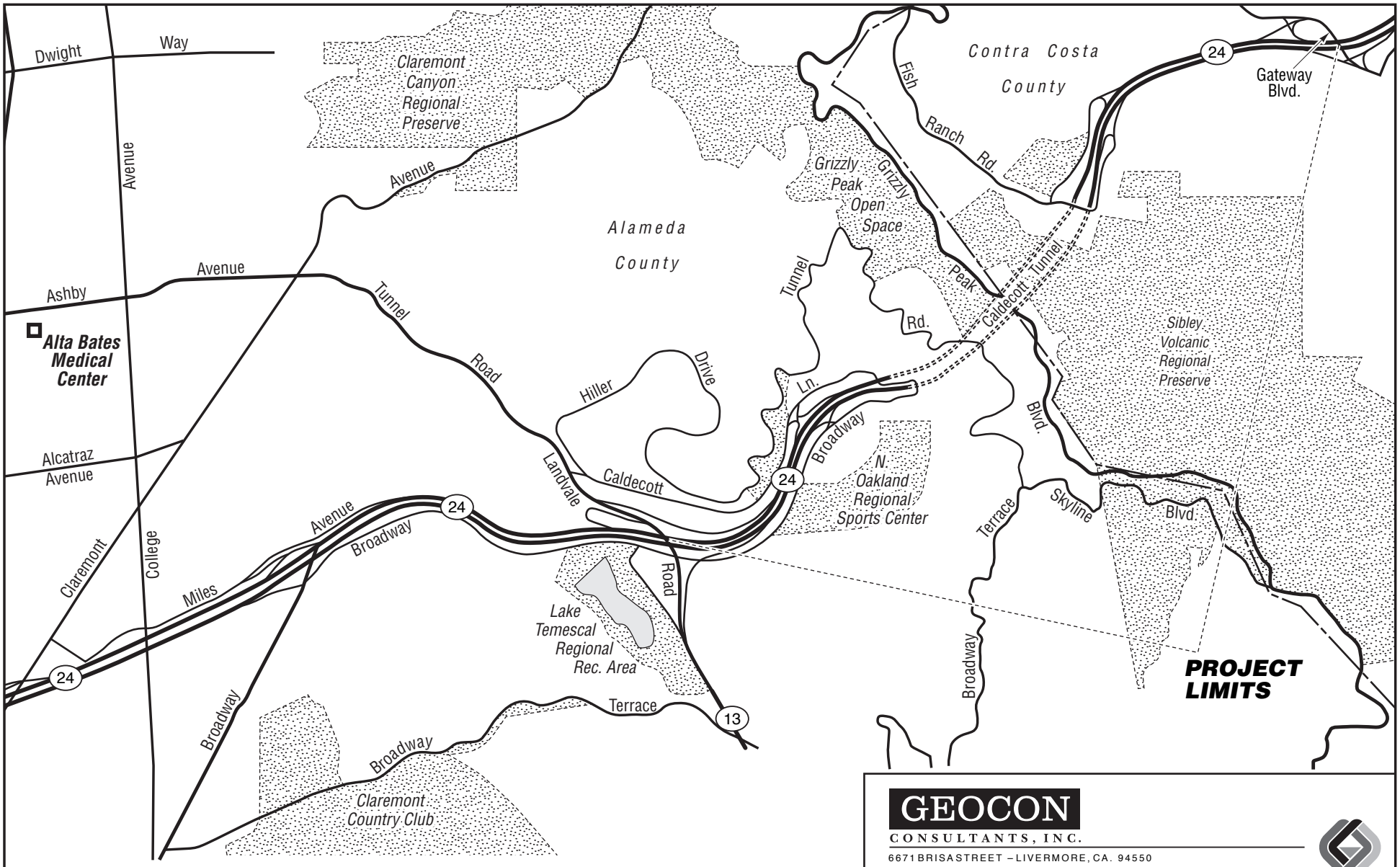
TOTAL LEAD UCLs

	Total Lead (mg/kg) Maximum
0 to 0.5 ft	440
1 to 1.5 ft	590
1.5 to 2.5 ft	450

EXCAVATION SCENARIOS

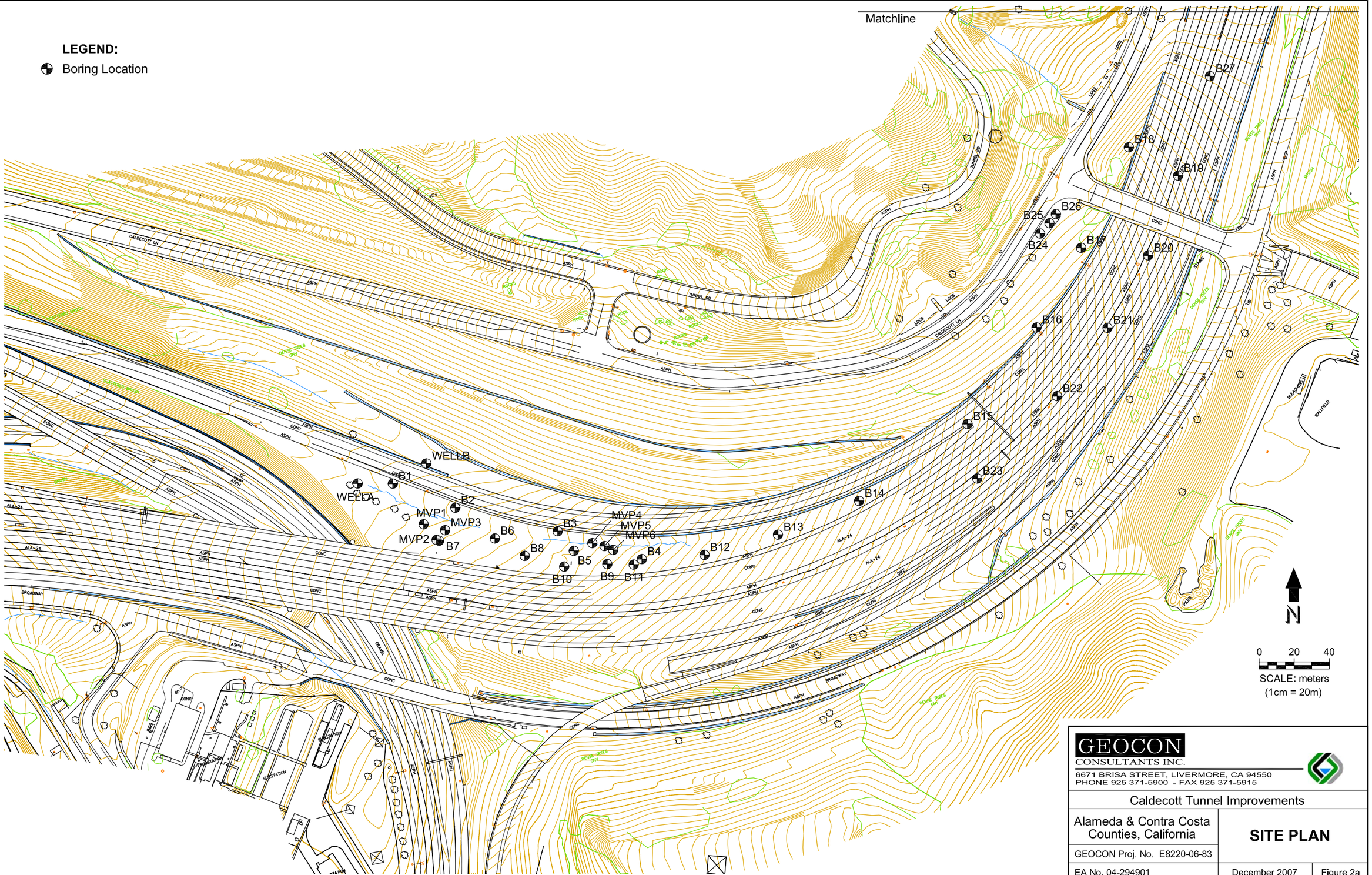
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1 ft.	440	30.8
Underlying Soil (1 to 2.5 ft.) [1]	*497*	*34.8*
0 to 2 ft.	490	34.3
Underlying Soil (1.5 to 2.5 ft.) [1]	*450*	*31.5*
0 to 2.5 ft.[1]	474	33.2

UCL = Upper Confidence Limit (90% UCL is applicable for waste classificattion; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.
[1] = Average Total Lead concentrations were calculated using maximum values.
Regression Line Slope: $y = 0.07 \quad x$



