

# **INFORMATION HANDOUT**

**For Contract No. 07-293804  
At 07-LA-110-8.6/14.0**

**Identified by  
Project ID 0713000412**

## **MATERIALS INFORMATION**

ADL Site Investigation Report



## AERIALLY DEPOSITED LEAD SITE INVESTIGATION REPORT

ADL SITE INVESTIGATION FOR MEASURE R  
PROJECT UPGRADE EXISTING  
COMMUNICATION SYSTEM, LOS ANGELES  
COUNTY, CALIFORNIA

LOCATION: LA 110-PM 8.60/13.97, LA 2  
PM 18.8, LA 405 PM 21.3,

PROJECT NUMBER: 0713000412-1

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CONTRACT NO. 07A3321

TASK ORDER NO. 18

STANTEC PROJECT NO.: 185831018

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## EXECUTIVE SUMMARY

At the request of the California Department of Transportation (Caltrans) District 7, an aerially deposited lead (ADL) site investigation (SI) was conducted at six proposed construction areas (A, B-1, B-2, B-3, B-4, and C) to evaluate the potential presence of lead contamination in subsurface soils along State Route 110 (SR110) corridor, from State Route 405 (SR405) at the south (PM 8.60) to Imperial Highway at the north (PM 13.97), Los Angeles County, California (the Project Area). The data from the SI will be evaluated to determine reuse and disposal options for the excess soil generated during construction activities.

A total of 15 borings were sampled in six areas as described below.

- Area A: One boring was advanced to a depth of 22 feet below ground surface (bgs) with samples collected at 1, 3, 5, 10, 15, 20, and 22 feet bgs.
- Area B-1: One boring was advanced to a depth of 27-feet bgs with samples collected at 1, 3, 5, 10, 15, 20, 25, and 27 feet bgs.
- Area B-2: One boring was advanced to a depth of eight feet bgs with samples collected at 1, 3, 5, and 8 feet bgs.
- Area B-3: Four hand auger borings were advanced to a depth of five feet bgs with samples collected at 1, 3, and 5 feet bgs.
- Area B-4: Four hand auger borings were advanced to 0.5 feet bgs with one sample collected from surface to 0.5 feet bgs.
- Area C: Four hand auger borings were advanced to 0.5 feet bgs with one sample collected from surface to 0.5 feet bgs

All borings were completed to their target depths.

Soil samples collected from each boring were analyzed for total lead and for soluble lead by the California Waste Extraction Test using Citric acid as the extractant (Cal WET-Citric). Select soil samples were analyzed Title 22 metals and pH. Samples with a Cal WET-Citric concentration equal to or greater than 5.0 milligrams per liter (mg/L) were analyzed for soluble lead by Cal WET modified using deionized water (Cal WET-DI). Twenty percent of samples exhibiting the highest total lead concentrations were analyzed for soluble lead using the Federal Toxicity Characteristic Leaching Procedure (TCLP).

The following summarizes investigative findings:

- Total Lead: Of the 39 soil samples analyzed for total lead, none of the samples reported total lead concentrations above the California total threshold limit concentration (TTL) of 1,000 milligrams per kilogram (mg/kg) (maximum concentration = 94 mg/kg).

- Cal WET-Citric Soluble Lead: Of the 39 soil samples analyzed for soluble lead by Cal WET-Citric, one of the samples reported concentrations above the soluble threshold limit concentration (STLC) (maximum concentration = 7.5 mg/L).
- Cal WET-DI Soluble Lead: The single sample analyzed for soluble lead by Cal WET-DI did not exceed 1.5 mg/L (maximum concentration = 0.36 mg/L).
- TCLP Soluble Lead: Of the nine soil samples analyzed for soluble lead by the Federal TCLP, none of the samples exceeded the Federal toxicity characteristic threshold of 5 mg/L (maximum concentration = 0.290 mg/L).
- Title 22 metals: All reported Title 22 metals, other than lead, were reported at concentrations below state and federal hazardous waste thresholds. Other than lead, no other metals were reported at concentrations warranting additional analysis for solubility (total concentrations were reported at less than 10 times the STLC). All reported Title 22 metals, other than arsenic, were reported at concentrations below their respective US EPA Region 9 Regional Screening Level (RSL) for industrial soil or California Human Health Screening Level (CHHSL) for commercial/industrial soil. Arsenic concentrations were reported within the range of expected background for Southern California.
- pH: Of the four soil samples analyzed for pH, all were reported within the range of non hazardous waste and above the lower limit of the Caltrans Lead Variance.

Stantec understands that Caltrans will use these data to perform statistical evaluations to classify wastes for on-site reuse in accordance with the Caltrans Lead Variance and to make recommendations for off-site disposal in accordance with State and Federal hazardous waste thresholds. Caltrans will also use the data to determine the health and safety protection of workers, consistent with California and the U.S. Occupational Safety and Health Administration (OSHA) regulations.

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## **1.0 INTRODUCTION**

### **1.1 PROJECT DESCRIPTION**

At the request of the California Department of Transportation (Caltrans) District 7, an aerially deposited lead (ADL) site investigation (SI) was conducted at six proposed construction areas (A, B-1, B-2, B-3, B-4, and C) to evaluate the potential presence of lead contamination in subsurface soils along State Route 110 (SR110) corridor, from State Route 405 (SR405) at the south (PM 8.60) to Imperial Highway at the north (PM 13.97), Los Angeles County, California (the Project Area). The data from the SI will be evaluated to determine reuse and disposal options for the excess soil generated during construction activities. The work was conducted pursuant to the provisions in Agreement 07A3321, and with Stantec's proposal dated November 25, 2014 attached to the Task Order No. 18 request dated November 25, 2014.

### **1.2 PURPOSE AND OBJECTIVES**

The objective of the SI is to evaluate potential constituents of concern in the surface and subsurface soil profile within the proposed construction footprint to support fiber optic upgrades to the existing communication system. The data will be provided to Caltrans for statistical evaluation and classification of soils for on-site reuse or off-site disposal, as necessary. Caltrans will also use the data to determine the health and safety protection of workers, consistent with California and the U.S. Occupational Safety and Health Administration (OSHA) regulations.

### **1.3 BACKGROUND**

According to the Task Order No. 18 Request, dated November 25, 2014, the project proposes to upgrade the existing communication system to all fiber optic communication along SR110 corridor, from SR405 at the south (PM 8.60) to Imperial Highway at the north (PM 13.97). The project also proposes to add cable at State Route 105 (SR105) interchange, install equipment at SR105 interchange, install equipment at the East Los Angeles Hub and Los Angeles Regional Transportation Management Center, improve existing ramp metering existing communications network from its current analog communication to digital communication and connecting the existing Transportation Management System (TMS) field elements, consisting of closed circuit television (CCTV) camera systems, to the fiber optic communication system and to upgrade the TMS field elements to be Internet Protocol (IP) ready. All work is expected to be conducted within State Right of Way (ROW) but outside of the traveled road way.

The remainder of this report describes the scope of work, methodology, findings, results of the SI to evaluate constituents of concern in the six proposed construction areas.

## **2.0 PROJECT SETTING**

This section describes the project setting including a description of the study area, the physiographic setting of the study area, the geology and hydrogeology, and a description of the area around the Project Area.

### **2.1 PROJECT AREA DESCRIPTION**

The study area is located along the southbound shoulder of SR110 from the SR405 interchange to the SR105 interchange, in Los Angeles County (Figure 1 and Table 1).

### **2.2 PHYSIOGRAPHIC SETTING**

The topography along the SR110 slopes southwest as the roadway progresses south from the SR105 interchange to the SR405 interchange from an approximate elevation of 150 to 30 feet above mean sea level (amsl) (United States Geological Survey (USGS), 1964 and photorevised in 1981).

### **2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY**

The Project Area is located within the Peninsular Ranges Geomorphic Province of California, within the Los Angeles Basin (CDCDMG, 1986). Regional geology is characterized by continental and marine sediments of Holocene, Pleistocene, and Pliocene ages. These sediments consist of interbedded sand, silt, and clay in variable proportions with lenses of gravel. In the local area, shallow marine, silt, and gravel sediments of the Pleistocene Lakewood Formation occur at grade; these are underlain by the progressively older Pleistocene San Pedro Formation, the Pico Formation, and the Pliocene-aged Repetto Formation. The Newport-Inglewood structural zone, which extends southeast to northwest across the Los Angeles coastal plain, exists in the local area. The zone is seismically active as evidenced by historic earthquakes, and it impacts groundwater underflow within the coastal plain (DWR, 1961).

According to DWR's Bulletin 118 (California Caltrans of Water Resources (DWR), 2004), the Project Area lies in the Coastal Plain of Los Angeles Groundwater Basin (West Coast Subbasin) within the South Coast Hydrologic Region. The West Coast Subbasin water bearing-deposits include unconsolidated and semi-consolidated marine and alluvial sediments of Holocene, Pleistocene, and Pliocene ages. The principal water-bearing formations in the West Coast Subbasin include Holocene unnamed Alluvium, the Pleistocene Lakewood Formation, and the Lower Pleistocene San Pedro Formation. The West Coast Subbasin is bounded on the north by the Ballona Escarpment, an abandoned erosional channel from the Los Angeles River. On the east it is bounded by the Newport-Inglewood fault zone, and on the south and west by the Pacific Ocean and consolidated rocks of the Palos Verdes Hills. The surface of the subbasin is crossed in the south by the Los Angeles River through the Dominguez Gap, and the San Gabriel River through the Alamitos Gap, both of which then flow into San Pedro Bay (DWR, 2004).

## **2.4 PROJECT AREA VICINITY**

The area surrounding the Project Area along SR110 is comprised largely of commercial and residential properties interspersed along the ROW.

### 3.0 SCOPE OF WORK

This section describes the scope of work presented in the task order proposal. The task order served as the Work Plan for the SI. The scope of the SI consisted of the general elements described below. Deviations from this scope of work are described in Section 4.3:

- Pre-field activities
  - Development of a site specific health and safety plan;
  - Notification to Underground Service Alert (USA) for inquiry identification numbers; and
  - Coordination of equipment and subcontractors.
  
- Field Investigations
  - Set-up of traffic control at each location;
  - Advancement of one direct push technology (DPT) boring at Area A to a depth of 22 feet below ground surface (bgs) with samples collected at 1, 3, 5, 10, 15, 20, and 22 feet bgs;
  - Advancement of one DPT boring at one Area B-1 to a depth of 27 feet bgs with samples collected at 1, 3, 5, 10, 15, 20, 25, and 27 feet bgs;
  - Advancement of one DPT boring at one Area B-2 to a depth of eight feet bgs with samples collected at 1, 3, 5, and 8 feet bgs;
  - Advancement of four hand auger borings at Area B-3 to a depth of five feet bgs with samples collected at 1, 3, and 5 feet bgs;
  - Advancement of eight hand auger borings at Areas B-4 and C to 0.5 feet bgs;
  - Collection and preservation of soil samples from each boring;
  - Collection of field quality control samples;
  - Boring location survey using global positioning system (GPS);
  - Boring abandonment; and
  - Transport and disposal of investigation derived wastes.
  
- Laboratory analysis of select soil samples
  - Total lead by EPA Test Method 6010B;
  - Soluble lead by the California Waste Extraction Test using Citric acid as the extractant (Cal WET-Citric);
  - Analysis of all Cal WET-Citric samples reporting a soluble lead concentration greater or equal to 5.0 milligrams per liter (mg/L) for soluble lead by Cal WET modified using deionized water (Cal WET-DI) as the extractant;

- Analysis of all samples with total lead concentrations greater or equal to 1,000 mg/kg and at least 20% of soil samples with the highest total lead concentration for soluble lead using Toxicity Characteristic Leaching Procedure (TCLP);
  - Analysis of a minimum of four or up to 10% of the total number of soil samples for pH by EPA Test Method 9045C;
  - Analysis of a minimum of 10 soil samples for Title 22 Metals by EPA Test Method 6010B/7000 series; and
  - Analysis of field quality control samples for Title 22 Metals by EPA Test Method 6010B/7000 series.
- 
- Data validation and report preparation.

## **4.0 SOIL INVESTIGATION METHODOLOGY**

The soil investigation was conducted in general accordance with the methods and requirements of Contract 07A3321, and with Stantec's proposal dated November 25, 2014 attached to Task Order No. 18 request dated November 25, 2014. The following subsections summarize the methodology implemented in completing the required scope of work. In addition, any deviations from the scope of work are also identified in the following subsections.

### **4.1 PRE-FIELD ACTIVITIES**

Prior to beginning field work, the scope of work was reviewed and approved by the Caltrans. Proposed sample locations designated on site plans by the Caltrans were checked for accessibility in the field through Project Area reconnaissance.

As required by Task Order No. 18, a site-specific Health and Safety Plan (HASP) was prepared in accordance with California Occupational Safety and Health Administration (Cal OSHA) requirements to guide field sampling activities. The HASP describes health and safety procedures and was submitted to Caltrans for approval prior to initiating field activities. A pre-field tail gate health and safety meeting was conducted at the Project Area with field personnel prior to beginning work each day. During the tail gate meeting, daily work activities and health and safety issues were discussed, including the following:

- Field tasks to be conducted throughout the day,
- Project schedule,
- Hazard awareness,
- General health and safety practices, procedures and issues,
- Specific health and safety issues related to the day's work,
- Health and Safety procedures, controls, etc.;
- Engineering controls; personal protective equipment and monitoring;
- Traffic control and safety; and
- Emergency procedures and contacts.

Field documentation of health and safety meetings and monitoring were maintained throughout the duration of field activities. A copy of the completed field forms are provided in Appendix A.

Stantec contacted USA to obtain inquiry identification numbers for the boring locations prior to the start of work. Boring locations in close proximity to each other were combined into one USA inquiry identification number. Locations were pre-marked in the field as required by USA. USA inquiry identification numbers as follows: A43380406, A43380427, and A43380447.

## **4.2 FIELD INVESTIGATIONS**

Field investigations were conducted on December 4 and 8, 2014. The weather was sunny throughout each day. There were no weather-related restrictions during the field investigation. The following subsections describe the methodology and procedures followed in conducting field investigations.

### **4.2.1 Traffic Control**

Soil borings were located no closer than six feet from the edge of pavement within existing Caltrans ROW within the proposed construction areas. To improve worker safety, traffic warning signage, cones and truck flashers were used to alert drivers of workers along the shoulders. Traffic control consisted of the following elements:

- W21-5 "Shoulder Work" signs were placed not less than 500 feet and not more than one mile from each borehole. The signs were moved as work progressed to assure that the signage follows the work. Signs were placed at the top of hills or ahead of roadway curves to improve visibility to drivers.
- High visibility reflective cones were placed along the pavement edge at least 100 feet from the work area.
- Work trucks were equipped with flashing amber strobe lights and were positioned as safety barriers between workers and oncoming traffic.

### **4.2.2 Soil Borings and Sampling**

Soil borings were advanced using a hand auger and/or DPT. Prior to DPT drilling, the surface at each boring location was excavated to five feet using a hand auger. Below five feet bgs, each boring was advanced using the DPT rig. All DPT borings at Areas A, B-1, B-2 and B-3 were drilled to their respective maximum depth (ranging from approximately 8 to 27 feet bgs) using a DPT drill rig with soil samples collected at target intervals described in Section 3.

The investigation areas were located off the southbound shoulder of SR110. Two step-out attempts were made within a two-foot area from the original boring location at boring 1269-102 (Area B-1). The target depth was ultimately achieved at all of the boring locations.

Boring locations are described on Table 1 and shown on Figures 2 through 5. Boring coordinates are provided in Appendix B and a photographic log is provided in Appendix F. The following paragraphs summarize field sample protocols.

### **4.2.3 Sample Collection and Preservation**

All borings were drilled to their respective target depth (ranging from approximately 0.5 to 27 feet bgs) using either a hand auger or a DPT drill rig with soil samples collected at intervals described in Attachment A of the Task Order Request. Shallow samples to five

feet bgs were collected from the hand auger bucket, discharged to a clean ziplock one (1) gallon bag, manually homogenized, and then discharged to eight-once laboratory certified clean glass jars. For deeper borings, samples below five feet bgs were collected using Geoprobe sampler lined with acetate liners advanced with the DPT rig. Once the sample was retrieved, the soil filled acetate liner was packaged by capping each end with a Teflon sheet followed by a tight-fitting plastic cap and sealed with non-VOC tape.

Upon sampling at each depth interval, the soil samples were visually examined and logged in accordance with the latest edition of the Soil & Rock Logging Classification Manual (Field Guide), State of California, Caltrans of Transportation, Engineering Service Center, Office of Structural Foundations. A summary of the soil classifications are presented in the boring logs in Appendix C.

Each sample jar was labeled with a specific sample I.D., boring I.D., project I.D., EA number, sample date, and sample time, and then placed in an ice-filled cooler. Each sample was also recorded on a chain-of-custody (CoC) form and delivered to an environmental laboratory for analysis.

#### **4.2.4 Boring Locations**

All boring locations were identified and plotted on a field map with a unique boring identification (I.D.) number to represent each borehole. In addition, the spatial coordinates for each borehole were obtained using a handheld field GPS Trimble unit and recorded on field data sheets. The latitude and longitude for each boring are provided in Appendix B. Boring locations are described on Table 1; their coordinates summarized in Appendix B and are shown on Figures 2 through 5.

#### **4.2.5 Decontamination**

All sampling equipment was decontaminated prior to advancing to the next sample depth within each borehole using a non-phosphate detergent solution and double-rinsed with distilled water.

#### **4.2.6 Borehole Abandonment**

As per the Task Order Request, for the shallow depth borings (5 feet and less), excess soil removed during this investigation were placed back into the boring. For the deeper borings (greater than 5 feet bgs), borings were backfilled with bentonite grout, emplaced with a tremie pipe from the bottom to the top of the borehole. The borings were capped to match the existing surface. Pursuant to Contract 07A3321, Method 17d, the excess soils removed from the deeper borings were spread around and nearby the borehole (since no evidence of impacts [staining or odors] was observed).

#### **4.2.7 Investigation Derived Wastes**

Investigation derived waste trash was transported to Stantec's office for disposal.

#### **4.2.8 *Field Quality Assurance/Quality Control***

One equipment blank and field blank was collected for every CoC (per field team per day) to evaluate the adequacy of field decontamination efforts. The equipment blanks were collected after decontaminating sampling equipment by pouring deionized water over the sampling equipment and collecting the water in appropriate sample containers. The field duplicates were collected by pouring High Performance Liquid Chromatography grade water into individual sample containers in the field. The equipment and field blanks were analyzed for Title 22 metals.

#### **4.3 DEVIATIONS FROM TASK ORDER SCOPE OF WORK**

There were no deviations from the proposed scope of work.

## 5.0 LABORATORY ANALYSIS

A total of 39 soil samples from borings advanced at six areas (A, B-1, B-2, B-3, B-4, and C), were submitted under CoC to Advanced Technology Laboratories (ATL). ATL is certified through the California Environmental Laboratory Accreditation Program (ELAP) to conduct the analyses required in this task order. The lab was directed to perform the following analyses:

- *Total lead by EPA test method 6010B*—used to evaluate total lead concentrations against health screening limits, California hazardous waste total threshold limit concentration (TTL), and the conditions of Caltrans' lead variance.
- *pH (EPA test method 9045C)*—select samples were analyzed for pH to evaluate the requirements for managing and disposing of excess soil in accordance with State and Federal regulations.
- *Title 22 metals (EPA test method 6010B/7470)*—select samples were analyzed for the full suite of Title 22 metals (except for lead) for characterization purposes.
- *CAL WET-Citric*—used to assess soluble concentrations with respect to the California Soluble Threshold Limit Concentration (STLC).
- *Cal WET-DI*—used to assess soluble lead concentrations with respect to on-site reuse options in accordance with the criteria set forth in Caltrans' Lead Variance.
- *TCLP (EPA test method 1311)*—used to evaluate waste characteristics and the requirements for disposal against Federal hazardous waste toxicity characteristic thresholds.

Copies of the laboratory CoCs and analytical reports are attached in Appendix D.

## 6.0 INVESTIGATIVE RESULTS

This section describes observations, findings and results of field investigations and laboratory analysis.

### 6.1 FIELD FINDINGS

The soils encountered during sampling were generally yellowish brown or very dark grayish brown in color and consisted primarily of silty sand and poorly-graded sand with silt. No chemical odors or evidence of staining were noted in the soil samples. Groundwater was not encountered in any of the boreholes and not expected to be present in shallow soils.

### 6.2 ANALYTICAL RESULTS

A summary of the analytical results is presented in Tables 1 and 2. Copies of the laboratory reports and CoC forms are included in Appendix D.

#### 6.2.1 Total Lead

A total of 39 soil samples were analyzed for total lead by EPA test method 6010B. Total lead concentrations ranged from 1.8 to 94 mg/kg (see Table 1).

None of the samples reported total lead concentrations above the California TTLC of 1,000 mg/kg. One of the samples reported a total lead concentration greater than 50 mg/kg.

#### 6.2.2 Soluble Lead (Cal WET- Citric)

A total of 39 soil samples were analyzed for soluble lead by Cal WET-Citric. All of the samples were analyzed for Cal WET-Citric. Soluble lead concentrations ranged from non-detect (<0.027 mg/L) to 7.5 mg/L (see Table 1). Cal WET-Citric soluble lead was reported above the STLC threshold of 5 mg/L in one sample.

#### 6.2.3 Soluble Lead (Cal WET- DI)

One sample was analyzed for soluble lead by Cal WET-DI. Samples with a Cal WET-Citric concentration equal or greater than 5 mg/L were analyzed for Cal WET-DI. The CalWET-DI soluble lead concentration was reported at 0.36 mg/L in sample 1269-102-3 (see Table 1).

The soluble lead concentration did not exceed the Caltrans variance threshold limit of 1.5 mg/L in the sample submitted for analysis.

#### 6.2.4 Soluble Lead (TCLP)

A total of nine (9) soil samples were analyzed for soluble lead by the Federal TCLP. A minimum of 20% of samples were analyzed for TCLP. TCLP soluble lead concentrations ranged from non-detect (<0.0014 mg/L) to 0.290 mg/L (see Table 1).

None of the samples reported soluble lead concentrations above the Federal toxicity characteristic threshold of 5 mg/L.

### **6.2.5 Title 22 Metals**

Ten (10) soil samples were analyzed for Title 22 metals to evaluate special handling and/or disposal requirements based on concentrations of other Title 22 heavy metals other than lead. Title 22 metals, other than arsenic, were reported at concentrations below their respective U.S. EPA Region 9 Regional Screening Level (RSL) for industrial soil or California Human Health Screening Level (CHHSL) for commercial/industrial soil. Title 22 metals, other than lead, were reported at concentrations generally consistent with expected background (Table 2). RSLs, CHHSLs, and expected background concentrations for each heavy metal analyte are included in Table 2.

### **6.2.6 pH**

Four soil samples (10% of the total number of samples) were analyzed for pH. The pH values ranged from 8.1 to 8.4, within the range for non-hazardous waste and well above the Caltrans's variance thresholds (Table 1).

## **6.3 DATA VALIDATION**

### **6.3.1 Field QA/QC**

Quality assurance and quality control (QA/QC) procedures were performed in general accordance with the Task Order No. 18 Request. QA/QC procedures included analyses of equipment and field blanks. Low concentrations of lead, antimony, barium, beryllium, cadmium, chromium, cobalt, copper, molybdenum, nickel, selenium, silver, and zinc were detected in the field and equipment blanks. The low levels may be attributed to the metal sampling equipment from which the sample was derived, from dust in the air during sample collection or potentially from laboratory artifact. The concentrations of lead detected are considered "tentatively identified", were detected below the method detection limit, and their associated numerical value represents an approximate concentration. Due to the low concentrations detected, these levels have little impact on the quality of the data or recommendations provided in this report.

### **6.3.2 Laboratory QA/QC**

Prior to submitting soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness. The laboratory reports were cross-checked with the chain-of-custody forms to confirm accurate transposing of sample information. In addition, an initial comparison of total lead and CalWET-citric data was conducted. Total lead and soluble lead are bivariate variables. Typically, CalWET-citric soluble lead concentrations range from 2 to 10 percent of the total lead concentrations. Based on initial evaluation of the data, none of the samples were

flagged as suspect for re-extraction and analysis.

Laboratory QA/QC data (method blanks, laboratory control samples and duplicates, matrix spike samples and duplicates) were also reviewed for compliance with QA/QC objectives. Stantec reviewed the laboratory QA/QC (duplicates, laboratory control, matrix spike and matrix spike duplicates). Other than minor issues related to natural heterogeneity of metals in soil duplicate sample analyses, and very low detections of certain metals in blank samples (common contaminants in field blanks are poured over metal sampling equipment), QA/QC data are within expected control limits and considered valid for the intended use. The following summarizes identified data QA/QC issues and associated remedy.

1. Method Blanks: Several metals analytes (barium, chromium, copper, nickel, silver, zinc and TCLP soluble lead) were reported in method blanks at very low concentrations. Associated sample results below the blank concentrations are flagged "UJB" in the data tables with the detection limit reported as the method blank concentration. Sample results greater than the blank concentration are flagged "JB". Sample results greater than 10 times the blank concentration require no qualifying action. The data for these analytes may be slightly biased high.
2. Equipment Blanks: Several metals (lead, antimony, barium, beryllium, cadmium, chromium, cobalt, copper, molybdenum, nickel, selenium, silver, and zinc) were reported in equipment blanks at very low levels, and may be reflective of one or more of the following sources: 1) laboratory method blank detections, 2) ambient artifact (e.g., dust), 3) incomplete decontamination, 4) contaminated decontamination rinse water, and/or 5) artifact from contact with metal sampling equipment. The reported detections are very low and do not appear to have adversely influenced sample results. Sample results greater than 10 times the blank concentration, no qualifying action required.
3. Laboratory Duplicate Samples: Laboratory duplicate samples were reported within the relative percent difference (RPD) control limit of 20 percent except for the following:
  - a. Batch B4L0215 – Laboratory duplicate RPD above limits for Lead at 22%. Associated result flagged "J" for 1269-107-3 only.
  - b. Batch B4L0456 – Laboratory duplicate RPD above limits for TCLP Lead at 26%. Associated result flagged "J" for 1269-110-0 only.
  - c. Batch B4L0424 – Laboratory duplicate RPD above limits for Selenium at 30%. Associated results flagged "J" for 1269-112-0 only.
  - d. Batch B4L0216 – Laboratory duplicate RPD above limits for Lead. Associated results flagged "J" for 1269-101-22 only.

4. Matrix Spike and Spike Duplicates: Matrix spike and duplicate samples were analyzed to assess accuracy and to evaluate matrix effects on data analysis. The percent recoveries and RPDs were found to within laboratory-determined control limits except:
  - a. Batch B4L0424 – Matrix recoveries for Antimony are below project the 60% limits. Associated results flagged “J” if positive or “UJ” if non-detect for sample 1269-112-0 only.
  - b. Batch B4L0448 – Post digestion spike recovery for Mercury is above laboratory limit of 115% at 116%. Associated positive results flagged “J” for all samples in both laboratory reports.

Based on the validation process, the data contained herein are adequate for the purposes of this study. The validated data are summarized in attached tables with appropriate qualifiers. A copy of the data validation report is included as Appendix E.

## 7.0 SUMMARY

At the request of the Caltrans District 7, an ADL SI was conducted at six proposed construction areas (A, B-1, B-2, B-3, B-4, and C) to evaluate the potential presence of lead contamination in subsurface soils along SR110 corridor, from SR405 at the south (PM 8.60) to Imperial Highway at the north (PM 13.97), Los Angeles County, California (the Project Area). The data from the SI will be evaluated to determine reuse and disposal options for the excess soil generated during construction activities.

A total of 15 borings were sampled in six areas as described below.

- Area A: One boring was advanced to a depth of 22 feet bgs with samples collected at 1, 3, 5, 10, 15, 20, and 22 feet bgs.
- Area B-1: One boring was advanced to a depth of 27-feet bgs with samples collected at 1, 3, 5, 10, 15, 20, 25, and 27 feet bgs.
- Area B-2: One boring was advanced to a depth of eight feet bgs with samples collected at 1, 3, 5, and 8 feet bgs.
- Area B-3: Four hand auger borings were advanced to a depth of five feet bgs with samples collected at 1, 3, and 5 feet bgs.
- Area B-4: Four hand auger borings were advanced to 0.5 feet bgs with one sample collected from surface to 0.5 feet bgs.
- Area C: Four hand auger borings were advanced to 0.5 feet bgs with one sample collected from surface to 0.5 feet bgs

All borings were completed to their target depths.

Soil samples collected from each boring were analyzed for total lead and for soluble lead by Cal WET-Citric. Select soil samples were analyzed Title 22 metals and pH. Samples with a Cal WET-Citric concentration equal to or greater than 5.0 mg/L were analyzed for Cal WET-DI. Twenty percent of samples exhibiting the highest total lead concentrations were analyzed for soluble lead using the Federal TCLP.

The following summarizes investigative findings:

- Total Lead: Of the 39 soil samples analyzed for total lead, none of the samples reported total lead concentrations above the California TTLC of 1,000 mg/kg (maximum concentration = 94 mg/kg).
- Cal WET-Citric Soluble Lead: Of the 39 soil samples analyzed for soluble lead by Cal WET-Citric, one of the samples reported concentrations above the STLC (maximum concentration = 7.5 mg/L).
- Cal WET-DI Soluble Lead: The single sample analyzed for soluble lead by Cal WET-DI did not exceeded 1.5 mg/L (maximum concentration = 0.36 mg/L).

- TCLP Soluble Lead: Of the nine soil samples analyzed for soluble lead by the Federal TCLP, none of the samples exceeded the Federal toxicity characteristic threshold of 5 mg/L (maximum concentration = 0.290 mg/L).
- Title 22 metals: All reported Title 22 metals, other than lead, were reported at concentrations below state and federal hazardous waste thresholds. Other than lead, no other metals were reported at concentrations warranting additional analysis for solubility (total concentrations were reported at less than 10 times the STLC). All reported Title 22 metals, other than arsenic, were reported at concentrations below their respective RSL for industrial soil or CHHSL for commercial/industrial soil. Arsenic concentrations were reported within the range of expected background for Southern California.
- pH: Of the four soil samples analyzed for pH, all were reported within the range of non hazardous waste and above the lower limit of the Caltrans Lead Variance.

Stantec understands that Caltrans will use these data to perform statistical evaluations to classify wastes for on-site reuse in accordance with the Caltrans Lead Variance and to make recommendations for off-site disposal in accordance with State and Federal hazardous waste thresholds. Caltrans will also use the data to determine the health and safety protection of workers, consistent with California and the U.S. OSHA regulations.

## 8.0 REFERENCES

- California Caltrans of Conservation Division of Mines and Geology (CDCDMG), 1986, Geomorphic Provinces and Some Principal Faults of California, May.
- California Caltrans of Toxic Substances Control (DTSC), 2008, Determination of a Southern California Regional Background Arsenic Concentration in Soil, March.
- California Caltrans of Toxic Substances Control (DTSC), 2009, Variance No. V09HQSCD006, July 1.
- California Environmental Protection Agency (Cal EPA), 2005, Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties, January.
- Cal EPA, 2010, Soil Screening Numbers – Updated Table (9/23/10), online. <http://oehha.ca.gov/risk/chhsltable.html>
- California Caltrans of Water Resources (DWR), 1961, Bulletin 104 – Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County – Appendix A Ground Water Geology, June.
- California Caltrans of Water Resources (DWR), 2004, California's Groundwater Bulletin 118, South Coast Hydrologic Region, Coastal Plain of Los Angeles Groundwater Basin, West Coast Subbasin, updated February 27.
- Kearny Foundation of Soil Science, 1996, Background Concentrations of Trace and Major Elements in California Soils, Division of Agriculture and Natural Resources, University of California, March.
- Marret, D.J., A.L. Page, G.R. Bradford, D. Bakhtar, R.C. Graham, A.C. Chang (Marret, et al), 1991, Background Levels of Soil Trace Elements in Southern California Soils, April.
- United States Geological Survey (USGS) Topographic Map, 1964 (photorevised 1981), 7.5-minute series, Torrance, California Quadrangle.
- U.S. EPA, Region 9, 2012, Regional Screening Levels for Chemical Contaminants at Superfund Sites, May.

## TABLES

TABLE 1  
SUMMARY OF SOIL ANALYTICAL RESULTS - LEAD and pH  
ADL SITE INVESTIGATION  
LA 110-PM 8.60/13.97, LA 2 PM 18.8, LA 405 PM 21.3  
LOS ANGELES COUNTY, CALIFORNIA  
EFIS:0713000412-1 (EA#293801)  
TASK ORDER #18

Location	Sample ID	Total Lead <sup>(1)</sup> (mg/kg)	Soluble Lead <sup>(1)</sup> Cal WET-Citric (mg/L)	Soluble Lead <sup>(1)</sup> Cal WET-DI (mg/L)	Soluble Lead <sup>(1)</sup> TCLP (mg/L)	pH <sup>(2)</sup>
A	1269-101-1	8.8	0.44 NJ	--	--	--
	1269-101-3	12	0.51 NJ	--	--	--
	1269-101-5	18	0.87 NJ	--	<0.0014	--
	1269-101-10	12	0.20 NJ	--	--	--
	1269-101-15	6.7	0.084 NJ	--	--	8.4
	1269-101-20	3.6	0.042 NJ	--	--	--
	1269-101-22	1.8 J	0.036 NJ	--	--	--
B-1	1269-102-1	9.3	0.21 NJ	--	--	8.4
	1269-102-3	<b>94</b>	<b>7.5</b>	0.36 NJ	0.290	--
	1269-102-5	7.4	0.30 NJ	--	<0.0014	--
	1269-102-10	37	1.6	--	0.027 NJ	--
	1269-102-15	17	0.79 NJ	--	0.0045 NJB	--
	1269-102-20	5.0	0.20 NJ	--	--	--
	1269-102-25	2.4	0.034 NJ	--	--	--
	1269-102-27	2.2	<0.027	--	--	--
B-2	1269-103-1	10	0.17 NJ	--	--	--
	1269-103-3	17	0.49 NJ	--	<0.0014	--
	1269-103-5	16	0.65 NJ	--	--	--
	1269-103-8	4.1	0.11 NJ	--	--	--
B-3	1269-104-1	8.1	0.22 NJ	--	--	--
	1269-104-3	13	0.54 NJ	--	--	--
	1269-104-5	7.6	0.19 NJ	--	--	--
	1269-105-1	11	0.22 NJ	--	--	--
	1269-105-3	13	0.36 NJ	--	--	--
	1269-105-5	6.0	0.17 NJ	--	--	--
	1269-106-1	13	0.15 NJ	--	--	--
	1269-106-3	13	0.44 NJ	--	--	8.4
	1269-106-5	6.5	0.26 NJ	--	--	--
	1269-107-1	8.8	0.13 NJ	--	--	--
	1269-107-3	22 J	0.78 NJ	--	<0.0014	--
1269-107-5	3.9	0.16 NJ	--	--	--	
B-4	1269-108-0	14	0.39 NJ	--	--	8.1
	1269-109-0	16	0.68 NJ	--	--	--
	1269-110-0	27	0.85 NJ	--	0.0044 NJB	--
	1269-111-0	17	0.72 NJ	--	0.0033 NJB	--
	1269-112-0	16	0.44 NJ	--	--	--
C	1269-113-0	15	0.44 NJ	--	--	--
	1269-114-0	12	0.32 NJ	--	--	--
	1269-115-0	14	0.34 NJ	--	--	--
Minimum		1.8	<0.027	0.36	<0.0014	8.1
Maximum		94	7.5	0.36	0.290	8.4
Mean		13.9	--	--	--	--
Standard Deviation		14.9	--	--	--	--
Type X Material Non Hazardous		<1000	<5	--	<5	>2 and <12.5
Type Y-1 Material California Non-RCRA Hazardous Waste		≤1411	--	≤1.5	<5	>5.5 and <12.5
Type Z-2 Material California Non-RCRA Hazardous Waste		≥1000	≥5	--	<5	>2 and <12.5
California Human Health Screening Level <sup>3</sup>		320	--	--	--	--
USEPA Regional Screening Level <sup>4</sup>		800	--	--	--	--

**Notes:**

- (1) Total Lead, California Waste Extraction Test (Cal WET - Citric), and Toxicity Characteristic Leaching Procedure (TCLP) analysis done using EPA method 6010B. Extraction methods vary.
  - (2) pH determined with EPA method 9045B.
  - (3) California Human Health Screening Levels for Commercial/Industrial and Residential Land Use, Soil, California Environmental Protection Agency, January 2005; updated 2010 Office of Environmental Health Hazard Assessment Table 1.
  - (4) United States Environmental Protection Agency (Region 9) Regional Screening Levels (RSLs; in mg/Kg) for VOCs for industrial and residential soil (last updated May 2013)
- mg/kg = milligrams per kilogram  
mg/L = milligrams per liter  
-- = Not analyzed or not applicable  
**Bold** = Exceeds threshold limit  
J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.  
NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.  
B - The analyte was detected in the method, field and/or trip blank.

**TABLE 2**  
**SUMMARY OF SOIL ANALYTICAL RESULTS - TITLE 22 METALS**  
**ADL SITE INVESTIGATION**  
**LA 110-PM 8.60/13.97, LA 2 PM 18.8, LA 405 PM 21.3**  
**LOS ANGELES COUNTY, CALIFORNIA**  
**EFIS:0713000412-1 (EA#293801)**  
**TASK ORDER #18**  
**CONTRACT 07A3321**

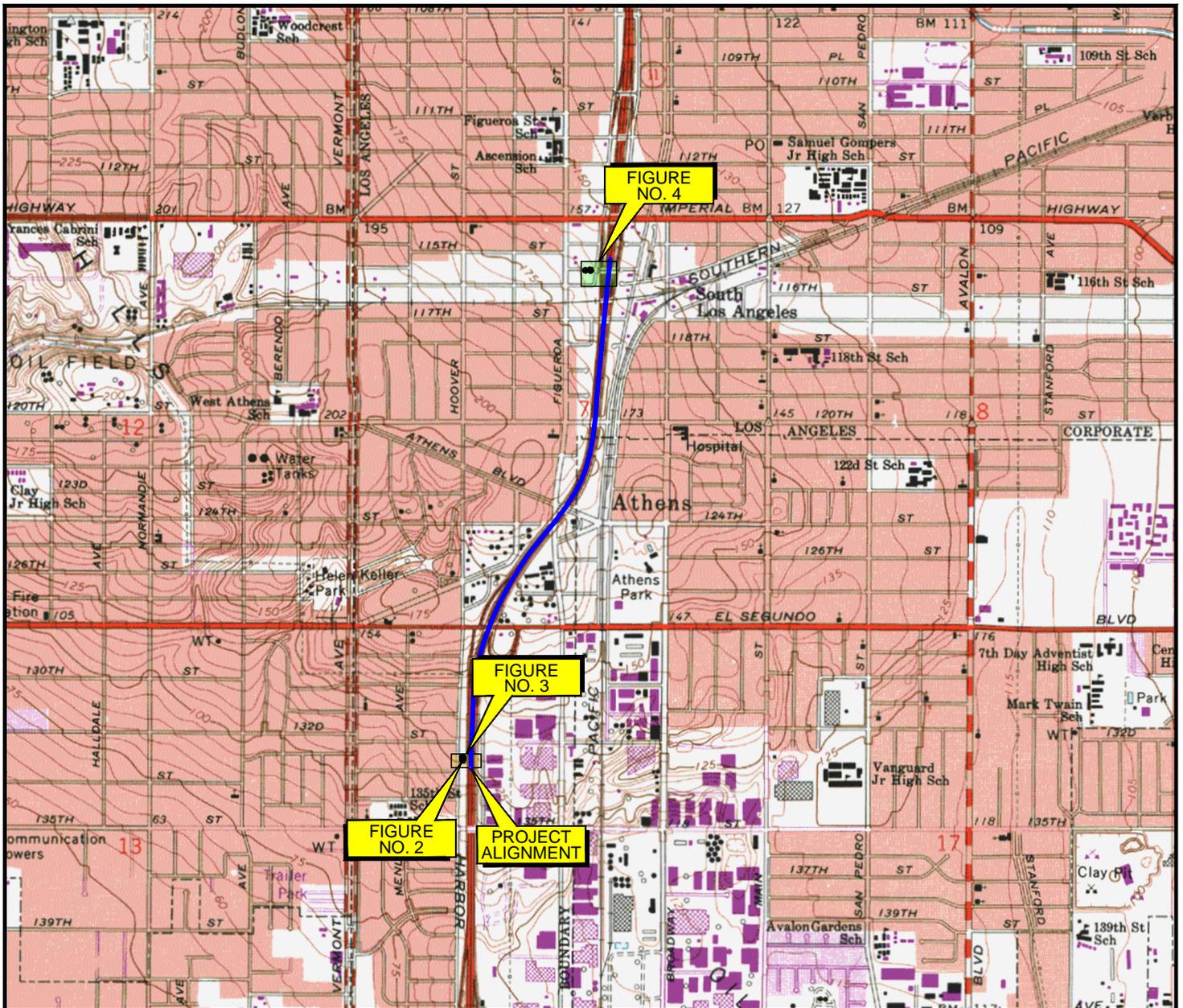
CALTRANS UNIQUE SAMPLE ID <sup>(1)</sup>	SAMPLE DEPTH <sup>(2)</sup>	SAMPLE DATE	TITLE 22 METALS																													
			ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	LEAD	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC	MERCURY													
<i>Regional Screening Levels</i> <sup>(3)</sup>			410	1.6	190,000	2,000	7.5	--	300	41,000	--	5,100	16,000	5,100	5100	10	5,200	310,000	43													
<i>California Human Health Screening Level--Comm.</i> <sup>(4)</sup>			380	0.24	6,300	190	7.5	100,000	3,200	38,000	--	4,800	16,000	4,800	4,800	63	6,700	100,000	180													
<i>Southern California Background Levels</i> <sup>(5)</sup>			380	0.6-11.0	133-1400	0.25-2.70	0.05-1.70	23-1579	2.7-46.9	9.1-96.4	--	0.1-9.6	9-509	0.015-0.430	13.2-39.4	9.8-36.2	75-288	133-236	0.05-0.90													
<i>California TTL (mg/kg)</i>			500	500	10,000	75	100	2,500	8,000	2,500	1,000	3,500	2,000	100	500	700	2,400	5,000	20													
<i>10 x California STLC (mg/kg)</i>			150	50	1,000	7.5	10	50	800	250	50	3,500	200	10	50	70	240	2,500	2													
<i>20 x RCRA Toxicity Characteristic (mg/kg)</i>			--	100	2,000	--	20	100	--	--	100	--	--	20	100	--	--	--	4													
<b>LA 110-PM 8.60/13.97, LA 2 PM 18.8, LA 405 PM 21.3</b>																																
1269-101-5	5-Feet	12/8/2014	<0.25	4.0	78	0.29	NJ	0.14	NJ	10	5.9	21	--	0.37	NJ	9.3	0.51	NJ	<0.06	<0.20	26	54	0.07	NJ								
1269-102-3	3-Feet	12/8/2014	0.27	NJB	2.6	84	0.52	NJ	0.4	NJ	12	5.4	20	--	2.2	9.4	0.51	NJ	0.12	NJ	<0.20	27	51	0.06	NJ							
1269-102-10	10-Feet	12/8/2014	<0.25	2.8	110	0.35	NJ	0.17	NJ	16	6.2	30	--	1.8	13	0.45	NJ	0.10	NJ	<0.20	31	100	0.05	NJ								
1269-102-15	15-Feet	12/8/2014	<0.25	5.4	95	0.21	NJ	<0.11		77	4.6	29	--	25	19	0.83	NJ	<0.06		<0.20	31	130	0.05	NJ								
1269-103-3	3-Feet	12/8/2014	0.34	NJB	3.0	99	0.66	NJ	0.21	NJ	15	7.1	16	--	0.66	NJ	12	0.46	NJ	0.12	NJ	<0.20	34	44	0.04	NJ						
1269-107-3	3-Feet	12/8/2014	<0.25	4.4	120	0.47	NJ	<0.11		18	8.0	22	--	0.25	NJ	16	0.51	NJ	<0.06		<0.20	35	45	0.06	NJ							
1269-109-0	Surface	12/8/2014	0.87	NJB	2.6	95	0.31	NJ	<0.11		13	5.5	26	--	1.5	11	0.44	NJ	<0.06		<0.20	27	77	0.05	NJ							
1269-110-0	Surface	12/8/2014	0.76	NJB	3.1	130	0.39	NJ	0.26	NJ	21	6.8	55	--	2.6	16	0.62	NJ	<0.06		<0.20	34	160	0.05	NJ							
1269-111-0	Surface	12/8/2014	0.30	NJB	2.8	110	0.35	NJ	0.12	NJ	16	6.3	39	--	1.5	12	0.30	NJ	<0.06		<0.20	31	94	0.05	NJ							
1269-112-0	Surface	12/8/2014	0.84	NJB	4.1	130	0.41	NJ	0.48	NJ	17	8.4	36	--	0.95	NJ	15	0.64	NJ	<0.06		<0.20	37	100	0.06	NJ						
EB-1-20141208	QA/QC*	12/8/2014	0.034	NJ	<0.0024	0.0011	NJB	0.0003	NJ	0.0002	NJ	0.0018	NJB	0.0006	NJ	0.0075	NJB	0.0014	NJ	0.0040	NJ	0.0013	UJB	<0.0040	0.0017	NJB	<0.0026	<0.0013	0.0110	NJB	<0.11	
EB2-120814	QA/QC*	12/8/2014	0.0036	NJ	<0.0024	<0.0006	UJB	<0.0002		<0.0001		0.0020	NJB	<0.0004		0.0045	NJB	<0.0014		0.0014	NJ	0.0020	NJB	<0.0040	0.0011	NJB	<0.0026	<0.0013	0.0081	NJB	<0.11	
FB-1-20141208	QA/QC*	12/8/2014	0.0073	NJ	<0.0024	0.0009	NJB	0.0002	NJ	<0.0001		0.0018	NJB	<0.0004		0.0061	NJB	<0.0014		0.0005	NJ	0.0015	UJB	<0.0040	0.0014	NJB	<0.0026	<0.0013	0.0060	NJB	<0.11	
FB2-120814	QA/QC*	12/8/2014	0.032	NJ	<0.0024	0.0007	NJB	0.0002	NJ	<0.0001		<0.0015	UJB	<0.0004		0.0062	NJB	0.0014	NJ	0.0030	NJ	0.0018	NJB	0.0047	NJ	0.0018	NJB	<0.0026	<0.0013	0.0072	NJB	<0.11

**NOTES:**

- (1) - Boring identification number
- (2) - Sample depth reported in feet below the ground surface
- (3) - United States Environmental Protection Agency (Region 9) Regional Screening Levels (RSLs; in mg/Kg) for industrial soil (last updated 2012)
- (4) - California Office of Environmental Health Hazard Assessment, California Human Health Screening Levels, Commercial/Industrial Soil, Table 1 (Updated September 23, 2010)
- (5) - Marrett, D.J., A.L. Page, G.R. Bradford, D. Bakhtar, R.C. Graham, A.C. Chang, Background Levels of Soil Trace Elements in Southern California Soils, April, 1991
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- B - The analyte was detected in the method, field and/or trip blank.

