

# **INFORMATION HANDOUT**

**For Contract No. 07-4T7704**

**At 07-LA-91-R12.9/R13.7**

**Identified by**

**Project ID 0715000172**

## **MATERIALS INFORMATION**

Site Investigation Report

Fiber Optic As-Built Drawings



## SITE INVESTIGATION REPORT

SITE INVESTIGATION FOR TRAFFIC SIGNAL  
AND LIGHTING PROJECT  
LA-91, LOS ANGELES COUNTY,  
CALIFORNIA  
LOCATION: LA-91 (PM 12.9/13.7)

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TASK ORDER NO. 26

STANTEC PROJECT NO.: 185831026

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## EXECUTIVE SUMMARY

At the request of the California Department of Transportation (Caltrans) District 7, a site investigation (SI) was conducted to evaluate the potential presence of constituents of concern in subsurface soils and groundwater (if encountered) along the project limits of State Route 91 (SR91), within Los Angeles County, California. The project limits include the intersections of the westbound off-ramp of SR91 to Cherry Avenue and the eastbound off-ramp of SR91 to Paramount Boulevard. The objective of the SI is to evaluate potential constituents of concern in the subsurface soil profile and groundwater (if encountered) within the proposed construction area.

A total of two borings were advanced for the purpose of sample collection and analysis. Soil samples were collected at depths of surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12.0 feet below ground surface (bgs) at each boring location using a hand auger. The samples from each boring were composited by the laboratory into a single sample for analysis. Additionally, discrete depth soil samples were collected from 4.5 to five feet and 11.5 to 12.0 feet bgs for analysis. Groundwater was not encountered.

Both composite soil samples were analyzed for Title 22 metals (including lead), soluble lead by the California Waste Extraction Test (Cal WET) using citric acid as the extractant, soluble lead by the Toxicity Characteristic Leaching Procedure (TCLP), and pH. The four discrete soil samples and one duplicate soil sample were analyzed for Total Petroleum Hydrocarbons (TPH) diesel range organics (TPH-DRO), motor oil range organics (TPH-MRO), gasoline range organics (TPH-GRO); and benzene, toluene, ethylbenzene, and xylenes (collectively BTEX).

The following summarizes investigative findings:

- Total Lead: Reported concentrations ranged from 11 to 24 milligrams per kilogram (mg/kg). The reported concentrations are well below the California total threshold limit concentration (TTL) of 1,000 mg/kg and below the California Department of Toxic Substances Control (DTSC) Office of Human and Ecological Risk (HERO) industrial human health soil screening level of 320 mg/kg.
- Cal WET-Citric Soluble Lead: Reported concentrations ranged from 0.21 to 0.47 milligrams per liter (mg/L). Neither sample reported soluble lead concentrations above the California soluble threshold limit concentration (STLC) of 5 mg/L.
- TCLP Soluble Lead: Reported concentrations ranged from non-detect (<0.0019 mg/L) to 0.0058 mg/L.
- Title 22 metals (other than lead): None of the analytes were reported at concentrations above California and Federal RCRA hazardous waste thresholds or guidelines. Similarly, none of the reported analytes were reported above

United States Environmental Protection Agency (USEPA) Region 9 Regional Screening Levels (RSLs) or the DTSC Office of HERO modified screening levels for industrial exposure, other than arsenic. Arsenic naturally occurs in California at concentrations above human health screening levels. The arsenic results were compared to the DTSC Southern California regional background arsenic concentration of 12 mg/kg (Chernoff et al). Arsenic concentrations ranged from 3.0 to 4.1 mg/kg.

- pH: The results ranged from 8.5 to 8.6. The reported results are within nonhazardous waste thresholds.
- TPH and BTEX: TPH concentrations were non-detect for TPH-GRO, TPH-DRO, and TPH-MRO. Benzene was detected at concentrations ranging from 4.7 to 5.0 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). Toluene was detected at concentrations ranging from 3.0 to 3.1  $\mu\text{g}/\text{kg}$ . Ethylbenzene and xylene were reported at non-detect concentrations. None of the reported analytes were reported above USEPA Region 9 RSLs or the DTSC Office of HERO modified screening levels for industrial exposure.

Based on the findings and results of the investigation, the following are concluded:

1. Subsurface soils within the investigation profile are impacted with heavy metals, benzene, and toluene.
2. Soil within the proposed construction zone exhibits the characteristics of nonhazardous waste (Table 1).

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## **1.0 INTRODUCTION**

### **1.1 PROJECT DESCRIPTION**

At the request of the California Department of Transportation (Caltrans) District 7, a site investigation (SI) was conducted to evaluate the potential presence of constituents of concern in subsurface soils and groundwater (if encountered) along the project limits of State Route 91 (SR91), within Los Angeles County, California. The project limits include the intersections of the westbound off-ramp of SR91 to Cherry Avenue and the eastbound off-ramp of SR91 to Paramount Boulevard. The work was conducted pursuant to the provisions in Agreement 07A3321, the Task Order No. 26 (TO-26) request, and Stantec's proposal dated November 23, 2015.

### **1.2 PURPOSE AND OBJECTIVES**

The objective of the SI is to evaluate potential constituents of concern in the subsurface soil profile and groundwater (if encountered) within the proposed construction area. The results of this SI will also assist the contractor in developing an appropriate health and safety plan/Lead Compliance Plan and training program for the field staff as required per Title 8 of the California Code of Regulations (8CCR) and Cal-OSHA Construction Safety Order.