GEOCON
CONSULTANTS, INC.
6671 BRISA STREET – LIVERMORE, CA. 94550
PHONE 925 371-5900 – FAX 925 371-5915

Caldecott Tunnel Improvements		
Alameda & Contra Costa Counties, California	**VICINITY MAP**	
GEOCON Proj. No. E8220-06-83		
Task Order No. 83, EA 04-294901	December 2007	Figure 1



GEOCON
CONSULTANTS INC.
6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

Alameda & Contra Costa Counties, California

SITE PLAN

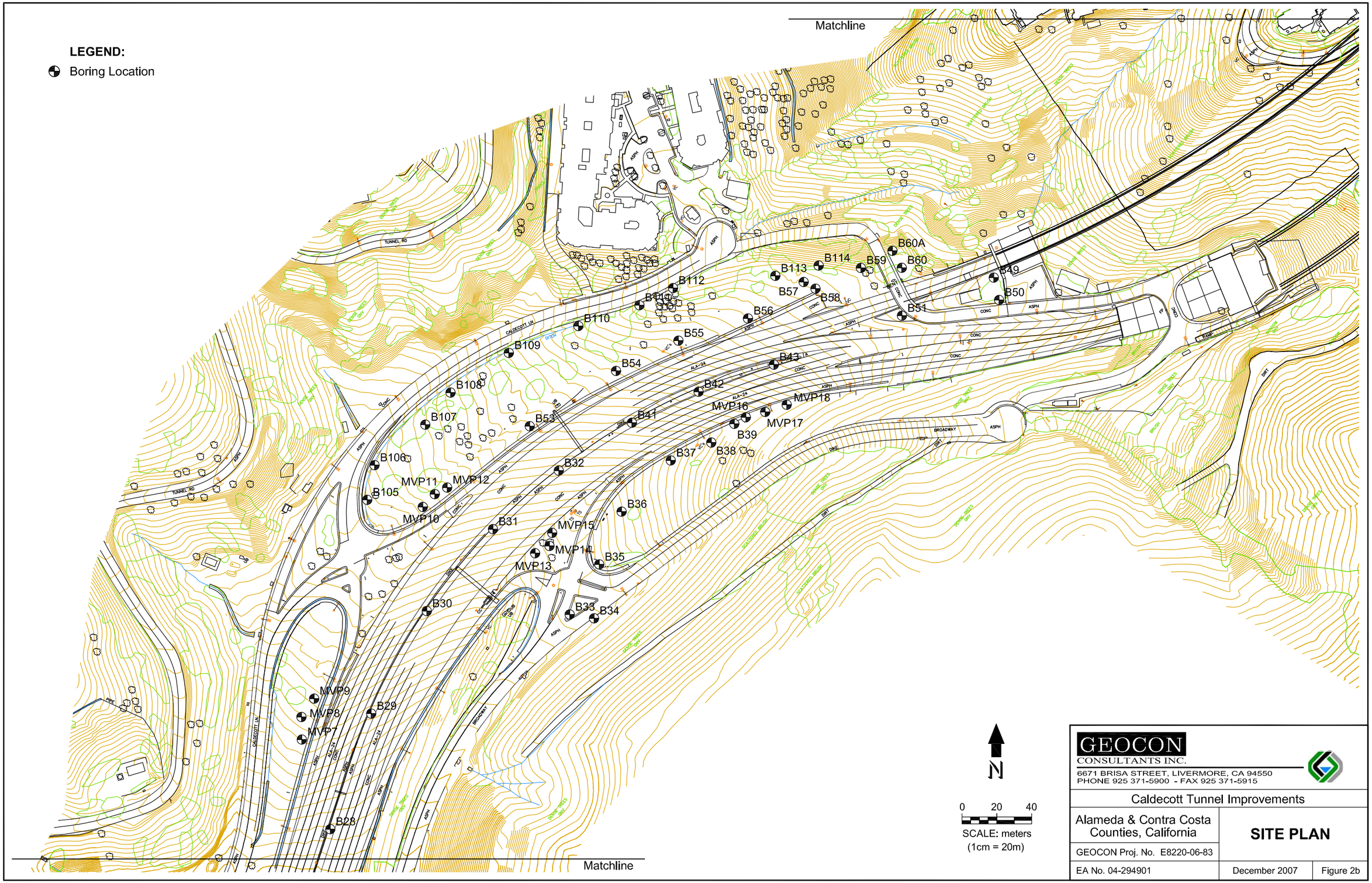
GEOCON Proj. No. E8220-06-83

EA No. 04-294901 | December 2007 | Figure 2a

SITE1107

LEGEND:

Boring Location



GEOCON
CONSULTANTS INC.
6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

Alameda & Contra Costa Counties, California

SITE PLAN

GEOCON Proj. No. E8220-06-83

EA No. 04-294901

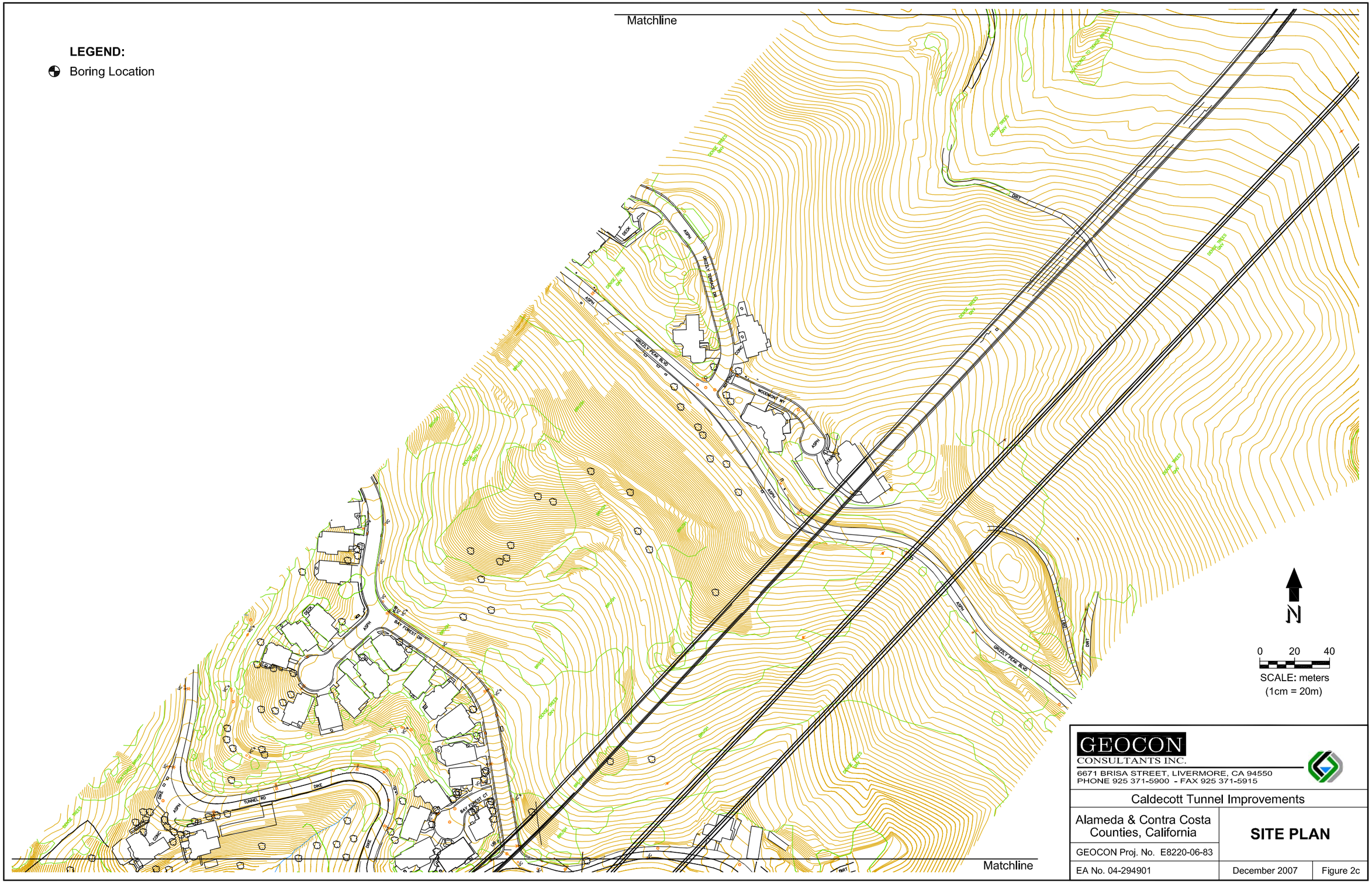
December 2007

Figure 2b

SITE1107

LEGEND:

Boring Location



GEOCON
CONSULTANTS INC.