All soil results in mg/Kg  
<0.5 - Analyte not reported at or above stated reporting limit  
\* QA/QC samples consisted of liquid equipment blanks (mg/L)

## FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, INGLEWOOD QUADRANGLE, 1964  
PHOTOREVISED, 1981



APPROXIMATE SCALE (FEET)



290 Conejo Ridge Avenue  
Thousand Oaks, CA 91361  
PHONE: (805) 230-1266 FAX: (805) 230-1277

FOR:  
ADL Site Investigation  
Agreement No. 07A3321  
Task Order No. 18  
LA-110-PM 8.60/13.97, LA 2 PM18.8, LA 405 PM 21.3  
PN/E-FIS: 0713000412-1 EA Number: 293801

SITE LOCATION MAP

1

JOB NUMBER:  
185831018

DRAWN BY:  
RAR

CHECKED BY:  
KE

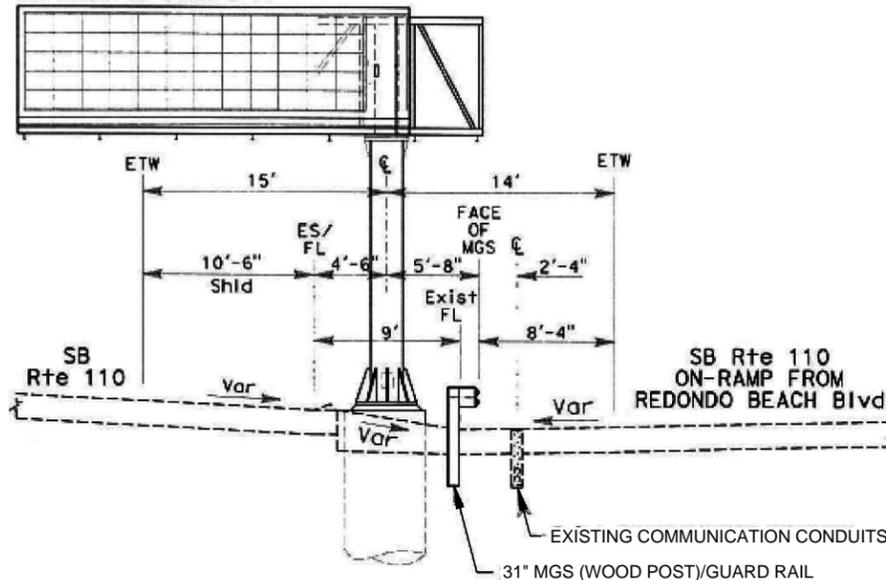
APPROVED BY:  
KE

DATE:  
01/06/15

**ABBREVIATION:**

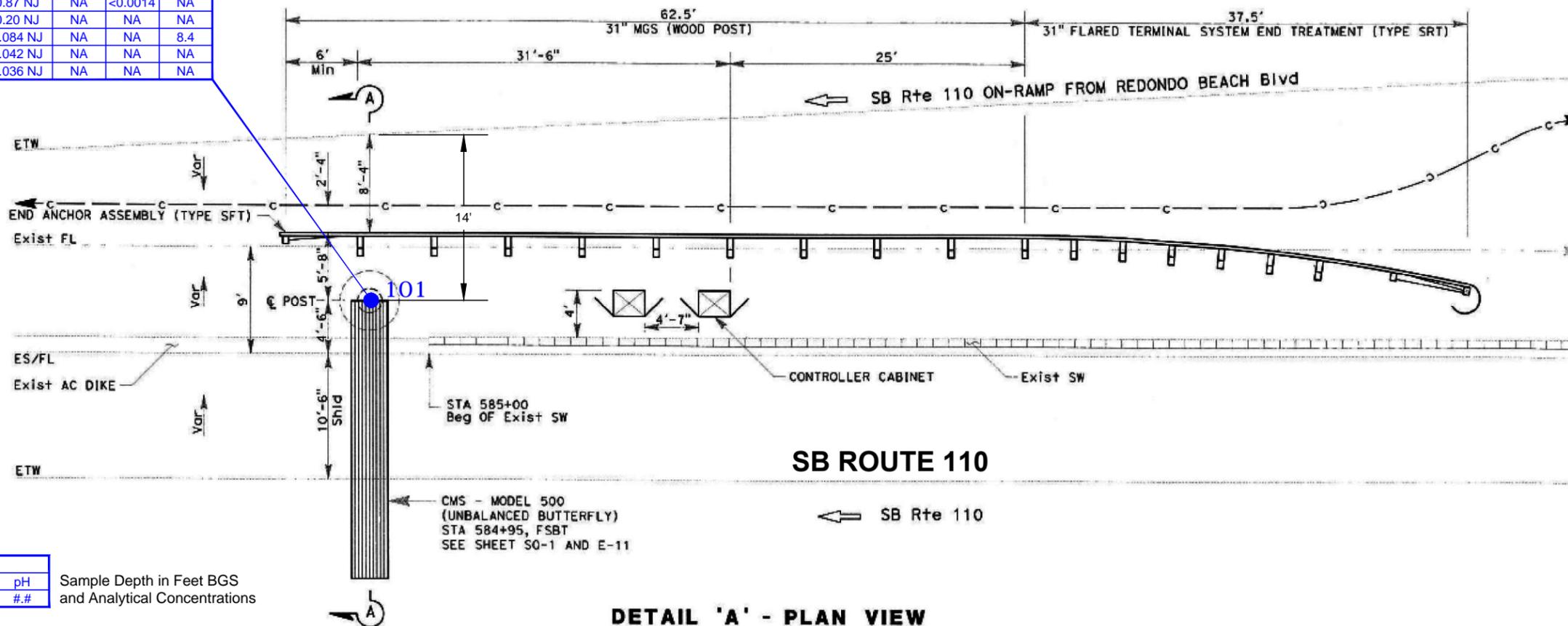
MGS: MIDWEST GUARDRAIL SYSTEM

CMS - MODEL 500 (UNBALANCED BUTTERFLY)  
 STA 584+95, FSBT  
 SEE SHEET S0-1 AND E-11



**SECTION A-A**

DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
1'	8.8	0.44 NJ	NA	NA	NA
3'	12	0.51 NJ	NA	NA	NA
5'	18	0.87 NJ	NA	<0.0014	NA
10'	12	0.20 NJ	NA	NA	NA
15'	6.7	0.084 NJ	NA	NA	8.4
20'	3.6	0.042 NJ	NA	NA	NA
22'	1.8 J	0.036 NJ	NA	NA	NA



**DETAIL 'A' - PLAN VIEW**

**LEGEND**

● SAMPLE LOCATION

SAMPLE ID	DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
#	##	##	##	##	##	##

Sample Depth in Feet BGS and Analytical Concentrations

- Total Pb = Total Lead (mg/kg)
- WET-Citric = Soluble Lead Cal Wet-Citric (mg/L)
- WET-DI = Soluble Lead Cal Wet-DI (mg/L)
- TCLP = Soluble Lead Toxicity Characteristic Leaching Procedure (mg/L)
- pH = pH
- NA = Not Analyzed
- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration
- B = The analyte was detected in the method, field and/or trip blank



NOT TO SCALE

**Stantec**  
 290 Conejo Ridge Avenue  
 Thousand Oaks, CA 91361  
 PHONE: (805) 230-1266 FAX: (805) 230-1277

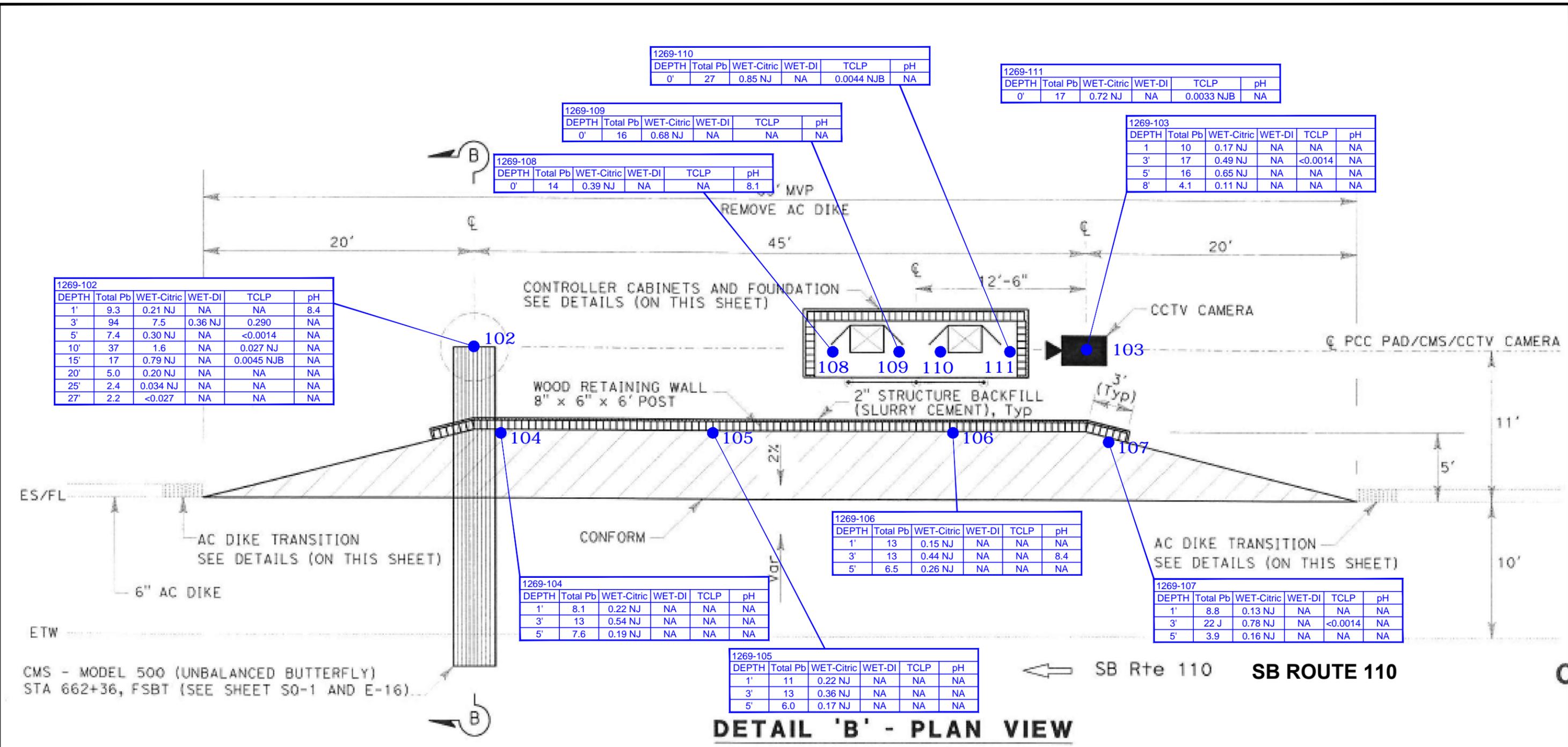
FOR: ADL Site Investigation  
 Agreement No. 07A3321  
 Task Order No. 18  
 LA-110-PM 8.60/13.97, LA 2 PM18.8, LA 405 PM 21.3  
 PN/E-FIS: 0713000412-1 EA Number: 293801

JOB NUMBER: 185831018  
 DRAWN BY: RAR  
 CHECKED BY: KE  
 APPROVED BY: KE  
 DATE: 01/06/15

**SITE PLAN A**

FIGURE: **2**

Background layout provided by Caltrans District 7, North. No warranty is made by Stantec as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed electronically, and may be updated without notification. Any reproduction may result in a loss of scale and/or information.



**DETAIL 'B' - PLAN VIEW**

**LEGEND**

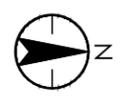
● SAMPLE LOCATION

SAMPLE ID						
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH	
#	##	##	##	##	##	##

Sample Depth in Feet BGS and Analytical Concentrations

- Total Pb = Total Lead (mg/kg)
- WET-Citric = Soluble Lead Cal Wet-Citric (mg/L)
- WET-DI = Soluble Lead Cal Wet-DI (mg/L)
- TCLP = Soluble Lead Toxicity Characteristic Leaching Procedure (mg/L)
- pH = pH
- NA = Not Analyzed
- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration
- B = The analyte was detected in the method, field and/or trip blank

Background layout provided by Caltrans District 7, North. No warranty is made by Stantec as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed electronically, and may be updated without notification. Any reproduction may result in a loss of scale and/or information.



NOT TO SCALE

<p><b>Stantec</b></p> <p>290 Conejo Ridge Avenue Thousand Oaks, CA 91361 PHONE: (805) 230-1266 FAX: (805) 230-1277</p>	FOR: ADL Site Investigation Agreement No. 07A3321 Task Order No. 18 LA-110-PM 8.60/13.97, LA 2 PM18.8, LA 405 PM 21.3 PN/E-FIS: 0713000412-1 EA Number: 293801		<b>SITE PLAN</b> B-1, B-2, B-3 & B-4		<b>FIGURE:</b>  <b>3</b>
	JOB NUMBER: 185831018	DRAWN BY: RAR	CHECKED BY: KE	APPROVED BY: KE	DATE: 01/06/15

**NOTE:**

FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



Background layout provided by Caltrans District 7, North. No warranty is made by Stantec as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed electronically, and may be updated without notification. Any reproduction may result in a loss of scale and/or information.

**LEGEND**

● SAMPLE LOCATION



NOT TO SCALE



290 Conejo Ridge Avenue  
Thousand Oaks, CA 91361  
PHONE: (805) 230-1266 FAX: (805) 230-1277

FOR: ADL Site Investigation  
Agreement No. 07A3321  
Task Order No. 18  
LA-110-PM 8.60/13.97, LA 2 PM18.8, LA 405 PM 21.3  
PN/E-FIS: 0713000412-1 EA Number: 293801

JOB NUMBER: 185831018  
DRAWN BY: RAR

SITE PLAN  
C

CHECKED BY: KE  
APPROVED BY: KE

FIGURE:  
4

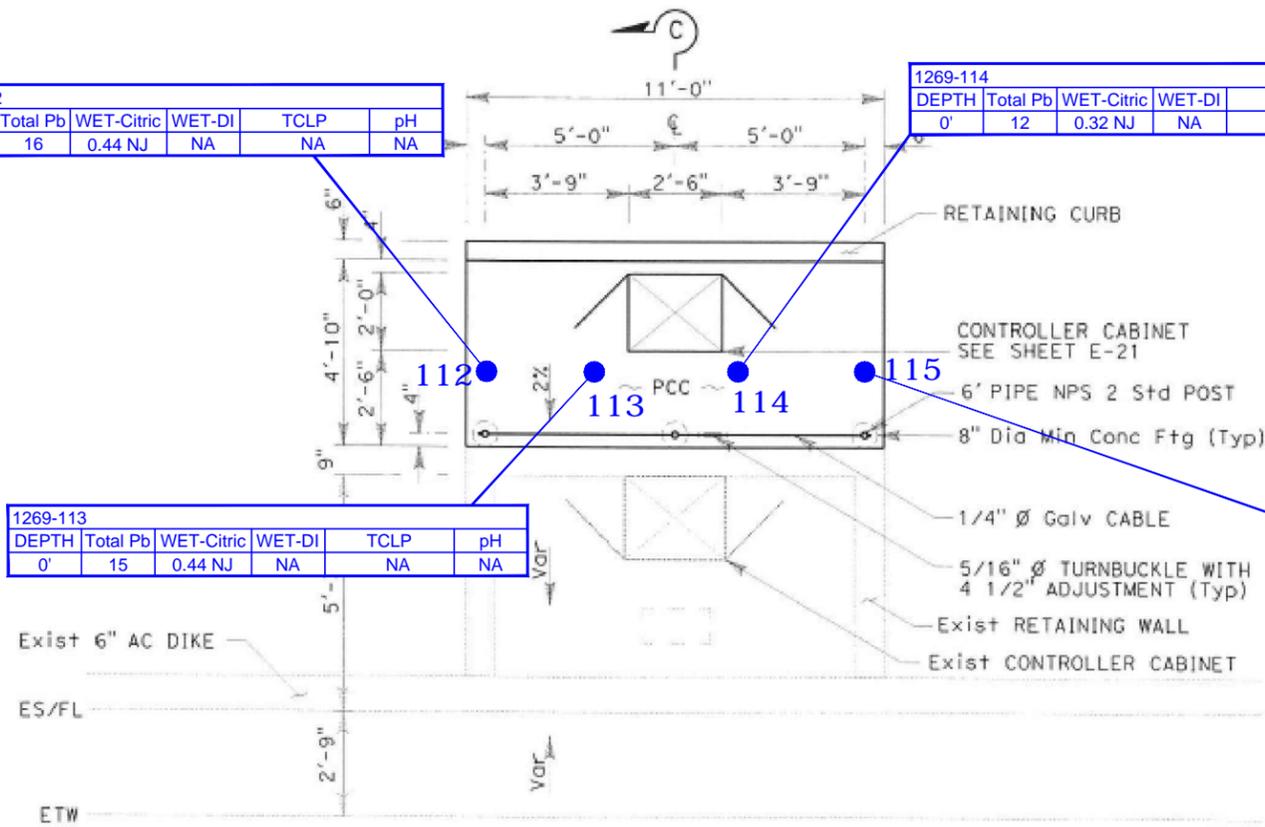
DATE: 01/06/15

1269-112					
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
0'	16	0.44 NJ	NA	NA	NA

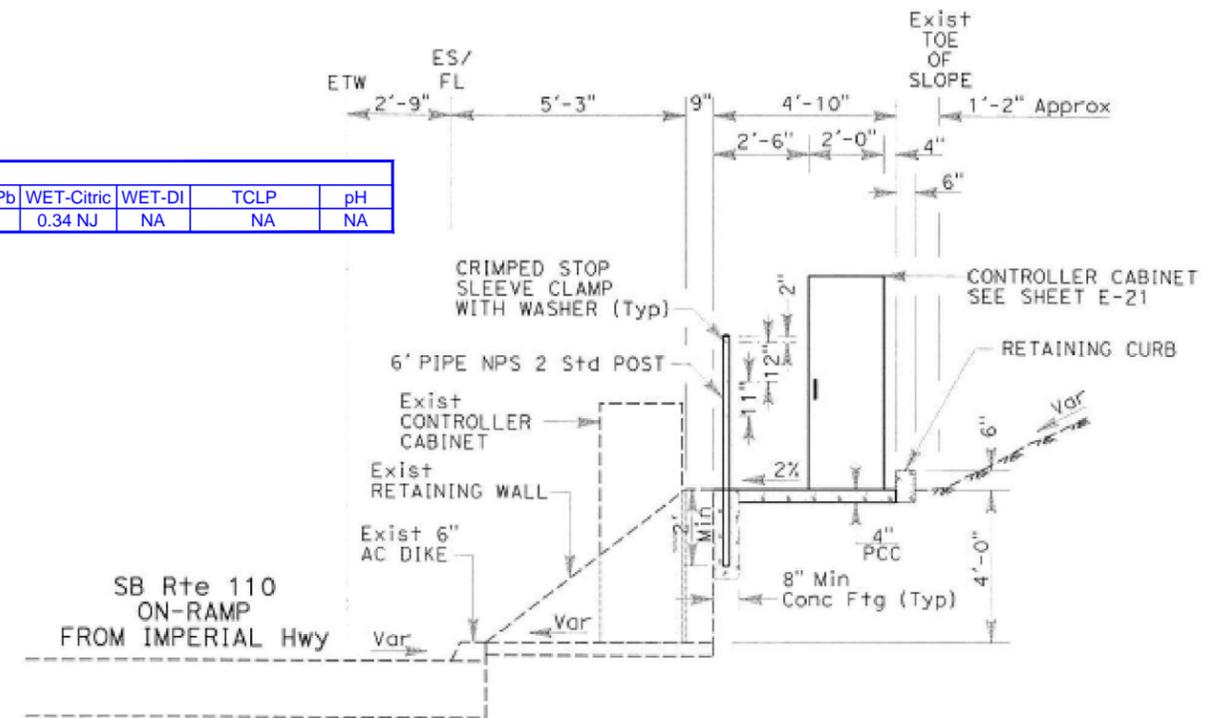
1269-114					
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
0'	12	0.32 NJ	NA	NA	NA

1269-113					
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
0'	15	0.44 NJ	NA	NA	NA

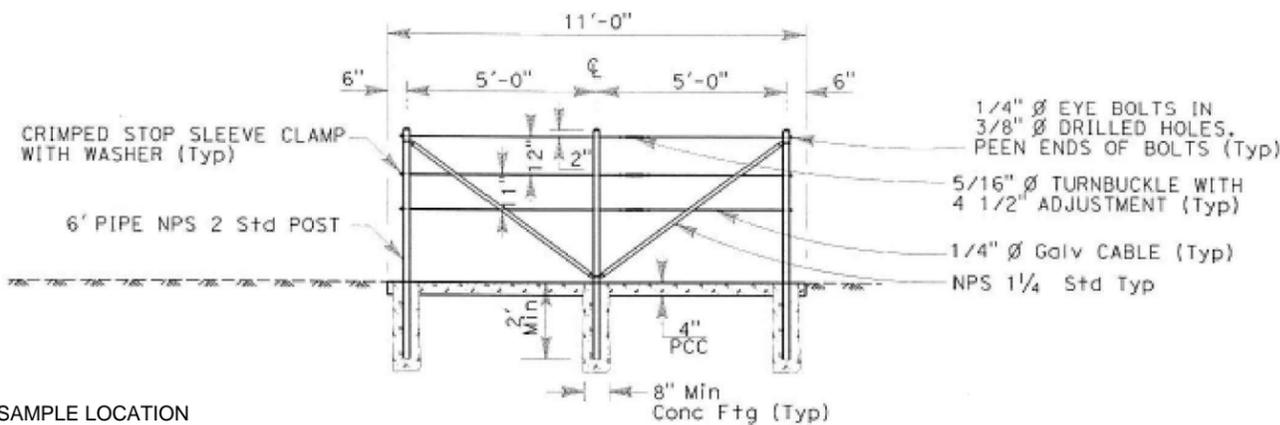
1269-115					
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
0'	14	0.34 NJ	NA	NA	NA



**SB ROUTE 110 ON-RAMP FROM IMPERIAL HWY**  
PLAN



**SECTION C-C**



**LEGEND**  
● SAMPLE LOCATION

SAMPLE ID					
DEPTH	Total Pb	WET-Citric	WET-DI	TCLP	pH
#	##	##	##	##	##

Sample Depth in Feet BGS and Analytical Concentrations

- Total Pb = Total Lead (mg/kg)
- WET-Citric = Soluble Lead Cal Wet-Citric (mg/L)
- WET-DI = Soluble Lead Cal Wet-DI (mg/L)
- TCLP = Soluble Lead Toxicity Characteristic Leaching Procedure (mg/L)
- pH = pH
- NA = Not Analyzed
- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration
- B = The analyte was detected in the method, field and/or trip blank



NOT TO SCALE



290 Conejo Ridge Avenue  
Thousand Oaks, CA 91361  
PHONE: (805) 230-1266 FAX: (805) 230-1277

FOR: ADL Site Investigation  
Agreement No. 07A3321  
Task Order No. 18  
LA-110-PM 8.60/13.97, LA 2 PM18.8, LA 405 PM 21.3  
PN/E-FIS: 0713000412-1 EA Number: 293801

JOB NUMBER: 185831018  
DRAWN BY: RAR

SITE PLAN  
C (Detail)

CHECKED BY: KE  
APPROVED BY: KE

FIGURE:  
**5**  
DATE: 01/06/15

Background layout provided by Caltrans District 7, North. No warranty is made by Stantec as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed electronically, and may be updated without notification. Any reproduction may result in a loss of scale and/or information.

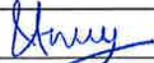
**APPENDIX A  
HASP FIELD FORMS**

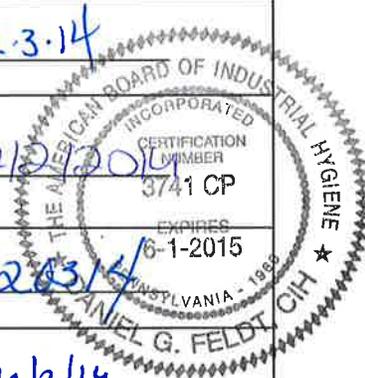
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<p><b>Client:</b> <u>The State of California, Department of Transportation – 07A3321</u></p> <p><b>Project Name:</b> <u>TASK ORDER NO. 18 – ADL</u></p> <p><b>Start Date:</b> <u>November 26, 2014</u></p> <p><b>Plan Review Date*:</b> <u>May 26, 2015</u></p> <p><small>(*The Plan Review Date is the date the HASP would need to be re-reviewed to maintain current information is included should the Task Order be extended. The Plan Review date is not longer than 6 months from the start of the Period of Performance – however, no reviews will be performed on the HASP outside of the Task Order Period of Performance.)</small></p>	<p><b>Site Name:</b> <u>Aerially Deposited Lead Site Investigation, Location: LA-110 PM 8.60/13.97, LA-2 PM 18.8, LA-405 PM 21.3</u></p> <p><b>Project Number:</b> <u>185831018</u></p> <p><b>End Date:</b> <u>January 31, 2015</u></p>
<p><u>Kevin Miskin</u> Project Manager</p>	<p>Signature: <u></u> Date: <u>12-3-14</u></p>
<p><u>Dan Feldt, MPH, CIH</u> Health and Safety Manager, Certified Industrial Hygienist (CIH) HASP review</p>	<p>Signature: <u></u> Date: <u>12/2/2014</u></p>
<p><u>StephAnnie Roberts</u> Office Safety Environmental Coordinator (OSEC)</p>	<p>Signature: <u></u> Date: <u>12/3/14</u></p>
<p><u>Keith Posekian</u> Site Health and Safety Officer (SHSO) <u>FOR</u></p>	<p>Signature: <u></u> Date: <u>12/3/14</u></p>
<p><u>Anuya Sawant</u> Peer Reviewer</p>	<p>Signature: <u></u> Date: <u>12/3/2014</u></p>
<p><u>Kristy Edblad</u> HASP Originator</p>	<p>Signature: <u></u> Date: <u>12-3-2014</u></p>



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This HASP should NOT be understood by contractors or anyone other than Stantec employees to provide information on all of the potential risks/hazards to which they may be exposed as a result of their work. Stantec claims no responsibility for use of this HASP by others.

Your signature below confirms the following: that you have read and understand the potential risks/hazards identified by Stantec and the associated mitigation measures discussed in this HASP; that there may be additional risks or hazards that are not identified in this HASP; that you have received training and medical surveillance according to this HASP and the OSHA Standard on Hazardous Waste Operations and Emergency Response (29 CFR 1910.120); and that you understand that you could be prohibited by the Stantec Site Health and Safety Officer or other authorized Stantec personnel from working on this project for not complying with any aspect of this or any other applicable HASP.

**(All Stantec and subcontractor personnel must sign.)**

Name	Signature	Company	Date
Anuya Sawant		Stantec	12/4/14
Sam Young		CT	12/4/14
Kelli Roseman		Stantec	12/8/14
Max Geissel		SEFS	12/8/14
Frank Rockiguer		SEFS	12-8-14
Mark Zilman		Stantec	12/8/14
Sam Young		CT	12/8/14

**HEALTH, SAFETY, AND ENVIRONMENT**  
**RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



Project: T.O. 18, ADL Survey LA110 Project No: 185831018  
 Client: Caltrans  
 Location: 110 Fwy  
 Start Date: 12/4/14

**Work Description Provide A General Description Of The Work To Be Conducted.**

*Mark boring locations with Caltrans PM*

**Documentation and Procedure Review**

1. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  No\*
2. Emergency Response Plan reviewed?  Yes  No\*  N/A
3. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  No\*
4. Attended Client Site Health and Safety meeting?  Yes  No\*  N/A
5. Conducted Stantec site safety meeting with all workforces?  Yes  No\*  N/A
6. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
*If yes, include in the Job Safety Analysis (JSA).*  Yes  No
7. Working alone or remote work?  
*If yes, complete call in/out process - Safe Work form must be completed.*  Yes  No

**Notifications and Permits**

8. Are work permits required for this site?  
*If yes, have they been completed and submitted as required?*  Yes  No  
 Yes  No\*
9. Are utility locates required for this site?  
*If yes, have they been completed and reviewed?*  Yes  No  
 Yes  No\*
10. Does the Client require any notification prior to starting the work?  
*If yes, has the notification been provided?*  Yes  No  
 Yes  No\*

**\*Contact your Project Manager immediately.**

**Personal Protective Equipment List specific PPE as needed. Verify type and inspect condition.**

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> Head Protection Type: _____ | <input type="checkbox"/> Hearing Protection: _____       | <input type="checkbox"/> Gloves Type: _____       |
| <input checked="" type="checkbox"/> Foot Protection Type: _____ | <input type="checkbox"/> Respiratory Protection: _____   | <input type="checkbox"/> Water Safety Gear: _____ |
| <input checked="" type="checkbox"/> Eye Protection Type: _____  | <input type="checkbox"/> Fire Retardant Coveralls: _____ | <input type="checkbox"/> _____                    |
| <input checked="" type="checkbox"/> High Visibility Vest: _____ | <input type="checkbox"/> Fall Protection: _____          | <input type="checkbox"/> _____                    |

**Tools and Equipment List specific equipment to be used. Verify type and inspect condition.**

- |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

HEALTH, SAFETY, AND ENVIRONMENT  
 RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day



Daily Tailgate Discussions/Subcontractor Input

Start	12/05/24/14	Time: 1005	Weather: Sunny
PPE / Hospital Route			
Mid-Day		Time:	Weather:
Post-Day		Time:	Weather:

**I know the hazards:**

By signing here, you are stating the following:

1. I have been involved in the Job Safety Analysis and understand the hazards and risk control actions associated with each task I am about to perform.
2. I understand the permit to work requirements applicable to the work I am about to perform (if it includes permitted activities).
3. I am aware that no jobs or work (that is not risk-assessed) is to be performed.
4. I am aware of my obligation to "Stop Work" (See Stop Work Section).

**I arrived and departed fit for duty:**

5. I am physically and mentally fit for duty.
6. I am not under the influence of any type of medication, drugs or alcohol that could affect my ability to work safely.
7. I am aware of my responsibility to bring any illness, injury (regardless of where or when it occurred) or fatigue issue I may have to the attention of the Crew Lead.
8. I signed out uninjured unless I have otherwise informed the Crew Lead.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP  
 Team Lead to contact Project Manager for any personnel identified as AP

Individual Name/Company Name/Signature	Time:	Time:	Time:
Ananya Sawant / Stantec / Anuya	1005 <sup>F</sup>	1130 <sup>F</sup>	
Sam Yang / CT. / SY	1005 <sup>F</sup>	1130 <sup>F</sup>	

- I will STOP the job any time anyone is concerned or uncertain about safety.
- I will STOP the job if anyone identifies a hazard or additional mitigation not recorded.
- I will be alert to any changes in personnel or their fitness level (AP), conditions at the work site or hazards.
- If it is necessary to STOP THE JOB, I will reassess the task, hazards and mitigations; and then proceed only when safe to do so.



- Remember to
1. Stop and think
  2. Look around
  3. Assess risk
  4. Control risks
  5. Begin/resume work

Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.

Signature of Crew Lead: [Signature]      Date: 12/4/14



**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



Project: ADL Surveys Project No: \_\_\_\_\_  
 Client: Caltrans  
 Location: SR 110 - Downtown LA  
 Start Date: 12/8/14

**Work Description Provide A General Description Of The Work To Be Conducted.**

**Documentation and Procedure Review**

1. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  No\*
2. Emergency Response Plan reviewed?  Yes  No\*  N/A
3. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  No\*
4. Attended Client Site Health and Safety meeting?  Yes  No\*  N/A
5. Conducted Stantec site safety meeting with all workforces?  Yes  No\*  N/A
6. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
If yes, include in the Job Safety Analysis (JSA).  Yes  No
7. Working alone or remote work?  
If yes, complete call in/out process – Safe Work form must be completed.  Yes  No

**Notifications and Permits**

8. Are work permits required for this site?  
If yes, have they been completed and submitted as required?  Yes  No  
 Yes  No\*
9. Are utility locates required for this site?  
If yes, have they been completed and reviewed?  Yes  No  
 Yes  No\*
10. Does the Client require any notification prior to starting the work?  
If yes, has the notification been provided?  Yes  No  
 Yes  No\*

**\*Contact your Project Manager immediately.**

**Personal Protective Equipment**

**List specific PPE as needed. Verify type and inspect condition.**

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> Head Protection Type: <u>Hard Hat</u>   | <input checked="" type="checkbox"/> Hearing Protection: <u>AS needed</u> | <input checked="" type="checkbox"/> Gloves Type: <u>AS needed</u> |
| <input checked="" type="checkbox"/> Foot Protection Type: <u>Steel Toed</u> | <input type="checkbox"/> Respiratory Protection: _____                   | <input type="checkbox"/> Water Safety Gear: _____                 |
| <input checked="" type="checkbox"/> Eye Protection Type: <u>Safety</u>      | <input type="checkbox"/> Fire Retardant Coveralls: _____                 | <input type="checkbox"/> _____                                    |
| <input type="checkbox"/> High Visibility Vest: _____                        | <input type="checkbox"/> Fall Protection: _____                          | <input type="checkbox"/> _____                                    |

**Tools and Equipment**

**List specific equipment to be used. Verify type and inspect condition.**

- |  |   |                          |
|--|---|--------------------------|
| <input checked="" type="checkbox"/> <u>LAR Drill Rig</u> | <input checked="" type="checkbox"/> <u>Hand Auger</u> | <input type="checkbox"/> |
| <input type="checkbox"/>                                 | <input type="checkbox"/>                              | <input type="checkbox"/> |

**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



**Daily Tailgate Discussions/Subcontractor Input**

Start	12/8/14	Time:	0730	Weather:	Sunny
HOSP. Route, SWA, Vehicle Turning, Working on fumes, Drill Rig safety, Bio Hazards, uneven Surfaces					
Mid-Day		Time:		Weather:	
Post-Day		Time:		Weather:	

**I know the hazards:**

By signing here, you are stating the following:

- I have been involved in the Job Safety Analysis and understand the hazards and risk control actions associated with each task I am about to perform.
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- I signed out uninjured unless I have otherwise informed the Crew Lead.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP			
Team Lead to contact Project Manager for any personnel identified as AP			
Individual Name/Company Name/Signature	Time:	Time:	Time:
Kate Rosecki / Stantec / Kate Rosecki	0730 <sup>F</sup>		
Max Grissel / SEPS / [Signature]	0730	1335	
Frank Rodriguez / SEPS / [Signature]	0730	1335	
Will Miller / Stantec	0730		
Amey / Savant / Stantec / Amey	0730 <sup>F</sup>		

- I will **STOP** the job any time anyone is concerned or uncertain about safety.
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- Remember to**
1. Stop and think
  2. Look around
  3. Assess risk
  4. Control risks
  5. Begin/resume work

Are you ready to work safely?

**Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.**

Signature of Crew Lead: \_\_\_\_\_

*Amey*

Date: \_\_\_\_\_

12/8/14





**SITE-SPECIFIC HEALTH AND SAFETY  
PLAN (HASP)  
TASK ORDER NO. 18 – ADL SURVEY  
LA-110**

**07A3321-18**

**Aerially Deposited Lead Site Investigation,  
Location: LA-110 PM 8.60/13.97, LA-2 PM  
18.8, LA-405 PM 21.3; Measure R Project for  
Upgrade to Existing Communication System  
Los Angeles County, California  
PN/EFIS: 0713000412-1  
EA: 293801**

**Prepared for:**

The State of California, Department of  
Transportation  
District 7 - South  
Los Angeles, California  
Contract # 07A3321

**Submitted by:**

Stantec Consulting Services Inc.  
25864-F Business Center Dr.  
Redlands, CA 92374

December 2, 2014

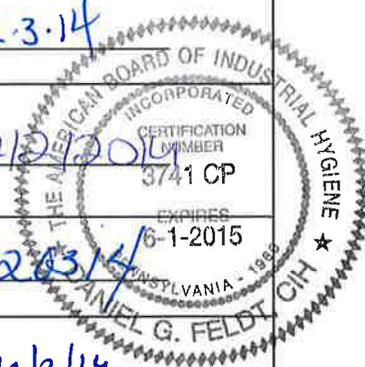
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<b>Project Name:</b> <u>TASK ORDER NO. 18 – ADL</u>	<b>Project Number:</b> <u>185831018</u>
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<u>Kevin Miskin</u> Project Manager	Signature: <u>[Signature]</u> Date: <u>12-3-14</u>
<u>Dan Feldt, MPH, CIH</u> Health and Safety Manager, Certified Industrial Hygienist (CIH) HASP review	Signature: <u>[Signature]</u> Date: <u>12/2/2014</u>
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Sam Young		CT	12/4/14
Keith Poserian		Stantec	12/8/14
Max Geissel		SEFS	12/8/14
Frank Rodriguez		SEFS	12-8-14
Mark Zilman		Stantec	12/8/14
Sam Young		CT	12/8/14



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<b>3.0 SCOPE OF WORK .....</b>	<b>3.1</b>
<b>4.0 SITE BACKGROUND AND POTENTIAL HAZARDS.....</b>	<b>4.1</b>
<b>5.0 JOURNEY MANAGEMENT PLAN .....</b>	<b>5.1</b>

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### ATTACHMENTS

Attachment A	General Safety Information (for all Sites)
Attachment B	Training Certificates
Attachment 1	Stantec Field Binder Checklist and Project Applicable Forms
Attachment 2	Job Safety Analyses
Attachment 3	RMS-2 Fit for Duty
Attachment 4	Driver's Fatigue Checklist /Safe Driving Vehicle Pre-Use Checklist
Attachment 5	RMS-3 incident/Near Miss Investigation and Collision Kit

# 1.0 Emergency Response

## PHONE NUMBERS

The nearest telephone is: Keith Posekian (Stantec) (760) 914-2845 cell. There is no landline available for this project and cell phone and cell phone reception may be intermittent. Additional personnel, including the SHSO, who may be on-site are listed below:

1. Anuya Sawant (Field Staff): (805) 341-9514 (cell phone)
2. Mark Zellmer (Field Staff): (714) 742-9131 (cell phone)
3. Scott Edblad (Field Staff): (661) 754-0862 (cell phone)

Emergency Response			
	Name	Telephone	Verification
Hospitals	Memorial Hospital of Gardena 1145 West Redondo Beach Blvd. Gardena, CA 90247	<b>911</b> or Non-emergency (310) 532-4200	11/26/2014
Ambulance	McCormick Ambulance 13933 Crenshaw Boulevard Hawthorne, CA 90250	<b>911</b> or Non-emergency (888) 349-8944	11/26/2014
Police	Gardena Police Department 1718 West 162nd Street Gardena, CA 90247	<b>911</b> or Non-emergency (310) 217-9600	11/26/2014
Fire Department	Los Angeles Fire Dept. Station 79 South Vermont Avenue Gardena, CA 90248	<b>911</b> or Non-emergency (310) 548-7579	11/26/2014
Spill Response	Belshire Environmental	(800)-995-8220	11/26/2014
Environmental Response	National Response Center (24-hour hotline)	(800) 424-8802	11/26/2014
Environmental Protection	US Environmental Protection Agency (24-hour hotline)	(800) 424-9346	11/26/2014
Emergency Services	Office of Emergency Services (24-hour hotline)	(800) 852-7550	11/26/2014
Poison Control	California/U.S. National Poison Control Center (24-hour hotline)	(800) 222-1222	11/26/2014
Agency / Line Locator			
National Line Locator	National 811 Call-Before-You-Dig Hotline (24-hour hotline)	811	11/26/2014
Public Utility Locator	DIG ALERT	811	11/26/2014

### Local office and additional contacts in case of an emergency or field questions regarding the Site:

1. **Kevin Miskin (Contract Manager) at (909) 224-3406**
2. **Anne Perez (TO Support) at (951) 288-2444**
3. **Kristy Edblad (TO Manager) at (661) 754-0863**

Flow charts for contacting additional departments in Stantec and official reporting protocol can be found in Section 1.4 of Attachment A.

## 2.0 Project Team Information

Project Team Phone Numbers			
Project Role/Name		Telephone	Verification
Stantec Project/Contract Manager	Kevin Miskin	909-224-3406 (cell) 909-255-8210 (office)	11/26/2014
<b>Field Staff #1:</b> Stantec Site Health and Safety Officer (SHSO)	Keith Posekian	760-914-2845	11/26/2014
<b>Field Staff #2:</b> Stantec Project Staff	Anuya Sawant	805-341-9514	11/26/2014
<b>Field Staff #3:</b> Stantec Project Staff	Mark Zellmer	714-742-9131	11/26/2014
<b>Field Staff #4:</b> Stantec Project Staff	Scott Edblad	661-754-0862	11/26/2014
<b>Field Staff #5:</b> Stantec Project Staff			
<b>Field Staff #6:</b> Stantec Project Staff			
<b>Field Staff #7:</b> Stantec Project Staff			
<b>Field Staff #8:</b> Stantec Project Staff			
<b>Field Staff #9:</b> Stantec Project Staff			
Stantec Business Unit Leader	Kyle Emerson	951-315-0534 (cell) 909-335-6116 (office)	11/26/2014
Senior Certified Industrial Hygienist (CIH)	Dan Feldt	414-305-1984	11/26/2014
Stantec West Region Health, Safety, Environment (HSE) Coordinator	Clint Reuter	818-395-8556 (cell) 949-923-6258 (office)	11/26/2014
Stantec Human Resources Representative	Peggy Ramos	949-923-6061	11/26/2014
OSEC (Stantec Office Safety & Environmental Coordinator)	StephAnnie Roberts	805-427-4873	11/26/2014
Strongarm Environmental	Darren Zuidema	800-701-0769 (office) 562-787-3161 (cell)	12/2/2014

(Note: The Field Staff will be on-Site. All others are Stantec employees supporting all Stantec staff and not necessarily charging time to the Task Order.)

### TRAINING

Site personnel will be trained and certified in hazardous waste operations and emergency response as follows:



- 40-Hour HAZWOPER Training;
- OSHA Respiratory Protection (29 CFR 1910.134)
- Annual 8-Hour Refresher [29 CFR 1910.120(8)];
- First Aid/CPR Training;
- Physical examination consistent with 29 Code of Federal Regulations (CFR) 1910.120 (and 8 California Code of Regulations (CCR) 5192, if applicable);
- Supervisory 8-hour Training [29 CFR 1910.120(4)] for the Site Manager/SHSO; and
- Additional training specific to the job being performed (e.g., Fall Protection, Lock Out/Tag Out, Hot Work, Confined Space, etc.).

In addition to the above-mentioned trainings, Stantec personnel are required to have training in a behavior-based safety program and defensive driving. Fit tests are also required for respirator use.

Client-Specific Safety Procedures:

Caltrans does not have any additional required safety programming or expectations, thus Stantec staff will comply with state, federal and local regulations, and Stantec policies, procedures and expectations.

Site specific staff safety training certification information is listed below and copies of their certificates are located in Attachment B.

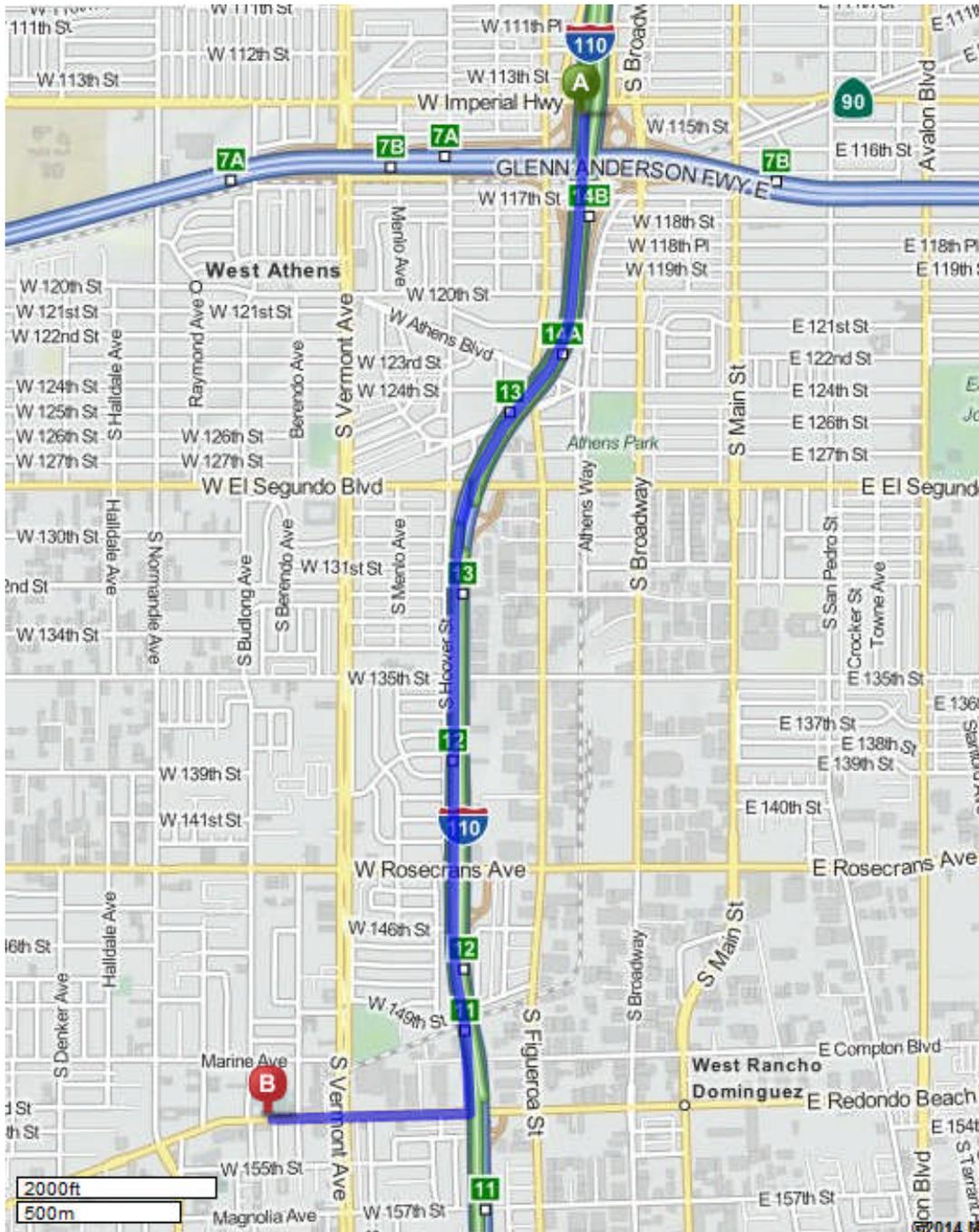
**SITE SPECIFIC STAFF TRAINING  
(Includes personnel that could potentially visit the Site)**

<b>Name</b>	<b>40Hr HAZWOPER</b>	<b>8Hr HAZWOPER Refresher</b>	<b>CPR / First Aid</b>	<b>Annual Physical</b>	<b>Defensive Driver Training</b>	<b>Respirator Fit Test</b>
FIELD STAFF: Keith Posekian	06/14/2013	07/13/2014	06/28/2013	04/30/2014	10/27/2013	04/30/2014
FIELD STAFF: Anuya Sawant	07/30/2010	07/23/2014	06/14/2013	08/26/2014	04/09/2013	08/26/2014
FIELD STAFF: Mark Zellmer	04/10/2007	05/31/2014	11/08/2013	03/11/2014	03/10/2013	03/17/2014
FIELD STAFF: Scott Edblad	11/04/2000	02/18/2014	06/14/2013	12/17/2013	09/12/2013	12/17/2013
<b>List Staff Changes/Additions Below</b>						

## DIRECTIONS AND MAP TO THE HOSPITAL

The SHSO will verify and validate the route to the hospital by driving it before work begins. Choose the nearest hospital to your work location.

### I-110



**Memorial Hospital of Gardena**  
1145 West Redondo Beach Boulevard  
Gardena, CA 90247

- 
- |   |   |        |
|---|---|--------|
|  | 1. Start out going <b>south</b> on <b>I-110 (EXPRESS) S/Harbor Fwy S</b> (Portions toll) (Electronic toll collection only). | 1.0 mi |
|---|---|--------|
- 
- |   |  |        |
|---|--|--------|
|  | 2. <b>I-110 (EXPRESS) S/Harbor Fwy S</b> becomes <b>I-110 S/Harbor Fwy S</b> . | 1.5 mi |
|---|--|--------|
- 
- |   |  |        |
|---|--|--------|
|  | 3. Take the <b>Redondo Beach Blvd</b> exit, <b>exit 11</b> . | 0.2 mi |
|---|--|--------|
- 
- |   |  |        |
|---|--|--------|
|  | 4. Turn <b>right</b> onto <b>W Redondo Beach Blvd</b> .<br><i>If you reach I-110 S you've gone about 0.2 miles too far</i> | 0.5 mi |
|---|--|--------|
- 
- |   |   |  |
|---|---|--|
|  | 5. <b>1145 W REDONDO BEACH BLVD</b> is on the <b>right</b> .<br><i>Your destination is just past S Catalina Ave<br/>If you reach S Budlong Ave you've gone a little too far</i> |  |
|---|---|--|

### 3.0 Scope of Work

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The scope of this project is described in the ADL Site Investigation Proposal, dated November 25, 2014 and the field activities are summarized below:

As directed in the Task Order No. 18 Request, Stantec proposes to advance up to fifteen (15) borings as outlined in Attachment A of the Task Order No. 18 Request. The boring depths are described below:

- Location A (DPT boring): One (1) boring to a depth of 22 feet bgs with samples collected at 1, 3, 5, 10, 15, 20, and 22 feet bgs.
- Location B-1 (DPT boring): One (1) boring to a depth of 27 feet bgs with samples collected at 1, 3, 5, 10, 15, 20, 25, and 27 feet bgs.
- Location B-2 (DPT boring): One (1) boring to a depth of 8 feet bgs with samples collected at 1, 3, 5, and 8 feet bgs.
- Location B-3 (Hand auger borings): Four (4) borings to a depth of 5 feet bgs with samples collected at 1, 3, and 5 feet bgs.
- Location B-4 (Hand auger borings): Four (4) surface sample borings to a depth of 0.5 feet bgs.
- Location C (Hand auger borings): Four (4) surface sample borings to a depth of 0.5 feet bgs.

Approximately 39 samples will be collected and analyzed at a stationary laboratory. No borings will be advanced outside of the existing right of way or in existing paved areas.

For shallow depth borings, samples will be collected directly from the hand auger bailer, discharged to a clean ziplock one (1) gallon bag, manually homogenized, then discharged to eight-ounce laboratory certified clean glass jars. For deeper borings, samples will be collected utilizing direct push technology drilling. Prior to DPT drilling at each location, the surface at each boring location will be excavated to five (5) feet using a hand auger. The shallow depth samples will be collected with the hand auger, discharged to a clean ziplock one (1) gallon bag, manually homogenized, then discharged into laboratory provided glass jars. Below 5 feet bgs, each boring will be advanced using the DPT rig. All borings will be drilled to their respective maximum depth (ranging from approximately 8 to 27 feet bgs) using a DPT drill rig with soil samples collected at intervals described above and in Attachment A of the Task Order Request. Soil samples will be collected from a Geoprobe-type sampler lined with brass, stainless steel or acetate sample liners. Once the sampler is retrieved, one sample liner will be packaged by capping each end with a Teflon sheet followed by a tight-fitting plastic cap and sealed with non-VOC tape.

All soil sampling equipment will be decontaminated before advancing each sample depth at each boring location using the three bucket system. Each sample will be labeled with a unique sample identification along with the borehole ID, sample depth, sample date, and sample time. All samples will be annotated on chain-of-custody forms and delivered to a laboratory certified by the California Department of Health Services Environmental Laboratory Accreditation Program for the analyses indicated herein.

Survey boring locations using a handheld Trimble GPS unit (during augering activities). Submit soil samples to the laboratory for the following analysis:

- All samples will be analyzed for:
  - Total lead by EPA Test Method 6010.
  - Soluble lead using the Soluble Threshold Limit Concentration (STLC) procedure by the California Waste Extraction Test (CalWET) using Citric acid as the extractant.
- When the soluble lead concentration is equal to or greater than 5 mg/L based on the CalWET-citric analysis, the laboratory shall proceed with soluble lead analysis by the California Waste Extraction Test

(CalWET) using deionized water (DI) as the extractant on the samples. For cost estimating, assume 50% of all samples will be analyzed for CalWET-DI.

- Eight (8) (a 20% minimum) of the total samples shall be tested for soluble lead using the Toxicity Characteristic Leaching Procedures (TCLP), EPA Method 1311. TCLP analysis shall be performed on all samples equal to and/or exceeding a total lead concentration of 1,000 mg/kg. If no samples equal to and/or exceeding 1,000 mg/kg, samples with the highest total lead concentrations shall be selected and analyzed by TCLP to meet the minimum of 20% of the total number of samples.
- Four (4) (minimum of 10%) of the total samples shall be tested for soil pH using EPA Method 9045.
- For verification purposes, ten (10) of the total samples shall be analyzed for Title 22 metals. These samples are to be split between samples exhibiting the highest total lead concentrations.
- This is to verify that no other concern for heavy metal with the exception for lead exists at the project site. This test is in anticipation of the Regional Water Quality Control Board requirements for a Site Investigation involving the possibility of other metals, in the proposed excavation areas, other than ADL.

Therefore, this HASP was prepared for the use of onsite personnel while the following tasks are being conducted:

1. Driving To/From the Job Site (w/o trailer);
2. Soil sampling via hand auger and borehole abandonment; and
3. Oversight of soil sampling via direct push drilling.

Subcontractors are responsible for the development of their own HASP which at a minimum shall reference and be consistent with the requirements of Stantec's HASP. Stantec will review and accept the subcontractor's HASP prior to starting the field work. Subcontractors will operate their own equipment and direct push drilling JSAs included herein is for Stantec's oversight of sample collection.

The above-stated tasks will be conducted in a manner consistent with the methods and assumptions outlined in **TASK ORDER NO. 18**.

All work plans referenced in this HASP will be available for Stantec personnel on site. The field staff may also call the Project Manager, Kevin Miskin (909-224-3406), should they have any questions that are not specifically addressed in the HASP or in the Task Order.

## 4.0 Site Background, Potential Hazards and Mitigation Measures

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The Site background is described in the Task Order Request, dated November 25, 2014, and summarized below.

According to the Caltrans Task Order No. 18 request, the Measure R Highway Project proposes to upgrade the existing communication system to all fiber optic communication along the State Route 110 (SR110) corridor, from State Route 405 (SR405) at the south (PM 8.60) to Imperial Highway at the north (PM 13.97). The project also proposes to add cable at the SR105 interchange, install equipment at the SR105 interchange, install equipment at the East Los Angeles Hub and Los Angeles Regional Transportation Management Center, improve existing ramp metering, improve existing communications network from its current analog communication to digital communication and connecting the existing Transportation Management System (TMS) field elements, consisting of closed circuit television (CCTV) camera systems, to the fiber optic communication system and to upgrade the TMS field elements to be Internet Protocol (IP) ready.

The data from the site investigation will be used to evaluate the proper disposal and handling of the excavated soil generated during the construction activities and pursuant to the provisions in Stantec's Agreement 07A3321, and with the Task Order No. 18 request. Caltrans will use the analytical results from the investigation to perform the statistical analysis that will allow Caltrans to evaluate the data against the options of reusing the soil on-site and/or managing the excess soil for disposal.