### **1.3 BACKGROUND**

According to the Task Order No. 26 (TO-26) Request, dated November 25, 2015, Caltrans proposes to add an optional left turn and through lane and protected left turn phasing on northbound Cherry Avenue to the westbound SR91 on-ramp and on southbound Paramount Boulevard to the eastbound SR91 on-ramp in the City of Long Beach. In addition, at the westbound SR91 on-ramp from Cherry Avenue, the existing high-occupancy vehicle (HOV) lane will be converted to a metered lane to handle high volume demands for dual left-turn lanes. A portion of the improvement project includes the installation of new traffic signals, street lights and Type 1-A ramp metering signals, upgrade existing signal heads, pedestrian buttons, audible pedestrian signals, countdown pedestrian signals, and bicycle detection at the subject intersections, and remove existing and delineate new yellow and white pavement markings at the intersections to accommodate the planned improvements.

The remainder of this report describes the scope of work, methodology, findings, results, and conclusions.

## **2.0 PROJECT SETTING**

This section describes the project setting including a description of the Site, the physiographic setting of the Site, the general geology and hydrogeology, and a description of the area around the Site.

### **2.1 SITE DESCRIPTION**

The Site is located at the intersection of the westbound off-ramp of SR91 to Cherry Avenue and the eastbound off-ramp of SR91 to Paramount Boulevard in the City of Long Beach (Figure 1).

### **2.2 PHYSIOGRAPHIC SETTING**

The general topography along SR91 is relatively flat with approximate elevations of 55 feet above mean sea level (amsl) near Cherry Avenue and 60 feet amsl near Paramount Boulevard (USGS, South Gate Quadrangle [1964, photorevised 1981]).

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

The Site 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. This zone is seismically active as evidenced by historic earthquakes (DWR, 1961).

According to California Department of Water Resources (DWR) Bulletin 118 (DWR, 2004), the Site 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). Groundwater is estimated to be approximately 13 to 14 feet bgs.

## **2.4 SITE VICINITY**

The Site surroundings are comprised largely of commercial properties along the State Right of Way (ROW) at each intersection.

### 3.0 SCOPE OF WORK

The following subsections present the original scope of work as outlined in the task order and deviations from the original scope of work.

#### 3.1 TASK ORDER SCOPE OF WORK

The original scope of work as described in the task order consisted of the following general elements:

- Pre-field activities
  - Development of a site specific health and safety plan;
  - Obtain permit from City of Long Beach Department of Health & Human Services Bureau of Environmental Health Water Program for the possibility of encountering groundwater and sampling;
  - Conduct a geophysical survey at each boring location to evaluate the potential presence of buried objects in the vicinity of the borehole locations;
  - Mark boring locations and notification to Underground Service Alert (USA); and
  - Coordination of equipment and subcontractors.
- Field Investigations
  - Implementation of traffic control at each location;
  - Advancement of two direct push technology (DPT) borings (1307-101 and 1307-102) to a depth of 12 feet below ground surface (bgs) with samples at four depths (surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12.0 feet bgs);
  - Collection and preservation of nine soil samples from two borings (including one duplicate);
  - Collection of field quality control samples;
  - Boring location survey using global positioning system (GPS);
  - Boring abandonment; and
  - Disposal of investigation-derived wastes (IDW).
- Laboratory analysis of soil samples
  - Composition of equal aliquots of all four samples collected from each boring into a single composite sample for analysis;
  - Analysis of the composite samples for the following:
    - Title 22 metals by United States Environmental Protection Agency (USEPA) Test Method 6010B/7000;
    - Soluble lead by the California Waste Extraction Test (Cal WET) using citric acid as the extractant;

- Soluble lead by the Toxicity Characteristic Leaching Procedure (TCLP) by USEPA Test Method 1311; and
    - pH by USEPA Test Method 9045C.
  - Analysis of the four discrete samples for the following:
    - Total Petroleum Hydrocarbons (TPH) diesel range organics (TPH-DRO), motor oil range organics (TPH-MRO), gasoline range organics (TPH-GRO); and benzene, toluene, ethylbenzene, and xylenes (collectively BTEX) by USEPA Test Methods 8015B and 8021 (5035).
  - Analysis of the groundwater and duplicate samples for the following:
    - Title 22 metals by USEPA Test Method 6010B/7000; and
    - TPH-DRO, TPH-MRO, TPH-GRO, and BTEX by USEPA Test Method 8015B and 8021 (5035).
- Data validation, evaluation and report preparation.

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

The following describes deviations from the original task order scope of work:

1. The City of Long Beach Department of Health & Human Services Bureau of Environmental Health Water Program required that a permit from the City of Long Beach Department of Public Works also be obtained since the boring locations appeared to be located in the public sidewalks. Both permits were obtained prior to conducting field activities. All markings were removed from the ground surface at the completion of field activities, as required in the permits.
2. As discussed and approved by Caltrans, the borings were advanced in the planters located next to the sidewalk for both locations. The City of Long Beach Department of Public Works permit contained costly concrete replacement requirements if the sidewalk was penetrated. No concrete cutting occurred during the execution of the field work.
3. The borings were advanced to depth using a hand auger. Various utilities surround each of the boring locations. The field team elected to hand auger to the maximum extent possible before switching to DPT. Due to favorable soil conditions, the boring was hand augered to the target depth.
4. The duplicate soil sample was analyzed for the same constituents as the main or initial soil sample. Thus, the duplicate soil sample was not analyzed for Title 22 metals.

## **4.0 SOIL INVESTIGATION METHODOLOGY**

The SI was conducted in general accordance with the methods and requirements of Contract 07A3321, the TO-26 request, and Stantec's proposal dated November 23, 2015. The following subsections summarize the methodology implemented in completing the required scope of work. In addition, any deviations from the proposed scope of work are identified in section 3.2 of this report.

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

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

As required by TO-26, a site-specific Health and Safety Plan (HASP) was used 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 copy of the HASP is provided in Appendix A.

