SITE CLEANUP PLAN
5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA
CITY OF EMERYVILLE

PREPARED FOR:
Emeryville Community Development Commission
1333 Park Avenue
Emeryville, California 94608

PREPARED BY:
Ninyo & Moore
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September 5, 2012
Project No. 401834001

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Mr. Markus Niebanck
Emeryville Community Development Commission
1333 Park Avenue
Emeryville, California 94608

Subject: Site Cleanup Plan
5701 Hollis Street
Emeryville, California

Dear Mr. Niebanck:

Ninyo & Moore has prepared this Site Cleanup Plan on behalf of the Emeryville Community Development Commission for the property located at 5701 Hollis Street in Emeryville, California. The purpose of this document is to submit details for implementation of soil remediation prior to redevelopment of the site.

We appreciate the opportunity to be of service to the City on this project.

Sincerely,

NINYO & MOORE

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

TABLE OF CONTENTS

Page

1. INTRODUCTION 1
   1.1. SCP Organization 1
   1.2. Site Description 2
   1.3. Summary of Previous Investigations 3
   1.4. May 2012 Waste Characterization Sampling Activities 4
      1.4.1. Soil Sampling and Analysis 4
      1.4.2. Soil Description 5
      1.4.3. Site Restoration and Investigation Derived Waste (IDW) 5
      1.4.4. Analytical Results 5
      1.4.5. Waste Characterization Analysis 9
      1.4.6. Data Validation 11
   1.5. Potential Environmental and/or Human Impacts 13
2. PLANNED FUTURE SITE USE 14
3. CLEANUP GOALS AND APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS 15
   3.1. Recommended Cleanup Goals 15
   3.2. California Environmental Quality Act (CEQA) 16
      3.2.1. California Environmental Quality Act Exemption 17
   3.3. Non-Hazardous and Hazardous Waste Management 17
   3.4. Bay Area Air Quality Management District (BAAQMD) 18
   3.5. Storm Water Discharge Management 18
4. ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) 18
   4.1. Remedial Action Scope 18
   4.2. Evaluation of Remedial Action Alternatives 20
      4.2.1. Alternative 1 – No Action 20
      4.2.2. Alternative 2 – Surface Capping/Institutional Controls 20
      4.2.3. Alternative 3 – Excavation/Off-Site Disposal 21
      4.2.4. Costs of Removal Action Alternatives 23
   4.3. Recommended Alternative 24
5. REMOVAL ACTION ACTIVITIES 25
   5.1. Pre-Field Activities 25
      5.1.1. Public Participation 25
      5.1.2. Permitting 25
      5.1.3. SSHSP 25
      5.1.4. Traffic Control and Transportation Plan 26
      5.1.5. Decontamination Plan 27
      5.1.6. Waste Profiling 27
   5.2. Pre-Excavation Field Activities 28

5.2.1. Utility Clearance 28
5.2.2. Well Abandonment 28
5.2.3. Delineation of Excavation Areas and Excavation Volumes 29
5.2.4. Security Measures 30
5.2.5. Contaminant Control Measures 30
5.3. Remediation Field Activities 31
5.3.1. Soil Excavation and Loading 31
5.4. Air and Meteorological Monitoring 32
5.4.1. Air Monitoring 32
5.4.2. Air Monitoring Strategy and Methodologies 33
5.4.3. Quantitative Monitoring 34
5.4.4. Meteorological Monitoring 35
5.5. Fugitive Dust Control Plan 35
5.6. Decontamination Procedures 36
5.7. Off-Site Disposal 37
5.8. Confirmation Sampling 39
5.8.1. Confirmation Sample Collection Methods 39
5.8.2. Confirmation Sample Analysis 40
5.8.3. Analytical Methods 42
5.9. Sample Handling, Documentation, and QA/QC Procedures 42
5.10. Confirmation Sample Analytical Results and Possible Over-Excavation 42
5.11. Treated Wood Waste (TWW) 43
5.12. Site Restoration 43
5.12.1. Load Checking 44
5.12.2. Diversion of Unacceptable Borrow 44
5.12.3. Documentation of Rejected Loads 44
6. SCHEDULE 45
7. REPORTING 45
8. LIMITATIONS 45
9. REFERENCES 47

Tables

Table A-1 – Confirmation Sample Locations, Depths, and Analysis
Table A-2 – Sample Containers, Volumes, Preservatives, and Holding Times
Table 1 – Analytical Results for Title 22 Metals
Table 2 – Analytical Results for TPH, VOCs, and SVOCs
Table 3 – Analytical Results for OCPs
Table 4 – Analytical Results for Herbicides
Table 5 – Excavation Volume and Remedial Cost Estimate Calculations

Figures

Figure 1 – Site Location
Figure 2 – Site Plan Boring Locations and Analytical Results Exceeding Cleanup Goals
Figure 3 – Boring Locations, Excavation Areas and Confirmation Sample Locations
Figure 4 – On Site Trucking Route, Dust Monitoring Locations, and Decontamination Areas
Figure 5 – Local Transportation Routes

Appendices

Appendix A – Supporting Documents
Appendix B – Boring Logs
Appendix C – Laboratory Results
Appendix D – Site Specific Health and Safety Plan
Appendix E – Dust Monitoring and Control Plan

1. INTRODUCTION

The Emeryville Community Development Commission contracted Ninyo & Moore to prepare this Site Cleanup Plan (SCP) for the removal action at the former Industrial Hard Chrome Plating Company property located at 5701 Hollis Street in Emeryville, California (site). This removal action is being funded through the Revolving Loan Fund (RLF) Program, a Brownfields cleanup loan program administered through a cooperative agreement with the United State Environmental Protection Agency (USEPA) in partnership with the California Department of Toxic Substances Control (DTSC) and other government agencies. The Emeryville Community Development Commission is acting as the oversight agency under a Memorandum of Understanding (MOU) with the DTSC and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). The Emeryville Community Development Commission will prepare a Conditional Approval of the SCP for DTSC and SFRWQCB concurrence.

1.1. SCP Organization

This SCP contains a summary of previous environmental investigations conducted on the site, identifies constituents of concern (COCs) and associated proposed cleanup goals (CGs), and includes a description of the proposed remedial alternative. Details of the remedial design implementation, including site preparation, soil excavation and loading, and off-site disposal are included in this SCP.

This SCP is organized into the following sections:

- Section 1 presents the introduction, a site description, a summary of previous site investigations, a summary of findings from recent waste characterization sampling activities, and potential human and/or environmental impacts.
- Section 2 presents a discussion of planned future site use.
- Section 3 presents applicable or relevant and appropriate requirements (ARARs).
- Section 4 presents an Engineer Evaluation/Cost Analysis (EE/CA).
- Section 5 describes the removal action activities including pre-field activities, pre-excavation field activities, and remediation field activities.

- Section 6 presents the project schedule.
- Section 7 discusses project reporting.
- Section 8 presents standard limitations.
- Section 9 presents references.

Supporting documents are presented in Appendix A, boring logs from recent waste characterization sampling activities are presented in Appendix B, laboratory analytical reports from recent waste characterization sampling activities are presented in Appendix C, the Site Specific Health and Safety Plan (SSHSP) is presented in Appendix D, and the Dust Monitoring and Control Plan is presented in Appendix E.

1.2. Site Description

The subject site is located in a commercial/industrial area of Emeryville between Peladeau Street, Hollis Street, Stanford Avenue, and Powell Street (Figure 1). The site is approximately 320 feet long and 18 feet wide (on average) and currently consists of vacant land, with exposed soil and vegetation in the northern portion, and asphalt pavement in the southern portion. Railroad tracks were formerly located adjacent to the site's western boundary, and a railroad spur existed on the site between 1931 and 2005 (Figure 2).

Based on information provided to Ninyo & Moore by the City of Emeryville (City), the site was part of the adjoining 5701 Hollis Street property until 2010. 5701 Hollis Street was the former Industrial Hard Chrome Plating Company, a former metal plating facility. The parcel for 5701 Hollis Street was divided in 2010, with the Emeryville Community Development Commission acquiring the subject site which will be remediated and thereafter transferred to and redeveloped by the City as part of the Emeryville Greenway. A copy of the City resolution describing the acquisition of the site is included in Appendix A.

1.3. Summary of Previous Investigations

Soil and groundwater at 5701 Hollis Street and surrounding properties (including the subject site now owned by the City) were characterized between 2000 and 2006 for metals, including arsenic, hexavalent chromium, and lead. Laboratory analytical results indicated that the highest concentration of hexavalent chromium was 130 milligrams per kilogram (mg/kg) in soil and 310,000 micrograms per liter (µg/L) in groundwater. The hexavalent chromium-impacted groundwater was remediated under SFRWQCB oversight through a series of cheese whey injections between 2003 and 2005. Based on post-remediation samples collected, hexavalent chromium concentrations in groundwater had been reduced to a maximum of 0.024 µg/L.

According to the City, in addition to the hexavalent chromium impacts to soil, elevated concentrations of arsenic, and to a lesser extent, lead, were reported in site soils, and were attributed to the former railroad spur on site. Arsenic and lead concentrations in site soil near the site's western boundary may also be attributed to the railroad tracks formerly located adjacent to and west of the site's western border. Remedial action addressing hexavalent chromium and other metals in soil consisted of the maintenance of the asphalt parking lot cap and a restriction on future property use.

A Declaration of Covenant and Environmental Restriction (Covenant) was recorded for the subject site in July 2006 at the SFRWQCB (SFRWQCB, 2006a). The Covenant requires that the subject site be occupied by only commercial and/or industrial properties, and that it remains capped to limit exposure to subsurface contaminants. In October 2006, the SFRWQCB issued a No Further Action letter (SFRWQCB, 2006b) for the subject site based on the Covenant, confirming the completion of inspection and remediation actions on site. The City acquisition of the land for redevelopment as part of the Emeryville Greenway requires the completion of additional cleanup actions.

In March 2006, Gribi Associates (GA) completed a *Risk Management Plan* (RMP) for the 5701 Hollis Street property, which at the time included the subject site, (Exhibit 2 in RWQCB, 2006a). The RMP included a discussion of previous investigations at the site.

According to the RMP, site characterization activities were completed between 2000 and 2003 by several consultants prior to the retention of GA. Results of the investigations documented the presence of arsenic, chromium and lead in soil and groundwater at concentrations exceeding regulatory standards.

1.4. May 2012 Waste Characterization Sampling Activities

On May 16, 2012, Ninyo & Moore performed waste characterization soil sampling activities at the site in accordance with the guidelines presented in Ninyo & Moore's Sampling and Analysis Plan (SAP) dated April 25, 2012, which was approved by Environmental Protection Agency (EPA) in a letter dated May 2, 2012. Ten borings (B-1 through B-10) were advanced to approximately 5 feet below ground surface (bgs) in areas throughout the site using a direct push drill rig (Figure 2).

1.4.1. Soil Sampling and Analysis

Soil samples were collected from depths of approximately 0.5-1.0, 2.0-2.5, and 4.5-5.0 feet bgs in each boring. Soil sample identifications ending with the numbers 1, 2.5, and 5 correspond with the sample collection depths of approximately 0.5-1.0, 2.0-2.5, and 4.5-5.0 feet bgs, respectively. Soil sampling was performed in accordance with the methods and procedures described in the SAP, including the collection of 10 percent duplicate samples, collection of soil samples in preserved vials in accordance with EPA Method 5035 for analysis of volatile organic compounds (VOCs) and total petroleum hydrocarbons as gasoline (TPHg), decontamination of sampling equipment between boring locations using a steam cleaner, and the collection of an equipment blank sample (EB-1) for analysis of lead and arsenic. Co-located borings were advanced to approximately 1 foot bgs adjacent to Borings B-1, B-2 and B-8 for the collection of duplicate soil samples from approximately 0.5-1.0 feet bgs. The soil samples from approximately 0.5-1.0 feet bgs in each boring were analyzed for Title 22 metals, total petroleum hydrocarbons as diesel (TPHd), as motor oil (TPHmo), and TPHg, organochlorine pesticides (OCPs), chlorinated herbicides, VOCs, and semi-volatile

organic compounds (SVOCs). Deeper samples were initially placed on hold and analyzed based on analytical results from the more shallow samples.

1.4.2. Soil Description

Soil cores were inspected and screened in the field using a photoionization detector (PID) meter to evaluate the presence of organic vapors in the soil cores and PID readings were recorded on borings logs. The lithology observed in the soil cores was classified in accordance with the Unified Soil Classification System (USCS) and recorded on boring logs. Fill material consisting of gravelly sand or gravelly clayey sand was encountered in all borings extending from the ground surface or just beneath asphalt pavement to approximately 1.5 to 2 feet bgs in most borings. Fill was also encountered in Boring B-1 extending to approximately 3.5 feet bgs, and in Boring B-4 extending to the total depth explored of approximately 5 feet bgs. Native clayey soil was encountered beneath the fill material. Borings logs from the waste characterization soil sampling activities are included in Appendix B.

1.4.3. Site Restoration and Investigation Derived Waste (IDW)

IDW including soil cuttings and decontamination rinsate water was contained in a 55-gallon drum which was labeled and left on-site. The IDW was characterized as non Resource Conservation and Recovery Act (RCRA) California Hazardous (Cal-Haz) waste based on the analytical results from soil samples. On June 22, 2012, the 55-gallon drum was removed from the site by Dillard Environmental Services, a licensed hazardous waste hauler located in Byron, California, and disposed of at the US Ecology Nevada Inc. facility located in Beatty, Nevada. The temporary EPA ID number CAC002696872 was obtained for disposal of the IDW.

1.4.4. Analytical Results

Analytical laboratory results from recent waste characterization sampling activities are summarized in Tables 1 through 4 and copies of analytical laboratory reports are included in Appendix C. The analytical results were compared to the RWQCB Direct

Exposure Soil Screening Levels (ESLs), Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (due to the presence of multiple COCs) and the California Human Health Screening Levels (CHHSLs) for Soil for Residential Land Use (Residential CHHSLs) established by the Office of Environmental Health and Hazard Assessment (OEHHA). The analytical results are discussed in detail in the following sections.

1.4.4.1. Metals in Soil

Concentrations of antimony, arsenic, chromium, lead, silver, vanadium, and mercury were detected at concentrations exceeding CHHSLs and/or ESLs (Table 1) and are discussed further below. The remaining 10 Title 22 Metals (barium, beryllium, cadmium, cobalt, copper, molybdenum, nickel, selenium, thallium, and zinc) were not detected at concentrations exceeding CHHSLs or ESLs, therefore these metals are not considered COCs and are not discussed further below.

- Antimony was detected in one soil sample (B4-S-1) at a concentration of 280 mg/kg, which exceeds the ESL of 6.3 mg/kg and CHHSL of 30 mg/kg. No other concentrations of antimony which exceed the ESL or CHHSL were detected in the soil samples analyzed.

- Arsenic was detected at concentrations ranging from 2.2 to 580 mg/kg in soil samples collected on site, exceeding the ESL of 0.39 mg/kg and the CHHSL of 0.007 mg/kg. Naturally occurring background concentrations of arsenic in soil in the region of the site routinely exceed the ESL and CHHSL. A background arsenic concentration of 17 mg/kg was previously established for a separate portion of the Emeryville Greenway, known as Horton Landing Park and located approximately 400 feet southwest of the site, as presented in the SCP prepared by Erler & Kalinowski Inc. (EKI), dated March 5, 2011. This arsenic background concentration was also approved for the portion of the Emeryville Greenway to be developed at 1301 59th Street, located approximately 600 feet northeast of the site, as presented in the Removal Action Workplan prepared by Sequoia Environmental, dated October 7, 2011. Based on the similarities in soil types and historic usage as railroad tracks and the planned future site use as a park, 17 mg/kg is proposed to be the background concentration for this site. The highest concentration of arsenic was detected in sample B6-S-1. The vertical extent of impacts from arsenic was defined by concentrations of arsenic detected below background at approximately 2 feet bgs in Borings B-3, B-5, B-7, B-8, and B-10; and at approximately 4.5 feet bgs in Boring B-6. Elevated

concentrations of arsenic with respect to the background concentration were reported in the deepest samples collected in Borings B-1, B-2, and B-4, so the vertical extent of soil impacts from arsenic was not defined below 5 feet bgs in these borings. Arsenic was detected at 3.8 mg/kg in sample B9-S-1 which is below background, therefore deeper soil samples from Boring B-9 were not analyzed for arsenic.

- Select soil samples (B4-S-1, B8-S-2.5, and B8-S-5) were analyzed for chromium VI based on elevated total chromium concentrations. Chromium VI analysis was performed for the sample with the highest detected concentration of total chromium (B4-S-1) to evaluate potential health risk associated with potential exposure to dust during site cleanup activities, and the other samples were analyzed for chromium VI because the results would affect the depth of proposed excavation. Chromium VI was detected at 2,700 mg/kg in sample B4-S-1, which is above the ESL and the CHHSL. Chromium VI was also detected at 15 mg/kg in sample B8-S-2.5, and 3,100 mg/kg in B8-S-5. The chromium VI result from sample B8-S-2.5 exceeded the ESL but was below the CHHSL. The chromium VI result from B8-S-5 exceeds both the ESL and CHHSL.

- Total chromium was detected at concentrations ranging from 14 to 17,000 mg/kg in soil samples collected on site. There is no CHHSL or ESL for total chromium. Elevated concentrations of total chromium were reported in the deepest samples collected in borings B-1, B-2, B-4, and B-8, so the vertical extent of soil impacts from total chromium was not defined past 5 feet bgs in these borings. Low concentrations of chromium were detected in samples collected at approximately 2.5 feet bgs in borings B-3, B5, and B7, at approximately 4.5 feet bgs in boring B-6, and at 1 foot in borings B9-S-1 and B-10-S-1, therefore deeper soil samples from these borings were not analyzed for total chromium.

- Lead was detected at concentrations ranging from 4.1 to 16,000 mg/kg in soil samples collected on site, with the highest concentration detected in sample B4-S-1. Concentrations of lead exceeded the ESL of 260 mg/kg and/or the CHHSL of 80 mg/kg in all soil samples collected from approximately 0.5-1.0 feet bgs, with the exception of samples B9-S-1 and B10-S-1. The vertical extent of impacts from lead was defined at approximately 2 feet bgs in Borings B3, and B-5 through B-8; and at 4.5 feet bgs in Borings B-1, B-2, and B-4.

- Concentrations of silver ranging from 1.8 to 460 mg/kg were detected in soil samples collected on site. The concentrations of silver detected in samples B2-S-1 (110 mg/kg), B4-S-1 (460 mg/kg), and B4-S-2.5 (210 mg/kg) exceed the ESL of 78 mg/kg, and the concentrations of silver detected in samples B4-S-1 also exceeds the CHHSL of 380 mg/kg. No other concentrations of

silver which exceed the ESL or CHHSL were detected in the soil samples analyzed.

- Concentrations of vanadium ranging from 12 to 36 mg/kg were detected in soil samples collected on site. Most of the detected concentrations of vanadium exceed the ESL of 16 mg/kg, however all concentrations are well below the CHHSL of 530 mg/kg. Because the detected concentrations of vanadium are well below the CHHSL, vanadium is not considered a COC.

- Concentrations of mercury ranging from 0.10 to 7.5 mg/kg were detected in soil samples collected on site. The concentration of mercury detected in sample B2-S-2.5 (7.5 mg/kg) exceeds the ESL of 1.3 mg/kg, and is below the CHSSL of 18 mg/kg. No other concentrations of mercury which exceed the ESL or CHHSL were detected in the soil samples analyzed. Because the detected concentration of mercury are well below the CHHSL and the area around sample B2-S-2.5 will be remediated due to other constituents, mercury is not considered a COC.

1.4.4.2. TPH in Soil

TPHg was not detected in any of the soil samples analyzed. Concentrations of TPHd (ranging from 1.4 to 960 mg/kg) and TPHmo (ranging from 3.1 to 1,800 mg/kg) were detected in soil samples collected on site. The detected concentrations of TPHd and TPHmo exceed their respective ESLs of 110 mg/kg and 370 mg/kg in all soil samples collected from approximately 0.5-1.0 feet bgs with the exception of sample B5-S-1, and TPHd in sample B9-S-1. The vertical extent of elevated TPHd and TPHmo (with respect to ESLs) was defined at 2 feet bgs in all borings with the exception of Boring B-2, in which slightly elevated TPHd (120 mg/kg) was detected in the sample collected from 2.0-2.5 feet bgs. The vertical extent of impacts from TPHd was defined at 4.5 feet bgs in Boring B-2.

1.4.4.3. SVOCs in Soil

SVOCs were not detected in soil samples collected from approximately 0.5-1.0 feet bgs, however elevated detection limits were reported for all samples collected from approximately 0.5-1.0 due to sample dilution. All soil samples collected from approximately 2.0-2.5 feet bgs were therefore analyzed for SVOCs. No

concentrations of SVOCs were detected in any of the soil samples collected from approximately 2.0-2.5, therefore deeper soil samples were not analyzed for SVOCs.

1.4.4.4. VOCs in Soil

Trichloroethylene (TCE) was detected in one soil sample (B6-S-1) at a concentration of 10 µg/kg, which is well below the ESL of 1,900 µg/kg. No other concentrations of VOCs were detected in the soil samples collected from approximately 0.5-1.0 feet bgs, therefore deeper soil samples were not analyzed for VOCs.

1.4.4.5. OCPs in Soil

Concentrations of OCPs including chlordane (ranging from 13 to 170 µg/kg), alpha chlordane (ranging from 1.0 to 25 µg/kg), gamma chlordane (ranging from 1.4 to 28 µg/kg), 4,4'-DDD (13 µg/kg), 4,4'-DDE (ranging from 4.4 to 21 µg/kg), 4,4'-DDT (ranging from 25 to 200 µg/kg), and dieldrin (3.6 µg/kg) were detected in soil several samples collected from approximately 0.5-1.0 feet bgs. The detected concentrations of OCPs do not exceeded their respective ESLs or CHHSLs, therefore deeper soil samples were not analyzed for OCPs.

1.4.4.6. Herbicides in Soil

Pentachlorophenal (PCP) was detected in one soil sample (B4-S-1) at a concentration of 69 µg/kg, which is well below the CHHSL of 4,400 µg/kg and the ESL of 3,000 µg/kg. No other concentrations of herbicides were detected in the soil samples collected from approximately 0.5-1.0 feet bgs, therefore deeper soil samples were not analyzed for herbicides.

1.4.5. Waste Characterization Analysis

Additional solubility analysis of soil samples was performed for waste characterization purposes in accordance with California Title 22 and RCRA guidelines. Soil samples B1-S-5, B3-S-2.5, B7-S-1 and B8-S-2.5 contained total metals concentrations which

exceeded the Trigger Levels requiring further solubility analysis and were below the Total Threshold Limit Concentrations (TTLCs) listed in the table below, therefore further analysis of these samples for soluble metals was performed using the Waste Extraction Test (WET) method. None of the solubility results for these samples exceeded the Solubility Threshold Limit Concentrations (STLCs) listed in the table below; therefore these samples were characterized as non-hazardous waste (Table 1). Soil samples with total metals concentrations exceeding the TTLC were further analyzed for soluble metals using the Toxicity Characteristic Leaching Procedure (TCLP) to evaluate their hazardous waste classification. Samples B2-S-5 and B4-S-5 exceeded the TCLP chromium limit of 5 milligrams per liter (mg/L) and were therefore classified as RCRA hazardous waste.

California Title 22 Limits			
Metals	**Soluble Threshold STLC: mg/L**	**Trigger Level mg/kg**	**Total Threshold TTLC: mg/kg**
Antinomy	15.0	150.0	500.0
Arsenic	5.0	50.0	500.0
Barium	100.0	1,000.0	10,000.0
Beryllium	0.75	7.5	75.0
Cadmium	1.0	10.0	100.0
Chromium	5.0	50.0	500.0
Cobalt	80.0	800.0	8,000.0
Copper	25.0	250.0	2,500.0
Lead	5.0	50.0	1000.0
Mercury	0.2	2.0	20.0
Molybdenum	350.0	3,500.0	3,500.0
Nickel	20.0	200.0	2,000.0
Selenium	1.0	10.0	100.0
Silver	5.0	50.0	500.0
Thallium	7.0	70.0	700.0
Vanadium	24.0	240.0	2,400.0
Zinc	250.0	2,500.0	5,000.0

1.4.6. Data Validation

Data were evaluated to determine whether the quantitative and qualitative needs of the sampling and analysis program had been met based on Ninyo & Moore's corporate data quality objectives (DQOs). The DQOs were specified in terms of specific data quality indicators (DQIs), i.e. comparability, representativeness, precision, accuracy, and completeness. The data generated from the sampling and analyses may not be considered invalid if the DQOs or criteria are not fully achieved, but variances will trigger the appropriate Quality Assurance/Quality Control (QA/QC) measures needed to evaluate and correct these activities, if necessary.

1.4.6.1. Surrogate Recoveries

Surrogate recoveries were within the limits established by the laboratories.

1.4.6.2. Laboratory QA/QC Samples

Laboratory QA/QC samples included method blanks, laboratory control samples (LCS), laboratory control samples duplicates (LCSD), matrix spikes (MS), and matrix spike duplicates (MSD). The percentage recoveries and relative percent differences were all within the specific acceptance limits for these types of samples, therefore the relevant QA/QC sample results are considered satisfactory and acceptable.

1.4.6.3. Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data set is considered comparable because EPA and/or DTSC Guidance methods were used in the sampling and analyses, and field activities met the standards and requirements set forth by DTSC. All data were calculated and reported in units consistent with standard procedures so that the results of the analyses can be compared with those of other laboratories, if necessary. The DQI for comparability has been met.

1.4.6.4. Representativeness

Representativeness is the degree to which data collected are an accurate characterization of the media sampled. Careful planning of the field activities based on known conditions and historical site usage was undertaken to promote a representative work plan. The data are considered representative based on the sampling and analytical procedures adherence to appropriate protocols and the general agreement in analytical results between primary and respective duplicate field samples. The DQI for representativeness has been met.

1.4.6.5. Precision

Precision measures the reproducibility of repetitive measurements by assessing the RPD between LCS/LCSD, and MS/MSD sample analysis. If the RPD exceeds limits as set by the laboratories, data may be qualified. The calculated RPDs between primary and duplicate analyses were within the laboratory's acceptance criteria. Laboratory duplicate sample analyses were deemed acceptable. The DQI for precision has been met.

1.4.6.6. Accuracy

Accuracy is a statistical measurement (the degree of agreement of a measurement with a known or true value) of correctness and includes components of random error (variability due to imprecision**)** and systematic error. Laboratory accuracy is expressed as the percent recovery by assessing LCS/LCSD, MS/MSD, and initial and continuing calibration of instruments. All recoveries of LCS/LCSD and MS/MSD were reported within the corresponding control limits. Field accuracy is assessed through the analysis of equipment rinsate blanks to monitor errors associated with the sampling process including equipment decontamination procedures, field contamination, sample preservations, and sample handling. The DQO for equipment rinsate blanks is that all reported values are less than the corresponding

reporting limits. The analytical results of the equipment rinsate were ND for their respective analytes which meets the accuracy DQI.

1.4.6.7. Completeness

Completeness is the amount of valid data obtained compared to the amount expected under ideal conditions. The DQI for completeness is to obtain valid results for 100 percent of the planned data results. Completeness may be affected by such factors as sample bottle breakage and non-acceptance of analytical results. The analytical data for the samples are 100 percent complete, and the DQI for completeness has been met.

1.5. Potential Environmental and/or Human Impacts

The site is located in a developed urban area with no environmentally sensitive habitats located within close proximity to the site, therefore potential impacts to environmental receptors are unlikely. Potential human health risks at the subject site include exposure to elevated concentrations of COCs including TPHd, TPHmo, antimony, arsenic, chromium VI, lead, silver and mercury in soil. Potential exposure pathways include direct contact, ingestion, and inhalation of particulates. Remediation of soil containing COCs at concentrations exceeding site specific CGs, as discussed in Section 2.2 below, will mitigate potential health risks associated with these potential exposure pathways. During soil remediation activities, inhalation of particulates would be the most significant potential exposure route due to the generation of dust. The elevated concentrations of arsenic, lead, and chromium VI detected in soil on site pose the most significant potential inhalation exposure risk and are discussed further below.

Arsenic: According to information presented in the GA report titled Request to Name Union Pacific Railroad (UPRR) Responsible for Arsenic Soil Impacts, Former Industrial Hard Chrome Site, 5701 Hollis Street, Emeryville, California (Gribi 2006), arsenic was detected at 1,400 mg/kg in a sample previously collected from 4 feet bgs near the southern end of the

site in Boring SB-2. It is uncertain whether Boring SB-2 was actually located on site based on its location presented on Figure 3 of the GA report referenced above, however it will be assumed that this concentration of arsenic is representative of soil on site based on its proximity to the site boundary. A copy of Figure 3 of the GA report referenced above is included in Appendix A. This highest detected concentration of arsenic was used to evaluate potential exposure issues associated with inhalation of particulates during site cleanup activities as discussed in Section 5.4.2.1 below.

Lead: The highest detected concentration of lead in soil on site of 16,000 mg/kg was reported in the sample collected from approximately 0.5-1.0 feet bgs in Boring B4. This concentration was used to evaluate potential exposure issues associated with inhalation of particulates during site cleanup activities as discussed in Section 5.4.2.1 below.

Chromium VI: The highest detected concentration of chromium VI in soil on site of 3,100 mg/kg was detected in the sample collected from approximately 4.5-5.0 feet bgs in Boring B-8. This concentration of chromium VI was used to evaluate potential exposure issues associated with inhalation of particulates during site cleanup activities as discussed in Section 5.4.2.1 below.

2. PLANNED FUTURE SITE USE

The primary objective for site cleanup is to reduce the volume, toxicity, and mobility of site contaminants to acceptable, risk-based levels for anticipated future site use. Specifically, the remedial action objective for this site is to reduce the concentrations of metals and TPH compounds in site soil to below their acceptable CGs in an effective and expedient manner.

A City park, a portion of the Emeryville Greenway, is proposed for future site use. As described above, analytical testing has shown that the subject site soil is contaminated with metals and petroleum hydrocarbons due to operations related to the former railroad spur and metal plating facility. The Covenant, recorded in association with previously completed remediation, required additional protective measures if the land is to be redeveloped for purposes other than a

commercial/industrial paved parking lot. The Emeryville Community Development Commission acquired the subject site in 2010, and following remediation will transfer the site to the City to be redeveloped as a segment of the Emeryville Greenway.

3. CLEANUP GOALS AND APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS

Previous investigations of the site indicate the presence of the COCs in soil at concentrations exceeding regulatory guidelines. The following sections discuss CGs and ARARs for the site.

3.1. Recommended Cleanup Goals

Potential exposure pathways for receptors (park patrons and construction workers) include direct contact (dermal absorption), ingestion, and inhalation of particulates.

In terms of site CGs, due to the City's desire to use the site as a park, the RWQCB Direct ESLs, Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (due to the presence of multiple COCs) and/or the CHHSLs for Soil for Residential Land Use (Residential CHHSLs) will generally be used as the CGs for the subject site. If both an ESL and CHHSL are available for a given COC, the lowest value between the ESL and CHHSL will be used as the CG.

As discussed in Section 1.4.4.1 above, naturally occurring concentrations of arsenic in soil in the region routinely exceed the ESL and CHHSL for arsenic; therefore, the CG for arsenic will be established based on the evaluation of background arsenic concentrations in the site vicinity. Based on an evaluation of arsenic concentrations detected on the greenway property adjacent to the west of the site, known as UPRR Parcel 6, an arsenic CG of 24 mg/kg was established for the previous cleanup of this western adjacent property. The soil types and historic usage are similar for the two sites, and the site will be developed as an extension of the same park which will occupy the western adjacent property. A background arsenic concentration of 17 mg/kg was previously established for a separate portion of the Emeryville Greenway, known as Horton Landing Park, located approximately 400 feet southwest of the

site. Based on the similarities in soil types and historic usage and the planned future site use as a park, the proposed CG for arsenic is 17 mg/kg.

The purpose of the actions described in this SCP will be to reduce concentrations of COCs to below the following CGs:

- The 95% upper confidence limit (UCL) for lead in soil must achieve the CHHSL of 80 mg/kg for residential soil.
- The 95% UCL for arsenic in soil must achieve the CG of 17 mg/kg.
- The 95% UCL for hexavalent chromium in soil must achieve the ESL of 9.4 mg/kg.
- Antimony in soil must be below the ESL of 6.3 mg/kg.
- Silver in soil must be below the ESL of 78 mg/kg.
- The 95% UCLs for TPHd and TPHmo in soil must achieve the ESLs of 110 mg/kg and 370 mg/kg, respectively.

The CGs for antimony and silver will not be evaluated using 95% UCLs as these metals were only detected at elevated concentrations in isolated locations, therefore the confirmation sample data sets for these metals would not be sufficient to perform evaluation of 95% UCLs.

3.2. California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) is a statute that requires State and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

A CEQA project is a California project that has a potential for resulting in a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment. CEQA applies to discretionary CEQA projects proposed to be carried out or approved by California public agencies, unless an exemption applies. Once an activity is determined as a CEQA project, the lead agency shall conduct a preliminary review to determine whether the project is exempt from CEQA. When the lead agency approves or

determines to carry out a CEQA-exempt project, the agency may file a Notice of Exemption (NOE).

3.2.1. California Environmental Quality Act Exemption

A CEQA NOE is a brief notice which may be filed by an agency after it has decided to carry out or approve a project and has determined that the project is exempt from CEQA as being a certified State regulatory program activity, statutory exemption, categorical exemption, or general rule exemption. The statute of limitation period for legal challenges to the agency's exemption decision is 35 days with a filed NOE and 180 days without a filed NOE.

The removal action presented in this SCP is a Class 30 categorical exemption project (as provided in California Code of Regulations, title 14, sections 15300.2 and 15330) and is, therefore, exempt from the provisions of CEQA.

3.3. Non-Hazardous and Hazardous Waste Management

Areas of impacted soil have been classified as RCRA-Haz, Cal-Haz, and non-hazardous waste. Soil determined to be hazardous will be documented by hazardous waste manifest, transported by registered hazardous waste haulers, and disposed of at an approved facility. Soil determined to be non-hazardous waste will be documented with non-hazardous bill of lading, and disposed of at an approved facility. The end destination for non-hazardous waste is currently expected to be either Republic Services Inc.'s Vasco Road Landfill or Waste Management's Altamont Landfill, both of which are in Livermore, California. The end destination for hazardous waste is currently expected to be Clean Harbor's Class I Landfill facility in Buttonwillow, California, or the ECDC Class I Landfill facility in East Carbon, Utah.

The classification of waste as either hazardous or non-hazardous follows the California Code of Regulations Title 22 Limits for Hazardous Waste (CCR 22261.24) as discussed in Section 1.4.5 above.

3.4. Bay Area Air Quality Management District (BAAQMD)

A notification of contaminated soil excavation will be provided to the BAAQMD by the remediation contractor to be selected by the City at a later date. Additional BAAQMD permits would not be required for this work. Dust control measures will be implemented according to the Dust Monitoring and Control Plan presented in Appendix E.