### POTENTIAL HAZARDS

#### **Chemical:**

No historical reports were provided indicating that specific chemical hazards have been discovered at the Site during previous investigations. However, potential chemical hazards at this site may include:

- o Aerially deposited lead (ADL) and other heavy metals in soil.

#### **Physical:**

The project area is located along the shoulder and on-, off-ramps of SR110 from Redondo Beach Boulevard to the SR105 interchange. Other potential site specific hazards may include:

- o Traffic
  - Set cones up in your immediate work area to provide visibility to the vehicles traveling in the area of the work zone. Don't face your back to traffic.
  - Use the work vehicle as an added buffer for your work area (DO NOT BLOCK TRAFFIC), and consider a closure of the immediately adjacent lane with proper signage.
- o Wind/debris
  - Should weather conditions change and become a hindrance to performing the task safely, stop work and contact the project manager.
- o Heat

- Be sure to drink plenty of liquids, be sure your co-worker is drinking enough liquids. The site appears to have access to areas that do provide a lot of shade so be sure to take breaks to cool down.
- Trips/falls
  - To protect yourself, always look before you step. Work will be done around the highway and along the highway slopes under bridges. Take care walking and standing working in all areas of the site.
- Noise
  - The Site is adjacent to Highway lanes – wear the proper hearing protection if found to be necessary.
- PPE
  - Wear the proper PPE for the tasks involved – minimum: gloves, hard hat, safety glasses, steel toed boots, safety vest. Additional safety wear may need to be used if site conditions change.

## HAZARD MITIGATION

Attachment A provides information for on avoiding, monitoring and mitigating chemical and physical hazards, including general hazards that can potentially be encountered on any project site (earthquakes, bees, etc.). As described, proper hygiene and personal protective equipment (PPE) shall be required including,

- Washing hands before eating or smoking, and
- Donning hard hats, reflective high visibility vests, steel toed shoes, and disposable sampling gloves.

Project work will be near the lanes of a busy highway. Traffic control will be essential for safety. To improve worker safety, traffic warning signage, cones and truck flashers will be provided to alert drivers to workers along the shoulders. Traffic control will consist of the following elements:

- W21-5 "Shoulder Work" signs will be placed in the area ahead of each borehole. The signs will be moved as work progresses to assure that the signage follows the work. Signs will be placed appropriately to improve visibility to drivers.
- High visibility reflective cones will be placed along the pavement edge ahead of and next to the work area.
- Work trucks will have flashing yellow strobe lights and will be positioned, preferably at a slight diagonal to the pavement edge, as safety barriers between workers and oncoming traffic.

**Protect yourself, always look before you step and wear proper PPE for the task being performed.**

## 5.0 Journey Management Plan

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### PURPOSE

The purpose of this Journey Management Procedure (JMP) is to prevent losses associated with motor vehicle related incidents including: injuries to drivers, passengers and pedestrians, damage to motor vehicles and damage to third party property. By communicating potential safety risks before mobilizing to a site, a motor vehicle operator will be able to prepare for and avoid potential hazards.

This JMP applies to all vehicles assigned for the support of site operations, including company owned and personal use vehicles. This JMP does not apply to vendors (such as UPS, FedEx. etc.) not under contract with Stantec or their supplier. This JMP does not address hazards that are external to the site access/egress and on the onsite project operations.

### Site Specific JMP

#### **General Vehicle Hazards**

Highways approaching/near the project site are typically congested – allow extra time and space, slow down, and watch for vehicles.

#### **Site Specific Potential Vehicle Hazards**

Traffic and winds. Watch for debris along the roadway. Highway adjacent – watch for traffic. If parking along the shoulder, watch for traffic before exiting vehicle. Use the vehicle to provide a buffer between you and the traffic, where possible. Watch for dips, debris, bushes.

#### **Directions: Access to the Site**

The Site is located along the SR110 between Redondo Beach Boulevard and the SR105 interchange. Access may be gained along the highway. Access to the areas along the on-off-ramps will be evaluated in order to take the safest exit into the shoulder which may be in a location off the ramps but the sampling area accessed by walking to it. Cones should be carried to the work area.

#### **Directions: Leaving the Site**

#### **Site Specific Restrictions and Controls**

None noted

This Journey Management Plan is approved for use:

From: 11/26/2014	Time: 0500	To: 01/31/2015	Time: 1900
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Journey Management Plan Maintained by

Field Manager : Keith Posekian	Cell:760-914-2845
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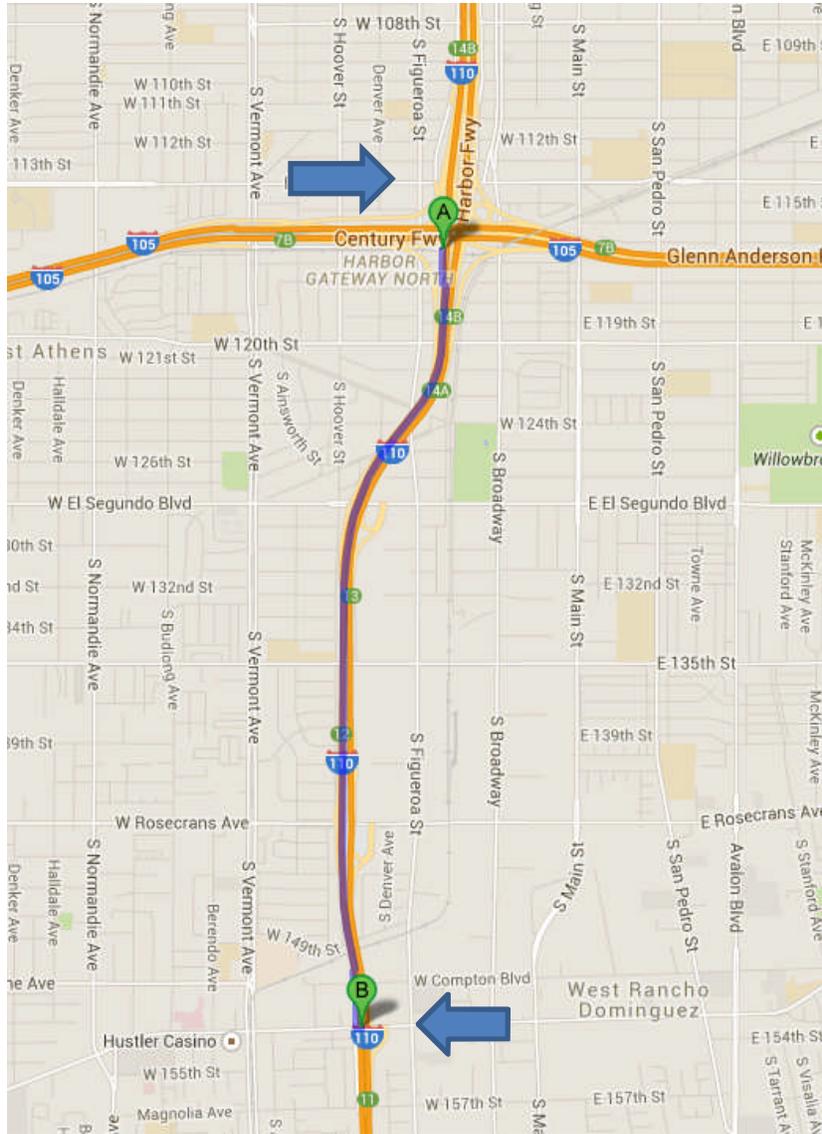
Contract Project Manager: Kevin Miskin	Cell: 909-224-3406
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Should an incident occur, refer to Attachment 5 for Stantec's procedures of notifications and reporting.

**SITE MAP/SKETCH**

It can be helpful in clarifying access/egress routes, parking and positioning of equipment, traffic cones and other delineators.

Site Sketch



The area of the ADL survey is approximately located between the two blue arrows on the figure above.

Access entry locations will vary at each of the ADL locations since they are not grouped together.

(Site view provided from Google Maps, 2014.)



## **Attachment A**

### **General Safety Information for ALL SITES**



## 1.0 General Safety Information

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### 1.1 Emergency Response Procedures: Evacuation

In the event of an on-site or off-site emergency requiring site evacuation (e.g., fire, release, explosion, etc), the following procedures will be followed:

- Stop Work and notify the SHSO.
- Evacuate the site and go to the emergency meeting location if safe conditions exist. The evacuation point is shown in the sketch below or following this page. If safe conditions prevent evacuation to this location, move upwind, away from the source of the emergency. Maintain a safe distance from the source.
- Check in with the SHSO at the emergency meeting location. The SHSO will take attendance once all personnel have gathered.
- Dial the appropriate emergency response number(s). State the problem clearly and completely and remain on the line until dismissed by the operator.
- Only attempt extinguishing small fires with portable dry chemical (A-B-C) extinguishers on-hand. When in doubt, emergency response personnel shall be notified.
- Do not reenter the emergency site without specific approval from emergency response personnel.

Randomly scheduled evacuation drills may be conducted at any time during field activities.

### 1.2 Emergency Response Procedures: Injury or Illness

If an injury or illness occurs, take the following action:

- Stop Work, stabilize the situation, and secure the site.
- Administer First Aid for the person immediately using a first aid and blood-borne pathogens kit.
- Determine if emergency response (fire/ambulance) is necessary. If so, call appropriate emergency response numbers on closest available phone. Provide the location of the injured person and other details as requested. Drive the individual to the hospital only if it makes sense.
- If emergency decontamination is required:
  - Immediately remove any contaminated personal protective equipment (PPE) or clothing. (EXCEPTION: if the person has been burned, only emergency medical services (EMS) personnel should remove any clothing)
  - If possible, wash contaminated area with mild soap and water.
  - Use eyewash station if necessary.
  - Personnel assisting the contaminated individual will don the proper PPE to avoid exposure.
- For all injuries or illness, even minor cuts, scratches, and bruises, notify the SHSO immediately. The SHSO is responsible for initiating incident reporting procedures immediately after the victim(s)/site have been stabilized. The SHSO will assume responsibility during a medical emergency until more qualified EMS personnel arrive at the site as needed.
- As promptly as possible following an injury or illness, the Project Manager or designee shall ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.4 for incident reporting procedures.

#### 1.2.1 Injuries or Illnesses Requiring Hospital Service WITHOUT Ambulance Service

Injuries or illnesses requiring hospital service without ambulance services include minor lacerations, minor sprains, etc. The following procedures will be taken immediately:

- The SHSO will ensure prompt transportation of the injured person to a physician or hospital.
- A representative of Stantec will always drive the injured employee to the medical facility and remain at the facility until the employee is ready to be discharged.
- If the driver of the vehicle is not familiar with directions to the hospital, a second person shall accompany the driver and the injured employee and navigate the route to the hospital.
- If it is necessary for the SHSO to accompany the injured employee, provisions will be made to have another employee, properly trained and certified in First Aid, to act as the temporary SHSO.
- If the injured employee is able to return to the job site the same day, he/she will bring a statement from the doctor containing such information as:
  - Date
  - Employee's name
  - Diagnosis
  - Date he/she is able to return to work, regular or light duty
  - Date he/she is to return to doctor for follow-up appointment, if necessary
  - Signature and address of doctor
- As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.4 for incident reporting procedures.

If the injured employee is unable to return to the job site the same day, the employee who transported him will bring this information back to the job site and report it to the Project Manager, office OSEC, Clint Reuter, Stantec's Practice and Risk Management (PRM), and their regional Human Resources Specialist.

### **1.2.2 Injuries or Illnesses Requiring Hospital Service WITH Ambulance Service**

Injuries or illnesses requiring transport by ambulance include life-threatening conditions such as severe head injuries, amputations, heart attacks, heat stroke, etc. The following procedures will be taken immediately:

- Call for ambulance service and notify the SHSO.
- Administer First Aid until ambulance service arrives or until relieved by EMS personnel.
- While the injured employee is being transported, the SHSO will contact the medical facility to be utilized.
- One designated representative will accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.
- As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.4 for incident reporting procedures.

### **1.2.3 Death of an Individual or Hospitalization of Three or More Employees**

The emergency response procedures above will be followed. If the injured person dies, follow the incident reporting procedures. PRM will notify the Human Resources Department, local officials and coroner immediately. Human Resources will notify the local OSHA\*\* office within 8 hours of a fatality or the hospitalization of three or more employees.

\*\*From this point forward in this document, the terms OSHA (i.e. federal Occupational Safety and Health Administration or FedOSHA) will be used interchangeably and shall be considered equivalent to the State of California Division of Occupational Safety and Health or CalOSHA.

### 1.3 Emergency Response Procedures: Spills or Cut Lines

Prevent problems by documenting the location of underground lines (e.g., product, sewer, electrical, gas, telephone, fiber optic) before starting site work. If a line or tank is drilled through, or a leak occurs, document the event as soon as possible using the Incident Investigation Report.

In the event of a spill/release, follow this plan:

- Stop Work, stabilize the situation, and secure the site.
- Stay upwind of the spill/release.
- Wear appropriate PPE.
- Turn off equipment and other sources of ignition, but only from a safe distance.
- Turn off pumps and shut valves to stop the flow/leak, but only from a safe distance.
- Plug the leak or collect drippings, when possible, if you can do this safely and within your level of training.
- Use sorbent pads to collect product and impede its flow, if possible and only if you can do it safely and within your level of training.
- Call Fire Department immediately if fire or explosion risk is involved (i.e. natural gas involved).
- Notify the SHSO to begin the incident reporting procedures. All spills/releases will be reported to the Client Project Manager within 24 hours.
- Determine if the client wants Stantec to repair the damage or if the client will use an emergency repair contractor of their choice.
- Based on agreements, contact emergency spill contractor for containment of free product. The contacts for this project will be the local fire department.
- Advise the client of spill discharge notification requirements and determine who will complete and submit forms. *(Do not submit or report to agencies without the client's consent.)* Document each interaction with the client and regulators and note, in writing; name, title, authorizations, refusals, decisions, and commitments to any action.
- Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soils/product may meet criteria for hazardous waste.
- Do not sign manifests as generator of wastes unless you have been given appropriate training and approval for signing on behalf of the generator; contact Project Manager or Waste Compliance Manager to discuss waste transportation.
- If the spill extends into waterways, the Coast Guard and the National Response Center shall be notified immediately by the client (or by the Stantec Project Manager with the client's permission).

The Project Manager will involve the client/generator in any Incident Investigation process. The client/generator is under obligation to report to the proper government agencies.

### 1.4 Incident Reporting Procedures

This section outlines the procedures that will be followed in the event of an incident. A flowchart and a table with necessary contact information (phone numbers, fax numbers, and email addresses) for incident reporting are also provided.

In the event of an incident:

1. Stop Work, stabilize the situation, and secure the site.
2. Report all incidents, injuries, spills, non-conformance events, permit exceedances and potential incidents (near losses) immediately to the SHSO, who will then notify the Stantec Project Manager. **If you are unsure whether or not something should be reported, Stop Work and proceed with notification anyway.**

3. The Stantec Project Manager will make internal notifications\* to the following:
  - Office OSEC
  - At least one Stantec Senior HSE Team Member (Clint Reuter, Keith Robinson);
  - The Account Manager (Jack Hardin)
  - **If a team member does not answer, leave a detailed message with a number at which you can be reached, and follow-up with another call later.**

\*Internal notification is a Stantec requirement. Internal reporting requirements were established primarily to provide a pathway for employees to obtain the assistance of company health and safety experts during an incident or significant near loss. Secondary to obtaining expert assistance, internal notification is required to help Stantec track injuries and near losses that occur to our employees. The data captured during the reporting process is then used to identify trends that can be pro-actively addressed to improve overall health and safety within our company. This helps everyone go home safely.

4. The Stantec Project Manager will obtain concurrence from at least one of Stantec's HSE Team Members and the Account Manager regarding Caltran's reporting requirements.
5. A: If the incident is determined to not be reportable to Caltrans, the SHSO, office OSEC, and Stantec Project Manager will submit an initial copy of the Stantec Incident Investigation/Near Loss Investigation (IINLI) report to Stantec's PRM group in Edmonton (via phone and fax), and Clint Reuter within 24 hours of the event. The final report is due within 5 business days.  
  
B: If the incident is determined to be reportable to Caltrans, the Stantec Project Manager and Account Manager will:
  - Notify Caltrans and also provide a written report of the incident on a Stantec IINLI form to Stantec's PRM group (via fax and phone), and Clint Reuter within 24 hours and a final report within 5 business days.

## Stantec Energy & Resources Incident Reporting

**Incident occurs:**  
 Stop work, stabilize the situation, secure the site & provide immediate care. Stantec employee or contractor must immediately report the incident the Stantec Project Lead. Injured personnel requiring medical attention will transport the injured person to medical care and remain until released.

**HSE TEAM:**

- Doug Schaefer (1-780-235-3557)  
[doug.schaefer@stantec.com](mailto:doug.schaefer@stantec.com)
- Tony Wong (1-805-234-6227)  
[tony.wong@stantec.com](mailto:tony.wong@stantec.com)
- Terry Arseneau (1-403-702-6686)  
[terry.arseneau@stantec.com](mailto:terry.arseneau@stantec.com)
- Scott Purves (1-403-542-9751)  
[scott.purves@stantec.com](mailto:scott.purves@stantec.com)
- Adam Taylor (1-403-585-3238)  
[adam.taylor@stantec.com](mailto:adam.taylor@stantec.com)
- Marty Ringen (1-780-862-3470)  
[marty.ringen@stantec.com](mailto:marty.ringen@stantec.com)
- Don Johnson (1-778-385-5846)  
[don.iohnson@stantec.com](mailto:don.iohnson@stantec.com)

Site Lead or Contractor Supervisor notifies Project Manager & Stantec Area HS Lead Verbal notification and email an **INCIDENT QUICK REPORT** notification within **1 hour**.  
**Client Reporting Schedule Starts (next Page)**

**Conference Call Review YES or NO**

**Senior Management Team 4-Hour HPI Flash Alert Notice Team (Email-description, classification & path forward)**

- Rocco Meraglia (1-403-619-9863)  
[rocco.meraglia@stantec.com](mailto:rocco.meraglia@stantec.com)
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[bob.seager@stantec.com](mailto:bob.seager@stantec.com)
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[kirk.morrison@stantec.com](mailto:kirk.morrison@stantec.com)
- Nick Poushinsky (1-250-413-7404)  
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- Tino Di Manno (403-716-8202)  
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- Peter Salusbury (1-778-837-0096)  
[peter.salusbury@stantec.com](mailto:peter.salusbury@stantec.com)



**YES**

**NO**

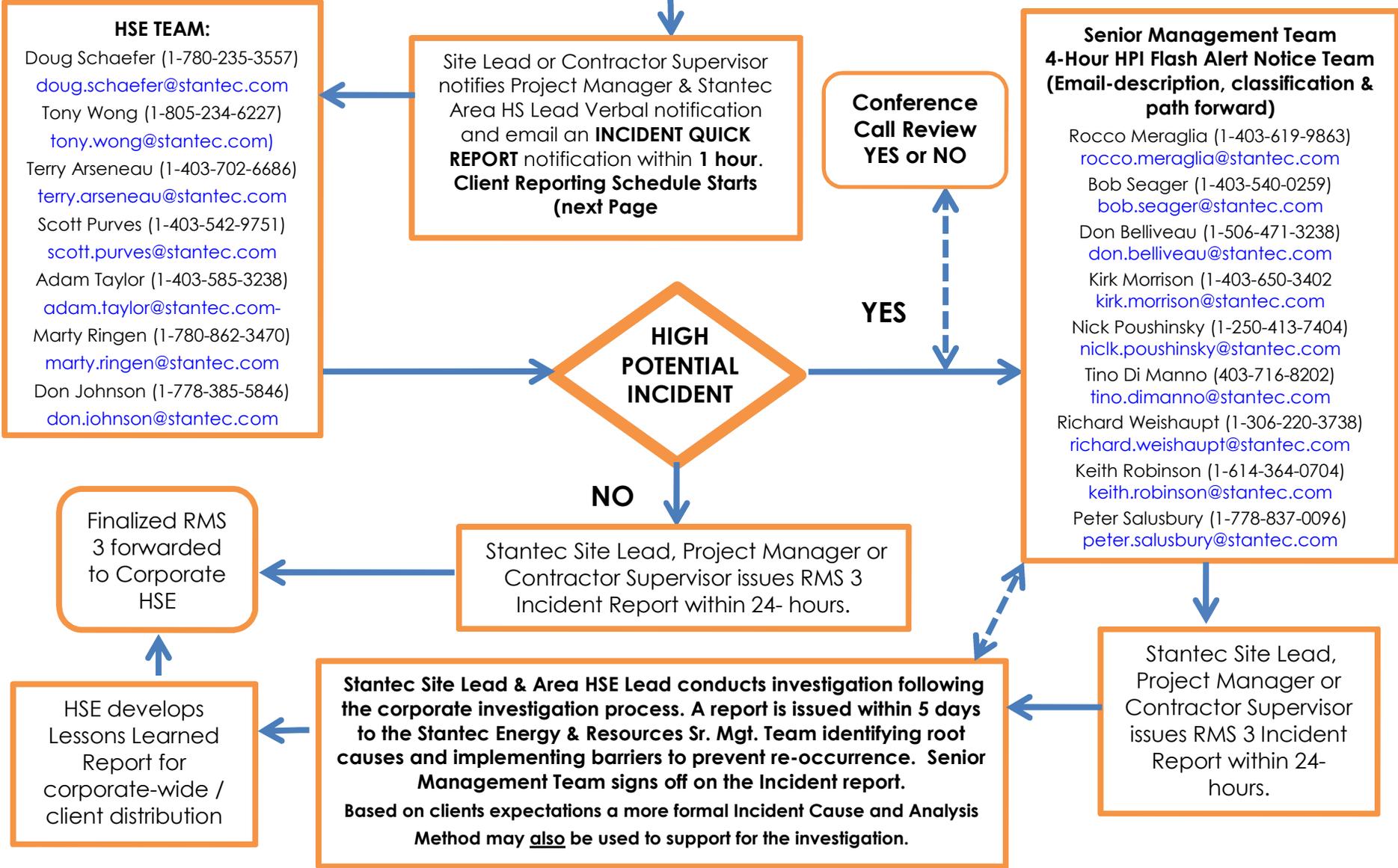
Stantec Site Lead, Project Manager or Contractor Supervisor issues RMS 3 Incident Report within 24- hours.

Stantec Site Lead, Project Manager or Contractor Supervisor issues RMS 3 Incident Report within 24- hours.

Stantec Site Lead & Area HSE Lead conducts investigation following the corporate investigation process. A report is issued within 5 days to the Stantec Energy & Resources Sr. Mgt. Team identifying root causes and implementing barriers to prevent re-occurrence. Senior Management Team signs off on the Incident report.  
 Based on clients expectations a more formal Incident Cause and Analysis Method may also be used to support for the investigation.

Finalized RMS 3 forwarded to Corporate HSE

HSE develops Lessons Learned Report for corporate-wide / client distribution



**Client Reporting Schedule  
“No client requirements”**

**Notifications**

**Stantec Account and HSE Support Contacts - notify within 1 hour**

See Project Team Phone Numbers for  
National Account Manager (NAM)  
Alternate NAM  
Health and Safety Coordinator

**Client - notify within 24 hours unless high potential (notify within 1 hour) :**

See Project Team Phone Numbers for  
Client

**Incident Investigation Report within 5 days**

See Project Team Phone Numbers for  
Client

Incident Type	Definition (Current Stantec Corporate Definitions)
<b>Report Only</b>	An employee needs to document a happening which may be relevant in the future. Examples include: witnessing an accident or a non work-related injury, an incident on a worksite not involving Stantec personnel, physical signs and symptoms related to workstation ergonomics and/or materials handling
<b>Incident</b>	Any unplanned event that adversely affects our employees, our business, its physical assets, the clients we serve, or the environment.
<b>Serious Incident</b>	Any work-related incident where there is property damage greater than \$5000, employee hospitalization, fatality, facility/site shutdown, or involves a third party (public). A near miss with the potential for any of the above consequences would also be considered a serious incident.
<b>Near-Miss</b>	Any event that could adversely affect our employees, our business, its physical assets, the customers we serve, or the environment, given any change in circumstances.
<b>Hazard Identification</b>	The identification of a condition or practice that has the potential for an incident or loss.
<b>Property Damage (Vehicle)</b>	Damage to any vehicle used for Stantec business, includes normal wear and tear (e.g. tire damage, minor scratches, stone chips to paint or windshield, mechanical wear), whether the vehicle is attended or not.
<b>Property Damage (Other)</b>	Damage to equipment, materials, etc., excluding vehicle damage.
<b>Theft</b>	Theft of any property under the care and control of Stantec.
<b>Non-compliance</b>	Where an employee or project is identified as operating outside the parameters of Stantec policy and/or legislative requirements.

Incident Type	Definition (Current Stantec Corporate Definitions)
<b>*Near Miss - Injury</b>	An employee reports physical symptoms related to work activities which have not yet resulted in treatment of any type, nor have they impacted the employee's working ability.
<b>First Aid</b>	An injury or illness requires first aid treatment only
<b>Medical Treatment</b>	Medical treatment above and beyond first aid, without loss of work time beyond the day of injury or illness.
<b>Restricted Work</b>	Change in job duties and/or shortened work day resulting from a work-related injury or illness, affecting the employee's ability to engage in one or more routine work activities (i.e. an activity carried out at least once per week).
<b>Lost Time</b>	Health care professional recommends one or more days away from work due to a work-related injury or illness.
<b>Fatality</b>	Work related fatality.
<b>Motor Vehicle Incident</b>	An incident involving a vehicle driven by an employee, whether on or off the road, that has resulted in damage to assets, the environment or Stantec's reputation, irrespective of cost or responsibility for cause. This does not include damage as a result of normal wear and tear (see Property Damage – Vehicle).
<b>Spill or Release</b>	Discharge of material or substance which is reportable to a third party such as a regulatory agency or a client, or which may expose an employee to a health risk.
<b>Contractor Recordable Injury</b>	Definitions as above, including Medical Aid – No Lost Time, Restricted Work, Lost Time or Fatality) but applied to a Stantec subcontractor.
<b>Fire / Explosion / Flood</b>	A natural or man-made hazard including fire, explosion or flood that causes damage or injury.
<b>Violence or Harassment</b>	Any act in which a person is abused, threatened, intimidated or assaulted in the course of their employment.
<b>3<sup>rd</sup> Party Incident</b>	Incident involves someone who is not party to the work being completed, but may be impacted. Example: Member of the public.
<b>Utility Strike</b>	Compromising or disrupting of service to buried and/or overhead utility service lines, municipal or third party owned utility services, UST system components and other subsurface property service lines or systems
<b>Work Refusal</b>	An employee has enacted their legislated Right to Refuse dangerous work.
<b>Stop Work Authority</b>	An employee has enacted Stantec's Stop Work Authority provisions upon observing the presence of unsafe conditions associated with Stantec work activities. All employees have the right to stop or refuse work when they perceive an immediate danger to their health and safety or that of their colleagues.
<b>High Potential Incident</b>	<p style="text-align: center;"><b>For Consideration</b></p> <p>A Near Miss, First Aid injury, Medical Aid injury, Modified Work injury or Lost Time injury can often have the potential to be a fatality or a Significant Injury with disability if the circumstances would have been slightly different. For example, a Lost Time incident due to a back soft tissue injury would only be counted as a Lost Time with low potential for a serious injury, whereas a First Aid incident involving a remotely operated machine striking a worker and imparting a small cut would be counted as a First Aid incident with high potential for a Fatality or a Significant Injury.</p> <p>Any incident with energy exchange that had the potential to be a Fatality or a Significant Injury if the circumstances would have been slightly different should be counted as High Potential; all others should be counted as low potential and reported as normal incidents (see above).</p> <p>In terms of Risk Assessment language when the exposure, probability and consequence of the hazard(s) that created the injury calculate to a High or Extreme Risk Level, the incident should be counted as a High Potential; all others should be counted as low potential.</p>

<b>Incident Type</b>	<b>Definition (Current Stantec Corporate Definitions)</b>
<b>Critical Risk Control</b>	<b>TBA</b> 1. Vehicles and Mobile Equipment 2. Hazardous Materials Management 3. Equipment Safeguarding 4. De-Energization, Isolation, Lock-Out, and Tagging 5. Working at Heights 6. Lifting Operations 7. Confined Space 8. Excavations and Trenching 9. Ergonomic & Manual Handling 10. Working on Ice or water 11. Wildlife Interactions

## 2.0 Potential Airborne Concerns and Air Monitoring Action Levels

\*\*NOTE: OSHA (federal) is used interchangeably and equally with California OSHA (CalOSHA) in this document.

The list below includes lead, TPH-oil, TPH-diesel, arsenic and volatile organic vapors.

Potential Airborne Concerns						
Chemical (Or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Warning Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/Target Organs
Lead	OSHA PEL: TWA 0.050 mg/m <sup>3</sup>	ACGIH TLV: TWA 0.050 mg/m <sup>3</sup>	A heavy, ductile, soft, gray solid	Inhalation, ingestion, skin and/or eye contact.	Effects of overexposure to lead - (1) Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can be fatal in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead can potentially adversely affect numerous body systems, and can cause forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.	See note below table

Potential Airborne Concerns						
Chemical (Or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Warning Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/Target Organs
TPHo	FedOSHA PEL 5 mg/m <sup>3</sup>  ACGIH TLV: TWA 5.0 mg/m <sup>3</sup>		Brown-to-black, oily liquid (used) Amber colored liquid with petroleum odor (new)	Inhalation, ingestion, skin and/or eye contact.	Slightly irritated noses, throats, and eyes, diarrhea, anemia and tremors, nausea. Irritated skin.	Respiratory system, skin epidermis.
TPH <sub>d</sub>	FedOSHA PEL and ACGIH TLV - 10 ppm Naphthalene  FedOSHA PEL and ACGIH TLV - 0.2 mg/m <sup>3</sup> total coal tar volatiles		Yellowish to light brown liquid	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Nausea, eye irritation, increased blood pressure, headache, light-headedness, loss of appetite, poor coordination, and difficulty concentrating. [Potential occupational carcinogen]	Kidneys, circulatory system
Benzene 1910.1028	FedOSHA PEL 1.0 ppm; FedOSHA STEL 5.0 ppm ACGIH TLV: TWA 0.5 ppm (skin)	NIOSH REL 0.1 ppm IDLH 500 ppm	Sweet, solvent odor.	Inhalation, dermal, ingestion, eyes.	Skin (dermatitis), eye, respiratory tract irritant, headache, dizziness, nausea.	Carcinogen, CNS, eye damage, bone marrow, blood, skin, leukemia.

Potential Airborne Concerns						
Chemical (Or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Warning Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/Target Organs
Toluene	FedOSHA PEL 200 ppm OSHA Ceiling 300 ppm ACGIH TLV: TWA 20 ppm	NIOSH REL 100 ppm ILDH 500 ppm	Sweet, pungent, benzene-like odor.	Inhalation, dermal, ingestion, eyes.	Skin (dermatitis) eye, respiratory tract irritant, headache, dizziness, weakness, and fatigue.	CNS, liver, kidneys, skin.
Ethylbenzene	FedOSHA PEL 100 ppm ACGIH TLV: TWA 20 ppm	NIOSH REL 100 ppm REL-STEL 125 ppm IDLH 800 ppm	Pungent aromatic odor.	Inhalation, dermal, ingestion, eyes.	Skin/eye/mucous membrane irritant, headache, dizziness, drowsiness.	Eyes, respiratory tract, skin, CNS, blood, kidneys, liver.
Total Xylenes	FedOSHA PEL 100 ppm  ACGIH TLV: TWA 100 ppm; 150 ppm STEL	NIOSH REL 100 ppm NIOSH REL 15 min STEL 100 ppm IDLH 900 ppm	Aromatic odor.	Inhalation, dermal, ingestion, eyes.	Throat and skin irritant (dermatitis), headache, nausea, drowsiness, fatigue.	Carcinogen, CNS, liver, kidneys, skin, gastrointestinal damage, eye damage.

Abbreviation	Explanation
<b>PEL</b>	Permissible Exposure Limit set by OSHA (8 hour time-weighted average/TWA)
<b>REL</b>	Recommended Exposure Limit (set by National Institute of Occupational Safety & Health-NIOSH)
<b>C</b>	Ceiling Limit (airborne concentration not to be exceeded for any period of time)
<b>STEL</b>	15-minute Short Term Exposure Limit
<b>IDLH</b>	Immediately Dangerous to Life or Health
<b>TWA</b>	8 hour time-weighted average (PEL, TLV, REL)
<b>TLV</b>	Threshold Limit Value set by the American Conference of Governmental Industrial Hygienists

	(ACGIH) 8 hr. TWA
<b>AIHA WEEL</b>	Workplace Environmental Exposure Level (set by the AIHA-American Industrial Hygiene Association)
<b>SKIN</b>	Skin Absorption is significant contributor to total exposure
<b>NIOSH</b>	National Institute for Occupation Safety and Health
<b>CNS</b>	Central Nervous System
<b>CVS</b>	Cardiovascular System

Chronic exposure to Lead (OSHA): Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

Potential damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead may also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead may impair the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

Air Monitoring Action Levels					
Chemical (Or Class)	Monitoring Equipment	Task	Monitoring Frequency/ Location	Level For Respirator Use	Level For Work Stoppage
Volatile Organic Vapors	PID as appropriate for chemicals of concern. Read manual to determine.	From start of mobilization to completion and demobilization.	<p>Sampling will be continuous during the project while disturbing potentially contaminated soil or uncovering/removing tanks and piping, or during drilling. At least every 15 minutes in the breathing zone.</p> <p>If there is a specific exclusion zone, sample at the exclusion zone boundaries every 30 minutes. Continuously sample during each soil sampling interval.</p>	<p>Respirator to be used will be full-face (or half) piece respirator with organic vapor/P-100 combination cartridges.</p> <p>The level for respirator use will be 5 ppm on the PID, sustained for two minutes. At donning respirator level, determine cause of exposure and implement engineering controls to reduce concentrations.</p>	<p>At 25 ppm total VOC in breathing zone with PID, Stop Work immediately.</p> <p>Continuously attempt to determine cause of exposure and usage of engineering controls to attempt to never reach the stop work level.</p>

- The Level for Respirator Use is the concentration at which a respirator will be put on; it does not require the job to stop. The respirator is a tool to be used while determining why the exposure has reached that concentration. Take action to reduce the concentration using engineering controls such as water mist, spray foam, plastic cover, etc.
- The Level for Work Stoppage is the concentration at which work activity on the job will cease. Determine why exposures have reached that concentration and how they can be reduced. Site evacuation is not necessary at this level. Implement engineering controls to reduce the concentration, and then resume work.
- Photoionization detectors (PIDs) are used for general hydrocarbon monitoring; an example would be benzene, toluene, ethylbenzene, and xylene, common on gasoline station sites. The PID typically uses either a 10.6 eV lamp (responds to pentane and higher hydrocarbons), or 11.7 eV lamp (responds to ethane [weakly], propane and higher hydrocarbons) to ionize and detect the gas. The PID will measure hydrocarbons that are ionized, and therefore is a screening device, not a chemical-specific measurement instrument.
- The Levels for Work Stoppage are based on measurements taken using PIDs calibrated with isobutylene; PIDs calibrated with gases other than isobutylene may have a different response factor.
- Action levels can be modified with particular knowledge of contaminants and site conditions.
- In the following cases, contact Clint Reuter for guidance on the air monitoring requirements.
  - When calibrating with a calibration gas other than isobutylene.
  - When requesting to modify the values above.
  - On sites impacted with chemicals other than petroleum products.

## 3.0 Other Potential Site Hazards

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### 3.1 Physical Hazards

Physical hazards may include traffic, uneven terrain, sharp debris, fencing, holes, noise, etc. Thusly, a constant awareness of one's location is paramount to your personal safety. However, knowing where you are, the level of noise produced by associated machinery and hearing protection may hinder your ability to hear vocal warnings. "Keep your head on a swivel" as the order of the day.

Be aware of the location of all of the equipment activities in your work area.

To protect yourself, always look before you step and wear proper PPE for the task being performed.

### 3.2 Weather and Natural Disasters

Hazards associated with weather and natural disasters may include, but are not limited to, effects of extreme heat (heat exhaustion, heat stroke), effects of extreme cold (hypothermia, frostbite), high winds, heavy rain, lightning, heavy snow, ice, earthquakes, landslides, flooding, etc.

The most likely hazards at the site are effects of extreme heat (heat exhaustion, heat stroke) and earthquakes.

To protect yourself from heat, perform the heaviest work during the coolest part of the day; drink plenty of cool water; wear light, loose-fitting, breathable clothing; and take frequent, short breaks in the shade. Certain medications, having a previous heat-related illness, and wearing PPE such as a respirator or protective suit can increase risk.

#### Heat Exhaustion

##### *What are the symptoms?*

**HEADACHES; DIZZINESS OR LIGHTEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN**

##### *What should you do?*

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

## Heat Stroke—A Medical Emergency

### *What are the symptoms?*

**DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE**

### *What should you do?*

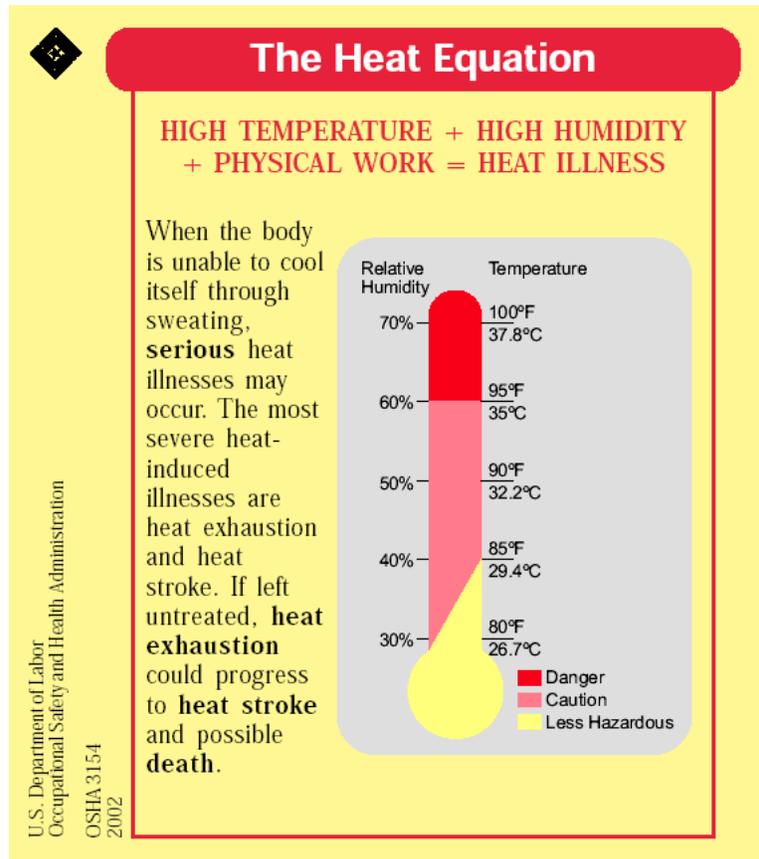
- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

### *How can you protect yourself and your coworkers?*

- Learn the signs and symptoms of heat-induced illnesses and how to respond.
- Train your workforce about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Build up tolerance to the heat and the work activity slowly. This usually takes about 2 weeks.
- Use the buddy system, with people working in pairs.
- Drink plenty of cool water, about a cup every 15 to 20 minutes.
- Wear light, loose-fitting, breathable clothing, such as cotton.
- Take frequent, short breaks in cool, shaded areas to allow the body to cool down.
- Avoid eating large meals before working in hot environments.
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk for heat illnesses.

### *What factors put you at increased risk?*

- Taking certain medications. Check with your health-care provider or pharmacist to see if any medicines you are taking affect you when working in hot environments.
- Having a previous heat-induced illness.
- Wearing personal protective equipment such as a respirator or protective suit.



## HEAT STRESS

### INTRODUCTION

Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress in employees engaged in such operations. Outdoor operations conducted in hot weather, such as construction, refining, asbestos removal, and hazardous waste site activities, especially those that require workers to wear semi-permeable or impermeable protective clothing, are also likely to cause heat stress among exposed workers.

### CAUSAL FACTORS

Age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or drugs, and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat. However, even the type of clothing worn must be considered. Prior heat injury predisposes an individual to additional injury. It is difficult to predict just who will be affected and when, because individual susceptibility varies. In addition, environmental factors include more than the ambient air temperature. Radiant heat, air movement, conduction, and relative humidity all affect an individual's response to heat.

### DEFINITIONS

The American Conference of Governmental Industrial Hygienists (2002) states that workers should not be permitted to work when their deep body temperature exceeds 100.4°F (38 °C).

**Heat** is a measure of energy in terms of quantity.

A **calorie** is the amount of heat required to raise 1 gram of water 1°C (based on a standard temperature of 16.5 to 17.5°).

**Conduction** is the transfer of heat between materials that contact each other. Heat passes from the warmer material to the cooler material. For example, a worker's skin can transfer heat to a contacting surface if that surface is cooler, and vice versa.

**Convection** is the transfer of heat in a moving fluid. Air can be described as a fluid. Air flowing past the body can cool the body if the air temperature is cool. On the other hand, air that exceeds 35°C (95°F) can increase the heat load on the body.

**Evaporative cooling** takes place when sweat evaporates from the skin. High humidity reduces the rate of evaporation and thus reduces the effectiveness of the body's primary cooling mechanism.

**Radiation** is the transfer of heat energy through space. A worker whose body temperature is greater than the temperature of the surrounding surfaces radiates heat to these surfaces. Hot surfaces and infrared light sources radiate heat that can increase the body's heat load.

**Globe temperature** is the temperature inside a blackened, hollow, thin copper globe.

**Metabolic heat** is a by-product of the body's activity.

**Natural wet bulb (NWB) temperature** is measured by exposing a wet sensor, such as a wet cotton wick fitted over the bulb of a thermometer, to the effects of evaporation and convection. The term natural refers to the movement of air around the sensor.

**Dry bulb (DB) temperature** is measured by a thermal sensor, such as an ordinary mercury-in-glass thermometer, that is shielded from direct radiant energy sources.

## HEAT DISORDERS AND HEALTH EFFECTS

### HEAT STROKE

Heat Stroke occurs when the body's system of temperature regulation fails and body temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. **Heat stroke is a medical emergency.** The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict. If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased (as long as the temperature of the air is less than 95° F) to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible.

The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment. Regardless of the worker's protests, no employee

suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

### **HEAT EXHAUSTION**

The signs and symptoms of heat exhaustion are headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment. Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, a real potential medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment and given fluid replacement. They should also be encouraged to get adequate rest.

### **HEAT CRAMPS**

Heat Cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused by both too much and too little salt. Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution ( $\pm 0.3\%$  NaCl), excess salt can build up in the body if the water lost through sweating is not replaced.

Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments. Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Studies have shown that drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

### **HEAT COLLAPSE**

Heat Collapse ("Fainting"). In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities. As a result, the exposed individual may lose consciousness. This reaction is similar to that of heat exhaustion and does not affect the body's heat balance. However, the onset of heat collapse is rapid and unpredictable. To prevent heat collapse, the worker should gradually become acclimatized to the hot environment.

### **HEAT RASHES**

Heat Rashes are the most common problem in hot work environments. "Prickly heat", as heat rashes are sometimes called, is manifested as red papules on the skin and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

### **HEAT FATIGUE**

A factor that predisposes an individual to heat fatigue is lack of acclimatization. The use of a program of acclimatization and training for work in hot environments is advisable. Acclimatization can take several weeks depending on the individual involved and the difference in temperature between the location from which the person is coming and the temperature to which he/she is going. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, mental, or vigilance

jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

### **CONTROL MEASURES FOR HEAT STRESS**

Ventilation, air-cooling, fans, shielding, and insulation are the five major types of engineering controls used to reduce heat stress in hot work environments. Heat reduction can also be achieved by using power assists and tools that reduce the physical demands placed on a worker.

However, for this approach to be successful, the metabolic effort required for the worker to use or operate these devices must be less than the effort required without them. Another method is to reduce the effort necessary to operate power assists. Workers should be allowed to take frequent rest breaks in a cooler environment.

### **ACCLIMATIZATION**

The human body can adapt to heat exposure to some extent. This physiological adaptation is called acclimatization. After a period of acclimatization, the same activity will produce fewer cardiovascular demands. The worker will sweat more efficiently (causing better evaporative cooling), and thus will more easily be able to maintain normal body temperatures.

### **FLUID REPLACEMENT**

Cool (50°-60°F) water or any cool liquid (except alcoholic beverages, tea and coffee) should be made available to workers to encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of liquids should be placed close to the work area. Although some commercial replacement drinks contain salt, this is not necessary for acclimatized individuals because most people add enough salt to their summer diets.

### **GENERAL VENTILATION**

General ventilation is used to dilute hot air with cooler air (generally cooler air that is brought in from the outside). This technique clearly works better in cooler climates than in hot ones. A permanently installed ventilation system usually handles large areas or entire buildings. Portable or local exhaust systems may be more effective or practical in smaller areas.

### **AIR TREATMENT/AIR COOLING**

Air treatment/air cooling differs from ventilation because it reduces the temperature of the air by removing heat (and sometimes humidity) from the air.

Air conditioning is a method of air-cooling, but it is expensive to install and operate. An alternative to air conditioning is the use of chillers to circulate cool water through heat exchangers over which air from the ventilation system is then passed; chillers are more efficient in cooler climates or in dry climates where evaporative cooling can be used.

Local air cooling can be effective in reducing air temperature in specific areas. Two methods have been used successfully in industrial settings. One type, cool rooms, can be used to enclose a specific workplace or to offer a recovery area near hot jobs. The second type is a portable blower with built-in air chiller. The main advantage of a blower, aside from portability, is minimal set-up time.

Another way to reduce heat stress is to increase the airflow or convection using fans, etc. in the work area (as long as the air temperature is less than the worker's skin temperature). Changes in air speed can help workers stay cooler by increasing both the convective heat exchange (the exchange between the skin surface and the surrounding air) and the rate of evaporation. Because this method does not actually cool the air, any increases in air speed must impact the worker directly to be effective.

If the outdoor air temperature (i.e. the dry bulb temperature) is higher than 95°F (35 °C) the hot air passing over the skin can actually make the worker hotter (i.e. add to the overall body heat load). When the temperature is >95°F and the air is dry, evaporative cooling may be improved by air movement, although this improvement will be offset by the convective heat. When the temperature exceeds 95°F and the relative humidity is 100%, air movement will make the worker hotter. Increases in air speed have no effect on the body temperature of workers wearing vapor-barrier clothing.

## **HEAT CONDUCTION**

Heat conduction methods include insulating the hot surface that generates the heat and changing the surface itself.

Simple engineering controls, such as shields, can be used to reduce radiant heat i.e. heat coming from hot surfaces within the worker's line of sight. Surfaces that exceed 95°F, and this is very common on hot summer days, are sources of infrared radiation that can add to the worker's heat load. Flat black surfaces absorb heat more than smooth, polished ones. Having cooler surfaces surrounding the worker, assists in cooling because the worker's body radiates heat toward them.

With some sources of radiation, such as heating pipes, it is possible to use both insulation and surface modifications to achieve a substantial reduction in radiant heat. Instead of reducing radiation from the source, shielding can be used to interrupt the path between the source and the worker. Polished surfaces make the best barriers, although special glass or metal mesh surfaces can be used if visibility is a problem.

Shields should be located so that they do not interfere with airflow, unless they are also being used to reduce convective heating. The reflective surface of the shield should be kept clean to maintain its effectiveness.

## **ADMINISTRATIVE CONTROLS/SAFE WORK PRACTICES**

Training is the key to good work practices. Unless all employees understand the reasons for using new, or changing old, work practices, the chances of such a program succeeding are greatly reduced. NIOSH (1986) states that a good heat stress training program should include least the following components:

- ♦ Knowledge of the hazards of heat stress;
- ♦ Recognition of predisposing factors, danger signs, and symptoms;
- ♦ Awareness of first-aid procedures for, and the potential health effects of, heat stroke and heat exhaustion;



- ♦ Employee responsibilities in avoiding heat stress;
- ♦ Dangers of using drugs, including therapeutic ones, and alcohol in hot work environments;
- ♦ Use of protective clothing and equipment; and
- ♦ Purpose and coverage of environmental and medical surveillance programs and the advantages of worker participation programs.

Hot jobs should be scheduled for the cooler part of the day when possible, and routine maintenance and repair work in hot areas should be scheduled for the cooler seasons of the year.

Measurement is often required of those environmental factors that most nearly correlate with deep body temperature and other physiological responses to heat. At the present time, the Wet Bulb Globe Temperature Index (WBGT) is the most used technique to measure these environmental factors. WBGT values are calculated by the following equations:

## WET BULB GLOBE TEMPERATURE INDEXES (WBGI)

Indoor or outdoors with no solar load

$$WBGT = 0.7NWB + 0.3GT$$

Outdoors with solar load

$$WBGT = 0.7NWB + 0.2GT + 0.1DB$$

Where: WBGT = Wet Bulb Globe Temperature Index  
NWB = Natural Wet Bulb Temperature  
DB = Dry Bulb (air) Temperature  
GT = Globe Thermometer Temperature

The determination of WBGT requires the use of a black globe thermometer, a natural (static) wet-bulb thermometer, and a dry-bulb thermometer. The measurement of environmental factors shall be performed as follows:

1. The range of the dry and the natural wet-bulb thermometers should be  $-5^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ , with an accuracy of  $\pm 0.5^{\circ}\text{C}$ . The dry bulb thermometer must be shielded from the sun and the other radiant surfaces of the environment without restricting the airflow around the bulb. The wick of the natural wet bulb thermometer should be kept wet with distilled water for at least one-half hour before the temperature reading is made. It is not enough to immerse the other end of the wick into a reservoir of distilled water and wait until the whole wick becomes wet by capillarity. The wick must be wetted by direct application of water from a syringe one-half hour before each reading. The wick must cover the bulb of the thermometer and an equal length of additional wick must cover the stem above the bulb. The wick should always be clean, and new wicks should be washed before using.
2. A globe thermometer, consisting of a 15 cm (6-inch) in diameter hollow copper sphere painted on the outside with a matte black finish, or equivalent, must be used. The bulb or sensor of a thermometer (range  $-5^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$  with an accuracy of  $\pm 0.5^{\circ}\text{C}$ ) must be fixed in the center of the sphere. The globe thermometer should be exposed at least 25 minutes before it is read.
3. A stand should be used to suspend the three thermometers so that they do not restrict free airflow around the bulbs and the wet-bulb and globe thermometer are not shaded.
4. It is permissible to use any other type of temperature sensor that gives a reading similar to that of a mercury thermometer under the same conditions.
5. The thermometers must be placed so that the readings are representative of the employee's work or rest areas, as appropriate.

Once the WBGT has been estimated, employers can estimate workers' metabolic heat load and use the ACGIH method to determine the appropriate work/rest regimen, clothing, and equipment to use to control the heat exposures of workers in their facilities.

## PERSONAL PROTECTIVE EQUIPMENT

### REFLECTIVE CLOTHING

Reflective clothing, which can vary from aprons and jackets to suits that completely enclose the worker from neck to feet, can stop the skin from absorbing radiant heat. However, since most reflective clothing does not allow air exchange through the garment, the reduction of radiant heat must more than offset the corresponding loss in evaporative cooling. For this reason, reflective clothing should be worn as loosely as possible. In situations where radiant heat is high, auxiliary-cooling systems can be used under the reflective clothing.