Permits were obtained from the City of Long Beach Department of Health & Human Services Bureau of Environmental Health Water Program and the City of Long Beach Department of Public Works. The permit from the Department of Public Works was required since the boring locations appeared to be located in the public sidewalks. Both permits were obtained prior to conducting field activities are provided in Appendix A.

The boring locations were marked in the field with Mr. Danntje Meijer on December 2, 2015. Stantec contacted USA to obtain inquiry identification numbers for the boring locations prior to the start of work. Locations were pre-marked in the field as required by USA. USA inquiry identification numbers are shown below.

- A53361069
- A53361075

### **4.2 FIELD INVESTIGATIONS**

Field investigations were conducted on December 15, 2015. The weather was sunny there were no weather-related restrictions during the field investigation.

All field activities were conducted under the project specific HASP. A pre-field tail gate health and safety meeting was conducted at the Site 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;
- 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 and the HASP are provided in Appendix A.

The following subsections describe the methodology and procedures followed in conducting the field investigations.

#### **4.2.1 Traffic Control**

Soil borings were located 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 sidewalk. Traffic control consisted of the following elements:

- W21-5 “Shoulder Work” signs were placed to alert drivers exiting along the off-ramps and traveling on the local roadway (Cherry Avenue or Paramount Boulevard) towards the Site. Signs were placed 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 along the off-ramps.

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

The borings were located near the intersections of the westbound off-ramp of SR91 to Cherry Avenue and the eastbound off-ramp of SR91 to Paramount Boulevard within the proposed construction area. Both borings were advanced to their target depth of 12 feet bgs using a hand auger (4-inch diameter bucket).

Boring locations are shown on Figures 2 and 3. Boring coordinates are provided in Appendix B and a photographic log is provided in Appendix C. The following paragraphs summarize field sample protocols.

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

All samples were collected using a hand auger. Soil samples were collected at the following depth intervals: surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12.0 feet bgs.

Initially, Terracore samplers were used to collect soil from 5 feet and 12 feet bgs following EPA Method 5035. Following Terracore sampling, the remainder of the soil was discharged to a clean ziplock one (1) gallon bag, manually homogenized, and then discharged to eight-ounce laboratory certified clean glass jars.

Upon sampling at each depth interval soils were visually examined and logged in accordance with the August 1996 edition of the Soil & Rock Logging Classification Manual (Field Guide), State of California, Department of Transportation, Engineering Service Center, Office of Structural Foundations. A summary of the soil classifications are presented in the boring logs in Appendix D (DOT, 1996).

Each sample 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. The laboratory was further directed to composite equal aliquots from each sample collected within each boring to create two composite samples 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 after completion of the borehole 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.

#### **4.2.5 Decontamination**

All sampling equipment (hand auger bucket) was decontaminated using a brush 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**

Borings were backfilled with hydrated bentonite crumbles (hydrated on two-foot intervals) from depth to surface and covered from surface to one foot with surrounding soil to match the existing surface.

#### **4.2.7 Investigation Derived Wastes (IDW)**

Excess soil removed from the borings was containerized in a 5-gallon bucket, labeled, and stored at the nearest Caltrans Maintenance Station/Yard (22101 Santa Fe Boulevard, Long Beach). The waste in this bucket was characterized as non-hazardous waste and may be disposed in the municipal trash or replaced at the Site. All IDW were disposed in accordance with U.S. USEPA publication OSWER Directive 9345.3-02 entitled "Management of Investigation-Derived Waste During Site Inspections" as specified in Contract 07A3322, Method 17. Used and soiled personal protective equipment (PPE) and decontamination solid waste (i.e., used gloves, paper towels, etc.) were bagged and disposed to the municipal trash (EPA, 1991).

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

One duplicate soil sample was collected from 1307-101-5 to evaluate sample heterogeneity. The duplicate sample was submitted to the laboratory and analyzed for TPH-DRO, TPH-MRO, TPH-GRO, and BTEX.

One equipment blank was collected to evaluate the adequacy of field decontamination efforts. The equipment blanks were collected by pouring deionized water over the sampling equipment and collecting the water in appropriate sample containers. The equipment blanks were analyzed for Title 22 metals, TPH-DRO, TPH-MRO, TPH-GRO, and BTEX.

## 5.0 LABORATORY ANALYSIS

A total of nine soil samples 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 laboratory was further directed to composite the various depth-specific samples submitted for borehole 1307-101 into a single sample and those submitted for borehole 1307-102 into a single sample.

Sample compositing of samples collected from boring 1307-101 and boring 1307-102 was completed per Section 5.8.3 Sample Receipt, Control and Log In of the laboratory's Standard Operating Procedure which involves collecting an equal amount of each sample depth by weighting sufficient quantity in a jar, mixing all aliquots well for uniformity, then giving the composite sample a new distinct ID.

The laboratory analyzed two composite soil samples, four discrete soil samples, and one duplicate soil sample for the following analyses:

- *Title 22 metals (USEPA Test Method 6010B/7470)*— used to screen soil samples for potentially elevated heavy metal analytes and to further characterize excess soil for off-site disposal.
- *Cal WET-Citric (USEPA Test Method 3010)*—used to evaluate waste characteristics and the requirements for disposal against California hazardous waste Soluble Threshold Limit Concentration (STLC).
- *TCLP (USEPA Test Method 1311)*—used to evaluate waste characteristics and the requirements for disposal against Federal hazardous waste toxicity characteristic thresholds.
- *pH (USEPA Test Method 9045C)*—used to evaluate the requirements for managing and disposing of excess soil in accordance with State and Federal regulations.
- *TPH and BTEX (USEPA Test Method 8015B and 8021 [5035])*—discrete and duplicate samples were analyzed for TPH and BTEX to further characterize the subsurface soils and evaluate the requirements for managing and disposing of excess soil in accordance with State and Federal regulations.