3.5. Storm Water Discharge Management

The SWRCB, as part of the National Pollutant Discharge Elimination System (NPDES), has adopted a statewide NPDES General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) to address discharges of storm water runoff from construction projects that encompass one acre or more in total acreage of soil disturbances. Construction activities subject to the General Permit include demolition, clearing, grading, excavation, soil stockpiling, material storing, onsite staging, offsite staging, and other land disturbance activities.

Because the total acreage of the areas to be disturbed during the site cleanup and redevelopment is less 1 acre, coverage under the General Permit will not be required. Contaminant control measures will still be performed to address potential discharges of storm water runoff as discussed in Section 5.2.5 below.

4. ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

4.1. Remedial Action Scope

The purpose of this section of the SCP is to identify and screen possible remedial action alternatives that achieve the primary objectives for site cleanup as discussed in Section 2 above. The screening of remedial action alternatives was conducted in general accordance with the EPA Guidance on Conducting Non-Time-Critical Removal Actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA [EPA, 1993b]); as such, remedial action alternatives were initially screened and evaluated on the basis of their effectiveness, implementability, and cost, as defined below:

Effectiveness – This criterion focuses on the degree to which a remedial action reduces toxicity, mobility, and volume through treatment; minimizes residual risk and affords long-term protection; minimizes short-term impacts and how quickly it achieves protection.

Implementability – Remedial actions are evaluated with respect to technical feasibility and applicability to site conditions. Some examples of this criterion include the ability to obtain necessary permits, regulatory approval of remedial actions, and availability of necessary equipment and skilled worker to implement the removal action.

Cost – This criterion relates to relative cost screening based on approximate capital and operation and maintenance costs.

Following the initial screening, each remedial action alternative presented in this SCP is independently analyzed without consideration to the other alternatives. The analysis addresses the criteria listed below:

Short-term effectiveness – This criterion evaluates the effects of the implementation of the remedial alternative during the construction and implementation phase through completion of remediation. It accounts for the protection of workers and the community during remedial activities and considers the environmental impacts resulting from implementing the action.

Long-term effectiveness and permanence – This criterion addresses issues related to the management of residual risk remaining on site following implementation of a given remedial action. The primary focus is placed on the long-term controls that may be required to manage the risk posed by treating remaining residuals or by leaving untreated wastes on site.

Reduction of toxicity, mobility, or volume – This criterion evaluates whether the remedial technology employed results in significant reduction in toxicity, mobility, or volume of the hazardous substances.

Implementability – This criterion evaluates the technical and administrative feasibility of the alternatives, as well as the availability of the necessary equipment, material, and services to complete the removal action. This includes the ability to construct and operate the alternative, ability to obtain services and equipment, ability to monitor the performance and effectiveness of technology, and the ability to obtain necessary approvals from oversight agencies.

Overall protection of human health and the environment – This criterion evaluates whether the remedial alternative provides acceptable protection of human health and the environment.

Cost effectiveness – This criterion involves capital and operation and maintenance costs and is based on a variety of information. The actual costs will depend on true labor and material costs, competitive market conditions, the final project scope, and the implementation schedule.

4.2. Evaluation of Remedial Action Alternatives

Three remedial action alternatives were evaluated for the impacted soil on site. These alternatives were evaluated using the criteria listed above. The three alternatives are:

Alternative 1 – No Action.
Alternative 2 – Surface Capping/Institutional Controls.
Alternative 3 – Excavation/Off-site Disposal.

Each alternative is discussed in the following sections.

4.2.1. Alternative 1 – No Action

The "No Action" alternative has been evaluated as required under the National Contingency Plan (NCP). The "No Action" alternative does not meet the effectiveness criterion as it would not reduce the toxicity, mobility, or volume of COCs and would therefore not reduce potential health risks or afford long-term protection. While the "No Action" alternative was not considered by the City, it was evaluated (as required under the NCP) as a baseline to which the relative benefits of the other alternatives could be compared. Because the "No Action" alternative does not meet the effectiveness criterion and has no associated costs, this alternative is not evaluated further in the sections below.

4.2.2. Alternative 2 – Surface Capping/Institutional Controls

This alternative would involve capping the ground surface with clean soil or other materials so that the risk of potential exposure to impacted soil on-site is mitigated. Because impacted soil would remain on-site, institutional controls would be required to monitor and maintain the integrity of the surface cap and minimize the likelihood of potential exposure through disturbance of the surface cap. Surface capping materials may consist of imported clean soil, asphalt or concrete pavement.

Field activities would be conducted in accordance with local permit requirements and the requirements of this SCP, thus complying with ARARs as discussed in Section 3.

This alternative would protect human health and the environment by eliminating, or reducing to an acceptable level, the risk associated with potential exposure to elevated concentrations of COCs. This alternative provides relatively long-term effectiveness, however it would potentially cause temporary short-term impacts (including dust, noise and traffic) to the local area. However, these impacts would be reduced through control measures to an acceptable level, thereby providing short-term effectiveness to this alternative

This alternative is relatively low cost, is technically and administratively feasible, could be implemented fairly easily, and could be permitted. Properly licensed contractors would complete all activities, and the alternative also could achieve State, Federal, and public acceptance.

The primary potential negative aspect of this alternative is that the impacted soils would not be removed, therefore the accompanying toxicity, mobility and volume of elevated concentrations of COCs would not be reduced at the site, therefore deed restrictions and an Operations and Maintenance (O&M) Plan would need to be prepared and implemented for the site.

4.2.3. Alternative 3 – Excavation/Off-Site Disposal

This alternative includes excavation and off-site disposal of soils containing concentrations of COCs above the CGs at the site. Excavated soils would be directly loaded into trucks for transportation to the appropriate landfills as waste classification has already been performed as described in Section 1.4.5 above. Waste profiling and acceptance from the appropriate landfill facilities would be completed prior to excavation activities.

A licensed hauler would transport soils to approved receiving facilities.

Following confirmation of adequate removal of impacted soils (based on confirmation sample results), the excavated areas would be backfilled and graded in preparation for redevelopment.

This alternative would remove impacted soils with the planned control measures of this SCP and protect human health and the environment. Soil removal activities would be conducted in accordance with applicable local permit requirements and the requirements of this SCP after its approval by the City, DTSC and SFRWQCB, thus complying with ARARs (see Section 3 above). Following remediation the site would be removed from the Covenant established for 5701 Hollis Street.

This alternative provides long-term effectiveness by permanently removing the impacted soils from the site. This alternative would potentially cause temporary short-term impacts (including dust, noise and traffic) to the local area. However, these impacts would be reduced through control measures to an acceptable level, thereby providing short-term effectiveness. Because this alternative would remove impacted soils, the accompanying toxicity, mobility and volume would be reduced to an acceptable level.

This alternative is technically and administratively feasible, and would be relatively easy to implement and permit. All of the activities involved are well proven and relatively simple including: soil sampling and analysis, excavation, loading and transport, and soil disposal.

All activities would be conducted in accordance with local permits by properly licensed contractors and transporters, which would also achieve State and Federal acceptance.

The potential negative aspects of this alternative are its implementation cost (due primarily to the volume of impacted soil and transportation and disposal costs) and temporary neighborhood disruption during field activities involving excavation noise and truck traffic. The construction activities will be conducted between the hours of 7 am and 6 pm, thus confining construction noise to normal working hours, and a Traffic Control and Transportation Plan (Section 5.1.4) will be prepared in order to direct

truck traffic outside of residential areas, thus mitigating potential noise and traffic problems. Public issues concerning this alternative would be addressed satisfactorily by the City, and community acceptance is anticipated.

4.2.4. Costs of Removal Action Alternatives

The following sections discuss the estimated costs for the remedial action alternatives described above based on the estimated remediation contractor costs and environmental consultant costs.

4.2.4.1. Cost of Alternative 2 – Surface Capping/Institutional Controls

Based on experience with similar projects, the remediation contractor cost for capping the site with a 1-foot thick layer of imported clean soil would be approximately $3 per square foot, which would total approximately $15,000 for the approximate 5,000 square feet of site area which would require capping. The major cost components are the mobilization and use of heavy equipment, and transportation of clean soil to the site.

Additional costs would be incurred for environmental consulting services which would be required for Alternative 2 including preparation of an O&M Plan and implementation of long term O&M activities. The estimated environmental consultant costs for Alternative 2 is approximately $30,000.

The total estimated project costs for Alternative 2 would therefore be approximately $45,000.

4.2.4.2. Cost of Alternative 3 – Excavation/Off-Site Disposal

The major cost components for implementing Alternative 3 are soil excavation, loading, transportation, disposal, importing soil, and backfilling/compaction. The estimated remediation contractor cost for Alternative 3 has been calculated based on estimated volumes of impacted soil stockpiles which will be off-hauled,

proposed excavation volumes, waste classifications for soil disposal, and additional contractor costs as presented in Table 5.

The remediation contractor costs for Alternative 3 is estimated to be approximately $164,000. This estimated costs assumes that the extent of excavation will not increase beyond the limits presented on Figure 3, and that soils can be disposed of according to the waste classifications presented in Table 5.

Additional costs would be incurred for environmental consulting services which would be required for Alternative 3 including remediation oversight, air monitoring, confirmation sampling and analysis, and report preparation. The estimated environmental consultant costs for Alternative 3 is approximately $35,000.

The total estimated project costs for Alternative 3 would therefore be approximately $199,000.

4.3. Recommended Alternative

The site is planned for redevelopment as a park, therefore the removal of shallow fill material is preferable over the installation of a 1-foot thick surface cap of imported clean soil (Alternative 2) which would result in the park being elevated with respect to surrounding grades. Based on the relatively shallow nature of impacted soil and the site redevelopment grading requirements, the alternative of excavation and off-site disposal (Alternative 3) is recommended as the preferred remedial action for impacted soil on-site.

This alternative meets the construction timeline for the City, provides an overall protection of human health and the environment at the site, reduces toxicity, mobility and volume of site contaminants, provides long term effectiveness, and is relatively simple to implement. Because this alternative is commonly practiced, it is expected that the City, DTSC, and SFRWQCB would approve this plan.

5. REMOVAL ACTION ACTIVITIES

The removal action activities will involve excavation and off-site disposal of soil at permitted landfills. Excavated soil will be directly loaded into trucks and transported to a Class I or II landfill facilities, as appropriate. After soil excavation, confirmation soil samples will be collected and analyzed to evaluate whether impacted soil has been sufficiently removed. The following sections summarize pre-field activities, pre-excavation field activities, and remediation field activities.

5.1. Pre-Field Activities

Pre-field activities include public participation, permitting, health and safety planning, preparation of a Traffic Control and Transportation Plan and a Decontamination Plan by the remediation contractor, and waste profiling.

5.1.1. Public Participation

To fulfill the requirements of public participation for the SCP process, Markus Niebanck, Project Coordinator, has been designated the project spokesperson. Mr. Niebanck can be reached at (510) 693-1242 or mneibanck@ci.emeryville.ca.us. The spokesperson will coordinate news releases, notify local citizens, establish an administrative record, and notify the public of the administrative record.

5.1.2. Permitting

Well destruction permits will be obtained from Alameda County prior to the abandonment of wells on site as discussed in further detail in Section 5.2.2 below. A City grading permit will be obtained by the remediation contractor prior to the start of excavation activities.

5.1.3. SSHSP

The remediation contractor will be required to develop a SSHSP for its workers. The SSHSP will be prepared by a certified industrial hygienist and submitted to the City for review and approval prior to initiating field activities. The SSHSP will be prepared in

accordance with current safety standards as defined by the EPA, outlined by Cal-OSHA in Title 8 of the CCR, General Industry and Construction Safety Orders and 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926, Construction Industry Standards, as well as other applicable federal, state and local laws and regulations. Additionally, the SSHSP will be prepared in accordance with guidelines set forth in Title 8 of the California Code of Regulations, Section 5192 and Title 29, CFR, section 1910.120 (29 CFR 1910.120), Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). In addition, Cal-OSHA's Construction Safety Orders (especially 8 CCR 1539 and 1541) will be followed as appropriate.

A SSHSP has been prepared by Ninyo & Moore for its employees at the site under the supervision of a certified industrial hygienist in accordance with current health and safety standards as specified by the federal and Cal-OSHA. A copy of Ninyo & Moore's SSHSP is provided in Appendix D.

5.1.4. Traffic Control and Transportation Plan

The remediation contractor will prepare a Traffic Control and Transportation Plan which will include:

1. Destinations of Wastes,
2. Transportation Mode (include proof of valid registration for hauling wastes),
3. Routes (including maps, emergency response and repair facilities along routes),
4. Traffic Control (including signs, flag persons, lane closures, and any other traffic control necessary for transportation, or work on 40th Street or Hollis Street),
5. Loading Procedures (including containment, decontamination, and techniques to be employed to prevent the release of water from saturated soil as a result of the natural vibrations during transportation such that there is free liquid on the surface of the soil in the transportation vehicle trailer or bin when it arrives at the disposal facility),
6. Record Keeping (including manifests, placarding, labeling, and tracking),

7. Health and Safety,
8. Contingency Plans and Procedures (specifically addressing spills), and
9. Emergency Notification Contacts for the remediation contractor, City, trucking Sub-contractor, and local, state, and federal agencies.

Suggested local transportation routes between the site and the Interstate 80 (I-80) freeway are discussed in Section 5.7 below and presented on Figure 5.

5.1.5. Decontamination Plan

The remediation contractor will prepare a Decontamination Plan which at a minimum, will describe plans for (a) removal and containment of dirt and other material from equipment including temporary fencing, dust control fabric, other equipment, and transportation vehicles; (b) decontamination of personnel and equipment exiting exclusion zones; and (c) plans for temporary storage, characterization, and treatment or off-site disposal of decontamination wastes generated during these decontamination activities. The Decontamination Plan should also include a figure illustrating the location of temporary fencing, the decontamination area, exclusion zone and contamination reduction zone.

5.1.6. Waste Profiling

The analytical results from recent waste characterization sampling activities (Appendix C) will be provided to the landfills selected by the remediation contractor for waste profiling and acceptance purposes. The anticipated landfills which may be selected for waste disposal are discussed in Section 5.7 below. It is anticipated that the selected landfills will accept soil from areas to be excavated as RCRA hazardous waste, non-RCRA Cal-Haz waste, and non hazardous waste based on the available analytical results. Proposed excavation areas and associated volumes of soil which have been characterized as either RCRA hazardous waste, non-RCRA Cal-Haz waste, and non hazardous waste are described in Section 5.2.3 below.

5.2. Pre-Excavation Field Activities

Pre-excavation field activities will include utility clearance, well abandonment, waste profiling, delineation of excavation areas, and setting up security and contaminant control measures.

5.2.1. Utility Clearance

At least 48 hours prior to the start of subsurface activities, the site will be marked and Underground Service Alert (USA) will be notified of the planned excavation activities. A private utility locator will also be hired by the remediation contractor to identify utilities on-site prior to the start of excavation activities. Additionally, active and inactive utility lines may require demolition or relocation to facilitate excavation of impacted soil.

5.2.2. Well Abandonment

Abandonment of groundwater monitoring wells and remedial injection wells located on site will be performed prior to the start of excavation activities. Based on Ninyo & Moore's field observations and review of previous environmental reports prepared for the site by Gribi, the wells to be abandoned are injection wells IW-6, IW-25, IW-26, and monitoring well MW-2. According to the Gribi *Report of Well Installation and Remediation Activities* dated May 3, 2004 (Gribi, 2004), and the Gribi *Report of 4th and 5th Remediation Injection Events* dated March 15, 2005 (Gribi, 2005), the wells were reportedly installed using 3.5 inch diameter direct push equipment and constructed with 3/4-inch diameter casings screened from approximately 5.5 to 20 feet bgs. The types of the well casings and annular materials used are unknown.

The wells will be abandoned by a licensed well driller in accordance with Alameda County guidelines. The wells will be abandoned by removing the well boxes and well seals using a jack hammer and/or breaking bar and removing the well casings using a drill rig. If the well casings break while being removed, the wells will be over drilled in order to remove the remainder of the well casings and the borings will be backfilled with cement grout. If over-drilling is required, soil cuttings will be stockpiled on plastic

sheeting placed on the unpaved northern portion of the site, and the stockpile will be covered with plastic sheeting which will be weighed down with pieces of concrete removed from around the well boxes. Soil cuttings would be disposed of with soil removed during remedial excavation activities. Decontamination rinsate water will be used to mix cement grout which will be used to fill the holes left from removal of well boxes.

5.2.3. Delineation of Excavation Areas and Excavation Volumes

The excavation boundaries will be marked with flags or spray paint prior to initiating excavation. The areas of proposed excavation are depicted on Figure 3. Excavation will occur on the subject site to the property boundaries. Because the excavation will cover the entire property, the excavation will measure approximately 320 feet long by approximately 18 feet wide (on average). The depth of excavation will range from approximately 2 to 6 feet bgs and is based on depths where impacts have been detected during previous investigations and recent waste characterization activities.

Areas of soil which have been characterized as non-hazardous waste are the soil from approximately 4.5 to 6 feet bgs in the area of excavation surrounding Boring B-1, the soil from approximately 2 to 6 feet bgs in the area of excavation surrounding Boring B-3, the soil from approximately 0 to 2 feet bgs in the areas of excavation surrounding Borings B-7, B-9, and B-10, and the soil from approximately 2 to 3 feet bgs in the areas of excavation surrounding Boring 8 (Figure 3). Soil from approximately 4.5 to 6 feet bgs in the area of excavation surrounding Borings B-2 and B-4 has been characterized as RCRA hazardous waste. Soil from all other areas and depths of proposed excavation has been characterized as Non-RCRA Cal-Haz waste.

Based on the proposed excavation extents, approximately 420 cubic yards (or 630 tons using a conversion factor of 1.5 tons per cubic yard) of Non-RCRA Cal-Haz soil, approximately 60 cubic yards (or 90 tons) of RCRA hazardous soil, and approximately

185 cubic yards (or 275 tons) of non hazardous soil will be excavated and off-hauled from the site. Calculations for the estimated excavation volumes are presented in Table 5.

5.2.4. Security Measures

Appropriate barriers and privacy fencing will be installed around the perimeter of the excavation area prior to beginning the excavation process to ensure that all work areas are secure and safe to ensure that trespassers or unauthorized personnel are not allowed onsite. A controlled gate will be located at the southern end of the site on Stanford Avenue (Figure 4). Security measures will include, but are not limited to the following:

- Posting notices directing visitors to the Site Manager;
- Maintaining a visitor's log. Visitors must have prior approval from the Site Manager to enter the site. In addition, visitors will not be permitted to enter the site without first receiving site -specific health and safety training from the Site Safety Manager;
- Installing barrier fencing to restrict access to sensitive areas such as exclusion zones;
- Providing adequate site security to ensure the unauthorized personnel have no access to work areas and/or excavated materials;
- Before leaving the site, all visitors must sign out in the visitor's log;
- Maintaining a safe and secure work area, including areas where equipment is stored or placed, at the close of each workday;
- A visual plastic barrier will be installed along the fence; and,
- Persons requesting site access will be required to demonstrate a valid purpose for access and provide appropriate documentation to demonstrate they have received proper training required. After work hours, access to the site will be controlled by the perimeter fence and a locked gate.

5.2.5. Contaminant Control Measures

Contaminant control measures will include the proper construction and maintenance of truck loading and decontamination areas to prevent potentially impacted soil from being released onto clean soil or tracked onto streets. Decontamination procedures are

described in further detail in Section 5.6 below and in the SSHSP presented in Appendix D. COCs carried by dust generated during excavation activities is another potential contamination migration route. This potential concern will be controlled by dust mitigation measures described in Section 5.5 below and in the Dust Monitoring and Control Plan (Appendix E). Additionally, dust monitoring stations will be placed on-site, and careful visual monitoring will be conducted to assure dust suppression techniques are effective in preventing dust from traveling off site during excavation and loading. Because the area of the site is less than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) will not be required by the RWQCB, however best management practices (BMPs) will be implemented to prevent sediments from entering storm drains in the site vicinity. BMPs will include installation of filter fabric over potentially affected storm drain inlets.

5.3. Remediation Field Activities

The remediation field activities will include soil excavation and loading, air and meteorological monitoring, dust control, decontamination, off-site disposal, confirmation sampling, and site restoration. The following sections describe these activities.

5.3.1. Soil Excavation and Loading

Figure 3 presents the proposed extents of remedial excavation which are based on previous data and recent waste characterization sampling results. The majority of soil to be excavated and off-hauled has been characterized as Cal-Haz waste, and portions of the soil to be excavated and off-hauled have been characterized as RCRA hazardous waste and non-hazardous waste.

Soil excavation will be performed by a licensed hazardous waste contractor. Excavation and direct loading will be performed using heavy equipment which may include a backhoe and/or excavator. Excavated soil will be loaded directly into trucks for off-hauling and disposal. Ninyo & Moore will oversee excavation activities and collect confirmation samples subsequent to excavation activities.

Excavations which extend to 5 feet bgs or deeper may be shored, sloped, or benched, to prevent soil movement. If there is a possibility of soil movement, even shallower excavations may be shored or sloped. At no time will workers be allowed to enter an excavation which reaches 5 feet bgs or deeper.

5.4. Air and Meteorological Monitoring

This section details the air and meteorological monitoring strategy and methodologies that will be used during remediation activities. The strategy and methodologies are designed to achieve several goals:

- Identify and measure the air contaminants generated during the soil removal and decontamination activities to assign the appropriate personal protective equipment (PPE) and safety systems specified for those activities.
- Provide feedback to site operations personnel regarding potential hazards from exposure to hazardous air contaminants generated through site activities.
- Identify and measure air contaminants at points outside of the soil removal and decontamination exclusion zones. Air monitoring will be conducted during work activities to measure potential exposure of sensitive receptors to site chemical constituents, as a result of removal activities.

5.4.1. Air Monitoring

Air monitoring will be performed during all site activities in which impacted or potentially impacted materials are being disturbed or handled. The remediation contractor will staff the site with an air monitoring/health and safety professional whose responsibilities will include:

- Monitoring dust levels in the exclusion zone and other locations. The site air monitoring professional will have the authority to stop-work in the event that onsite activities generate dust levels that exceed the site or community action levels (see the chart in Section 5.4.2.1 below). The air-monitoring professional will monitor onsite meteorological instrumentation and/or coordinate with offsite meteorological professionals to identify conditions that require cessation of work, e.g. wind speeds high enough to result in visible dust emissions from the point-of-origin or crossing the property line, despite the application of dust mitigation measures.
- Assure that all real-time aerosol monitors and industrial hygiene air sampling equipment and media are properly calibrated and in good working condition. Real-

time, data-logging aerosol monitors (personal data RAM) will be used, when required, to measure dust levels. Real-time information will be posted daily, and discussed with site workers. As analytical results for industrial hygiene samples (using Cal-OSHA/NIOSH approved methods) are received, the air monitoring professional will prepare summary sheets and discuss results with onsite management and workers.

- Coordinate general site safety activities including all daily hazard communication, safety practices and procedure briefings.
- Oversight of personal decontamination practices.
- General site safety leadership, support and recordkeeping activities.

5.4.2. Air Monitoring Strategy and Methodologies

The remediation contractor will monitor dust levels and airborne levels of the COCs in the following locations which are indicated on Figure 4 and Figure E-1 (Appendix E):

- One location upwind of excavation operations (as determined by wind direction meter [Section 5.4.4]). Based on the prevailing wind direction being from the northwest, this location will likely be in the northwest corner of the site.
- Three locations downwind of excavation operations. These locations would likely be on the fence along the eastern site boundary.
- One location within the exclusion zone (with a technician).

Final locations will be determined in the field based on observed wind directions. Air monitoring samples will be collected over an 8-hour period each day that activities which disturb impacted soils are conducted. The air-monitoring professional will check the equipment every 30 minutes during operation.

5.4.2.1. Action Levels for Particulates

Particulate dust monitoring will be performed in accordance with the regulations of the BAAQMD which regulates the generation of fugitive dust particles with diameters of 10 microns or less, also known as PM_{10}. This monitoring will be conducted during soil excavation and off-hauling activities outlined in this SCP and will be designed to be protective of both worker health and the surrounding community as

described in the Dust Monitoring and Control Plan (Appendix E). An evaluation of the potential airborne concentrations of COCs was performed by a Certified Industrial Hygienist (CIH) based on the highest concentrations of COCs detected in soil samples collected from areas to be excavated on-site. Based on this evaluation, the fence line action level (FAL) of 50 micrograms per cubic meter ($\mu g/m^3$) and Site Action Level of 1 milligram per cubic meter (mg/m^3) for total dust above upwind total dust levels should be protective for the community and site workers, respectively, based on the concentrations of COCs on-site.

5.4.3. Quantitative Monitoring

Quantitative sampling will be performed upwind, downwind and within the work area at the locations described above. The samplers will be operated for a minimum of 5 hours per day, during periods of relatively constant wind directions and having the greatest velocity as documented by the meteorological survey. In order to achieve laboratory detection limits below the FAL of 50 $\mu g/ m^3$ for total dust, each set of samples will be collected over the course of 3 days.

At the end of each 3rd days of sampling, the filter cassettes will be replaced with clean samplers. The filter cassettes removed from the samplers will be shipped to a certified laboratory to be tested for total dust by NIOSH test method 0500 or equivalent. In addition, the sampling cassettes will be analyzed for total lead using NIOSH test method 7300 or equivalent. Use of the quantitative samplers for evaluating concentrations of arsenic or other metals will not be required as the action levels for lead in this case, serve to be highly protective of the other potential contaminants.

As analytical results for quantitative samples are received, the air monitoring professional will prepare summary sheets and discuss results with onsite management and workers. The remediation contractor will request a 24-hour turn-around-time (TAT) from the analytical laboratory for the quantitative dust and lead samples. If the site

action levels for total dust or lead are exceeded during quantitative sampling, the Project Certified Industrial Hygienist will be immediately consulted.

5.4.4. Meteorological Monitoring

Onsite ambient weather conditions (wind speed and direction) will be monitored by an onsite meteorological station. Onsite meteorological monitoring will be performed simultaneously with the excavation activities to ensure all necessary precautions have been taken. Detailed information on meteorological monitoring is described in the Dust Monitoring and Control Plan (Appendix E).

5.5. Fugitive Dust Control Plan

The remediation contractor will implement appropriate procedures to control the generation of airborne dusts by soil removal activities. Such procedures will include but will not be limited to the following:

- The site air monitoring professional will monitor dust levels in the locations outlined in Section 5.4.2 above and have the authority to stop-work in the event of that onsite activities generate dust levels in excess of the onsite (1.0 mg/m^3) or community/fence line (50 ug/m^3) action levels. Generation of dust during the removal operations will be minimized as necessary with the use of water as a dust suppressant. The water will be available via a water truck or a metered discharge from a fire hydrant located proximate to the site. The remediation contractor will control dust generation by spraying water prior to daily work activities, during excavation/loading activities (as necessary to maintain concentrations below action levels), and at truck staging locations. Watering equipment will be continuously available to provide proper dust control.

- If required, the air monitoring professional will monitor onsite meteorological instrumentation and/or coordinate with offsite meteorological professionals to identify conditions that require cessation of work. All removal activities will cease in the event wind conditions change creating an uncontrollable condition.

- Measurement of airborne dust levels at locations outlined in Section 5.4.2 using real-time, data-logging aerosol monitors (i.e., Personal DataRAM or PDM-3 MiniRAM particular monitor manufactured by MIE). These instruments will be calibrated daily and monitoring information posted daily, and discussed with site workers. The monitors will be set to log dust levels over 5-minute periods and will be visually read every 30 minutes.

- The PDM-3 Miniram or equivalent will be placed on a technician to provide worst case dust concentrations on the site. Dust masks will be provided to site workers in the event particulate concentrations within the exclusion zone exceed 1 mg/m^3.

- While on the property, vehicles will maintain slow speeds (i.e., less than 5 mph) for safety purposes and for dust control measures.

- When loading soil into trucks, the drop height from the bucket of the excavator or back-hoe to the truck bed will be minimized and tarps will be placed over the loaded truck beds prior to exiting the site in order to minimize the potential release of dust during transport.

The emission of fugitive dust will not be allowed from any active operation, open storage pile, or disturbed surface area such that:

- The dust remains visible in the atmosphere beyond the property line of the emission source; or

- The dust emission exceeds 20 percent opacity (estimated visually), if the dust emission is the results of movement of a motorized source.

Misting or wetting of soil should not be excessive to the point of creating puddles or runoff. If the dust suppression techniques do not lower particulates to acceptable levels (below 50 $\mu g/m^3$ at the fence line and no visible suspended dust), work must be suspended until appropriate corrective measures are approved to remedy the situation or the wind velocity decreases so the downwind monitoring (direct-reading) shows concentrations less than 50 $\mu g/m^3$ above upwind concentrations.

The Personal DataRAM or equivalent will be set with a flow rate of 2 liters per minute and will collect minimum, maximum, and average total aerosol concentration (measured in $\mu g/m^3$) every 5 minutes of operating time. Each 30 minutes of field time, the direct-reading instrumentation will be visually checked and the results will be reviewed and manually recorded.

5.6. Decontamination Procedures

Vehicles, excavation equipment, and hand-held equipment will be decontaminated prior to leaving the site. Decontamination areas will be prepared on site prior to impacted-soil excavation. These areas will be designed to contain soil removed from equipment during the

decontamination process. The decontamination areas will be easily accessible to outgoing vehicles and equipment and will be lined with plastic sheeting for easier cleaning. Decontamination will be performed using dry brushing methods to remove soil from equipment and vehicle tires. After decontamination, the equipment and vehicles will be visually inspected for signs of residue. The storage bins or beds of the trucks will be inspected to ensure the loads are properly covered and secured. In addition, personnel overseeing decontamination procedures will be responsible for ensuring soil is not tracked off site. The proposed decontamination areas are indicated on Figure 4. The remediation contractor shall prepare and submit a separate Decontamination Plan to the City for their vehicles, trucks, personnel and equipment as described in Section 5.1.5 above.

Disposable plastic trowels will be used for excavation confirmation sample collection, therefore decontamination of sampling equipment is not anticipated to be required for confirmation sampling activities.

If non-dedicated or non-disposable sampling equipment (such as a stainless steel trowel) is used, decontamination will be performed using a steam cleaner or the following procedures:

- Non-phosphate detergent in tap water wash, using a brush, if necessary.
- Tap-water rinse.
- Initial deionized/distilled water rinse.
- Final deionized/distilled water rinse.

Soil removed from excavation equipment and vehicles during decontamination will be added to the material being off-hauled from the site. If generated, decontamination rinsate water will be containerized in a 55-gallon drum and appropriately disposed of upon receipt of laboratory profiling data.

5.7. Off-Site Disposal

The end destination for non-hazardous waste is currently expected to be either Republic Services Inc.'s Vasco Road Landfill or Waste Management's Altamont Landfill, both of which are in Livermore, California. The end destination for hazardous waste is currently expected

to be Clean Harbor's Class I Landfill facility in Buttonwillow, California, or the ECDC Class I Landfill facility in East Carbon, Utah.

Waste generated from the site will be transported by an appropriately licensed hauler and disposed of at a properly authorized (permitted) treatment, storage and disposal (TSD) facility. The proposed landfill facilities were verified to be properly authorized (permitted) to accept the type of associated waste by reviewing the permit status of the landfills in California on the State of California Solid Waste Information System (SWIS) CalRecycle database (located at http://www.calrecycle.ca.gov/SWFacilities/Directory/search.aspx) and by reviewing the permit status of the ECDC Landfill on the Utah Department of Environmental Quality provided Single Line Handler Report (located at http://www.hazardouswaste.utah.gov/Docs/RCRAInfoMasterlist.pdf). The landfills/accepted wastes include non-hazardous soil at either Republic Services Inc.'s Vasco Road Landfill or Waste Management's Altamont Landfill (both of which are in Livermore, California), and hazardous soil at Clean Harbor's Landfill facility in Buttonwillow, California, or the ECDC Landfill facility in East Carbon, Utah. If landfill facilities other than those discussed above are selected by the remediation contractor for disposal of waste generated at the site, the selected landfill facilities will be verified to be properly authorized (permitted) to accept the type of waste being disposed of.

Local transportation routes between the site and the Interstate 80 (I-80) freeway which will be used en-route to the anticipated landfills are presented on Figure 5. Trucks would exit the site from the southern gate and turn left (south) onto Peladeu Street, turn left (east) onto Stanford Avenue, turn left (north) onto Hollis Street, turn left (west) onto Powell Street, turn right (north) onto West Frontage Road, and merge onto westbound I-80. Trucks returning to the site would exit I-80 onto east bound Powell Street and turn right to enter the site at the northern gate.

5.8. Confirmation Sampling

Following the removal of impacted soil to the extents indicated on Figure 3, confirmation samples will be collected to verify that impacted soil has been sufficiently removed. Proposed confirmation sample locations are presented on Figure 3.

One excavation bottom confirmation sample will be collected for up to 50 feet of excavation to a specific depth along the length of the site, or portion thereof. Excavation bottom confirmation sample locations will be identified with the letters CS-B followed by a unique number for each sample location. Excavation bottom confirmation samples will be identified using the sample location followed by the depth below original grade from which the confirmation sample was collected. For example CS-B-1-5.0 is a confirmation sample collected at location CS-B-1 from a depth of 5.0 feet bgs. Excavation bottom confirmation sample locations will be selected near the center of the excavation areas and spaced to distribute locations evenly across the excavation areas.

One excavation sidewall confirmation sample will also be collected for up to 50 feet of horizontal sidewall, or portion thereof. Excavation sidewall confirmation sample locations will be identified with the letters CS-S followed by a unique number for each sample location. Excavation sidewall confirmation samples will be identified using the sample location followed by the depth below original grade from which the confirmation sample was collected. For example CS-S-1-3 is a confirmation sample collected at location CS-S-1 from a depth of 3 feet bgs. The sidewall confirmation samples will be collected near the center of the sidewall and spaced to distribute locations evenly across the sidewalls.

5.8.1. Confirmation Sample Collection Methods

Confirmation soil samples will be collected using a new disposable plastic trowel and new nitrile gloves for each sample location to minimize the likelihood of cross contamination. Samples will be collected in the appropriate sized glass jar supplied by the analytical laboratory. Upon retrieval, the samples will be labeled, placed in individual

zip-lock type bags, recorded on a chain of custody, and placed in a cooler on ice for delivery to a State-certified laboratory for chemical analyses.

If the depth of an excavation reaches 5 feet bgs or deeper or the excavation is not considered safe for entry because the sidewalls have not been adequately shored, sloped, or benched, the bucket of an excavator will be used for collection of confirmation samples. The soil samples would be collected from the center of the soil retrieved by the excavator bucket to minimize the likelihood of cross contamination through contact with the excavator bucket.

5.8.2. Confirmation Sample Analysis

Excavation bottom confirmation samples will be analyzed for the COCs which were previously detected at elevated concentrations in the deepest samples collected from above the proposed depth of the excavation within an excavation area. Excavation sidewall confirmation samples will be analyzed for all COCs which were previously detected at elevated concentrations in borings near the confirmation sample locations. Low concentrations of total chromium were reported in the samples collected from approximately 0.5-1.0 feet bgs in Borings B-9 and B-10, therefore the confirmation samples in the area of Borings B-9 and B-10 will not be analyzed for chromium VI. The proposed analysis and depths for confirmation samples to be collected are presented in Table A-1 below. Confirmation samples from the excavation bottoms, western sidewall, and sidewalls between areas of differing excavation depths will be analyzed on a 24-hour TAT to evaluate whether over-excavation may be necessary. All other confirmation sidewall samples (northern, southern, and eastern sidewalls) will be analyzed on a normal (5 to 7 day) TAT as over-excavation of other sidewalls would not be performed as discussed further in Section 5.10 below.