### AUXILIARY BODY COOLING

1. Commercially available **ice vests**, though heavy, may accommodate as many as 72 ice packets, which are usually filled with water. Carbon dioxide (dry ice) can also be used as a coolant. The cooling offered by ice packets lasts only 2 to 4 hours at moderate to heavy heat loads, and frequent replacement is necessary. However, ice vests do not encumber the worker and thus permit maximum mobility. Cooling with ice is also relatively inexpensive.

2. **Wetted clothing** is another simple and inexpensive personal cooling technique. It is effective when reflective or other impermeable protective clothing is worn. The clothing may be wetted terry cloth coveralls or wetted two-piece, whole-body cotton suits. This approach to auxiliary cooling can be quite effective under conditions of high temperature and low humidity, where evaporation from the wetted garment is not restricted.

3. **Water-cooled garments** range from a hood, which cools only the head, to vests and "long johns," which offer partial or complete body cooling. Use of this equipment requires a battery-driven circulating pump, liquid-ice coolant, and a container.

Although this system has the advantage of allowing wearer mobility, the weight of the components limits the amount of ice that can be carried and thus reduces the effective use time. The heat transfer rate in liquid cooling systems may limit their use to low-activity jobs; even in such jobs, their service time is only about 20 minutes per pound of cooling ice. To keep outside heat from melting the ice, an outer insulating jacket should be an integral part of these systems.

4. **Circulating air** is the most highly effective, as well as the most complicated, personal cooling system. By directing compressed air around the body from a supplied air system, both evaporative and convective cooling is improved. The greatest advantage occurs when circulating air is used with impermeable garments or double cotton overalls.

One type, used when respiratory protection is also necessary, forces exhaust air from a supplied-air hood ("bubble hood") around the neck and down inside an impermeable suit. The air then escapes through openings in the suit. Air can also be supplied directly to the suit without using a hood in three ways:

- by a single inlet;
- by a distribution tree; or
- by a perforated vest.

In addition, a vortex tube can be used to reduce the temperature of circulating air. The cooled air from this tube can be introduced either under the clothing or into a bubble hood. The use of a vortex tube separates the air stream into a hot and cold stream; these tubes also can be used to supply heat in cold climates. Circulating air, however, is noisy and requires a constant source of compressed air supplied through an attached air hose.

One problem with this system is the limited mobility of workers whose suits are attached to an air hose. Another is that of getting air to the work area itself. These systems should therefore be used in work areas where workers are not required to move around much or to climb. Another concern with these systems is that they can lead to dehydration. The cool, dry air feels comfortable and the worker may not realize that it is important to drink liquids frequently.

## RESPIRATOR USAGE

The use of any kind of respiratory protection device increases stress on a worker, and this stress contributes to overall heat stress. Chemical protective clothing such as totally encapsulating chemical protection suits will also add to the heat stress problem.

## SUMMARY

Heat stress offers significant challenges when work needs to be performed under hot ambient conditions. However, a well thought-out program can substantially reduce the chances of heat stress. A combination of engineering and administrative controls along with effective use of personal protective equipment can protect employees from suffering the effects of heat stress

## EARTHQUAKES

Earthquakes can last just a few seconds or as long as several minutes. Safety precautions include (as amended from [http://safety.lovetoknow.com/Earthquake\\_Safety\\_Precautions](http://safety.lovetoknow.com/Earthquake_Safety_Precautions)):

- Before an earthquake:
  - Store heavy items or glassware on low shelves so they do not become dangerous projectiles. Secure large equipment with straps, bolts, or other stabilizing methods.
  - Know the emergency meeting location at the site.
- During an earthquake:
  - Immediately seek a safe location such as in a doorway, beneath a table or desk, or along an interior wall away from windows or hazardous objects.
  - Cover the back of your head and your eyes to minimize injury from flying debris
  - Do not take elevators during an earthquake.
  - If outdoors, stay in open areas away from buildings, power lines, trees, and other potential hazards.
  - If driving, stop quickly but safely and stay in the vehicle. Do not stop near power lines, bridges, overpasses, or other potentially dangerous locations.
  - Stay calm and brace yourself to keep your balance. Sit if possible.
- After an earthquake:
  - Be prepared for aftershocks, which may be stronger than the initial jolt.
  - Administer First Aid and summon emergency assistance if necessary.
  - Wear PPE (boots, gloves) to avoid getting cut by broken glass.
  - Turn off gas, electricity, and water if damage is suspected or if advised to do so by authorities.
  - Be cautious opening cabinets, cupboards, and closets in case items are poised to fall.
  - Keep phone lines clear for emergency use.
  - Be patient: it may take hours or days to restore all services depending on the severity of the quake.

### 3.3 Biological Hazards

Biological hazards may include, but are not limited to, bees/wasps, spiders, snakes, stray dogs, rats and poisonous/allergenic plants.

#### Bee/Wasp Precautions

##### Purpose

Bees and similar organisms such as wasps, hornets and yellow jackets can cause significant injury, pain and/or discomfort during our work. This precaution has been developed to help avoid injury.

We can encounter these organisms during a number of our tasks such as:

- Opening well vault covers
- Opening core or sample boxes
- Performing O & M in system compounds
- Working in tall grass, weeds and brush
- Performing site assessments (indoors and outdoors)

#### Yellow Jackets

Yellow Jackets are found throughout the United States. Yellow Jackets feed on insects, spiders and a wide variety of other food items. They are medium-sized, stout-bodied, and black with bright yellow bands. Yellow-jackets construct globular paper nests, usually in underground cavities. Favorite nesting places include rodent burrows, compost piles and wall voids.



Yellow Jackets are scavengers and frequently are found foraging around compost piles and garbage receptacles. Their activity can be discouraged in the vicinity of patios, parks, picnic and other recreational areas by covering all food and disposing of waste in covered containers.

#### Paper Wasps

Paper wasps are about 1" in length, have a spindle-shaped body and are marked with a brown and yellow pattern. Paper wasps construct umbrella-shaped, single-layered nests with exposed cells. Nests may be built in trees and shrubs but frequently are found under building overhangs, in attics, barns, garages and sheds. These wasps are not considered overly aggressive and usually pose a threat only when their nests are disturbed. However, foraging wasps can cause considerable annoyance as they fly in and about entrances of buildings.



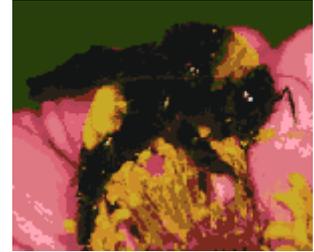
#### Honey Bees



Honey bees may become troublesome when they swarm or build colonies in or near residential areas. Honeybees occasionally invade homes and establish a colony, building combs of wax containing honey, pollen and brood in wall spaces. Once established, a colony is difficult to remove because it usually involves structural modification of the building. To be effective, the honey and wax should be removed along with the bees or the site will remain attractive to other swarms.

## Bumble Bees

These bees most commonly become a problem when they establish nests close to a sidewalk or near building foundations. Bumble bees are large, robust bees covered with dense black and yellow hairs. They commonly reach one inch in length. Bumble bees usually are not overly aggressive, but will sting if molested. To avoid confrontations with bumble bees, stay clear of patches of flowers visited by adults. These bees can be controlled by spraying or dusting insecticides into their nests. Retreatment may be necessary.



## What to do?

Naturally, there are many kinds of bees, and other insects for that matter, about which we should be concerned. The following are some good rules of thumb to keep in mind.

To mitigate hazards associated with bees/wasps:

- Avoid known locations of bees/wasps.
- Keep your eyes and ears open for swarms.
- Look for insects flying in and out of openings such as a crack in the wall, an open pipe end, or a well vault lid.
- Be cautious of tall grass as some bees build their hives at ground level.
- Be cautious of pointed structures, especially in barns, storage sheds, and outbuildings as bees often build hives in those structures.
- Avoid wearing citrus or floral aftershaves or perfumes as bees/wasps may be attracted to these odors.
- Wear light colored clothing as insects are generally attracted to dark colors.
- Fill in cracks or crevices and close open ends of pipes when bees/wasps are not around.
- Leave the area as quickly as possible if a nest has been disturbed. Do not retrieve nearby belongings. Do not stand still. Do not try to fight them.

If stung by a bee or wasp, wash the area with soap and water. If you have been stung over 15 times or are having symptoms other than pain and swelling, seek emergency medical assistance immediately. Staff that are allergic will carry an EpiPen® as prescribed by a doctor. The SHSO, OSEC and Project Manager should be made aware of this prior to the start of the project.

## Insect Sting Reactions

Insect sting reactions can be classified into three types - a normal reaction, a toxic reaction, and an allergic reaction. A normal reaction, lasts only a few hours, involves pain, redness, swelling, itching, and warmth at the site of the sting. A toxic reaction lasts for several days, results from multiple stings and causes muscle cramps, headache, fever, and drowsiness. An allergic reaction is similar to a toxic reaction but is triggered with only one sting.

An allergic reaction can involve one or more of the following: hives, itching, and swelling in areas other than the sting site; tightness in the chest and difficulty in breathing; a hoarse voice or swelling of the tongue; dizziness or a sharp drop in blood pressure; and unconsciousness or cardiac arrest.

## 4.0 Site Control and Safety Procedures

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Procedures described in this section are intended to aid Stantec personnel in mitigating site risks/hazards.

### Video Cameras

Prior to using a camera or other electronic recording devices on this site, all on-site personnel and/or visitors will obtain approval from the Project Manager.

### Daily Production Health and Safety Briefings

A safety meeting will be conducted twice daily and as needed at the site to discuss the health and safety issues for the activities to be conducted that day. The topics of the meeting will include, at a minimum, general health and safety procedures, reviewing health and safety policies and reviewing the job hazard analyses for the tasks to be conducted. Additional safety meetings may be conducted if the scope of work changes during the day, or if other health and safety issues are identified.

### Driving

- Review the Stantec Safe Driving Procedures provided on-site.
- Utilize the Journey Hazard Assessment Card to identify potential driving/journey/traffic hazards before each trip.
- Utilize the Daily Vehicle Checklist at least once a day for each vehicle driven for Stantec business to identify potential vehicle issues/hazards. Have each team member who will travel to/from the site review the site-specific Journey Management Plan (JMP) before traveling to identify routes of travel and potential driving/journey/traffic hazards. JMP(s) will be kept with each traveling employee throughout the entire course of travel.
- A Stantec Vehicle Collision Kit will be kept in every vehicle used for Stantec project work. A Stantec Vehicle Collision Kit is included in this HASP as Attachment 5.

### Drug and Alcohol Testing

Following an incident, Stantec will follow the incident reporting procedures. If appropriate, Stantec will include drug and alcohol testing, consistent with Stantec's Policies and Procedures, as well as the client's contractual requirements for testing.

### Exclusion Zone and Decontamination (as applicable)

No eating, drinking, or smoking or raw tobacco use is permitted within the exclusion zone. These activities will be conducted only in designated areas of the site. Use of PDAs, cell phones, pagers, or other electrical devices (with the exception of intrinsically safe devices) are prohibited in the exclusion zone. Personnel will properly decontaminate after leaving an exclusion zone. Decontamination procedures may involve disposing of Tyveks, latex gloves, etc. in a decontamination zone located immediately outside of the exclusion zone. At a minimum, personnel will wash any exposed skin before leaving a site using soap and water or pre-moistened cleansing towels. Stantec will evaluate the hazards and develop site-specific decontamination procedures to address the chemical hazards at each site. These procedures can be found in the job safety analyses.

### HASP Inspections



The site-specific HASP should be inspected in the field by the SHSO or other Stantec personnel to determine the effectiveness of the plan. Any deficiencies should be corrected and changes will be recorded on the HASP Modification Log.

#### Jewelry

Jewelry can be dangerous and shall not be worn during field activities. Large earrings, long necklaces, loose-fitting bracelets, rings, watches, etc. can become entangled in machinery and cause traumatic amputation of limbs, as well as be conductive of electricity.

#### Job Safety Analysis

Job Safety Analyses (JSAs) will be prepared or revised prior to mobilizing to the field. Applicable JSAs will be reviewed in detail on a daily basis by all affected on-site workers and/or visitors. Any revisions to the JSAs will be hand written into the JSAs, forwarded to the project manager, and communicated to during Daily Production Health and Safety Briefings. **JSAs are located in Attachment 2.**

#### Material Safety Data Sheets (a.k.a. Safety Data Sheets/GHS)

Material Safety Data Sheets (MSDSs) will be available in the Stantec HASP &/or in the sub-contractor's HASP for chemicals on site (including chemicals brought on site by on-site personnel and/or visitors).

#### Permits

The approved/signed Task Order for the project is the permit to work on Caltrans right-of-way and must be available onsite at all times.

#### Personal Protective Equipment

PPE is identified in JSAs. PPE listed in each JSA is specific to the task outlined in the JSA and is consistent with Appendix B of 29 CFR 1910.120. PPE is to be used in accordance with manufacturers' recommendations and employee training. Minimum PPE at the site includes steel toe/steel shank boots, high visibility work gloves, hi-viz safety vest, long sleeve shirt, pants, safety glasses with side shields, and a hard hat.

#### Pre-entry Briefing

All on-site workers and visitors will receive a pre-entry briefing prior to accessing work areas of the site. The briefing will include reviewing contents of the HASP, signing the Acknowledgement and Agreement Form. The briefing for visitors may be abbreviated to be fit-for-purpose based on the intent of the visit.

#### Public Questions and Press

Questions about the site posed by neighbors, the press, or other interested parties will be directed to the Caltrans Project Manager Samuel Yang (213) 897-4058.

#### Shutoff Valves/Switches

(IF NEEDED) The SHSO will identify the location of shutoff valves and switches for utilities and products on the Site Plan and disseminate this information to all site personnel and visitors as appropriate.

#### Site Access and Layout

Before mobilizing to the site for an event, the property owner(s) will be notified.

### Site Security

Security of our staff, subcontractors, equipment, and the public is of paramount importance to Stantec. Employees are trained in hazard recognition and will follow standard policies and procedures to report and mitigate site security issues/hazards if identified. Note that security consideration is different than traffic guidance and control, which also impacts security to some extent. Security refers to personal safety and freedom from theft or violence. The following items will be evaluated when considering security measures at the site:

- Recent criminal activity at the site and nearby areas (ask site owner/operator and the police);
- Work hours (security concerns may be different depending on the time of day); and
- Lighting at the site (thieves are generally dissuaded from stealing on well lighted sites).

Standard security measures will be implemented on site to minimize the potential for loss at the site. Standard security measures include properly maintained lighting, functioning locks for windows/doors/equipment storage areas, and maintaining control of tools and equipment when not in use. Security may be implemented in a variety of ways:

- Orange construction fence (minimal security);
- Chain link fencing;
- Extra lighting;
- Specialized locks; and/or
- Contract security.

### Traffic Guidance and Control

Incidents on sites have shown the need for a site-specific Traffic Guidance and Control Plan. The SHSO and project staff will develop a Traffic Guidance and Control Plan and disseminate this information to all site personnel. This plan will consider the amount of traffic at a site and provide for the safety of all workers. Equipment and resources to be considered as part of traffic guidance and control include:

- Vehicle hazard lights (tail and headlights)
- Cones/Delineators
- Placement of vehicles as barriers between workers and traffic
- Rotating amber hazard lights that can be placed on top of vehicles
- Signage advising drivers of shoulder work.

Other considerations for the Traffic Guidance and Control Plan include:

- Requiring personal vehicles (that aren't being used as barriers) to park as far away from potential traffic as possible.
- Cordoning off as much space as is necessary to ensure our safety.
- Identifying traffic flow routes and parking areas for heavy equipment (e.g., vacuum trucks, drill rigs, etc.) and establishing site speed limits.
- Reviewing local regulations for: formally developed traffic guidance and control plans signed by licensed individuals, police details, flagmen, hours of activity, closure of streets, etc.

### Work Hours

Work on this project will be conducted between the hours of 0700 to 1800.



Waste Management

**A. Waste Generation** (Type(s)/Quantities Expected):

Anticipated (YES/NO): **NO**

Types:  Liquid  Solid  Sludge  Other (describe) \_\_\_\_\_

Quantity (Expected Volume): \_\_\_\_\_

**B. Characteristics** (Expected):

Corrosive  Flammable/Combustible  Radioactive  Toxic

Reactive \_\_\_\_\_

Other (specify) \_\_\_\_\_

**C. Packaging Requirements for Waste Material** (Expected):

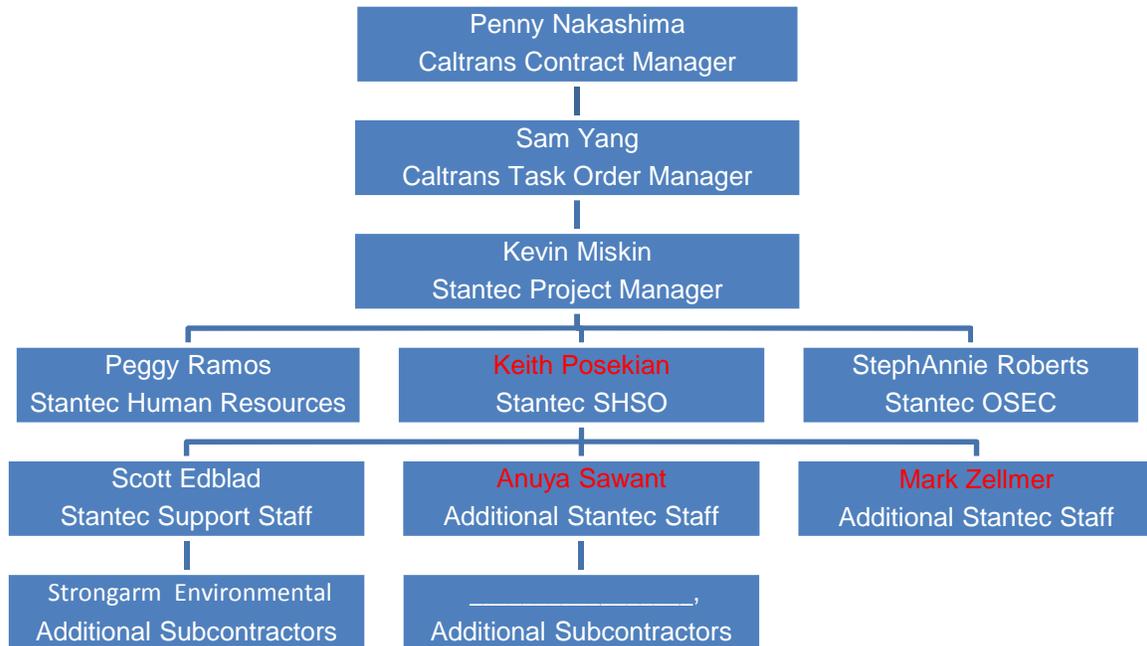
- DOT-approved Drums
- Baker Tanks (possibly tankers if trucked off-site) \_\_\_\_\_
- Lined Waste Bins \_\_\_\_\_
- Temporary Stockpile \_\_\_\_\_

**D. Disposal and/or Treatment Methods Proposed** (Expected):

As per the Task Order, for the shallow depth borings (5 feet and less), excess soil removed during this investigation will be placed back into the borings. For the deeper borings (greater than 5 feet), borings will be backfilled with a bentonite grout, emplaced by tremie pipe, poured in one continuous motion beginning at the bottom of the space to be grouted Pursuant to Contract 07A3321, Method 17d, the excess soils removed from the deeper borings will be spread around and nearby the borehole, provided that there is no evidence of hazardous waste. If soils are found to be hazardous or contaminated (staining or odors), then the IDW will be disposed as specified in Method 17a of Contract 07A3321. Belshire Environmental will be responsible for the categorization and transportation of all solid waste generated on this Site, if any. All materials will be disposed of or treated in accordance with federal, state and local regulations as selected and arranged by Stantec.

## 4.1 Organization and Responsibilities

An organization chart for project personnel is provided below.



A table summarizing responsibilities for project personnel is provided below.

Project Job Title	General Project Responsibilities
Stantec Project Manager	Overall financial and logistics. Contact client and subs to understand all hazards. Discuss with SHSO. Follow-up all incidents upon notice.
Stantec Site Health and Safety Officer	Conduct Site Safety Meeting (tailgate) and fieldwork in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.
Stantec Support/Project Staff	Assist Stantec Site Health and Safety Officer in implementing site scope of work
Stantec Business Unit Leader	Provide immediate support at notice of all incidents
Stantec Sr. Certified Industrial Hygienist	Respond with corporate resources to all incidents as appropriate. Assist in HASP review. Assist in incident investigation.
Stantec Human Resources	Assist with incident review, recordkeeping.
Stantec Office Safety and Environment Coordinator	Manage Health and Safety responsibilities for personnel in Office. Assist employees with setting up training and attending/completing necessary courses.
Caltrans Project Manager	Provide all known analytical data gathered by others and notice of hazards. Provide access to site and available emergency response capabilities.

**Attachment B**  
**Training Certificates**



# ***Certificate of Completion***

*Presented to*

**Keith Posekian**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

**Stantec Hazwoper Refresher Course v3, PS4 eLesson**

*Dated:* **07-13-2014**

A handwritten signature in blue ink, appearing to read 'L.O. SIMONS', written over two horizontal lines.



# ***Certificate of Completion***

*Presented to*

**Anuya Sawant**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

**Stantec Hazwoper Refresher Course v3, PS4 eLesson**

*Dated:* **07-23-2014**

A handwritten signature in blue ink, appearing to read 'Sawant', written over two horizontal lines.



# ***Certificate of Completion***

*Presented to*

**Mark Zellmer**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

**Stantec Hazwoper Refresher Course v3, PS4 eLesson**

**Dated: 5/31/2014**

A handwritten signature in blue ink, appearing to read 'D. Zellmer'.

*Senior Engineer*



# ***Certificate of Completion***

*Presented to*

**Scott Edblad**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

**Stantec Hazwoper Refresher Course v3, PS4 eLesson**

*Dated:* **2/18/2014**

  
\_\_\_\_\_  
Steven Dixon



ENVIRONMENTAL TRAINING AND COMPLIANCE

## CERTIFICATE OF COMPLETION

**OSHA 40-HOUR HAZARDOUS WASTE OPERATIONS WORKER**

**Maxwell Geissel**

has successfully completed ETAC's Health and Safety Training course, satisfying the OSHA & Cal OSHA Hazardous Waste Operations & Emergency Response Standards (HAZWOPER) [29 CFR 1910.120(e); and 8 CCR 5192(e)]. Hazard Communication Standard: Globalized Harmonized System 8 CCR 5194 & 29 CFR 1910.1200

Class Date: January 27-31, 2014

**Expiration Date: January 31, 2015**

Certificate # 34116

Joseph T. Thompson, MPH

2111 W. Crescent Ave., Suite B • Anaheim, CA. 92801 • Phone: 800-949-4473

# Safety Management Systems

Certificate Awarded to

**Frank Rodriguez**

has successfully completed

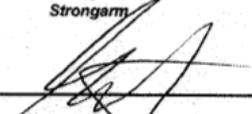
**Hazardous Waste Operations and Emergency Response  
Refresher**

*Certificate #140023*

Hazardous Waste Operations and Emergency Response Refresher  
Training as required by the Code of Federal Regulations 29, 1910.120 and the  
California Code of Regulations Title 8, 5192 on this day: **January 21, 2014**

*Strongarm*



  
\_\_\_\_\_  
**Gil Prieto**

[www.SafetyCat.com](http://www.SafetyCat.com), (714) 490-3816

Safety Management Systems, 5405 Alton Parkway, Suite 5A-549, Irvine, CA 92604:

## **Attachment 1**

### **Stantec Field Binder Checklist and Project Applicable Forms**

## Stantec Field Binder Checklist

INCLUDED			FORMS	Qty.	COMMENTS
YES	NO	N/A			
<b>PROJECT DOCUMENTS</b>					
			Kick-off Meeting Materials	1	
X			Task Order / Written Scope	1	
			Project Management Checklist	1	
X			Field and Safety Supplies Checklist	5	
X			Sampling Procedures	1	
X			Permits	1	
X			Traffic Control Plans	1	
<b>STANTEC ENVIRONMENTAL SERVICES SECTOR</b>					
<b>Field Notes and Logs</b>					
X			<a href="#">Site Observation Report</a>	20	
			Borehole/Well Construction Logs	10	
			Gauging Logs	5	
			Purge Groundwater Sampling Logs	10	
			Grab Groundwater Sample Log	10	
			Non-Aqueous Phase Liquid Bailing Sheets	5	
			O&M Field Data Log	20	
X			Waste Management Form	10	
<b>Oil &amp; Gas Subsector</b>					
<b>HSE Monitoring</b>					
X			Equipment Calibration Sheet	5	
			Air Monitoring Logs	10	
X			HSE Opportunity Card	5	
			SAFE Observation Remedial System	1	
			SAFE Observation Emergency Drill	1	
			SAFE Observation Groundwater	1	
			SAFE Observation Drilling	1	
			SAFE Observation Excavation	1	
			SAFE Observation Heavy Equipment	1	
<b>STANTEC CORPORATE HEALTH SAFETY AND ENVIRONMENT</b>					
<b>Hazard Assessment</b>					
X			<a href="#">RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day</a>	20	
X			<a href="#">RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 5 days</a>	10	
X			<a href="#">RMS 7 - Quantified Hazard Assessment</a>	1	
X			SWP 102a - Workplace Violence	1	



## Stantec Field Binder Checklist

INCLUDED			FORMS	Qty.	COMMENTS
YES	NO	N/A			
			Inspection Form		
X			SWP 105a - Hazard Assessment for PPE Assessment Form	1	
<b>HSE Monitoring and Incident Report</b>					
X			<a href="#">RMS 5 - Worksite Inspection - Field</a>	1	
X			<a href="#">RMS 3 - Incident Report</a>	1	
<b>Driving Safety and JMP</b>					
X			<a href="#">SWP 124a - Vehicle Pre-Use Checklist</a>	20	
			<a href="#">SWP 124b - Journey Management Plan</a>	1	
<b>Ground Disturbance</b>					
X			<a href="#">SWP 213a - Pre-Ground Disturbance Worksheet Approval</a>	3	
X			<a href="#">SWP 213c - Site Management and Post-Disturbance Checklist</a>	3	
X			<a href="#">SWP 213d - Backfill Inspection Form</a>	1	
<b>Electrical Work</b>					
			<a href="#">SWP 406a - Electrical Job Brief Hazard Assessment</a>	1	
			<a href="#">SWP 406b - Energized Work Permit</a>	1	
			<a href="#">SWP 408a - LTT Permit</a>	1	
			<a href="#">SWP 408b - Emergency LTT Removal</a>	1	
			<a href="#">SWP 408c - LTT Periodic Audit</a>	1	
<b>Confined Space</b>					
			<a href="#">SWP 411a - Confined Space Entry Permit</a>	1	
			<a href="#">SWP 411b - Alternate Entry Permit</a>	1	
<b>Lifting Operations</b>					
			<a href="#">SWP 217a - Forklift Pre-Operational Checklist</a>	1	
<b>CLIENT-SPECIFIC DOCUMENTS</b>					
<b>Caltrans</b>					
X			Signed Task Order Contract	1	
Instructions: Review your Stantec Field Binder prior to starting work and ensure applicable contents are included. Sign and date the checklist. Your signature indicates your acknowledgement that you will maintain the field binder with forms required for your work.					
Signature					Date:



## WORK SITE INSPECTION FIELD – RMS 5

Department: \_\_\_\_\_

Business Centre: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Purpose: To identify hazards in the field where Stantec personnel are working.

Responsibility: The Project Manager will determine how often work site inspections are required. OSEC will assist.

NOTE: for pre-use vehicle inspection, record inspection on SWP 124a – Vehicle Pre-Use Checklist.

	Status			Severity Ranking			Repeat Item (Y or blank)	Action Required (incl. champion's name)	Date Done
	Okay	Needs Work	N/A	A	B	C			
<b>HSE Documentation</b>									
Rms1 – hazard assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Health and Safety Plan (HASP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Toolbox meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Permits (e.g. work, confined space, hot work, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Clearances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Training requirements met	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Safe Work Practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Inspection forms (e.g. ladder, chainsaw, client-specific excavation, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Emergency Preparedness</b>									
Emergency Response Plan current & available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Muster point	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
First aid kit stocked/available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Emergency eyewash available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
First aid providers on-site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Fire extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Communication available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Spill response kit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Protective Equipment</b>									
Hard hats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Safety glasses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Hearing protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
High visibility vests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Proper work gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Safety boots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
18" PVC orange traffic cones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Road signs as required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

A – Major – Includes potential for serious incident or illness, hospitalization, permanent disability, fatality or extensive property damage

B – Moderate – Includes potential for lost-time injury or illness, temporary disability or considerable property damage

C – Minor – Includes potential for first aid injury, minor illness, no lost time or limited property damage

Last Updated: September 12, 2014

**Printed copy uncontrolled—current version on StanNet**

Document Owner: HSE

Page 1 of 3

	Status			Severity Ranking			Repeat Item (Y or blank)	Action Required (incl. champion's name)	Date Done
	Okay	Needs Work	N/A	A	B	C			
Fall arrest/restraint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Personal floatation device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Tools and Equipment</b>									
Maintenance – tools in good condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Used properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Appropriate for job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Stored and/or secured safely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Lockout system established	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Clearance from panels/overhead wires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Guards in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Chemicals</b>									
Controlled products labeled properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Stored properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
MSDS available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
TDG compliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Site</b>									
Parking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Accessibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Work area demarcated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Visibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Slipping and tripping hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Overhead hazards identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Buried utilities located/marked and exposed by hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Pits/excavations barricaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Excavation/Trench supports/slope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Traffic hazards controlled (including pedestrian walkways)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>Environment</b>									
Sensitive areas identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Noise levels (< /= 84dBA – 8hr shift; 82dBA – 12hr shift)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

A – Major – Includes potential for serious incident or illness, hospitalization, permanent disability, fatality or extensive property damage

B – Moderate – Includes potential for lost-time injury or illness, temporary disability or considerable property damage

C – Minor – Includes potential for first aid injury, minor illness, no lost time or limited property damage

	Status			Severity Ranking			Repeat Item (Y or blank)	Action Required (incl. champion's name)	Date Done
	Okay	Needs Work	N/A	A	B	C			
Chemical hazards identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Working near water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Heat/Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Gas, fumes, dusts, vapors, asbestos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Ventilation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Confined space (including monitor and attendant(s))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<b>General (including Buildings/Trailers)</b>									
Exits marked and accessible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Stairs and walkways clean and dry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Handrails sturdy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Emergency lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
General housekeeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Body positioning, ergonomics (resources available on StanNet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Other: Specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

Prepared by: \_\_\_\_\_  
Signature
Date

Approved by: \_\_\_\_\_  
Signature (Project Manager)
Date

Original Copy: Project Files  
Copies: OSEC & Field Files

A – Major – Includes potential for serious incident or illness, hospitalization, permanent disability, fatality or extensive property damage  
B – Moderate – Includes potential for lost-time injury or illness, temporary disability or considerable property damage  
C – Minor – Includes potential for first aid injury, minor illness, no lost time or limited property damage

A proactive approach to safety requires systematic analysis of the tasks each occupation is required to perform regularly. The objectives of this hazard assessment process are to review and quantify the risk inherent in each task, to assess the effectiveness of existing controls and to develop new controls if necessary. Tasks with high levels of inherent risk are *critical tasks*, and require detailed and stringent controls. It is important that the people who perform the tasks are involved in this analysis, as their experience and knowledge are essential to the process. The controls identified and created should be used as tools for training and orienting new employees and contractors.

Using the attached risk matrix rate each task using severity and likelihood. Once this evaluation is complete, critical tasks will be identified and the existing controls evaluated.

#### Instructions:

1. List all the tasks that are completed as part of the job, even if they are not daily occurrences.
2. List the hazards associated with completing the task (consider hazard categories: chemical, physical, ergonomic, biological or environmental).
3. Using the attached Risk Matrix, use Tables 1 and 2 to determine the severity and likelihood rating for each task.
4. Determine the Risk Ranking according to the coloured Risk Matrix.
5. Using Table 3, tasks which are ranked A or B require immediate/prompt attention, and may be considered critical tasks. Critical tasks require further hazard analysis and assessment of controls.
6. As a baseline for the organization as a whole, a [critical task inventory](#) has been created for Stantec operations. Please [contact](#) your Regional Safety and Environment Coordinator (RSEC) for information and guidance.



## RMS7 – QUANTIFIED HAZARD ASSESSMENT - TASK INVENTORY

TASK INVENTORY		Date:		
Occupation:		Name:		
Task	Hazards	Severity (1 to 4)	Likelihood (1 to 4)	Risk Level (A to D)
<i>Example: Vehicle Operation</i>	<i>Other drivers, poor vehicle maintenance, loose objects in the cab, animals, fatigue, weather conditions, darkness, inexperience, distractions</i>	4	3	A

Controls Required to Mitigate Identified Risks to an Acceptable Level		
1.	4.	7.
2.	5.	8.
3.	6.	9.

## RMS7 – QUANTIFIED HAZARD ASSESSMENT – RISK MATRIX

<b>LIKELIHOOD</b>	4	C	B	A	A
	3	C	B	B	A
	2	D	C	B	B
	1	D	D	C	C
		1	2	3	4
<b>SEVERITY</b>					

Severity Level	People Impacts	Property Impacts	Liability/Cash Flow Impacts	Environmental Impacts
1	<b>Minor Injury</b> (first aid only – may have to see doctor)	<b>Minor</b> operational upset or damage to equipment. Total loss less than \$10,000	<b>Minor</b> Third party damage claim. Total loss less than \$10,000	<b>Incidental</b> Release with incidental or insignificant effects within facility.
2	<b>Medical Treatment Case</b> (had to see doctor AND get treatment)	<b>Moderate</b> operational upset and/or equipment damage. Total loss between \$10,000 and \$50,000	<b>Moderate</b> Third party damage claim/lawsuit. Total loss between \$10,000 and \$50,000	<b>Minor</b> Release within or outside fence with known consequences. Localized effect with mild environmental effects. Requires reporting to regulatory authorities.
3	<b>Serious Injury</b> (Modified Work, Away from Work and/or Long Term Disability)	<b>Major</b> operational upset and/or equipment damage. Total loss between \$50,000 and \$150,000	<b>Major</b> Civil charges laid against company or employees. Lawsuit anticipated. Total loss between \$50,000 and \$150,000	<b>Adverse</b> Release outside fence with known detrimental effects. Requires response from outside agencies (Hazmat units, police, and fire department)
4	<b>Death</b> (to 1 or more people)	<b>Critical</b> major damages or complete loss to essential equipment. Total loss more than \$150,000	<b>Critical</b> Criminal charges laid against company or employees. Operation of site or operation halted by regulatory agency. Company-wide negative effects to operations. Lawsuit anticipated. Total loss more than \$150,000.	<b>Serious</b> Release outside fence with known detrimental effects. Requires an ongoing cleanup requiring significant resources. Regulatory or other charges are possible.

**Table 2: Probability Result Criteria**

Likelihood Level	Result Criteria (where Likelihood = Frequency x Probability)
4	<p><b>Constant.</b> Constant or continuous exposure to the risk. Task or activity is performed or may occur daily on a continuing basis.</p> <p><b>High</b> probability of <b>RISK resulting in incident.</b> Incident is certain to occur, risk not fully controlled. Expected – occurs often as part of the process.</p>
3	<p><b>Frequently.</b> Regular exposure to the risk. Task or activity is performed or may occur once per week or more.</p> <p><b>Moderate</b> probability of <b>RISK resulting in incident.</b> Incidents happen, risk not fully eliminated. <b>POSSIBLE – KNOWN TO OCCUR DURING THE PROCESS.</b></p>
2	<p><b>Occasionally.</b> Low frequency of exposure to the risk. Task or activity is performed or may occur two or three times per month.</p> <p><b>Low</b> probability of <b>RISK resulting in incident.</b> Occurrence is not likely but may have occurred in the past. Unusual – known to occur occasionally but not normally anticipated.</p>
1	<p><b>Seldom.</b> Very low frequency of exposure to the risk. Task or activity performed or may occur once per month or less.</p> <p><b>Extremely Low</b> probability of <b>RISK resulting in incident.</b> Occurrence very unlikely and may not have occurred in the past.</p>

**Table 3: Required Action For Each Risk Level**

Risk Level	Category	Action Required
<b>A</b>	Unacceptable	Must be mitigated with appropriate controls to a risk ranking of C or D immediately.
<b>B</b>	Undesirable	Must be mitigated with appropriate controls to a risk ranking of C or D as soon as possible.
<b>C</b>	Acceptable with Controls	Risk mitigation to risk ranking of Dis optional; procedures and controls must be verified.
<b>D</b>	Acceptable as is	No risk mitigation required.

**HEALTH, SAFETY AND ENVIRONMENT  
SAFE WORK PRACTICE  
PRE-GROUND DISTURBANCE WORKSHEET & APPROVAL FORM  
SWP-213a**



*\* Form to be completed by Project Manager or Designate*

Section One: Project Information			
Project Number:	Project Name:		
Project Manager:			
Client:			
Location:			
Planned Excavation Method:	<input type="checkbox"/> Mechanical	<input type="checkbox"/> Hand	Planned Excavation Depth: <input type="checkbox"/> <30 cm / 1 ft and/or <input type="checkbox"/> >30cm / 1 ft
Work Description: (provide detail information as to what work is planned and how it will be executed):			
Information provided/completed by: <input type="checkbox"/> Client <input type="checkbox"/> Stantec			
Section Two: Utilities Location and Verification			
1. Review location description provided by client.	Yes <input type="checkbox"/>	(circle all that apply) Green Field / Brown Field / White Zone / Other	
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
2. Identify and confirm land use.	Yes <input type="checkbox"/>	(circle all that apply) Ag Land / Urban / Municipal Urban / Native Forest / Industrial	
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3a. Full-sweep line locate required	Yes <input type="checkbox"/>		
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3b. Point-specific line locates	Yes <input type="checkbox"/>		
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3c. Quote required and authorized (prior to location activities started)	Yes <input type="checkbox"/>	Provided by: Client Name:	Date:
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
4. Utility locates have been performed by public utility company(s) within required timeframe. Locates are clear/visible.	Yes <input type="checkbox"/>	Contact Date:	Ticket Number:
		Contact Person:	Alternate Contact:
		Proposed Meet Date:	Meet Time:
*for multiple utility companies, please note dates and contact information using questions 5-15	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
			Ticket Expiration Date:
5. Private locate company has been contacted and is an approved utility locating contractor. <i>Markings are clear and visible.</i>	Yes <input type="checkbox"/>	Contact Name:	
		Contact Number:	Meet Date: Meet Time:
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:

**HEALTH, SAFETY AND ENVIRONMENT  
SAFE WORK PRACTICE  
PRE-GROUND DISTURBANCE WORKSHEET & APPROVAL FORM  
SWP-213a**



<p>6. Site access/permission has been secured. <i>Land owner/tenant has been contacted.</i></p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>Land Owner Name: _____</p> <p>Permit/Authorization Number: _____</p> <p>Land Agent Name: _____</p> <p><i>* Attach Access Agreement and Permit Authorization</i></p> <p>N/A <input type="checkbox"/> Justification: _____</p>	<p>Contact Number: _____</p> <p>Contact Number: _____</p>
<p>7. Work discussed with owner/tenant.</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>Owner Name: _____</p> <p>N/A <input type="checkbox"/> Justification: _____</p>	<p>Tenant Name: _____</p>
<p>8a. All crossing agreements for third party and owner facilities are in place and conditions have been met.</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>Crossing or proximity agreements:</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p><i>* Attach crossing agreements with conditions</i></p> <p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>8b. Have third party line owners been given 48 hours' notice to crossing or encroachment?</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>9. Is owner's representative required to be present when exposing or excavating near/across lines?</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>10a. Reviewed site information to identify subsurface structures relevant to planned site activities. <i>Review easements, right of ways, historical plot plans, previous site investigation, soil surveys, boring logs, etc.</i></p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p><i>Check all that apply:</i></p> <p><input type="checkbox"/> 3rd party identified</p> <p><input type="checkbox"/> Recent low pressure plots reviewed?</p> <p><input type="checkbox"/> Land Standing Report reviewed?</p> <p>N/A <input type="checkbox"/> Justification: _____</p>	<p><input type="checkbox"/> Recent high pressure plots reviewed?</p> <p><input type="checkbox"/> Land title search reviewed?</p> <p><input type="checkbox"/> Previous Site Investigations?</p> <p><input type="checkbox"/> Other</p>
<p>10b. Most recent as-built drawings and/or site plans surveys obtained. <i>Including UST, product and vent lines, building layout.</i></p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>10c. Municipal utilities drawings.</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>11. All applicable local, provincial and federal permits have been obtained.</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<p>Local/City Permit Number: _____</p> <p>Other: _____</p> <p><i>* Copy attached and on site</i></p> <p>N/A <input type="checkbox"/> Justification: _____</p>	<p>Provincial/State Permit Number: _____</p> <p>Other: _____</p>
<b>Approval to Proceed with Field Activities</b>			
<b>Client Approval:</b>			
Print Name: _____	Signature: _____	Date: _____	
<b>Project Manager/Designate Approval:</b>			
Print Name: _____	Signature: _____	Date: _____	

HEALTH, SAFETY AND ENVIRONMENT  
**SAFE WORK PRACTICE**  
**GROUND DISTURBANCE FORM**  
**SWP-213b**



Ground Disturbance Form

Field Activity				
1. Copy of current locates and drawings on site.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
2. All site personnel involved in ground disturbance activities have been briefed on clearance protocols, line locations and signed off on work plan	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3a. Work area is secured.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3b. Site work permits have been obtained.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3c. Emergency shut-off switch is located for all impacted equipment.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3d. Fire extinguishers/warning sign/barriers are present.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3e. Signage in place for overhead power lines.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Justification:
3f. Specify other safety equipment as needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Location of area lights/signs and associated subsurface lines identified.	Yes <input type="checkbox"/>	Located by:	Phone:	Date:
Ticket/Confirmation No:	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Company/Utility:	
5a. Location of all telecommunication and associated subsurface lines identified.	Yes <input type="checkbox"/>	Located by:	Phone:	Date:
Ticket/Confirmation No:	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Company/Utility:	
5b. Fiber optic lines identified.	Yes <input type="checkbox"/>	Located by:	Phone:	Date:
Ticket/Confirmation No:	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Company/Utility:	
6. Location of drains and associated inter-connecting lines identified.	Yes <input type="checkbox"/>	Located by:	Phone:	Date:
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Company/Utility:	
7. Location of all electrical junction boxes and associated interconnecting lines identified.	Yes <input type="checkbox"/>	Located by:	Phone:	Date:
	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Company/Utility:	
	Status: Live <input type="checkbox"/>	Shut-off and locked out <input type="checkbox"/>	Removed from service <input type="checkbox"/>	
	Confirmation of status: Name:			Date:
* Maintain minimum safe distance of > 7 m/23 ft.				

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<p>8. Location of natural gas meters or connections and all interconnecting lines identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Located by: _____ Company/Utility: _____ N/A <input type="checkbox"/> Justification: _____ Status: Live <input type="checkbox"/> Shut-off and locked out <input type="checkbox"/> Removed from service <input type="checkbox"/> Confirmation of status: Name: _____</p>	<p>Phone: _____ Date: _____ Date: _____</p>
<p>9. Location of Cable lines.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Located by: _____ Company/Utility: _____ N/A <input type="checkbox"/> Justification: _____</p>	<p>Phone: _____ Date: _____</p>
<p>10. Location of Water lines.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Located by: _____ Company/Utility: _____ N/A <input type="checkbox"/> Justification: _____</p>	<p>Phone: _____ Date: _____</p>
<p>11. Presence and tracing of process/storm sewers identified /understood. <i>If other concrete, fiberglass, untraced PVC lines are potentially in the ground disturbance area, identify means of identification in comments section.</i></p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Located by: _____ Company/Utility: _____ N/A <input type="checkbox"/> Justification: _____ Comments (need to comment on water sewer line): _____</p>	<p>Phone: _____ Date: _____</p>
<p>12. Presence of underground pipelines associated with pumps and pump galleries, manifolds, tank fields, compressors, production wells, loading racks and equipment identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Located by: _____ Company/Utility: _____ N/A <input type="checkbox"/> Justification: _____</p>	<p>Phone: _____ Date: _____</p>
<p>13. Location of all aboveground indicators of subsurface utilities/services that may be leading to or from buildings within planned work area are Identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>14a. Orientation, arrangement, location, sizes of tanks, STP and extractor covers identified. .</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>14b. Burial depth of tank determined if relevant</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>Depth: _____ N/A <input type="checkbox"/> Justification: _____</p>	
<p>14c. Presence of underground lines for instrumentation, process analyzer, and motor-operated valves are inspected/identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>15. Location of other pertinent features surface or sub-surface that may be of relevance to work scope has been identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	
<p>16. Are all buried lines and utilities that are identified on all drawing sources staked or marked in the ground disturbance zone plus a 30 m /100 ft. buffer?</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>N/A <input type="checkbox"/> Justification: _____</p>	

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<p>17. Critical zones have been identified. <i>5 m / 16.5 ft. of pipeline crossing area, or the distance defined in the pipeline crossing agreement. 3 m / 10 ft. distance from edge of tank, pumps and pump galleries, manifolds, on/below grade transformers, compressors, production wells, flow lines, loading racks, other process equipment, operating dispenser islands and suspected hazardous/critical utilities, product lines, other subsurface structures, and entire area between tank field and dispensers at retail sites</i></p>	<p>Yes <input type="checkbox"/> Identify critical zones: No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						
<p>18. Has the owner/representative inspected the crossings or encroachment areas prior to beginning work?</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						
<p>19. Are all conditions of the Crossing Agreements being met?</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						
<p>20. Are all operators aware of the mechanical excavation zone as discussed in the tailgate meeting?</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						
<p>21. Location of surface features indicative of product lines or other subsurface structures identified.</p>	<p><i>Check all that apply:</i></p> <table border="0"> <tr> <td><input type="checkbox"/> Pipe marker signs present</td> <td><input type="checkbox"/> Surface scaring present</td> </tr> <tr> <td><input type="checkbox"/> Ground depressions present</td> <td><input type="checkbox"/> Water cc's identified</td> </tr> <tr> <td><input type="checkbox"/> Cut lines observed</td> <td><input type="checkbox"/> Vegetation distressed</td> </tr> </table> <p>Other:</p> <p>No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>	<input type="checkbox"/> Pipe marker signs present	<input type="checkbox"/> Surface scaring present	<input type="checkbox"/> Ground depressions present	<input type="checkbox"/> Water cc's identified	<input type="checkbox"/> Cut lines observed	<input type="checkbox"/> Vegetation distressed
<input type="checkbox"/> Pipe marker signs present	<input type="checkbox"/> Surface scaring present						
<input type="checkbox"/> Ground depressions present	<input type="checkbox"/> Water cc's identified						
<input type="checkbox"/> Cut lines observed	<input type="checkbox"/> Vegetation distressed						
<p>22. Road and pipeline crossing zones identified.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						
<p>23. If subsurface structures exposed, extra precautions have been taken to ensure structural integrity.</p>	<p>Yes <input type="checkbox"/> Describe: No <input type="checkbox"/> N/A <input type="checkbox"/> Justification:</p>						

Comments / Findings	Actions to Close Out Items	Person Completing	Date Completed
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HEALTH, SAFETY AND ENVIRONMENT  
**SAFE WORK PRACTICE**  
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Completed by: (print name)	Company:
Signature	Date:

HEALTH, SAFETY AND ENVIRONMENT  
**SAFE WORK PRACTICE**  
**SITE MANAGEMENT AND POST-DISTURBANCE CHECKLIST**  
**SWP-213c**



Location:	Client:			
	Project Number:			
Land Use:	Project Manager:			
Ground Disturbance Supervisor:	Work Period Date:			
Contactor(s):	Ground Disturbance Activity:			
<b>Post Disturbance</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Initial</b>
Have all hand or daylighting exposure points been backfilled to the satisfaction of the owner?				
Has the owner inspected all exposed facilities in an excavation? If so, have owner initial here: _____				
Has a written backfill inspection been completed?				
Have photos been taken prior to backfill of an excavation?				
Has a written summary of all aspects of the work been completed?				
Have photos been taken after the excavation was backfilled?				
Comments:				
Company	Signature	Print Name	Date (dd/mm/yy)	

- Requires Attachments:
1. Backfill Inspection report
  2. Photographs
  3. Written work summary

HEALTH, SAFETY AND ENVIRONMENT  
**SAFE WORK PRACTICE – BACKFILL INSPECTION FORM**  
**SWP-213d**



Location:	Client:
	Project Number:
Land Use:	Project Manager:
Ground Disturbance Supervisor:	Work Period Date:
Contacto(r)s):	Ground Disturbance Activity:
<b>Facility/Property Information</b>	
Type:	
Name of Facility Owner:	
Number of Utilities in common ROW:	
Crossing agreement (Yes/No):	
Description of exposed Utility:	
Type of exposure:	
Dimensions of exposure (m):	
Depth of Utility below original ground (m):	
Position of Utility in exposure:	
Describe any visible damage:	
Backfill Description:	
Material type of backfill:	
Placement method:	
Contractor:	
Inspected by owner? (yes/no)	
Number of photographs:	

**HEALTH, SAFETY AND ENVIRONMENT  
SAFE WORK PRACTICE – BACKFILL INSPECTION FORM  
SWP-213d**



Site Sketch of Backfill Site (plan and cross section)

NW	NE
SW	SE

Approval			
Company	Name	Signature	Date (text)

**Key Contacts and Telephone Numbers:**

Information Source	Telephone	Web Address
<b>Stantec Key Safety Contacts</b>		

**Attachment 2**  
**Job Safety Analyses**

## 1. Driving to/from the job Site (with no trailer) Job Safety Analysis (JSA)

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	10/04/2006		
			05/27/2008	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			12/2/2014	Kristy Edblad	HASP Originator
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Last-Minute Risk Assessment (LMRA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, and lightening) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability. Use Stop Work Authority as needed.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Perform LMRA procedures.	Wear reflective vest for traffic, steel toed shoes, long sleeve shirt, hardhat, safety glasses with side shields, and high visibility work gloves.	Slip/trip/falls, struck by traffic	<ul style="list-style-type: none"> <li>● Assess the potential hazards. Analyze how to reduce the risk. – STANTEC_____.</li> <li>● Review JSA – STANTEC_____.</li> </ul>
Verify Journey Management Plan is complete and current		Unexpected traffic detours	<ul style="list-style-type: none"> <li>● Assure directions are available and understood prior to commencing travel – STANTEC_____.</li> <li>● Pull the vehicle into a safe location if additional directions must be confirmed – STANTEC_____.</li> <li>● Increase following distance to allow extra time to stop if you are in</li> </ul>