The equipment blank was analyzed for Title 22 metals by USEPA Test Method 6010B/7470A series and TPH and BTEX by USEPA Test Method 8015B and 8021 [using USEPA Preservation Method 5035]). Copies of the laboratory CoCs and analytical reports are attached in Appendix E.

## **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 light to dark yellowish brown in color and consisted primarily of silty sand, sandy silt, and poorly graded sand with trace silt. Groundwater was not encountered in either borehole.

### **6.2 ANALYTICAL RESULTS**

A summary of the analytical results is presented in Tables 1 through 3 and discussed in the following paragraphs. Copies of the laboratory reports and CoC forms are included in Appendix E.

#### **6.2.1 Total Lead**

Two composite soil samples were analyzed for total lead by USEPA Test Method 6010B. The total lead concentrations reported are 11 and 24 milligrams per kilogram (mg/kg) (see Table 1).

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

Two composite soil samples were analyzed for soluble lead by Cal WET-Citric. Neither sample reported a concentration greater than the STLC of 5.0 milligrams per liter (mg/L). The soluble lead concentrations reported are 0.21 and 0.47 mg/L (see Table 1).

#### **6.2.3 Soluble Lead (TCLP)**

Two composite soil sample were analyzed for soluble lead by TCLP. The TCLP soluble lead concentrations reported are non-detect (<0.0019 mg/L) and 0.0058 mg/L (see Table 1).

#### **6.2.4 pH**

Two composite soil samples were analyzed for pH. The pH values reported are 8.5 and 8.6 (Table 1).

#### **6.2.5 Title 22 Metals**

Two composite soil samples were analyzed for Title 22 metals to evaluate whether concentrations of heavy metals, other than lead, would require special handling and disposal. None of the analytes were reported at concentrations above California and Federal RCRA hazardous waste thresholds or guidelines. Similarly, none of the reported analytes were reported above USEPA Region 9 Regional Screening Levels (RSLs) or the DTSC Office of HERO modified screening levels for industrial exposure, other than arsenic. Arsenic naturally occurs in California at concentrations above human health screening levels. The arsenic results were compared to the DTSC Southern California

regional background arsenic concentration of 12 mg/kg (Chernoff et al). Arsenic concentrations ranged from 3.0 to 4.1 mg/kg. The results are tabulated in Table 2.

### **6.2.6 TPH and BTEX**

A total of four discrete soil samples and one duplicate soil sample were analyzed for TPH and BTEX. TPH concentrations reported were non-detect for TPH-GRO, TPH-DRO, and TPH-MRO. Benzene was detected in sample 1307-101-5 and the corresponding duplicate sample (1307-101-5D) at concentrations ranging of 4.7 and 5.0 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ); respectively. Toluene was detected in sample 1307-101-5 and the corresponding duplicate sample (1307-101-5D) at concentrations of 3.0 and 3.1  $\mu\text{g}/\text{kg}$ ; respectively. Ethylbenzene and xylene were non-detect (Table 3).

## **6.3 DATA VALIDATION**

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

Quality assurance and quality control (QA/QC) procedures were performed in general accordance with Stantec's proposal dated November 23, 2015 and the Task Order No. 26 request. Field QA/QC procedures included analyses of equipment blanks. Low concentrations of barium, beryllium, cadmium, chromium, cobalt, molybdenum, nickel, and thallium were detected in the field equipment blank analyzed for Title 22 metals (Table 2). The concentrations were reported below the Practical Quantitation Limit (PQL) but above the Method Detection Limit (MDL). The low levels may be attributed to ambient impacts (dust) and/or artifact from the metal sampling equipment from which the sample was derived. The very low concentrations represent an insignificant impact on the quality of the data and conclusions presented in this report.

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

Prior to submitting soil samples to the laboratory, the CoC 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 Cal WET-Citric data was conducted. Total lead and soluble lead are bivariate variables. Typically, Cal WET-Citric soluble lead concentrations are less than 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 (field duplicates, 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 and thallium), toluene and m&p-xylene were reported in method blanks 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.
2. Equipment Blanks: Several metals were reported in equipment blanks at very low levels, and may be reflective of laboratory method blank detections, field artifact associated with dust, incomplete decontamination or artifact from contact with metal sampling equipment.
3. Laboratory Control Samples (LCS): All LCS samples reported percent recoveries within method and/or laboratory limits.
4. Laboratory Duplicate Samples: Laboratory duplicate samples were reported within the relative percent difference (RPD) control limit of 20 percent except for the following:
  - a. 6010B batch B5L0497 – Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for STLC Lead (66%). Sample site specific. Associated result flagged "J" for 1307-102 only.
  - b. 8021 batch B5L0573 - Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for Benzene (31%) and Toluene (33%). Sample site specific. Associated result flagged "J" for 1307-101-5D only.

The discrepancy appears to be related to natural sample heterogeneity and the data were qualified as indicated above.

5. 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.
6. One field duplicate was collected. All RPDs are within the control limit of 20%.

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 F.

## 7.0 CONCLUSIONS

At the request of the Caltrans District 7, a SI was conducted to evaluate the potential presence of constituents of concern in subsurface soils and groundwater (if encountered) along the project limits of SR91, within Los Angeles County, California. The project limits include the intersections of the westbound off-ramp of SR91 to Cherry Avenue and the eastbound off-ramp of SR91 to Paramount Boulevard. The objective of the SI is to evaluate potential constituents of concern in the subsurface soil profile and groundwater (if encountered) within the proposed construction area.