6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

Alameda & Contra Costa Counties, California

SITE PLAN

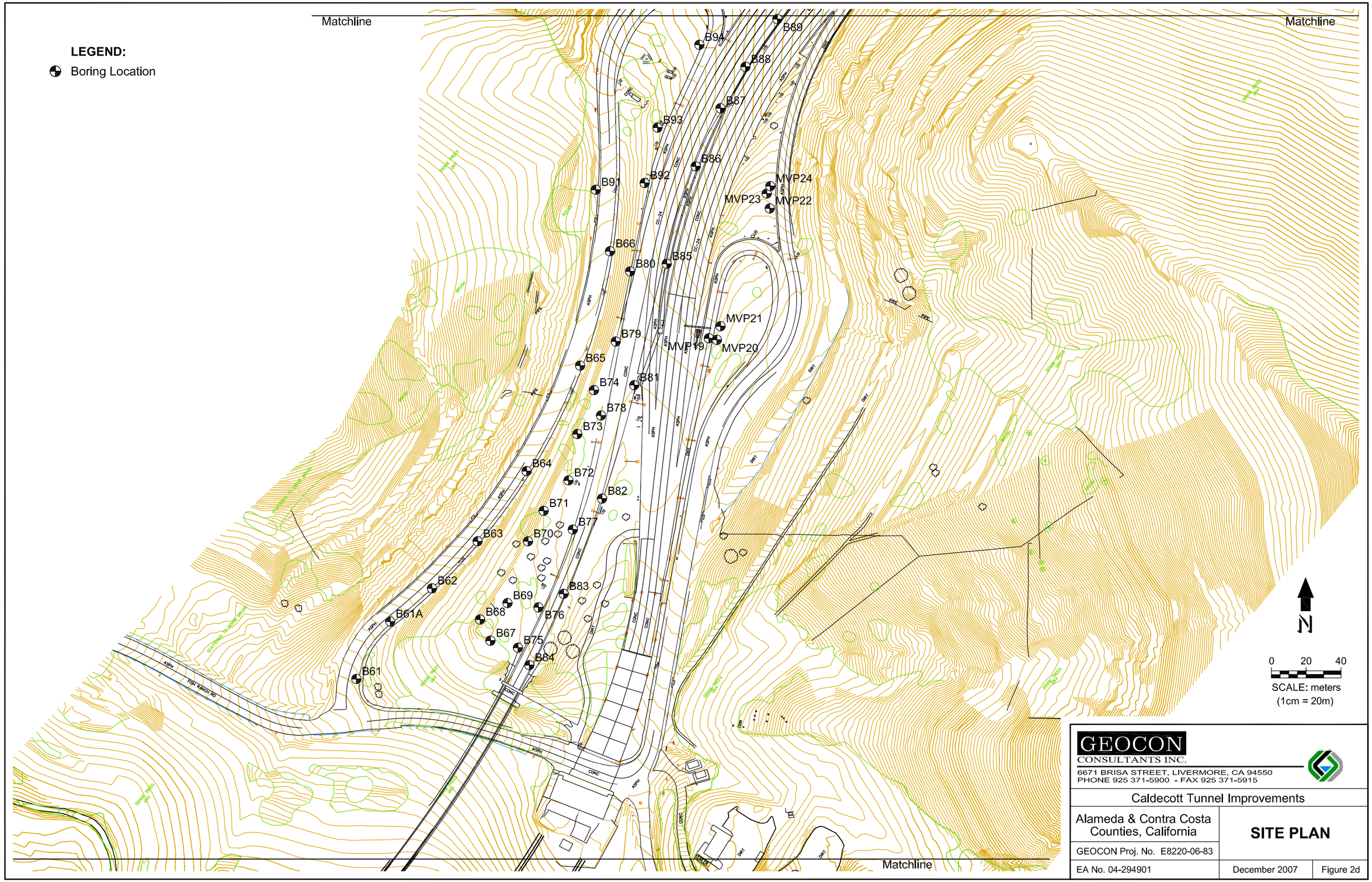
GEOCON Proj. No. E8220-06-83

EA No. 04-294901

December 2007

Figure 2c

SITE1107



GEOCON
CONSULTANTS INC.