Table A-1 –Confirmation Sample Locations, Depths, and Analysis

Boring Locations within Excavation Areas	Confirmation Sample Locations	Sample Depth (feet bgs)	Sample Analysis
B-1 through B-4	CS-B-1 through CS-B-3	6	arsenic & chromium VI
B-1	CS-S-1 through CS-S-3	3	arsenic, lead, chromium VI, TPHd & TPHmo
B-2 and B-3	CS-S-4 through CS-S-6	3	arsenic, lead, chromium VI, silver, TPHd & TPHmo
B-4	CS-S-7 through CS-S-9	3	antimony, arsenic, lead, chromium VI, silver, TPHd & TPHmo
B-5	CS-B-4	2	arsenic, lead, chromium VI
B-5	CS-S-10 and CS-S-11	1	arsenic, lead, chromium VI
B-6	CS-B-5	4.5	arsenic & chromium VI
B-6	CS-S-12 through CS-S-15	2.5	arsenic, lead, chromium VI, TPHd & TPHmo
B-7	CS-B-6	2	arsenic, lead, chromium VI, TPHd & TPHmo
B-7	CS-S-16 and CS-S-17	1	arsenic, lead, chromium VI, TPHd & TPHmo
B-8	CS-B-7	6	chromium VI
B-8	CS-S-18 and CS-S-21	4.5	arsenic, lead, chromium VI, TPHd, & TPHmo
B-8	CS-S-19 and CS-S-20	3	arsenic, lead, chromium VI, TPHd, & TPHmo
B-9	CS-B-8	2	TPHmo
B-9	CS-S-22 and CS-S-23	1	TPHmo
B-10	CS-B-9	2	arsenic, TPHd & TPHmo
B-10	CS-S-24 through CS-S-26	1	arsenic, TPHd & TPHmo

5.8.3. Analytical Methods

The samples will be analyzed for COCs using the methods presented in Table A-2 below. Table A-2 also lists the required sample containers, preservatives, and recommended maximum holding times for samples.

Table A-2 – Sample Containers, Volumes, Preservatives, and Holding Times

Analyte	EPA Analytical Method	Container	Preservative	Holding Time
Soil Matrix				
TPHd & TPHmo	8015M	4-oz glass or sleeve	4°C	14 days to extraction, 40 days to analyze
Metals	6010B	4-oz glass or sleeve	4°C	180 days
Chromium VI	7196A	4-oz glass or sleeve	4°C	28 days

5.9. Sample Handling, Documentation, and QA/QC Procedures

Sample handling, documentation and QA/QC procedures will follow the guidelines described in Sections 3.5 through 3.8, 9, and 10 of the SAP. QA/QC procedures will include collection of approximately 10 percent duplicate samples which will be submitted blind to the analytical laboratory, and collection of equipment blank rinsate samples if non disposable sampling equipment is used. Advanced Technologies Laboratories (ATL) will be used as the analytical laboratory for analysis of confirmation samples. A copy of ATL's Quality Assurance Program Plan (QAPP) was included in Appendix A of the SAP.

5.10. Confirmation Sample Analytical Results and Possible Over-Excavation

If excavation bottom confirmation sample results reveal concentrations of COCs exceeding CGs, over-excavation may be performed and confirmation samples would be collected from the newly exposed bottom of the excavation. Over-excavation will not extend below the depth of groundwater, which is anticipated to be encountered at approximately 6 to 7 feet bgs. If a failing sidewall confirmation sample is collected from an excavation face adjacent

to the southern, northern or eastern site boundary, over-excavation will not be performed beyond the site boundary as the eastern/southern adjacent property is not owned by the City. If a failing sidewall confirmation sample is collected from the excavation face adjacent to the western site boundary, over-excavation would be performed because the adjacent property is owned by the City. Over-excavation would extend approximately 1 foot into and around the excavation face (sidewall or bottom) area where the failing confirmation sample was collected. The lateral extent of over-excavation would extend to the nearest confirmation samples which did not exceed CGs. An additional confirmation sample would be collected from the newly exposed excavation face and would be analyzed for the constituents which exceeded cleanup goals in the original confirmation sample.

5.11. Treated Wood Waste (TWW)

Railroad ties from the former railroad spur which crossed the site (Figure 2) may be encountered during excavation activities. Railroad ties are considered TWW and will be stored, labeled, and disposed of in accordance with the regulations in CCR Section 67386. TWW will be disposed of at an appropriately licensed TWW disposal facility such as Waste Management's Altamont Landfill in Livermore, California.

5.12. Site Restoration

The site is scheduled to be redeveloped as a park following completion of soil remediation activities. Clean soil will be imported and compacted as necessary to achieve construction requirements. Sampling and analysis of proposed backfill material will be required to demonstrate contaminated materials are not being imported to the site, and that backfill is suitable for future site uses. Proposed backfill material will be analyzed in accordance with the DTSC Information Advisory, Clean Imported Fill Material, dated October 2001 (DTSC, 2001). The proposed backfill must also be tested for properties as required by the project landscape architect and/or arborist to ensure it is suitable for future site uses. The remediation contractor will be responsible for performing the necessary laboratory testing and will provide the results of testing and background information on the source of the proposed

backfill material to the City for approval prior to the importing of any backfill material to the site.

5.12.1. Load Checking

All loads of imported fill material will be checked by visual screening to verify that the imported soil is from the approved source, and will be visually screened for staining to minimize the likelihood of impacted soil being delivered to the site.

5.12.2. Diversion of Unacceptable Borrow

Imported fill material will be visually checked for unacceptable materials at the working face. If loads containing unacceptable materials (exhibit staining, detectable odors or differing soil types) are dumped, transporters of the unacceptable loads will be stopped before leaving the site.

Equipment operators will watch for evidence of impacted imported fill in loads being dumped at the working face. If impacted soils are found or suspected, the imported fill soils are to be isolated. The hauler of the prohibited materials will be identified and the remediation contractor's site superintendent will be contacted and the appropriate actions will be taken, including. segregating improper fill materials and removing from the working face immediately. These materials will be reloaded to the transporter's vehicle when possible or stockpiled in an appropriate area for later removal by a properly licensed waste hauler.

5.12.3. Documentation of Rejected Loads

All loads, which enter the site and are subsequently rejected, will be recorded. Data compiled will include when the incident occurred, who the hauler was, why the load was rejected, whether the load was dumped prior to rejection, and what steps were taken to remove the rejected material. Additional data may be recorded as deemed necessary for the particular situation.

A separate area will be maintained for the storage of unacceptable materials, pending removal by the original transporter or a properly licensed waste hauler. A temporary pad will be constructed for temporary storage of unacceptable soils segregated from dumped loads. The pad will be used to store these segregated materials solely for the length of time required to enlist the services of a licensed waste hauler for their removal.

6. SCHEDULE

Soil excavation activities are scheduled to begin in Fall 2012. Remediation and site restoration activities are anticipated to require 2 weeks to complete.

7. REPORTING

Site activities will be documented in daily field logs and a Removal Action Completion Report. Relevant information will include descriptions of excavation, off-hauling, confirmation sampling, backfill, and grading activities. This report will include the following:

- Quantities of soil removed from the site,
- Areas and depths where soil was excavated,
- Locations where confirmation samples were collected and analytical results for confirmation samples,
- Analytical results for samples collected from backfill materials,
- Copies of waste manifests documenting transportation and disposal of site wastes.

8. LIMITATIONS

Our opinions are based on our observations and field investigation test results. If conditions different from those described in this SCP are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the site or adjacent and nearby sites. In addition, changes to the applicable

laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this SCP may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This SCP is intended exclusively for use by the Emeryville Community Development Commission and assignees. Any use or reuse of this report by parties other than the Emeryville Community Development Commission and assignees is undertaken at said parties' sole risk.

9. REFERENCES

Erler & Kalinowski Inc., 2010, Site Cleanup Plan, Horton Landing Park, Emeryville, California; dated March 5.

Gribi Assocaites, 2004, Report of Well Installation and Remediation Activities, 5701 Hollis Street, Emeryville, California: dated May 3.

Gribi Assocaites, 2005, Report of Fourth and Fifth Remediation Injection Events, 5701 Hollis Street, Emeryville, California: dated March 15.

Gribi Assocaites, 2006, Risk Management Plan, 5701 Hollis Street, Emeryville, California: dated March 22.

Gribi Assocaites, 2006, Request to Name UPRR Responsible for Arsenic Soil Impacts, 2006, Former Industrial Hard Chrome Site, 5701 Hollis Street, Emeryville, California: dated June 16.

Ninyo & Moore, 2012, Sampling and Analysis Plan, 5701 Hollis Street, Emeryville, California: dated April 25.

RWQCB, 2006a, Declaration of Covenant and Environmental Restriction on Property, Commercial Property, 5701 Hollis Street, Emeryville, California: dated July 19.

RWQCB, 2006b, No Further Action, Former Industrial Hard Chrome, 5701 Hollis Street, Emeryville, California: dated October 2.

San Francisco Bay Regional Water Quality Control Board, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater: dated May.

Sequoia Environmental, 2011, Removal Action Workplan, 1301 59th Street Project, Emeryville, California; dated October 7.

TABLE 1 - ANALYTICAL RESULTS FOR TITLE 22 METALS

Sample ID	Sample Depth (feet bgs)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury	Chromium III	Chromium VI	TCLP Antimony	TCLP Arsenic	TCLP Barium	WET (STLC) Chromium	TCLP Chromium	TCLP Copper	WET (STLC) Lead	TCLP Lead	TCLP Mercury	TCLP Silver
			Total Metals Results (mg/kg)																			Solubility Results (mg/L)									
B1-S-1	0.5-1.0	5/16/2012	ND<2.0	6.8	150	ND<1.0	ND<1.0	**340**	12	46	**350**	ND<1.0	25	ND<1.0	1.8	ND<1.0	33	89	0.40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B11-S-1*	0.5-1.0	5/16/2012	ND<40	ND<20	120	ND<20	ND<20	**1300**	ND<20	120	**1900**	ND<20	21	ND<20	ND<20	ND<20	32	97	0.45	NA	NA	NA	NA	NA	NA	0.55	NA	NA	0.29	NA	NA
B1-S-2.5	2.0-2.5	5/16/2012	ND<40	**100**	56	ND<20	ND<20	**1700**	ND<20	130	**150**	ND<20	ND<20	ND<20	ND<20	ND<20	28	51	0.53	NA	NA	NA	ND<0.05	NA	NA	0.31	NA	NA	0.25	NA	NA
B1-S-5	4.5-5.0	5/16/2012	NA	**47**	NA	NA	NA	**100**	NA	NA	4.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	NA	NA	NA	NA	NA	NA
B2-S-1	0.5-1.0	5/16/2012	ND<40	ND<20	65	ND<20	ND<20	**3000**	ND<20	150	**480**	ND<20	25	ND<20	**110**	ND<20	36	42	0.35	NA	NA	NA	NA	NA	NA	0.87	NA	NA	0.62	NA	0.31
B21-S-1*	0.5-1.0	5/16/2012	ND<40	ND<20	67	ND	ND	**3400**	ND<20	170	**440**	ND<20	29	ND<20	**110**	ND<20	22	49	0.34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B2-S-2.5	2.0-2.5	5/16/2012	ND<40	**210**	310	ND	ND	**10000**	ND<20	200	**740**	ND<20	25	ND<20	ND<20	ND<20	27	35	**7.5**	NA	NA	NA	ND<0.05	NA	NA	2.0	NA	NA	0.33	0.0028	NA
B2-S-5	4.5-5.0	5/16/2012	ND<40	**120**	210	ND<20	ND<20	**6000**	ND<20	80	ND<20	ND<20	27	ND<20	ND<20	ND<20	33	63	0.85	NA	NA	NA	ND<0.05	NA	NA	6.5	NA	NA	NA	NA	NA
B3-S-1	0.5-1.0	5/16/2012	ND<40	ND<20	93	ND<20	ND<20	**620**	ND<20	120	**430**	ND<20	ND<20	ND<20	ND<20	ND<20	25	78	0.14	NA	NA	NA	NA	NA	NA	0.26	NA	NA	0.42	NA	NA
B3-S-2.5	2.0-2.5	5/16/2012	ND<2.0	3.3	97	ND<1.0	ND<1.0	**110**	10	45	4.3	ND<1.0	19	ND<1.0	ND<1.0	ND<1.0	19	20	ND<0.1	NA	NA	NA	NA	NA	ND<1.0	NA	NA	NA	NA	NA	NA
B4-S-1	0.5-1.0	5/16/2012	**280**	**22**	1000	ND<20	ND<20	**17000**	ND<20	580	**16000**	28	73	ND<20	**460**	ND<20	ND<20	49	0.24	14,300	**2,700**	ND<0.10	NA	0.82	NA	0.56	2.9	NA	2.4	NA	0.39
B4-S-2.5	2.0-2.5	5/16/2012	ND<40	**130**	60	ND<20	ND<20	**4700**	ND<20	170	**1000**	ND<20	30	ND<20	**210**	ND<20	26	30	0.51	NA	NA	NA	ND<0.05	NA	NA	1.4	NA	NA	0.23	NA	0.35
B4-S-5	4.5-5.0	5/16/2012	ND<40	**54**	110	ND<20	ND<20	**2500**	ND<20	75	38	ND<20	38	ND<20	34	ND<20	24	37	0.10	NA	NA	NA	ND<0.05	NA	NA	5.6	NA	NA	NA	NA	NA
B5-S-1	0.5-1.0	5/16/2012	ND<40	**48**	150	ND<20	ND<20	**1500**	ND<20	280	**1500**	ND<20	31	ND<20	ND<20	ND<20	25	92	0.26	NA	NA	NA	NA	NA	NA	0.43	0.38	NA	0.47	NA	NA
B5-S-2.5	2.0-2.5	5/16/2012	ND<2.0	3.1	71	ND<1.0	ND<1.0	**25**	2.7	7.1	5.1	ND<1.0	20	ND<1.0	ND<1.0	ND<1.0	20	23	ND<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B6-S-1	0.5-1.0	5/16/2012	ND<40	**580**	100	ND<20	ND<20	**4200**	ND<20	940	**210**	ND<20	54	ND<20	35	ND<20	23	130	0.75	NA	NA	NA	ND<0.05	NA	NA	0.48	2.5	NA	0.10	NA	NA
B6-S-2.5	2.0-2.5	5/16/2012	ND<2.0	**87**	86	ND<1.0	ND<1.0	**530**	4.4	150	5.7	ND<1.0	28	ND<1.0	3.6	ND<1.0	24	47	ND<0.1	NA	NA	NA	ND<0.05	NA	NA	0.16	NA	NA	NA	NA	NA
B6-S-5	4.5-5.0	5/16/2012	NA	2.3	NA	NA	NA	**14**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B7-S-1	0.5-1.0	5/16/2012	ND<40	**22**	87	ND<20	ND<20	**200**	ND<20	65	**230**	ND<20	20	ND<20	ND<20	ND<20	25	56	0.13	NA	NA	NA	NA	NA	1.3	NA	NA	4.2	NA	NA	NA
B7-S-2.5	2.0-2.5	5/16/2012	ND<2.0	6.0	48	ND<1.0	ND<1.0	**25**	3.1	17	7.2	ND<1.0	15	ND<1.0	ND<1.0	ND<1.0	20	23	ND<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B8-S-1	0.5-1.0	5/16/2012	ND<40	**34**	140	ND<20	ND<20	**760**	ND<20	250	**760**	ND<20	45	ND<20	ND<20	ND<20	36	190	0.31	NA	NA	NA	NA	NA	NA	0.25	0.08	NA	0.27	NA	NA
B81-S-1*	0.5-1.0	5/16/2012	ND<2.0	**53**	100	ND<1.0	ND<1.0	**63**	6.6	44	3.3	ND<1.0	20	ND<1.0	ND<1.0	ND<1.0	13	29	0.38	NA	NA	NA	ND<0.05	NA	NA	NA	NA	NA	NA	NA	NA
B8-S-2.5	2.0-2.5	5/16/2012	ND<2.0	2.2	52	ND<1.0	ND<1.0	**140**	1.7	76	4.1	ND<1.0	15	ND<1.0	ND<1.0	ND<1.0	12	32	ND<0.1	125	**15**	NA	NA	NA	4.7	NA	NA	NA	NA	NA	NA
B8-S-5	4.5-5.0	5/16/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3,100**	NA	NA	NA	NA	0.35	NA	NA	NA	NA	NA
B9-S-1	0.5-1.0	5/16/2012	ND<2.0	3.8	81	ND<1.0	ND<1.0	**22**	4.8	15	32	ND<1.0	15	ND<1.0	ND<1.0	ND<1.0	20	55	0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B10-S-1	0.5-1.0	5/16/2012	ND<2.0	**36**	170	ND<1.0	ND<1.0	**24**	7.0	36	67	ND<1.0	25	ND<1.0	ND<1.0	ND<1.0	25	350	0.23	NA	NA	NA	NA	NA	NA	NA	NA	3.5	NA	NA	NA
B10-S-2.5	2.0-2.5	5/16/2012	NA	3.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ESLs			6.3	0.39**	3,000	31	1.7	9.4***	280	6,300	260	78	300	78	78	1.3	16	4,700	1.3	23,000	9.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHHSLs			30	0.007**	5,200	150	1.7	17***	660	3,000	80	380	1,600	380	380	5	530	23,000	18	100,000	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Equipment Blank Sample Analytical Results (mg/L)																												
EB-1	NA	5/16/2012	NA	ND<0.01	NA	NA	NA	NA	NA	NA	ND<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* indicates duplicate of preceeding sample
** indicates that a proposed arsenic cleanup goal for arsenic of 17 mg/kg will be used
*** indicates that the ESL and CHHSL for chromium VI is used for comapirson to total chromium concentrations
Title 22 Metals analyzed by EPA Method 6010B/7471
STLC - Solubility Threshold Limit Concentrations
TCLP Toxicity Characteristic Leaching Procedure
STLC/TCLP Metals analyzed by Waste Extraction Test (WET)/EPA Method 6010B/7470
Chromium VI analyzed by EPA Method 7196A
Bold indicates concentration equal to or exceeding cleanup goal
Grey Shading indicates concentration exceeding Title 22 limits, classifying soil as California Hazardous Waste
Red Shading indicates concentration exceeding TCLP limit, classifying soil as Resource Conservation and Recovery Act (RCRA) Hazardous Waste
ESLS - RWQCB Direct Exposure Soil Screening Levels, Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (ESLs Table K-1)
CHHSLs - California Human Health Screening Levels (CHHSLs) for Soil for Residential Land Use
mg/kg – milligram per kilogram
mg/L – milligram per liter
bgs – below ground surface
ND<X - not detected, below the laboratory reporting limit of X
NA – not applicable or not analyzed

TABLE 2 - ANALYTICAL RESULTS FOR TPH, VOCs and SVOCs

Sample ID	Sample Depth (feet bgs)	Sample Date	TPH (mg/kg)			VOCs (µg/kg)		All SVOCs (µg/kg)
			TPHg	TPHd	TPHmo	TCE	All Other VOCs	
B1-S-1	0.5-1.0	5/16/2012	ND<0.81	**430**	**1800**	ND<4.4	ND	ND
B11-S-1*	0.5-1.0	5/16/2012	ND<0.99	**320**	**1400**	ND<4.1	ND	ND
B1-S-2.5	2.0-2.5	5/16/2012	NA	60	210	NA	NA	ND
B2-S-1	0.5-1.0	5/16/2012	ND<1.1	**420**	**1100**	ND<4.8	ND	ND
B21-S-1*	0.5-1.0	5/16/2012	NA	**450**	**1100**	NA	NA	ND
B2-S-2.5	2.0-2.5	5/16/2012	NA	**120**	190	NA	NA	ND
B2-S-5	4.5-5.0	5/16/2012	NA	2.4	NA	NA	NA	NA
B3-S-1	0.5-1.0	5/16/2012	ND<0.81	**180**	**550**	ND<4.5	ND	ND
B3-S-2.5	2.0-2.5	5/16/2012	NA	1.4	3.4	NA	NA	ND
B4-S-1	0.5-1.0	5/16/2012	ND<1.1	**960**	**1800**	ND<4.3	ND	ND
B4-S-2.5	2.0-2.5	5/16/2012	NA	14	30	NA	NA	ND
B5-S-1	0.5-1.0	5/16/2012	ND<0.82	100	310	ND<4.9	ND	ND
B5-S-2.5	2.0-2.5	5/16/2012	NA	NA	NA	NA	NA	ND
B6-S-1	0.5-1.0	5/16/2012	ND<0.84	**290**	**810**	10	ND	ND
B6-S-2.5	2.0-2.5	5/16/2012	NA	1.6	3.2	NA	NA	ND
B7-S-1	0.5-1.0	5/16/2012	ND<0.82	**210**	**830**	ND<4.8	ND	ND
B7-S-2.5	2.0-2.5	5/16/2012	NA	3.6	12	NA	NA	ND
B8-S-1	0.5-1.0	5/16/2012	ND<0.88	**440**	**1500**	ND<5.0	ND	ND
B8-S-2.5	2.0-2.5	5/16/2012	NA	1.5	3.1	NA	NA	ND
B9-S-1	0.5-1.0	5/16/2012	ND<0.81	93	**390**	ND<4.0	ND	ND
B9-S-2.5	2.0-2.5	5/16/2012	NA	NA	3.7	NA	NA	ND
B10-S-1	0.5-1.0	5/16/2012	ND<0.82	**140**	**490**	ND<4.2	ND	ND
B10-S-2.5	2.0-2.5	5/16/2012	NA	2.0	5.0	NA	NA	ND
ESLs			110	110	370	1,900	NA	NA

Notes:
TPH – Total Petroleum Hydrocarbons by EPA Method 8015B (modified).
SVOCs – Semi-Volatile Organic Compounds by EPA Method 8270C.
VOCs - Volatile Organic Compounds by EPA Method 8260B
TCE - Trichloroethylene
* indicates a duplicate of the preceeding sample
ESLS - RWQCB Direct Exposure Soil Screening Levels, Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (ESLs Table K-1)
CHHSLs - California Human Health Screening Levels (CHHSLs) for Soil for Residential Land Use
mg/kg – milligrams per kilogram
µg/kg – micrograms per kilogram
Bold indicates concentration exceeding cleanup goal
bgs – below ground surface
ND<X - not detected, below the laboratory reporting limit of X
ND – non detect (Detection Limits Vary, see Lab Report)
NA – not analyzed or not applicable

TABLE 3 - ANALYTICAL RESULTS FOR OCPs

Sample ID	Depth (feet bgs)	Date	Analytical Results (µg/kg)							
			4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-Chlordane	Chlordane	Dieldrin	gamma-Chlordane	All Other OCPs
B1-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	1.0	13	ND<2.0	1.5	ND
B11-S-1*	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	1.6	24	ND<2.0	3.5	ND
B2-S-1	0.5-1.0	5/16/2012	ND<2.0	10	34	ND<1.0	ND<8.5	ND<2.0	ND<1.0	ND
B3-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	ND<1.0	ND<8.5	ND<2.0	ND<1.0	ND
B4-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	ND<1.0	ND<8.5	ND<2.0	ND<1.0	ND
B5-S-1	0.5-1.0	5/16/2012	ND<2.0	4.4	ND<2.0	ND<1.0	ND<8.5	3.6	ND<1.0	ND
B6-S-1	0.5-1.0	5/16/2012	13	21	200	2.2	28	ND<2.0	3.9	ND
B7-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	ND<1.0	ND<8.5	ND<2.0	ND<1.0	ND
B8-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	25	25	170	ND<2.0	28	ND
B9-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	1.4	16	ND<2.0	1.4	ND
B10-S-1	0.5-1.0	5/16/2012	ND<2.0	ND<2.0	ND<2.0	ND<1.0	ND<8.5	ND<2.0	ND<1.0	ND
ESLs			2,400	1,700	1,700	440**	440	34	440**	NA
CHHSLs			2,300	1,600	1,600	430**	430	35	430**	NA

Notes:
bgs - below ground surface
OCPs - organochlorine pesticides analyzed using EPA Method 8081A
* indicates a duplicate of the preceeding sample
ESLS - RWQCB Direct Exposure Soil Screening Levels, Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (ESLs Table K-1)
CHHSLs - California Human Health Screening Levels (CHHSLs) for Soil for Residential Land Use
** - indicates the ESL and CHHSL for Cholrdane were used
µg/kg - micrograms per kilogram
NA - not applicable
ND – non detect (detection limits vary, see lab report)
ND<X - not detected, below the laboratory reporting limit of X

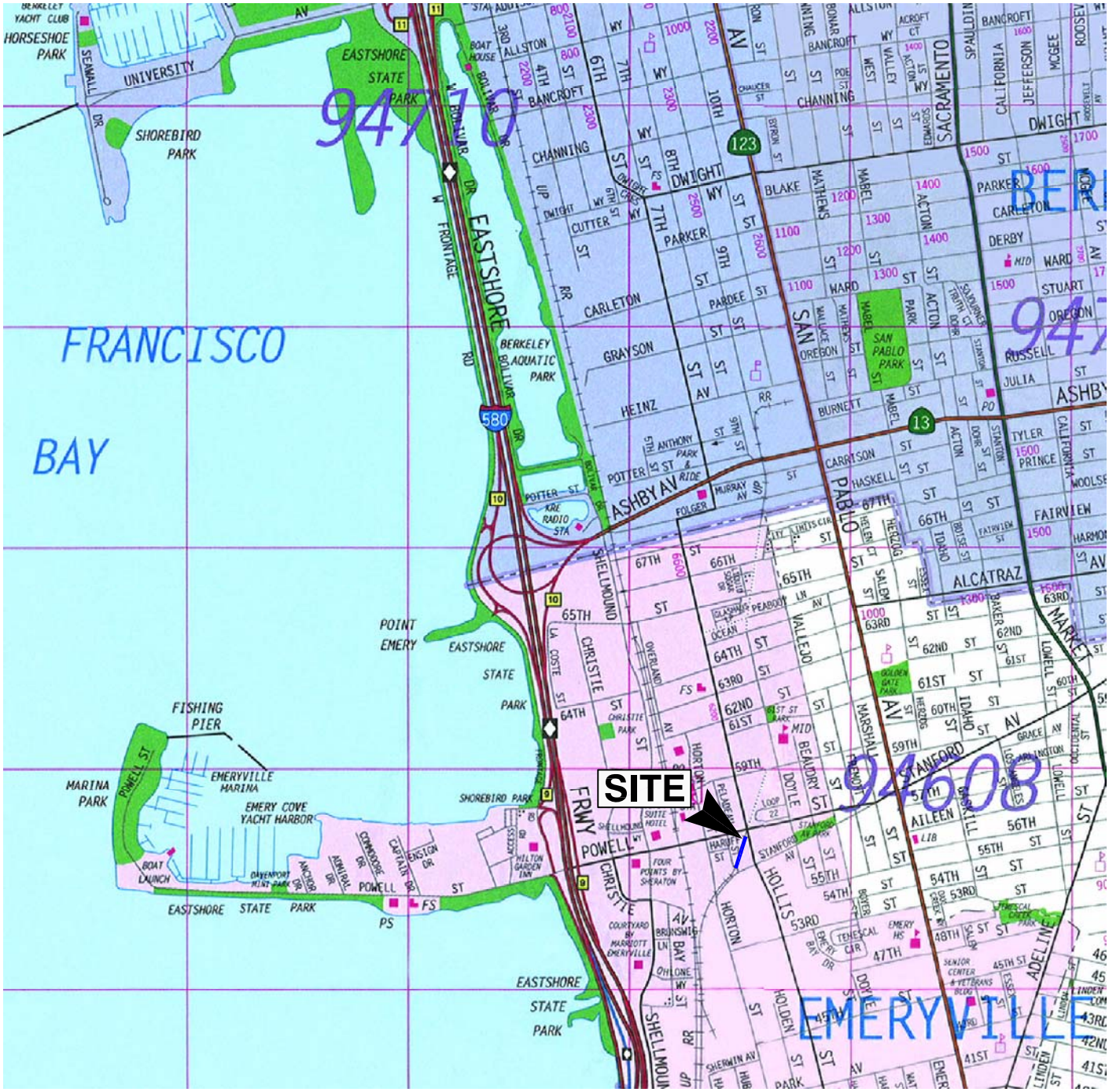
TABLE 4 - ANALYTICAL RESULTS FOR HERBICIDES

Sample ID	Sample Depth (feet bgs)	Sample Date	Analytical Results (µg/kg)	
			Pentachlorophenol (PCP)	All Other Herbicides
B1-S-1	0.5-1.0	5/16/2012	ND<20	ND
B11-S-1*	0.5-1.0	5/16/2012	ND<20	ND
B2-S-1	0.5-1.0	5/16/2012	ND<10	ND
B3-S-1	0.5-1.0	5/16/2012	ND<10	ND
B4-S-1	0.5-1.0	5/16/2012	69.0	ND
B5-S-1	0.5-1.0	5/16/2012	ND<10	ND
B6-S-1	0.5-1.0	5/16/2012	ND<10	ND
B7-S-1	0.5-1.0	5/16/2012	ND<10	ND
B8-S-1	0.5-1.0	5/16/2012	ND<20	ND
B9-S-1	0.5-1.0	5/16/2012	ND<10	ND
B10-S-1	0.5-1.0	5/16/2012	ND<10	ND
ESLs			3,000	NA
CHHSLs			4,400	NA

Notes:
bgs - below ground surface
Herbicides analyzed using EPA Method 8151A
* indicates a duplicate of the preceeding sample
ESLS - RWQCB Direct Exposure Soil Screening Levels, Residential Exposure Scenario, using a hazard quotient of 0.2 for non-carcinogens (ESLs Table K-1)
CHHSLs - California Human Health Screening Levels (CHHSLs) for Soil for Residential Land Use
µg/kg - micrograms per kilogram
NA - not applicable
ND – non detect (detection limits vary, see lab report)
ND<X - not detected, below the laboratory reporting limit of X

Table 5 - Excavation Volume and Remedial Cost Estimate Calculations							
Boring Locations Within Excavation Area	**Approximate Excavation Area (square feet)**	**Approximate Depth of Excavation (feet bgs)**	**Approximate Soil Volume (cubic yards)**	**Approximate Soil Weight (tons)**	**Waste Classification**	**Estimated $/Ton ***	**Remediation Contractor Cost**
Excavation/Direct Loading, Transportation and Disposal of Impacted Soil							
B-1	260	4.5	43	65	Cal-Haz	$ 135.00	$ 8,775.00
B-1	260	4.5 to 6	14	22	Non-Haz	$ 43.00	$ 931.67
B-2	400	4.5	67	100	Cal-Haz	$ 135.00	$ 13,500.00
B-2	400	4.5 to 6	22	33	RCRA-Haz	$ 220.00	$ 7,333.33
B-3	550	2	41	61	Cal-Haz	$ 135.00	$ 8,250.00
B-3	550	2 to 6	81	122	Non-Haz	$ 43.00	$ 5,255.56
B-4	670	4.5	25	37	Cal-Haz	$ 135.00	$ 5,025.00
B-4	670	4.5 to 6	37	56	RCRA-Haz	$ 220.00	$ 12,283.33
B-5	490	2	36	54	Cal-Haz	$ 135.00	$ 7,350.00
B-6	700	4.5	117	175	Cal-Haz	$ 135.00	$ 23,625.00
B-7	360	2	27	40	Non-Haz	$ 43.00	$ 1,720.00
B-8	500	2	37	56	Cal-Haz	$ 135.00	$ 7,500.00
B-8	500	2 to 3	19	28	Non-Haz	$ 43.00	$ 1,194.44
B-8	500	3 to 6	56	83	Cal-Haz	$ 135.00	$ 11,250.00
B-9 and B-10	1,000	2	44	66	Non-Haz	$ 43.00	$ 2,842.78
Totals			**666**	**999**	NA	NA	**$ 116,836.11**
Backfilling/Site Restoration							
NA	NA	NA	666	999	NA	$ 30.00	**$ 29,958.33**
Line Items							
Dust and Meteorological Montoring Costs (Estimated at $1,500/Day for 1 Week)							**$ 7,500.00**
Additional Contractor Costs Including Project Management, Plan Preparation, Mobilization, Fencing, Sanitation, etc.							**$ 10,000.00**
Total Remediation Contractor Cost							**$ 164,294.44**

Notes:
* indicates estimated pricing is based on rates available during preparation of the estimate and are subject to change over time



REFERENCE: METRO AREAS OF ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO, AND SANTA CLARA COUNTIES, THOMAS GUIDE, 2008.