A total of two borings were advanced for the purpose of sample collection and analysis. Soil samples were collected at depths of surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12.0 feet bgs at each boring location using a hand auger. The samples from each boring were composited by the laboratory into a single sample for analysis. Additionally, discrete depth soil samples were collected from 4.5 to five feet and 11.5 to 12.0 feet bgs for analysis. Groundwater was not encountered.

Both composite soil samples were analyzed for Title 22 metals (including lead), soluble lead by the Cal WET using citric acid as the extractant, soluble lead by the TCLP, and pH. The four discrete soil samples and one duplicate soil sample were analyzed for TPH-DRO, TPH-MRO, TPH-GRO; and BTEX.

The following summarizes investigative findings:

- Total Lead: Reported concentrations ranged from 11 to 24 mg/kg. The reported concentrations are well below the California total threshold limit concentration (TTL) of 1,000 mg/kg and below the California Department of Toxic Substances Control (DTSC) Office of Human and Ecological Risk (HERO) industrial human health soil screening level of 320 mg/kg.
- Cal WET-Citric Soluble Lead: Reported concentrations ranged from 0.21 to 0.47 mg/L. Neither sample reported soluble lead concentrations above the California STLC of 5 mg/L.
- TCLP Soluble Lead: Reported concentrations ranged from non-detect (<0.0019 mg/L) to 0.0058 mg/L.
- Title 22 metals (other than lead): None of the analytes were reported at concentrations above California and Federal RCRA hazardous waste thresholds or guidelines. Similarly, none of the reported analytes were reported above USEPA Region 9 RSLs or the DTSC Office of HERO modified screening levels for industrial exposure, other than arsenic. Arsenic naturally occurs in California at concentrations above human health screening levels. The arsenic results were compared to the DTSC Southern California regional background arsenic concentration of 12 mg/kg (Chernoff et al). Arsenic concentrations ranged from 3.0 to 4.1 mg/kg.

- pH: The results ranged from 8.5 to 8.6. The reported results are within nonhazardous waste thresholds.
- TPH and BTEX: TPH concentrations were non-detect for TPH-GRO, TPH-DRO, and TPH-MRO. Benzene was detected at concentrations ranging from 4.7 to 5.0 µg/kg. Toluene was detected at concentrations ranging from 3.0 to 3.1 µg/kg. Ethylbenzene and xylene were reported at non-detect concentrations. None of the reported analytes were reported above USEPA Region 9 RSLs or the DTSC Office of HERO modified screening levels for industrial exposure.

Based on the findings and results of the investigation, the following are concluded:

1. Subsurface soils within the investigation profile are impacted with heavy metals, benzene, and toluene.
2. Soil within the proposed construction zone exhibits the characteristics of nonhazardous waste (Table 1).

## 8.0 REFERENCES

- California Department of Conservation Division of Mines and Geology (CDCEMG), 1986, Geomorphic Provinces and Some Principal Faults of California, May.
- California Department of Toxic Substances Control (DTSC), 2008, Determination of a Southern California Regional Background Arsenic Concentration in Soil, March.
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- California Department of Toxic Substances Control (DTSC), 2015, Human and Ecological Risk Office (HERO), Human Health Risk Assessment (HHRA) Note 3, DTSC-modified Screening Levels (DTSC-SLs) for Lead (in mg/kg) for industrial soil, October.
- California Department 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.
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- 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.

State of California, Department of Transportation (DOT), 1996, Soil & Rock Logging Classification Manual (Field Guide), Engineering Service Center, Office of Structural Foundations, August.

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U.S. USEPA, Region 9, 2015, Regional Screening Levels for Chemical Contaminants at Superfund Sites, January.

## **TABLES**

**TABLE 1**  
**SUMMARY OF SOIL ANALYTICAL RESULTS - LEAD and pH**  
**SITE INVESTIGATION**  
**LA-91 PM 12.9/13.7**  
**EA: 07-4T7701 (E-FIS: 0715000172-1)**  
**TASK ORDER #26 CONTRACT 07A3321**

Boring	Sample Depth (feet bgs)	Total Lead <sup>1</sup> (mg/kg)	Soluble Lead <sup>1</sup> Cal WET-Citric (mg/L)	Soluble Lead <sup>1</sup> TCLP (mg/L)	pH <sup>2</sup>	Soil Classification for Disposal	Soil Classification for On-Site Reuse
1307-101	Composite <sup>3</sup>	11	0.21	<0.0019	8.5	Type X	Type X
1307-102	Composite <sup>3</sup>	24	0.47 J	0.0058 NJ	8.6	Type X	Type X
1307-EB121515 (mg/L)		<0.0019	--	--	--	--	--
Minimum		11	0.21	0.0058	8.5	--	--
Maximum		24	0.47	0.0058	8.6	--	--
Mean		17.5	0.34	--	--	--	--
UCL95		--	--	--	--	--	--
Type X Material Non Hazardous		<1000	<5	<5	>2 and <12.5	--	--
Type Y-1 Material California Non-RCRA Hazardous		≤1411	--	<5	>5.5 and <12.5	--	--
Type Y-2 Material California Non-RCRA Hazardous		≤3397	--	<5	>5 and <12.5	--	--
Type Z-2 Material California Non-RCRA Hazardous		≥1000	≥5	<5	>2 and <12.5	--	--
Type Z-3 Material RCRA Hazardous Waste		--	--	≥5	≤2 or ≥12.5	--	--
DTSC HERO Screening Levels - Industrial Soils <sup>4</sup>		320	--	--	--	--	--
DTSC Unrestricted Use SL <sup>4</sup>		80	--	--	--	--	--