6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

Alameda & Contra Costa Counties, California

SITE PLAN

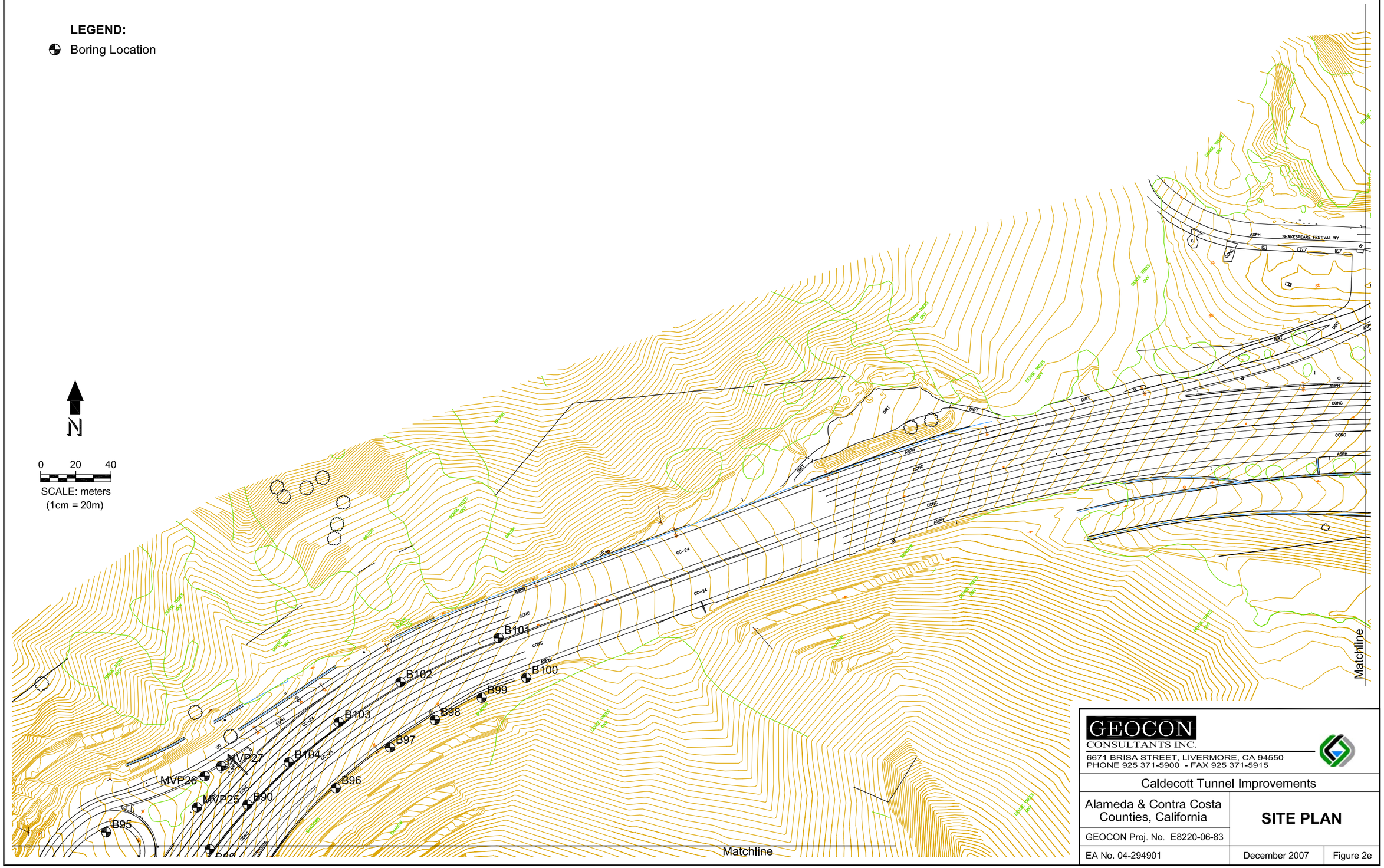
GEOCON Proj. No. E8220-06-83

EA No. 04-294901 | December 2007 | Figure 2d

SITE1107

LEGEND:

Boring Location



GEOCON
CONSULTANTS INC.
6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

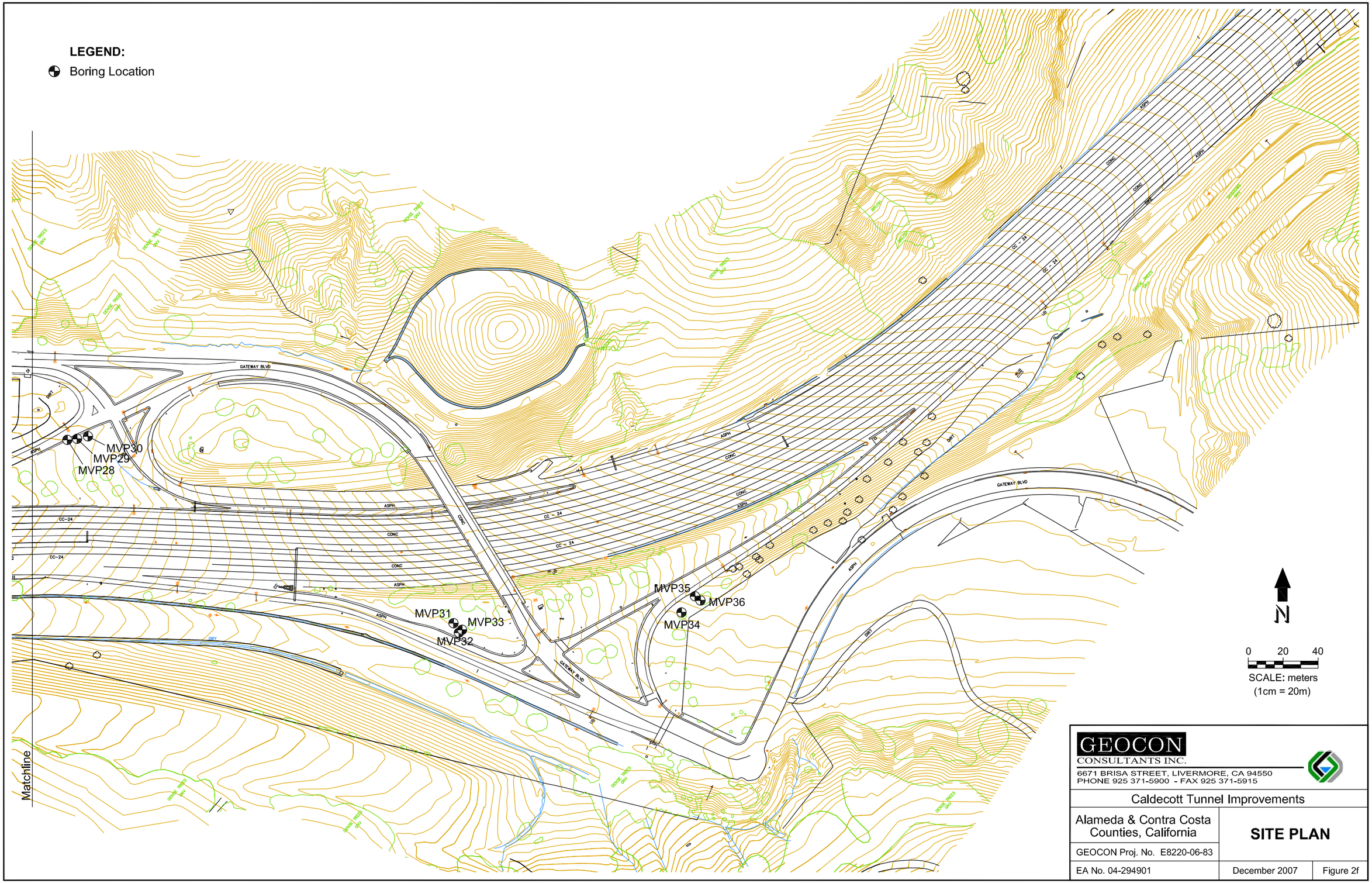
Alameda & Contra Costa Counties, California

SITE PLAN

GEOCON Proj. No. E8220-06-83

EA No. 04-294901 | December 2007 | Figure 2e

SITE1107



GEOCON
CONSULTANTS INC.
6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925 371-5900 - FAX 925 371-5915

Caldecott Tunnel Improvements

Alameda & Contra Costa Counties, California

SITE PLAN

GEOCON Proj. No. E8220-06-83

EA No. 04-294901 | December 2007 | Figure 2f

SITE1107