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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
			unfamiliar territory - STANTEC_____.
Verify a Vehicle Collision Kit, a 3-lb type ABC fire extinguisher, and other as needed emergency equipment is in the vehicle.	Safety vest, high visibility work gloves, steel-toe/shank boots, safety glasses, long-sleeved shirt	Struck by another vehicle, pinch points, falling equipment	<ul style="list-style-type: none"> <li>● Verify prepared field kit is in the vehicle. Inventory of the kit should include first aid kit, blood borne pathogen kit, fire extinguisher, collision kit, flashlight, etc. – STANTEC_____.</li> </ul>
Perform perimeter walk around of vehicle for damage or unusual conditions, and complete the Stantec Daily Vehicle Checklist.	Safety vest, high visibility work gloves, steel-toe/shank boots, safety glasses, long-sleeved shirt	Getting hit by a car, pinch points, slip/trip/fall, chemical contacts (grease or oil from car), overheated engine or break-down due to lack of critical fluids.	<ul style="list-style-type: none"> <li>● Complete the Stantec Daily Vehicle Checklist prior to travel – STANTEC_____</li> <li>● Wear safety vest and watch for cars during walk around– STANTEC_____.</li> <li>● Address all questionable items prior to departure – STANTEC_____.</li> <li>● Assure tires are properly inflated – STANTEC_____.</li> <li>● Assure there are no cuts or bulges in the sidewalls – STANTEC_____.</li> <li>● Assure windshield and window glass is clean and not cracked or crazed – STANTEC_____.</li> <li>● Lift wiper arms and check wiper blades for damage or deterioration – STANTEC_____.</li> <li>● Check behind vehicle for obstructions – STANTEC_____.</li> <li>● Check under vehicle engine for evidence of fluid leaks – STANTEC_____.</li> <li>● Check fluid levels– STANTEC_____.</li> <li>● Wear Nitrile gloves when checking under hood – STANTEC_____.</li> <li>● Verify all traffic control equipment is removed/safely stowed away – STANTEC_____.</li> <li>● Look for and identify possible slip, trip, fall, and pinch point hazards – STANTEC_____.</li> </ul>

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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Enter and prepare to start vehicle	<b>SEAT BELT</b> , sunglasses if needed	Back or body strain, slip/trip/fall, blind spots, inability to signal intentions, streaking windshield, impaired vision.	<ul style="list-style-type: none"> <li>● Be aware of footing, handholds, and head room when entering vehicle – STANTEC_____.</li> <li>● Adjust seat so back is fully supported, upper arms close to body, and pedals within easy reach – STANTEC_____.</li> <li>● Lower steering wheel so hands are below shoulders and shoulders are relaxed – STANTEC_____.</li> <li>● Check mirror adjustments each time vehicle is re-started – STANTEC_____.</li> <li>● Locate and test operations of front and rear turn signals, headlamps, wipers, and washer fluid – STANTEC_____.</li> <li>● Verify proper operation of climate controls – STANTEC_____.</li> <li>● Fasten seat belt – STANTEC_____.</li> <li>● Lock doors – STANTEC_____.</li> <li>● Driver's cell phone shall be turned off – STANTEC_____.</li> <li>● Turn on headlights if vehicle is not equipped with day-time running lights – STANTEC_____.</li> </ul>
Start engine and let vehicle warm up.	<b>SEAT BELT</b> , sunglasses if needed	Unexpected movement.	<ul style="list-style-type: none"> <li>● Assure that transmission is in Park, or in neutral if a manual transmission, and that parking brake is set – STANTEC_____.</li> <li>● Refer to Manufacturers vehicle manual for warm up times – STANTEC_____.</li> <li>● Assure there is sufficient gas, oil and other critical fluids – STANTEC_____.</li> <li>● Check for proper function of warning lights – STANTEC_____.</li> <li>● Make any other necessary adjustments prior to driving – STANTEC_____.</li> </ul>
Pull out of parking space.	<b>SEAT BELT</b> , sunglasses if needed	Collision with other vehicles, pedestrians, or stationary objects.	<ul style="list-style-type: none"> <li>● Check mirrors and over shoulder in all directions prior to pulling out of parking space – STANTEC_____.</li> <li>● Give two short blasts on the horn and while looking over your</li> </ul>

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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
			shoulder – STANTEC_____ <ul style="list-style-type: none"> <li>● Slowly pull out of the parking space being prepared to apply the brakes if needed – STANTEC_____.</li> <li>● Signal if parallel parked along a street – STANTEC_____.</li> <li>● Avoid reversing when possible – STANTEC_____.</li> <li>● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone, before getting in the car, assess the area for approaching pedestrians and vehicles – STANTEC_____.</li> </ul>
Drive a motor vehicle	<b>SEAT BELT</b> , sunglasses if needed	Collision, injury or death to occupants or other parties.	<ul style="list-style-type: none"> <li>● Use the Stantec safe driving techniques – STANTEC_____.</li> <li>● <b>Scan</b> – Scan your horizon – STANTEC_____.</li> <li>● <b>Timing</b> – Do you have enough time to stop – STANTEC_____.</li> <li>● <b>Alert</b> – Don't drive when you are tired – STANTEC_____.</li> <li>● <b>Next</b> – Anticipate what could happen next – STANTEC_____.</li> <li>● <b>Team</b> – Passengers need to assist – STANTEC_____.</li> <li>● <b>Elevate</b> – Elevate your line of site – STANTEC_____.</li> <li>● <b>Courteous</b> – Don't be the driver others dislike – STANTEC_____.</li> <li>● Driver's cell phone shall be turned off – STANTEC_____.</li> <li>● Scan major and minor intersections before entry (left-right-left) – STANTEC_____.</li> <li>● Scan mirrors frequently, at least one mirror every 5-8 seconds – STANTEC_____.</li> <li>● Avoid staring while evaluating road conditions – STANTEC_____.</li> <li>● Maintain adequate spacing between your vehicle and the vehicle in front of you (Rule of thumb is 1 second for every 10 miles per hour – STANTEC_____.</li> <li>● After stopping, allow vehicle in front to move for 3 seconds before accelerating – STANTEC_____.</li> </ul>

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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
			<ul style="list-style-type: none"> <li>● Evaluate approaching merge before you reach them – STANTEC_____.</li> <li>● Avoid being boxed in by other vehicles – STANTEC_____.</li> <li>● Seek eye contact with other drivers – STANTEC_____.</li> <li>● Before changing lanes, signal well in advance, check mirrors and over shoulder, and allow adequate space before changing lanes – STANTEC_____.</li> <li>● Avoid blind spots – STANTEC_____.</li> <li>● Increase the distance between your vehicle and the vehicle in front of you at night and in inclement weather. – STANTEC_____.</li> </ul>
Pauses in travel	Safety vest, high visibility work gloves, steel-toe/shank boots, safety glasses, long-sleeved shirt, cell phone.	Struck by another vehicle, insecure connections	<ul style="list-style-type: none"> <li>● If there is a pause in travel (i.e. rest stop, gas station) do another walk around the vehicle prior to resuming travel – STANTEC_____.</li> <li>● Be aware of nefarious characters – STANTEC_____.</li> </ul>
Reversing the vehicle	<b>SEAT BELT</b> , sunglasses if needed	Collision, injury or death to occupants or other parties.	<ul style="list-style-type: none"> <li>● Make all backing maneuvers slowly and cautiously – STANTEC_____.</li> <li>● Check mirrors and over shoulders – STANTEC_____.</li> <li>● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone, before getting in the car, assess the area for approaching pedestrians and vehicles – STANTEC_____.</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Last-Minute Risk Assessment (LMRA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, and lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability. Use Stop Work Authority as needed.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Parking	<b>SEAT BELT</b> , sunglasses if needed	Collision, injury or death to occupants or other parties.	<ul style="list-style-type: none"> <li>● Park away from other cars when possible and when safe. – STANTEC_____</li> <li>● Look for pull-through parking to avoid reversing – STANTEC_____.</li> <li>● Back into parking spot when possible and safe and legal – STANTEC_____.</li> <li>● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone, before getting in the car, assess the area for approaching pedestrians and vehicles – STANTEC_____.</li> <li>● Maintain cushion of safety from fixed objects – STANTEC_____.</li> <li>● Set parking brake – STANTEC_____.</li> </ul>
POST-TRIP		Conditions worsen leading to mechanical failure possibly resulting in accident, injury, or death.	<ul style="list-style-type: none"> <li>● Report vehicle problems immediately to company representative or rental car agency – STANTEC_____.</li> <li>● Schedule a tune-up or repair if necessary – STANTEC_____.</li> </ul>

## 2. The following table addresses the concerns with hand augering for the collection of soil samples.

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
	Michael Allen Philipp	West Region Health and Safety Manager	09/23/05		
			02/02/06	Michael Allen Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made on and by			12/02/2014	Kristy Edblad	HASP Originator
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					
<p><i>Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Last-Minute Risk Assessment (LMRA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.</i></p>					
① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions		
Clear hand augering locations.	Wear reflective vest for traffic, steel toed and shank shoes, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards, overhead and underground installations, product releases, property damage, dealer inconvenience.	<ul style="list-style-type: none"> <li>● Reference Utility Clearance Review form (<b>Attachment 1</b>).</li> <li>● Coordinate with client to minimize potential conflicts.</li> <li>● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc.</li> <li>● Mark out the proposed borehole locations.</li> <li>● Call underground utility locating service for public line location clearance and get list of utilities being contacted. If necessary, coordinate private line locator for private property.</li> <li>● Develop a traffic guidance and control plan with the client and local agencies as applicable. Plan may include use of delineators, barrier tape, jersey barriers, construction fence, etc.</li> <li>● <b>It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available.</b></li> </ul>		
Mobilize with proper equipment/supplies for hand augering/soil sampling.	Gather necessary PPE. Reflective vest for traffic, steel toed and shank shoes, hard hat, safety glasses with side shields, ear plugs/muffs, leather gloves for the non-chemical aspects	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	<ul style="list-style-type: none"> <li>● Start project with Production Safety Meeting.</li> <li>● Follow safe driving procedures.</li> <li>● Employ safe lifting procedures.</li> </ul>		

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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
	of work as necessary; Wear an air purifying respirator with combination organic vapor/P-100 cartridges, and other PPE as needed. (Use a North 7700 series half-face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly-coated chemical resistant suit or its equivalent).		<ul style="list-style-type: none"> <li>● Review permit conditions (if applicable).</li> </ul>
Visually clear proposed hand augering/soil sampling locations.	Wear reflective vest for traffic, steel toed and shank shoes, hardhat, safety glasses with side shields, and leather gloves as necessary.	Underground installations.	<ul style="list-style-type: none"> <li>● Complete Pre-Mobilization section of Utility Clearance Review form (<b>Attachment 1</b>) and adjust hand augering locations as necessary.</li> </ul>
Set up necessary traffic guidance and control equipment.	Wear reflective vest for traffic, steel toed and shank shoes, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic guidance and control equipment placement.	<ul style="list-style-type: none"> <li>● Use buddy system for placing traffic guidance and control equipment.</li> <li>● Implement traffic guidance and control plan such as setting out delineators, construction fence and caution tape defining safety area.</li> <li>● Adhere to approved Traffic Guidance and Control Plans when working in roadways.</li> <li>● <b>It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available.</b></li> </ul>
Set up exclusion zone(s) and workstations (hand augering and logging/sample collection).	Wear reflective vest for traffic, steel toed and shank shoes, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during set up. Slip, trip and fall hazards.	<ul style="list-style-type: none"> <li>● Implement exclusion zone set-up.</li> <li>● <b>It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up.</b></li> <li>● Set up workstations with clear walking paths to and from hand augering location.</li> <li>● Use delineators, construction fence, and/or safety tape as required.</li> <li>● If utilizing Visqueen, (sheet plastic), for sampling area, completely secure Visqueen to the pavement, dirt, etc. with duct tape,</li> </ul>

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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
Commence hand augering .	Don required PPE as appropriate for this step: steel toed and shank shoes, hard hat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/P-100 cartridges if necessary. (Use a North 7700 series half-face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek poly-coated suit or its equivalent).	Back strain, exposure to chemical hazards, hitting an underground utility, repetitive motion.	<p>delineators, etc. Do not use objects that are hard to notice or could become a trip hazard themselves.</p> <ul style="list-style-type: none"> <li>● Initiate air quality monitoring as outlined in <b>Section 2 if required.</b></li> <li>● Have respirator with appropriate cartridges within 3-5 feet of work area, readily available.</li> <li>● Stand upwind to avoid exposure whenever possible.</li> <li>● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE.</li> <li>● Use proper lifting techniques and tools.</li> <li>● Complete the Pre-Drilling section of the Borehole Clearance Review form.</li> <li>● Decontaminate sampling equipment after collecting a sample and decontaminate hand augering equipment after each borehole.</li> <li>● Avoid twisting back during the operation; Decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums in a location agreed upon by the SHSO and the Property/Station Owner/Manager.</li> </ul>
Collect samples in accordance with sampling plan.	Steel toed and shank shoes, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed.	Cross-contamination, improper labeling or storage, exposure to site contaminants.	<ul style="list-style-type: none"> <li>● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE.</li> <li>● Decontaminate sampling equipment between each sampling run. Label samples in accordance with sampling plan.</li> <li>● Keep samples stored in proper containers, at correct temperature, and away from work area.</li> <li>● Conduct air monitoring as outlined in <b>Section 2.</b></li> <li>● Have respirator with appropriate cartridges within 3-5 feet of work area, readily available.</li> </ul>
Proper clean up and disposal of broken	Safety glasses Long sleeved shirts	Exposure to broken glass and acid (from water	<ul style="list-style-type: none"> <li>● Isolate area where broken glass is located - STANTEC/Contractor.</li> </ul>

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① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
sample container.	Leather Work Gloves Hand Broom and Dust Pan A receptacle for the broken glass (something to contain the broken glass (double garbage bag, a box, or bucket).	preservation acids) Injury	<ul style="list-style-type: none"> <li>● Determine if the sample container was preserved (did it have acid in it?) - STANTEC.</li> <li>● Determine what to contain the broken glass in, and where to dispose of the broken glass before beginning to pick up the glass - STANTEC.</li> <li>● Collect equipment needed to clean up and contain the broken glass - STANTEC/Contractor.</li> <li>● Minimize "picking up" broken glass pieces with your gloved hands. Use a dust pan if possible/practical - STANTEC/Contractor.</li> <li>● If broken glass is located inside a container (i.e. box), to the extent practical, leave glass inside box and put entire box into a garbage bag. Double bag if warranted. Place into dumpster - STANTEC/Contractor.</li> <li>● If broken glass is inside a cooler, remove all other sample containers and place in a safe location, then use hand broom and dust pan to sweep up glass in cooler - STANTEC.</li> <li>● After clean up is complete, contact your Project Manager to report this Loss/Incident - STANTEC.</li> </ul>
Supervisor/SHSO must confirm all boreholes are closed, filled in and/or capped.		Possible injuries and damage to property due to stepping into or driving over the well.	<ul style="list-style-type: none"> <li>● Visually inspect each and every borehole.</li> </ul>
Perform personal decontamination procedures.	As worn in exclusion zone.	Slips/trips/falls. Splashes, chemical contamination. Contact with contaminated materials.	<ul style="list-style-type: none"> <li>● Perform personal (dry) decontamination procedures – STANTEC/Contractor. <ul style="list-style-type: none"> <li>■ Drop off tools and perform equipment decontamination procedures on the equipment - STANTEC/Contractor.</li> <li>■ Perform a "dry" decontamination on boots using a stiff bristle fiberglass long handled brush - STANTEC/Contractor.</li> <li>■ Remove inner/outer gloves and dispose of properly - STANTEC/Contractor.</li> </ul> </li> <li>● Wash hands, face, arms and neck (any exposed skin) using sink or bottled water. If water isn't available, use baby wipes or a similar</li> </ul>

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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
Clean site/demobilize.	Steel toed and shank shoes, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Traffic. Safety hazard left on site. Lifting hazards.	product - STANTEC/Contractor. <ul style="list-style-type: none"> <li>● Use buddy system as necessary to remove traffic guidance and control equipment.</li> <li>● Leave site clean of refuse and debris.</li> <li>● Clearly mark/barricade any borings that need later topping off or curing.</li> <li>● Notify site personnel of departure, final well locations and any cuttings/purge water left onsite.</li> <li>● Use proper lifting techniques</li> </ul>
Package and deliver samples to lab.		Bottle breakage, back strain.	<ul style="list-style-type: none"> <li>● Handle and pack bottle carefully (bubble wrap bags are helpful). Use proper lifting techniques.</li> </ul>

**3. The following table addresses the generic concerns of oversight of soil sampling direct push drilling.**

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
	Jocelyn Jackson	OE Coordinator	09/07/06		
	Dennis Rourke	Principal Geologist	10/03/06		
	Anne Perez		10/21/14		
			12/06/06	Michael A Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made on and by			12/02/14	Kristy Edblad	HASP Originator
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

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① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
Clear drilling locations.	Wear reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards, overhead and underground installations, product releases, property damage, dealer inconvenience.	<ul style="list-style-type: none"> <li>● Perform PPE/SPSA procedures – STANTEC/Contractor.</li> <li>● Review utility clearance - STANTEC/Contractor.</li> <li>● Coordinate with Site Manger (or designee) to minimize potential conflicts – STANTEC.</li> <li>● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc - STANTEC/Contractor.</li> <li>● Mark out the proposed borehole locations - STANTEC/Contractor.</li> <li>● Call underground utility locating service for public line location clearance and get list of utilities being contacted. If necessary, coordinate private line locator for private property - STANTEC.</li> <li>● Develop a traffic control plan with the client and local agencies as applicable. Plan may include use of delineators, barrier tape, jersey barriers, etc. - STANTEC/Contractor.</li> <li>● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Control configuration if a "formally developed" Traffic Control Plan is not available - STANTEC.</li> <li>● Verify records in possession are for equipment on site - STANTEC.</li> </ul>

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Obtain sub-contractor equipment maintenance records prior to commencing work.		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	<ul style="list-style-type: none"> <li>● Verify maintenance is current - STANTEC.</li> </ul>
Mobilize with proper equipment/supplies for drilling.	<p>Gather necessary PPE. Reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hard hat, safety glasses with side shields, goggles with face shield for operating air knife/hydro-excavation, ear plugs/muffs for hearing protection, leather gloves for the non-chemical aspects of work as necessary; Wear an air purifying respirator with combination organic vapor/ P-100 cartridges, and other PPE as needed. (Use a North 7600 series full face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly coated chemical resistant suit or its equivalent).</p>	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	<ul style="list-style-type: none"> <li>● Start project with Production Safety Meeting - STANTEC/Contractor. Discuss: <ul style="list-style-type: none"> <li>-Ensure all STANTEC/Client permits are filled out appropriately and discussed - STANTEC.</li> <li>-potential hazards and ways to avoid them - STANTEC/Contractor.</li> <li>- motor vehicle safety topic - STANTEC/Contractor.</li> <li>- current days weather conditions - STANTEC/Contractor.</li> <li>- PPE requirements - STANTEC/Contractor.</li> <li>- check subcontractors HASP, Certs, MSDS's, and equipment maintenance records - STANTEC.</li> <li>- using safe lifting procedures - STANTEC/Contractor.</li> </ul> </li> <li>● Make sure sub-contractors are aware of their responsibilities for labor, equipment and supplies - STANTEC/Contractor.</li> <li>● Review permit conditions - STANTEC/Contractor.</li> <li>● Conduct Plan, Prevent, Execute/Safe Performance Self Assessment - STANTEC/Contractor.</li> <li>● Take your time. Do not rush - STANTEC/Contractor.</li> <li>● Assess the area, are there hazards present - STANTEC/Contractor.</li> <li>● Employ proper lifting and bending techniques – STANTEC/Contractor.</li> <li>● Wear safety glasses and leather work gloves when loading, unloading, and whenever material handling - STANTEC/Contractor.</li> <li>● Secure load in vehicle - STANTEC/Contractor</li> <li>● Use lids to debris/garbage containers. Do not leave buckets open with out a lid! Material in the bucket can spill - STANTEC/Contractor.</li> <li>● Use bubble wrap or other insulating material to cushion the sample</li> </ul>

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			containers during transport – STANTEC ● Use the right tools to open and close well boxes. Wear leather gloves when opening/closing well boxes – STANTEC/Contractor.
Visually clear proposed drilling locations.	Wear reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Underground and overhead installations.	● Adjust drilling locations as necessary - STANTEC/Contractor.
Set up necessary traffic guidance and control equipment.	Wear reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic control equipment placement.	● Use buddy system for placing traffic control. Implement traffic control plan such as setting out delineators, construction fence and/or caution tape defining safety area - STANTEC/Contractor. ● Adhere to approved Traffic Control Plans when working in roadways - STANTEC/Contractor. ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Control configuration if a "formally developed" Traffic Control Plan is not available- STANTEC.
Set up exclusion zone(s) and workstations.	Wear reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during set up. Slip, trip and fall hazards.	● Implement exclusion zone set-up – STANTEC/Contractor. ● It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up - STANTEC. ● Set up workstations with clear walking paths to and from rig. Use delineators, with caution tape and/or construction fence – STANTEC/Contractor.
Assist with set up of drill rig.	Wear reflective vest for traffic, steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Vehicle accident during rig movement. Damage caused by equipment while accessing set-up location. Contact with overhead installations. Soft terrain. Air knife movement.	● All staff should know where the kill switch is for the drilling rig - STANTEC/Contractor. ● Verify clear pathway to drilling location and clearance for raising mast - STANTEC/Contractor. ● Provide as-needed hand signals and guidance to driver to place rig - STANTEC/Contractor. ● Visually inspect drill rig (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition,

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			<p>pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition?) - STANTEC/Contractor.</p> <ul style="list-style-type: none"> <li>● Provide as-needed hand signals and guidance to driver to place rig - STANTEC/Contractor.</li> <li>● If necessary, use wooden blocks under jacks to spread load. Chock wheels - Contractor.</li> </ul>
<p>Clear upper five feet of direct push location using hand auger. Follow the JSA for hand augering.</p>	<p>Don required PPE as appropriate for this step: steel toed and shank shoes, long sleeve shirt, hard hat, safety glasses with side shields, goggles with face shield for operating air knife/hydro-excavation and suction equipment, ear plugs/muffs for hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/ P-100 cartridges if necessary. (Use a North 7600 series full face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek poly coated suit or its equivalent).</p>	<p>Back strain, exposure to chemical hazards, hitting an underground utility, repetitive motion. Eye injury from airborne debris. Personal injury from compressed air.</p>	<ul style="list-style-type: none"> <li>● Initiate air quality monitoring as necessary – STANTEC.</li> <li>● Stand upwind to avoid exposure whenever possible- STANTEC/Contractor.</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> <li>● Limit number of people working directly in area of drilling operation to avoid getting blasted by flying debris - STANTEC/Contractor.</li> <li>● Use the PID/FID aggressively to track the airborne concentration of contaminants close to potential sources such as the core as it is being raised from the hole, the core is opened, etc – STANTEC.</li> <li>● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE - STANTEC.</li> <li>● Use proper lifting techniques and tools - STANTEC/Contractor.</li> <li>● Complete the Pre-Drilling section of the Borehole Clearance Review form - STANTEC/Contractor.</li> <li>● Avoid twisting back during the operation; Decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums (stored onsite until waste is characterized) - STANTEC/Contractor.</li> </ul>

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Remove loose soil from borehole.	Don required PPE as appropriate for this step: steel toed and shank shoes, long sleeved shirts, hard hat, goggles with face shield for operating air knife/hydro-excavation and suction equipment, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/P-100 cartridges if necessary.	Back strain, eye injury, exposure to chemical hazards, slip, trip and fall hazards, equipment failure, lifting hazards, overhead hazards.	<ul style="list-style-type: none"> <li>● Decontaminate drill rod after each borehole. Decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a second de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums (<i>stored onsite until waste is characterized</i>) - STANTEC/Contractor.</li> <li>● Use proper lifting techniques - STANTEC/Contractor.</li> <li>● Conduct air monitoring as necessary - STANTEC.</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> <li>● Monitor drilling progress – proceed cautiously – watching for cuttings - STANTEC/Contractor.</li> <li>● Keep work area clear of tripping or slipping hazards - STANTEC/Contractor.</li> <li>● Perform periodic visual inspections of drilling equipment and compressor - STANTEC/Contractor.</li> </ul>
Commence direct push operations.	Steel toed and shank shoes, long sleeved shirts, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed. Wear chemical resistant gloves if needed.	Cross-contamination from previous hole. Back strain, heat or cold, eye injury, noise, exposure to chemical hazards, hitting an underground utility, slips, trips and falls, equipment failure.	<ul style="list-style-type: none"> <li>● Decontaminate sampling equipment after collecting a sample. Decontaminate equipment after each use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a second de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums – Task Order indicates the water can be disposed onsite provided the water does not enter the roadway.</li> <li>● Decontaminate direct push equipment after each location. STANTEC/Contractor.</li> <li>● Use proper lifting techniques - STANTEC/Contractor.</li> <li>● Conduct air monitoring as necessary - STANTEC.</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
			<ul style="list-style-type: none"> <li>● Monitor direct push progress - STANTEC/Contractor.</li> <li>● When driving pipe, drive cylinder should never be extended at a rate where pipe exhibits lateral flex from vertical or the rig wheels lose contact with the ground – STANTEC/Contractor.</li> <li>● Use correct tools for opening sleeves (hooked safety blade) – STANTEC/Contractor.</li> <li>● When opening sleeves, place on sturdy surface and cut away from body – STANTEC/Contractor.</li> <li>● Do not stow tools in unsecured locations. Stow hack saws and other small tools on hooks - STANTEC/Contractor.</li> <li>● Keep work area clear of tripping or slipping hazards - STANTEC/Contractor.</li> <li>● Perform periodic visual inspections of direct push rig - STANTEC/Contractor.</li> </ul>
<p>Collect samples in accordance with sampling plan.</p>	<p>Steel toed and shank shoes, long sleeved shirts, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed.</p>	<p>Cross-contamination, improper labeling or storage, exposure to site contaminants.</p>	<ul style="list-style-type: none"> <li>● Conduct air monitoring as necessary - STANTEC.</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> <li>● Decontaminate sampling equipment between each sampling run (unless disposable). If the equipment is reusable, then decontamination will be accomplished by an Alconox wash with tap water rinse followed by a second de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums (<i>onsite until waste is characterized</i>) - STANTEC/Contractor.</li> <li>● Use proper lifting/bending techniques. Utilize knee pads or a kneeling pad - STANTEC/Contractor.</li> <li>● Label samples in accordance with sampling plan - STANTEC.</li> <li>● Keep samples stored in proper containers, at correct temperature, and away from work area - STANTEC.</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
			<ul style="list-style-type: none"> <li>● Determine the best location to set the sample containers (avoid stepping on them or other materials coming into contact with them. - STANTEC</li> <li>● Fill sample containers slowly and over a bucket to eliminate potential spills or place sample container on bucket lid on the ground or other surface, then fill container to avoid sample container from slipping out of your nitrile gloved hand – STANTEC.</li> <li>● Do not over pack cooler. - STANTEC</li> <li>● Use bubble wrap or other insulating material for cushioning sample containers in the cooler. - STANTEC</li> <li>● Keep samples stored in proper containers, at correct temperature, and away from work area. Handle bottles carefully. - STANTEC</li> </ul>
<p>Proper clean up and disposal of broken sample container.</p>	<p>Safety glasses, long sleeved shirts, leather work gloves. Hand broom and dust pan. A receptacle for the broken glass (something to contain the broken glass (double garbage bag, a box, or bucket).</p>	<p>Exposure to broken glass and acid (from water preservation acids) Injury</p>	<ul style="list-style-type: none"> <li>● Isolate area where broken glass is located - STANTEC/Contractor.</li> <li>● Determine if the sample container was preserved (did it have acid in it?) - STANTEC.</li> <li>● Determine what to contain the broken glass in, and where to dispose of the broken glass before beginning to pick up the glass - STANTEC.</li> <li>● Collect equipment needed to clean up and contain the broken glass - STANTEC/Contractor.</li> <li>● Minimize "picking up" broken glass pieces with your gloved hands. Use a dust pan if possible/practical - STANTEC/Contractor.</li> <li>● If broken glass is located inside a container (i.e. box), to the extent practical, leave glass inside box and put entire box into a garbage bag. Double bag if warranted. Place into dumpster - STANTEC/Contractor.</li> <li>● If broken glass is inside a cooler, remove all other sample containers and place in a safe location, then use hand broom and dust pan to sweep up glass in cooler - STANTEC.</li> <li>● After clean up is complete, contact your Project Manager to report this Loss/Incident - STANTEC.</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
<p>Cuttings will be picked up by shovel and placed directly in 55 gallon drums. Per the Task Order – soil removed from the borehole can be replaced in the borehole.</p>	<p>Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. If you suspect that equipment is contaminated, wear chemical resistant gloves. Wear appropriate air purifying respirator with combination organic vapor/ P-100 cartridges as needed.</p>	<p>Exposure to public. Traffic hazard or obstruction/inconvenience to station operation. Improper storage or disposal. Back strain. Eye injury from airborne debris.</p>	<ul style="list-style-type: none"> <li>● Have proper storage containment and labeling available onsite. Place materials in isolated location away from traffic and other site functions. (See next section for Waste Description) STANTEC.</li> <li>● Use appropriate drum handling procedures. Do not attempt to lift, push or move drums without the proper tools and equipment - STANTEC/Contractor.</li> <li>● Conduct air monitoring as necessary - STANTEC.</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> </ul>
<p>Backfill borehole. Per the Task Order – soil removed from the borehole can be replaced in the borehole.</p>	<p>Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.</p>	<p>Improper grouting can lead to future vertical conduit for contaminant migration. Back strain, trip hazards, and eye injury from splashing or release of pressurized grout. Unauthorized backfilling causes extra work.</p>	<ul style="list-style-type: none"> <li>● Mix grout to specification and completely fill the hole. – STANTEC/Contractor.</li> <li>● Use proper lifting/bending techniques. – STANTEC/Contractor.</li> <li>● Keep work area clear of slip/trip/fall hazards. – STANTEC/Contractor.</li> </ul>
<p>Dispose purge water (if any) onsite.</p>	<p>Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.</p>	<p>Back strain. Exposure to contaminants. If disposing through onsite treatment system, damage or injury from improper use of equipment. Improper storage or disposal.</p>	<ul style="list-style-type: none"> <li>● Use appropriate drum handling practice. - STANTEC</li> <li>● Use proper equipment to transport water (pumps, drum dollies, etc). - STANTEC</li> <li>● Monitor air quality as necessary. - STANTEC</li> <li>● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. – STANTEC</li> <li>● Visually inspect drums prior to use, if corroded dispose of properly.</li> <li>● Label storage containers properly, and locate in isolated area away from traffic and other site functions. - STANTEC</li> <li>● Coordinate offsite disposal (where applicable). - STANTEC</li> <li>● Do not attempt to lift, push or move bins/drums without the proper</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
Perform personal decontamination procedures.	As worn in exclusion zone.	Slips/trips/falls. Splashes, chemical contamination. Contact with contaminated materials.	<p>tools and equipment. - STANTEC</p> <ul style="list-style-type: none"> <li>● Perform personal (dry) decontamination procedures – STANTEC/Contractor. <ul style="list-style-type: none"> <li>■ Drop off tools and perform equipment decontamination procedures on the equipment - STANTEC/Contractor.</li> <li>■ Perform a “dry” decontamination on boots using a stiff bristle fiberglass long handled brush - STANTEC/Contractor.</li> <li>■ Remove inner/outer gloves and dispose of properly - STANTEC/Contractor.</li> </ul> </li> <li>● Wash hands, face, arms and neck (any exposed skin) using sink or bottled water. If water isn't available, use baby wipes or a similar product - STANTEC/Contractor.</li> </ul>
Supervisor/SHSO must confirm all air-knifed/hydro-excavation locations are closed, filled in and/or capped. If necessary.	Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Possible injuries and damage to property due to stepping into or driving over the well.	<ul style="list-style-type: none"> <li>● Visually inspect each and every air-knifed/hydro-excavation location – STANTEC/Contractor.</li> </ul>
Clean site/demobilize.	Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Traffic. Safety hazard left on site. Lifting hazards.	<ul style="list-style-type: none"> <li>● Use buddy system as necessary to remove traffic control - STANTEC/Contractor.</li> <li>● Leave site clean of refuse and debris - STANTEC/Contractor.</li> <li>● Clearly mark/barricade any borings that need later topping off or curing - STANTEC/Contractor.</li> <li>● Notify site personnel of departure, final well locations and any cuttings/purge water left onsite - STANTEC.</li> <li>● Use proper lifting techniques - STANTEC/Contractor.</li> <li>● Use a mechanical aid or other colleague, as appropriate to help lift weights over 50lbs - STANTEC/Contractor.</li> <li>● Be aware of sharp edges on equipment - STANTEC/Contractor.</li> </ul>

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

① Job Steps	② Personal Protective Equipment	③ Potential Hazard	④ Critical Actions
			<ul style="list-style-type: none"> <li>● Ensure that all waste containers are closed before moving them - STANTEC/Contractor.</li> <li>● Do not jump off the back of the pick-up - STANTEC/Contractor.</li> </ul>

**Attachment 3**  
**RMS-2 Fit for Duty**

**HEALTH, SAFETY, AND ENVIRONMENT**  
**RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



Project: T.O. 18, ADL Survey LA110 Project No: 185831018  
 Client: Caltrans  
 Location: 110 Fwy  
 Start Date: 12/4/14

**Work Description Provide A General Description Of The Work To Be Conducted.**

*Mark boring locations with Caltrans PM*

**Documentation and Procedure Review**

1. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  No\*
2. Emergency Response Plan reviewed?  Yes  No\*  N/A
3. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  No\*
4. Attended Client Site Health and Safety meeting?  Yes  No\*  N/A
5. Conducted Stantec site safety meeting with all workforces?  Yes  No\*  N/A
6. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
*If yes, include in the Job Safety Analysis (JSA).*  Yes  No
7. Working alone or remote work?  
*If yes, complete call in/out process - Safe Work form must be completed.*  Yes  No

**Notifications and Permits**

8. Are work permits required for this site?  
*If yes, have they been completed and submitted as required?*  Yes  No  
 Yes  No\*
9. Are utility locates required for this site?  
*If yes, have they been completed and reviewed?*  Yes  No  
 Yes  No\*
10. Does the Client require any notification prior to starting the work?  
*If yes, has the notification been provided?*  Yes  No  
 Yes  No\*

**\*Contact your Project Manager immediately.**

**Personal Protective Equipment List specific PPE as needed. Verify type and inspect condition.**

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> Head Protection Type: _____ | <input type="checkbox"/> Hearing Protection: _____       | <input type="checkbox"/> Gloves Type: _____       |
| <input checked="" type="checkbox"/> Foot Protection Type: _____ | <input type="checkbox"/> Respiratory Protection: _____   | <input type="checkbox"/> Water Safety Gear: _____ |
| <input checked="" type="checkbox"/> Eye Protection Type: _____  | <input type="checkbox"/> Fire Retardant Coveralls: _____ | <input type="checkbox"/> _____                    |
| <input checked="" type="checkbox"/> High Visibility Vest: _____ | <input type="checkbox"/> Fall Protection: _____          | <input type="checkbox"/> _____                    |

**Tools and Equipment List specific equipment to be used. Verify type and inspect condition.**

- |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

HEALTH, SAFETY, AND ENVIRONMENT  
 RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day



Daily Tailgate Discussions/Subcontractor Input

Start	Time: 1005	Weather: Sunny
PPE / Hospital Route		
Mid-Day	Time:	Weather:
Post-Day	Time:	Weather:

**I know the hazards:**

By signing here, you are stating the following:

1. I have been involved in the Job Safety Analysis and understand the hazards and risk control actions associated with each task I am about to perform.
2. I understand the permit to work requirements applicable to the work I am about to perform (if it includes permitted activities).
3. I am aware that no jobs or work (that is not risk-assessed) is to be performed.
4. I am aware of my obligation to "Stop Work" (See Stop Work Section).

**I arrived and departed fit for duty:**

5. I am physically and mentally fit for duty.
6. I am not under the influence of any type of medication, drugs or alcohol that could affect my ability to work safely.
7. I am aware of my responsibility to bring any illness, injury (regardless of where or when it occurred) or fatigue issue I may have to the attention of the Crew Lead.
8. I signed out uninjured unless I have otherwise informed the Crew Lead.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP  
 Team Lead to contact Project Manager for any personnel identified as AP

Individual Name/Company Name/Signature	Time:	Time:	Time:
Ananya Sawant / Stantec / Ananya	1005 <sup>F</sup>	1130 <sup>F</sup>	
Sam Yang / CT. / [Signature]	1005 <sup>F</sup>	1130 <sup>F</sup>	

I will STOP the job any time anyone is concerned or uncertain about safety.  
 I will STOP the job if anyone identifies a hazard or additional mitigation not recorded.  
 I will be alert to any changes in personnel or their fitness level (AP), conditions at the work site or hazards.  
 If it is necessary to STOP THE JOB, I will reassess the task, hazards and mitigations; and then proceed only when safe to do so.



- Remember to**
1. Stop and think
  2. Look around
  3. Assess risk
  4. Control risks
  5. Begin/resume work

Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.

Signature of Crew Lead: [Signature]      Date: 12/4/14

Job Safety Analysis (JSA) Must be completed for all field activities.

Basic Job Steps	Potential Hazards	Controls to Reduce or Eliminate Hazard	Person Responsible
Drive to & from Site	Vehicular Traffic, Slipping roads	Follow Stantec Defensive Driver Program instructions	Stantec personnel
mark boring locations	Traffic, Biological hazards	Watch out for vehicles, Proper Traffic control Setup	Stantec personnel

Review the hazard categories below and check the mitigation measures applicable to the identified scope of work.

<p><b>Environmental Hazards</b></p> <p>1. Work area clean <input type="checkbox"/></p> <p>2. Material storage identified <input type="checkbox"/></p> <p>3. Dust/Mist/Fume <input type="checkbox"/></p> <p>4. Noise in area <input type="checkbox"/></p> <p>5. Extreme temperatures <input type="checkbox"/></p> <p>6. Spill potential <input type="checkbox"/></p> <p>7. Waste containers needed <input type="checkbox"/></p> <p>8. Waste properly disposed <input type="checkbox"/></p> <p>9. Waste plan identified <input type="checkbox"/></p> <p>10. Excavation permit required <input type="checkbox"/></p> <p>11. Other workers in area <input type="checkbox"/></p> <p>12. Weather conditions <input type="checkbox"/></p> <p>13. MSDS reviewed <input type="checkbox"/></p>	<p><b>Access/Egress Hazards</b></p> <p>23. Aerial lift/Man basket (inspected &amp; tagged) <input type="checkbox"/></p> <p>24. Scaffold (inspected &amp; tagged) <input type="checkbox"/></p> <p>25. Ladders (tied off) <input type="checkbox"/></p> <p>26. Slips &amp; trips <input type="checkbox"/></p> <p>27. Hoisting (tools, equipment) <input type="checkbox"/></p> <p>28. Evacuation (alarms, routes, ph. #) <input type="checkbox"/></p> <p>29. Confined space entry permit required <input type="checkbox"/></p>	<p><b>Rigging &amp; Hoisting Hazards</b></p> <p>38. Lift study required <input type="checkbox"/></p> <p>39. Proper tools used <input type="checkbox"/></p> <p>40. Tools inspected <input type="checkbox"/></p> <p>41. Equipment inspected <input type="checkbox"/></p> <p>42. Slings inspected <input type="checkbox"/></p> <p>43. Others working overhead/below <input type="checkbox"/></p> <p>44. Critical lift permit <input type="checkbox"/></p>
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Are you ready to work safely?

**Remember to**

1. Stop and think
2. Look around
3. Assess risk
4. Control risks
5. Begin/resume work

<p><b>Ergonomic Hazards</b></p> <p>14. Awkward body position <input type="checkbox"/></p> <p>15. Over extension <input type="checkbox"/></p> <p>16. Prolonged twisting/bending motion <input type="checkbox"/></p> <p>17. Working in a tight area <input type="checkbox"/></p> <p>18. Lift too heavy/awkward to lift <input type="checkbox"/></p> <p>19. Parts of body in line of fire <input type="checkbox"/></p> <p>20. Repetitive motion <input type="checkbox"/></p> <p>21. Hands not in line of sight <input type="checkbox"/></p> <p>22. Working above your head <input type="checkbox"/></p>	<p><b>Overhead Hazards</b></p> <p>30. Barricades &amp; signs in place <input type="checkbox"/></p> <p>31. Hole coverings identified <input type="checkbox"/></p> <p>32. Harness/lanyard inspected <input type="checkbox"/></p> <p>33. 100% Tie-off with harness <input type="checkbox"/></p> <p>34. Tie off points identified <input type="checkbox"/></p> <p>35. Falling items <input type="checkbox"/></p> <p>36. Foreign bodies in eyes <input type="checkbox"/></p> <p>37. Hoisting or moving loads overhead <input type="checkbox"/></p>	<p><b>Electrical Hazards</b></p> <p>45. GFI test <input type="checkbox"/></p> <p>46. Lighting levels too low <input type="checkbox"/></p> <p>47. Working on/near energized equipment <input type="checkbox"/></p> <p>48. Electrical cords condition <input type="checkbox"/></p> <p>49. Electrical tools condition <input type="checkbox"/></p> <p>50. Fire extinguisher <input type="checkbox"/></p> <p>51. Hot work or electrical permit required <input type="checkbox"/></p>
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It is important that all relevant hazards have plans in place to reduce risk.  
 Be sure that all associated permits are closed off at the end of the job.

**Remember: Stop and Think**

Reviewed by Name and Signature:

*Ananya Sawant* *Stacy*

**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



Project: ADL Surveys Project No: \_\_\_\_\_  
 Client: Caltrans  
 Location: SR 110 - Pompano LA  
 Start Date: 12/8/14

**Work Description Provide A General Description Of The Work To Be Conducted.**

**Documentation and Procedure Review**

1. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  No\*
2. Emergency Response Plan reviewed?  Yes  No\*  N/A
3. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  No\*
4. Attended Client Site Health and Safety meeting?  Yes  No\*  N/A
5. Conducted Stantec site safety meeting with all workforces?  Yes  No\*  N/A
6. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
If yes, include in the Job Safety Analysis (JSA).  Yes  No
7. Working alone or remote work?  
If yes, complete call in/out process – Safe Work form must be completed.  Yes  No

**Notifications and Permits**

8. Are work permits required for this site?  
If yes, have they been completed and submitted as required?  Yes  No  
 Yes  No\*
9. Are utility locates required for this site?  
If yes, have they been completed and reviewed?  Yes  No  
 Yes  No\*
10. Does the Client require any notification prior to starting the work?  
If yes, has the notification been provided?  Yes  No  
 Yes  No\*

**\*Contact your Project Manager immediately.**

**Personal Protective Equipment**

**List specific PPE as needed. Verify type and inspect condition.**

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> Head Protection Type: <u>Hard Hat</u>   | <input checked="" type="checkbox"/> Hearing Protection: <u>AS needed</u> | <input checked="" type="checkbox"/> Gloves Type: <u>AS needed</u> |
| <input checked="" type="checkbox"/> Foot Protection Type: <u>Steel Toed</u> | <input type="checkbox"/> Respiratory Protection: _____                   | <input type="checkbox"/> Water Safety Gear: _____                 |
| <input checked="" type="checkbox"/> Eye Protection Type: <u>Safety</u>      | <input type="checkbox"/> Fire Retardant Coveralls: _____                 | <input type="checkbox"/> _____                                    |
| <input type="checkbox"/> High Visibility Vest: _____                        | <input type="checkbox"/> Fall Protection: _____                          | <input type="checkbox"/> _____                                    |

**Tools and Equipment**

**List specific equipment to be used. Verify type and inspect condition.**

- |  |   |                          |
|--|---|--------------------------|
| <input checked="" type="checkbox"/> <u>LAR Drill Rig</u> | <input checked="" type="checkbox"/> <u>Hand Auger</u> | <input type="checkbox"/> |
| <input type="checkbox"/>                                 | <input type="checkbox"/>                              | <input type="checkbox"/> |

HEALTH, SAFETY, AND ENVIRONMENT  
 RMS2- FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day



Daily Tailgate Discussions/Subcontractor Input

Start	12/8/14	Time:	0730	Weather:	Sunny
HOSP. Route, SWA, Vehicle Traffic, Working on furs, Drill Rig safety, Bio Hazards, uneven Surfaces					
Mid-Day		Time:		Weather:	
Post-Day		Time:		Weather:	

**I know the hazards:**

By signing here, you are stating the following:

- I have been involved in the Job Safety Analysis and understand the hazards and risk control actions associated with each task I am about to perform.
- I understand the permit to work requirements applicable to the work I am about to perform (if it includes permitted activities).
- I am aware that no jobs or work (that is not risk-assessed) is to be performed.
- I am aware of my obligation to "Stop Work" (See Stop Work Section).

**I arrived and departed fit for duty:**

- I am physically and mentally fit for duty.
- I am not under the influence of any type of medication, drugs or alcohol that could affect my ability to work safely.
- I am aware of my responsibility to bring any illness, injury (regardless of where or when it occurred) or fatigue issue I may have to the attention of the Crew Lead.
- I signed out uninjured unless I have otherwise informed the Crew Lead.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP			
Team Lead to contact Project Manager for any personnel identified as AP			
Individual Name/Company Name/Signature	Time:	Time:	Time:
Kate Poskani / Stantec / Kate Poskani	0730 <sup>F</sup>		
Max Grissel / SEPS / Max Grissel	0730	1335	
Frank Rodriguez / SEPS / Frank Rodriguez	0730	1335	
Will Miller / Stantec / Will Miller	0730		
Amey / Stantec / Amey	0730 <sup>F</sup>		

- I will STOP the job any time anyone is concerned or uncertain about safety.
- I will STOP the job if anyone identifies a hazard or additional mitigation not recorded.
- I will be alert to any changes in personnel or their fitness level (AP), conditions at the work site or hazards.
- If it is necessary to STOP THE JOB, I will reassess the task, hazards and mitigations; and then proceed only when safe to do so.



- Remember to
1. Stop and think
  2. Look around
  3. Assess risk
  4. Control risks
  5. Begin/resume work

Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.

Signature of Crew Lead: Amey

Date: 12/8/14



Project: \_\_\_\_\_ Project No: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Start Date: \_\_\_\_\_

**Work Description Provide A General Description Of The Work To Be Conducted.**

**Documentation and Procedure Review**

1. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  **No\***
2. Emergency Response Plan reviewed?  Yes  **No\***  N/A
3. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  **No\***
4. Attended Client Site Health and Safety meeting?  Yes  **No\***  N/A
5. Conducted Stantec site safety meeting with all workforces?  Yes  **No\***  N/A
6. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
*If yes, include in the Job Safety Analysis (JSA).*  Yes  No
7. Working alone or remote work?  
*If yes, complete call in/out process – Safe Work form must be completed.*  Yes  No

**Notifications and Permits**

8. Are work permits required for this site?  
*If yes, have they been completed and submitted as required?*  Yes  No  
 Yes  **No\***
9. Are utility locates required for this site?  
*If yes, have they been completed and reviewed?*  Yes  No  
 Yes  **No\***
10. Does the Client require any notification prior to starting the work?  
*If yes, has the notification been provided?*  Yes  No  
 Yes  **No\***

**\*Contact your Project Manager immediately.**

**Personal Protective Equipment List specific PPE as needed. Verify type and inspect condition.**

<input type="checkbox"/> Head Protection Type: _____	<input type="checkbox"/> Hearing Protection: _____	<input type="checkbox"/> Gloves Type: _____
<input type="checkbox"/> Foot Protection Type: _____	<input type="checkbox"/> Respiratory Protection: _____	<input type="checkbox"/> Water Safety Gear: _____
<input type="checkbox"/> Eye Protection Type: _____	<input type="checkbox"/> Fire Retardant Coveralls: _____	<input type="checkbox"/> _____
<input type="checkbox"/> High Visibility Vest: _____	<input type="checkbox"/> Fall Protection: _____	<input type="checkbox"/> _____

**Tools and Equipment List specific equipment to be used. Verify type and inspect condition.**

<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2– FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 1 day**



**Daily Tailgate Discussions/Subcontractor Input**

<b>Start</b>	Time:	Weather:
<b>Mid-Day</b>	Time:	Weather:
<b>Post-Day</b>	Time:	Weather:

**I know the hazards:**

By signing here, you are stating the following:

1. I have been involved in the Job Safety Analysis and understand the hazards and risk control actions associated with each task I am about to perform.
2. I understand the permit to work requirements applicable to the work I am about to perform (if it includes permitted activities).
3. I am aware that no jobs or work (that is not risk-assessed) is to be performed.
4. I am aware of my obligation to **"Stop Work"** (See *Stop Work Section*).

**I arrived and departed fit for duty:**

5. I am physically and mentally fit for duty.
6. I am not under the influence of any type of medication, drugs or alcohol that could affect my ability to work safely.
7. I am aware of my responsibility to bring any illness, injury (regardless of where or when it occurred) or fatigue issue I may have to the attention of the Crew Lead.
8. I signed out uninjured unless I have otherwise informed the Crew Lead.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP Team Lead to contact Project Manager for any personnel identified as AP			
Individual Name/Company Name/Signature	Time:	Time:	Time:

I will **STOP** the job any time anyone is concerned or uncertain about safety.

I will **STOP** the job if anyone identifies a hazard or additional mitigation not recorded.

I will be alert to any changes in personnel or their fitness level (AP), conditions at the work site or hazards.

If it is necessary to **STOP THE JOB**, I will reassess the task, hazards and mitigations; and then proceed only when safe to do so.



Are you ready to work safely?