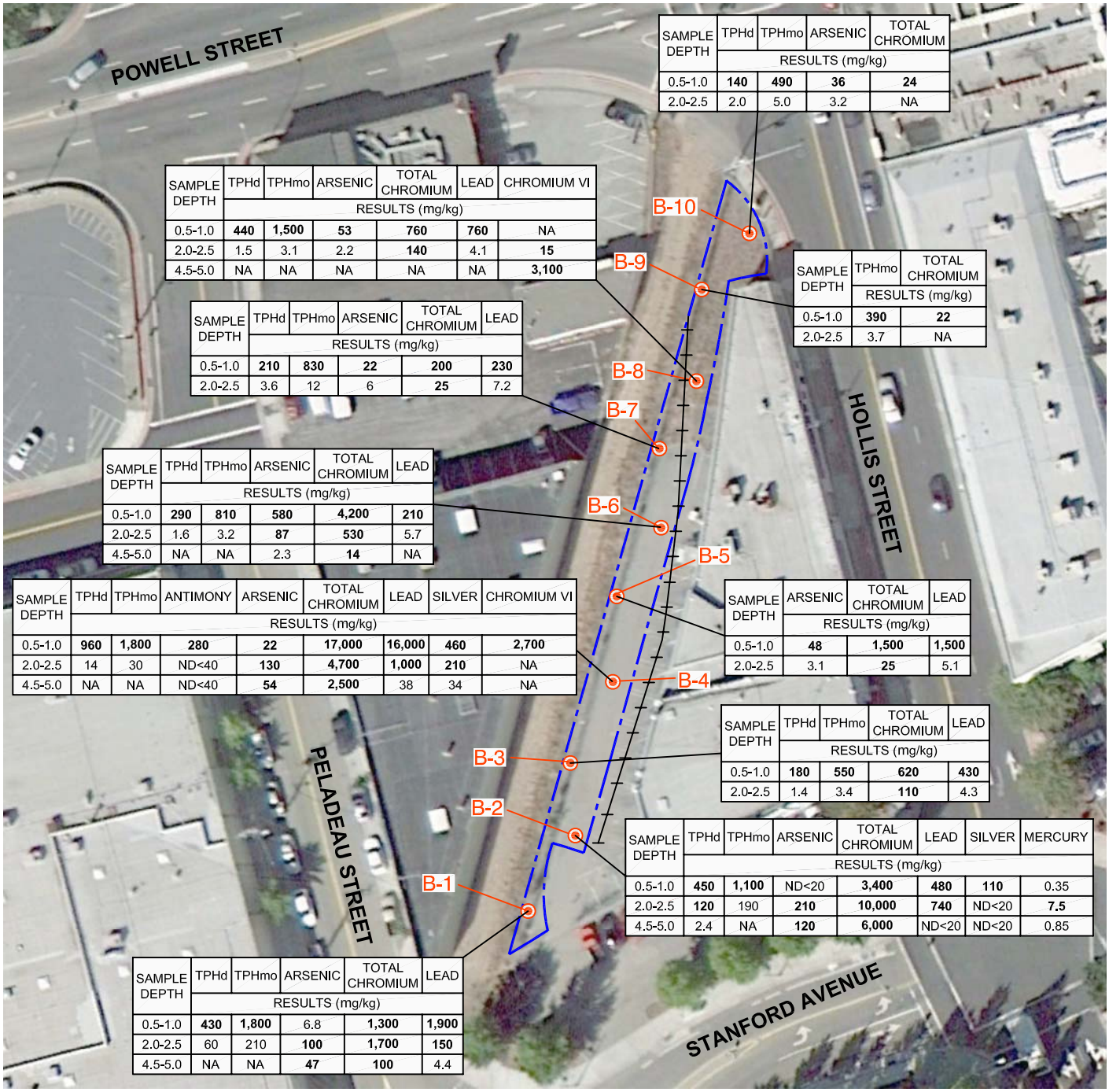
N

SCALE IN FEET

0 2,000 4,000

NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	SITE LOCATION	FIGURE
PROJECT NO.	DATE	SITE CLEANUP PLAN 5701 HOLLIS STREET EMERYVILLE, CALIFORNIA	1
401834001	9/12		



SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM
	RESULTS (mg/kg)			
0.5-1.0	**140**	**490**	**36**	**24**
2.0-2.5	2.0	5.0	3.2	NA

SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM	LEAD	CHROMIUM VI
	RESULTS (mg/kg)					
0.5-1.0	**440**	**1,500**	**53**	**760**	**760**	NA
2.0-2.5	1.5	3.1	2.2	**140**	4.1	**15**
4.5-5.0	NA	NA	NA	NA	NA	**3,100**

SAMPLE DEPTH	TPHmo	TOTAL CHROMIUM
	RESULTS (mg/kg)	
0.5-1.0	**390**	**22**
2.0-2.5	3.7	NA

SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM	LEAD
	RESULTS (mg/kg)				
0.5-1.0	**210**	**830**	**22**	**200**	**230**
2.0-2.5	3.6	12	6	**25**	7.2

SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM	LEAD
	RESULTS (mg/kg)				
0.5-1.0	**290**	**810**	**580**	**4,200**	**210**
2.0-2.5	1.6	3.2	**87**	**530**	5.7
4.5-5.0	NA	NA	2.3	**14**	NA

SAMPLE DEPTH	TPHd	TPHmo	ANTIMONY	ARSENIC	TOTAL CHROMIUM	LEAD	SILVER	CHROMIUM VI
	RESULTS (mg/kg)							
0.5-1.0	**960**	**1,800**	**280**	**22**	**17,000**	**16,000**	**460**	**2,700**
2.0-2.5	14	30	ND<40	**130**	**4,700**	**1,000**	**210**	NA
4.5-5.0	NA	NA	ND<40	**54**	**2,500**	38	34	NA

SAMPLE DEPTH	ARSENIC	TOTAL CHROMIUM	LEAD
	RESULTS (mg/kg)		
0.5-1.0	**48**	**1,500**	**1,500**
2.0-2.5	3.1	**25**	5.1

SAMPLE DEPTH	TPHd	TPHmo	TOTAL CHROMIUM	LEAD
	RESULTS (mg/kg)			
0.5-1.0	**180**	**550**	**620**	**430**
2.0-2.5	1.4	3.4	**110**	4.3

SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM	LEAD	SILVER	MERCURY
	RESULTS (mg/kg)						
0.5-1.0	**450**	**1,100**	ND<20	**3,400**	**480**	**110**	0.35
2.0-2.5	**120**	190	**210**	**10,000**	**740**	ND<20	**7.5**
4.5-5.0	2.4	NA	**120**	**6,000**	ND<20	ND<20	0.85

SAMPLE DEPTH	TPHd	TPHmo	ARSENIC	TOTAL CHROMIUM	LEAD
	RESULTS (mg/kg)				
0.5-1.0	**430**	**1,800**	6.8	**1,300**	**1,900**
2.0-2.5	60	210	**100**	**1,700**	**150**
4.5-5.0	NA	NA	**47**	**100**	4.4

REFERENCE: GOOGLE EARTH, 2011.

CLEANUP GOALS IN mg/kg							
TPHd	TPHmo	ANTIMONY	ARSENIC	LEAD	SILVER	CHROMIUM VI	MERCURY
110	370	6.3	17	80	78	9.4	1.3

N

SCALE IN FEET

0 60 120

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

B-10	MAY 2011 BORING LOCATION
	SITE BOUNDARY
	LOCATION OF FORMER RAILROAD SPUR
mg/kg	MILLIGRAMS PER KILOGRAM
NA	NOT ANALYZED
TPHd	TOTAL PETROLEUM HYDROCARBONS AS DIESEL
TPHmo	TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
BOLD	INDICATES CONCENTRATION EQUAL TO OR EXCEEDING CLEANUP GOAL. CLEANUP GOAL FOR CHROMIUM VI USED FOR COMPARISON WITH TOTAL CHROMIUM CONCENTRATIONS.

Ninyo & Moore

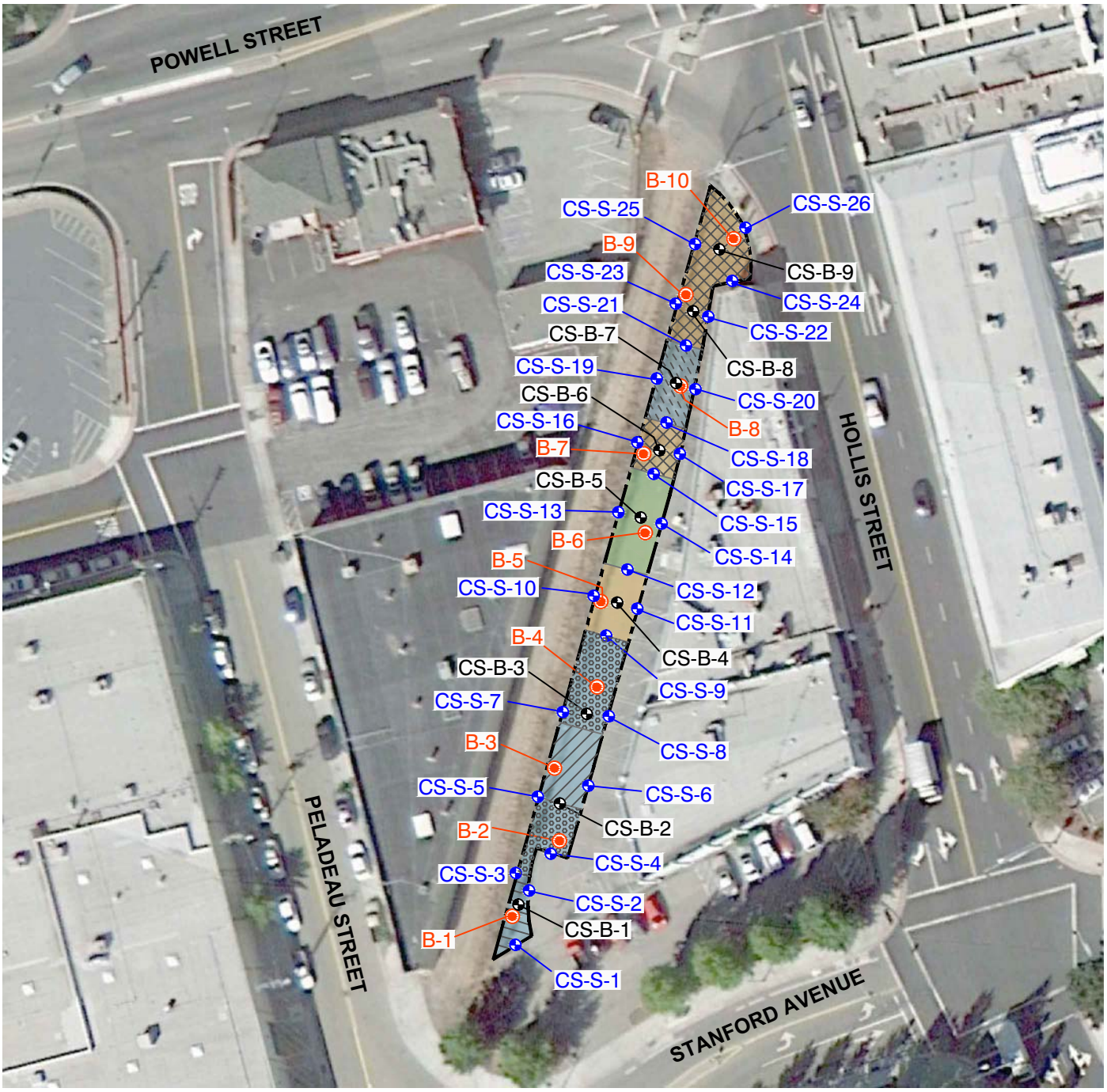
SITE PLAN, BORING LOCATIONS AND ANALYTICAL RESULTS EXCEEDING CLEANUP GOALS

FIGURE **2**

PROJECT NO.	DATE
401834001	9/12

SITE CLEANUP PLAN
5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

401834001-FIG2.dwg, Sep 04, 2012, 1:34pm snguyen



REFERENCE: GOOGLE EARTH, 2011.

N

SCALE IN FEET

0 60 120

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- SITE BOUNDARY
- B-10 MAY 2011 BORING LOCATION
- CS-S-26 PROPOSED SIDEWALL CONFIRMATION SAMPLE LOCATION
- CS-B-9 PROPOSED BOTTOM CONFIRMATION SAMPLE LOCATION
- BGS BELOW GROUNDSURFACE
- EXCAVATION TO 2 FEET BGS
- EXCAVATION TO 4.5 FEET BGS
- EXCAVATION TO 6 FEET BGS
- INDICATES NON-HAZ SOIL FROM 0 TO 2 FEET BGS
- INDICATES NON-HAZ SOIL FROM 2 TO 3 FEET BGS
- INDICATES NON-HAZ SOIL FROM 2 TO 6 FEET BGS
- INDICATES NON-HAZ SOIL FROM 4.5 TO 6 FEET BGS
- INDICATES RCRA-HAZ SOIL FROM 4.5 TO 6 FEET BGS

Ninyo & Moore

BORING LOCATIONS, EXCAVATION AREAS AND CONFIRMATION SAMPLE LOCATIONS

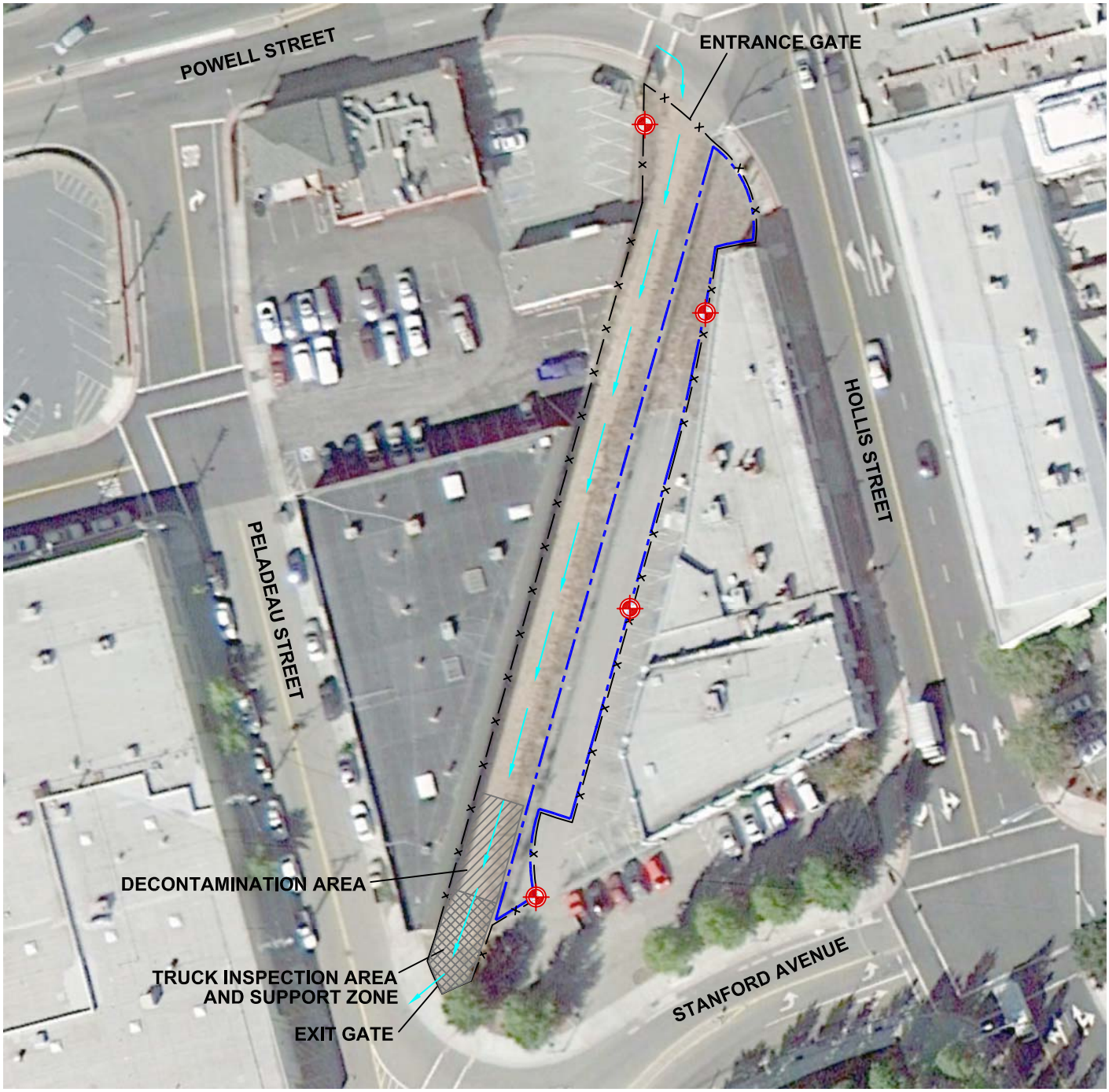
PROJECT NO.	DATE
401834001	9/12

SITE CLEANUP PLAN
5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

FIGURE

3

401834001-FIG3.dwg, Sep 04, 2012, 1:35pm,snguyen



REFERENCE: GOOGLE EARTH, 2011.

N

SCALE IN FEET

0 60 120

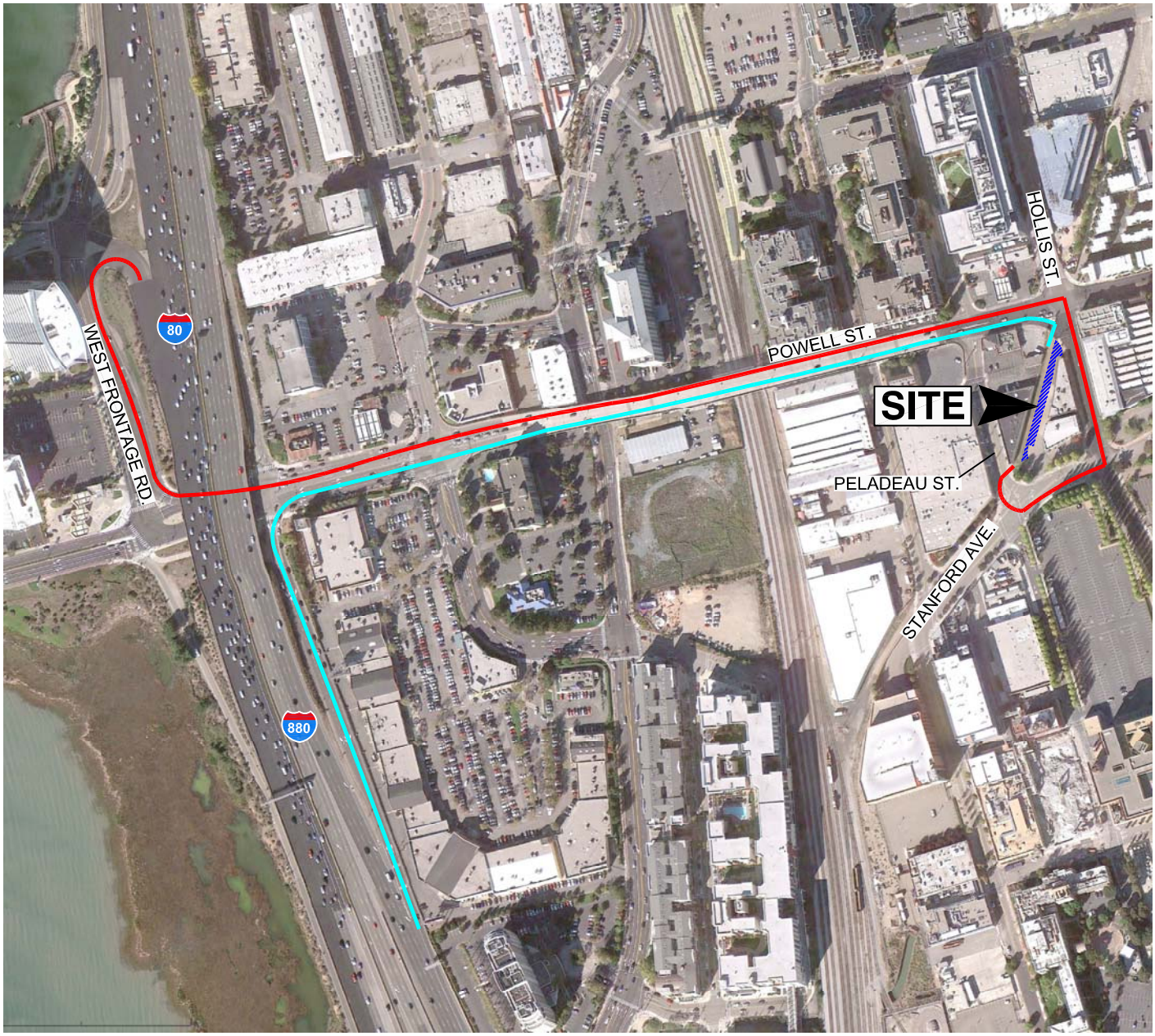
NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- DUST MONITORING LOCATION
- SITE BOUNDARY
- FENCED/ENCLOSED EXCLUSION ZONE
- ON SITE TRUCKING ROUTE

Ninyo & Moore		ON SITE TRUCKING ROUTE, DUST MONITORING LOCATIONS AND DECONTAMINATION AREA	FIGURE
PROJECT NO.	DATE	SITE CLEANUP PLAN 5701 HOLLIS STREET EMERYVILLE, CALIFORNIA	4
401834001	9/12		

401834001-FIG4.dwg, Sep 04, 2012, 1:37pm snguyen



REFERENCE: GOOGLE EARTH IMAGERY, 2011.

N

SCALE IN FEET

0 400 800

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- TRUCKS LEAVING SITE
- TRUCKS RETURNING TO SITE

Ninyo & Moore		LOCAL TRANSPORTATION ROUTES	FIGURE
PROJECT NO.	DATE	SITE CLEANUP PLAN 5701 HOLLIS STREET EMERYVILLE, CALIFORNIA	5
401834001	9/12		

401834001-FIG5.dwg, Sep 04, 2012, 1:38pm snguyen

APPENDIX A

SUPPORTING DOCUMENTS

RESOLUTION NO. 11-34

RESOLUTION OF INTENTION OF THE CITY COUNCIL OF THE CITY OF EMERYVILLE TO VACATE A PORTION OF STANFORD AVENUE BETWEEN HOLLIS STREET AND PELADEAU STREET CURRENTLY USED FOR PUBLIC PARKING PURSUANT TO CHAPTER 3 OF PART 3 OF DIVISION 9 OF THE CALIFORNIA STREETS AND HIGHWAYS CODE TO ENABLE THE VACATED AREA TO BE CONVERTED TO A PRIVATELY HELD PARKING LOT IN EXCHANGE FOR EQUAL SQUARE FOOTAGE OF LAND TO BE UTILIZED AS PART OF THE EMERYVILLE GREENWAY.

WHEREAS, the City of Emeryville established the Emeryville Redevelopment Project Area in 1976 and the Shellmound Park Project Area in 1987 ("Shellmound and 1976 Project Areas"), pursuant to California Redevelopment Law (Health & Safety Code Section 33000 et. seq.); and

WHEREAS, California Redevelopment Law defines one of the purposes of redevelopment as the elimination of social, economic and physical blight; and

WHEREAS, the Agency acquired segments of the Union Pacific spur for the creation of the "Emeryville Greenway" along the border of the Shellmound and 1976 Project Areas for the purpose of revitalizing a blighted site as well as the neighborhood around the Emeryville Greenway Acquisition Site through its redevelopment as a pedestrian and bicycle accessible pathway through Emeryville; and

WHEREAS, on March 26, 2009, pursuant to Resolution CPC Number UP08-11/DR08-23/VAR08-03,, the Emeryville Planning Commission adopted Conditions of Approval for the 5701 Hollis site (APN 49-1318—3,-9) as a Office, Laboratory, or Other Commercial Uses ("5701 Hollis Development") as proposed by 5701 HOLLIS STREET LLC, a California limited liability company ("5701 Hollis LLC") which stated:

B. PRIOR TO ISSUANCE OF TEMPORARY CERTIFICATE OF OCCUPANCY

1. Land Exchange. Prior to the issuance of temporary certificate of occupancy, the Public Works Director shall confirm that the City and the applicant have negotiated an exchange of parcels (APNs: 49-1318-3; and -9). In the alternative, prior to the issuance of temporary certificate of occupancy, the applicant shall enter into a Deferred Improvement Agreement with the City for a term expiring two years from the date of issuance of the temporary certificate of occupancy, to ensure completion of the exchange of parcels; and

WHEREAS, on January 27, 2011 by Resolution CPC VAC 11-01, the Emeryville Planning Commission made a finding that the proposed vacation of Stanford Street was consistent with the Emeryville General Plan; and

WHEREAS, the 5701 Hollis Development requires use of a portion of Stanford Street for inclusion as private parking in exchange for a landscaped, public pedestrian pathway, thereby requiring the City to formally vacate a portion of Stanford Street, and eventually

convey it to 5701 Hollis LLC under the terms and conditions of approval as set forth by the Planning Commission; and

WHEREAS, said portion of Stanford Street to be vacated is described in the legal description attached hereto as Exhibit A and depicted in the map attached hereto as Exhibit B; now, therefore, be it

RESOLVED, that it is the intent of the City Council of the City of Emeryville to vacate the property depicted and described herein and such vacation is made pursuant to Chapter 3 of Part 3 of Division 9 of the California Streets and Highway Code; and be it

FURTHER RESOLVED, that all persons interested in the proposed vacation may appear and be heard at a public hearing of the City Council of the City of Emeryville on Tuesday, April 5, 2011, at 7:16 p.m., or as soon thereafter as the matter is heard, in the City Council Chambers, 1333 Park Avenue, Emeryville, California; and be it

FURTHER RESOLVED, that the City Clerk is hereby directed to post this Resolution of Intention in locations prescribed by the City Council for posting of notices, to publish this Resolution in the Oakland Tribune twice for at least two successive weeks prior to the hearing in accordance with Streets and Highways Code Section 8322, to send notice to property owners located within 300 feet of the property, to post at least three notices of Vacation along the line of the proposed street to be vacated at least two weeks prior to the hearing in accordance with Streets and Highways Code Section 8323, and to send notice to affected public utility companies at least two weeks prior to the hearing.

ADOPTED by the City Council of the City of Emeryville at its regular meeting held Tuesday, March 1, 2011 by the following vote:

AYES: (4)Mayor Davis, Vice Mayor West and Council Members Brinkman and Bukowski

NOES: (0) None **ABSENT:** None

EXCUSED: (1)Council Member Atkin **ABSTAINED:** None

MAYOR: Mark Davis

ATTEST: **APPROVED AS TO FORM:**

Michael L. Biddle

CITY CLERK **CITY ATTORNEY**

EXHIBIT A
Page 1 of 2

DESCRIPTION
TO BE ABANDONED BY
THE CITY OF EMERYVILLE
CONVEYED TO
5701 HOLLIS STREET, LLC

ALL THAT CERTAIN REAL PROPERTY SITUATE IN THE CITY OF EMERYVILLE, COUNTY OF ALAMEDA, STATE OF CALIFORNIA, BEING A PORTION OF THE RIGHT OF WAY OF STANFORD AVENUE, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF LANDS GRANTED TO 5701 HOLLIS STREET, LLC, A LIMITED LIABILITY COMPANY, BY DEED RECORDED AS DOCUMENT NUMBER 2003-413639 ON JULY 16TH, 2003 IN OFFICIAL RECORDS, COUNTY OF ALAMEDA, THENCE ALONG THE SOUTHERLY LINE OF SAID DEED, SAID SOUTHERLY LINE BEING COMMON TO THE NORTHERLY LINE OF THE RIGHT OF WAY OF STANFORD AVENUE, THE FOLLOWING TWO (2) COURSES:

1) SOUTH 61°44'12" WEST 102.87 FEET, AND
2) THENCE SOUTH 51°25'43" WEST 65.40 FEET;

THENCE LEAVING SAID COMMON LINE AND ENTERING INTO THE RIGHT OF WAY OF STANFORD AVENUE ALONG A NON-TANGENT CURVE BEING CONCAVE EASTERLY, AND HAVING A RADIAL BEARING OF NORTH 79°42'38" EAST, ALSO HAVING A RADIUS OF 101.00 FEET, THENCE ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 21°21'54" AND AN ARC LENGTH OF 37.66 FEET;

THENCE NORTH 57°40'53" EAST 38.06 FEET;

TEHNCE NORTH 60°29'47" EAST 17.23 FEET;

THENCE NORTH 51°46'52" WEST 3.46 FEET;

THENCE NORTH 01°33'49" EAST 7.26 FEET;

THENCE ALONG AN ARC OF A TANGENT CURVE BEING CONCAVE EASTERLY, AND HAVING A RADIUS OF 1.50 FEET, THROUGH A CENTRAL ANGLE 113°36'31" AND AN ARC LENGTH OF 2.97 FEET;

THENCE NORTH 61°49'39" EAST 93.97 FEET;

THENCE NORTH 10°51'02" EAST 10.95 FEET;

THENCE ALONG AN ARC OF A TANGENT CURVE BEING CONCAVE EASTERLY, AND HAVING A RADIUS OF 30.00 FEET, THROUGH A CENTRAL ANGLE 32°58'21" AND AN ARC LENGTH OF 17.26 FEET TO A POINT OF REVERSE CURVEATURE;

THENCE ALONG SAID REVERSE CURVE, HAVING A RADIUS OF 30.00 FEET, THROUGH A CENTRAL ANGLE OF 36°49'10" AND AN ARC LENGTH OF 19.28 FEET TO THE **POINT OF BEGINNING.**

CONTAINING 6,349 SQUARE FEET MORE OR LESS.

END OF DESCRIPTION

THE DIMENSIONS STATED IN THIS DESCRIPTION AND PLAT ARE GROUND DISTANCES.

SEE EXHIBIT "B" PLAT TO ACCOMPANY DESCRIPTION, ATTACHED HERETO FOR REFERENCE ONLY.

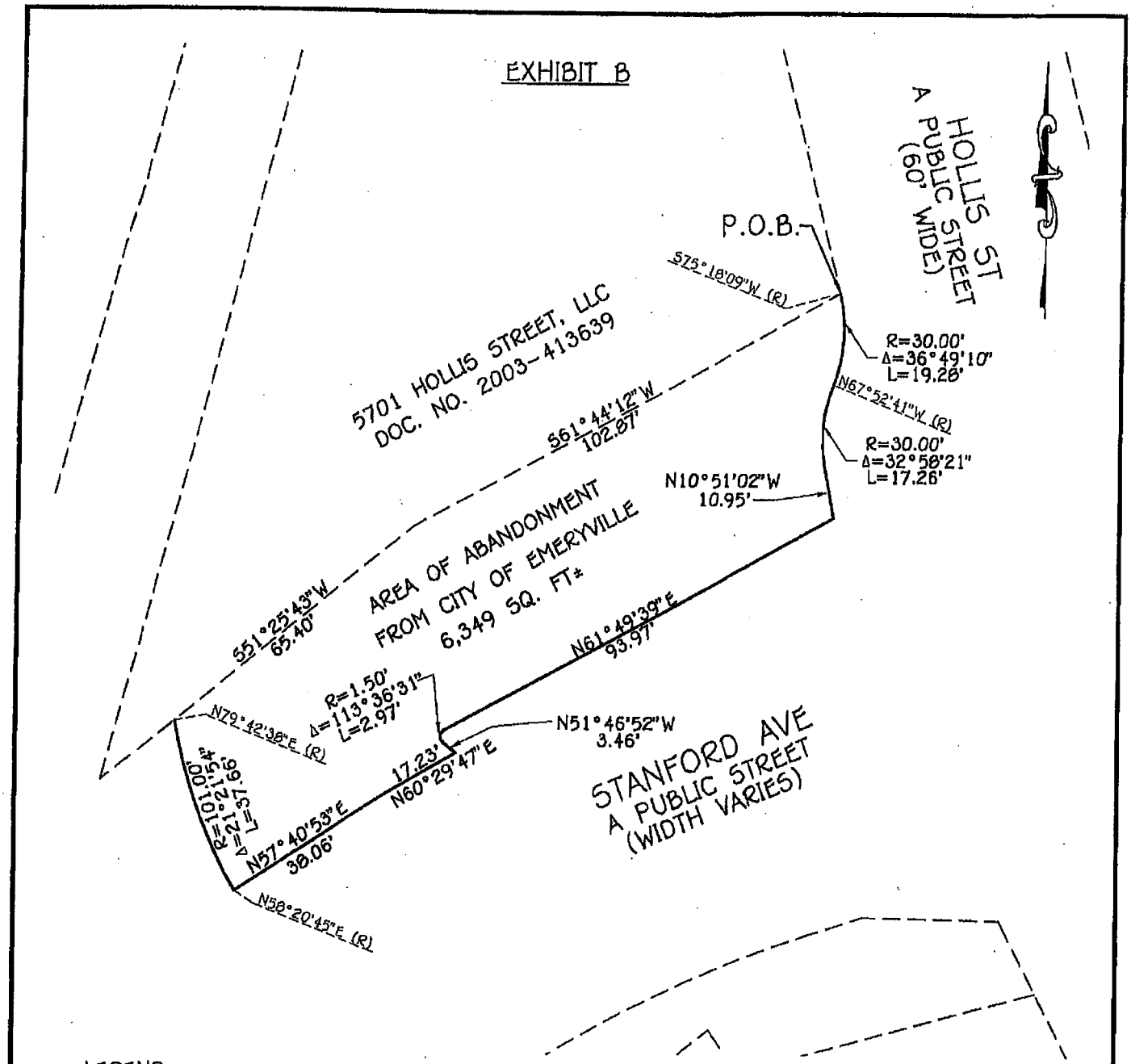
John T May

JOHN T. MAY
PLS 8570
Exp. 03-31-11

1-25-11
DATE

LICENSED LAND SURVEYOR
JOHN THOMAS
MAY
No. 8570
Exp. 03-31-11
STATE OF CALIFORNIA

EXHIBIT B



LEGEND

- - - - - -	EXISTING LOT LINE
———	ABANDONEMENT LINE
- - - - - -	RADIAL LINE
P.O.B.	POINT OF BEGINNING

0 15 30 60

(IN FEET)
1 inch = 30 ft.

LICENSED LAND SURVEYOR
JOHN THOMAS MAY
No. 8570
Exp. 03-31-11
STATE OF CALIFORNIA

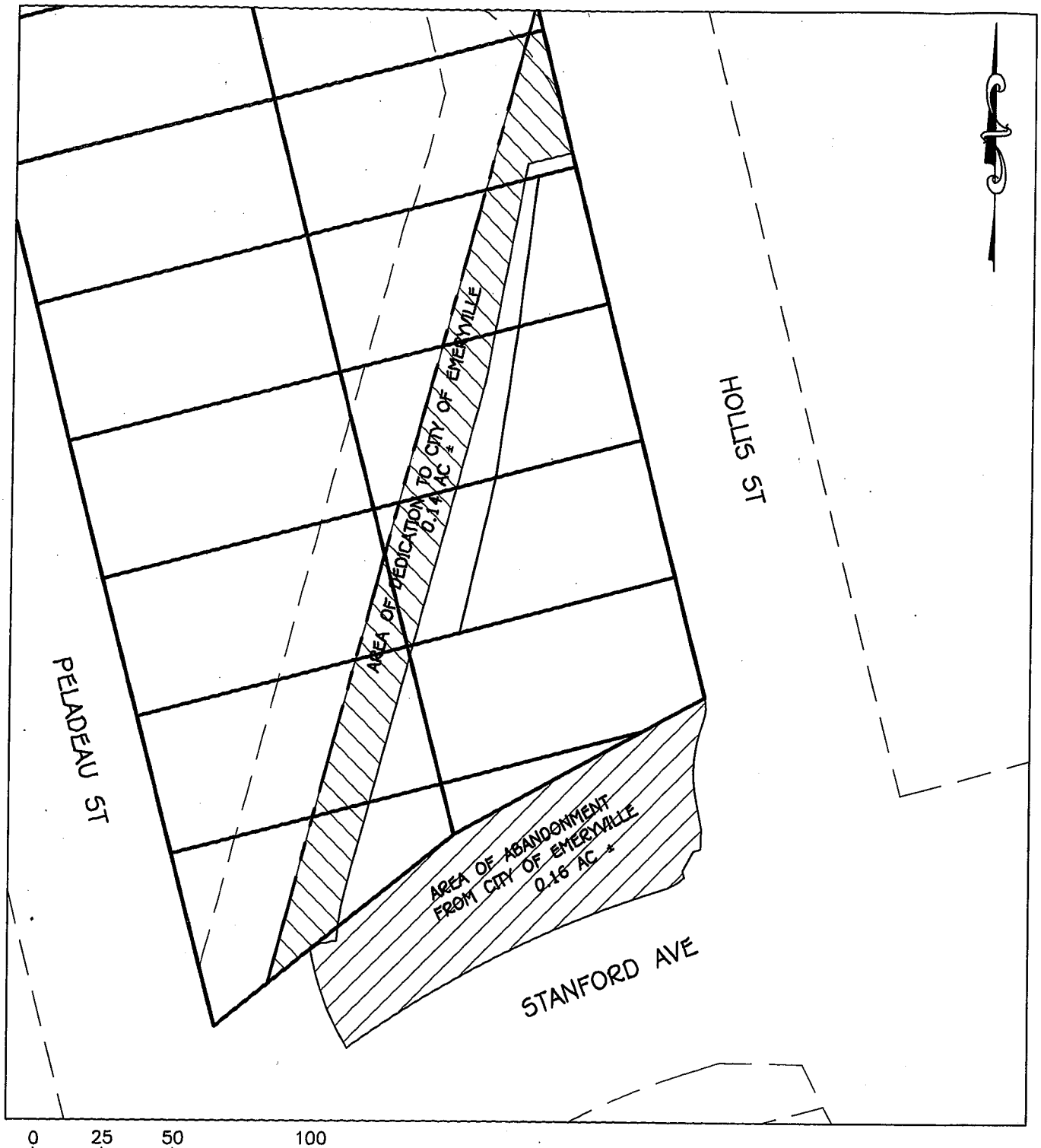
CITY OF EMERYVILLE ALAMEDA COUNTY CALIFORNIA

ALIQUOT
PLANNERS
CIVIL ENGINEERS
SURVEYORS

1390 SOUTH MAIN STREET
SUITE 310
WALNUT CREEK, CA. 94596
(925) 476-2300
FAX (925) 476-2350

Subject ABANDONMENT
Job No. 209001.10 Scale 1"=30'
By JTM Date 1/25/2011 Chkd. AM
SHEET 1 OF 1

ATTACHMENT 1



0 25 50 100

(IN FEET)
1 inch = 50 ft.