**NOTES:**

- (1) Total Lead, California Waste Extraction Test (Cal WET - Citric), and Toxicity Characteristic Leaching Procedure (TCLP) analysis using EPA Method 6010B. Extraction methods vary.
- (2) pH determined with EPA Method 9045B.
- (3) Laboratory composited sample from the following five depth intervals: surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12 feet bgs.
- (4) - California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO), Human Health Risk Assessment (HHRA) Note 3, DTSC-modified Screening Levels (DTSC-SLs) for Lead (in mg/kg) for industrial soil, October 2015.

bgs = below ground surface

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

-- = Not analyzed or not applicable

<0.0014 - Analyte not reported at or above stated detection limit

**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.

TABLE 2  
SUMMARY OF SOIL ANALYTICAL RESULTS - TITLE 22 METALS  
SITE INVESTIGATION  
LA-91 PM 12.9/13.7  
EA: 07-4T7701 (E-FIS: 0715000172-1)  
TASK ORDER #26 CONTRACT 07A3321

CALTRANS UNIQUE SAMPLE ID <sup>1</sup>	SAMPLE DEPTH <sup>2</sup>	SAMPLE DATE	TITLE 22 METALS (USEPA Test Method 6010B/7000)																
			ANTIMONY	ARSENIC <sup>5</sup>	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COBALT	COPPER	MOLYBDENUM	NICKEL	SELENIUM	SILVER	THALLIUM	VANADIUM	ZINC	MERCURY	
<i>Regional Screening Levels<sup>3</sup></i>			470	0.42	220,000	15	5.2	270,000	350	47,000	5,800	4,300	5,800	5,800	12	1,500	350,000	3.9	
<i>DTSC HERO Screening Levels - Industrial Soils<sup>4</sup></i>			500	500	10,000	75	100	2,500	8,000	2,500	3,500	2,000	100	500	700	2,400	5,000	20	
<i>California TTLC (mg/kg)</i>			500	500	10,000	75	100	2,500	8,000	2,500	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	3,500	200	10	50	70	240	2,500	2	
<i>20 x RCRA Toxicity Characteristic (mg/kg)</i>			--	100	2,000	--	20	100	--	--	--	--	20	100	--	--	--	4	
1307-101	Composite <sup>6</sup>	12/15/2015	<0.21	4.1	87	0.23 NJB	<0.06	15	6.7	20	0.22 NJ	12	<0.32	<0.12	3.2	28	63	0.05 NJ	
1307-102	Composite <sup>6</sup>	12/15/2015	<0.21	3.0	76	0.16 NJ	0.14 NJ	12	5.3	19	0.46 NJ	10	<0.32	<0.12	2.2	23	110	0.04 NJ	
1307-EB121515 (mg/L)		12/15/2015	<0.0073	<0.0084	0.0025 NJB	0.0008 NJ	0.0019 NJ	0.0063 JB	0.0023 NJ	<0.0059 UJB	0.0028 NJ	0.0021 NJ	<0.0065	<0.0012	0.0084 NJB	<0.0017	<0.0087	<0.15	

**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 January 2015). Lowest value between RSLs and DTSC HERO screening levels for cancer and non-cancer presented.  
(4) - California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO), Human Health Risk Assessment (HHRA) Note 3, DTSC-modified Screening Levels (DTSC-SLs) for industrial soil (in mg/kg). Lowest value between RSLs and DTSC HERO screening levels for cancer and non-cancer presented.  
(5) - Chernoff, G.; Bosan, W.; Oudiz D. Undated. Determination of a Southern California Regional Background Arsenic Concentration in Soil, California Department of Toxic Substances Control (<https://www.dtsc.ca.gov/upload/Background-Arsenic.pdf>).  
(6) Laboratory composited sample from the following five depth intervals: surface to 0.5 feet, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12 feet bgs.  
All soil results in mg/Kg  
<0.5 - Analyte not reported at or above stated reporting limit  
-- = Not analyzed or not applicable  
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.  
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.  
QA/QC sample consisted of liquid equipment blanks (mg/L)

**TABLE 3**  
**SUMMARY OF SOIL ANALYTICAL RESULTS - TPH and BTEX**  
**SITE INVESTIGATION**  
**LA-91 PM 12.9/13.7**  
**EA: 07-4T7701 (E-FIS: 0715000172-1)**  
**TASK ORDER #26 CONTRACT 07A3321**

Boring	Sample ID <sup>1</sup>	SAMPLE DEPTH <sup>2</sup>	Sample Date	TOTAL PETROLEUM HYDROCARBONS <sup>3</sup>			VOLATILE ORGANIC COMPOUNDS <sup>4</sup>				
				GRO (mg/kg)	DRO (mg/kg)	ORO (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	m,p-Xylene (ug/kg)	o-Xylene (ug/kg)
<b>USEPA RSL - Industrial Soils<sup>5</sup></b>				<b>420</b>	<b>600</b>	<b>33,000</b>	<b>5,100</b>	<b>47,000,000</b>	<b>25,000</b>	<b>2,400,000</b>	<b>2,800,000</b>
<b>DTSC HERO Screening Levels - Industrial Soils<sup>6</sup></b>											
<b>LARWQCB Interim Site Assessment and Cleanup Guidebook<sup>7</sup></b>				<b>100</b>	<b>100</b>	<b>1,000</b>	<b>5,100</b>	<b>47,000,000</b>	<b>25,000</b>	<b>2,400,000</b>	<b>2,800,000</b>
1307-101	1307-101-5	5-Feet	12/15/2015	<0.16	<1.0	<1.0	<b>5.0</b>	<b>3.1</b> NJB	<0.60	<0.39	<0.58
1307-101	1307-101-5D	5-Feet	12/15/2015	<0.15	<1.0	<1.0	<b>4.7</b> J	<b>3.0</b> NJB	<0.55	<1.1	<0.53
1307-101	1307-101-12	12-Feet	12/15/2015	<0.16	<1.0	<1.0	<0.23	<0.48	<0.62	<0.40	<0.60
1307-102	1307-102-5	5-Feet	12/15/2015	<0.22	<1.0	<1.0	<0.30	<0.63	<0.81	<0.52	<0.78
1307-102	1307-102-12	12-Feet	12/15/2015	<0.15	<1.0	<1.0	<0.21	<0.43	<0.55	<0.36	<0.54
1307-EB121515 (mg/L)		QA/QC	12/15/2015	<0.05	<0.05	<0.05	<0.18	<0.08	<0.12	<0.25	<0.13