**Remember to**

1. Stop and think
2. Look around
3. Assess risk
4. Control risks
5. Begin/resume work

**Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.**

**Signature of Crew Lead:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Job Safety Analysis (JSA) Must be completed for all field activities.**

Basic Job Steps	Potential Hazards	Controls to Reduce or Eliminate Hazard	Person Responsible

**Review the hazard categories below and check the mitigation measures applicable to the identified scope of work.**

<p><b>Environmental Hazards</b></p> <p>1. Work area clean <input type="checkbox"/></p> <p>2. Material storage identified <input type="checkbox"/></p> <p>3. Dust/Mist/Fume <input type="checkbox"/></p> <p>4. Noise in area <input type="checkbox"/></p> <p>5. Extreme temperatures <input type="checkbox"/></p> <p>6. Spill potential <input type="checkbox"/></p> <p>7. Waste containers needed <input type="checkbox"/></p> <p>8. Waste properly disposed <input type="checkbox"/></p> <p>9. Waste plan identified <input type="checkbox"/></p> <p>10. Excavation permit required <input type="checkbox"/></p> <p>11. Other workers in area <input type="checkbox"/></p> <p>12. Weather conditions <input type="checkbox"/></p> <p>13. MSDS reviewed <input type="checkbox"/></p>	<p><b>Access/Egress Hazards</b></p> <p>23. Aerial life/Man basket (inspected &amp; tagged) <input type="checkbox"/></p> <p>24. Scaffold (inspected &amp; tagged) <input type="checkbox"/></p> <p>25. Ladders (tied off) <input type="checkbox"/></p> <p>26. Slips &amp; trips <input type="checkbox"/></p> <p>27. Hoisting (tools, equipment) <input type="checkbox"/></p> <p>28. Evacuation (alarms, routes, ph. #) <input type="checkbox"/></p> <p>29. Confined space entry permit required <input type="checkbox"/></p>	<p><b>Rigging &amp; Hoisting Hazards</b></p> <p>38. Lift study required <input type="checkbox"/></p> <p>39. Proper tools used <input type="checkbox"/></p> <p>40. Tools inspected <input type="checkbox"/></p> <p>41. Equipment inspected <input type="checkbox"/></p> <p>42. Slings inspected <input type="checkbox"/></p> <p>43. Others working overhead/below <input type="checkbox"/></p> <p>44. Critical lift permit <input type="checkbox"/></p>	
<p><b>Ergonomic Hazards</b></p> <p>14. Awkward body position <input type="checkbox"/></p> <p>15. Over extension <input type="checkbox"/></p> <p>16. Prolonged twisting/bending motion <input type="checkbox"/></p> <p>17. Working in a tight area <input type="checkbox"/></p> <p>18. Lift too heavy/awkward to lift <input type="checkbox"/></p> <p>19. Parts of body in line of fire <input type="checkbox"/></p> <p>20. Repetitive motion <input type="checkbox"/></p> <p>21. Hands not in line of sight <input type="checkbox"/></p> <p>22. Working above your head <input type="checkbox"/></p>	<div style="text-align: center;">  <p><b>Remember to</b></p> <ol style="list-style-type: none"> <li>1. Stop and think</li> <li>2. Look around</li> <li>3. Assess risk</li> <li>4. Control risks</li> <li>5. Begin/resume work</li> </ol> </div> <p><b>Overhead Hazards</b></p> <p>30. Barricades &amp; signs in place <input type="checkbox"/></p> <p>31. Hole coverings identified <input type="checkbox"/></p> <p>32. Harness/lanyard inspected <input type="checkbox"/></p> <p>33. 100% Tie-off with harness <input type="checkbox"/></p> <p>34. Tie off points identified <input type="checkbox"/></p> <p>35. Falling items <input type="checkbox"/></p> <p>36. Foreign bodies in eyes <input type="checkbox"/></p> <p>37. Hoisting or moving loads overhead <input type="checkbox"/></p>	<p><b>Electrical Hazards</b></p> <p>45. GFI test <input type="checkbox"/></p> <p>46. Lighting levels too low <input type="checkbox"/></p> <p>47. Working on/near energized equipment <input type="checkbox"/></p> <p>48. Electrical cords condition <input type="checkbox"/></p> <p>49. Electrical tools condition <input type="checkbox"/></p> <p>50. Fire extinguisher <input type="checkbox"/></p> <p>51. Hot work or electrical permit required <input type="checkbox"/></p>	
<p><b>It is important that all relevant hazards have plans in place to reduce risk.                  Be sure that all associated permits are closed off at the end of the job.</b></p> <p><b>Remember: Stop and Think</b></p>			<p><b>Personal Limitations/Hazards</b></p> <p>52. Procedure not available for task <input type="checkbox"/></p> <p>53. Confusing instructions <input type="checkbox"/></p> <p>54. No training for task or tools to be used <input type="checkbox"/></p> <p>55. First time performing the task <input type="checkbox"/></p> <p>56. Micro break (stretching/flexing) <input type="checkbox"/></p> <p>57. Report <b>all injuries</b> to your supervisor <input type="checkbox"/></p>

Reviewed by Name and Signature: \_\_\_\_\_

Fit for Duty

Safety is influenced by many factors, but the most important is the health and well-being of Stantec’s employees and partners. Physical and mental health are just as important as good tools, good practices, and good job planning.

This card is designed to help you do a quick self-assessment of your physical and mental health. Any concerns resulting from your assessment regarding your ability to carry out your job responsibilities safely and in good health need to be discussed with your supervisor before starting work.

- Am I feeling good today and ready to work at my typical level of physical activity and responsibility?
- Do I have any sprains/strains, areas of weakness or soreness?
- Am I managing multiple sources of stress?
- Am I well hydrated?
- Any physically-demanding activities recently (chores, sports, hobbies)?
- Am I well-rested with a good energy level? When did I eat last?
- Am I taking any medications that can make me drowsy or adversely affect my safe performance?
- Any cuts/scrapes are clean and bandaged?
- Did I remember to bring with me my health maintenance medications (blood pressure, diabetes, cholesterol, heart, etc.)?

If your answers to any of the questions above indicate that you may not be ready to work, contact your supervisor immediately to discuss a plan of action.

LAST-MINUTE RISK ASSESSMENT (LMRA)

- **1. STOP and Think**
- 2. Look around**

Is the work area safe?  
Will my work endanger others?  
Will other people pose risk?

**3. Assess risk**

Do I clearly understand the task?  
Will lifting or manual handling be required?  
Potential for slips, trips, or falls?  
Are there driving or vehicle concerns?  
Have I considered all underground services?  
Moving or pressurized equipment?  
What could go wrong?

**4. Control risk**

What can I do to control hazards?  
Do I have the right tools?  
Is the SWP (Safe Work Practice) appropriate?  
Do I have the appropriate PPE?  
Are emergency plans in place?

**5. Begin/Resume work**

If you're unsure, talk to your supervisor.



Are you ready to work safely?

**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2 – FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 5 day**



Project: \_\_\_\_\_ Project No: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Start Date: \_\_\_\_\_

**Documentation and Procedure Review**

- 11. Risk Management Strategy (RMS1) form and/or Site Specific Health and Safety Plan signed and reviewed?  Yes  **No\***
- 12. Emergency Response Plan reviewed?  Yes  **No\***  N/A
- 13. Tested two-way communications (cell phone, satellite phone) and security measures?  Yes  **No\***
- 14. Attended Client Site Health and Safety meeting?  Yes  **No\***  N/A
- 15. Conducted Stantec site safety meeting with all workforces?  Yes  **No\***  N/A
- 16. Are there any new or unexpected hazards not identified in the RMS1/HASP?  
*If yes, include in the Job Safety Analysis (JSA).*  Yes  No
- 17. Working alone or remote work?  
*If yes, complete call in/out process – Safe Work form must be completed.*  Yes  No

**Notifications and Permits**

- 18. Are work permits required for this site?  
*If yes, have they been completed and submitted as required?*  Yes  No  
 Yes  **No\***
- 19. Are utility locates required for this site?  
*If yes, have they been completed and reviewed?*  Yes  No  
 Yes  **No\***
- 20. Does the Client require any notification prior to starting the work?  
*If yes, has the notification been provided?*  Yes  No  
 Yes  **No\***

**\*Contact your Project Manager immediately.**

**Work Description Provide a general description of the work to be conducted.**

**Personal Protective Equipment List specific PPE as needed. Verify type and inspect condition.**

<input type="checkbox"/> Head Protection Type: _____	<input type="checkbox"/> Hearing Protection: _____	<input type="checkbox"/> Gloves Type: _____
<input type="checkbox"/> Foot Protection Type: _____	<input type="checkbox"/> Respiratory Protection: _____	<input type="checkbox"/> Water Safety Gear: _____
<input type="checkbox"/> Eye Protection Type: _____	<input type="checkbox"/> Fire Retardant Coveralls: _____	<input type="checkbox"/> _____
<input type="checkbox"/> High Visibility Vest: _____	<input type="checkbox"/> Fall Protection: _____	<input type="checkbox"/> _____

**Tools and Equipment List specific equipment to be used. Verify type and inspect condition.**

<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input checked="" type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

**HEALTH, SAFETY, AND ENVIRONMENT**

**RMS2 – FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 5 day**

**05.1 DAILY TAILGATE DISCUSSIONS/SUBCONTRACTOR INPUT**



<b>Date:</b>		<b>Time:</b>	<b>Weather:</b>
Start			
Mid-Day			
Post-Day			
<b>Date:</b>		<b>Time:</b>	<b>Weather:</b>
Start			
Mid-Day			
Post-Day			
<b>Date:</b>		<b>Time:</b>	<b>Weather:</b>
Start			
Mid-Day			
Post-Day			
<b>Date:</b>		<b>Time:</b>	<b>Weather:</b>
Start			
Mid-Day			
Post-Day			
<b>Date:</b>		<b>Time:</b>	<b>Weather:</b>
Start			
Mid-Day			
Post-Day			

**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2 – FIELD LEVEL Risk ASSESSMENT (FIT FOR DUTY), 5 day**



**I know the hazards:**

By signing here, you are stating the following:

- 9. I have been involved in the Job Safety Analysis (JSA) and understand the hazards and risk control actions associated with each task I am about to perform.
- 10. I understand the permit to work requirements applicable to the work I am about to perform (if it includes permitted activities).
- 11. I am aware that work that has not been risk-assessed must not be performed.
- 12. I am aware of my ability and obligation to **Stop Work** (See below).

**I arrived and departed fit for duty (see Fit for Duty card for further information):**

- 13. I am physically and mentally fit for duty.
- 14. I am not under the influence of any type of medication, drugs or alcohol that could affect my ability to work safely.
- 15. I am aware of my responsibility to bring any illness, injury (regardless of where or when it occurred), symptoms of soreness or discomfort, or fatigue issue I may have to the attention of the Crew Lead or Supervisor.
- 16. I sign out uninjured unless I have otherwise informed the Crew Lead or Supervisor.

Insert fitness level under corresponding time column: Fit for Duty = F      Alternate Plan = AP Team Lead to contact Project Manager for any personnel identified as AP															
Individual Name/Company Name/Signature	Date:														
	Time:														

**I will STOP WORK** any time anyone is concerned or uncertain about safety. **I will STOP WORK** if anyone identifies a hazard or additional mitigation not recorded. **I will** be alert to any changes in personnel or their fitness level (AP), conditions at the work site or hazards. If it is necessary to **STOP WORK**, I will reassess the task, hazards and mitigations; and then proceed only when safe to do so.

**Conclusion of day: I certify that the planned work activities are completed for the day and all injuries and first aids have been reported via RMS3.**

Signature of Crew Lead: \_\_\_\_\_ Date: \_\_\_\_\_



- Remember to**
- 1. Stop and think
  - 2. Look around
  - 3. Assess risk
  - 4. Control risks
  - 5. Begin/resume work

Basic Job Steps	Potential Hazards	Controls to Reduce or Eliminate Hazard	Person Responsible

Review the hazard categories below and check the mitigation measures applicable to the identified scope of work.

<p><b>Environmental Hazards</b></p> <ul style="list-style-type: none"> <li>23. Work area clean</li> <li>24. Material storage identified</li> <li>25. Dust/Mist/Fume</li> <li>26. Noise in area</li> <li>27. Extreme temperatures</li> <li>28. Spill potential</li> <li>29. Waste containers needed</li> <li>30. Waste properly disposed</li> <li>31. Waste plan identified</li> <li>32. Excavation permit required</li> <li>33. Other workers in area</li> <li>34. Weather conditions</li> <li>35. MSDS reviewed</li> </ul>	<p><b>Access/Egress Hazards</b></p> <ul style="list-style-type: none"> <li>38. Aerial life/Man basket (inspected &amp; tagged)</li> <li>39. Scaffold (inspected &amp; tagged)</li> <li>40. Ladders (tied off)</li> <li>41. Slips &amp; trips</li> <li>42. Hoisting (tools, equipment)</li> <li>43. Evacuation (alarms, routes, ph. #)</li> <li>44. Confined space entry permit required</li> </ul>	<p><b>Rigging &amp; Hoisting Hazards</b></p> <ul style="list-style-type: none"> <li>58. Lift study required</li> <li>59. Proper tools used</li> <li>60. Tools inspected</li> <li>61. Equipment inspected</li> <li>62. Slings inspected</li> <li>63. Others working overhead/below</li> <li>64. Critical lift permit</li> </ul>	
<p><b>Ergonomic Hazards</b></p> <ul style="list-style-type: none"> <li>36. Awkward body position</li> <li>37. Over extension</li> <li>38. Prolonged twisting/bending motion</li> <li>39. Working in a tight area</li> <li>40. Lift too heavy/awkward to lift</li> <li>41. Parts of body in line of fire</li> <li>42. Repetitive motion</li> <li>43. Hands not in line of sight</li> <li>44. Working above your head</li> </ul>	 <p><b>Remember to</b></p> <ul style="list-style-type: none"> <li>1. Stop and think</li> <li>2. Look around</li> <li>3. Assess risk</li> <li>4. Control risks</li> <li>5. Begin/resume work</li> </ul>	<p><b>Electrical Hazards</b></p> <ul style="list-style-type: none"> <li>65. GFI test</li> <li>66. Lighting levels too low</li> <li>67. Working on/near energized equipment</li> <li>68. Electrical cords condition</li> <li>69. Electrical tools condition</li> <li>70. Fire extinguisher</li> <li>71. Hot work or electrical permit required</li> </ul>	
<p><b>Overhead Hazards</b></p> <ul style="list-style-type: none"> <li>45. Barricades &amp; signs in place</li> <li>46. Hole coverings identified</li> <li>47. Harness/lanyard inspected</li> <li>48. 100% Tie-off with harness</li> <li>49. Tie off points identified</li> <li>50. Falling items</li> <li>51. Foreign bodies in eyes</li> <li>52. Hoisting or moving loads overhead</li> </ul>			<p><b>Personal Limitations/Hazards</b></p> <ul style="list-style-type: none"> <li>72. Procedure not available for task</li> <li>73. Confusing instructions</li> <li>74. No training for task or tools to be used</li> <li>75. First time performing the task</li> <li>76. Micro break (stretching/flexing)</li> <li>77. Report <b>all injuries</b> to your supervisor</li> </ul>

It is important that all relevant hazards have plans in place to reduce risk.  
Be sure that all associated permits are closed off at the end of the job.

**Remember: Stop and Think**

Reviewed by Name and Signature: \_\_\_\_\_

# Required Pre-Entry Discussion Topics / Requirements for All Workers and Visitors



Safety rules apply to anyone entering a Stantec workplace or worksite, including employees, supervisors, management and visitors

## **COMPANY SAFETY RULES (REFERENCE: STANTEC'S HSE MANUAL SECTION 1.3)**

- Take reasonable care to protect the health and safety of yourself and others, and the environments in which we all work.
- Consumption of alcohol is only approved during company-sponsored events. Consumption or possession of illegal drugs on company premises, or on any company jobsite, is prohibited.
- Horseplay, fighting or otherwise interfering with other employees is prohibited.
- Theft, vandalism or any other abuses or misuse of company property is prohibited.
- All unsafe acts and conditions, including "near miss" incidents, spills or releases of hazardous materials, property damage, and injuries are to be promptly reported to your supervisor in accordance with Section 12 of the HSE manual, and Attachment 5 of this health and safety plan (HASP).
- Clothing and personal protective equipment (PPE) shall be appropriate to tasks being performed, as determined by hazard assessment (refer to job safety analyses and/or standard operating procedures in Attachment 2 and the work risk assessment tool in Attachment 1 of this HASP).
- All work shall be conducted in accordance with applicable regulatory safety requirements, client safety requirements, and in accordance with Stantec's HSE manual.
- Only use tools, vehicles and equipment that are in good repair, with all guards and safety devices in place, and for which you have sufficient training and experience. Select tools, vehicles and equipment appropriate for the task intended, and use them in compliance with the manufacturer's written instructions.
- Every employee will keep the work area neat, clean and orderly. A floor or other surface used by any employee will be kept free of obstructions, hazards, and accumulations of refuse, snow or ice.
- As a Stantec employee, you are responsible and authorized to STOP work immediately if you become aware of an unsafe act or condition that could place anyone in danger, or if you are not confident in the work plan. Refer to the Stop Work Authority for guidance.

## **DISCUSSION IDEAS FOR THE DAILY PRODUCTION H&S MEETING**

- Emergency response plan, emergency vehicle (full of fuel) and muster point
- Route to medical aid (hospital or other facility)
- Work hours, is night work planned?
- Hand signals around heavy equipment
- Traffic control
- Pertinent Legislation and Regulations
- Above and below ground utilities (energized or de-energized)
- Material Safety Data Sheets (MSDS)
- To who, what, why, and when to report an incident
- Fire extinguisher and First Aid kit locations
- Excavations, trenching sloping and shoring
- Personal protective equipment ( PPE ) and training

## **Required Pre-Entry Discussion Topics / Requirements for All Workers and Visitors**

- Safety equipment and training
- Emergency telephone and telephone numbers (may not be 911)
- Eye wash stations and washroom locations
- Energy lock-out/tag-out procedures. Location of "kill Switches" etc.
- Weather restrictions
- Site security. Site hazards. Is special waste present?
- Traffic and people movements
- Working around machinery (both static and mobile)
- Sources of ignition, static electricity etc.
- Stings, bites, large animals and other naturally related injuries
- Working above grade
- Working at isolated sites
- Decontamination procedures (both personnel and equipment)
- Falls, trips, sprains and lifting injuries (how to prevent)
- Right to refuse unsafe work
- Adjacent property issues (residence, business, school, day care center)
- Hand & glove safety, pinch points, hand positioning

**Attachment 4**

**Driver's Fatigue Checklist /Safe Driving Vehicle Pre-Use Checklist**

# too tired? Too tired to drive?

A road safety initiative of RACV, Rural Ambulance Victoria and Metropolitan Ambulance Service

## Driver Fatigue Checklist

**Before you drive, answer these questions to make sure you are not too tired to drive.**

	Yes	No
<p>Have you been getting full nights of restful sleep over the past week?</p> <p><i>When you don't get enough sleep you acquire sleep debt. The only way to repay the debt is by sleeping.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are you setting off on a trip after a good night's sleep, rather than after a full day at work?</p> <p><i>Being awake for 17 hours has the same effect on driving as having a BAC (Blood Alcohol Concentration) of .05, doubling your risk of crashing. After 24 hours the BAC equivalent is 0.1, equating to a 7 times greater risk of crashing than someone who is well rested.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are you planning to start your trip after 6am, rather than starting out earlier when you would normally be asleep?</p> <p><i>Your body naturally wants to sleep between about 1am and 6am greatly increasing your risk of crashing, at those times.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Have you allowed time in your trip to stop and rest if you feel tired?</p> <p><i>Regular breaks every 2 hours will help maintain vigilance, however, the only way to combat fatigue is to sleep.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Do you stop and have a Powernap if you feel tired while driving?</p> <p><i>Stopping for a 15 to 30 minute sleep or Powernap when you are tired is effective in alleviating the short-term effects of fatigue, but ensure you allow time to recover from your sleep before commencing to drive.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are you sure that you do not suffer from a sleeping disorder, such as sleep apnoea?</p> <p><i>2% of people suffer from the most common sleep disorder, sleep apnoea. Men over 50, particularly those overweight, are most at risk.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>

**If you have answered "no" to any of these questions you may be at risk of fatigue.**



# too tired? Too tired to drive

## What is fatigue?

**Driver fatigue contributes to more than 25 per cent of all road crashes in Victoria.**

### Two main causes:

- lack of quality sleep
- driving at times when you would normally be asleep.

### Protect yourself from having a fatigue-related crash by:

- making sure you regularly get enough sleep
- being aware of the fatigue high crash risk times when driving between 1am-6am
- not starting a long trip after a long day's work
- planning your trip so you can take regular breaks
- seeking medical advice if you often feel sleepy
- being aware of the effects of any medication taken.

### Once you're on the road:

- regular rest breaks to help keep you alert, but if you feel tired, the only way to keep safe is to stop and sleep
- eat proper and well-balanced meals, preferably at your normal meal times.

**If you feel tired when driving, take a Powernap (sleep for 15 to 30 minutes), but allow time to recover from your sleep before commencing to drive.**

**Don't be fooled by myths about fatigue! The following common beliefs about fatigue are untrue:**

- myth** – Coffee is the best way to combat fatigue.  
*Coffee only provides short-term benefits; once its effects wear off, you suffer from sleep rebound, which is a major cause of crashes.*
- myth** – Playing music will help keep me alert.  
*This is only a short-term benefit.*
- myth** – Plenty of fresh air through the window will help keep me alert.  
*This is only a short-term benefit.*
- myth** – Young people need less sleep.  
*In fact, drivers under 25 years of age are over-represented in fatigue crashes.*
- myth** – I know when I am tired, or when I am having "sleep attacks".  
*The danger is that you only find out how tired you are when it's too late.*

**The only cure for fatigue is sleep**



**Attachment 5**  
**RMS-3 incident/Near Miss Investigation and Collision Kit**



# INCIDENT REPORT – RMS 3

Incidents involving injury, potential injury, or report of pain, soreness, or discomfort must be reported immediately (within one hour) to a supervisor. Supervisors will then immediately contact their HSE representative to develop a plan for assessment and care. This form must be completed and submitted within 24 hours of any incident. Do not delay submission waiting for signatures. Email to [hse@stantec.com](mailto:hse@stantec.com) or fax unsigned report to (780) 969-2030 and file locally in compliance with the corporate [records retention policy and practices](#) once all signatures have been obtained.

This document contains privileged and confidential information prepared at the request of Stantec's Legal Counsel. The contents of this report are restricted to HR personnel, Risk Management Representatives, Project Manager and PC Leader, and Stantec's Insurer, Adjuster and Legal Counsel. Information collected will be used solely for the purpose of meeting the requirements of Stantec's HSE and insurance programs, complying with applicable legislation, and will be used in accordance with any governing privacy legislation. The information collected will be maintained electronically and may be included in required reports.

SECTION 1: GENERAL INFORMATION			
Office location:		BC number:	
Location of incident:			
Incident date and time:		Date and time reported:	
Project name:		Project number:	
Client Name:			
Person in charge:		Person in Charge Phone:	

SECTION 2: STANTEC EMPLOYEE INFORMATION (if more than one identify extras in incident details below)			
Name:		Phone:	
Job position:		Group name:	
Time employee began work:		Job Experience (in years)	
Type of employment:	Full Time <input type="checkbox"/> ; Visitor <input type="checkbox"/> ; Contract <input type="checkbox"/> ; Volunteer <input type="checkbox"/> ; Seasonal <input type="checkbox"/>		
Supervisor:		Supervisor Phone:	

SECTION 3: INCIDENT DETAILS			
Type of Incident:	<b>*incident types marked with an asterisk, please complete pages 1 and 4 only</b>		
	<b>See StanNet for a list of <a href="#">Incident Type Definitions</a></b>		
<input type="checkbox"/> *Report Only	<input type="checkbox"/> *Hazard Identification	<input type="checkbox"/> *Near Miss	
<input type="checkbox"/> First Aid	<input type="checkbox"/> Motor Vehicle Incident	<input type="checkbox"/> 3 <sup>rd</sup> Party Incident (i.e., Public)	
<input type="checkbox"/> Medical Aid – No Lost Time	<input type="checkbox"/> Property Damage - Vehicle	<input type="checkbox"/> Spill or Release	
<input type="checkbox"/> Restricted Work	<input type="checkbox"/> Property Damage - Other	<input type="checkbox"/> Utility Strike	
<input type="checkbox"/> Lost Time	<input type="checkbox"/> Theft	<input type="checkbox"/> Fire/Explosion/Flood	
<input type="checkbox"/> Fatality	<input type="checkbox"/> Contractor Recordable Incident	<input type="checkbox"/> Stop Work Authority	
<input type="checkbox"/> Violence or Harassment	<input type="checkbox"/> Non-compliance	<input type="checkbox"/> Other (specify details below)	
Describe incident in detail: (include any issues related to people, equipment, materials, environment, and processes)			
Immediate corrective actions taken:			

Canada East (Atlantic) – Neil Clements (506-639-2961); Canada East (ON/QC) – Jim Elkins (613-404-8508); Canada Prairie & Mountain – Yvonne Beattie (780-616-8909); International – Kev Metcalfe (780-231-2185); US Northeast & South – Fred Miller (610-235-7315); US Midwest & Mid-Atlantic - Keith Kuhlmann (740-816-6170); US West – Clint Reuter (818-395-8556)



# INCIDENT REPORT – RMS 3

<b>SECTION 4: MEDICAL INFORMATION</b>											
Name of first aid attendant:	Injury recorded in first aid log? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>										
Description of first aid or medical treatment administered:											
Clinic/hospital sent to:											
Attending physician/paramedic (if known):											
<b>Area of Injury – Please check all that apply:</b>											
<input type="checkbox"/> Head	<input type="checkbox"/> Teeth	<input type="checkbox"/> Upper back	Left	Right	Left	Right	Left	Right	Left	Right	
<input type="checkbox"/> Face	<input type="checkbox"/> Neck	<input type="checkbox"/> Lower back	<input type="checkbox"/> Shoulder	<input type="checkbox"/>	<input type="checkbox"/> Wrist	<input type="checkbox"/>	<input type="checkbox"/> Hip	<input type="checkbox"/>	<input type="checkbox"/> Ankle	<input type="checkbox"/>	
<input type="checkbox"/> Eye(s)	<input type="checkbox"/> Chest	<input type="checkbox"/> Abdomen	<input type="checkbox"/> Arm	<input type="checkbox"/>	<input type="checkbox"/> Hand	<input type="checkbox"/>	<input type="checkbox"/> Thigh	<input type="checkbox"/>	<input type="checkbox"/> Foot	<input type="checkbox"/>	
<input type="checkbox"/> Ear(s)	<input type="checkbox"/> Pelvis		<input type="checkbox"/> Elbow	<input type="checkbox"/>	<input type="checkbox"/> Finger(s)	<input type="checkbox"/>	<input type="checkbox"/> Knee	<input type="checkbox"/>	<input type="checkbox"/> Toe(s)	<input type="checkbox"/>	
<input type="checkbox"/> Other	Specify _____		<input type="checkbox"/> Forearm	<input type="checkbox"/>			<input type="checkbox"/> Lower Leg	<input type="checkbox"/>			
Has the injured employee had a previous similar injury or disability?										Yes <input type="checkbox"/>	No <input type="checkbox"/>

<b>SECTION 5: PROPERTY OR VEHICLE DAMAGE: STANTEC</b>			
Ownership Details (choose one):	<input type="checkbox"/> Rented (attach rental agreement)	<input type="checkbox"/> Stantec Owned	<input type="checkbox"/> Personal (employee vehicle)
Year, Make, and Model of Vehicle:	Vehicle ID # (VIN)		
Nature of damage:	Estimated cost of damage:		\$
Description of damaged property:			
Attending police officer (if known):		Badge #:	
Copy of police report received	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, file number: (attach copy of police report)		
<b>PROPERTY OR VEHICLE DAMAGE: 3<sup>RD</sup> PARTY</b>			
Name of owner and contact number:			
Year, Make, and Model of Vehicle:		License Plate Number:	
Insurer and Policy Number:			
Injured parties? Yes <input type="checkbox"/> No <input type="checkbox"/>		If yes, describe Injuries:	
Diagram or photographs attached?		Yes <input type="checkbox"/> No <input type="checkbox"/>	

<b>WITNESS INFORMATION - #1</b>			
Name:	Phone Number:		
Witness statement provided?	Yes (attached) <input type="checkbox"/>	No <input type="checkbox"/>	

<b>WITNESS INFORMATION - #2</b>			
Name:	Phone Number:		
Witness statement provided?	Yes (attached) <input type="checkbox"/>	No <input type="checkbox"/>	

<b>SECTION 6: SPILL OR RELEASE</b>			
Substance:			
Quantity:	Employee(s) exposed via: <input type="checkbox"/> Inhalation <input type="checkbox"/> Contact <input type="checkbox"/> Ingestion <input type="checkbox"/> n/a		
Off-site impacts observed or anticipated?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, describe:		
Name of regulatory agencies contacted:			
Contact name, number, date and time of call:			

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SECTION 7: ANALYSIS				
IMMEDIATE/DIRECT CAUSES				
<b>A. UNSAFE ACTIONS (check off as many as necessary)</b>				
<input type="checkbox"/> Operating equipment without authority	<input type="checkbox"/> Failing to use personal protective equipment properly	<input type="checkbox"/> Failure to identify hazard or risk		
<input type="checkbox"/> Failure to warn	<input type="checkbox"/> Improper loading	<input type="checkbox"/> Inattention		
<input type="checkbox"/> Failure to secure	<input type="checkbox"/> Improper placement	<input type="checkbox"/> Failure to communicate		
<input type="checkbox"/> Operating at improper speed	<input type="checkbox"/> Improper lifting or handling	<input type="checkbox"/> Other: Specify		
<input type="checkbox"/> Making safety devices inoperative	<input type="checkbox"/> Improper position for a task			
<input type="checkbox"/> Removing safety devices	<input type="checkbox"/> Servicing equipment in operation			
<input type="checkbox"/> Using defective/improper equipment	<input type="checkbox"/> Horseplay			
<input type="checkbox"/> Using equipment improperly	<input type="checkbox"/> Failure to follow procedure, policy or practice			
<b>B. UNSAFE CONDITIONS (check off as many as necessary)</b>				
<input type="checkbox"/> Inadequate guards/barriers	<input type="checkbox"/> Radiation exposure	<input type="checkbox"/> Inadequate information/data		
<input type="checkbox"/> Improper/inadequate PPE	<input type="checkbox"/> High or low temperature exposures	<input type="checkbox"/> Inadequate preparation/planning		
<input type="checkbox"/> Defective tools or equipment	<input type="checkbox"/> Inadequate or excess illumination	<input type="checkbox"/> Inadequate support/assistance		
<input type="checkbox"/> Congested work area	<input type="checkbox"/> Inadequate ventilation	<input type="checkbox"/> Road conditions		
<input type="checkbox"/> Inadequate warning system	<input type="checkbox"/> Presence of harmful materials	<input type="checkbox"/> Weather conditions		
<input type="checkbox"/> Fire and explosion hazards	<input type="checkbox"/> Inadequate instructions/procedures	<input type="checkbox"/> Other: Specify		
<input type="checkbox"/> Poor housekeeping; disorder	<input type="checkbox"/> Hazardous environmental conditions; gases, dusts, smokes, fumes, vapours			
<input type="checkbox"/> Noise exposure				
BASIC/ROOT CAUSES				
<b>C. PERSONAL FACTORS (check off as many as necessary)</b>				
<input type="checkbox"/> Inadequate physical capability	<input type="checkbox"/> Mental stress	<input type="checkbox"/> Lack of knowledge		
<input type="checkbox"/> Physical stress	<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Other: Specify		
<b>D. JOB FACTORS (check off as many as necessary)</b>				
<input type="checkbox"/> Inadequate leadership or supervision	<input type="checkbox"/> Inadequate maintenance (scheduled or preventative)	<input type="checkbox"/> Excessive wear and tear		
<input type="checkbox"/> Inadequate engineering	<input type="checkbox"/> Inadequate tools or equipment	<input type="checkbox"/> Inadequate communications		
<input type="checkbox"/> Inadequate purchasing	<input type="checkbox"/> Inadequate work standards	<input type="checkbox"/> Improper motivation		
<input type="checkbox"/> Abuse or misuse	<input type="checkbox"/> Other: Specify			
SECTION 8: FOLLOW-UP				
<b>Short-term:</b>	<b>Corrective Action</b>	<b>Assigned To</b>	<b>Target Date</b>	<b>Completion Date</b>
<b>Long-term:</b>	<b>Corrective Action</b>	<b>Assigned To</b>	<b>Target Date</b>	<b>Completion Date</b>

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REVIEW COMMENTS		
<b>Involved Employee Comments:</b>		
Signature: Job Title:	Print Name:	Date:
<b>Lead Investigator Comments:</b>		
Signature: Job Title:	Print Name:	Date:
<b>Supervisor/Project Manager:</b>		
Signature: Job Title:	Print Name:	Date:
<b>HSE Representative (OSEC/JH&amp;S Committee/RSEC/HSE Manager):</b>		
Signature: Job Title:	Print Name:	Date:
<b>Management Review:</b>		
Signature: Job Title:	Print Name:	Date:
<b>Client Review (if required):</b>		
Signature: Job Title:	Print Name:	Date:
<b>Additional Comments:</b>		

Canada East (Atlantic) – Neil Clements (506-639-2961); Canada East (ON/QC) – Jim Elkins (613-404-8508); Canada Prairie & Mountain – Yvonne Beattie (780-616-8909); International – Kev Metcalfe (780-231-2185); US Northeast & South – Fred Miller (610-235-7315); US Midwest & Mid-Atlantic – Keith Kuhlmann (740-816-6170); US West – Clint Reuter (818-395-8556)

**Contact information.**

Immediately Call Corporate HSE, and Practice & Risk Management, and (if injuries) Human Resources.

Health, Safety & Environment: Call:

Keith Robinson	Office (614) 545-3787	Cell (614) 545-3787
Clint Reuter	Office (949) 923-6258	Cell (818) 395-8556

Practice & Risk Management: Fax unsigned report to (780) 969-2030

Human Resources: **For Injuries Only** contact the Human Resources Rep. for your region:

US East: Jennie Moore

Jennie Moore: Phone: (585) 413-5241, Cell: (585) 613-8022, Fax: (585) 272-7442,

E-Mail: [jennie.moore@stantec.com](mailto:jennie.moore@stantec.com).

US West: Peggy Ramos

Peggy Ramos: Phone: (949) 923-6061, Fax: (949) 923-6015,

E-Mail: [peggy.ramos@stantec.com](mailto:peggy.ramos@stantec.com)

US Mtn Desert: (Arlington, Houston, Midland, Phoenix, Scottsdale, Ponca City SLIC): Shannon Drake

Shannon Drake: Phone: (602) 707-4627, Fax (602) 532-7784,

E-Mail: [Shannon.Drake@stantec.com](mailto:Shannon.Drake@stantec.com)

US Mtn Desert: (Dallas, Fort Worth, Denver, Fort Collins, Golden, Las Vegas, Reno, Oklahoma City, Tucson) Sheryl Appelt

Sheryl Appelt: Phone: (602) 707-9495, Fax (602) 926-2217,

E-Mail: [Sheryl.Appelt@stantec.com](mailto:Sheryl.Appelt@stantec.com)

Fax and/or scan-email report to all three.

## VEHICLE COLLISION KIT

### Stantec Vehicle Collision Kit

The following items should be enclosed in an envelope in the glove box of all Stantec vehicles:

- Vehicle Registration Card
- Vehicle Insurance Card with name and phone number of agent
- Name of Preferred Body Shop or Maintenance Facility to take damaged vehicle (usually nearest Dealership)
- Owner's Manual
- Disposable Camera
- Note Pad and Pen

### WHAT TO DO AFTER A COLLISION:

Auto collisions: Even the most careful drivers may be involved. Knowledge of what to do **after** the collision can make the experience a little less frightening and decrease the chance of unnecessary complications.

#### After a Collision

- Check for injuries. Life and health are more important than damage to vehicles.
- Make note of specific damages to all vehicles involved.
- Write down the names, addresses and license numbers of persons involved in the collision. Also, write a description of the other vehicles.
- Call the police, even if the collision is minor.
- Jot down names and addresses of anyone who may have witnessed the collision. This can prevent disagreement concerning how the collision actually happened.

#### Other Do's and Don'ts

- DO jot down details about the collision, the location, and circumstances such as weather conditions and visibility.
- DO notify your insurance agent about the collision immediately.
- DON'T sign any document unless it is for the police or your insurance agent.

**Remember that a Stantec incident investigation form must also be completed following any collision. The collision must be reported to the Stantec Project Manager in addition to the following people:**

#### Practice and Risk Management :

Fax: 780-969-2030

Keith Robinson	Office (614) 545-3787	Cell (614) 545-3787
Clint Reuter	Office (949) 923-6258	Cell (818) 395-8556



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
11/01/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER  AON REED STENHOUSE INC. AON RISK SERVICES CENTRAL, INC. 900 - 10025 - 102A AVENUE EDMONTON, AB T5J 0Y2	CONTACT NAME: ANDREA OTTO	
	PHONE (A/C No. Ext.): 1-952-807-0679	FAX (A/C No.): 1-312-381-6608
	E-MAIL ADDRESS: ANDREA.OTTO@AON.COM	
INSURED  STANTEC CONSULTING SERVICES INC. 25864-F BUSINESS CENTER DRIVE, REDLANDS, CA 92374	INSURER(S) AFFORDING COVERAGE	
	INSURER A: ZURICH AMERICAN INSURANCE COMPANY	NAIC # 16535
	INSURER B: SENTRY INSURANCE A MUTUAL COMPANY	24988
	INSURER C: ZURICH INSURANCE COMPANY	
	INSURER D: SENTRY INSURANCE A MUTUAL COMPANY	24988
	INSURER E:	

COVERAGES                      CERTIFICATE NUMBER: 582                      REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> CONTRACTUAL/CROSS LIABILITY <input checked="" type="checkbox"/> OWNERS & CONTRACTORS GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PER-ACC <input checked="" type="checkbox"/> LOC			GLO5415704  XCU COVER INCLUDED	05/01/14	05/01/15	EACH OCCURRENCE \$ 2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 2,000,000 GENERAL AGGREGATE \$ 4,000,000 PRODUCTS - COM/POP AGG \$ 2,000,000 \$
B	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS			90-17043-03	11/01/14	11/01/15	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			8831307 EXCESS GENERAL, AUTO AND EMPLOYERS LIABILITY (FOLLOW FORM)	05/01/14	05/01/15	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$
D	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE/OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N <input checked="" type="checkbox"/> N If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	90-17043-01	11/01/14	11/01/15	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)  
REDLANDS, CA.

CERTIFICATE HOLDER  TO WHOM IT MAY CONCERN	CANCELLATION  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE  <i>Andrea P. Otto</i>

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**APPENDIX B**  
**BORING GPS COORDINATES**

**APPENDIX B  
BORING GPS COORDINATES  
ADL SITE INVESTIGATION  
LA 110-PM 8.60/13.97, LA 2 PM 18.8, LA 405 PM 21.3  
LOS ANGELES COUNTY, CALIFORNIA  
EFIS:0713000412-1 (EA#293801)  
TASK ORDER #18**

Location ID	Boring ID	Latitude <sup>1</sup> (degrees north)	Longitude <sup>1</sup> (degrees west)	Latitude <sup>1</sup> (decimal degrees north)	Longitude <sup>1</sup> (decimal degrees west)
A	1269-101	33 ° 54 ' 42.312	- 118 ° 17 ' 13.005	33.91175340	-118.28694590
B-1	1269-102	33 ° 54 ' 42.139	- 118 ° 17 ' 13.185	33.91170534	-118.28699590
B-2	1269-103	33 ° 54 ' 42.462	- 118 ° 17 ' 13.181	33.91179488	-118.28699472
B-3	1269-104	33 ° 54 ' 42.013	- 118 ° 17 ' 13.116	33.91167024	-118.28697660
	1269-105	33 ° 54 ' 42.136	- 118 ° 17 ' 13.110	33.91170444	-118.28697503
	1269-106	33 ° 54 ' 42.271	- 118 ° 17 ' 13.117	33.91174185	-118.28697699
	1269-107	33 ° 54 ' 42.469	- 118 ° 17 ' 13.078	33.91179705	-118.28696616
B-4	1269-108	33 ° 54 ' 42.263	- 118 ° 17 ' 13.171	33.91173971	-118.28699193
	1269-109	33 ° 54 ' 42.302	- 118 ° 17 ' 13.169	33.91175050	-118.28699140
	1269-110	33 ° 54 ' 42.343	- 118 ° 17 ' 13.157	33.91176185	-118.28698796
	1269-111	33 ° 54 ' 42.379	- 118 ° 17 ' 13.161	33.91177202	-118.28698924
C	1269-112	33 ° 55 ' 45.197	- 118 ° 17 ' 13.185	33.92922148	-118.28699590
	1269-113	33 ° 55 ' 45.150	- 118 ° 16 ' 53.581	33.92920825	-118.28155030
	1269-114	33 ° 55 ' 45.212	- 118 ° 16 ' 53.556	33.92922545	-118.28154327
	1269-115	33 ° 55 ' 45.245	- 118 ° 16 ' 53.710	33.92923486	-118.28158611

Notes: <sup>1</sup> North American Datum 83 (WPS 84)

**APPENDIX C  
BORING LOGS**



# Field Report

GEO-301

Page 1 of 1

Rev. 0 Apr 2005

FIELD OFFICE:	DATE	PAGE	CLIENT
Stantec Thousand Oaks.	12/8/14	1	Caltrans
TO:	PROJECT NO.	TASK NO.	SUBCONTRACTOR
			Strongarm Environmental
	LOCATION		
	110 Fwy		
	WEATHER	TEMP.	
	Sunny	75°F	

CHRONOLOGY OF FIELD ACTIVITIES/ISSUES/OBSERVATIONS

0715: <sup>Arrived onsite</sup> H&S meeting with crew. <sup>conducted</sup>

0735: Sam from Caltrans was onsite. H&S meeting with him.

0800: Keith's crew (drillers) & Sam left for the meeting location to set up @ location B. Anuya S. & Mark Z. left to location C.

0831: <sup>begin</sup> HA @ location C.

0940: <sup>arrive</sup> Arrive @ location B. Start HA @ 108 locations.

1005: ~~HA~~ Began HA @ 107. Since soil was very compacted & HA was not possible after 5ft, the LAR was used to reach 8ft.

1052: ~~HA~~ Began HA @ 106, ~~continued HA @~~ followed by 106, 105, 104. Reached total depth of 7ft bgs for all locations.

1315: Completed all HA @ location B.

1325: Collected Field Blank. FBZ-120814.

1330: Collected GPS co-ordinates for all locations.

1400: Met Keith @ location A & assisted him with loading Traffic control setup.

1430: ~~Lab~~ Filled the COC & submitted the samples & completed & signed COC to the lab. M. Zellman departed the site.

1500: Left Keith & Anuya departed the site.

EQUIPMENT USED:	SUBCONTRACTOR HOURS:	STAFF HOURS:
MILEAGE:	REVIEWED BY:	
CC:	PREPARED BY:	



# Field Report

GEO-301

Page 1 of 1

Rev. 0

Apr 2005

FIELD OFFICE:	DATE 12/8/14	PAGE	CLIENT Caltans
TO:	PROJECT NO.	TASK NO.	SUBCONTRACTOR Strangarn
	LOCATION SR 110		
	WEATHER Sunny	TEMP. 70-80	

## CHRONOLOGY OF FIELD ACTIVITIES/ISSUES/OBSERVATIONS

0700 arrive on-site

0835 Arrive @ 1269-102. 0940 collect 1269-102-1. Refusal @ ~1.5' BGS; step 2' to W.; Refusal @ ~1.5' again, step 1' to S Refusal #3 @ ~2' BGS, will try to use rig to drill thru it. 0920 - Collect 102-3 0925 collect 102-5

0945 Refusal @ ~12' BGS; Step 5' to N. Highly compacted poorly graded sand.

0940 - Collect 102-10 1040 - Collect 102-15 1105 - Collect 102-20 1110 - 102-25

1115 - 102-27; 1120 - Begin to backfill w/ native & bentonite; 1130 - move to 1269-103 - to collect 8' sample; 1135 - Collect 1269-103-8 1150 - Collect FB-1-20141208 @ 1150. 1200 - Breakdown exclusion zone, move to 101.

1230 Begin coring 1269-101; 1250 - collect 101-1; 1255 - collect 101-3

1300 Collect 101-5; 1305 - Collect 101-10; 1307 - Collect 101-15;

1310 - Collect 101-20; 1312 - collect 101-22; 1320 - Begin backfilling w/ bentonite. 1340 - Strangarn & Sam (Caltans) offsite. 1400 - move to Jack-in-the-Box to meet lab; 1500 - move back to office.

EQUIPMENT USED:	SUBCONTRACTOR HOURS:	STAFF HOURS:
MILEAGE:	REVIEWED BY:	
CC:	PREPARED BY:	

Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: 1245 Completed: 1312  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec  
 Drilling Equipment:  
 Drilling Method:  
 Sampling Equipment: Acetate Sleeve

Boring ID: 1269-101  
 Page: 1 of 2  
 Northing:  
 Latitude:  
 Ground Elev (ft):  
 Initial DTW (ft):  
 Static DTW (ft):  
 Well Casing DIA (in): NA  
 Logged By: K. Posekian  
 Easting:  
 Longitude:  
 TOC Elev (ft):  
 Borehole Depth (ft):  
 Well Depth (ft): NA  
 Borehole Dia (in):  
 Checked By:



Time & Depth (ft)	Graphic log	USCS	Description:	Sample	Time/Sample ID/Method	Measured Recovery (ft)	Blow Counts	Headspace PID (ppm)	Depth (ft)	Well Construction or Borehole Backfill
0		AS	Asphalt @ surface							
1		SP	Poorly graded sand w/gravel (10YR 3/1) V. Dark Gray; 80-90% fine grained sand; 10-20% fine-med gravel; Subang-Subrand Non-plastic; Loose; moist; No odor/stain		1269-101-1 1250					
2		SM	Sandy Silt w/gravel (10YR 3/2) V. Dark grayish Brown; Mostly fines; fine-med grained sand; fine-med gravels; moist; Med. Dense; Plastic; No odor/stain		1269-101-3 1255					
3		SM	Sandy Silt w/gravel (10YR 3/2) V. Dark Grayish Brown; Some fines; fine-med grained sand; some gravels; Med Dense; plastic; moist; No odor/stain		1269-101-5 1300					
6		SM	SAA		1269-101-10 1305					
15		SM	SAA but (10YR 3/3) Dark Brown; Decreasing gravels		1269-101-15 1307					
30		SM	SAA							



Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: 0835 Completed:  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec / Strongarm  
 Drilling Equipment:  
 Drilling Method:  
 Sampling Equipment:

Boring ID: 1269-102  
 Page: 1 of 2  
 Northing:  
 Latitude:  
 Ground Elev (ft):  
 Initial DTW (ft):  
 Static DTW (ft):  
 Well Casing DIA (in): NA  
 Logged By: K. Pockian  
 Stantec  
 Easting:  
 Longitude:  
 TOC Elev (ft):  
 Borehole Depth (ft): 27  
 Well Depth (ft): NA  
 Borehole Dia (in):  
 Checked By:

Time & Depth (ft)	Graphic Log	USCS	Description:	Sample	Time/Sample ID/Method	Measured Recovery (ft)	Blow Counts	Headspace PID (ppm)	Depth (ft)	Well Construction or Borehole Backfill	
0	Hand Arrows ↓	SP	Poorly graded sand w/ silt & gravel (10YR 3/3) Dark olive Brown; Mostly fines; trace fine-grained gravels; Subnormal; moist; med. dense; no odor/stain	1269-102-1 0840					0		
1									1		
2									2		
3						1269-102-3 0920				3	
4			SP	Poorly graded sand w/ gravel; 80-90% fine grained sand; 10-20% fine-med. grained gravel; 10YR 3/3 Dark olive Brn. moist; med dense; non plastic; no odor/stain; Highly compacted						4	
5						1269-102-5 0925				5	
6										6	
7										7	
8			SP	SAA bit (10YR 5/6) yellowish Brown; Dry;						8	
9										9	
10					1269-102-10 0940				10		
1.5		SP	SAA		1269-102-15 1040				1.5		
2.0		SP	SAA bit increasing fine-med. grained gravels Highly compacted		1269-102-20 1105				2.0		







Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: \_\_\_\_\_ Completed: \_\_\_\_\_  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec  
 Drilling Equipment: HA  
 Drilling Method: HA  
 Sampling Equipment: 802SRS

Boring ID: 1269 - 104 1105  
 Page: 1 of 1  
 Northing: \_\_\_\_\_ Easting: \_\_\_\_\_  
 Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
 Ground Elev (ft): \_\_\_\_\_ TOC Elev (ft): \_\_\_\_\_  
 Initial DTW (ft): \_\_\_\_\_ Borehole Depth (ft): \_\_\_\_\_  
 Static DTW (ft): \_\_\_\_\_ Well Depth (ft): NA  
 Well Casing DIA (in): NA Borehole Dia (in): \_\_\_\_\_  
 Logged By: A. Sawant Checked By: \_\_\_\_\_

Time & Depth (ft)	Graphic log	USCS	Description:	Sample	Time/Sample ID/Method	Measured Recovery (ft)	Blow Counts	Headspace PID (ppm)	Depth (ft)	Well Construction or Borehole Backfill
1269-104			Example: SAND (SP) - olive (2.5Y 5/4), trace (5%) fines, 20-30% fine grained sand, fine to coarse gravel, medium dense, medium plasticity, stiff, moist, no petroleum hydrocarbon odor, no staining							
			Silty sand, dark yellowish brown (10YR 3/6) ~60% sand; ~30% fine-med. grained sand; moist; ~10% clay; no stains		1269-104-1					SOIL CUTTINGS
			Silty sand; dark yellowish brown (10YR 4/6) ~60% sand; 30% fine-coarse grained sand; moist; no stains		1269-104-3					
			Sandy silt; light yellowish brown (10YR 6/4) fine sand ~60% silt; 20% fine to coarse grained sand; ~20% fine sand		1269-104-5					
			Hole terminated @ 5ft bgs							
1269-105										
			Silty sand; dark yellowish brown (10YR 3/6) ~60% sand; ~30% fine-med. grained sand; moist; ~10% clay; no stains		1269-105-1 1150					SOIL CUTTINGS
			Silty sand; dark yellowish brown (10YR 4/6) ~60% sand; 30% fine-coarse grained sand; moist; no stains		1269-105-3 1225					
			Sandy silt; light yellowish brown (10YR 6/4) ~60% silt; 20% fine-coarse grained sand; ~20% fine sand		1269-105-5 1230					
			Hole terminated @ 5ft bgs							









Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: \_\_\_\_\_ Completed: \_\_\_\_\_  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec  
 Drilling Equipment: HA  
 Drilling Method: HA  
 Sampling Equipment: 802 Jars

Boring ID: 1269 - 110/111  
 Page: 1 of 1  
 Northing: \_\_\_\_\_ Easting: \_\_\_\_\_  
 Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
 Ground Elev (ft): \_\_\_\_\_ TOC Elev (ft): \_\_\_\_\_  
 Initial DTW (ft): \_\_\_\_\_ Borehole Depth (ft): \_\_\_\_\_  
 Static DTW (ft): \_\_\_\_\_ Well Depth (ft): NA  
 Well Casing DIA (in): NA Borehole Dia (in): \_\_\_\_\_  
 Logged By: M. Zellman Checked By: \_\_\_\_\_

Time & Depth (ft)	Graphic log	USCS	Description:	Sample	Time/ Sample ID/ Method	Measured Recovery (ft)	Flow Counts	Headspace PID (ppm)	Depth (ft)	Well Construction or Borehole Backfill
0	1269-110		Example: SAND (SP) - olive (2.5Y 5/4), trace (5%) fines, 20-30% fine grained sand, fine to coarse gravel, medium dense, medium plasticity, stiff, moist, no petroleum hydrocarbon odor, no staining	X	1269-110-0 0952				0	SOIL CUTTINGS
0.5			sm silty sand; 10YR 4/4; fine grain, 40% fines; moist, clayey; plant fragments, rootlets hole terminated @ 0.5' bgs							
0	1269-111		Example: SAND (SP) - olive (2.5Y 5/4), trace (5%) fines, 20-30% fine grained sand, fine to coarse gravel, medium dense, medium plasticity, stiff, moist, no petroleum hydrocarbon odor, no staining	X	1269-111-0 0953				0	SOIL CUTTINGS
0.5			sm silty sand; 10YR 4/4; fine grain, 40% fines; moist, clayey; plant fragments, rootlets hole terminated @ 0.5' bgs							



Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: \_\_\_\_\_ Completed: \_\_\_\_\_  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec  
 Drilling Equipment: HPA  
 Drilling Method: HA  
 Sampling Equipment: 802 JARs

Boring ID: 1269 - 112/113  
 Page: 1 of 1  
 Northing: \_\_\_\_\_ Easting: \_\_\_\_\_  
 Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
 Ground Elev (ft): \_\_\_\_\_ TOC Elev (ft): \_\_\_\_\_  
 Initial DTW (ft): \_\_\_\_\_ Borehole Depth (ft): \_\_\_\_\_  
 Static DTW (ft): \_\_\_\_\_ Well Depth (ft): NA  
 Well Casing DIA (in): NA Borehole Dia (in): \_\_\_\_\_  
 Logged By: A. Sawant Checked By: \_\_\_\_\_

Time & Depth (ft)	Graphic Log	USCS	Description: <small>Example: SAND (SP) - olive (2.5Y 5/4), trace (5%) fines, 20-30% fine grained sand, fine to coarse gravel, medium dense, medium plasticity, stiff, moist, no petroleum hydrocarbon odor, no staining</small>	Sample	Time/ Sample ID/ Method	Measured Recovery (%)	Blow Counts	Headspace PID (ppm)	Depth (ft)	Well Construction or Borehole Backfill
1269-112	ML		sandy silt; dark brown (10YR 3/3); ~70% silt, 40% clay; ~20% sand (fine-med grained sand); moist; no stains; roots observed	X	1269-112-0				0	SC
			Hole terminated @ 0.5' bgs						1	SC
1269-113	ML		sandy silt; dark brown (10YR 3/3); ~70% silt; 40% clay; ~20% sand (fine-med grained sand); moist; no stains; roots observed	X	1269-113-0				0	SC
			Hole terminated @ 0.5' bgs						1	SC



Project: Caltrans, Contract No. 07A3321, Task Order No. 18  
 Location: SR 110  
 Project #: 1858031018.200  
 Drilling Start: \_\_\_\_\_ Completed: \_\_\_\_\_  
 Installation Start: NA Completed: NA  
 Drilling Company: Stantec  
 Drilling Equipment: HA  
 Drilling Method: HA  
 Sampling Equipment: 802 JARS

Boring ID: 1269 - 114/115  
 Page: 1 of 1  
 Northing: \_\_\_\_\_ Easting: \_\_\_\_\_  
 Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
 Ground Elev (ft): \_\_\_\_\_ TOC Elev (ft): \_\_\_\_\_  
 Initial DTW (ft): \_\_\_\_\_ Borehole Depth (ft): \_\_\_\_\_  
 Static DTW (ft): \_\_\_\_\_ Well Depth (ft): NA  
 Well Casing DIA (in): NA Borehole Dia (in): \_\_\_\_\_  
 Logged By: A. Sawano Checked By: \_\_\_\_\_

Time & Depth (ft)	Graphic log	USCS	Description:	Sample	Time/Sample ID/Method	Measured Recovery (ft)	Blow Counts	Headspace P10 (ppm)	Depth (ft)	Well Construction or Borehole Backfill
0			Example: SAND (SP) - olive (2.5Y 5/4), trace (5%) fines, 20-30% fine grained sand, fine to coarse gravel, medium dense, medium plasticity, stiff, moist, no petroleum hydrocarbon odor, no staining							
0			sandy silt, dk brown (10YR 3/3) ~ 70% silt, ~ 10% clay, ~ 20% sand, fine to med. grained sand, med. silt; no stains, no obs observed		1269-114-0					SC CK
1			Note terminated @ 0.5' bgs							
0			sandy silt, dk brown (10YR 3/3); ~ 70% silt, ~ 10% clay, ~ 20% sand (fine - med); moist, no stains; no obs observed		1269-115-0					SC CK
0			Note terminated @ 0.5' bgs							

**APPENDIX D**  
**ANALYTICAL LABORATORY REPORTS and CHAIN-OF-CUSTODY RECORDS**



December 16, 2014

Anne Perez/Kristy Edblad  
Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361  
Tel: (805) 230-1266  
Fax: (805) 230-1277

ELAP No.: 1838  
CSDLAC No.: 10196  
ORELAP No.: CA300003  
TCEQ No. : T104704502

Re: ATL Work Order Number : 1403877  
Client Reference : 185831018, Task: 200.0003, Caltrans 07A3321

Enclosed are the results for sample(s) received on December 08, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', is written over a light gray rectangular background.