CITY OF EMERYVILLE ALAMEDA COUNTY CALIFORNIA

ALIQUOT
PLANNERS
CIVIL ENGINEERS
SURVEYORS

1390 SOUTH MAIN STREET
SUITE 310
WALNUT CREEK, CA. 94596
(925) 476-2300
FAX (925) 476-2350

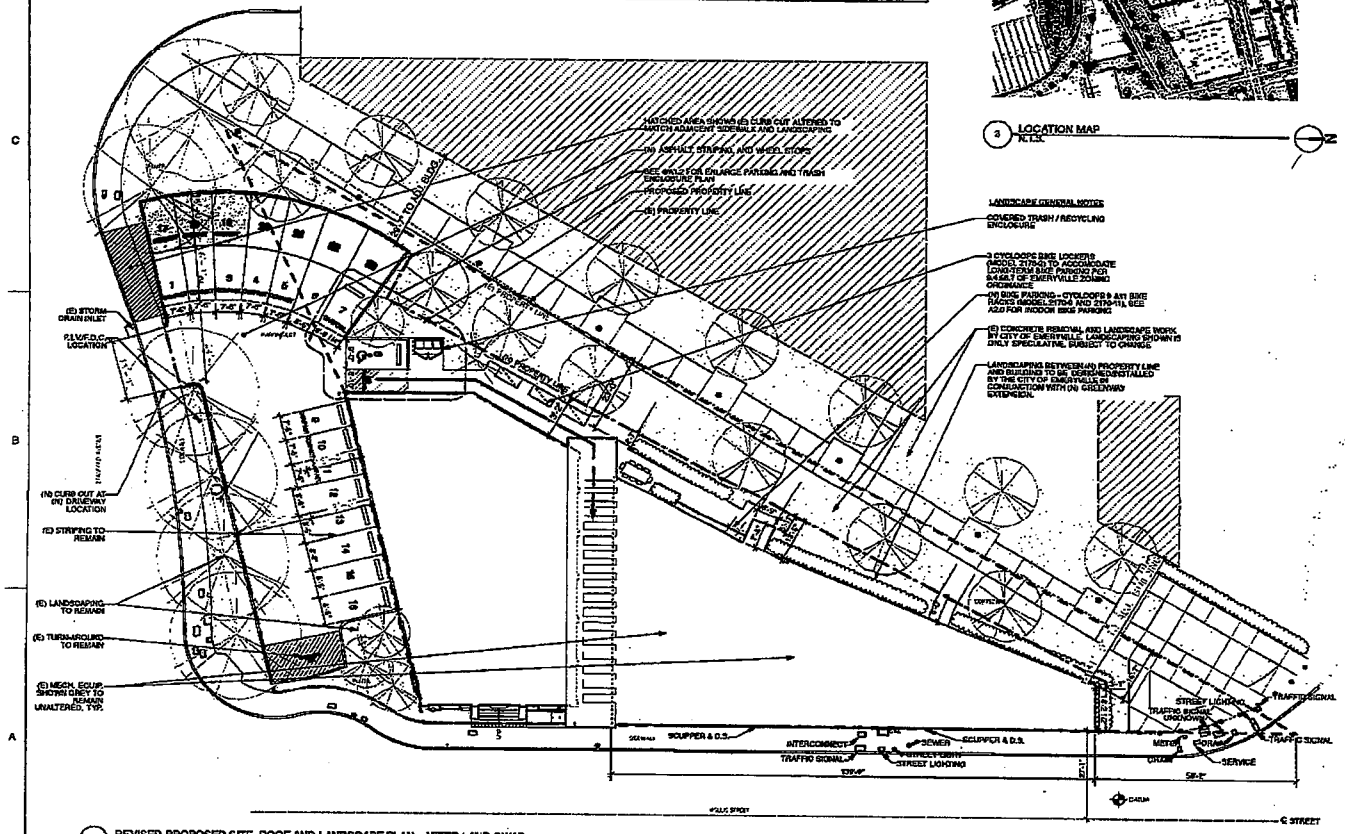
Subject ABANDONMENT/DEDICATION
Job No. 209001.10 Scale 1"=200'
By JTM Date 10/20/09 Chkd. JO
SHEET 1 OF 1

PROPERTY EXCHANGE:

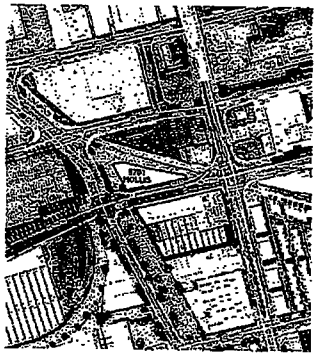
- - - - - EXISTING PROPERTY LINE: APPROXIMATELY 21,700 SQUARE FEET

— — — — PROPOSED PROPERTY LINE: APPROXIMATELY 21,700 SQUARE FEET

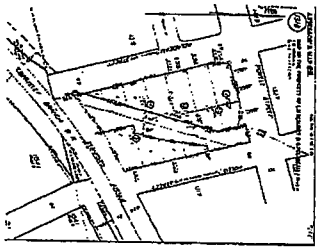
PARKING SPACE SUMMARY			
[illegible]	[illegible]	[illegible]	[illegible]



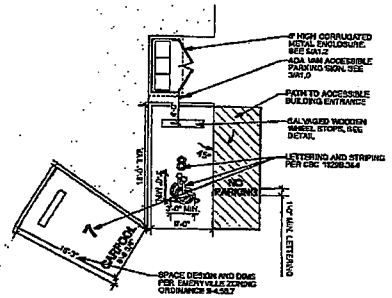
1 REVISED PROPOSED SITE, ROOF AND LANDSCAPE PLAN - AFTER LAND SWAP
1/16" = 1'-0"



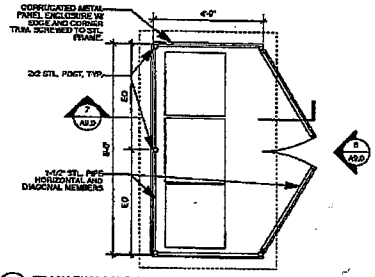
3 LOCATION MAP
N.T.S.



2 PARCEL MAP
N.T.S.



4 ENLARGED PARKING AND TRASH ENCLOSURE PLAN
1/16" = 1'-0"



5 TRASH ENCLOSURE DETAIL
1/2" = 1'-0"

Project Title:

5701-5705 HOLLIS, LLC

[redacted]

5701-5705 HOLLIS STREET
Emeryville, CA 94608
510 / 595-5695
FAX 510 / 595-5846

Consultants:

[redacted]

No.	Date	Issue
	04/30/09	Issued for Permit
	08/18/09	Plan Check Revision

Issue Note:

DRAFT property exchange

04/30/10

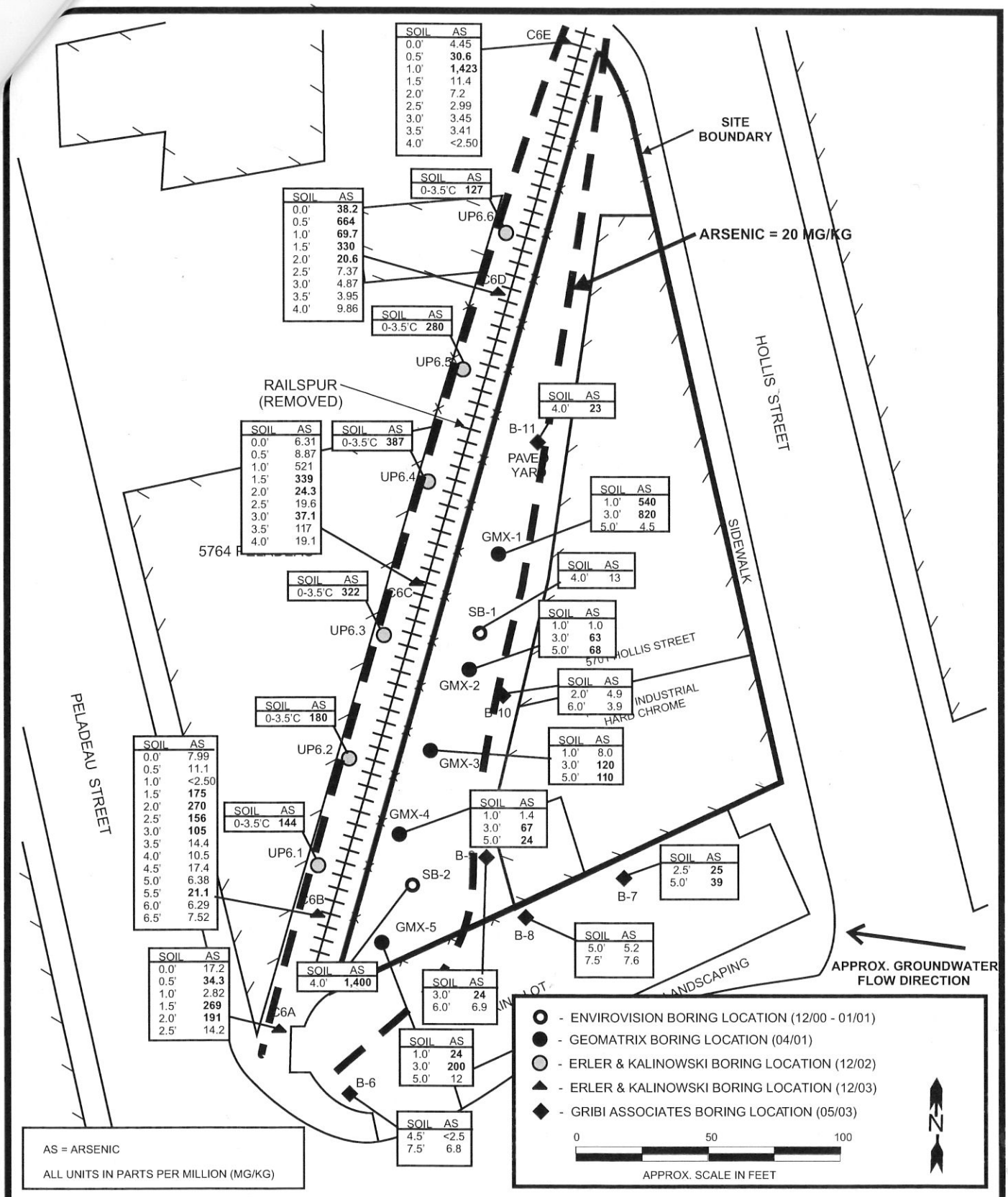
Project ID: 5701
File Name: -
Drawn By: DK
Reviewed By:
Plot Date: 04/30/10
Sheet Title:

REVISED PROPOSED/ PROPERTY EXCHANGE

Sheet No.:

A1.2

ATTACHMENT 2



DESIGNED BY:	CHECKED BY:	**ARSENIC SOIL IMPACTS**	DATE: 06/15/06	FIGURE: 3
DRAWN BY: JEG	SCALE:	FORMER INDUSTRIAL HARD CHROME 5701 HOLLIS STREET EMERYVILLE, CALIFORNIA	**GRIBI Associates**	
PROJECT NO: 231-01-01				

APPENDIX B

BORING LOGS

DATE DRILLED 5-16-12 BORING NO. B-1

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SW	FILL: Brown, moist, gravelly SAND.
						0			
		X				0			
						0		CL	ALLUVIUM: Brown, moist, silty sandy CLAY.
		X				0			
5									Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-1

DATE DRILLED 5-16-12 BORING NO. B-2

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SC	FILL: Brown, moist, gravelly clayey SAND.
		X				0		CL	ALLUVIUM: Brown, silty sandy CLAY. Stiff.
						0		SC	Brown, moist, clayey SAND; with small gravel.
						0			
		X							
5									Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-2

DATE DRILLED 5-16-12 BORING NO. B-3

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0 0		SC	FILL: Brown, moist, gravelly clayey SAND.
		X				0 0 0		CL	ALLUVIUM: Light brown, moist, silty sandy CLAY. Some gravel in clay.
5									Final Depth = 5 feet bgs. Groundwater not encountered. Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-3

DATE DRILLED 5-16-12 BORING NO. B-4

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SC	FILL: Brown, moist, gravelly clayey SAND.
		X				0			
						0			
						0			
5		X							Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-4

DATE DRILLED 5-16-12 BORING NO. B-5

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SW	FILL: Brown, moist, gravelly SAND.
						0			
		X				0		CL	ALLUVIUM: Brown, moist, silty CLAY.
						0			Light brown, moist, silty sandy CLAY.
						0			
5		X							Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-5

DATE DRILLED 5-16-12 BORING NO. B-6

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SC	FILL: Brown, moist, gravelly clayey SAND.
						0			
		X				0		CL	ALLUVIUM: Light brown, moist, CLAY.
						0			
						0			Light brown, moist, silty sandy CLAY.
		X							
5									Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-6

DATE DRILLED 5-16-12 BORING NO. B-7

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0									ASPHALT = Approximately 3 inches thick.
		X				0		SW	FILL: Brown, moist, gravelly SAND.
						0			
		X				0		CL	ALLUVIUM: Light brown, moist, CLAY.
						0			
						0			Light brown, moist, sandy CLAY with gravel.
5		X							Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-7

DATE DRILLED 5-16-12 BORING NO. B-8

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						0		SW	FILL: Brown, dry to moist, gravelly SAND.
		X				0			
						0		CL	ALLUVIUM: Brown, moist, CLAY.
		X				0			
						0		SC	Brown, moist, gravelly clayey SAND.
						0		CL	Brown, moist, stiff, silty sandy CLAY.
		X							
5									Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-8

DATE DRILLED 5-16-12 BORING NO. B-9

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								SW	FILL: Brown, dry to moist, gravelly SAND.
		X				0			
						0			
		X				0		CL	ALLUVIUM: Brown, moist, stiff, CLAY.
						0			
						0			Light brown, moist, stiff, silty sandy CLAY.
		X				0			
5									Final Depth = 5 feet bgs.
									Groundwater not encountered.
									Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-9

DATE DRILLED 5-16-12 BORING NO. B-10

GROUND ELEVATION 18 ± MSL SHEET 1 OF 1

METHOD OF DRILLING Dirct Push

DRIVE WEIGHT _____ DROP _____

SAMPLED BY CRA LOGGED BY CRA REVIEWED BY KML

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	PID READING (PPM)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0		X				0 0		SW	FILL: Brown, dry to moist, gravelly SAND.
		X				0 0 0		CL	ALLUVIUM: Brown, moist, CLAY.
5									Final Depth = 5 feet bgs. Groundwater not encountered. Boring grouted on 5/16/12.
10									
15									
20									

Ninyo & Moore

BORING LOG

5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
401834001	9/12	B-10

APPENDIX D

SITE SPECIFIC HEALTH AND SAFETY PLAN

SITE SPECIFIC HEALTH AND SAFETY PLAN
SITE CLEANUP PLAN
5701 HOLLIS STREET
EMERYVILLE CALIFORNIA, CALIFORNIA

PREPARED FOR:
City of Emeryville Redevelopment Agency
1333 Park Avenue
Emeryville, California 94608

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
1956 Webster Street Suite 400
Oakland, California 94612

September 5, 2012
Project No. 401834001

TABLE OF CONTENTS

Page

1. APPLICABLE STANDARDS AND CODES 1
   1.1. General 1
   1.2. Scope and Applicability of the Health and Safety Plan 2
2. SITE DESCRIPTION 3
3. ORGANIZATION AND RESPONSIBILITIES 3
   3.1. Responsibilities of the Field Team Leader 3
   3.2. Responsibilities of the Air Monitoring Officer 4
   3.3. Responsibilities of the Site Health and Safety Officer (SHSO) 5
   3.4. Responsibilities of Onsite Field Personnel 5
4. TRAINING AND MEDICAL SURVEILLANCE REQUIREMENTS 6
   4.1. Training 6
   4.2. Medical Surveillance Requirements 7
5. DESCRIPTION OF FIELD WORK 8
   5.1. Site Preparation 8
   5.2. Soil Excavation 8
   5.3. Loading/Transportation of Contaminated Materials 8
6. HAZARD ANALYSIS 8
   6.1. Physical Hazards 8
      6.1.1. Noise 8
      6.1.2. Energized and Rotating Equipment 9
      6.1.3. Vehicle and Heavy Equipment Operation 9
      6.1.4. Contractor-Furnished Equipment 10
      6.1.5. Falling, Slipping, and Tripping 10
      6.1.6. Trenching and Excavation 10
      6.1.7. Inspections 11
      6.1.8. Manual Lifting Techniques 11
      6.1.9. Lifting/Twisting Injuries 12
      6.1.10. Work Near Roadways 12
      6.1.11. Procedures for Hot Weather 12
      6.1.12. Preparing for Work in the Heat 19
      6.1.13. Severe Weather 22
      6.1.14. General Physical Hazards 23
   6.2. Industrial Hazards 23
      6.2.1. Underground Utilities 24
      6.2.2. Overhead Electrical Hazards 24
      6.2.3. High-Pressure Hoses 24
   6.3. Chemical Hazards 24
      6.3.1. Arsenic 25
      6.3.2. Lead 25

6.3.3. Hexavalent Chromium (Chromium VI) 25
6.3.4. Other Heavy Metals 25
6.3.5. Petroleum Hydrocarbons 26

7. SITE CONTROL 26

8. DECONTAMINATION 27
8.1. Personnel Decontamination 27
8.2. Vehicle and Equipment Decontamination 27

9. PPE 27

10. METEOROLOGICAL MONITORING 28

11. STANDARD OPERATING PROCEDURES 28
11.1. Standard Safe Work Practices 28
11.2. General Rules of Conduct 29
11.3. Injury/Illness Reporting 30

12. CONFINED SPACES 30

13. AIR MONITORING AND DUST CONTROL 31
13.1. Air Monitoring 31
13.2. Air Monitoring Strategy and Methodologies 32
13.3. Action Levels for Particulates 33
13.4. Quantitative Monitoring 35
13.5. Fugitive Dust Control Plan 36

14. DESCRIPTION OF SITE WORK ZONES 38
14.1. Work Areas 38
14.2. Work Area Access 39

15. SANITATION 40

16. EMERGENCY SUPPLIES 40

17. EMERGENCY RESPONSE 40
17.1. General 40
17.2. Pre-Emergency Planning 41
17.3. Site Resources 41
17.4. Emergency Procedures 41

18. SPILL PREVENTION AND CONTROL MEASURES 42
18.1. Preventive Measures 42
18.2. Spill Containment Measures 42
18.3. Record Keeping and Notifications 43

19. CERTIFIED INDUSTRIAL HYGIENIST REVIEW 44

1. APPLICABLE STANDARDS AND CODES

1.1. General

During recent and previous site investigations, elevated concentrations of total petroleum hydrocarbons as diesel (TPHd) and as motor oil (TPHmo), and metals including antimony, arsenic, chromium VI, lead and silver were detected in shallow soil on the former Industrial Hard Chrome Plating Company property located at 5701 Hollis Street in Emeryville, California (site) currently planned for redevelopment by the City of Emeryville (City). The subject site is located in a commercial/industrial area of Emeryville between Peladeau Street, Hollis Street, Stanford Avenue, and Powell Street.

A proposed removal action (excavation and offsite disposal of impacted soils) will be conducted at the site by the City. A Site Cleanup Plan (SCP) has been prepared for the proposed excavation and offsite disposal of soils contaminated with chemicals of concern (COCs) at levels above the following cleanup goals:

- The 95% upper confidence limit (UCL) for lead in soil must achieve the California Human Health Screening Level (CHHSL) of 80 mg/kg for residential soil.
- The 95% UCL for arsenic in soil must achieve the CG of 17 mg/kg.
- The 95% UCL for hexavalent chromium in soil must achieve the ESL of 9.4 mg/kg.
- Antimony in soil must be below the ESL of 6.3 mg/kg.
- Silver in soil must be below the ESL of 78 mg/kg.
- The 95% UCLs for TPHd and TPHmo in soil must achieve the ESLs of 110 mg/kg and 370 mg/kg, respectively.

This Site Specific Health and Safety Plan (SSHSP), prepared for the proposed removal action to be conducted at the site, is a major component of the SCP. This SSHSP specifies the procedures and protective measures that will be employed to ensure the health and safety of the individuals working in and around the site, and those who reside and/or work near the site.

The purpose of this SSHSP is to provide site-specific safety information and procedures. Site-specific information and procedures contained herein include: a brief overview of site

hazards, a hazard analysis, chemicals of concern, action levels, initial levels of personal protective equipment (PPE) to be used for various site activities, decontamination procedures, employee training assignments, air monitoring procedures, medical surveillance requirements, site control and emergency resources and information.

The procedures in this document should be consistent with the City's Health and Safety Policies. If there are any questions regarding possible inconsistencies please contact the Site Health and Safety Officer, or the Site Air Monitoring Officer.

1.2. Scope and Applicability of the Health and Safety Plan

The provisions of this SSHSP are mandatory for all City personnel and its contractors. Subcontractors doing fieldwork in association with the SCP either adopt and abide by this SSHSP or shall develop their own safety plans which, at a minimum, meet the requirements of this SSHSP. All onsite personnel shall read this plan and sign the accompanying plan acceptance form (Attachment A) before starting site activities. In addition, personnel will operate in accordance with the most current requirements of Title 8 California Code of Regulations, Section 5192 (T8 CCR Section 5192) and Title 29 Code of Federal Regulations, Section 1910.120 (29 CFR 1910.120), *Standards for Hazardous Waste Operations and Emergency Response* (HAZWOPER). These regulations include the following provisions for employees: training, T8 CCR Section 5192(e), 29 CFR 1910.120(e); medical surveillance, T8 CCR Section 5192(f), 29 CFR 1910.120(f); and PPE, T8 Section 5192(g), 29 CFR 1910.120(g).

Onsite personnel are responsible for operating in accordance with all applicable regulations of the California Occupational Safety & Health Administration (Cal-OSHA) outlined in T8 CCR General Industry and Construction Safety Orders, and 29 CFR 1910 and 29 CFR 1926 Construction. Additionally, all personnel shall operate in compliance with all California OSHA requirements.

2. SITE DESCRIPTION

A SCP has been prepared for the former Industrial Hard Chrome Plating Company property located at 5701 Hollis Street in Emeryville, California. The site is approximately 300 feet long and 20 feet wide and currently consists of vacant land, with exposed soil and vegetation in the northern portion, and asphalt pavement in the southern portion. Recent site characterization activities and previous investigations revealed elevated concentrations of lead (up to 16,000 milligrams per kilogram [mg/kg]), arsenic (up to 1,400 mg/kg), chromium VI (up to 3,100 mg/kg), antimony (up to 280 mg/kg), silver (up to 460 µg/kg), TPHd (up to 960 mg/kg), and TPHmo (up to 1,800 mg/kg) in soil.

3. ORGANIZATION AND RESPONSIBILITIES

Personnel responsible for fieldwork are identified in Table 1.

Table 1 – Responsible Personnel for the Site

Title	Name	Daytime	After Hours
Project Manager	Cem Atabek	510-633-5640	510-772-7418
Field Team Leader	Jake Wilson	510-633-5640	510-277-6074
Site Health and Safety Officer(SHSO)	Jake Wilson	510-633-5640	510-277-6074
Site Air Monitoring Officer	To Be Determined	N/A	N/A
Ninyo & Moore Corporate Safety and Health Manager	Steve Waide	858-576-1000 X1282	(858) 449-8619

3.1. Responsibilities of the Field Team Leader

The Field Team Leader will direct the site activities. The Field Team Leader has the primary responsibility for ensuring that all personnel are aware of:

- Names of personnel and alternates responsible for site safety and health.
- Safety, health, and other hazards present onsite.
- Use of PPE and ensuring that the equipment is available.
- Work practices by which the employee can reduce risks from hazards.
- Safe use of engineering controls and equipment onsite.

- Medical surveillance requirements, including recognition of symptoms which might indicate overexposure to hazards.
- Site control measures, decontamination procedures, site standard operating procedures, and the contingency plan and responses to emergencies including the necessary PPE.

The Field Team Leader is also responsible for ensuring that all employees have received at least 40 hours of health and safety instruction (offsite), and 3 days of actual field experience under the direct supervision of a trained experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training.

The Field Team Leader also monitors the performance of personnel to ensure that mandatory health and safety procedures are being performed and corrects any performances that do not comply with the HASP. Copies of health and safety training certificates must be available for review by the Field Team Leader and Site Health and Safety Officer.

If unforeseen site conditions or emergencies occur, the Field Team Leader shall ensure that the medical surveillance program is implemented as required by T8 CCR 5192, and 29 CFR 1910.120. Additional responsibilities may include:

- Consulting with the Site Health and Safety Officer and/or other personnel.
- Preparation and submittal of any and all project reports — includes progress, accident, incident, contractual, etc.
- Monitoring personnel decontamination to ensure that all personnel are complying with the established decontamination procedures.

3.2. Responsibilities of the Air Monitoring Officer

The responsibilities of the Air Monitoring Officer include:

- Perform real time particulate monitoring, as appropriate, to ensure contaminants are not migrating off the site, and record results.
- Calibrate instruments in accordance with manufacturer's instructions.
- Perform personnel and area samples, and record results.
- Monitor weather conditions using a meteorological station and/or Internet information.
- Inform all site personnel of existing conditions.

3.3. Responsibilities of the Site Health and Safety Officer (SHSO)

The responsibilities of the SHSO include:

- Ensure that a copy of the HASP is maintained onsite during all field activities
- Advise the Field Team Leader and Project Manager on all health and safety-related matters involved onsite.
- Direct and ensure that the safety program is being correctly followed in the field, including the proper use of personal protective and site monitoring equipment.
- Ensure that field personnel observe the appropriate work zones and decontamination procedures.
- Report any safety violations to the Field Team Leader.
- Conduct safety briefings during field activities.

The Site Health and Safety Officer will be trained to use air monitoring equipment, interpret the data collected with the instruments, and will be familiar with symptoms of heat stress and the location and use of safety equipment onsite. This person will also be familiar with this HASP.

The following criteria outline when the Site Health and Safety Officer will be replaced: (1) termination of employment, (2) sickness, (3) end of shift, (4) injury, or (5) death. Because only one shift will be working, the SHSO will be responsible for the day shift. If circumstances arise that require work during other periods, an alternate Site Health and Safety Officer will be designated.

3.4. Responsibilities of Onsite Field Personnel

The responsibilities of onsite field personnel include:

- All personnel going onsite must be thoroughly briefed on anticipated hazards and trained on equipment to be worn, safety procedures to be followed, emergency procedures, and communications.
- Visual contact must be maintained between pairs onsite and site safety personnel. Field personnel should remain close together to assist each other during emergencies.

- All field personnel should use their senses to alert themselves to potentially dangerous situations which they should avoid, e.g., presence of strong and irritating or nauseating odors.

- Personnel should practice unfamiliar operations prior to performing the actual procedures in the field.

- Field personnel shall be familiar with the physical characteristics of the site, including:
  - Wind direction in relation to contamination zones
  - Accessibility to associates, equipment and vehicles
  - Communications
  - Operation zones
  - Site access
  - Nearest water sources

- The number of personnel and equipment in the contaminated area must be kept to a minimum, consistent with effective site operations.

- Procedures for leaving a contaminated area must be planned and implemented before going onsite in accordance with the site HASP.

- All visitors to the job site must comply with the HASP procedures. Personal protection equipment may be modified for visitors depending on the situation. Modifications must be approved by the SHSO.

4. TRAINING AND MEDICAL SURVEILLANCE REQUIREMENTS

4.1. Training

Only authorized personnel with at least 40 hours of health and safety training meeting the requirements of Cal-OSHA (T8 CCR Section 5192) and Federal OSHA (29 CFR 1910.120) and 3 days of supervised field experience are permitted to participate in the fieldwork. As applicable, all personnel shall have the required annual HAZWOPER refresher training. Additionally, the Field Team Leader shall have an additional 8 hours of Supervisor/Manager HAZWOPER Training. All site personnel will document training. A matrix summarizing training requirements for Ninyo & Moore personnel, subcontract supervisors and personnel, visitors, and vendors is presented in Table 2.

Table 2 – Training Assignment Matrix

Category	40-Hour Basic	8-Hour Refresher	24 Hours Supervised Experience	8-Hour Supervisor Refresher[3]	Site-Specific	N&M Safety Orientation	First Aid/CPR
N&M Employee	X	X	X		X	X	X[1]
N&M or Subcontractor Supervisor	X[2]	X[2]	X	X[3]	X[3]	X[3]	X[1]
Subcontractor	X[2]	X[2]	X		X[3]	X[3]	X[1]
Visitor	X[5]	X[5]	X[6]		X		
Vendor	X[5]	X[5]	X[6]		X		

Notes:

1 At remote locations, (emergency responders more than 10 minutes away) a minimum of two people will be on-site, during fieldwork, who have a valid certificate in basic first aid/CPR from the American Red Cross (or equivalent) documented training.

2 The requirement for 40-hour basic and 8-hour refresher training for certain non-intrusive work shall be made on a case-by-case basis by the Corporate Safety Manager.

3 Employees may take supervisor training in lieu of standard refresher training.

4 A site-specific safety orientation must be given to all visiting/working personnel.

5 For vendors/visitors requiring controlled area access to work on contaminated equipment.

6 Not required if escorted.

4.2. Medical Surveillance Requirements

All personnel who enter hazardous waste/spill sites or have the potential for exposure to hazardous materials therein must participate in a Medical Monitoring Program. All site personnel will be required to participate in their employer's medical surveillance program before being permitted to work on location. The medical surveillance program for Ninyo & Moore employees is described in the Ninyo & Moore Injury and Illness Prevention Program. Teaming partner or subcontractor medical surveillance programs are described in respective company documents. Subcontractors will be required to demonstrate, by document submittal, their maintenance of Cal-OSHA-compliant programs and to maintain records as required by the applicable contract. Specific exceptions to the medical surveillance requirements may be granted by the SHSO for site access by specialty subcontractors performing non-intrusive activity.

5. DESCRIPTION OF FIELD WORK

5.1. Site Preparation

- Define and mark the limits of excavations.
- Set up removal action site controls, including perimeter fencing with fabric.
- Set up soil stockpiling areas.
- Set up decontamination areas.

5.2. Soil Excavation

- Excavate and direct load contaminated soil into truck.
- Excavate and stockpile potentially clean soil for possible re-use on-site.
- Verification of excavation grade.
- Perform confirmation samples.
- Backfill, re-grade and compact surfaces as appropriate.

5.3. Loading/Transportation of Contaminated Materials

- Transport stockpiled materials from site to landfill.
- Secure liners and tarps for transport offsite.

6. HAZARD ANALYSIS

6.1. Physical Hazards

The physical hazards associated with this Ninyo & Moore project may include excavation hazards, hazardous atmospheres, noise; energized and rotating equipment; heavy equipment; steam-cleaning equipment; falling, slipping, and tripping; manual lifting; heat stress; working over or near water; and general physical hazards. These physical hazards are discussed in the following sections.

6.1.1. Noise

Working near an excavator or a number of other site activities, can subject workers to noise exposures in excess of allowable limits. Nonessential personnel who do not need to be next to loud equipment should stay as far away as possible to lower the risk of

noise-induced hearing loss. Personnel who operate or must work next to excavation equipment will be required to wear hearing protection (ear plugs or muffs) to reduce their exposure to excessive noise. Persons who enter areas in excess of 85 decibels (dB) will be required to wear hearing protection.

Subcontractor personnel will implement equivalent effective hearing conservation programs in accordance with Program requirements.

6.1.2. Energized and Rotating Equipment

In all cases, heavy equipment with rotating shafts or gears will be guarded to prevent accidental contact. Only experienced operators are allowed to work around rotating parts that cannot be adequately guarded. Personnel who must work around rotating equipment will not wear loose-fitting clothes that could get caught. Special precautions should be observed during drilling operations involving casing removal to avoid potential accidents due to equipment failure or breakage.

Site personnel will not operate or handle heavy equipment owned by subcontractors. The excavation subcontractor will maintain and implement safety procedures according to their safety and health plan. Only qualified subcontractor personnel will operate heavy equipment during field activities. Subcontractors will maintain in operating condition all appropriate safety devices on all machinery and rotating equipment (e.g., backup alarms, emergency stops, guards) at all times. Subcontractors will implement effective safety programs for use of this type of equipment.

6.1.3. Vehicle and Heavy Equipment Operation

Vehicles will only be operated in authorized areas. When moving equipment, caution should be exercised in order not to damage equipment or cause injury. When backing up heavy vehicles (larger than pickup trucks), passenger vehicles, or pickups with obscured rear vision, a guide will be used to direct the vehicle. Extra caution will be exercised during vehicle operation on dike roads, industrial areas, and other close spaces.

Personnel directing traffic will wear orange vests. Each vehicle will be equipped with a minimum of one fire extinguisher rated 3A:40B:40C.

6.1.4. Contractor-Furnished Equipment

The contractor is responsible for proper and safe operation of all the equipment they bring to the site. Program employees will not operate contractor-furnished equipment unless that equipment is expressly provided for use of Program personnel. This section does not prohibit use of power from contractor-provided generators or the handling of drilling tool components such as samplers.

6.1.5. Falling, Slipping, and Tripping

Work zone surfaces will be maintained in a neat and orderly state. Foot traffic will avoid areas where materials are stored on the ground. Tools and materials will not be left randomly on surfaces where not in direct use. The excavation crew supervisor will assure that the work area around each excavation is maintained in a neat and orderly state. Hoses and cables will be grouped, routed to minimize hazards, and covered with a ramp or bridge or clearly marked with hazard tape or flags if such material will remain in place for more than one shift.

6.1.6. Trenching and Excavation

All operations involving excavation or trenching will be performed in accordance with 29 CFR 1926.650 and Cal-OSHA Regulations for excavations (Title 8, 1539 -1547). An excavation is considered to be any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

No personnel will be allowed to enter an excavation which is 5 feet bgs or deeper. All excavation activities must be performed at a minimum under the direction of a competent person. The competent person will be Mr. Jake Wilson or another qualified representative of Ninyo & Moore.

Some areas of planned excavation will be deeper than 5 feet bgs. Excavations which will be entered by personnel will be shored or sloped as necessary and as discussed in Section 5.3.1 of the SCP. At no time will workers be allowed to enter an excavation which reaches 5 feet bgs or deeper. If the depth of an excavation reaches 5 feet bgs or deeper or the excavation is not considered safe for entry because the sidewalls have not been adequately shored, sloped, or benched, the bucket of an excavator will be used for collection of confirmation samples as discussed in Section 5.8.1 of the SCP.