**NOTES:**

RSL = Regional Screening Level

(1) - Boring identification number/Caltrans Unique ID assigned

(2) - Sample depth reported in feet below the ground surface

(3) - Total Petroleum Hydrocarbons (TPH): TPH-g by EPA Test Method LUFT/GCMS; TPH-d and TPH-o by EPA Test Method 8015M

(4) - BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Test Method 8021 (5035)

(5) - United States Environmental Protection Agency (Region 9) Regional Screening Levels (RSLs; in mg/Kg) for VOCs for industrial and residential soil

(last updated January 2015) - Traditional Table with a Target Cancer Risk Level of 1.0x10<sup>-6</sup> and a Target Hazard Quotient of 1.0. Lowest value between RSLs and DTSC HERO screening levels for cancer and non-cancer presented.

(6) - California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO), Human Health Risk Assessment (HHRA) Note 3, DTSC-modified Screening Levels (DTSC-SLs) for Lead (in mg/kg) for industrial soil. Lowest value between RSLs and DTSC HERO screening levels for cancer and non-cancer presented.

(7) - Los Angeles Regional Water Quality Control Board (LARWQCB) Interim Site Assessment and Cleanup Guidebook - May 1996.

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

mg/L = milligrams per liter

-- = Not analyzed or not applicable

**Bold** =Detected above reporting limit

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

B - The analyte was detected in the method, field and/or trip blank.

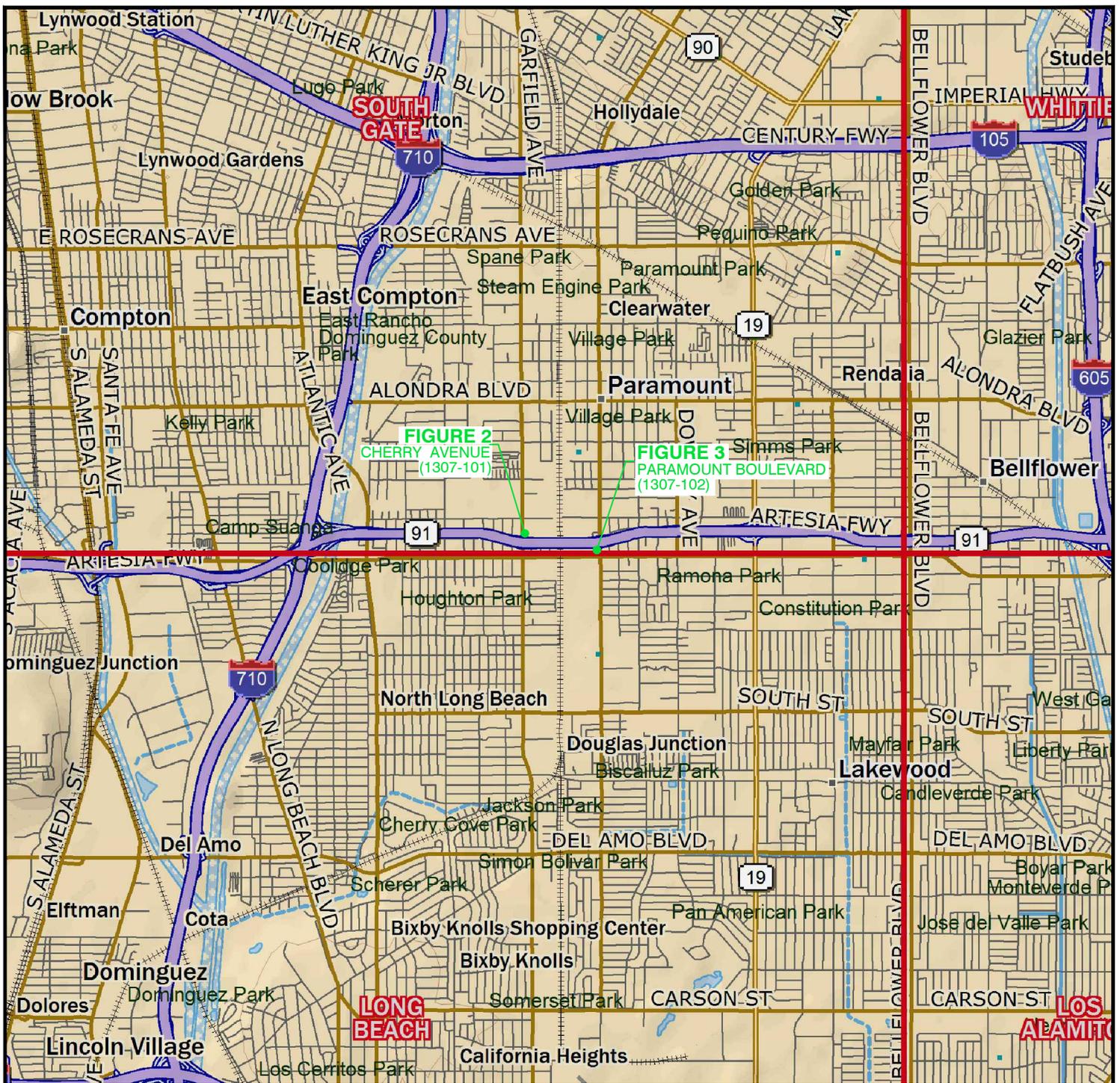
UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