Eddie Rodriguez  
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



## Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

### SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1269-112-0	1403877-01	Soil	12/08/14 8:31	12/08/14 14:40
1269-113-0	1403877-02	Soil	12/08/14 8:41	12/08/14 14:40
1269-114-0	1403877-03	Soil	12/08/14 8:51	12/08/14 14:40
1269-115-0	1403877-04	Soil	12/08/14 8:55	12/08/14 14:40
1269-108-0	1403877-05	Soil	12/08/14 9:43	12/08/14 14:40
1269-109-0	1403877-06	Soil	12/08/14 9:45	12/08/14 14:40
1269-110-0	1403877-07	Soil	12/08/14 9:52	12/08/14 14:40
1269-111-0	1403877-08	Soil	12/08/14 9:53	12/08/14 14:40
EB2-120814	1403877-09	Water	12/08/14 9:05	12/08/14 14:40
1269-107-1	1403877-10	Soil	12/08/14 10:52	12/08/14 14:40
1269-107-3	1403877-11	Soil	12/08/14 10:58	12/08/14 14:40
1269-107-5	1403877-12	Soil	12/08/14 11:16	12/08/14 14:40
1269-103-1	1403877-13	Soil	12/08/14 10:05	12/08/14 14:40
1269-103-3	1403877-14	Soil	12/08/14 10:12	12/08/14 14:40
1269-103-5	1403877-15	Soil	12/08/14 10:35	12/08/14 14:40
1269-106-1	1403877-16	Soil	12/08/14 11:25	12/08/14 14:40
1269-106-3	1403877-17	Soil	12/08/14 11:35	12/08/14 14:40
1269-106-5	1403877-18	Soil	12/08/14 11:46	12/08/14 14:40
1269-105-1	1403877-19	Soil	12/08/14 11:50	12/08/14 14:40
1269-105-3	1403877-20	Soil	12/08/14 12:25	12/08/14 14:40
1269-105-5	1403877-21	Soil	12/08/14 12:36	12/08/14 14:40
1269-104-1	1403877-22	Soil	12/08/14 12:50	12/08/14 14:40
1269-104-3	1403877-23	Soil	12/08/14 13:02	12/08/14 14:40
1269-104-5	1403877-24	Soil	12/08/14 13:15	12/08/14 14:40
1269-103-8	1403877-25	Soil	12/08/14 11:35	12/08/14 14:40
FB2-120814	1403877-26	Water	12/08/14 13:25	12/08/14 14:40

### CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



# Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

## Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403877-01	1269-112-0	16	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:35	
1403877-02	1269-113-0	15	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:35	
1403877-03	1269-114-0	12	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:36	
1403877-04	1269-115-0	14	mg/kg	0.99	0.07	1	B4L0215	12/09/2014	12/10/14	12:37	
1403877-05	1269-108-0	14	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:38	
1403877-06	1269-109-0	16	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:38	
1403877-07	1269-110-0	27	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:39	
1403877-08	1269-111-0	17	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:42	
1403877-10	1269-107-1	8.8	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:43	
1403877-11	1269-107-3	22	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:43	
1403877-12	1269-107-5	3.9	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:46	
1403877-13	1269-103-1	10	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:46	
1403877-14	1269-103-3	17	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:47	
1403877-15	1269-103-5	16	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:48	
1403877-16	1269-106-1	13	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:49	
1403877-17	1269-106-3	13	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:52	
1403877-18	1269-106-5	6.5	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:52	
1403877-19	1269-105-1	11	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:53	
1403877-20	1269-105-3	13	mg/kg	1.0	0.07	1	B4L0215	12/09/2014	12/10/14	12:54	
1403877-21	1269-105-5	6.0	mg/kg	0.99	0.07	1	B4L0215	12/09/2014	12/10/14	12:55	
1403877-22	1269-104-1	8.1	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:33	
1403877-23	1269-104-3	13	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:34	
1403877-24	1269-104-5	7.6	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:35	
1403877-25	1269-103-8	4.1	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:35	



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### TCLP Metals by ICP-AES EPA 6010B

**Analyte: Lead**

**Analyst: RR**

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	
									Analyzed	Notes
1403877-07	1269-110-0	<b>0.0044</b>	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14 15:45	J
1403877-08	1269-111-0	<b>0.0033</b>	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14 15:54	J
1403877-11	1269-107-3	<b>ND</b>	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14 15:56	
1403877-14	1269-103-3	<b>ND</b>	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14 15:59	



## Certificate of Analysis

Stantec

290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321

Report To : Anne Perez/Kristy Edblad

Reported : 12/16/2014

### STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	
									Analized	Notes
1403877-01	1269-112-0	0.44	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:38	J
1403877-02	1269-113-0	0.44	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:40	J
1403877-03	1269-114-0	0.32	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:42	J
1403877-04	1269-115-0	0.34	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:45	J
1403877-05	1269-108-0	0.39	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:47	J
1403877-06	1269-109-0	0.68	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:49	J
1403877-07	1269-110-0	0.85	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:51	J
1403877-08	1269-111-0	0.72	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:57	J
1403877-10	1269-107-1	0.13	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 14:59	J
1403877-11	1269-107-3	0.78	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:02	J
1403877-12	1269-107-5	0.16	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:08	J
1403877-13	1269-103-1	0.17	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:10	J
1403877-14	1269-103-3	0.49	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:13	J
1403877-15	1269-103-5	0.65	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:15	J
1403877-16	1269-106-1	0.15	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:17	J
1403877-17	1269-106-3	0.44	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:23	J
1403877-18	1269-106-5	0.26	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:25	J
1403877-19	1269-105-1	0.22	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:27	J
1403877-20	1269-105-3	0.36	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:30	J
1403877-21	1269-105-5	0.17	mg/L	1.0	0.027	20	B4L0328	12/11/2014	12/11/14 15:32	J
1403877-22	1269-104-1	0.22	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 15:51	J
1403877-23	1269-104-3	0.54	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 15:53	J
1403877-24	1269-104-5	0.19	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 15:55	J
1403877-25	1269-103-8	0.11	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 15:58	J



# Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

## Mercury by AA (Cold Vapor) EPA 7470A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1403877-09	EB2-120814	ND	ug/L	0.20	0.11	1	B4L0321	12/11/2014	12/11/14 14:15		
1403877-26	FB2-120814	ND	ug/L	0.20	0.11	1	B4L0321	12/11/2014	12/11/14 14:41		

## Mercury by AA (Cold Vapor) EPA 7471A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1403877-01	1269-112-0	0.06	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:28		J
1403877-06	1269-109-0	0.05	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:38		J
1403877-07	1269-110-0	0.05	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:40		J
1403877-08	1269-111-0	0.05	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:42		J
1403877-11	1269-107-3	0.06	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:48		J
1403877-14	1269-103-3	0.04	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:50		J

## pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1403877-05	1269-108-0	8.1	pH Units	0.10	0.10	1	B4L0336	12/11/2014	12/11/14 12:38		
1403877-17	1269-106-3	8.4	pH Units	0.10	0.10	1	B4L0336	12/11/2014	12/11/14 12:38		



# Certificate of Analysis

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 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

**Client Sample ID 1269-112-0**

**Lab ID: 1403877-01**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	0.84	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:34	J
Arsenic	4.1	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:34	
Barium	130	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:34	
Beryllium	0.41	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:34	J
Cadmium	0.48	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:34	J
Chromium	17	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:34	
Cobalt	8.4	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:34	
Copper	36	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:34	
Molybdenum	0.95	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:34	J
Nickel	15	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:34	
Selenium	0.64	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:34	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:34	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:34	
Vanadium	37	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:34	
Zinc	100	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:34	

**Client Sample ID 1269-109-0**

**Lab ID: 1403877-06**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	0.87	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:40	J
Arsenic	2.6	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:40	
Barium	95	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:40	
Beryllium	0.31	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:40	J
Cadmium	ND	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:40	
Chromium	13	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:40	
Cobalt	5.5	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:40	
Copper	26	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:40	
Molybdenum	1.5	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:40	
Nickel	11	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:40	
Selenium	0.44	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:40	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:40	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:40	
Vanadium	27	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:40	
Zinc	77	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:40	



# Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

**Client Sample ID 1269-110-0**

**Lab ID: 1403877-07**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	0.76	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:42	J
Arsenic	3.1	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:42	
Barium	130	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:42	
Beryllium	0.39	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:42	J
Cadmium	0.26	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:42	J
Chromium	21	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:42	
Cobalt	6.8	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:42	
Copper	55	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:42	
Molybdenum	2.6	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:42	
Nickel	16	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:42	
Selenium	0.62	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:42	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:42	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:42	
Vanadium	34	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:42	
Zinc	160	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:42	

**Client Sample ID 1269-111-0**

**Lab ID: 1403877-08**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	0.30	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:44	J
Arsenic	2.8	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:44	
Barium	110	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:44	
Beryllium	0.35	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:44	J
Cadmium	0.12	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:44	J
Chromium	16	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:44	
Cobalt	6.3	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:44	
Copper	39	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:44	
Molybdenum	1.5	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:44	
Nickel	12	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:44	
Selenium	0.30	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:44	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:44	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:44	
Vanadium	31	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:44	
Zinc	94	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:44	



# Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

**Client Sample ID EB2-120814**

**Lab ID: 1403877-09**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Antimony</b>	<b>0.0036</b>	0.010	0.0026	1	B4L0319	12/11/2014	12/11/14 13:52	J
Arsenic	ND	0.010	0.0024	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Barium</b>	<b>0.0006</b>	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 13:52	J
Beryllium	ND	0.0030	0.0002	1	B4L0319	12/11/2014	12/11/14 13:52	
Cadmium	ND	0.0030	0.0001	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Chromium</b>	<b>0.0020</b>	0.0030	0.0003	1	B4L0319	12/11/2014	12/11/14 13:52	J
Cobalt	ND	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Copper</b>	<b>0.0045</b>	0.0090	0.0009	1	B4L0319	12/11/2014	12/11/14 13:52	J
Lead	ND	0.0050	0.0014	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Molybdenum</b>	<b>0.0014</b>	0.0050	0.0005	1	B4L0319	12/11/2014	12/11/14 13:52	J
<b>Nickel</b>	<b>0.0020</b>	0.0050	0.0004	1	B4L0319	12/11/2014	12/11/14 13:52	J
Selenium	ND	0.010	0.0040	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Silver</b>	<b>0.0011</b>	0.0030	0.0006	1	B4L0319	12/11/2014	12/11/14 13:52	J
Thallium	ND	0.015	0.0026	1	B4L0319	12/11/2014	12/11/14 13:52	
Vanadium	ND	0.0030	0.0013	1	B4L0319	12/11/2014	12/11/14 13:52	
<b>Zinc</b>	<b>0.0081</b>	0.025	0.0017	1	B4L0319	12/11/2014	12/11/14 13:52	J



# Certificate of Analysis

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 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

**Client Sample ID 1269-107-3**

**Lab ID: 1403877-11**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Arsenic</b>	<b>4.4</b>	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Barium</b>	<b>120</b>	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Beryllium</b>	<b>0.47</b>	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:45	J
Cadmium	ND	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Chromium</b>	<b>18</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Cobalt</b>	<b>8.0</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Copper</b>	<b>22</b>	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Molybdenum</b>	<b>0.25</b>	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:45	J
<b>Nickel</b>	<b>16</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Selenium</b>	<b>0.51</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:45	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:45	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Vanadium</b>	<b>35</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:45	
<b>Zinc</b>	<b>45</b>	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:45	

**Client Sample ID 1269-103-3**

**Lab ID: 1403877-14**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Antimony</b>	<b>0.34</b>	2.0	0.26	1	B4L0424	12/15/2014	12/16/14 14:51	J
<b>Arsenic</b>	<b>3.0</b>	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Barium</b>	<b>99</b>	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Beryllium</b>	<b>0.66</b>	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:51	J
<b>Cadmium</b>	<b>0.21</b>	1.0	0.12	1	B4L0424	12/15/2014	12/16/14 14:51	J
<b>Chromium</b>	<b>15</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Cobalt</b>	<b>7.1</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Copper</b>	<b>16</b>	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Molybdenum</b>	<b>0.66</b>	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:51	J
<b>Nickel</b>	<b>12</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Selenium</b>	<b>0.46</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:51	J
<b>Silver</b>	<b>0.12</b>	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:51	J
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Vanadium</b>	<b>34</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:51	
<b>Zinc</b>	<b>44</b>	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:51	



# Certificate of Analysis

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290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

**Client Sample ID FB2-120814**

**Lab ID: 1403877-26**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Antimony</b>	<b>0.032</b>	0.010	0.0026	1	B4L0319	12/11/2014	12/11/14 14:00	
Arsenic	ND	0.010	0.0024	1	B4L0319	12/11/2014	12/11/14 14:00	
<b>Barium</b>	<b>0.0007</b>	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Beryllium</b>	<b>0.0002</b>	0.0030	0.0002	1	B4L0319	12/11/2014	12/11/14 14:00	J
Cadmium	ND	0.0030	0.0001	1	B4L0319	12/11/2014	12/11/14 14:00	
<b>Chromium</b>	<b>0.0015</b>	0.0030	0.0003	1	B4L0319	12/11/2014	12/11/14 14:00	J
Cobalt	ND	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:00	
<b>Copper</b>	<b>0.0062</b>	0.0090	0.0009	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Lead</b>	<b>0.0014</b>	0.0050	0.0014	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Molybdenum</b>	<b>0.0030</b>	0.0050	0.0005	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Nickel</b>	<b>0.0018</b>	0.0050	0.0004	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Selenium</b>	<b>0.0047</b>	0.010	0.0040	1	B4L0319	12/11/2014	12/11/14 14:00	J
<b>Silver</b>	<b>0.0018</b>	0.0030	0.0006	1	B4L0319	12/11/2014	12/11/14 14:00	J
Thallium	ND	0.015	0.0026	1	B4L0319	12/11/2014	12/11/14 14:00	
Vanadium	ND	0.0030	0.0013	1	B4L0319	12/11/2014	12/11/14 14:00	
<b>Zinc</b>	<b>0.0072</b>	0.025	0.0017	1	B4L0319	12/11/2014	12/11/14 14:00	J



## Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

### QUALITY CONTROL SECTION

#### Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B4L0319 - EPA 3010A\_W**

**Blank (B4L0319-BLK1)**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010		NR					
Arsenic	ND	0.010		NR					
Barium	0.000625	0.0030		NR					J
Beryllium	ND	0.0030		NR					
Cadmium	ND	0.0030		NR					
Chromium	0.001463	0.0030		NR					J
Cobalt	ND	0.0030		NR					
Copper	0.003656	0.0090		NR					J
Lead	ND	0.0050		NR					
Molybdenum	ND	0.0050		NR					
Nickel	0.001536	0.0050		NR					J
Selenium	ND	0.010		NR					
Silver	0.000901	0.0030		NR					J
Thallium	ND	0.015		NR					
Vanadium	ND	0.0030		NR					
Zinc	0.005032	0.025		NR					J

**LCS (B4L0319-BS1)**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	0.966834	0.010	1.00000	96.7	80 - 120
Arsenic	0.932792	0.010	1.00000	93.3	80 - 120
Barium	1.01066	0.0030	1.00000	101	80 - 120
Beryllium	0.998165	0.0030	1.00000	99.8	80 - 120
Cadmium	0.953865	0.0030	1.00000	95.4	80 - 120
Chromium	1.00446	0.0030	1.00000	100	80 - 120
Cobalt	0.972405	0.0030	1.00000	97.2	80 - 120
Copper	1.01311	0.0090	1.00000	101	80 - 120
Lead	0.996295	0.0050	1.00000	99.6	80 - 120
Molybdenum	0.923243	0.0050	1.00000	92.3	80 - 120
Nickel	0.966286	0.0050	1.00000	96.6	80 - 120
Selenium	0.883514	0.010	1.00000	88.4	80 - 120
Silver	1.02806	0.0030	1.00000	103	80 - 120
Thallium	0.984127	0.015	1.00000	98.4	80 - 120
Vanadium	0.997442	0.0030	1.00000	99.7	80 - 120
Zinc	0.928423	0.025	1.00000	92.8	80 - 120

**Duplicate (B4L0319-DUP1)**

**Source: 1403877-09**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010	0.003638	NR				20	
Arsenic	ND	0.010	ND	NR				20	
Barium	0.000694	0.0030	0.000591	NR		16.1		20	J
Beryllium	ND	0.0030	ND	NR				20	
Cadmium	ND	0.0030	ND	NR				20	
Chromium	0.001161	0.0030	0.001971	NR		51.7		20	R, J
Cobalt	ND	0.0030	ND	NR				20	



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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#### Batch B4L0319 - EPA 3010A\_W (continued)

##### Duplicate (B4L0319-DUP1) - Continued

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Copper	0.004472	0.0090		0.004508	NR		0.805	20	J
Lead	ND	0.0050		ND	NR			20	
Molybdenum	ND	0.0050		0.001444	NR			20	
Nickel	0.001981	0.0050		0.002005	NR		1.23	20	J
Selenium	ND	0.010		ND	NR			20	
Silver	0.001097	0.0030		0.001069	NR		2.60	20	J
Thallium	ND	0.015		ND	NR			20	
Vanadium	ND	0.0030		ND	NR			20	
Zinc	0.007402	0.025		8.1093E-3	NR		9.12	20	J

##### Matrix Spike (B4L0319-MS1)

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	2.34256	0.010	2.50000	0.003638	93.6	78 - 121			
Arsenic	2.38056	0.010	2.50000	ND	95.2	78 - 124			
Barium	2.42188	0.0030	2.50000	0.000591	96.9	81 - 118			
Beryllium	2.47049	0.0030	2.50000	ND	98.8	87 - 119			
Cadmium	2.32176	0.0030	2.50000	ND	92.9	80 - 113			
Chromium	2.42000	0.0030	2.50000	0.001971	96.7	85 - 115			
Cobalt	2.39156	0.0030	2.50000	ND	95.7	83 - 113			
Copper	2.42075	0.0090	2.50000	0.004508	96.6	72 - 132			
Lead	2.45058	0.0050	2.50000	ND	98.0	77 - 121			
Molybdenum	2.28564	0.0050	2.50000	0.001444	91.4	82 - 111			
Nickel	2.40812	0.0050	2.50000	0.002005	96.2	80 - 114			
Selenium	2.32732	0.010	2.50000	ND	93.1	75 - 121			
Silver	2.40243	0.0030	2.50000	0.001069	96.1	84 - 116			
Thallium	2.42203	0.015	2.50000	ND	96.9	70 - 122			
Vanadium	2.38051	0.0030	2.50000	ND	95.2	85 - 114			
Zinc	2.35615	0.025	2.50000	8.1093E-3	93.9	70 - 123			

##### Matrix Spike Dup (B4L0319-MSD1)

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	2.45624	0.010	2.50000	0.003638	98.1	78 - 121	4.74	20	
Arsenic	2.44646	0.010	2.50000	ND	97.9	78 - 124	2.73	20	
Barium	2.43358	0.0030	2.50000	0.000591	97.3	81 - 118	0.482	20	
Beryllium	2.52448	0.0030	2.50000	ND	101	87 - 119	2.16	20	
Cadmium	2.30852	0.0030	2.50000	ND	92.3	80 - 113	0.572	20	
Chromium	2.56204	0.0030	2.50000	0.001971	102	85 - 115	5.70	20	
Cobalt	2.45848	0.0030	2.50000	ND	98.3	83 - 113	2.76	20	
Copper	2.44834	0.0090	2.50000	0.004508	97.8	72 - 132	1.13	20	
Lead	2.36401	0.0050	2.50000	ND	94.6	77 - 121	3.60	20	
Molybdenum	2.33299	0.0050	2.50000	0.001444	93.3	82 - 111	2.05	20	
Nickel	2.47574	0.0050	2.50000	0.002005	98.9	80 - 114	2.77	20	
Selenium	2.38586	0.010	2.50000	ND	95.4	75 - 121	2.48	20	
Silver	2.43940	0.0030	2.50000	0.001069	97.5	84 - 116	1.53	20	
Thallium	2.49406	0.015	2.50000	ND	99.8	70 - 122	2.93	20	
Vanadium	2.40959	0.0030	2.50000	ND	96.4	85 - 114	1.21	20	
Zinc	2.40342	0.025	2.50000	8.1093E-3	95.8	70 - 123	1.99	20	

#### Batch B4L0424 - EPA 3050B\_S



## Certificate of Analysis

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290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B4L0424 - EPA 3050B\_S (continued)**

**Blank (B4L0424-BLK1)**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	ND	2.0			NR			
Arsenic	ND	1.0			NR			
Barium	ND	1.0			NR			
Beryllium	ND	1.0			NR			
Cadmium	ND	1.0			NR			
Chromium	0.228352	1.0			NR			J
Cobalt	ND	1.0			NR			
Copper	0.083008	2.0			NR			J
Molybdenum	ND	1.0			NR			
Nickel	0.154850	1.0			NR			J
Selenium	ND	1.0			NR			
Silver	ND	1.0			NR			
Thallium	ND	1.0			NR			
Vanadium	ND	1.0			NR			
Zinc	0.137787	1.0			NR			J

**LCS (B4L0424-BS1)**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	46.8887	2.0	50.0000		93.8	80 - 120		
Arsenic	46.6313	1.0	50.0000		93.3	80 - 120		
Barium	50.6323	1.0	50.0000		101	80 - 120		
Beryllium	49.5539	1.0	50.0000		99.1	80 - 120		
Cadmium	48.4388	1.0	50.0000		96.9	80 - 120		
Chromium	51.0089	1.0	50.0000		102	80 - 120		
Cobalt	49.6663	1.0	50.0000		99.3	80 - 120		
Copper	48.8048	2.0	50.0000		97.6	80 - 120		
Molybdenum	50.6317	1.0	50.0000		101	80 - 120		
Nickel	48.6714	1.0	50.0000		97.3	80 - 120		
Selenium	43.9551	1.0	50.0000		87.9	80 - 120		
Silver	47.3022	1.0	50.0000		94.6	80 - 120		
Thallium	47.9295	1.0	50.0000		95.9	80 - 120		
Vanadium	48.3858	1.0	50.0000		96.8	80 - 120		
Zinc	48.1496	1.0	50.0000		96.3	80 - 120		

**Duplicate (B4L0424-DUP1)**

**Source: 1403877-01**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	ND	2.0		0.839300	NR		20	
Arsenic	4.28002	1.0		4.14678	NR	3.16	20	
Barium	147.197	1.0		134.756	NR	8.82	20	
Beryllium	0.457094	1.0		0.413350	NR	10.1	20	J
Cadmium	0.462973	1.0		0.477001	NR	2.98	20	J
Chromium	19.7257	1.0		17.4490	NR	12.2	20	
Cobalt	9.28294	1.0		8.43577	NR	9.56	20	
Copper	29.3756	2.0		35.9531	NR	20.1	20	R
Molybdenum	0.913688	1.0		0.946196	NR	3.50	20	J
Nickel	17.6603	1.0		15.1509	NR	15.3	20	
Selenium	0.867274	1.0		0.641824	NR	29.9	20	R, J
Silver	ND	1.0		ND	NR		20	
Thallium	ND	1.0		ND	NR		20	



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Project Number : 185831018, Task: 200.0003, Caltrans 07A3321

Report To : Anne Perez/Kristy Edblad

Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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#### Batch B4L0424 - EPA 3050B\_S (continued)

##### Duplicate (B4L0424-DUP1) - Continued

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Vanadium	39.6848	1.0		36.8187	NR		7.49	20	
Zinc	105.621	1.0		103.951	NR		1.59	20	

##### Matrix Spike (B4L0424-MS1)

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	71.5913	2.0	125.000	0.839300	56.6	21 - 126			
Arsenic	99.4473	1.0	125.000	4.14678	76.2	57 - 113			
Barium	227.547	1.0	125.000	134.756	74.2	29 - 146			
Beryllium	98.2818	1.0	125.000	0.413350	78.3	65 - 110			
Cadmium	90.4932	1.0	125.000	0.477001	72.0	56 - 107			
Chromium	116.332	1.0	125.000	17.4490	79.1	49 - 127			
Cobalt	101.658	1.0	125.000	8.43577	74.6	57 - 112			
Copper	134.240	2.0	125.000	35.9531	78.6	56 - 127			
Molybdenum	97.9554	1.0	125.000	0.946196	77.6	62 - 108			
Nickel	106.829	1.0	125.000	15.1509	73.3	42 - 127			
Selenium	93.8880	1.0	125.000	0.641824	74.6	58 - 105			
Silver	103.466	1.0	125.000	ND	82.8	63 - 113			
Thallium	88.3352	1.0	125.000	ND	70.7	53 - 110			
Vanadium	136.137	1.0	125.000	36.8187	79.5	66 - 112			
Zinc	181.038	1.0	125.000	103.951	61.7	28 - 137			

##### Matrix Spike Dup (B4L0424-MSD1)

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	70.8914	2.0	125.628	0.839300	55.8	21 - 126	0.982	20	
Arsenic	99.3529	1.0	125.628	4.14678	75.8	57 - 113	0.0950	20	
Barium	250.781	1.0	125.628	134.756	92.4	29 - 146	9.71	20	
Beryllium	96.6548	1.0	125.628	0.413350	76.6	65 - 110	1.67	20	
Cadmium	89.2842	1.0	125.628	0.477001	70.7	56 - 107	1.34	20	
Chromium	116.396	1.0	125.628	17.4490	78.8	49 - 127	0.0548	20	
Cobalt	107.526	1.0	125.628	8.43577	78.9	57 - 112	5.61	20	
Copper	136.998	2.0	125.628	35.9531	80.4	56 - 127	2.03	20	
Molybdenum	95.9874	1.0	125.628	0.946196	75.7	62 - 108	2.03	20	
Nickel	113.854	1.0	125.628	15.1509	78.6	42 - 127	6.37	20	
Selenium	93.8306	1.0	125.628	0.641824	74.2	58 - 105	0.0612	20	
Silver	101.200	1.0	125.628	ND	80.6	63 - 113	2.21	20	
Thallium	87.5085	1.0	125.628	ND	69.7	53 - 110	0.940	20	
Vanadium	135.888	1.0	125.628	36.8187	78.9	66 - 112	0.183	20	
Zinc	200.039	1.0	125.628	103.951	76.5	28 - 137	9.97	20	

#### Batch S4L0167 - B4L0318

##### Instrument Blank (S4L0167-IBL1)

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010		NR					
Arsenic	ND	0.010		NR					
Barium	ND	0.0030		NR					
Beryllium	ND	0.0030		NR					
Cadmium	ND	0.0030		NR					
Chromium	ND	0.0030		NR					
Cobalt	ND	0.0030		NR					



# Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

## Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
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### Batch S4L0167 - B4L0318 (continued)

#### Instrument Blank (S4L0167-IBL1) - Continued

Prepared: 12/11/2014 Analyzed: 12/11/2014

Copper	ND	0.0090						NR
Lead	ND	0.0050						NR
Molybdenum	ND	0.0050						NR
Nickel	ND	0.0050						NR
Selenium	ND	0.010						NR
Silver	ND	0.0030						NR
Thallium	ND	0.015						NR
Vanadium	ND	0.0030						NR
Zinc	ND	0.025						NR



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Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0215 - EPA 3050 Modified_S</b>								
<b>Blank (B4L0215-BLK1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	0.336024	1.0			NR			J
<b>Blank (B4L0215-BLK2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	0.193559	1.0			NR			J
<b>LCS (B4L0215-BS1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	55.6757	1.0	50.0000		111      80 - 120			
<b>Duplicate (B4L0215-DUP1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	5.74752	1.0		5.99127	NR	4.15	20	
<b>Duplicate (B4L0215-DUP2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	17.8712	1.0		22.2682	NR	21.9	20	R
<b>Matrix Spike (B4L0215-MS1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	239.009	1.0	250.000	5.99127	93.2	33 - 134		
<b>Matrix Spike (B4L0215-MS2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	248.811	1.0	250.000	22.2682	90.6	33 - 134		
<b>Matrix Spike Dup (B4L0215-MSD1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	242.279	1.0	250.000	5.99127	94.5	33 - 134	1.36	20
<b>Batch B4L0216 - EPA 3050 Modified_S</b>								
<b>Blank (B4L0216-BLK1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	ND	1.0			NR			
<b>Blank (B4L0216-BLK2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	0.105132	1.0			NR			J
<b>LCS (B4L0216-BS1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	52.5992	1.0	50.0000		105	80 - 120		
<b>Duplicate (B4L0216-DUP1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	2.38842	1.0		1.76894	NR	29.8	20	R
<b>Duplicate (B4L0216-DUP2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	5.27428	1.0		5.03888	NR	4.56	20	
<b>Matrix Spike (B4L0216-MS1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	235.280	1.0	250.000	1.76894	93.4	33 - 134		
<b>Matrix Spike (B4L0216-MS2)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	238.618	1.0	250.000	5.03888	93.4	33 - 134		
<b>Matrix Spike Dup (B4L0216-MSD1)</b>								
						Prepared: 12/9/2014 Analyzed: 12/10/2014		
Lead	245.806	0.99	247.525	1.76894	98.6	33 - 134	4.38	20

**Batch S4L0149 - B4L0215**



### Certificate of Analysis

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Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

#### Lead by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Instrument Blank (S4L0149-IBL1)</b>					Prepared: 12/10/2014 Analyzed: 12/10/2014			
Lead	ND	1.0			NR			



## Certificate of Analysis

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 Reported : 12/16/2014

### TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0456 - EPA 3010A_S</b>									
<b>Blank (B4L0456-BLK1)</b>									
Lead	1.6255E-3	0.050							J
<b>LCS (B4L0456-BS1)</b>									
Lead	0.930651	0.050	1.00000		93.1	80 - 120			
<b>Duplicate (B4L0456-DUP1)</b>									
Lead	0.003400	0.050		0.004401	NR		25.7	20	R, J
<b>Matrix Spike (B4L0456-MS1)</b>									
Lead	2.32065	0.050	2.50000	0.004401	92.6	77 - 121			
<b>Matrix Spike Dup (B4L0456-MSD1)</b>									
Lead	2.27722	0.050	2.50000	0.004401	90.9	77 - 121	1.89	20	



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Reported : 12/16/2014

### STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0328 - STLC_S Extraction</b>								
<b>Blank (B4L0328-BLK1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR			
<b>Blank (B4L0328-BLK2)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR			
<b>LCS (B4L0328-BS1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	2.02555	1.0	2.00000		101    80 - 120			
<b>Duplicate (B4L0328-DUP1)</b>		<b>Source: 1403877-21</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	0.141754	1.0		0.169662	NR	17.9	20	J
<b>Duplicate (B4L0328-DUP2)</b>		<b>Source: 1403877-11</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	0.745902	1.0		0.775854	NR	3.94	20	J
<b>Matrix Spike (B4L0328-MS1)</b>		<b>Source: 1403877-21</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	2.47187	1.0	2.50000	0.169662	92.1	44 - 130		
<b>Matrix Spike (B4L0328-MS2)</b>		<b>Source: 1403877-11</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	3.12950	1.0	2.50000	0.775854	94.1	44 - 130		
<b>Matrix Spike Dup (B4L0328-MSD1)</b>		<b>Source: 1403877-21</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	2.57090	1.0	2.50000	0.169662	96.0	44 - 130	3.93	20
<b>Batch B4L0330 - STLC_S Extraction</b>								
<b>Blank (B4L0330-BLK1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR			
<b>Blank (B4L0330-BLK2)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR			
<b>LCS (B4L0330-BS1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	1.99871	1.0	2.00000		99.9	80 - 120		
<b>Duplicate (B4L0330-DUP1)</b>		<b>Source: 1403881-15</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	ND	1.0		0.036203	NR		20	
<b>Duplicate (B4L0330-DUP2)</b>		<b>Source: 1403881-06</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	0.242676	1.0		0.197829	NR	20.4	20	R, J
<b>Matrix Spike (B4L0330-MS1)</b>		<b>Source: 1403881-15</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	2.42708	1.0	2.50000	0.036203	95.6	44 - 130		
<b>Matrix Spike (B4L0330-MS2)</b>		<b>Source: 1403881-06</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	2.58794	1.0	2.50000	0.197829	95.6	44 - 130		
<b>Matrix Spike Dup (B4L0330-MSD1)</b>		<b>Source: 1403881-15</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Lead	2.39879	1.0	2.50000	0.036203	94.5	44 - 130	1.17	20



## Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

### Mercury by AA (Cold Vapor) EPA 7470A - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0321 - EPA 245.1/7470_W</b>								
<b>Blank (B4L0321-BLK1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	ND	0.20			NR			
<b>LCS (B4L0321-BS1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	10.9722	0.20	10.0000		110 80 - 120			
<b>Duplicate (B4L0321-DUP1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	ND	0.20		ND	NR			20
<b>Matrix Spike (B4L0321-MS1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	10.3612	0.20	10.0000	ND	104 70 - 130			
<b>Matrix Spike Dup (B4L0321-MSD1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	10.3885	0.20	10.0000	ND	104 70 - 130	0.263		20
<b>Post Spike (B4L0321-PS1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	5.67840		5.00000	-0.031453	114 85 - 115			
<b>Batch S4L0168 - B4L0320</b>								
<b>Instrument Blank (S4L0168-IBL1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	ND	0.20			NR			



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 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

### Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0448 - EPA 7471_S</b>								
<b>Blank (B4L0448-BLK1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	ND	0.10			NR			
<b>LCS (B4L0448-BS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.916033	0.10	0.833333		110	80 - 120		
<b>Duplicate (B4L0448-DUP1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.064246	0.10		0.061465	NR		4.42	20 J
<b>Matrix Spike (B4L0448-MS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.895276	0.10	0.833333	0.061465	100	70 - 130		
<b>Matrix Spike Dup (B4L0448-MSD1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.902776	0.10	0.833333	0.061465	101	70 - 130	0.834	20
<b>Post Spike (B4L0448-PS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.006556		5.00000E-3	0.000738	116	85 - 115		M1



# Certificate of Analysis

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290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

## pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD RPD	RPD Limit	Notes
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**Batch B4L0336 - z\_Prep\_WC\_1\_S**

**Duplicate (B4L0336-DUP1)**

**Source: 1403877-05**

Prepared: 12/11/2014 Analyzed: 12/11/2014

pH	8.54000	0.10		8.06000	NR		5.78	20	
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## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

- Notes:
- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
  - (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
  - (3) Results are wet unless otherwise specified.



# STANTEC CHAIN-OF-CUSTODY RECORD

COC # 1 of 3

FIELD OFFICE INFORMATION		PROJECT INFORMATION		ANALYSES / METHOD REQUEST		REMARKS / PRECAUTIONS	
OFFICE: Stantec Consulting Services, T.O.		Project No.: 185831018 Task: 200.0003		Title 22 Metals - 6010/7000		TAI <input type="checkbox"/> Normal <input type="checkbox"/> Rush <input checked="" type="checkbox"/> Other: 3 days	
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361		Project Name: Caltrans 07A3321		pH - 9045		REPORTING REQUIREMENTS <input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Raw Data <input type="checkbox"/> CLP Rpt <input checked="" type="checkbox"/> EDD <input type="checkbox"/> Other	
Telephone: 805-230-1266		Project Manager: Anne Perez/Kristy Edblad		TCLP-1311		A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed.	
Fax/E-Mail: kristy.edblad@stantec.com/ anne.perez@stantec.com		Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755		STLC: Cal-WET Citric			
Sample No. / Identification	Date	SAMPLE Time	Matrix *	Container & Size **	Preservative	Number of Containers	
						Total Lead (TLC) - 6010	STLC: Cal-WET Citric
1269-112-0	12/8/14	0831	Soil	80z	Free	X	B
1269-113-0		0841					
1269-114-0		0851					
1269-115-0		0855					
1269-108-0		0943					
1269-109-0		0945					
1269-110-0		0952					
1269-111-0		0953					
1269-107-1		1052	Spill	80z		X	A
1269-107-3		1058	Spill	80z		X	A

Possible Hazard Identification  
 Non-Hazardous  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for Months

Sample Disposal  
 Return to Client  Disposal by Lab  Archive for Months

Sampled by: A Sawant / M. Zellman Shipment Method: Lab Pickup Airbill Number: \_\_\_\_\_

Signature	Print Name	Company	Date	Time
	Amya Sawant	Stantec	12/8/14	14:30
	Jeff H. Cox	ATK	12/8/14	14:40
	Jeff H. Cox	ATK	12/8/14	18:45
	F. Brown	AT	12/8/14	18:45

\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other  
 \*\*Container: A = Amber C = Clear Glass V = VOA S = Soil Jar O = Orbo T = Tedlar B = Brass P = Plastic OT = Other



# STANTEC CHAIN-OF-CUSTODY RECORD

COC # 2 of 3

FIELD OFFICE INFORMATION			PROJECT INFORMATION			ANALYSES / METHOD REQUEST			REMARKS / PRECAUTIONS		
OFFICE: Stantec Consulting Services, T.O.			Project No.: 185831018 Task: 200.0003			Title 22 Metals - 6010/7000			TAT		
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361 Telephone: 805-230-1266			Project Name: Caltrans 07A3321			pH - 9045			Normal <input type="checkbox"/>		
Fax/E-Mail: kristy.edblad@stantec.com/ anne.perez@stantec.com			Project Manager: Anne Perez/Kristy Edblad			TCLP-1311			Dup/MS/MSD <input type="checkbox"/>		
			Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755			STLC: Cal-WET Citric			Rush <input type="checkbox"/>		
						STLC: Cal-WET Citric			Raw Data <input type="checkbox"/>		
						Total Lead (TLC) - 6010			CLP Rpt <input type="checkbox"/>		
						STLC: Cal-WET Citric			EDD <input checked="" type="checkbox"/>		
						If Cal WET-Citric is > or = 5 mg/L, analyze for Cal WET-DI			Other <input type="checkbox"/>		
						STLC: Cal-WET Citric			Other <input type="checkbox"/>		
						STLC: Cal-WET Citric			A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed.		
						STLC: Cal-WET Citric			B = 10 highest TTLC results of the total samples, analyze for Title 22		
12	1269-107-5	12/8/14	1116	Soil	80z	MA	Free				
13	1269-103-1		1005								
14	1269-103-3		1012								
15	1269-103-5		1035								
16	1269-106-1		1125								
17	1269-106-3		1135								
18	1269-106-5		1146								
19	1269-105-1		1150								
20	1269-105-3		1225								
21	1269-105-5		1236								
22	1269-104-1		1250								

Possible Hazard Identification  
 Non-Hazardous  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Number of Containers: 1

Sample Disposal:  Return to Client  Disposal by Lab

Sampled by: Anya Sawant / M. Zellman Shipment Method: Lab Pickup Airbill Number: \_\_\_\_\_

Signature	Print Name	Company	Date	Time
	Anya Sawant	Stantec Consulting	12/8/14	14:30
	Joe H. H. H.	ARC	12/8/14	14:40
	Joe H. H. H.	ARC	12/8/14	15:45
	Joe H. H. H.	ARC	12/8/14	18:45
	Joe H. H. H.	ARC	12/8/14	18:45
	Joe H. H. H.	ARC	12/8/14	18:45

\*\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other  
 \*\*Container: A = Amber C = Clear Glass V = VOA S = Soil Jar O = Orbo T = Tedlar B = Brass P = Plastic OT = Other



# STANTEC CHAIN-OF-CUSTODY RECORD

COC # 3 of 3

FIELD OFFICE INFORMATION		PROJECT INFORMATION		ANALYSES / METHOD REQUEST		REMARKS / PRECAUTIONS	
OFFICE: Stantec Consulting Services, T.O.		Project No.: 185831018		Task: 200.0003			
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361		Project Name: Caltrans 07A3321		Project Manager: Anne Perez/Kristy Edblad			
Telephone: 805-230-1266		Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755					
Fax/E-Mail: kristy.edblad@stantec.com/ anne.perez@stantec.com							
Sample No. / Identification	Date	SAMPLE Time	Matrix *	Container & Size **	Preservative	Number of Containers	
						Total Lead (TLC) - 6010	STC: Cal-WET Citric
1269-104-3	12/8/14	1302	Soil	802	NONE	1	1
1269-104-5	↓	1315	↓	Acetate 5 liter	↓	1	1
1269-103-8	↓	1135	↓	poly	↓	1	1
FB2-120814	12/8/14	1325	W	poly	NONE	1	1
<b>A</b>							
Possible Hazard Identification <input type="checkbox"/> Non-Hazardous <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown							
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months							
STC: Cal-WET Citric				STC: Cal-WET Citrate			
TCLP-1311				Title 22 Metals - 6010/7000			
A				B			
TAT <input type="checkbox"/> Normal <input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Rush <input type="checkbox"/> Raw Data <input checked="" type="checkbox"/> Other: 3 days <input checked="" type="checkbox"/> CLP Rpt <input type="checkbox"/> EDD <input type="checkbox"/> Other							
REPORTING REQUIREMENTS <input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Raw Data <input type="checkbox"/> CLP Rpt <input checked="" type="checkbox"/> EDD <input type="checkbox"/> Other							
A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed. B = 10 highest TCLC results of the total samples, analyze for Title 22							

FIELD OFFICE INFORMATION		PROJECT INFORMATION		ANALYSES / METHOD REQUEST		REMARKS / PRECAUTIONS	
OFFICE: Stantec Consulting Services, T.O.		Project No.: 185831018		Task: 200.0003			
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361		Project Name: Caltrans 07A3321		Project Manager: Anne Perez/Kristy Edblad			
Telephone: 805-230-1266		Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755					
Fax/E-Mail: kristy.edblad@stantec.com/ anne.perez@stantec.com							
Sample No. / Identification	Date	SAMPLE Time	Matrix *	Container & Size **	Preservative	Number of Containers	
						Total Lead (TLC) - 6010	STC: Cal-WET Citric
1269-104-3	12/8/14	1302	Soil	802	NONE	1	1
1269-104-5	↓	1315	↓	Acetate 5 liter	↓	1	1
1269-103-8	↓	1135	↓	poly	↓	1	1
FB2-120814	12/8/14	1325	W	poly	NONE	1	1
<b>A</b>							
Possible Hazard Identification <input type="checkbox"/> Non-Hazardous <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown							
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months							
STC: Cal-WET Citric				STC: Cal-WET Citrate			
TCLP-1311				Title 22 Metals - 6010/7000			
A				B			
TAT <input type="checkbox"/> Normal <input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Rush <input type="checkbox"/> Raw Data <input checked="" type="checkbox"/> Other: 3 days <input checked="" type="checkbox"/> CLP Rpt <input type="checkbox"/> EDD <input type="checkbox"/> Other							
REPORTING REQUIREMENTS <input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Raw Data <input type="checkbox"/> CLP Rpt <input checked="" type="checkbox"/> EDD <input type="checkbox"/> Other							
A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed. B = 10 highest TCLC results of the total samples, analyze for Title 22							

Sampled by: Annika Sawant Shipment Method: Lab Pickup Airbill Number: \_\_\_\_\_

Signature	Print Name	Company	Date	Time
	Annika Sawant	Stantec	12/8/14	1430
	Joe Arceo	ATK	12/8/14	1540
	Joe Arceo	ATK	12/8/14	1845
	Joe Arceo	ATK	12/8/14	1845
	Joe Arceo	ATK	12/8/14	1845
	Joe Arceo	ATK	12/8/14	1845

\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other \*\*Container: A = Amber C = Clear Glass V = VOA S = Soil Jar O = Orbo T = Tedlar B = Brass P = Plastic OT = Other



December 16, 2014

Anne Perez/Kristy Edblad  
Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361  
Tel: (805) 230-1266  
Fax:(805) 230-1277

ELAP No.: 1838  
CSDLAC No.: 10196  
ORELAP No.: CA300003  
TCEQ No. : T104704502

Re: ATL Work Order Number : 1403881  
Client Reference : 185831018, Task: 200.0003, Caltrans 07A3321

Enclosed are the results for sample(s) received on December 08, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', is written over a light gray rectangular background.