6.1.7. Inspections

Daily inspections of excavations, the adjacent areas, and protective systems will be made to determine if a situation exists that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection will be conducted prior to the start of fieldwork and as needed throughout the shift.

Inspections will also be made after every rainstorm to ensure that no water accumulation has occurred. Employees shall not work in excavations where water has accumulated, unless adequate precautions are taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

6.1.8. Manual Lifting Techniques

During any manual material-handling tasks, personnel will be trained to lift with the force of the load suspended on their legs and not on their backs. An adequate number of personnel or an appropriate mechanical device must be used to safely lift or handle heavy equipment. When heavy objects must be lifted manually, workers will keep the load close to the body and will avoid any twisting or turning motions to minimize stress on the lower back. The SHSO can provide a lifting orientation and specific back stretching and warm-up exercises to help minimize the potential for back injuries. Use of these

exercises by all field personnel at the start of each shift will be encouraged by the SHSO.

6.1.9. Lifting/Twisting Injuries

Site activities may subject workers to forces which could cause back, shoulder or neck injury. Common-sense safety precautions will be followed such as frequent rest breaks, proper lifting technique and careful ergonomic practices.

6.1.10. Work Near Roadways

Work on some areas of the site may subject workers to vehicle traffic. Traffic will be carefully controlled if applicable by traffic cones and early warning signs. In addition, workers will maintain high awareness of traffic condition during work location mobilization and during subsequent activity. Whenever possible, work will be conducted behind barriers such as work vehicles which will themselves be marked by early warning signs such as cones, lighted signs or flagmen.

6.1.11. Procedures for Hot Weather

Accidents appear to occur more frequently in hot environments than in more moderate conditions. In addition to heat-related illness, working in a hot environment lowers an individual's mental alertness and physical performance. Increased body temperature and physical discomfort promote irritability and other emotional states that can cause workers to overlook safety procedures and divert their attention from hazardous tasks.

6.1.11.1. Health Problems

Heat stress, heat-related illness, and heat-related disorders are three terms used interchangeably to express health problems associated with exposure to hot environments. Heat stress is the term used herein.

Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders. Several of the more common disorders, in decreasing order of severity, are briefly described below:

6.1.11.2. Heat Stroke

Heat stroke, a true life-threatening emergency, has mortality ranging from 20 percent to 70 percent. Heat stroke is sometimes called sunstroke, although the sun is not required for its onset. The condition results when the heat-regulating mechanisms of the body break down and fail to cool the body sufficiently. The body becomes overheated, with temperature rising to between 105° and 110° F; no sweating occurs in about half the victims. The buildup of heat and inadequate cooling can damage brain cells and may cause permanent disability or death. Central nervous system dysfunction is virtually universal at temperatures higher than 113°F. It first becomes apparent as confusion, lethargy, or agitation and may progress to seizure and coma.

There are two basic kinds of heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally affects inactive people who are in hot environments. Exertional heat stroke, in which victims retain the ability to sweat, usually occurs during periods of physical exertion and muscle stress.

Heat stroke commonly occurs during times of high temperatures combined with high humidity and low wind velocity. Some signs and symptom of heat stroke include the following:

- Temperature of 105° F or higher
- Hot, reddish skin; skin can be wet or dry, since approximately half of all heat stroke victims sweat profusely
- Initially constricted pupils, later becoming dilated
- Tremors
- Mental confusion and anxiety

- Initially deep, rapid breathing that sounds like snoring; breathing becomes shallow and weak as damage progresses
- Headache
- Dry mouth
- Shortness of breath
- Loss of appetite, nausea, or vomiting
- Increasing dizziness and weakness
- Convulsions, sudden collapse, and possible unconsciousness
- Seizures

Left untreated, a patient may likely die. Emergency care of heat stroke is aimed at immediately cooling the body. Emergency care includes the following:

- Remove the patient, when possible, from the source of heat.
- Call an ambulance.
- Remove as much of the patient's clothing as possible or reasonable, pour cool water over his/her body (avoiding the nose and mouth), fan the patient briskly, and shade from the sun if he is still outdoors. Wrapping a wet sheet around the patient's body and then directing an electric fan at the patient are also good ways of cooling. Cool the patient more slowly if he starts to shiver since that produces heat.
- Elevate the patient's head ad shoulders slightly during cooling, and make sure that he/she is comfortable.
- Never give the patient stimulants or hot drinks.

If proper precautions are taken, heat stroke is completely preventable. Exertion should be limited when temperatures and humidity are high, and activities in direct sunlight should be avoided. Adequate hydration is an absolute necessity and may be the single most important prerequisite for avoiding heat illness. Both fluids and electrolytes should be replaced after any activity in the heat; water itself is usually sufficient during exertion.

A period of acclimatization is recommended before vigorous activity is undertaken. At least 2 weeks in a hot environment are needed to bring heat control mechanisms to maximum efficiency, and even this period may be inadequate if temperature and exertion are extreme.

6.1.11.3. Heat Exhaustion

Heat exhaustion, the most common heat injury, occurs in an otherwise fit person who is involved in extreme physical exertion in a hot, humid environment. This condition results from a serious disturbance of the blood flow, similar to the circulatory disturbance of shock. Heat exhaustion is, in fact, a mild state of shock brought on by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body loses large quantities of salt and water. When the water is not adequately replaced, blood circulation diminishes, affecting brain, heart, and lung functions. Heat exhaustion is sometimes, though not always, accompanied by heat cramps due to salt loss.

There are two basic kinds of heat exhaustion. The first is salt depletion (sodium depletion), which occurs when un-acclimatized individuals exert themselves and drink enough water but do not replace the sodium. Second, there is water depletion, which occurs when individuals do not drink enough water during extreme heat. This type of heat exhaustion is characterized by extreme anxiety and agitation, intense thirst, headache, weakness, fever, lack of muscle coordination, and decreased sweating.

The most critical problem in heat exhaustion is dehydration; salt loss poses an additional problem. Heat exhaustion normally strikes those who are poorly acclimatized and who suddenly participate in strenuous exercise in a hot climate. Their water and salt levels become unbalanced: either the salt depletion is greater than the water

depletion, or vice versa. Primary signs and symptoms of heat exhaustion are much like flu symptoms. They include the following:

- Headache, giddiness, and extreme weakness
- Nausea and possible vomiting
- Dizziness and faintness
- Profuse sweating
- Loss of appetite
- Fatigue
- Diarrhea
- Dilated pupils
- Weak and rapid pulse
- Rapid, shallow breathing
- Pale, cool, sweaty skin, usually ashen gray in color
- Possible heat cramps or muscle aches

While the signs and symptoms of heat exhaustion may seem similar to those of heat stroke to the casual observer or to an uninformed patient, there are some distinct differences, which will help make the correct evaluation.

The two most reliable and distinct differences are the condition of the skin and the body temperature. In heat stroke, the skin is flushed and hot to the touch; patients experiencing heat exhaustion usually have wet or clammy, pale, cool skin. Body temperature in a patient with heat stroke can soar above 105° F; in a victim of heat exhaustion, it usually stays at normal or sometimes even dips below normal. Emergency care for a person who is experiencing heat exhaustion includes the following:

- Move the patient to a cool place away from the source of heat, but make sure he does not become chilled. Apply cold, wet compresses to the skin, and fan the patient lightly.
- Have the patient lie down. Raise the feet 8 to 12 inches, and lower the head to help increase blood circulation to the brain. Remove as much of the patient's clothing as possible, and loosen what you can not remove. Help make the patient as comfortable as possible.

- If the patient is fully conscious, administer cool water at the rate of one-half glassful every 15 minutes for 1 hour.
- If the patient is unconscious, remove his clothing and sponge with cool water.
- If the patient vomits, stop giving him fluids and transport immediately to a hospital, where he can receive intravenous fluids.

There are two ways to prevent heat exhaustion. If un-acclimated, do not overexert the body. Keep persons well hydrated with liquids that can replace the electrolytes lost in sweat and have frequent rest periods in cool places.

CAUTION: PEOPLE WITH HEART PROBLEMS OR THOSE ON "LOW-SODIUM" DIETS WHO WORK IN HOT ENVIRONMENTS SHOULD CONSULT A PHYSICIAN ABOUT POTENTIAL HEALTH PROBLEMS.

6.1.11.4. Heat Cramps

Heat cramps are muscular spasms that occur when the body loses too much salt during profuse sweating, when not enough salt is taken into the body, when calcium levels are low, and when too much water is consumed. Occasionally, heat cramps also can be caused by overexerting muscles, inadequate stretching or warm-up, and lactic acid buildup in poorly conditioned muscles. Heat cramps can be mild or extremely painful. When the body becomes low on salt and water, the patient interprets it as thirst. To quench the thirst, he consumes large quantities of water without replacing the salt. Heat cramps usually occur in the arms, legs, or abdomen (the major complaint may be severe abdominal pain) and are often a signal of approaching heat exhaustion.

Hot weather is not necessarily a prerequisite to heat cramps. A person who exercises strenuously in cold weather and perspires may develop heat cramps if he/she drinks water but does not replace salt. Heat cramps result when blood calcium levels are too high in proportion to those of blood sodium. To function properly, the muscles need a strict balance of water, calcium, and sodium; whenever that balance

is disrupted, regardless of temperature, muscular contraction malfunctions, and heat cramps may result. Cramping occurs when the muscle contracts without relaxing again; the muscle remains firm in a knotted configuration, leaving a cavity at its origin. Some signs and symptoms of heat cramps are as follows:

- Severe muscular cramps and pain, especially of the legs, calves, and abdomen
- Faintness and dizziness
- A stiff, boardlike abdomen
- Possible nausea and vomiting
- Normal mental status and consciousness

Emergency care of heat cramps is as follows:

- If the patient is in a hot environment, remove him from the heat immediately.
- To relieve pain, try gently stretching the involved muscle groups. Manipulate or push the knotted muscle mass back to its normal position.

To prevent heat cramps, the out-of-shape or un-acclimated should not overexert themselves. Take frequent breaks in cool places. Before any strenuous activities are undertaken, warm up with exercises. Keep well hydrated and drink liquids that can replenish electrolytes.

6.1.11.5. Fainting

A worker who is not accustomed to hot environments and who stands immobile in the heat can faint. Due to the body's attempts to control internal temperature, enlarged blood vessels in the skin and lower part of the body may pool blood rather than returning it to the heart. Upon lying down, the worker should soon recover. Keeping slightly active should prevent blood from pooling and further fainting.

6.1.11.6. Heat Rash

Heat rash is likely to occur in hot, humid environments where sweat does not readily evaporate from the skin, leaving it wet most of the time. Sweat ducts become plugged, and a skin rash can develop. When the rash is extensive or complicated by

infection, heat rash can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by taking breaks and resting in a cool place, changing into dry clothes, and regularly bathing and drying the skin.

6.1.11.7. Transient Heat Fatigue

Transient heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance. The severity of transient heat fatigue can be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

6.1.12. Preparing for Work in the Heat

One of the best ways to reduce the heat stress in workers is to minimize the heat in the work-place. However, heat production is difficult to control in some environments, such as outdoors where exposure to various weather conditions is likely, and when wearing personal protective clothing.

Humans, to a large extent, can acclimate to the heat. Adjusting to heat under normal circumstances usually takes 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat stress is more likely to occur among workers who have not been given time to adjust to working in the heat, among workers who have been away from hot environments, or among workers who have never been exposed to hot environments. Hot weather in the summer is likely to affect the worker who is not acclimatized to heat. Likewise, workers who return to work after a leisurely vacation or extended illness can be affected by the heat in the work environment. Under such circumstances, the worker should be allowed to gradually reacclimatize.

Heat stress also depends, in part, on the amount of heat the worker's body produces while doing a job. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Ways of reducing the potential for heat stress are to make the job less strenuous, lessen its duration, or provide adequate or longer breaks.

6.1.12.1. Number and Duration of Exposures

Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the work load evenly over the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or rising humidity can create overly stressful conditions.

6.1.12.2. Scheduling/Work Rotation

When possible, perform the most demanding tasks in cooler parts of the day, morning, and evening. Also, begin work shifts earlier in the day, or start later in the afternoon. Labor-intensive tasks may be spread out over a greater number of days. Use less intensive tasks to fill in the rest of the day.

6.1.12.3. Rest Areas

Providing cool rest areas in hot work environments considerably reduces the stress of working there. Shaded areas should be as close to the work area as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles benefit the worker most.

6.1.12.4. Drinking Water

In the course of a day a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake be about equal to the amount of sweat produced. Most workers exposed to hot conditions drink less fluids than needed due to an insufficient thirst drive. Therefore, a worker should not depend on thirst to signal when and how much to drink. Instead, the worker should drink one cup of fluids every 15 to 20 minutes. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. Whatever the temperature, the water must be palatable and readily available. Individual drinking cups should be provided — never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If for some reason, salt replacement is required, the best way to compensate is to add a little extra salt to the food. Salt tablets SHOULD NOT be used.

6.1.12.5. Heat Stress Surveillance

If hot weather conditions occur during field activities or if site personnel exhibit signs of heat related illness medical surveillance will be performed to minimize the likelihood of site personnel being affected by heat related illness which will include measuring of body core temperatures to determine if site personnel must be removed from work. The action levels for heat stress are presented in Table 3 below and the frequency of temperature monitoring is presented in Table 4 below.

Table 3 – Action Levels for Heat Stress

Type Measurement	Action Level	Action
Ear insertable core temperature	100.4 degrees F or greater	Remove from work
Ear insertable core temperature	<99 degrees F	Return to work

Table 4 – Recommended Frequency of Physiological Monitoring for Fit and Acclimated Workers

Adjusted Temperature[1]	Normal Work Ensemble[2] After Each:	Impermeable Ensemble After Each:
90° F (32.2° C) or above	45 minutes of work	15 minutes of work
86.5° F - 90° F (30.8° C - 32.2° C)	60 minutes of work	30 minutes of work
82.5° F - 86.5° F (28.1° C - 30.8° C)	90 minutes of work	60 minutes of work
76.5° F - 82.5° F (25.3° C - 28.1° C)	120 minutes of work	90 minutes of work
72.5° F - 76.5° F (22.5° C - 25.3° C)	150 minutes of work	120 minutes of work

Notes:

1 Calculate the adjusted air temperature (Ta adj) with the following equation: Ta adj(°F) = Ta(°F) + (13 X %sunshine / 100)
Measure air temperature (Ta) with a standard mercury-in-glass thermometer with the bulb shielded from radiant heat. Estimate the percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to attenuate shadow (100% sunshine = no cloud cover and a sharp, distinct shadow; 0% sunshine = no shadow).

2- A normal work ensemble consists of coveralls or other cotton clothing with long sleeves and pants.

6.1.13. Severe Weather

Fieldwork shall not be conducted when lightning can be seen or thunder heard from the work area. When lightning and/or thunder occur, employees are to cease work, perform emergency personal and equipment decontamination as needed, then seek shelter.

During extreme weather conditions, the Field Team Leader shall use his best judgment and has the authority to stop fieldwork or dismiss workers for the day. Examples of conditions that may warrant work stoppage include: tornado warnings, high winds, hail, flooding, and ice storms.

Field operations will be conducted during the time of year the Santa Anna winds start blowing. A field meteorological station will be on site to monitor wind speed, temperature and relative humidity.

6.1.14. General Physical Hazards

The site may include ditches, areas that are poorly drained, rough or uneven terrain, depressed areas (that may present oxygen deficiency or flammable gas collection areas), protruding objects, and impalement hazards. The SHSO will assure that a careful pre-work walkover is made of all work areas and potential access or egress routes. Unsafe areas may be flagged or taped by the SHSO and will be identified to all personnel.

6.2. Industrial Hazards

Project activities at field sites may expose personnel to various industrial hazards. Table 8-1 and the following sections present a summary of the common industrial hazards expected and general methods that will be utilized by the Program to assure worker safety. A task-by-task analysis of industrial hazards for work to be conducted at a site during a specific task will be developed for that work.

The SHSO or designee will observe all operations, particularly drill rig operations, to oversee industrial safety hazards such as pinch-points (areas on drill rigs or heavy equipment where limbs or extremities may become caught, mutilated, or dismembered).

To prevent injuries from industrial hazards, engineering controls, administrative procedures (e.g., lockout-tagout procedures), and equipment-guarding techniques will be implemented. In addition, PPE will be used when engineering controls alone cannot reduce the risk of exposure to hazards to acceptable limits.

The overall risks posed by industrial activities associated with cleaning, decontamination, excavation, vehicle operation, and earth-drilling activities are considered greater than the risks posed by potential exposure to chemicals that are the subject of investigation when

proper PPE practices are followed; therefore, compliance with safety rules and procedures is of equal or greater importance than compliance with health rules.

6.2.1. Underground Utilities

Because buried underground utilities may be present at this site, an underground utility check will be performed before excavation activities. The City will provide available utility plans to the remediation contractor prior to excavation activities. In addition, where records are inadequate or questionable, a utility search using specialized detection equipment will be performed. Hand digging will be utilized to locate utilities when their presence is suspected. It will be the responsibility of the remediation contractor to ensure that all underground utilities in the excavation areas are properly abandoned prior to excavation activities or protected during excavation activities if they will remain in place.

6.2.2. Overhead Electrical Hazards

Overhead cables are not present on-site. If necessary, a detailed hazard analysis will be prepared by the remediation contractor prior to operating heavy equipment (drilling rigs, excavators, cranes) if overhead cables will be present above or within 20 feet of the maximum reach of the equipment.

6.2.3. High-Pressure Hoses

High-pressure hose ends may whip if the fitting becomes disconnected. All hose ends will be secured to minimize whipping, and connections should be secured to prevent accidental disconnects.

6.3. Chemical Hazards

This section describes the toxicological (health) hazards associated with exposure to organic and inorganic chemicals and metals during the project. Chemicals which are expected to be encountered are discussed in the following sections.

In dry, arid desert conditions, exposure may occur principally by inhalation of contaminated particulates. Material Safety Data Sheets for the constituents listed below are included as Attachment B.

6.3.1. Arsenic

Inorganic arsenic may be found in areas where certain industrial residue may have contaminated soils. Arsenic may also be found in areas where arsenic was used as an herbicide. Some arsenic compounds may release a toxic gas when in an acidic environment. Arsenic is a toxic heavy metal. Inorganic arsenic is regulated by OSHA as a carcinogen.

6.3.2. Lead

Lead may be encountered as a contaminant of soil in locations near underground storage tanks (USTs) and areas of exposed soil around buildings as a result of lead based paint (LBP) on building exteriors. Lead is a toxic heavy metal and a suspected carcinogen that may be encountered in inorganic or organic forms.

6.3.3. Hexavalent Chromium (Chromium VI)

Humans can be exposed to chromium VI through inhalation, ingestion, and skin or eye contact. Chromium VI is thought to have detrimental effects to internal organs such as lungs, liver, kidneys, blood, eyes, etc. Lung cancer is a possible long term effect of exposure to hexavalent chrome.

6.3.4. Other Heavy Metals

A variety of heavy metals are encountered as contaminants at industrial or military sites. Some heavy metals are highly toxic; others are also recognized human carcinogens. Because these materials are not volatile unless highly heated, control by proper use of PPE and personnel hygiene practices will prevent significant exposure to heavy metals.

6.3.5. Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. TPH is a mixture of chemicals, but they are all made mainly from hydrocarbons. Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components. Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals. The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a]pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC. TPH-D and TPH-MO have been reported above action levels, however neither compound has been classified as a carcinogen.

7. SITE CONTROL

Precautions shall be taken to assure that only authorized personnel with the proper training and PPE enter work areas associated with the operation of heavy equipment and/or the potential for exposure to hazardous conditions/materials. In these areas, access is controlled with fencing, caution tape and/or barricades.

8. DECONTAMINATION

8.1. Personnel Decontamination

Decontamination procedures will include disposing of PPE on site and washing hands and face prior to eating, drinking, or smoking and upon leaving the site.

8.2. Vehicle and Equipment Decontamination

Vehicles, excavation equipment, and hand-held equipment will be decontaminated prior to leaving the site. A decontamination area will be prepared on site prior to impacted-soil excavation. This area will be designed to contain soil removed from equipment during the decontamination process. The decontamination area will be easily accessible to outgoing vehicles and equipment and will be lined with plastic sheeting for easier cleaning. Decontamination will be performed using dry brushing methods to remove soil from equipment and vehicle tires. After decontamination, the equipment and vehicles will be visually inspected for signs of residue. The storage bins or beds of the trucks will be inspected to ensure the loads are properly covered and secured. In addition, personnel overseeing decontamination procedures will be responsible for ensuring soil is not tracked off site. The proposed decontamination area is indicated on Figure 4 of the SCP.

9. PPE

All site personnel will be required to wear the appropriate PPE to protect against known and suspected site hazards. PPE is selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, and greater emphasis is placed on experience and sound safety practices. As discussed above, PPE for site workers will be based on site history and on the activities to be performed there.

The initial level of PPE for all site work will be Level D. Level D consists of the following:

- Normal work clothing (long pants)

- Steel toed boots
- Safety glasses
- Nitrile inner and cloth or leather outer gloves
- Hard Hats
- Safety reflective vests
- Ear plugs (when heavy equipment is operating)

PPE requirements are subject to change as site information is updated or changes. If site conditions warrant upgrade to Modified Level D or higher PPE, work will stop until the SSHSP is updated.

10. METEOROLOGICAL MONITORING

Meteorological monitoring will begin at least 3 days prior to field activities to evaluate prevailing wind patterns, and will continue during field activities. One wind speed and direction monitor will be set up at the site to collect continuous wind data during the monitoring events. The wind speed and direction data are needed to support each upwind and downwind monitoring event and to locate sampler downwind locations. A wind system consists of a Climatronics monitoring system with Model F4450 wind sensors (or similar system), with threshold speeds of 0.5 miles per hour. The wind instrument must meet regulatory specifications. The wind data will be collected through a data acquisition system equipped with a back-up recording device.

11. STANDARD OPERATING PROCEDURES

11.1. Standard Safe Work Practices

Standard safe work practices required at the site include:

- Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.
- Hands and face must be thoroughly washed upon leaving the work area.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as practical after leaving the contamination reduction zone.

- Contact with contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces or lean, sit, or place equipment on drums, containers, or soil suspected of being contaminated.

- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should be not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.

- Adequate side and overhead clearance must be maintained to ensure the equipment booms do not touch or pass close to any overhead power lines or other overhead obstacles or obstructions.

- "Dig-Alert" representatives shall be asked to identify all underground utilities. Utility lines should be marked using characteristic spray paint or labeled stakes.

11.2. General Rules of Conduct

The following general rules of conduct are required for anyone working on this project:

- Liquor, firearms, narcotics, tape recorders, and other contraband items are not permitted on the premises.

- Any violation of local, state, or federal laws, or conduct outside the generally accepted moral standards of the community is prohibited.

- Willfully damaging or destroying property, or removing records is forbidden.

- Misappropriation or unauthorized alteration of any record is forbidden.

- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.

- Compliance with posted signs and notices is required.

- Boisterousness and noisy or offensive work habits, abusive language, or any oral, written, symbolic, or other communication that tends to disrupt work or morale of others is forbidden.

- Fighting or threatening bodily harm to another is forbidden.

- Defacing any property is forbidden.

- Wearing shorts of any type and/or offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants, slacks, or coverall-type garments will be worn at all times.
- People operating motor vehicles will obey all traffic regulations.

11.3. Injury/Illness Reporting

OUSD's contractor will maintain copies of required accident investigations, copies of the Cal-OSHA 300 Logs, hazard identification and abatement, and certification of employee safety training. A written report will be maintained on each recordable accident, injury or on-the-job illness. See Attachment C for Accident Report Form. A record of each such injury or illness is recorded on Cal-OSHA Log and Summary of Occupational Injuries Form 300 according to its instructions. Supplemental records of each injury are maintained on Cal-OSHA Form 301, or state specific Employers Report of Injury or Illness Form. Every year, a summary of all reported injuries or illnesses is posted no later than February 1, for one month, until March 1, on Cal-OSHA Form 300. These records will be maintained by the contractor for five (5) years from the date of preparation.

The results of each investigation will be presented in writing and submitted for review to the City's contractor management, its insurance risk management advisors, and if the accident resulted in serious injury, to company attorneys. All accidents involving a death, multiple personnel injuries, lost time injury, or substantial property damage will be investigated.

The procedure may be directed by the attorneys to provide the most reliable evidence or description legally permissible. All investigations pursuant to the directions of legal counsel will be protected by all applicable privileges. The attorney will provide more detail on this topic during the investigation.

12. CONFINED SPACES

No confined space entry is anticipated or authorized at the site. A confined space protocol will be developed for Agency review and approval should conditions at the site change. Excavations

deeper than 4 feet will be evaluated by a competent person prior to worker entry. Excavations deeper than 5 feet will not be entered.

13. AIR MONITORING AND DUST CONTROL

This section details the air monitoring strategy and methodologies that will be used for the RAW activities at the site. In consultation with the City, the air monitoring program may be modified as warranted in the field. The strategy and methodologies are designed to achieve several goals:

- Identify and monitor the air contaminants generated during the soil removal and decontamination activities to assure the appropriate assignment of PPE and safety systems specified for those activities.
- Provide feed back to site operations personnel regarding potential hazards from exposure to hazardous air contaminants generated through site activities.
- Identify and monitor air contaminants at points outside of the soil removal and decontamination exclusion zones. Air monitoring will be conducted during work activities to measure potential exposure of sensitive receptors including commercial and residential areas to site chemical constituents, as a result of removal activities.

The City's remediation contractor will monitor dust levels within the exclusion zone and at the work area boundary nearest to downwind receptor locations. Due to the fact that site chemicals of concern to be excavated are primarily particulate, the City's remediation contractor will focus on the implementation of mitigation measures and monitoring of airborne total dust and lead levels generated by removal activities. Air monitoring methods and procedures are also described in Sections 5.4 and 5.5 of the SCP and in the Dust Monitoring and Control Plan (Appendix E).

13.1. Air Monitoring

Air monitoring will be performed during all site activities in which impacted or potentially impacted materials are being disturbed or handled. The RA contractor will staff the site with an air monitoring/health and safety professional whose responsibilities will include:

- Monitoring dust levels in the exclusion zone and other locations. The site air monitoring professional will have the authority to stop-work in the event that onsite activities generate dust levels that exceed the site or community action levels (see the chart in Section 13.3 below). The air-monitoring professional will monitor onsite meteorological instrumentation and/or coordinate with offsite meteorological professionals to identify

conditions that require cessation of work, e.g. wind speeds high enough to result in visible dust emissions from the point-of-origin or crossing the property line, despite the application of dust mitigation measures.

- Assure that all real-time aerosol monitors and industrial hygiene air sampling equipment and media are properly calibrated and in good working condition. Real-time, data-logging aerosol monitors (personal data RAM) will be used to measure dust levels. Real-time information will be posted daily, and discussed with site workers. As analytical results for industrial hygiene samples (using Cal-OSHA/NIOSH approved methods) are received, the air monitoring professional will prepare summary sheets and discuss results with onsite management and workers.

- Coordinate general site safety activities including all daily hazard communication, safety practices and procedure briefings.

- Oversight of personal decontamination practices.

- General site safety leadership, support and recordkeeping activities.

13.2. Air Monitoring Strategy and Methodologies

The RA contractor will monitor dust levels and collect air samples in the following locations which are indicated on Figure 4 of the SCP and Figure E-1 (Appendix E):

- One location upwind of excavation operations (as determined by wind direction meter [Section 10 above]). Based on the prevailing wind direction being from the northwest, this location will likely be in the northwest corner of the site.

- Three locations downwind of excavation operations. The downwind locations will likely be located along the eastern site boundary because the nearest sensitive receptors (commercial properties) are located adjacent to the east of the site.

- One location within the exclusion zone (with a technician).

Actual locations will be determined in the field. Air monitoring will be performed over an 8-hour period each day that excavation and off-hauling activities are conducted. The air-monitoring professional will check the equipment every 30 minutes during operation. In consultation with the City, this frequency may be changed based on site conditions and newly available data.

The particulate monitoring will be performed during the handling of waste or impacted soil, or when on-site activities may generate fugitive dust from exposed waste or impacted soil.

Real-time, data-logging aerosol monitors (i.e., Personal DataRAM or PDM-3 MiniRAM particulate monitor manufactured by MIE) will be used to provide continuous real-time data measurement of the total dust FAL of 50 ug/m^3 above upwind total dust levels. The Personal DataRAM or equivalent will collect minimum, maximum, and average total aerosol concentrations (measured in ug/m^3) every 5 minutes of operating time. Each 30 minutes of field time, the direct-reading instrumentation will be visually checked and the results will be reviewed and manually recorded. If particulate levels downwind of the work area are detected in excess of 50 µg/m^3, the upwind background level must checked immediately. If the downwind particulate measurement is greater than 50 µg/m^3 above the upwind background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust, and corrective action must be taken to reduce the potential for contaminant migration.

13.3. Action Levels for Particulates

Particulate dust monitoring will be performed in accordance with the regulations of the Bay Area Air Quality Management District (BAAQMD) which regulates the generation of fugitive dust particles with diameters of 10 microns or less, also known as PM_{10}. This monitoring will be conducted during soil excavation and off-hauling activities outlined in the Site Cleanup Plan (SCP) and will be designed to be protective of both worker health and the surrounding community. An evaluation of the potential airborne concentrations of chemicals of concern (COCs) was performed based on the highest concentrations of COCs detected in soil samples collected from areas to be excavated on-site. The evaluation was performed to determine whether the real time monitoring fence line action level (FAL) of 50 micrograms per cubic meter (µg/m^3) for total dust (which is the maximum allowable fence line total dust level according to BAAQMD regulations) would be protective for the adjacent community, and whether the site action level of 1 milligram per cubic meter (mg/m^3) for total dust (which is 10% of the threshold limit value [TLV] established by the American Conference for Governmental Industrial Hygienists[ACGIH]) would be protective for site workers. The evaluation of potential airborne concentrations of COCs was performed by Mr. Stephen Waide of Ninyo & Moore, a Certified Industrial Hygienist (CIH).

The calculations for the potential airborne concentrations of COCs are presented in Attachment A of the Dust Monitoring and Control Plan (Appendix E). Based on Mr. Waide's evaluation, the FAL of 50 $\mu g/m^3$ and Site Action Level of 1 mg/m^3 for total dust above upwind total dust levels should be protective for the community and site workers, respectively, based on the concentrations of COCs on-site. The calculations indicated that if the site action level for total dust was based on the ACGIH TLV of 10 mg/m^3, airborne lead could potentially reach concentrations which exceed the CalOSHA Permissible Exposure Limit (PEL) and Action Level; airborne chromium VI could potentially reach concentrations which exceed the CalOSHA PEL, and airborne arsenic could potentially reach concentrations which exceed the ACGIH TLV based on the highest concentrations of lead (16,000 mg/kg), chromium VI (3,100 mg/kg) and arsenic (1,400 mg/kg) detected in soil on-site. Since the Site Action Level is set an order of magnitude less than the ACGIH TLV at 1 mg/m^3, real-time monitoring with the prescribed site action levels will adequately protect site workers from COCs. Based on the calculations in Attachment A of Appendix E, airborne lead could potentially exceed the FAL of 15 $\mu g/m^3$ if total dust levels exceed the FAL of 50 $\mu g/m^3$. However, because the average concentration of lead detected on site is much lower than the highest concentration used in the calculation, and strict dust control measures will be implemented to maintain total dust levels below the site action level and FAL, the total dust FAL of 50 $\mu g/m^3$ should adequately protect the adjacent community. Additionally, quantitative monitoring of airborne total dust and lead will be performed to verify compliance with the FALs as described in Section 13.4 below.

Table 5 – Exposure Guidelines for Site Chemical Hazards

Chemical Name	Odor Thresh-old	CAL/OSHA PEL [a]	ACGIH TLV [b]	Site Action Levels	Community Action Level (Fence Line)
Total Dust	Not Listed	15 mg/m^3	10 mg/m^3	1.0 mg/m^3 [c]	50 µg/m^3 [d]
Lead	N/A	0.05 mg/m^3	0.05 mg/m^3	30 µg/m^3	0.15 µg/m^3 [e]
Arsenic	N/A	0.5 mg/m^3	0.01 mg/m^3	0.01 mg/m^3	N/A
Total Chro-mium	N/A	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	N/A
Chromium VI	N/A	0.005 mg/m^3	0.01 mg/m^3	0.005 mg/m^3	N/A

Notes:
mg/m^3 — milligrams per cubic meter
µg/ m^3 — micrograms per cubic meter
a Permissible Exposure Limits (Cal/OSHA Article 107, Table AC1)
b 1990-1991 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists
c Site Action Level for total dust is calculated as 10% of threshold limit value (as measured by NIOSH methods). If this action level is met or exceeded, then respiratory protection will be worn by site personnel while additional dust mitigation measures are implemented. If the site air contaminants cannot be controlled reliably within 15 minutes, all work will cease and a certified Industrial Hygienist will be consulted.
d Community Action Level (FAL) of 50 µg/m^3 total dust/particulate is based on the BAAQMD regulation of 50 µg/m^3 of total dust.
e The National Ambient Air Quality Standard (NAAQS) for lead at 0.15 µg/m^3 is selected as the fence-line community action level.

The conservative total dust action level described above will not only protect site workers from lead and other metals but will also be utilized to insure off-site migration of fugitive dust is in compliance with BAAQMD regulations. A total dust action level of 1.0 mg/m^3 (as measured with direct-reading instrumentation) will be utilized for engineering (dust) control actions at work operations. This level, easily detected with field instruments, will help to keep perimeter dust levels within the expected low range.

13.4. Quantitative Monitoring

Quantitative sampling will be performed upwind, downwind and within the work area at the locations described above. The samplers will be operated for a minimum of 5 hours per day, during periods of relatively constant wind directions and having the greatest velocity as documented by the meteorological survey. In order to achieve laboratory detection limits below the FAL of 50 µg/ m^3 for total dust, each set of samples will be collected over the course of 3 days.

At the end of each 3rd days of sampling, the filter cassettes will be replaced with clean samplers. The filter cassettes removed from the samplers will be shipped to a certified laboratory to be tested for total dust by NIOSH test method 0500 or equivalent. In addition, the sampling cassettes will be analyzed for total lead using NIOSH test method 7300 or equivalent. Use of the quantitative samplers for evaluating concentrations of arsenic or other metals will not be required as the action levels for lead in this case, serve to be highly protective of the other potential contaminants.

As analytical results for quantitative samples are received, the air monitoring professional will prepare summary sheets and discuss results with onsite management and workers. The remediation contractor will request a 24-hour turnaround time from the analytical laboratory for the quantitative dust and lead samples. If the site action levels for total dust or lead are exceeded during quantitative sampling, the Project Certified Industrial Hygienist will be immediately consulted.

13.5. Fugitive Dust Control Plan

The RA contractor will implement appropriate procedures to control the generation of airborne dusts by soil removal activities. Such procedures will include but will not be limited to the following:

- The site air monitoring professional will monitor dust levels in the locations outlined in Section 13 above and will have the authority to stop-work in the event of that on-site activities generate dust levels in excess of the site (1.0 mg/m^3) or community/fence line (50 ug/m^3) action levels. Generation of dust during the removal operations will be minimized as necessary with the use of water as a dust suppressant. The water will be available via a water truck or a metered discharge from a fire hydrant located in close proximity to the site. The RA contractor will control dust generation by spraying water prior to daily work activities, during excavation/loading activities (as necessary to maintain concentrations below action levels), and at truck staging locations. Watering equipment will be continuously available to provide proper dust control.

- The air monitoring professional will monitor onsite meteorological instrumentation and/or coordinate with offsite meteorological professionals to identify conditions that require cessation of work. All removal activities will cease in the event wind conditions change, creating an uncontrollable condition.

- Measurement of airborne dust levels at locations outlined in Section 13 using real-time, data-logging aerosol monitors (i.e., Personal DataRAM or PDM-3 MiniRAM particular monitor manufactured by MIE). These instruments will be calibrated daily and monitoring information posted daily, and discussed with site workers. The monitors will be set to log dust levels over 5-minute periods and will be visually read and recorded in field notes every 30 minutes. In consultation with DTSC, the frequency may be changed based on site conditions and newly available data.

- The PDM-3 Miniram or equivalent will be placed on a technician to provide worst case dust concentrations on the site. Dust masks will be provided to site workers in the event particulate concentrations within the exclusion zone exceed 1 mg/m^3.

- While on the property, vehicles will maintain slow speeds (i.e., less than 5 mph) for safety purposes and for dust control measures.

- When loading soil into trucks, the drop height from the bucket of the excavator or backhoe to the truck bed will be minimized and tarps will be placed over the loaded truck beds to minimize the potential release of dust.

The emission of fugitive dust will not be allowed from any active operation, open storage pile, or disturbed surface area such that:

- The dust remains visible in the atmosphere beyond the property line of the emission source; or,

- The dust emission exceeds 20 percent opacity (estimated visually), if the dust emission is the results of movement of a motorized source.

The Personal DataRAM or equivalent will provide continuous real-time data measurement of the total dust FAL of 50 µg/m3.

Misting or wetting of soil should not be excessive to the point of creating puddles or runoff. If the dust suppression techniques do not lower particulates to acceptable levels (below 50 $\mu g/m^3$ at the fence line and no visible suspended dust), work must be suspended until appropriate corrective measures are approved to remedy the situation or the wind velocity decreases so the downwind monitoring (direct-reading) shows concentrations less than 50 $\mu g/m^3$.

The Personal DataRAM or equivalent will be set with a flow rate of 2 liters per minute and will collect minimum, maximum, and average total aerosol concentration (measured in ug/m3) every 5 minutes of operating time. Each 30 minutes of field time, the direct-reading instrumentation will be visually checked and the results will be reviewed and manually recorded.

14. DESCRIPTION OF SITE WORK ZONES

14.1. Work Areas

Site control will be established and maintained around the area scheduled for removal action according to the recommendations in the U.S. Environmental Protection Agency's *Interim Standard Operating Safety Guides*, revised September 1982. Three general zones of operation will be established in the field to reduce the potential for contaminant migration and risk of personnel exposure:

- The exclusion zone
- The contamination reduction zone
- The support zone

The exclusion zone is the area where contamination is identified. All personnel within it must use the prescribed levels of PPE. A checkpoint must be established at the exclusion zone's periphery to regulate the flow of personnel and equipment into and out of the area. Establishment of the exclusion zone boundary (hotline) is based upon the suspected presence of contaminated materials. The boundary may be adjusted based on subsequent observations and/or measurements of the contaminant concentrations and/or level of effort. Gross decontamination of personnel (i.e., protective coveralls, gloves, etc.), will occur in the work area, as required, with most personnel decontamination activities occurring in a decontamination area. Only authorized personnel with at least of 40 hours health and safety training meeting the Cal-OSHA requirements (29 CFR 1910.120) and 3 days of supervised field experience are permitted within the exclusion and contamination reduction zones.

The exclusion zone for the current project is the fenced boundary shown on Figure 4 of the SCP. The person entering the exclusion zone must be accompanied by a person who is able to:

- Assist his or her partner.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the Site Field Team Leader, his representative, or others if emergency help is needed.

A decontamination area will serve as the **contamination reduction zone** for most site activities and will serve as a buffer between the primary exclusion zone and the support zone. All decontamination procedures will be conducted in this area. Personnel will leave the support zone and enter the contamination reduction zone through a controlled access point. They must wear the prescribed PPE. Exiting the contamination reduction zone requires removing all contaminants through compliance with established decontamination procedures. The contamination reduction zone for this site will be the decontamination area (see Figure 4 of the SCP).

The support zone is the outermost area and is considered an uncontaminated or clean area. It contains the command post for field operations, first-aid station, sanitation station, and other supplies and equipment necessary to support the exclusion zone and the contamination reduction zone activities. The support zone for this site will be east of the small equipment and personnel decontamination area and near the site exit (Figure 4 of the SCP).

14.2. Work Area Access

The City's contractor personnel, subcontractors, and other site visitors must provide the site supervisor or Site Health and Safety Officer (SHSO) documentation showing their HAZWOPER training is current, and must agree to comply with this SSHSP, or equivalent health and safety requirements prior to site entry. Personnel failing to meet or abide by the provisions of this SSHSP, or equivalent health and safety procedures, shall be restricted from entering work areas.

If the SHSO believes that the City's contractor personnel are in danger or others may be in danger because of activities being conducted, he/she has the authority to immediately suspend work and may instruct personnel to evacuate the area. Examples of situations when this may happen are:

- Severe weather conditions such as thunder or lightening.
- Extreme winds (e.g., in excess of 25 mph).
- Site conditions have changed, for whatever reason, such that the SSHSP does not adequately address the current situation.
- Safety precautions being used are inadequate for the situation.
- Personnel including the City's contractor, subcontractors, or visitors, are or may be exposed to an immediate health hazard.

15. SANITATION

A restroom and hand washing station will be made available at the site by the City's contractor during the removal action.

16. EMERGENCY SUPPLIES

A fire extinguisher will be available onsite during field activities. Field technicians will be informed on the proper use of fire extinguishers.

A first aid kit will also be available onsite during field activities.

17. EMERGENCY RESPONSE

17.1. General

In the event of a medical emergency or fire during fieldwork at the site, the standard "**911**" emergency telephone number shall be called from the on-site mobile phone or any landline phone. A mobile telephone will be available during all field activities. On a daily basis, and at each work location, the SHSO and/or field team leader will verify that mobile phones are operational.

17.2. Pre-Emergency Planning

During the site briefing that is held daily and also at special periodic meetings all site workers will be trained in and reminded of the provisions of the emergency response plan, communications systems, and evacuation routes.

17.3. Site Resources

First-aid equipment, telephones, restroom facilities, and water supply will be available. The City's contractor personnel working in the primary exclusion zone should have communication and first-aid equipment available at the work zones at all times.

17.4. Emergency Procedures

Emergency procedures are to be followed if any of the following situations develop onsite:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while onsite.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- Site work area entrance and exit routes will be planned and emergency escape routes delineated by the SHSO.
- If any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the SHSO.
- For applicable site activities, wind indicators visible to all onsite personnel will be provided by the SHSO to indicate possible routes for upwind escape.
- Identifying any conditions that would suggest a situation more hazardous than anticipated will result in the suspension of work until the SHSO has evaluated the situation and provided the appropriate instructions to the field team.
- If an accident occurs, the Site Field Team Leader is to complete an accident report form for submittal to the appropriate company official.
- If a member of the field crew suffers a personal injury, the SHSO will call 911 (serious injury) to alert appropriate emergency response agencies or administer onsite first aid

(minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.

- If a member of the field crew suffers a chemical exposure, the affected areas should be flushed immediately with copious amounts of clean water. If the situation dictates, the SHSO should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. An Accident Report Form will be completed for any such incident.

Emergency facility locations and phone numbers are listed in Table 6 below. The emergency facility located in closest proximity to the site is the Summit Medical Center. The hospital address is 350 Hawthorne Avenue, Oakland, California. The route and directions from the site to the hospital are shown on Figure A.

Table 6 – Emergency Phone Numbers
(to be posted by Site Health and Safety Officer at all phone locations)

Emergency	Number	Contact	Notes
Major Medical, Fire or Police Emergency	911	Emergency Operator	
Summit Medical Center	(510) 869-6600	Emergency room	

18. SPILL PREVENTION AND CONTROL MEASURES

18.1. Preventive Measures

- Inspect all containers upon delivery to the site for visible defects and ensure that each drum or container includes a re-sealable lid.
- Set any 55-gallon drums on wooden pallets to facilitate transport via forklift
- Perform weekly inspections of the storage area.
- Select flat areas for temporary storage away from high-traffic zones and storm or sewer drains.

18.2. Spill Containment Measures

The following actions will be taken by Ninyo & Moore field personnel assigned to the field activities in the event of a spill:

- The Site Coordinator (field team leader) and SHSO are to be notified immediately;
- workers not involved in spill containment and/or cleanup shall evacuate the immediate area and designated emergency response personnel attired in appropriate PPE (see Section 9), shall proceed to the spill area with a spill cleanup and control kit, including absorbent materials;
- attempts shall be made to stop the source(s) of spillage immediately;
- the SHSO shall monitor for exposure to chemicals or hazardous substances during spill cleanup work and shall stay at the spill area until the area has been cleared, inspected, and readied for reentry; and
- a spill incident report shall be prepared by the SHSO.

18.3. Record Keeping and Notifications

The SHSO and Field Team Leader shall thoroughly document the spill in an Incident Report which will be forwarded to the Corporate Safety Manager and Project Manager. Records of all hazardous materials releases shall be maintained with the project files and the facility operating record. The Project Manager will make any necessary notifications to off-site authorities and he and the Safety Manager will approve the reentry to the site for routine use and will issue a final release report pertaining to cleanup of the area.

19. CERTIFIED INDUSTRIAL HYGIENIST REVIEW

The above Health and Safety Plan has been reviewed and approved by the Certified Industrial Hygienist (CIH) indicated below.

Stephen J. Waide, CIH, CSP

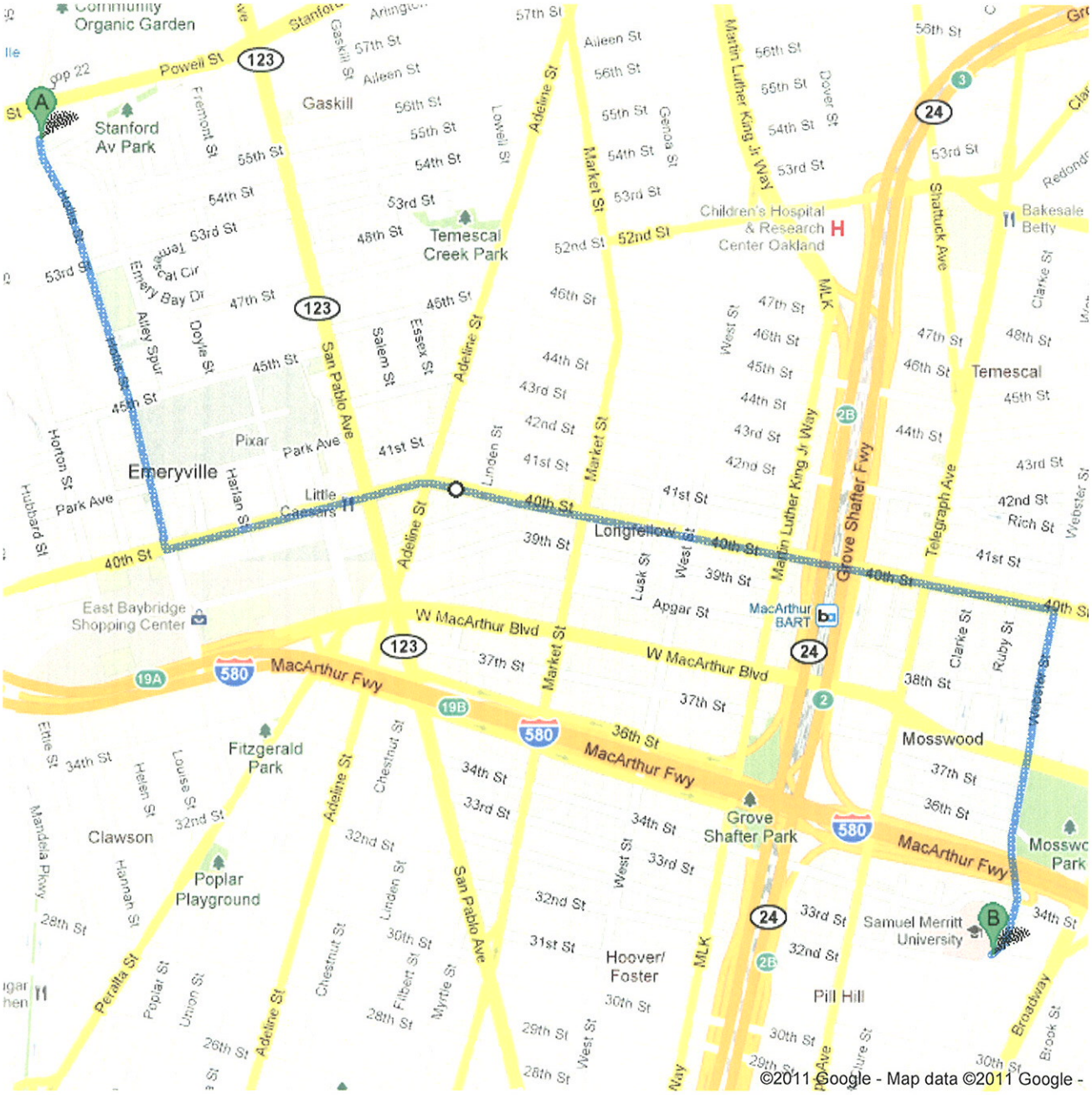
Certified Industrial Hygienist No. CP 7005

FIGURE A

ROUTE TO HOSPITAL

Directions to 350 Hawthorne Ave, Oakland, CA 94609
2.6 mi – about **10 mins**

Save trees. Go green!
Download Google Maps on your phone at **google.com/gmm**



5701 Hollis St, Emeryville, CA 94608

	1. Head **south** on **Hollis St** toward **Stanford Ave/Union Pacific Railroad** About 2 mins	go 0.7 mi total 0.7 mi
	2. Turn left onto **40th St** About 5 mins	go 1.4 mi total 2.0 mi
	3. Turn right onto **Webster St** Destination will be on the right About 3 mins	go 0.5 mi total 2.6 mi

350 Hawthorne Ave, Oakland, CA 94609

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2011 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Attachment A

Health and Safety Plan Acknowledgement Sheet

ONSITE WORKING PERSONNEL SIGN IN

The personnel listed below have 40-hour HAZWOPER training with current refresher status and have read and understood this Health and Safety plan, and agree to abide by its provisions.

Onsite Personnel Name	Signature	Company	Date

Attachment B

Material Safety Data Sheets

Chromic acid and chromates

Synonyms & Trade Names Chromic acid (CrO_3): Chromic anhydride, Chromic oxide, Chromium(VI) oxide (1:3), Chromium trioxide
Synonyms of chromates (i.e., chromium(VI) compounds) such as zinc chromate vary depending upon the specific compound.

CAS No. 1333-82-0 (CrO_3)	RTECS No. GB6650000 (CrO_3) (/niosh-rtecs/GB657890.html)	DOT ID & Guide 1755 154 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=154) (http://www.cdc.gov/Other/disclaimer.html) (acid solution) 1463 141 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=141) (http://www.cdc.gov/Other/disclaimer.html) (acid, solid)
Formula CrO_3 (acid)	Conversion	IDLH Ca [15 mg/m³ {as Cr(VI)}] See: 1333820 (/niosh/idlh/1333820.html)
Exposure Limits NIOSH REL (as Cr): Ca TWA 0.001 mg/m³ See Appendix A (nengapdxa.html) See Appendix C (nengapdxc.html) OSHA PEL (as CrO_3): TWA 0.005 mg/m³ See Appendix C (nengapdxc.html)		Measurement Methods **NIOSH** 7600 (/niosh/docs/2003-154/pdfs/7600.pdf), 7604 (/niosh/docs/2003-154/pdfs/7604.pdf), 7605 (/niosh/docs/2003-154/pdfs/7605.pdf), 7703 (/niosh/docs/2003-154/pdfs/7703.pdf), 9101 (/niosh/docs/2003-154/pdfs/9101.pdf); **OSHA** ID103 (http://www.osha.gov/dts/sltc/methods/inorganic/id103/id103.html) (http://www.cdc.gov/Other/disclaimer.html), ID215 (http://www.osha.gov/dts/sltc/methods/inorganic/id215/id215.html) (http://www.cdc.gov/Other/disclaimer.html), W4001 (http://www.osha.gov/dts/sltc/methods/validated/t-w4001-fv-02-0104-m/t-w4001-fv-02-0104-m.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description CrO_3: Dark-red, odorless flakes or powder. [Note: Often used in an aqueous solution (H_2CrO_4).]

MW: 100.0	BP: 482°F (Decomposes)	MLT: 387°F (Decomposes)	Sol: 63%	VP: Very low	IP: NA
Sp.Gr: 2.70 (CrO_3)	FLP: NA	UEL: NA	LEL: NA		

CrO_3: Noncombustible Solid, but will accelerate the burning of combustible materials.

Incompatibilities & Reactivities Combustible, organic, or other readily oxidizable materials (paper, wood, sulfur, aluminum, plastics, etc.); corrosive to metals

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation respiratory system; nasal septum perforation; liver, kidney damage; leukocytosis (increased blood leukocytes), leukopenia (reduced blood leukocytes), eosinophilia; eye injury, conjunctivitis; skin ulcer, sensitization dermatitis; [potential occupational carcinogen]

Target Organs Blood, respiratory system, liver, kidneys, eyes, skin

Cancer Site [lung cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 1194 (/niosh/ipcsneng/neng1194.html) See MEDICAL TESTS: 0051 (/niosh/docs/2005-110/nmed0051.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - cdcinfo@cdc.gov

Antimony

Synonyms & Trade Names Antimony metal, Antimony powder, Stibium		
CAS No. 7440-36-0	RTECS No. CC4025000 (/niosh-rtecs/CC3D6AA8.html)	DOT ID & Guide 1549 157 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=157) (http://www.cdc.gov/Other/disclaimer.html) (inorganic compounds, n.o.s.) 2871 170 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=170) (http://www.cdc.gov/Other/disclaimer.html) (powder) 3141 157 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=157) (http://www.cdc.gov/Other/disclaimer.html) (inorganic liquid compounds, n.o.s.)
Formula Sb	Conversion	IDLH 50 mg/m3 (as Sb) See: 7440360 (/niosh/idlh/7440360.html)
Exposure Limits NIOSH REL *: TWA 0.5 mg/m3 [*Note: The REL also applies to other antimony compounds (as Sb).] OSHA PEL *: TWA 0.5 mg/m3 [*Note: The PEL also applies to other antimony compounds (as Sb).]		Measurement Methods **NIOSH** 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), P&CAM261 (II-4); **OSHA** ID121 (http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html) (http://www.cdc.gov/Other/disclaimer.html), ID125G (http://www.osha.gov/dts/sltc/methods/inorganic/id125g/id125g.html) (http://www.cdc.gov/Other/disclaimer.html), ID206 (http://www.osha.gov/dts/sltc/methods/inorganic/id206/id206.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.

MW: 121.8	BP: 2975° F	MLT: 1166°F	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 6.69	FLP: NA	UEL: NA	LEL: NA		

Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly

Target Organs Eyes, skin, respiratory system, cardiovascular system

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact	First Aid (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash immediately

Eyes: Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet or contaminated **Change:** Daily	**Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 5 mg/m3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 12.5 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.

Up to 25 mg/m3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0775 (/niosh/ipcsneng/neng0775.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - cdcinfo@cdc.gov

Silver (metal dust and soluble compounds, as Ag)

Synonyms & Trade Names **Silver metal:** Argentum
Synonyms of soluble silver compounds such as Silver nitrate ($AgNO_3$) vary depending upon the specific compound.

CAS No. 7440-22-4 (metal)	RTECS No. VW3500000 (metal) (/niosh-rtecs/VW3567E0.html)	DOT ID & Guide
Formula Ag (metal)	Conversion	IDLH 10 mg/m3 (as Ag) See: 7440224 (/niosh/idlh/7440224.html)

Exposure Limits	Measurement Methods
NIOSH REL : TWA 0.01 mg/m3 OSHA PEL : TWA 0.01 mg/m3	**NIOSH** 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf); **OSHA** ID121 (http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Metal: White, lustrous solid.

MW: 107.9	BP: 3632° F	MLT: 1761°F	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 10.49 (metal)	FLP: NA	UEL: NA	LEL: NA		

Metal: Noncombustible Solid, but flammable in form of dust or powder.

Incompatibilities & Reactivities Acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, tartaric acid

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance

Target Organs Nasal septum, skin, eyes

Personal Protection/Sanitation (See protection codes (protect.html))	First Aid (See procedures (firstaid.html))
Skin: Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet or contaminated ($AgNO_3$) **Change:** Daily **Provide:** Eyewash	**Eye:** Irrigate immediately **Skin:** Water flush **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations
NIOSH/OSHA

Up to 0.25 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode[£]
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.[£]

Up to 0.5 mg/m3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0810 (/niosh/ipcsneng/neng0810.html) See MEDICAL TESTS: 0208 (/niosh/docs/2005-110/nmed0208.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - cdcinfo@cdc.gov

MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

EMERGENCY OVERVIEW
CAUTION!
OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT
EFFECTS CENTRAL NERVOUS SYSTEM
HARMFUL OR FATAL IF SWALLOWED

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.
If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

NFPA 704 (Section 16)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800) 424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732) 750-6000
MSDS INTERNET WEBSITE: www.hess.com (See Environment, Health, Safety & Social Responsibility)

SYNONYMS: Ultra Low Sulfur Diesel (ULSD); Low Sulfur Diesel; Motor Vehicle Diesel Fuel; Diesel Fuel #2; Dyed Diesel Fuel; Non-Road, Locomotive and Marine Diesel Fuel; Tax-exempt Diesel Fuel

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Diesel Fuel (68476-34-6)	100
Naphthalene (91-20-3)	Typically < 0.01

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher. Diesel fuel may be dyed (red) for tax purposes. May contain a multifunctional additive.

3. HAZARDS IDENTIFICATION

EYES
Contact with liquid or vapor may cause mild irritation.

SKIN
May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	> 125 ^{o}F (> 52 ^{o}C) minimum PMCC
AUTOIGNITION POINT:	494 ^{o}F (257 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	2 (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT (%):	0.6
UPPER EXPLOSIVE LIMIT (%):	7.5

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Diesel fuel, and in particular low and ultra low sulfur diesel fuel, has the capability of accumulating a static electrical charge of sufficient energy to cause a fire/explosion in the presence of lower flashpoint products such as gasoline. The accumulation of such a static charge occurs as the diesel flows through pipelines, filters, nozzles and various work tasks such as tank/container filling, splash loading, tank cleaning; product sampling; tank gauging; cleaning, mixing, vacuum truck operations, switch loading, and product agitation. There is a greater potential for static charge accumulation in cold temperature, low humidity conditions.

Documents such as 29 CFR OSHA 1910.106 "Flammable and Combustible Liquids, NFPA 77 Recommended Practice on Static Electricity, API 2003 "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents and ASTM D4865 "Standard Guide for Generation and Dissipation of Static

Electricity in Petroleum Fuel Systems" address special precautions and design requirements involving loading rates, grounding, bonding, filter installation, conductivity additives and especially the hazards associated with "switch loading." ["Switch Loading" is when a higher flash point product (such as diesel) is loaded into tanks previously containing a low flash point product (such as gasoline) and the electrical charge generated during loading of the diesel results in a static ignition of the vapor from the previous cargo (gasoline).]

Note: When conductivity additives are used or are necessary the product should achieve 25 picosiemens/meter or greater at the handling temperature.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits TWA/STEL	Note
Diesel Fuel: (68476-34-6)	OSHA	5 mg/m, as mineral oil mist	
	ACGIH	100 mg/m^3 (as totally hydrocarbon vapor) TWA	A3, skin
Naphthalene (91-20-3)	OSHA	10 ppm TWA	
	ACGIH	10 ppm TWA / 15 ppm STEL	A4, Skin

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION
A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE
Clear, straw-yellow liquid. Dyed fuel oil will be red or reddish-colored.

ODOR
Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	320 to 690 oF (160 to 366 ^{o}C)
VAPOR PRESSURE:	0.009 psia @ 70 ^{o}F (21 ^{o}C)
VAPOR DENSITY (air = 1):	> 1.0
SPECIFIC GRAVITY (H_2O = 1):	0.83 to 0.88 @ 60 ^{o}F (16 ^{o}C)
PERCENT VOLATILES:	100 %
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H_2O):	Negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY
Acute dermal LD50 (rabbits): > 5 ml/kg
Acute oral LD50 (rats): 9 ml/kg
Primary dermal irritation: extremely irritating (rabbits)
Draize eye irritation: non-irritating (rabbits)
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY
Carcinogenic: OSHA: NO IARC: NO NTP: NO ACGIH: A3

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

MUTAGENICITY (genetic effects)
This material has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Diesel Fuel	Placard (International Only):
HAZARD CLASS and PACKING GROUP:	3, PG III	
DOT IDENTIFICATION NUMBER:	NA 1993 (Domestic) UN 1202 (International)	
DOT SHIPPING LABEL:	None	
		Use Combustible Placard if shipping in bulk domestically

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Diesel Engine Exhaust (no CAS Number listed)	10/01/1990

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3 (Combustible Liquid) and Class D, Division 2, Subdivision B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING	HEALTH:	0	
	FIRE:	2	
	REACTIVITY:	0	

Refer to NFPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING	HEALTH:	1 *	* Chronic
	FIRE:	2	
	PHYSICAL:	0	

SUPERSEDES MSDS DATED: 02/28/2001

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212) 642-4900
API	American Petroleum Institute (202) 682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MATERIAL SAFETY DATA SHEET

QUAKER STATE® PEAK PERFORMANCE CONVENTIONAL MOTOR OIL - ALL GRADES

1. PRODUCT AND COMPANY IDENTIFICATION

MSDS Number: 14938
Version Date: 07/16/02

Product Name: QUAKER STATE® PEAK PERFORMANCE CONVENTIONAL MOTOR OIL - ALL GRADES
Product Use: Engine oil
Synonyms: 5W-30, 10W-30, 10W-40, 20W-50, 15W-40

Company Information
SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427
USA

Phone Numbers
Medical Emergency: 1-800-546-6040
Transportation Emergency (USA): 1-800-424-9300
Transportation Emergency (International): 1-703-527-3887 (Call Collect)
MSDS Assistance: 1-800-546-6227
Fax On Demand: 1-800-546-6227
Technical Assistance: 1-800-458-4998
Customer Service: 1-800-468-8397
Fax Number: 713-217-3181
Internet Address: www.MSDS.PZLQS.com

2. COMPONENT INFORMATION

Component	CAS No.	Weight Percent Range	Hazardous in Blend
HYDROTREATED HEAVY PARAFFINIC PETROLEUM DISTILLATES	64742-54-7	< 70	No
SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE	64742-65-0	< 70	No
DETERGENT/DISPERSANT	MIXTURE	5 - 10	No
VISCOSITY MODIFIER	9003-29-6	< 10	No
POUR POINT DEPRESSANT	MIXTURE	< 2	No

Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Other: No information available

3. HAZARDS IDENTIFICATION

Emergency and Hazards Overview
CAUTION: Contains Petroleum Lubricant. Repeated skin contact can cause skin disorders.

ATTENTION: Used motor oil is a possible skin cancer hazard based on animal data. Repeated exposure to oil mist in excess of the OSHA limit (5mg/m3) can result in accumulation of oil droplets in pulmonary tissue.

NFPA Ratings: **Health** 1 **Flammability** 1 **Reactivity** 0

Primary Route of Exposure: **Skin** X **Inhalation** -- **Eye** X

Health Effect Information
Eye Contact: This product is practically non-irritating to the eyes upon direct contact. Based on testing of similar products and/or components.

Skin Contact: Avoid skin contact. This product is minimally irritating to the skin upon direct contact. Based on testing of similar products and/or components. Prolonged or repeated contact may result in contact dermatitis which is characterized by dryness, chapping, and reddening. Prolonged or repeated contact may result in oil acne which is characterized by blackheads with possible secondary infection. Avoid prolonged and repeated skin contact with used motor oils. See Section 11 - Toxicological Information.

Inhalation: This product has a low vapor pressure and is not expected to present an inhalation hazard at ambient conditions. Caution should be taken to prevent aerosolization or misting of this product. On rare occasions, prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as chronic lung inflammation. Signs of respiratory effects vary with concentration and length of exposure and include nasal discharge, sore throat, coughing, bronchitis, pulmonary edema and difficulty breathing. Shortness of breath and cough are the most common symptoms.

Ingestion: Do not ingest. This product is relatively non-toxic by ingestion. This product has laxative properties and may result in abdominal cramps and diarrhea. Exposure to a large single dose, or repeated smaller doses, may lead to lung aspiration, which can lead to lipid pneumonia or chronic lung inflammation. These are low-grade, chronic localized tissue reactions.

Medical Conditions Aggravated by Exposure: Drying and chapping may make the skin more susceptible to other irritants, sensitizers and disease.

Other: No information available

4. FIRST AID INFORMATION

Eye Contact: Immediately flush eyes with large amounts of water and continue flushing until irritation subsides. If material is hot, treat for thermal burns and seek immediate medical attention.

Skin Contact: No treatment is necessary under ordinary circumstances. Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If material is hot, submerge injured area in cold water. If victim is severely burned, remove to a hospital immediately.

Inhalation: This material has a low vapor pressure and is not expected to present an inhalation exposure at ambient conditions. If vapor or mist is generated when the material is heated, and the victim experiences signs of respiratory tract irritation, remove to fresh air.

Ingestion: No treatment is necessary under ordinary circumstances. Do not induce vomiting. If victim exhibits signs of lung aspiration such as coughing or choking, seek immediate medical assistance.

Notes to Physician: No information available

Other: No information available

5. FIRE AND EXPLOSION INFORMATION

Flammable Properties

Flash Point: 415 F, 212.8 C **Test Method:** ASTM 3278 - Closed Cup

Flammable Limits in Air

Upper Percent: No data available

Lower Percent: No data available

Autoignition Temperature: No data available **Test Method:** No information available

NFPA Classification: Class III-B combustible liquid

Extinguishing Media: Use dry chemical, foam, or carbon dioxide.

Fire Fighting Measures

Special Fire Fighting Procedures and Equipment: Water may be ineffective but can be used to cool containers exposed to heat or flame to prevent vapor pressure buildup and possible container rupture. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid.

Unusual Fire and Explosion Conditions: Dense smoke may be generated while burning. Carbon monoxide, carbon dioxide, and other oxides may be generated as products of combustion.

Hazardous Combustion By-Products: None

Other: No information available

6. ACCIDENTAL RELEASE MEASURES

Personnel Safeguards: Consult Health Effect Information in Section 3, Personal Protection Information in Section 8, Fire and Explosion Information in Section 5, and Stability and Reactivity Information in Section 10.

Regulatory Notifications: Notify appropriate authorities of spill.

Containment and Clean up: Contain spill immediately. Do not allow spill to enter sewers or watercourses. Absorb with appropriate inert material such as sand, clay, etc. Large spills may be picked up using vacuum pumps, shovels, buckets, or other means and placed in drums or other suitable containers.

Other: No information available

7. HANDLING AND STORAGE INFORMATION

Handling: Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106--Flammable and Combustible Liquids.

Storage: Do not transfer to unmarked containers. Store in closed containers away from heat, sparks, open flame, or oxidizing materials.

Empty Container Warnings

Drums: Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed.

Plastic: Empty container may retain product residues.

Other: No information available

8. EXPOSURE CONTROLS / PERSONAL PROTECTION INFORMATION

Exposure Limits and Guidelines

This product does not contain any components with OSHA or ACGIH exposure limits.

Personal Protective Equipment

Eye/Face Protection: Eye protection is not required under conditions of normal use. If material is handled such that it could be splashed into eyes, wear plastic face shield or splash-proof safety goggles.

Skin Protection: No skin protection is required for single, short duration exposures. For prolonged or repeated exposures, use impervious clothing (boots, gloves, aprons, etc.) over parts of the body subject to exposure. If handling hot material, use insulated protective clothing (boots, gloves, aprons, etc.). Launder soiled clothes. Properly dispose of contaminated leather articles including shoes, which cannot be decontaminated.

Respiratory Protection: Respiratory protection is not required under conditions of normal use. If vapor or mist is generated when the material is heated or handled, use an organic vapor respirator with a dust and mist filter. All respirators must be NIOSH certified. Do not use compressed oxygen in hydrocarbon atmospheres.

Personal Hygiene: Consumption of food and beverage should be avoided in work areas where hydrocarbons are present. Always wash hands and face with soap and water before eating, drinking, or smoking.

Engineering Controls / Work Practices

Ventilation: If vapor or mist is generated when the material is heated or handled, adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure or flammable limits.

Other: The OSHA permissible exposure limit (PEL) and ACGIH threshold limit value (TLV) for oil mist is 5 mg/m3. The ACGIH short-term exposure limit (STEL) for oil mist is 10 mg/m3.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Amber to dark amber	
Odor: Hydrocarbon - mild	**Vapor Pressure:** No data available
Physical state: Liquid	**Vapor Density (air=1):** No data available
pH: No data available	**Percent Volatile by Volume:** No data available
Boiling Point: No data available	**Volatile Organic Content:** No data available
Melting Point: No data available	**Molecular Weight:** No data available
Specific Gravity: 0.88 - 0.9 @ 16 C / 60 F	**Average Carbon Number:** No data available
Pour Point: -15 F, -26.1 C	**Viscosity @ 100 F:** No data available
	Viscosity @ 40 C: No data available
Solubility in Water: Negligible in water	
Octanol / Water Coefficient: Log K_{ow} = No data available	

10. STABILITY AND REACTIVITY INFORMATION

Chemical Stability: Stable

Conditions to Avoid: High heat and open flames.

Incompatible Materials to Avoid: May react with strong oxidizing agents.

Other: No information available

11. TOXICOLOGICAL INFORMATION

Primary Eye Irritation: No information available

Primary Skin Irritation: No information available

Acute Dermal Toxicity: No information available

Subacute Dermal Toxicity: No information available

Dermal Sensitization: No information available

Inhalation Toxicity: No information available

Inhalation Sensitization: No information available

Oral Toxicity: No information available

Mutagenicity: No information available

Carcinogenicity: The International Agency for Research on Cancer (IARC) has concluded that there is inadequate data to evaluate the carcinogenicity to experimental animals of this class of product. IARC has concluded there is sufficient evidence that used gasoline-engine motor oils produce skin tumors in experimental animals. Also, IARC has determined this class of products belongs to Group 3-"not classifiable as to its carcinogenicity to humans".