Eddie Rodriguez  
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

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www.atlglobal.com*



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1269-102-1	1403881-01	Soil	12/08/14 8:40	12/08/14 14:20
1269-102-3	1403881-02	Soil	12/08/14 9:20	12/08/14 14:20
1269-102-5	1403881-03	Soil	12/08/14 9:25	12/08/14 14:20
1269-102-10	1403881-04	Soil	12/08/14 9:40	12/08/14 14:20
1269-102-15	1403881-05	Soil	12/08/14 10:40	12/08/14 14:20
1269-102-20	1403881-06	Soil	12/08/14 11:05	12/08/14 14:20
1269-102-25	1403881-07	Soil	12/08/14 11:10	12/08/14 14:20
1269-102-27	1403881-08	Soil	12/08/14 11:15	12/08/14 14:20
1269-101-1	1403881-09	Soil	12/08/14 12:50	12/08/14 14:20
1269-101-3	1403881-10	Soil	12/08/14 12:55	12/08/14 14:20
1269-101-5	1403881-11	Soil	12/08/14 13:00	12/08/14 14:20
1269-101-10	1403881-12	Soil	12/08/14 13:05	12/08/14 14:20
1269-101-15	1403881-13	Soil	12/08/14 13:07	12/08/14 14:20
1269-101-20	1403881-14	Soil	12/08/14 13:10	12/08/14 14:20
1269-101-22	1403881-15	Soil	12/08/14 13:12	12/08/14 14:20
EB-1-20141208	1403881-16	Water	12/08/14 13:01	12/08/14 14:20
FB-1-20141208	1403881-17	Water	12/08/14 11:50	12/08/14 14:20

### CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



# Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

## Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-01	1269-102-1	9.3	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:36	
1403881-02	1269-102-3	94	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:37	
1403881-03	1269-102-5	7.4	mg/kg	0.99	0.07	1	B4L0216	12/09/2014	12/10/14	15:38	
1403881-04	1269-102-10	37	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:40	
1403881-05	1269-102-15	17	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:41	
1403881-06	1269-102-20	5.0	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:42	
1403881-07	1269-102-25	2.4	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:44	
1403881-08	1269-102-27	2.2	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:45	
1403881-09	1269-101-1	8.8	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:46	
1403881-10	1269-101-3	12	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:47	
1403881-11	1269-101-5	18	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	15:48	
1403881-12	1269-101-10	12	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	13:30	
1403881-13	1269-101-15	6.7	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	13:31	
1403881-14	1269-101-20	3.6	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	13:32	
1403881-15	1269-101-22	1.8	mg/kg	1.0	0.07	1	B4L0216	12/09/2014	12/10/14	13:33	

## TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-02	1269-102-3	0.29	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14	16:01	
1403881-04	1269-102-10	0.027	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14	16:08	J
1403881-05	1269-102-15	0.0045	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14	16:10	J
1403881-11	1269-101-5	ND	mg/L	0.050	0.0014	1	B4L0456	12/16/2014	12/16/14	16:13	



# Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

## STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-01	1269-102-1	0.21	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:00		J
1403881-02	1269-102-3	7.5	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:02		
1403881-03	1269-102-5	0.30	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:04		J
1403881-04	1269-102-10	1.6	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:11		
1403881-05	1269-102-15	0.79	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:13		J
1403881-06	1269-102-20	0.20	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:14		J
1403881-07	1269-102-25	0.034	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:21		J
1403881-08	1269-102-27	ND	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:23		
1403881-09	1269-101-1	0.44	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:25		J
1403881-10	1269-101-3	0.51	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:28		J
1403881-11	1269-101-5	0.87	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:30		J
1403881-12	1269-101-10	0.20	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:36		J
1403881-13	1269-101-15	0.084	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:38		J
1403881-14	1269-101-20	0.042	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:40		J
1403881-15	1269-101-22	0.036	mg/L	1.0	0.027	20	B4L0330	12/11/2014	12/11/14 16:42		J

## STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-02	1269-102-3	0.36	mg/L	1.0	0.027	20	B4L0399	12/14/2014	12/15/14 11:34		J

## Mercury by AA (Cold Vapor) EPA 7470A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-16	EB-1-20141208	ND	ug/L	0.20	0.11	1	B4L0321	12/11/2014	12/11/14 14:43		
1403881-17	FB-1-20141208	ND	ug/L	0.20	0.11	1	B4L0321	12/11/2014	12/11/14 14:45		



# Certificate of Analysis

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 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

## Mercury by AA (Cold Vapor) EPA 7471A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-02	1269-102-3	0.06	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:53		J
1403881-04	1269-102-10	0.05	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:55		J
1403881-05	1269-102-15	0.05	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:57		J
1403881-11	1269-101-5	0.07	mg/kg	0.10	0.009	1	B4L0448	12/16/2014	12/16/14 14:59		J

## pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1403881-01	1269-102-1	8.4	pH Units	0.10	0.10	1	B4L0336	12/11/2014	12/11/14 12:38		
1403881-13	1269-101-15	8.4	pH Units	0.10	0.10	1	B4L0336	12/11/2014	12/11/14 12:38		

Client Sample ID 1269-102-3

Lab ID: 1403881-02

## Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time		Notes
							Analized		
Antimony	0.27	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:52		J
Arsenic	2.6	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:52		
Barium	84	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:52		
Beryllium	0.52	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:52		J
Cadmium	0.36	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:52		J
Chromium	12	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:52		
Cobalt	5.4	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:52		
Copper	20	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:52		
Molybdenum	2.2	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:52		
Nickel	9.4	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:52		
Selenium	0.51	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:52		J
Silver	0.12	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:52		J
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:52		
Vanadium	27	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:52		
Zinc	51	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:52		



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321

Report To : Anne Perez/Kristy Edblad

Reported : 12/16/2014

**Client Sample ID 1269-102-10**

**Lab ID: 1403881-04**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:54	
Arsenic	<b>2.8</b>	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:54	
Barium	<b>110</b>	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:54	
Beryllium	<b>0.35</b>	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:54	J
Cadmium	<b>0.17</b>	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:54	J
Chromium	<b>16</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:54	
Cobalt	<b>6.2</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:54	
Copper	<b>30</b>	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:54	
Molybdenum	<b>1.8</b>	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:54	
Nickel	<b>13</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:54	
Selenium	<b>0.45</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:54	J
Silver	<b>0.10</b>	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:54	J
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:54	
Vanadium	<b>31</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:54	
Zinc	<b>100</b>	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:54	

**Client Sample ID 1269-102-15**

**Lab ID: 1403881-05**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:56	
Arsenic	<b>5.4</b>	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:56	
Barium	<b>95</b>	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:56	
Beryllium	<b>0.21</b>	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:56	J
Cadmium	ND	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:56	
Chromium	<b>77</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:56	
Cobalt	<b>4.6</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:56	
Copper	<b>29</b>	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:56	
Molybdenum	<b>25</b>	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:56	
Nickel	<b>19</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:56	
Selenium	<b>0.83</b>	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:56	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:56	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:56	
Vanadium	<b>31</b>	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:56	
Zinc	<b>130</b>	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:56	



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

**Client Sample ID 1269-101-5**

**Lab ID: 1403881-11**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.25	1	B4L0424	12/15/2014	12/16/14 14:57	
Arsenic	4.0	1.0	0.19	1	B4L0424	12/15/2014	12/16/14 14:57	
Barium	78	1.0	0.14	1	B4L0424	12/15/2014	12/16/14 14:57	
Beryllium	0.29	1.0	0.04	1	B4L0424	12/15/2014	12/16/14 14:57	J
Cadmium	0.14	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:57	J
Chromium	10	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:57	
Cobalt	5.9	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:57	
Copper	21	2.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:57	
Molybdenum	0.37	1.0	0.05	1	B4L0424	12/15/2014	12/16/14 14:57	J
Nickel	9.3	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:57	
Selenium	0.51	1.0	0.15	1	B4L0424	12/15/2014	12/16/14 14:57	J
Silver	ND	1.0	0.06	1	B4L0424	12/15/2014	12/16/14 14:57	
Thallium	ND	1.0	0.20	1	B4L0424	12/15/2014	12/16/14 14:57	
Vanadium	26	1.0	0.07	1	B4L0424	12/15/2014	12/16/14 14:57	
Zinc	54	1.0	0.11	1	B4L0424	12/15/2014	12/16/14 14:57	



# Certificate of Analysis

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 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

**Client Sample ID EB-1-20141208**  
**Lab ID: 1403881-16**

## Title 22 Metals by ICP-AES EPA 6010B

**Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Antimony</b>	<b>0.034</b>	0.010	0.0026	1	B4L0319	12/11/2014	12/11/14 14:23	
Arsenic	ND	0.010	0.0024	1	B4L0319	12/11/2014	12/11/14 14:23	
<b>Barium</b>	<b>0.0011</b>	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Beryllium</b>	<b>0.0003</b>	0.0030	0.0002	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Cadmium</b>	<b>0.0002</b>	0.0030	0.0001	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Chromium</b>	<b>0.0018</b>	0.0030	0.0003	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Cobalt</b>	<b>0.0006</b>	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Copper</b>	<b>0.0075</b>	0.0090	0.0009	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Lead</b>	<b>0.0014</b>	0.0050	0.0014	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Molybdenum</b>	<b>0.0040</b>	0.0050	0.0005	1	B4L0319	12/11/2014	12/11/14 14:23	J
<b>Nickel</b>	<b>0.0013</b>	0.0050	0.0004	1	B4L0319	12/11/2014	12/11/14 14:23	J
Selenium	ND	0.010	0.0040	1	B4L0319	12/11/2014	12/11/14 14:23	
<b>Silver</b>	<b>0.0017</b>	0.0030	0.0006	1	B4L0319	12/11/2014	12/11/14 14:23	J
Thallium	ND	0.015	0.0026	1	B4L0319	12/11/2014	12/11/14 14:23	
Vanadium	ND	0.0030	0.0013	1	B4L0319	12/11/2014	12/11/14 14:23	
<b>Zinc</b>	<b>0.011</b>	0.025	0.0017	1	B4L0319	12/11/2014	12/11/14 14:23	J



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

**Client Sample ID FB-1-20141208**

**Lab ID: 1403881-17**

**Title 22 Metals by ICP-AES EPA 6010B**

**Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Antimony</b>	<b>0.0073</b>	0.010	0.0026	1	B4L0319	12/11/2014	12/11/14 14:26	J
Arsenic	ND	0.010	0.0024	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Barium</b>	<b>0.0009</b>	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:26	J
<b>Beryllium</b>	<b>0.0002</b>	0.0030	0.0002	1	B4L0319	12/11/2014	12/11/14 14:26	J
Cadmium	ND	0.0030	0.0001	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Chromium</b>	<b>0.0018</b>	0.0030	0.0003	1	B4L0319	12/11/2014	12/11/14 14:26	J
Cobalt	ND	0.0030	0.0004	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Copper</b>	<b>0.0061</b>	0.0090	0.0009	1	B4L0319	12/11/2014	12/11/14 14:26	J
Lead	ND	0.0050	0.0014	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Molybdenum</b>	<b>0.0005</b>	0.0050	0.0005	1	B4L0319	12/11/2014	12/11/14 14:26	J
<b>Nickel</b>	<b>0.0015</b>	0.0050	0.0004	1	B4L0319	12/11/2014	12/11/14 14:26	J
Selenium	ND	0.010	0.0040	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Silver</b>	<b>0.0014</b>	0.0030	0.0006	1	B4L0319	12/11/2014	12/11/14 14:26	J
Thallium	ND	0.015	0.0026	1	B4L0319	12/11/2014	12/11/14 14:26	
Vanadium	ND	0.0030	0.0013	1	B4L0319	12/11/2014	12/11/14 14:26	
<b>Zinc</b>	<b>0.0060</b>	0.025	0.0017	1	B4L0319	12/11/2014	12/11/14 14:26	J



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Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### QUALITY CONTROL SECTION

#### Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B4L0319 - EPA 3010A\_W**

**Blank (B4L0319-BLK1)**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010		NR					
Arsenic	ND	0.010		NR					
Barium	0.000625	0.0030		NR					J
Beryllium	ND	0.0030		NR					
Cadmium	ND	0.0030		NR					
Chromium	0.001463	0.0030		NR					J
Cobalt	ND	0.0030		NR					
Copper	0.003656	0.0090		NR					J
Lead	ND	0.0050		NR					
Molybdenum	ND	0.0050		NR					
Nickel	0.001536	0.0050		NR					J
Selenium	ND	0.010		NR					
Silver	0.000901	0.0030		NR					J
Thallium	ND	0.015		NR					
Vanadium	ND	0.0030		NR					
Zinc	0.005032	0.025		NR					J

**LCS (B4L0319-BS1)**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	0.966834	0.010	1.00000	96.7	80 - 120				
Arsenic	0.932792	0.010	1.00000	93.3	80 - 120				
Barium	1.01066	0.0030	1.00000	101	80 - 120				
Beryllium	0.998165	0.0030	1.00000	99.8	80 - 120				
Cadmium	0.953865	0.0030	1.00000	95.4	80 - 120				
Chromium	1.00446	0.0030	1.00000	100	80 - 120				
Cobalt	0.972405	0.0030	1.00000	97.2	80 - 120				
Copper	1.01311	0.0090	1.00000	101	80 - 120				
Lead	0.996295	0.0050	1.00000	99.6	80 - 120				
Molybdenum	0.923243	0.0050	1.00000	92.3	80 - 120				
Nickel	0.966286	0.0050	1.00000	96.6	80 - 120				
Selenium	0.883514	0.010	1.00000	88.4	80 - 120				
Silver	1.02806	0.0030	1.00000	103	80 - 120				
Thallium	0.984127	0.015	1.00000	98.4	80 - 120				
Vanadium	0.997442	0.0030	1.00000	99.7	80 - 120				
Zinc	0.928423	0.025	1.00000	92.8	80 - 120				

**Duplicate (B4L0319-DUP1)**

**Source: 1403877-09**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010		0.003638	NR			20	
Arsenic	ND	0.010		ND	NR			20	
Barium	0.000694	0.0030		0.000591	NR		16.1	20	J
Beryllium	ND	0.0030		ND	NR			20	
Cadmium	ND	0.0030		ND	NR			20	
Chromium	0.001161	0.0030		0.001971	NR		51.7	20	R, J
Cobalt	ND	0.0030		ND	NR			20	



## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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#### Batch B4L0319 - EPA 3010A\_W (continued)

##### Duplicate (B4L0319-DUP1) - Continued

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Copper	0.004472	0.0090		0.004508	NR		0.805	20	J
Lead	ND	0.0050		ND	NR			20	
Molybdenum	ND	0.0050		0.001444	NR			20	
Nickel	0.001981	0.0050		0.002005	NR		1.23	20	J
Selenium	ND	0.010		ND	NR			20	
Silver	0.001097	0.0030		0.001069	NR		2.60	20	J
Thallium	ND	0.015		ND	NR			20	
Vanadium	ND	0.0030		ND	NR			20	
Zinc	0.007402	0.025		8.1093E-3	NR		9.12	20	J

##### Matrix Spike (B4L0319-MS1)

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	2.34256	0.010	2.50000	0.003638	93.6	78 - 121			
Arsenic	2.38056	0.010	2.50000	ND	95.2	78 - 124			
Barium	2.42188	0.0030	2.50000	0.000591	96.9	81 - 118			
Beryllium	2.47049	0.0030	2.50000	ND	98.8	87 - 119			
Cadmium	2.32176	0.0030	2.50000	ND	92.9	80 - 113			
Chromium	2.42000	0.0030	2.50000	0.001971	96.7	85 - 115			
Cobalt	2.39156	0.0030	2.50000	ND	95.7	83 - 113			
Copper	2.42075	0.0090	2.50000	0.004508	96.6	72 - 132			
Lead	2.45058	0.0050	2.50000	ND	98.0	77 - 121			
Molybdenum	2.28564	0.0050	2.50000	0.001444	91.4	82 - 111			
Nickel	2.40812	0.0050	2.50000	0.002005	96.2	80 - 114			
Selenium	2.32732	0.010	2.50000	ND	93.1	75 - 121			
Silver	2.40243	0.0030	2.50000	0.001069	96.1	84 - 116			
Thallium	2.42203	0.015	2.50000	ND	96.9	70 - 122			
Vanadium	2.38051	0.0030	2.50000	ND	95.2	85 - 114			
Zinc	2.35615	0.025	2.50000	8.1093E-3	93.9	70 - 123			

##### Matrix Spike Dup (B4L0319-MSD1)

Source: 1403877-09

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	2.45624	0.010	2.50000	0.003638	98.1	78 - 121	4.74	20	
Arsenic	2.44646	0.010	2.50000	ND	97.9	78 - 124	2.73	20	
Barium	2.43358	0.0030	2.50000	0.000591	97.3	81 - 118	0.482	20	
Beryllium	2.52448	0.0030	2.50000	ND	101	87 - 119	2.16	20	
Cadmium	2.30852	0.0030	2.50000	ND	92.3	80 - 113	0.572	20	
Chromium	2.56204	0.0030	2.50000	0.001971	102	85 - 115	5.70	20	
Cobalt	2.45848	0.0030	2.50000	ND	98.3	83 - 113	2.76	20	
Copper	2.44834	0.0090	2.50000	0.004508	97.8	72 - 132	1.13	20	
Lead	2.36401	0.0050	2.50000	ND	94.6	77 - 121	3.60	20	
Molybdenum	2.33299	0.0050	2.50000	0.001444	93.3	82 - 111	2.05	20	
Nickel	2.47574	0.0050	2.50000	0.002005	98.9	80 - 114	2.77	20	
Selenium	2.38586	0.010	2.50000	ND	95.4	75 - 121	2.48	20	
Silver	2.43940	0.0030	2.50000	0.001069	97.5	84 - 116	1.53	20	
Thallium	2.49406	0.015	2.50000	ND	99.8	70 - 122	2.93	20	
Vanadium	2.40959	0.0030	2.50000	ND	96.4	85 - 114	1.21	20	
Zinc	2.40342	0.025	2.50000	8.1093E-3	95.8	70 - 123	1.99	20	

#### Batch B4L0424 - EPA 3050B\_S



## Certificate of Analysis

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290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B4L0424 - EPA 3050B\_S (continued)**

**Blank (B4L0424-BLK1)**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	ND	2.0			NR			
Arsenic	ND	1.0			NR			
Barium	ND	1.0			NR			
Beryllium	ND	1.0			NR			
Cadmium	ND	1.0			NR			
Chromium	0.228352	1.0			NR			J
Cobalt	ND	1.0			NR			
Copper	0.083008	2.0			NR			J
Molybdenum	ND	1.0			NR			
Nickel	0.154850	1.0			NR			J
Selenium	ND	1.0			NR			
Silver	ND	1.0			NR			
Thallium	ND	1.0			NR			
Vanadium	ND	1.0			NR			
Zinc	0.137787	1.0			NR			J

**LCS (B4L0424-BS1)**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	46.8887	2.0	50.0000	93.8	80 - 120			
Arsenic	46.6313	1.0	50.0000	93.3	80 - 120			
Barium	50.6323	1.0	50.0000	101	80 - 120			
Beryllium	49.5539	1.0	50.0000	99.1	80 - 120			
Cadmium	48.4388	1.0	50.0000	96.9	80 - 120			
Chromium	51.0089	1.0	50.0000	102	80 - 120			
Cobalt	49.6663	1.0	50.0000	99.3	80 - 120			
Copper	48.8048	2.0	50.0000	97.6	80 - 120			
Molybdenum	50.6317	1.0	50.0000	101	80 - 120			
Nickel	48.6714	1.0	50.0000	97.3	80 - 120			
Selenium	43.9551	1.0	50.0000	87.9	80 - 120			
Silver	47.3022	1.0	50.0000	94.6	80 - 120			
Thallium	47.9295	1.0	50.0000	95.9	80 - 120			
Vanadium	48.3858	1.0	50.0000	96.8	80 - 120			
Zinc	48.1496	1.0	50.0000	96.3	80 - 120			

**Duplicate (B4L0424-DUP1)**

**Source: 1403877-01**

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	ND	2.0	0.839300	NR		20		
Arsenic	4.28002	1.0	4.14678	NR	3.16	20		
Barium	147.197	1.0	134.756	NR	8.82	20		
Beryllium	0.457094	1.0	0.413350	NR	10.1	20	J	
Cadmium	0.462973	1.0	0.477001	NR	2.98	20	J	
Chromium	19.7257	1.0	17.4490	NR	12.2	20		
Cobalt	9.28294	1.0	8.43577	NR	9.56	20		
Copper	29.3756	2.0	35.9531	NR	20.1	20	R	
Molybdenum	0.913688	1.0	0.946196	NR	3.50	20	J	
Nickel	17.6603	1.0	15.1509	NR	15.3	20		
Selenium	0.867274	1.0	0.641824	NR	29.9	20	R, J	
Silver	ND	1.0	ND	NR		20		
Thallium	ND	1.0	ND	NR		20		



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Reported : 12/16/2014

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B4L0424 - EPA 3050B\_S (continued)**

**Duplicate (B4L0424-DUP1) - Continued**

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Vanadium	39.6848	1.0		36.8187	NR		7.49	20
Zinc	105.621	1.0		103.951	NR		1.59	20

**Matrix Spike (B4L0424-MS1)**

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	71.5913	2.0	125.000	0.839300	56.6	21 - 126		
Arsenic	99.4473	1.0	125.000	4.14678	76.2	57 - 113		
Barium	227.547	1.0	125.000	134.756	74.2	29 - 146		
Beryllium	98.2818	1.0	125.000	0.413350	78.3	65 - 110		
Cadmium	90.4932	1.0	125.000	0.477001	72.0	56 - 107		
Chromium	116.332	1.0	125.000	17.4490	79.1	49 - 127		
Cobalt	101.658	1.0	125.000	8.43577	74.6	57 - 112		
Copper	134.240	2.0	125.000	35.9531	78.6	56 - 127		
Molybdenum	97.9554	1.0	125.000	0.946196	77.6	62 - 108		
Nickel	106.829	1.0	125.000	15.1509	73.3	42 - 127		
Selenium	93.8880	1.0	125.000	0.641824	74.6	58 - 105		
Silver	103.466	1.0	125.000	ND	82.8	63 - 113		
Thallium	88.3352	1.0	125.000	ND	70.7	53 - 110		
Vanadium	136.137	1.0	125.000	36.8187	79.5	66 - 112		
Zinc	181.038	1.0	125.000	103.951	61.7	28 - 137		

**Matrix Spike Dup (B4L0424-MSD1)**

Source: 1403877-01

Prepared: 12/15/2014 Analyzed: 12/16/2014

Antimony	70.8914	2.0	125.628	0.839300	55.8	21 - 126	0.982	20
Arsenic	99.3529	1.0	125.628	4.14678	75.8	57 - 113	0.0950	20
Barium	250.781	1.0	125.628	134.756	92.4	29 - 146	9.71	20
Beryllium	96.6548	1.0	125.628	0.413350	76.6	65 - 110	1.67	20
Cadmium	89.2842	1.0	125.628	0.477001	70.7	56 - 107	1.34	20
Chromium	116.396	1.0	125.628	17.4490	78.8	49 - 127	0.0548	20
Cobalt	107.526	1.0	125.628	8.43577	78.9	57 - 112	5.61	20
Copper	136.998	2.0	125.628	35.9531	80.4	56 - 127	2.03	20
Molybdenum	95.9874	1.0	125.628	0.946196	75.7	62 - 108	2.03	20
Nickel	113.854	1.0	125.628	15.1509	78.6	42 - 127	6.37	20
Selenium	93.8306	1.0	125.628	0.641824	74.2	58 - 105	0.0612	20
Silver	101.200	1.0	125.628	ND	80.6	63 - 113	2.21	20
Thallium	87.5085	1.0	125.628	ND	69.7	53 - 110	0.940	20
Vanadium	135.888	1.0	125.628	36.8187	78.9	66 - 112	0.183	20
Zinc	200.039	1.0	125.628	103.951	76.5	28 - 137	9.97	20

**Batch S4L0167 - B4L0318**

**Instrument Blank (S4L0167-IBL1)**

Prepared: 12/11/2014 Analyzed: 12/11/2014

Antimony	ND	0.010			NR			
Arsenic	ND	0.010			NR			
Barium	ND	0.0030			NR			
Beryllium	ND	0.0030			NR			
Cadmium	ND	0.0030			NR			
Chromium	ND	0.0030			NR			
Cobalt	ND	0.0030			NR			



# Certificate of Analysis

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Project Number : 185831018, Task: 200.0003, Caltrans 07A3321

Report To : Anne Perez/Kristy Edblad

Reported : 12/16/2014

## Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
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### Batch S4L0167 - B4L0318 (continued)

#### Instrument Blank (S4L0167-IBL1) - Continued

Prepared: 12/11/2014 Analyzed: 12/11/2014

Copper	ND	0.0090						NR
Lead	ND	0.0050						NR
Molybdenum	ND	0.0050						NR
Nickel	ND	0.0050						NR
Selenium	ND	0.010						NR
Silver	ND	0.0030						NR
Thallium	ND	0.015						NR
Vanadium	ND	0.0030						NR
Zinc	ND	0.025						NR



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 Reported : 12/16/2014

### Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0216 - EPA 3050 Modified_S</b>								
<b>Blank (B4L0216-BLK1)</b>								
Lead	ND	1.0						
					Prepared: 12/9/2014 Analyzed: 12/10/2014			
					NR			
<b>Blank (B4L0216-BLK2)</b>								
Lead	0.105132	1.0						J
					Prepared: 12/9/2014 Analyzed: 12/10/2014			
					NR			
<b>LCS (B4L0216-BS1)</b>								
Lead	52.5992	1.0	50.0000		105	80 - 120		
					Prepared: 12/9/2014 Analyzed: 12/10/2014			
<b>Duplicate (B4L0216-DUP1)</b>								
		<b>Source: 1403881-15</b>			Prepared: 12/9/2014 Analyzed: 12/10/2014			
Lead	2.38842	1.0		1.76894	NR		29.8	20 R
<b>Duplicate (B4L0216-DUP2)</b>								
		<b>Source: 1403881-06</b>			Prepared: 12/9/2014 Analyzed: 12/10/2014			
Lead	5.27428	1.0		5.03888	NR		4.56	20
<b>Matrix Spike (B4L0216-MS1)</b>								
		<b>Source: 1403881-15</b>			Prepared: 12/9/2014 Analyzed: 12/10/2014			
Lead	235.280	1.0	250.000	1.76894	93.4	33 - 134		
<b>Matrix Spike (B4L0216-MS2)</b>								
		<b>Source: 1403881-06</b>			Prepared: 12/9/2014 Analyzed: 12/10/2014			
Lead	238.618	1.0	250.000	5.03888	93.4	33 - 134		
<b>Matrix Spike Dup (B4L0216-MSD1)</b>								
		<b>Source: 1403881-15</b>			Prepared: 12/9/2014 Analyzed: 12/10/2014			
Lead	245.806	0.99	247.525	1.76894	98.6	33 - 134	4.38	20
<b>Batch S4L0149 - B4L0215</b>								
<b>Instrument Blank (S4L0149-IBL1)</b>								
Lead	ND	1.0						
					Prepared: 12/10/2014 Analyzed: 12/10/2014			
					NR			



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 Reported : 12/16/2014

### TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0456 - EPA 3010A_S</b>								
<b>Blank (B4L0456-BLK1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Lead	1.6255E-3	0.050			NR			J
<b>LCS (B4L0456-BS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Lead	0.930651	0.050	1.00000		93.1	80 - 120		
<b>Duplicate (B4L0456-DUP1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Lead	0.003400	0.050		0.004401	NR		25.7	20 R, J
<b>Matrix Spike (B4L0456-MS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Lead	2.32065	0.050	2.50000	0.004401	92.6	77 - 121		
<b>Matrix Spike Dup (B4L0456-MSD1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Lead	2.27722	0.050	2.50000	0.004401	90.9	77 - 121	1.89	20



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 Reported : 12/16/2014

### STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0330 - STLC_S Extraction</b>									
<b>Blank (B4L0330-BLK1)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR				
<b>Blank (B4L0330-BLK2)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0			NR				
<b>LCS (B4L0330-BS1)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	1.99871	1.0	2.00000		99.9	80 - 120			
<b>Duplicate (B4L0330-DUP1)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	ND	1.0		0.036203	NR			20	
<b>Duplicate (B4L0330-DUP2)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	0.242676	1.0		0.197829	NR		20.4	20	R, J
<b>Matrix Spike (B4L0330-MS1)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	2.42708	1.0	2.50000	0.036203	95.6	44 - 130			
<b>Matrix Spike (B4L0330-MS2)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	2.58794	1.0	2.50000	0.197829	95.6	44 - 130			
<b>Matrix Spike Dup (B4L0330-MSD1)</b>					Prepared: 12/11/2014 Analyzed: 12/11/2014				
Lead	2.39879	1.0	2.50000	0.036203	94.5	44 - 130	1.17	20	



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 Reported : 12/16/2014

### STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0399 - STLC DI_S Extraction</b>								
<b>Blank (B4L0399-BLK1)</b>				Prepared: 12/14/2014 Analyzed: 12/15/2014				
Lead	ND	1.0			NR			
<b>LCS (B4L0399-BS1)</b>				Prepared: 12/14/2014 Analyzed: 12/15/2014				
Lead	2.10070	1.0	2.00000		105	80 - 120		
<b>Duplicate (B4L0399-DUP1)</b>				Prepared: 12/14/2014 Analyzed: 12/15/2014				
Lead	0.341778	1.0		0.356311	NR		4.16	20 J
<b>Matrix Spike (B4L0399-MS1)</b>				Prepared: 12/14/2014 Analyzed: 12/15/2014				
Lead	2.98196	1.0	2.50000	0.356311	105	70 - 130		
<b>Matrix Spike Dup (B4L0399-MSD1)</b>				Prepared: 12/14/2014 Analyzed: 12/15/2014				
Lead	2.96961	1.0	2.50000	0.356311	105	70 - 130	0.415	20
<b>Batch S4L0200 - B4L0359</b>								
<b>Instrument Blank (S4L0200-IBL1)</b>				Prepared: 12/15/2014 Analyzed: 12/15/2014				
Lead	ND	0.050			NR			



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### Mercury by AA (Cold Vapor) EPA 7470A - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0321 - EPA 245.1/7470_W</b>								
<b>Blank (B4L0321-BLK1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	ND	0.20			NR			
<b>LCS (B4L0321-BS1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	10.9722	0.20	10.0000		110 80 - 120			
<b>Duplicate (B4L0321-DUP1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	ND	0.20		ND	NR			20
<b>Matrix Spike (B4L0321-MS1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	10.3612	0.20	10.0000	ND	104 70 - 130			
<b>Matrix Spike Dup (B4L0321-MSD1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	10.3885	0.20	10.0000	ND	104 70 - 130	0.263		20
<b>Post Spike (B4L0321-PS1)</b>		<b>Source: 1403877-09</b>			Prepared: 12/11/2014 Analyzed: 12/11/2014			
Mercury	5.67840		5.00000	-0.031453	114 85 - 115			
<b>Batch S4L0168 - B4L0320</b>								
<b>Instrument Blank (S4L0168-IBL1)</b>				Prepared: 12/11/2014 Analyzed: 12/11/2014				
Mercury	ND	0.20			NR			



## Certificate of Analysis

Stantec  
 290 Conejo Ridge Avenue, Suite 200  
 Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
 Report To : Anne Perez/Kristy Edblad  
 Reported : 12/16/2014

### Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B4L0448 - EPA 7471_S</b>								
<b>Blank (B4L0448-BLK1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	ND	0.10			NR			
<b>LCS (B4L0448-BS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.916033	0.10	0.833333		110 80 - 120			
<b>Duplicate (B4L0448-DUP1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.064246	0.10		0.061465	NR	4.42	20	J
<b>Matrix Spike (B4L0448-MS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.895276	0.10	0.833333	0.061465	100	70 - 130		
<b>Matrix Spike Dup (B4L0448-MSD1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.902776	0.10	0.833333	0.061465	101	70 - 130	0.834	20
<b>Post Spike (B4L0448-PS1)</b>				Prepared: 12/16/2014 Analyzed: 12/16/2014				
Mercury	0.006556		5.00000E-3	0.000738	116	85 - 115		M1



# Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks , CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

## pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD RPD	RPD Limit	Notes
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**Batch B4L0336 - z\_Prep\_WC\_1\_S**

**Duplicate (B4L0336-DUP1)**

**Source: 1403877-05**

Prepared: 12/11/2014 Analyzed: 12/11/2014

pH	8.54000	0.10		8.06000	NR		5.78	20	
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## Certificate of Analysis

Stantec  
290 Conejo Ridge Avenue, Suite 200  
Thousand Oaks, CA 91361

Project Number : 185831018, Task: 200.0003, Caltrans 07A3321  
Report To : Anne Perez/Kristy Edblad  
Reported : 12/16/2014

### Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

- Notes:
- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
  - (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
  - (3) Results are wet unless otherwise specified.



# STANTEC CHAIN-OF-CUSTODY RECORD

COC # \_\_\_\_\_ of 1 Page

FIELD OFFICE INFORMATION		PROJECT INFORMATION		ANALYSES / METHOD REQUEST		REMARKS / PRECAUTIONS	
OFFICE: Stantec Consulting Services, T.O.		Project No.: 185831018 Task: 200.0003		Title 22 Metals - 6010/7000		REPORTING REQUIREMENTS	
Send Report to: Stantec, 290 Conejo Ridge Avenue, Thousand Oaks, CA 91361		Project Name: Caltrans 07A3321		PH - 9045		<input type="checkbox"/> MB & SURGS <input type="checkbox"/> Dup/MS/MSD <input type="checkbox"/> Raw Data <input type="checkbox"/> CLP Rpt <input checked="" type="checkbox"/> EDD <input type="checkbox"/> Other	
Telephone: 805-230-1266		Project Manager: Anne Perez/Kristy Edblad		TCLP-1311		<input type="checkbox"/> Normal <input type="checkbox"/> Rush <input checked="" type="checkbox"/> Other: 3 days	
Fax/E-Mail: kristy.edblad@stantec.com / anne.perez@stantec.com		Laboratory: Advanced Technology Laboratories, 3275 Walnut Avenue, Signal Hill, CA 90755		STLC: Cal-WET Citric		<input type="checkbox"/> A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed.	
SAMPLE		Container & Size **		STLC: Cal-WET Citric		B = 10 highest TTLC results of the total samples, analyze for Title 22	
Date	Time	Matrix *	Preservative	Total Lead (TLC) - 6010	If Cal WET-Citric is > or = 5 mg/L, analyze for Cal WET-DI		
12/8/14	0840	Soil	N/A	x	x		
1269-102-1	0920	802 Jar		x			
1269-102-3	0925	802 Jar		x			
1269-102-5	0940	Acetate		x			
1269-102-10	1040			x			
1269-102-15	1105			x			
1269-102-20	1110			x			
1269-102-25	1115			x			
1269-102-27	1250			x			
1269-101-1	1255			x			
1269-101-3	1300			x			
1269-101-5				x			

Number of Containers: \_\_\_\_\_

Sample Disposal:  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Possible Hazard Identification:  Non-Hazardous  Flammable  Skin Irritant  Poison B  Unknown

Sampled by: K. Posekian Shipment Method: \_\_\_\_\_ Airbill Number: \_\_\_\_\_

Signature	Print Name	Company	Date	Time
1(a) Relinquished by: <u>[Signature]</u>	KEITH POSEKIAN	STANTEC	12/8/14	1420
1(b) Received by: <u>[Signature]</u>	JOEL ARCEO	ATL	12/8/14	1820
2(a) Relinquished by: <u>[Signature]</u>	JOEL ARCEO	ATL	12/8/14	1845
2(b) Received by: <u>[Signature]</u>	FRANK	ATL	12/8/14	1845
3(a) Relinquished by: _____	_____	_____	_____	_____
3(b) Received by: _____	_____	_____	_____	_____

\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other \*\*Container: A = Amber C = Clear Glass V = VOA S = Soil Jar O = Orbo T = Tedlar B = Brass P = Plastic OT = Other



# STANTEC CHAIN-OF-CUSTODY RECORD

COC # 2 of 2

FIELD OFFICE INFORMATION		PROJECT INFORMATION			ANALYSES / METHOD REQUEST		REMARKS / PRECAUTIONS	
OFFICE: Stantec Consulting Services, T.O.		Project No.: 185831018	Task: 200.0003	Request: Title 22 Metals - 6010/7000		REPORTING REQUIREMENTS		
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361		Project Name: Caltrans 07A3321	Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755		TAT		<input type="checkbox"/> Normal <input type="checkbox"/> Rush <input checked="" type="checkbox"/> Other: 3 days <input checked="" type="checkbox"/> EDD <input type="checkbox"/> Other	
Telephone: 805-230-1266		Project Manager: Anne Perez/Kristy Edblad		STLC: Cal-WET Citrate		A = TCLP: samples reporting 1,000 mg/kg of lead or the highest of 20% total lead concentrations will be analyzed.		
Fax/E-Mail: kristy.edblad@stantec.com / anne.perez@stantec.com		Laboratory:		STLC: Cal-WET Citrate		B = 10 highest TTLC results of the total samples, analyze for Title 22		
Sample No. / Identification	Date	SAMPLE Time	Matrix *	Container & Size **	Preservative	Number of Containers		Other
						Total Lead (TLC) - 6010	STLC: Cal-WET Citrate	
1269-101-10	12/8/14	1305	Soil	Acetate	N/A	1	1	
1269-101-15		1307				1	1	
1269-101-20		1310				1	1	
1269-101-22		1312				1	1	
FB-1-20141208		1301	Water	500ml poly	N/A	1	1	Only Title 22 metals *
FB-1-20141208		1150	Water	500ml poly	N/A	1	1	* Only Title 22 metals *
<input type="checkbox"/> Non-Hazardous <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months								

Possible Hazard Identification		Shipment Method: Lab Pickup		Airbill Number:	
<input type="checkbox"/> Non-Hazardous	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input checked="" type="checkbox"/> Unknown	<input type="checkbox"/> Return to Client
Sampled by: <u>K. Posehian</u>		Print Name		Company	
1(a) Relinquished by:		<u>KEITH POSEHIAN</u>		<u>STANTEC</u>	
1(b) Received by:		<u>JOEL ANCO</u>		<u>ATL</u>	
2(a) Relinquished by:		<u>JOEL ANCO</u>		<u>ATL</u>	
2(b) Received by:		<u>FRANK</u>		<u>ATL</u>	
3(a) Relinquished by:					
3(b) Received by:					
Signature		Date		Time	
		12/8/14		1420	
		12/8/14		1420	
		12/8/14		1845	
		12/8/14		1845	

\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other \*\*Container: A = Amber C = Clear Glass V = VOA S = Soil Jar O = Orbo T = Tedlar B = Brass P = Plastic OT = Other

**APPENDIX E**  
**DATA VALIDATION RECORDS**

## APPENDIX E

### DATA VALIDATION REPORT

AERIALY DEPOSITED LEAD (ADL) SITE INVESTIGATION REPORT  
MEASURE R PROJECT UPGRADE EXISTING COMMUNICATION SYSTEM IN LOS  
ANGELES COUNTY

LA 110-PM 8.60/13.97, LA 2 PM 18.8, LA 405 PM 21.3  
Caltrans Contract Number 07A3321, Task Order #18  
EA Number: 07-293801  
Los Angeles County, California

The data validation procedure is based on the principles of the *U.S. EPA National Functional Guidelines* and U.S. EPA Region 9 requirements and is designed to ensure completeness and adequacy of the data set. Samples were collected and submitted for analysis to Advanced Technology Laboratories (ATL) in Signal Hill, California. Samples were analyzed for Total Title 22 Metals or Total Lead, TCLP Lead, SPLC Lead and STLC DI Lead by EPA SW-846 6010B, Mercury by 7471A/7470A and pH by 9045C.

The Data Validation Reports/Checklists summarize compounds that were qualified and are attached to this summary. Data was validated based on Regional EPA and *U.S. EPA National Functional Guidelines*. Data validation was performed in accordance with the Scope of Work. Data validation was performed to ensure the quality of project data. Two analytical reports and associated addenda were validated:

- 1403877 and
- 1403881.

The data were validated and reviewed for the following:

- Completeness of data deliverables (chain of custody records, laboratory data, laboratory quality assurance and quality control (QA/QC) data);
- Sample holding time;
- Sample preservation;
- Blank data (method, trip, and equipment);
- Laboratory control sample (LCS) recovery;
- Laboratory duplicate sample precision;
- Matrix spike/matrix spike duplicate (MS/MSD) recovery; and
- Overall data assessment.

The following summarizes the results of the validation:

1. Data Completeness: Data for 39 samples, two field blanks and two equipment blanks were collected on December 08, 2014 were validated. Samples specified for analysis on the chain of custodies were analyzed as specified. The project goal of 90 percent completeness was achieved.

2. Sample Hold Times: All samples were analyzed within sample hold times.
3. Sample Preservation: All samples were preserved in appropriate containers and preservative.
4. Method Blanks: Several metals analytes (barium, chromium, copper, nickel, silver, zinc and TCLP lead) were reported in the method blank at very low concentrations. Associated sample results below the blank concentration are validated to non-detect and flagged "UJB". Sample results greater than the blank concentration are flagged "JB". The detection limit is changed to the blank concentration. Sample results greater than 10 times the blank concentration require no qualifying action.
5. Equipment Blanks: Several metals were reported in equipment blanks at very low levels, and may be reflective of laboratory method blank detections, or artifact from contact with metal sampling equipment.
6. Laboratory Control Samples: No LCS samples reported percent recoveries outside of method and/or laboratory limits.
7. Laboratory Duplicate Samples: Laboratory duplicate samples were reported within the relative percent difference (RPD) control limit of 20 percent except for the following:
  - a. Laboratory report 1403877; 6010B batch B4L0215 – Laboratory duplicate RPD above limits for Lead at 22%. Associated result flagged "J" for 1269-107-3 only.
  - b. Laboratory report 1403877; 6010B batch B4L0456 – Laboratory duplicate RPD above limits for TCLP Lead at 26%. Associated result flagged "J" for 1269-110-0 only.
  - c. Laboratory report 1403877; 6010B batch B4L0424 – Laboratory duplicate RPD above limits for Selenium at 30%. Associated results flagged "J" for 1269-112-0 only.
  - d. Laboratory report 1403881; 6010B batch B4L0216 – Laboratory duplicate RPD above limits for Lead. Associated results flagged "J" for 1269-101-22 only.
8. Matrix Spike and Spike Duplicates: Matrix spike and duplicate samples were analyzed to assess accuracy and to evaluate matrix effects on data analysis. The percent recoveries and RPDs were found to within laboratory-determined control limits except:

- a. Laboratory report 1403877; 6010B batch B4L0424 – Matrix recoveries for Antimony are below project the 60% limits. Associated results flagged “J” if positive or “UJ” if non-detect for sample 1269-112-0 only.
  - b. Laboratory report 140877 and 1403881; 7471A batch B4L0448 – Post digestion spike recovery for Mercury is above laboratory limit of 115% at 116%. Associated positive results flagged “J” for all samples in both laboratory reports.
9. Data were considered “useable” and marked as such in the tables provided and that it was validated according to the EPA and scope of work. No data was qualified as “rejected”. The Data Validation Reports/Checklists summarize compounds that were qualified and are attached to this summary. Additionally, data qualifiers and the reason codes associated with the qualifier are in Tables 1 and 2.

**Stantec Analytical Validation Report/Checklist**

**Report No. 121814-EC-03**

Project Name: Caltrans 07A	Project Number: 185831018		
Stantec Validator: Elizabeth Crowley	Laboratory: ATL, Signal Hill, CA		
Date Validated: 12/16/14	Laboratory Project Number: 1403877		
Sample Start-End Date: 12/08/14	Laboratory Report Date: 12/16/14		
Parameters Validated: Total Metals, TCLP Lead and SPLC Lead by EPA SW-846 6010B, Mercury by 7471A/7470A and pH by 9045C.			
Samples Validated: 24 solid field samples, 1 Field Blank and 1 Equipment Blank			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>N</b>	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
<b>B</b>	The analyte was detected in the method, field and/or trip blank.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments: Additional analyses are dependent on initial analyses results, all required analyses reported.			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes X	No
Comments: Refer to laboratory report for dilution and minor issues.			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments: All signatures and required items present.			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments: All holding times met for all analyses.			
6.	Were correct concentration units reported?	Yes X	No
Comments: Results reported in both mg/Kg and mg/L depending on the analytical method.			
7.	Were detections found in laboratory blank samples?	Yes X	No

<p>Comments: 6010B batch B4L0215 – Lead = 0.34 mg/Kg.  Batch B4L0216 – Lead = 0.11 mg/Kg.  Batch B4L0424 – Chromium = 0.23 mg/Kg, Copper = 0.083 mg/Kg, Nickel = 0.15 mg/Kg and Zinc = 0.14 mg/Kg.  Sample results greater than 10 times the blank concentration, no qualifying action required.</p> <p>6010B batch B4L0319 – Barium = 0.0006 mg/L, Chromium = 0.0015 mg/L, Copper = 0.0037 mg/L, Nickel = 0.0015, Silver = 0.0009 mg/L and Zinc = 0.0050 mg/L.  Batch B4L0456 = TCLP Lead = 0.0016 mg/L.  Sample results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration are flagged “JB”. The detection limit changed to the blank concentration. Sample results greater than 10 times the blank concentration require no qualifying action.  Reason Code – MB</p>		
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	Yes X	No
<p>Comments: EB-2 – Antimony = 0.0036 mg/L, Barium = 0.0006 mg/L, Chromium = 0.0020 mg/L, Copper = 0.0045 mg/L, Molybdenum = 0.0014 mg/L, Nickel = 0.0020 mg/L, Silver = 0.0011 mg/L and Zinc = 0.081 mg/L.  Sample results greater than 10 times the blank concentration, no qualifying action required.</p> <p>FB2 - Antimony = 0.032 mg/L, Barium = 0.0007 mg/L, Beryllium = 0.0002 mg/L, Chromium = 0.0015 mg/L, Copper = 0.0062 mg/L, Lead = 0.0014 mg/L, Molybdenum = 0.0030 mg/L, Nickel = 0.0018 mg/L, Selenium = 0.0047 mg/L, Silver = 0.0018 mg/L and Zinc = 0.0072 mg/L.  Sample results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration are flagged “JB”. The detection limit changed to the blank concentration. Sample results greater than 10 times the blank concentration require no qualifying action.  Reason Code – FB</p>		
9. Were instrument calibrations within method criteria?	Yes NA	No
<p>Comments: Level II data package and validation, no data provided.</p>		
10. Were surrogate recoveries within control limits?	Yes NA	No
<p>Comments: No organic analyses requested.</p>		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
<p>Comments: All laboratory control sample recoveries are within limits.</p>		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	Yes	No X
<p>Comments: 6010B batch B4L0424 - %Rs below 60% limit for Antimony. Associated result flagged “J” for 1269-112-0 only.  Reason Code – MS</p>		
13. Were RPDs within control limits?	Yes	No X

Comments: 6010B batch B4L0215 – Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for Lead at 22%. Sample site specific. Associated result flagged “J” for 1269-107-3 only.

Batch B4L0456 – Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for TCLP Lead at 26%. Sample site specific. Associated result flagged “J” for 1269-110-0 only.

Batch B4L0424 – Laboratory duplicate RPD above limits ( $\pm 20$ ) for Selenium at 30%. Sample site specific. Associated result flagged “J” for 1269-112-0 only.

Reason Code – LDUP

14. Were dilutions required on any samples?	Yes	No
	X	

Comments: No action required.

15. Were Tentatively Identified Compounds (TIC) present?	Yes	No
	X	

Comments: Sample results below the reporting limit do not possess the degree of qualitative or quantitative confidence required. The value may be a false positive and is an estimated value and is flagged “NJ”. Reason Code – SQL

16. Were organic system performance criteria met?	Yes	No
	NA	

Comments: No organic analyses requested.

17. Were GC/MS internal standards within method criteria?	Yes	No
	NA	

Comments: No organic analyses requested.

18. Were inorganic system performance criteria met?	Yes	No
		X

Comments: 7471A batch B4L0448 - Serial dilution above limits for Mercury. Sample site specific. All associated sample results flagged “J” if positive.

Reason Code – PDS

19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No
		X

Duplicate Sample Nos.

Comments:

20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes	No	Initials
	X		EAC

Comments:

21. Other:	Yes	No
		X

Comments:

<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials EAC
Comments: Data usable as qualified.			
Sensitivity:	Acceptable X	Unacceptable	Initials EAC
Comments: Samples analyzed at lowest levels possible to achieve required screening limits.			
Accuracy:	Acceptable X	Unacceptable	Initials EAC
Comments: No data qualified for laboratory control issues.			
Representativeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments: No data are rejected.			

**Stantec Analytical Validation Report/Checklist**

**Report No. 121914-EC-01**

Project Name: Caltrans 07A		Project Number: 185831018	
Stantec Validator: Elizabeth Crowley		Laboratory: ATL, Signal Hill, CA	
Date Validated: 12/18/14		Laboratory Project Number: 1403881	
Sample Start-End Date: 12/08/14		Laboratory Report Date: 12/16/14	
Parameters Validated: Total Metals, TCLP Lead, SPLC Lead and STLC DI Lead by EPA SW-846 6010B, Mercury by 7471A/7470A and pH by 9045C.			
Samples Validated: 15 solid field samples, 1 Field Blank and 1 Equipment Blank			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>N</b>	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
<b>B</b>	The analyte was detected in the method, field and/or trip blank.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments: Additional analyses are dependent on initial analyses results, all required analyses reported.			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes X	No
Comments: Refer to laboratory report for dilution and minor issues.			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments: All signatures and required items present.			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments: All holding times met for all analyses.			
6.	Were correct concentration units reported?	Yes X	No
Comments: Results reported in both mg/Kg and mg/L depending on the analytical method.			
7.	Were detections found in laboratory blank samples?	Yes X	No

<p>Comments: 6010B batch B4L0215 – Lead = 0.34 mg/Kg.  Batch B4L0216 – Lead = 0.11 mg/Kg.  B4L0424 – Chromium = 0.23 mg/Kg, Copper = 0.083 mg/Kg, Nickel = 0.15 mg/Kg and Zinc = 0.14 mg/Kg.  Sample results greater than 10 times the blank concentration, no qualifying action required.</p> <p>6010B batch B4L0319 – Barium = 0.0006 mg/L, Chromium = 0.0015 mg/L, Copper = 0.0037 mg/L, Nickel = 0.0015, Silver = 0.0009 mg/L and Zinc = 0.0050 mg/L.  Batch B4L0456 = TCLP Lead = 0.0016 mg/L.  Sample results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration are flagged “JB”. The detection limit changed to the blank concentration. Sample results greater than 10 times the blank concentration require no qualifying action.  Reason Code – MB</p>		
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	Yes X	No
<p>Comments: EB1 – Antimony = 0.034 mg/L, Barium = 0.0011 mg/L, Beryllium = 0.0003 mg/L, Cadmium = 0.0002 mg/L, Chromium = 0.0018 mg/L, Cobalt = 0.0006 mg/L, Copper = 0.0075 mg/L, Lead = 0.0014 mg/L, Molybdenum = 0.0040 mg/L, Silver = 0.0017 mg/L and Zinc = 0.040 mg/L.  Sample results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration are flagged “JB”. The detection limit changed to the blank concentration. Sample results greater than 10 times the blank concentration require no qualifying action.  Reason Code – EB</p> <p>FB1 - Antimony = 0.0073 mg/L, Barium = 0.0009 mg/L, Beryllium = 0.0002 mg/L, Chromium = 0.0018 mg/L, Copper = 0.0061 mg/L, Molybdenum = 0.0005 mg/L, Silver = 0.0014 mg/L and Zinc = 0.0060 mg/L.  Associated sample results greater than 10 times the blank concentration. No qualifying action required.</p>		
9. Were instrument calibrations within method criteria?	Yes NA	No
<p>Comments: Level II data package and validation, no data provided.</p>		
10. Were surrogate recoveries within control limits?	Yes NA	No
<p>Comments: No organic analyses requested.</p>		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
<p>Comments: All laboratory control sample recoveries are within limits.</p>		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	Yes X	No
<p>Comments:</p>		
13. Were RPDs within control limits?	Yes	No X
<p>Comments: 6010B batch B4L0216 – Laboratory duplicate RPD above limits (± 20%) for Lead at 30%. Sample site specific. Associated result flagged “J” for 1269-101-22 only.  Reason Code – LDUP</p>		
14. Were dilutions required on any samples?	Yes X	No

Comments: No action required.			
15. Were Tentatively Identified Compounds (TIC) present?	Yes X	No	
Comments: Sample results below the reporting limit do not possess the degree of qualitative or quantitative confidence required. The value may be a false positive and is an estimated value and is flagged "NJ". Reason Code – SQL			
16. Were organic system performance criteria met?	NA	Yes	No
Comments: No organic analyses requested.			
17. Were GC/MS internal standards within method criteria?	NA	Yes	No
Comments: No organic analyses requested.			
18. Were inorganic system performance criteria met?	Yes	No	X
Comments: 7471A batch B4L0448 - Serial dilution above limits for Mercury. Sample site specific. All associated sample results flagged "J" if positive. Reason Code – PDS			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No	X
Duplicate Sample Nos.			
Comments:			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes X	No	Initials EAC
Comments:			
21. Other:	Yes	No	X
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials EAC
Comments: Data usable as qualified.			
Sensitivity:	Acceptable X	Unacceptable	Initials EAC
Comments: Samples analyzed at lowest levels possible to achieve required screening limits.			
Accuracy:	Acceptable X	Unacceptable	Initials EAC
Comments: No data qualified for laboratory control issues.			

Representativeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments: No data are rejected.			

**APPENDIX F  
PHOTOGRAPHIC LOG**

**STANTEC CONSULTING SERVICES  
PHOTOGRAPHIC RECORD**

**Client:** CalTrans District 7 – 07A3321

**Job Number:** 185831018

**Site Name:** Task Order 18 – SR110 ADL

**Location:** SR110 Freeway – Los Angeles County

**Photographer:** AS

**Date:** December 4, 2014

**Photograph No. 1**



Borings 1269-101 at sample location "A" located on southbound on-ramp to SR110 from Redondo Beach Boulevard

**Photograph No. 2**



Borings 1269-102 at sample location "B" located on southbound SR110 Freeway

**STANTEC CONSULTING SERVICES  
PHOTOGRAPHIC RECORD**

**Client:** CalTrans District 7 – 07A3321

**Job Number:** 185831018

**Site Name:** Task Order 18 – SR110 ADL

**Location:** SR110 Freeway – Los Angeles County

**Photographer:** AS

**Date:** December 4, 2014

**Photograph No. 3 & 4**



Borings 1269-103 and 1269-102, 1269-104 through 1269-111 at sample location "B" located on southbound SR110 Freeway

**Photograph No. 5 & 6**



Borings 1269-112 through 1269-115 at sample location "C" located on southbound on-ramp to SR110 from Imperial Highway