Reproductive and Developmental Toxicity: No information available

Teratogenicity: No information available

Immunotoxicity: No information available

Neurotoxicity: No information available

Other: No information available

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: No information available

Terrestrial Toxicity: No information available

Chemical Fate and Transport: No information available

Other: No information available

13. DISPOSAL INFORMATION

Regulatory Information: All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded, may be a regulated waste. Refer to state and local regulations. Caution! If regulated solvents are used to clean up spilled material, the resulting waste mixture may be regulated. Department of Transportation (DOT) regulations may apply for transporting this material when spilled.

Waste Disposal Methods: Waste material may be landfilled or incinerated at an approved facility. Materials should be recycled if possible.

Other: No information available

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)
Highway / Rail (Bulk): Not Regulated
Highway / Rail (Non-Bulk): Not Regulated

For US shipments, US DOT law requires the shipper to determine the proper shipping description of the material that is being shipped. The shipping information and description contained in this section may not be suitable for all shipments of this material, but may help the shipper determine the proper shipping description for a particular shipment.

International Information

Vessel:	**IMDG Regulated:**	--	**IMDG Not Regulated:**	X
Air:	**ICAO Regulated:**	--	**ICAO Not Regulated:**	X

Other: No information available

15. Regulatory Information

Regulatory Lists Searched: The components listed in Section 2 of this MSDS were compared to substances that appear on the following regulatory lists. Each list is numerically identified. See Regulatory Search Results below.

Health & Safety: 10 - IARC carcinogen, 11 - NTP carcinogen, 12 - OSHA carcinogen, 15 - ACGIH TLV, 16 - OSHA PEL, 17 - NIOSH exposure limit, 20 - US DOT Appendix A, Hazardous substances, 22 - FDA 21 CFR Total food additives, 23 - NFPA 49 or 325

Environmental: 30 - CAA 1990 Hazardous air pollutants, 31 - CAA Ozone depletors, 33 - CAA HON rule, 34 - CAA Toxic substance for accidental release prevention, 35 - CAA Volatile organic compounds (VOC's) in SOCMI, 41 - CERCLA / SARA Section 302 extremely hazardous substances, 42 - CERCLA / SARA Section 313 emissions reporting, 43 - CWA Hazardous substances, 44 - CWA Priority pollutants, 45 - CWA Toxic pollutants, 46 - EPA Proposed test rule for hazardous air pollutants, 47 - RCRA Basis for listing - Appendix VII, 48 - RCRA waste, 49 - SDWA - (S)MCLs

International: 50 - Canada - WHMIS Classification of substance, 54 - Mexico - Drinking water - ecological criteria, 55 - Mexico - Wastewater discharges, 56 - US -TSCA Section (12)(b) - export notification

State Lists: 60 - CA - Proposition 65, 61 - FL - Substances, 62 - MI - Critical materials, 63 - MA - RTK, 64 - MA - Extraordinarily hazardous substances, 65 - MN - Hazardous substances, 66 - PA - RTK, 67 - NJ - RTK, 68 - NJ - Environmental hazardous substances, 69 - NJ - Special hazardous substances

Inventories: 80 - Canada - Domestic substances , 81 - European - EINECS, 82 - Japan - ENCS, 83 - Korea - Existing and evaluated chemical substances, 84 - US - TSCA , 85 - China Inventory

Regulatory Search Results:
HYDROTREATED HEAVY PARAFFINIC PETROLEUM DISTILLATES: 80, 81, 83, 84, 85
SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE: 80, 81, 83, 84, 85
VISCOSITY MODIFIER: 35, 80, 83, 84, 85

U.S. TSCA Inventory: All components of this material are on the US TSCA Inventory.

SARA Section 313: This product is not known to contain any SARA, Title III, Section 313 Reportable Chemicals at or greater than 1.0% (0.1% for carcinogens).

IARC: No information available

SARA 311 / 312 Categories
Acute: -- **Chronic:** -- **Fire:** -- **Pressure:** -- **Reactive:** --
Not Regulated: X

Canadian WHMIS Classification
Not a controlled substance under WHMIS

European Union Classification
Hazard Symbols:
No classification recommended
Risk Phrases:
No classification recommended
Safety Phrases:
No classification recommended

Other: No information available

16. OTHER INFORMATION

Health and Environmental Label Language

WARNING: Continuous contact with used gasoline engine oils has caused skin cancer in animal tests.
ATTENTION: Prolonged or repeated skin contact may cause oil acne or dermatitis. Repeated exposure to oil mist in excess of the OSHA limit (5mg/m3 can result in accumulation of oil droplets in pulmonary tissue.

Precautionary Measures: Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid generation and inhalation of oil mists.

First Aid: Skin Contact: Wash skin with soap and water. Launder soiled clothes and discard oil-soaked shoes. If irritation persists seek medical attention. Eye Contact: Flush with water. If irritation persists seek medical attention. Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. If discomfort persists seek medical assistance.

Instructions in Case of Fire or Spill: In case of fire, use water fog, foam, dry chemical or carbon dioxide. Water spray may be ineffective, but can be used to cool containers. Do not use a direct stream of water. Material will float and can be reignited on surface of water.

Spill or Leak: Dike and contain spill. Do not use water; soak up with absorbent material such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Contains: highly refined petroleum distillate, mixture; zinc compounds, mixture; polymer additives, mixture.

KEEP OUT OF REACH OF CHILDREN. (If intended for retail also)

MSDS Revisions
Previous Version Date: 06/01/01

Previous Version Information
Revised Section 1 - Product Name

Other

No information available

Prepared By:

SOPUS Products
P.O. Box 4427
Houston, TX 77210-4453 USA

Disclaimer of Warranty: The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used, SOPUS Products must rely upon the hazard evaluation of such components submitted by that product's manufacturer or importer. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information, the results to be obtained from the use thereof, or that any such use do not infringe any patent. Since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%
Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000
Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.
Danger! May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause allergic skin reaction. May cause heritable genetic damage.
Target Organs: Reproductive system, skin.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.
Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.
Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: yellow to brown
Odor: faint aromatic odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 495 deg C @ 760 mm Hg
Freezing/Melting Point:175 - 179 deg C
Decomposition Temperature: Not available.
Solubility: 1.60x10-3 mg/l @25°C
Specific Gravity/Density: Not available.
Molecular Formula:C20H12
Molecular Weight:252.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 50-32-8: DJ3675000
LD50/LC50:

Not available.

Carcinogenicity:
CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in humans.Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:		9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: immediate, delayed.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: CAS# 50-32-8: 0.06 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 46 May cause heritable genetic damage.
R 60 May impair fertility.
R 61 May cause harm to the unborn child.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou
s waste.
S 61 Avoid release to the environment. Refer to special instructions
/safety data sheets.

WGK (Water Danger/Protection)
CAS# 50-32-8: No information available.

Canada - DSL/NDSL
CAS# 50-32-8 is listed on Canada's DSL List.

Canada - WHMIS
This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List
CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #7 Date: 6/30/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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NIOSH Pocket Guide to Chemical Hazards

Arsenic (inorganic compounds, as As)

CAS 7440-38-2

As (metal)

RTECS CG052

Synonyms & Trade Names

Arsenic metal: Arsenia
Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]

DOT ID & Gu
1558 152 (metal)
1562 152 (dust)

Exposure Limits

NIOSH REL: Ca C 0.002 mg/m^3 [15-minute] See Appendix A

OSHA PEL: [1910.1018] TWA 0.010 mg/m^3

IDLH Ca [5 mg/m^3 (as As)] See: 7440382

Conversion

Physical Description

Metal: Silver-gray or tin-white, brittle, odorless solid.

MW: 74.9	BP: Sublimes	MLT: 1135°F (Sublimes)	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.73 (met
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities

Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]

Measurement Methods

NIOSH 7300, 7301, 7303, 7900, 9102; OSHA ID105
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)

Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)

Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positiv mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canis N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-c breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, skin and/or eye contact ingestion

Symptoms Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irri hyperpigmentation of skin, [potential occupational carcinogen]

Target Organs Liver, kidneys, skin, lungs, lymphatic system

Cancer Site [lung & lymphatic cancer]

See also: INTRODUCTION See ICSC CARD: 0013 See MEDICAL TESTS: 0017

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

Lead

CAS 7439-92-1

Pb

RTECS OF752

Synonyms & Trade Names
Lead metal, Plumbum

DOT ID & Gu

Exposure Limits

NIOSH REL*: TWA (8-hour) 0.050 mg/m^3 See Appendix C [*Note: The REL also appli compounds (as Pb) -- see Appendix C.]

OSHA PEL*: [1910.1025] TWA 0.050 mg/m^3 See Appendix C [*Note: The PEL also ap lead compounds (as Pb) -- see Appendix C.]

IDLH 100 mg/m^3 (as Pb) See: 7439921

Conversion

Physical Description
A heavy, ductile, soft, gray solid.

MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities
Strong oxidizers, hydrogen peroxide, acids

Measurement Methods
NIOSH 7082, 7105, 7300, 7301, 7303, 7700, 7701, 7702, 9100, 9102, 9105; OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH/OSHA

Up to 0.5 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facep quarter-mask respirators. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter

Up to 2.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation. pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hyp

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

See also: INTRODUCTION See ICSC CARD: 0052 See MEDICAL TESTS: 0127

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

Dieldrin

CAS 60-57-1

$C_{12}H_8Cl_6O$

RTECS IO175(

Synonyms & Trade Names
HEOD; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,exo-5,8-dimethanonaphthalene

DOT ID & Gu
2761 151

Exposure Limits

NIOSH REL: Ca TWA 0.25 mg/m^3 [skin] See Appendix A

OSHA PEL: TWA 0.25 mg/m^3 [skin]

IDLH Ca [50 mg/m^3] See: 60571

Conversion

Physical Description
Colorless to light-tan crystals with a mild, chemical odor. [insecticide]

MW: 380.9	BP: Decomposes	MLT: 349°F	Sol: 0.02%
VP(77°F): 8 x 10-7 mmHg	IP: ?		Sp.Gr: 1.75
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Strong oxidizers, active metals such as sodium, strong acids, phenols

Measurement Methods
NIOSH S283 (II-3)
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, se breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb je convulsions; coma; [potential occupational carcinogen]; in animals: liver, kidney damage

Target Organs central nervous system, liver, kidneys, skin

Cancer Site [in animals: lung, liver, thyroid & adrenal gland tumors]

See also: INTRODUCTION See ICSC CARD: 0787 See MEDICAL TESTS: 0077

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

Chlordane

CAS 57-74-9

$C_{10}H_6Cl_8$

RTECS PB980

Synonyms & Trade Names
Chlordan; Chlordano; 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane

DOT ID & Gu
2762 131

Exposure Limits

NIOSH REL: Ca TWA 0.5 mg/m^3 [skin] See Appendix A

OSHA PEL: TWA 0.5 mg/m^3 [skin]

IDLH Ca [100 mg/m^3] See: 57749

Conversion

Physical Description
Amber-colored, viscous liquid with a pungent, chlorine-like odor. [insecticide]

MW: 409.8	BP: Decomposes	FRZ: 217-228°F	Sol: 0.0001%
VP: 0.00001 mmHg	IP: ?		Sp.Gr(77°F): 1.6
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Liquid, but may be utilized in flammable solutions.

Incompatibilities & Reactivities
Strong oxidizers, alkaline reagents

Measurement Methods
NIOSH 5510; OSHA 67
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positiv mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, se breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Blurred vision; confusion; ataxia, delirium; cough; abdominal pain, nausea, vomiting, diarrhea; irritability, tr convulsions; anuria; in animals: lung, liver, kidney damage; [potential occupational carcinogen]

Target Organs central nervous system, eyes, lungs, liver, kidneys

Cancer Site [in animals: liver cancer]

See also: INTRODUCTION See ICSC CARD: 0740 See MEDICAL TESTS: 0042

Attachment C

Accident Reporting Form

ATTACHMENT C

ACCIDENT REPORT FORM

ACCIDENT REPORT FORM

This form is required by Public Law 91-596 and must be kept in the establishments for 5 years. Failure to maintain can result in the issuance of citations and assessment of penalties.	**Case of File No.**
Location of Office:	
1. Name	
2. Mail address (No. and street, city or town, State, and zip code)	
3. Location if different from mail address	
Injured or Ill Employee	
4. Name *(First, middle, and last)*	Social Security No.
5. Home address *(No. and street, city or town, State, and zip code)*	
6. Age	7. Sex *(Check one)* Male Female
8. Occupation *(Enter regular job title, not the specific activity he was performing at time of injury.)*	

9. Department *(Enter name of department of division in which the injured person is regularly employed, even though he may have been temporarily working in another department at the time of injury.)*

The Accident or Exposure to Occupational Illness

If accident or exposure occurred on employer's premises, give address of plant or establishment in which it occurred. Do not indicate department or division within the plant or establishment. If accident occurred outside employer's premises at an identifiable address, give that address. If it occurred on a public highway or at any other place which cannot be identified by number and street, please provide place references locating the place of injury as accurately as possible.

10. Place of accident or exposure *(No. And street, city or town, State and zip code)*

11. Was place of accident or exposure on employer's premises? Yes No

12. What was the employee doing when injured? *(Be specific. If he was using tools or equipment or handling material, name them and tell what he was doing with them.)*

13. How did the accident occur? *(Describe fully the events which resulted in the injury or occupational illness. Tell what happened and how it happened. Name any objects or substances involved and tell how they were involved. Give full details on all factors which led or contributed to the accident. Use separate sheet for additional space.*

Occupational Injury or Occupational Illness	
14. Describe the injury or illness in detail and indicate the part of body affected. *(e.g., amputation of right index finger at second joint; fracture of ribs; lead poisoning; dermatitis of left hand, etc.)*	
15. Name the object or substance which directly injured the employee/. *(For example, the machine or thing he struck against or which struck him; the vapor or poison he inhaled or swallowed; the chemical or radiation which irritated his skin; or in cases of strains, hernias, etc, the thing he has lifting, pulling, etc.)*	
16. Date of injury or initial diagnosis of occupational illness:	17. Did employee die? *(Check one)* Yes No
Other	
18. Name and address of physician	
19. If hospitalized, name and address of hospital	

Date of report	Prepared by *(Print)*	Official position

APPENDIX E

DUST MONITORING AND CONTROL PLAN

DUST MONITORING AND CONTROL PLAN

SITE CLEANUP PLAN

5701 HOLLIS STREET

EMERYVILLE, CALIFORNIA

TABLE OF CONTENTS

Page

1. INTRODUCTION 1
2. CONTAMINANT CONCENTRATIONS AND EXPOSURE GUIDELINES 2
3. DUST MONITORING PROGRAM 3
4. DUST MONITORING LOCATIONS 3
5. QUANTITATIVE MONITORING 4
6. DUST SUPPRESSION METHODS 5
7. CERTIFIED INDUSTRIAL HYGIENIST REVIEW 7

Figures
Figure E-1 - Dust Monitoring Locations

Attachments
Attachment A - Calculations for Potential Airborne Concentrations of COCs

1. INTRODUCTION

Particulate dust monitoring will be performed in accordance with the regulations of the Bay Area Air Quality Management District (BAAQMD) which regulates the generation of fugitive dust particles with diameters of 10 microns or less, also known as PM_{10}. This monitoring will be conducted during soil excavation and off-hauling activities outlined in the Site Cleanup Plan (SCP) and will be designed to be protective of both worker health and the surrounding community. An evaluation of the potential airborne concentrations of chemicals of concern (COCs) was performed based on the highest concentrations of COCs detected in soil samples collected from areas to be excavated on-site. The evaluation was performed to determine whether the real time monitoring fence line action level (FAL) of 50 micrograms per cubic meter ($\mu g/m^3$) for total dust (which is the maximum allowable fence line total dust level according to BAAQMD regulations) would be protective for the adjacent community, and whether the site action level of 1 milligram per cubic meter (mg/m^3) for total dust (which is 10% of the threshold limit value [TLV] established by the American Conference for Governmental Industrial Hygienists[ACGIH]) would be protective for site workers. The evaluation of potential airborne concentrations of COCs was performed by a Certified Industrial Hygienist (CIH). The calculations for the potential airborne concentrations of COCs are presented in Attachment A. Based on this evaluation, the FAL of 50 $\mu g/m^3$ and Site Action Level of 1 mg/m^3 for total dust above upwind total dust levels should be protective for the community and site workers, respectively, based on the concentrations of COCs on-site. The calculations indicated that if the site action level for total dust was based on the ACGIH TLV of 10 mg/m^3, airborne lead could potentially reach concentrations which exceed the CalOSHA Permissible Exposure Limit (PEL) and Action Level; airborne chromium VI could potentially reach concentrations which exceed the CalOSHA PEL, and airborne arsenic could potentially reach concentrations which exceed the ACGIH TLV based on the highest concentrations of lead (16,000 mg/kg), chromium VI (3,100 mg/kg) and arsenic (1,400 mg/kg) detected in soil on-site. Since the Site Action Level is set an order of magnitude less than the ACGIH TLV at 1 mg/m^3, real-time monitoring with the prescribed site action levels will adequately protect site workers from COCs. Based on the calculations in Attachment A, airborne lead could potentially exceed the FAL of 15 $\mu g/m^3$ if total dust levels exceed the FAL of 50 $\mu g/m^3$. However, because

the average concentration of lead detected on site is much lower than the highest concentration used in the calculation, and strict dust control measures will be implemented to maintain total dust levels below the site action level and FAL, the total dust FAL of 50 µg/m^3 should adequately protect the adjacent community. Additionally, quantitative monitoring of airborne total dust and lead will be performed to verify compliance with the FALs as described in Section 5 below.

2. CONTAMINANT CONCENTRATIONS AND EXPOSURE GUIDELINES

For worker protection within the site exclusion zone, a conservative 1 mg/m^3 total dust level will be utilized as the maximum allowable airborne dust limit for donning of respiratory protection. The highest measured levels of COCs in soil at the subject site are well below levels that would trigger action for worker protection from airborne contaminants at the total dust action level specified. The RA contractor will base dust control measures on the Action Levels specific in the chart below.

Exposure Guidelines for Site Chemical Hazards

Chemical Name	Odor Threshold	CAL/OSHA PEL [a]	ACGIH TLV [b]	Site Action Levels	Community Action Level (Fence Line)
Total Dust	Not Listed	15 mg/m^3	10 mg/m^3	1.0 mg/m^3 [c]	50 µg/m^3 [d]
Lead	N/A	0.05 mg/m^3	0.05 mg/m^3	30 µg/m^3	0.15 µg/m^3 [e]
Arsenic	N/A	0.5 mg/m^3	0.01 mg/m^3	0.01 mg/m^3	N/A
Total Chromium	N/A	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	N/A
Chromium VI	N/A	0.005 mg/m^3	0.01 mg/m^3	0.005 mg/m^3	N/A

Notes:
mg/m^3 — milligrams per cubic meter
µg/ m^3 — micrograms per cubic meter

a *Permissible Exposure Limits (Cal/OSHA Article 107, Table AC1)*

b *1990-1991 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists*

c *Site Action Level for total dust is calculated as 10% of threshold limit value (as measured by NIOSH methods). If this action level is met or exceeded, then respiratory protection will be worn by site personnel while additional dust mitigation measures are implemented. If the site air contaminants cannot be controlled reliably within 15 minutes, all work will cease and a certified Industrial Hygienist will be consulted.*

d *Community Action Level (FAL) of 50 µg/m^3 total dust/particulate is based on* the *BAAQMD regulation of 50 µg/m^3 of total dust.*

e *The National Ambient Air Quality Standard (NAAQS) for lead at 0.15 µg/m^3 is selected as the fence-line community action level.*

The conservative total dust action level described above will not only protect site workers from lead and other metals but will also be utilized to insure off-site migration of fugitive dust is in compliance with BAAQMD regulations. A total dust action level of 1.0 mg/m^3 (as measured with direct-reading instrumentation) will be utilized for engineering (dust) control actions at work operations. This level, easily detected with field instruments, will help to keep perimeter dust levels within the expected low range.

3. DUST MONITORING PROGRAM

The dust-monitoring program will aid in minimizing off-site migration of contaminated soil (as airborne dust) and protect both on-site workers and the off-site public from exposure to elevated levels of dust. The dust-monitoring program will include meteorological monitoring and real-time monitoring of dust using portable aerosol monitors.

Meteorological monitoring will begin at least three days prior to field activities to evaluate prevailing wind patterns, and will continue during intrusive field activities. One wind speed and direction monitor will be set up at the site to collect continuous wind data during the monitoring events. The wind speed and direction data are needed to support each upwind and downwind monitoring event and to locate sampler downwind locations. A wind system consists of a Climatronics monitoring system with Model F4450 wind sensors (or similar system), with threshold speeds of 0.5 miles per hour. The wind instrument must meet regulatory specifications. The wind data will be collected through a data acquisition system equipped with a back-up recording device.

4. DUST MONITORING LOCATIONS

The RA contractor will monitor dust levels in the following locations which are indicated on Figure 4 of the SCP and Figure E-1:

- One location upwind of excavation operations (as determined by wind direction meter [Section 3 above]). Based on the prevailing wind direction being from the northwest, this location will likely be in the northwest corner of the site.

- Three locations downwind of excavation operations. The downwind locations will likely be located along the eastern site boundary because the nearest sensitive receptors (commercial properties) are located adjacent to the east of the site.
- One location within the exclusion zone (real-time instrument handled by a technician).

Actual locations will be determined in the field. Air monitoring will be performed over an 8-hour period each day that excavation and off-hauling activities are conducted. The air-monitoring professional will check the equipment every 30 minutes during operation. In consultation with the City, this frequency may be revised based on site conditions and newly available data.

The particulate monitoring will be performed during the handling of waste or impacted soil, or when on-site activities may generate fugitive dust from exposed waste or impacted soil. Real-time, data-logging aerosol monitors (i.e., Personal DataRAM or PDM-3 MiniRAM particulate monitor manufactured by MIE) will be used to provide continuous real-time data measurement of the total dust FAL of 50 ug/m^3 above upwind total dust levels. The Personal DataRAM or equivalent will collect minimum, maximum, and average total aerosol concentrations (measured in ug/m^3) every 5 minutes of operating time. Each 30 minutes of field time, the direct-reading instrumentation will be visually checked and the results will be reviewed and manually recorded. If particulate levels downwind of the work area are detected in excess of 50 µg/m^3, the upwind background level must checked immediately. If the downwind particulate measurement is greater than 50 µg/m^3 above the upwind background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust, and corrective action must be taken to reduce the potential for contaminant migration.

5. QUANTITATIVE MONITORING

Quantitative sampling will be performed upwind, downwind and within the work area at the locations described above. The samplers will be operated for a minimum of 5 hours per day, during periods of relatively constant wind directions and having the greatest velocity as documented by the meteorological survey. In order to achieve laboratory detection limits below the FAL of 50 µg/ m^3 for total dust, each set of samples will be collected over the course of three days.

At the end of each 3rd days of sampling, the filter cassettes will be replaced with clean samplers. The filter cassettes removed from the samplers will be shipped to a certified laboratory to be tested for total dust by NIOSH test method 0500 or equivalent. In addition, the sampling cassettes will be analyzed for total lead using NIOSH test method 7300 or equivalent. Use of the quantitative samplers for evaluating concentrations of arsenic or other metals will not be required as the action levels for lead in this case, serve to be highly protective of the other potential contaminants.

As analytical results for quantitative samples are received, the air monitoring professional will prepare summary sheets and discuss results with onsite management and workers. The remediation contractor will request a 24-hour turnaround time from the analytical laboratory for the quantitative dust and lead samples. If the site action levels for total dust or lead are exceeded during quantitative sampling, the Project Certified Industrial Hygienist will be immediately consulted.

6. DUST SUPPRESSION METHODS

Additional dust-suppression techniques may include the following:

- Applying water on haul roads or paths,
- Wetting equipment and excavation faces,
- Spraying water on excavation-equipment buckets during excavation and dumping,
- Covering excavated areas and material after excavation activities cease, and
- Increasing the frequency of misting roads and stockpiles from once to twice per hour.

Misting may also be used on soil placed in the transport trucks. Efforts will be made to minimize the soil drop height from the loader's bucket onto the soil pile or into the transport trucks. After the soil is loaded into the transport trucks, the soil will be covered to prevent soil from spilling out of the truck during transport to the disposal facility.

While on the site, all vehicles will maintain slow speeds (i.e., less than 5 miles per hour) for safety purposes and for dust control measures. Prior to departure, transport and dump trucks will be cleaned of loose debris clinging to the sides and/or wheels to minimize off-site contaminants.

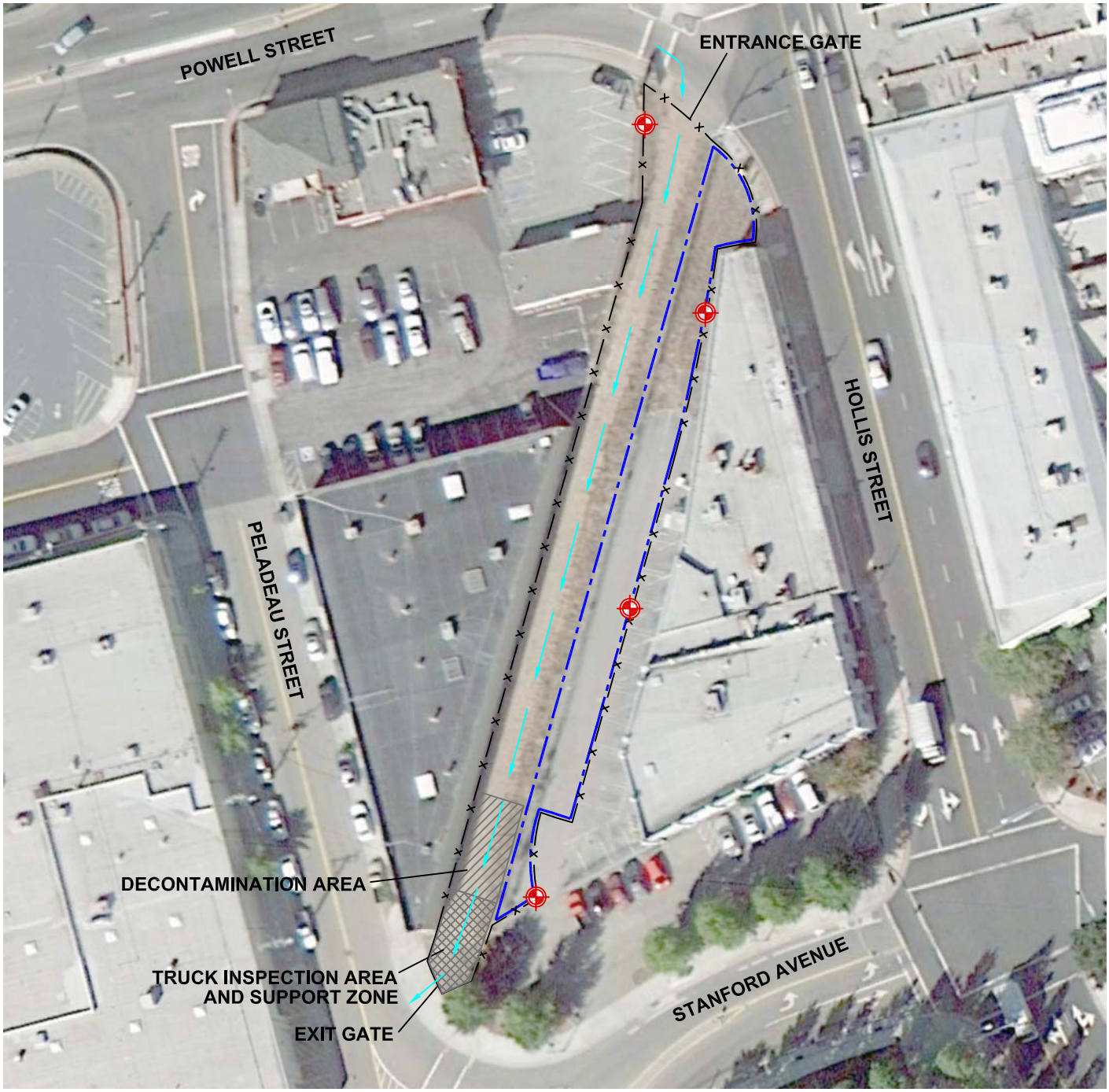
Misting or wetting of soil should not be excessive to the point of creating puddles or runoff. If the dust suppression techniques do not lower particulates to acceptable levels (below 50 $\mu g/m^3$ at the fence line and no visible suspended dust), work must be suspended until appropriate corrective measures are approved to remedy the situation or the wind velocity decreases so the downwind monitoring (direct-reading) shows concentrations less than 50 $\mu g/m^3$ above upwind background total dust levels.

7. CERTIFIED INDUSTRIAL HYGIENIST REVIEW

The above Dust Monitoring and Control Plan has been reviewed and approved by the Certified Industrial Hygienist (CIH) indicated below.

Stephen J. Waide, CIH, CSP

Certified Industrial Hygienist No. CP 7005



REFERENCE: GOOGLE EARTH, 2011.

N

SCALE IN FEET

0 60 120

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- DUST MONITORING LOCATION
- SITE BOUNDARY
- FENCED/ENCLOSED EXCLUSION ZONE
- ON SITE TRUCKING ROUTE

Ninyo & Moore

DUST MONITORING LOCATIONS

PROJECT NO.	DATE
401834001	7/12

SITE CLEANUP PLAN
5701 HOLLIS STREET
EMERYVILLE, CALIFORNIA

FIGURE

E-1

401834001-FIG E-1.dwg, Jul 12, 2012, 3:11pm,snguyen

ATTACHMENT A

CALCULATIONS FOR POTENTIAL AIRBORNE CONCENTRATIONS OF COCs

DETERMINATION OF POTENTIAL AIRBORNE ARSENIC FROM SOIL SAMPLE RESULTS

ENTER HIGHEST SOIL SAMPLE RESULT HERE IN mg/kg>>	1400.00	mg/kg	Enter action level here>>>	0.01	mg/m3
This converts result to mg/gram in soil>>>>>>>>>>	1.40000			(based on ACGIH TLV)	
This converts result to mg of sample/mg soil>>>>	0.001400				
This gives contaminant amount found in 10 mg soil>	0.014000	mg	(at Total Dust ACGIH TLV)		
ALERT!' if sample shows potential above action level>>> (Prior to reaching Total Dust ACGIH TLV)	**ALERT!**				
This gives contaminant amount found in 1 mg soil>	0.001400	mg	(at Site Action Level)		
ALERT!' if sample shows potential above action level>>> (Prior to reaching Total Dust Site Action Level)	**no concern**		Enter action level here>>>	0.01	mg/m3

The above model shows that disturbing site soil with an arsenic concentration of 1,400 mg/kg could potentially reach the ACGIH TLV for airborne arsenic prior to reaching the total dust ACGIH TLV of 10 mg/m3. However airborne arsenic would not reach the ACGIH TLV prior to reaching the site action level for total dust of 1 mg/m3.

DETERMINATION OF POTENTIAL AIRBORNE TOTAL CHROMIUM FROM SOIL SAMPLE RESULTS

ENTER HIGHEST SOIL SAMPLE RESULT HERE IN mg/kg>>	17000.00	mg/kg	Enter action level here>>>	0.5	mg/m3
This converts result to mg/gram in soil>>>>>>>>>>	17.00000			(based on CalOSHA PEL)	
This converts result to mg of sample/mg soil>>>>	0.017000				
This gives contaminant amount found in 10 mg soil>	0.170000	mg	(at Total Dust ACGIH TLV)		
ALERT!' if sample shows potential above action level>>>	**no concern**				
(Prior to reaching Total Dust ACGIH TLV)					
SOIL SAMPLE RESULT TIMES 3>>	51000.00	mg/kg	Enter action level here>>>	0.5	mg/m3
This converts result to mg/gram in soil>>>>>>>>>>	51.00000			(based on CalOSHA PEL)	
This converts result to mg of sample/mg soil>>>>	0.051000				
This gives contaminant amount found in 10 mg soil>	0.510000	mg			
ALERT!' if sample shows potential above action level>>>	**ALERT!**				
(Prior to reaching Total Dust ACGIH TLV)					

The above model shows that site soil would have to be contaminated with three times the amount of the highest detected concentration of total chromium in order to potentially reach the CalOSHA PEL for airborne total chromium prior to reaching the total dust ACGIH TLV of 10 mg/m3.

DETERMINATION OF POTENTIAL AIRBORNE CHROMIUM VI FROM SOIL SAMPLE RESULTS

ENTER HIGHEST SOIL SAMPLE RESULT HERE IN mg/kg>>	3100.00	mg/kg		
This converts result to mg/gram in soil>>>>>>>>>>	3.10000			
This converts result to mg of sample/mg soil>>>>	0.003100			
This gives contaminant amount found in 10 mg soil>	0.031000	mg	(at Total Dust ACGIH TLV)	
ALERT!' if sample shows potential above action level>>>	**ALERT!**		Enter action level here>>>	0.005 mg/m3
(Prior to reaching Total Dust ACGIH TLV)				(based on CalOSHA PEL)
This gives contaminant amount found in 1 mg soil>	0.003100	mg	(at Site Action Level)	
ALERT!' if sample shows potential above action level>>>	**no concern**		Enter action level here>>>	0.005 mg/m3
(Prior to reaching Total Dust Site Action Level)				(based on CalOSHA PEL)

The above model shows that disturbing site soil with a chromium VI concentration of 3,100 mg/kg could potentially reach the CalOSHA PEL for airborne chromium VI prior to reaching the total dust ACGIH TLV of 10 mg/m3. However airborne chromium VI would not reach the CalOSHA PEL prior to reaching the site action level for total dust of 1 mg/m3.

DETERMINATION OF POTENTIAL AIRBORNE LEAD FROM SOIL SAMPLE RESULTS

ENTER HIGHEST SOIL SAMPLE RESULT HERE IN mg/kg>>	16000.00	mg/kg		
This converts result to mg/gram in soil>>>>>>>>>>	16.00000			
This converts result to mg of sample/mg soil>>>>	0.016000			
This gives contaminant amount found in 10 mg soil>	0.160000	mg	(at Total Dust ACGIH TLV)	
ALERT!' if sample shows potential above action level>>>	**ALERT!**		Enter action level here>>>	0.03 mg/m3
(Prior to reaching Total Dust ACGIH TLV)				(based on CalOSHA Action Level)
This gives contaminant amount found in 1 mg soil>	0.016000	mg	(at Site Action Level)	
ALERT!' if sample shows potential above action level>>>	**no concern**		Enter action level here>>>	0.03 mg/m3
(Prior to reaching Total Dust Site Action Level)				(based on CalOSHA Action Level)
This gives contaminant amount found in 0.05 mg soil>	0.008000	mg	(at Fence Line Action Level)	
ALERT!' if sample shows potential above action level>>>	**ALERT!**		Enter action level here>>>	0.00015 mg/m3
(Prior to reaching Total Dust Fence Line Action Level)				(based on NAAQS)

The above model shows that disturbing site soil with a lead concentration of 16,000 mg/kg could potentially expose workers to airborne lead above the CalOSHA action level of 30 ug/m3 and PEL of 50 µg/m3 prior to reaching the total dust ACGIH TLV of 10 mg/m3. However airborne lead would not reach the CalOSHA action level prior to reaching the site action level for total dust of 1 mg/m3. Airborne lead could exceed the NAAQS limit of 15 ug/m3 prior to reaching the total dust fence line action level of 50 ug/m3.