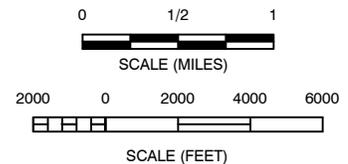
D - Duplicate

QA/QC samples consisted of liquid equipment blanks (mg/L)

## FIGURES



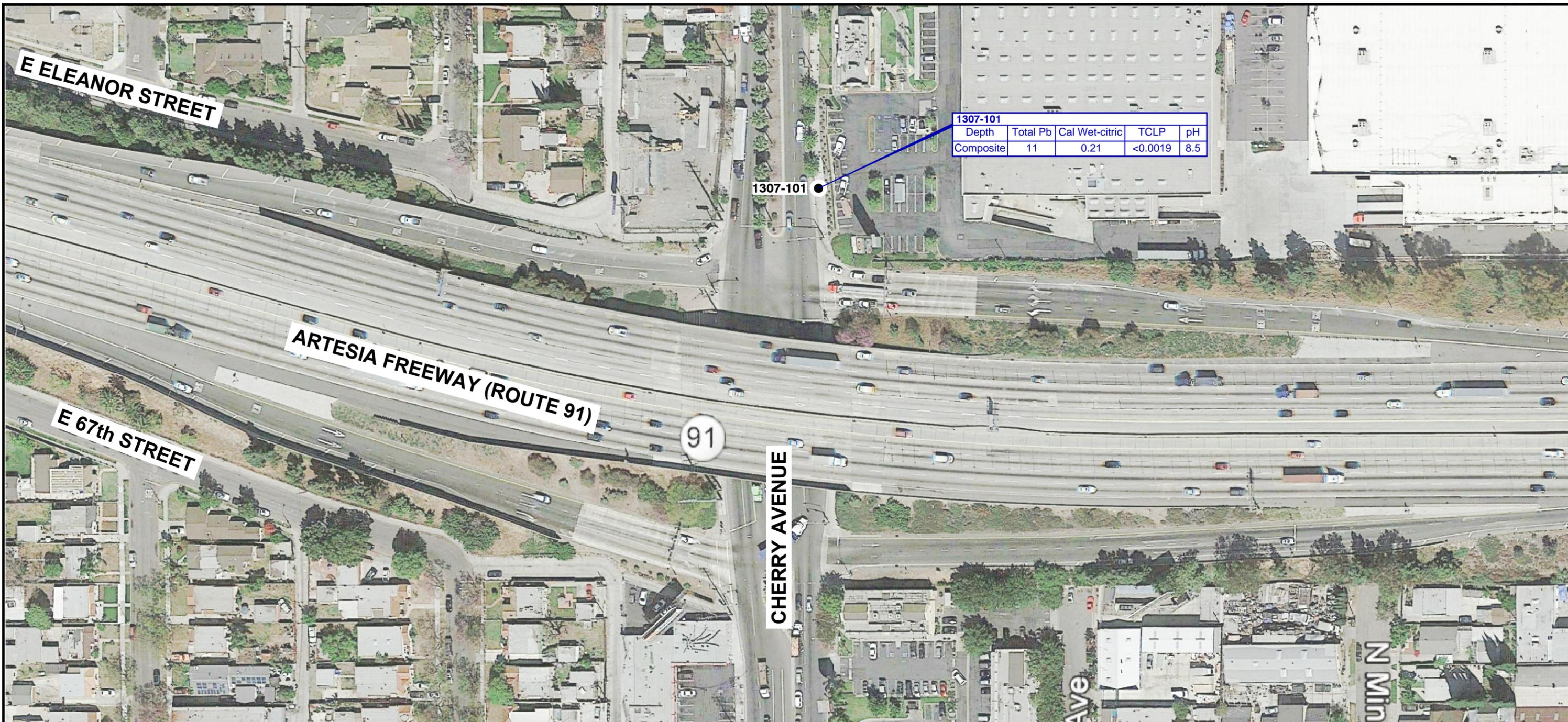
CALIFORNIA



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REFERENCE: DELORME TOPO MAP, SOUTH GATE, CALIFORNIA

 <p>290 CONEJO RIDGE AVENUE THOUSAND OAKS, CA. 91361 PHONE: (805) 230-1266 FAX: (805) 230-1277</p>	CALIFORNIA DEPARTMENT OF TRANSPORTATION ADL SITE INVESTIGATION AGREEMENT No. 07A3321 TASK ORDER No. 26 LA-91 PM 12.9/13.7 PN/E-FIS: 0715000172-1 EA NUMBER: 07-417701		<b>SAMPLE LOCATION MAP</b>		FIGURE:  <b>1</b>
	JOB NUMBER: 185831026.200.0001	DRAWN BY: STA	CHECKED BY: KE	APPROVED BY: KM	DATE: 01/12/16



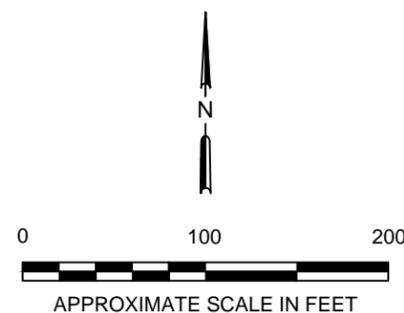
**LEGEND:**

● SAMPLE LOCATION

1307-101	Depth	Total Pb	Cal Wet-citric	TCLP	pH
Composite	11	0.21	<0.0019	8.5	

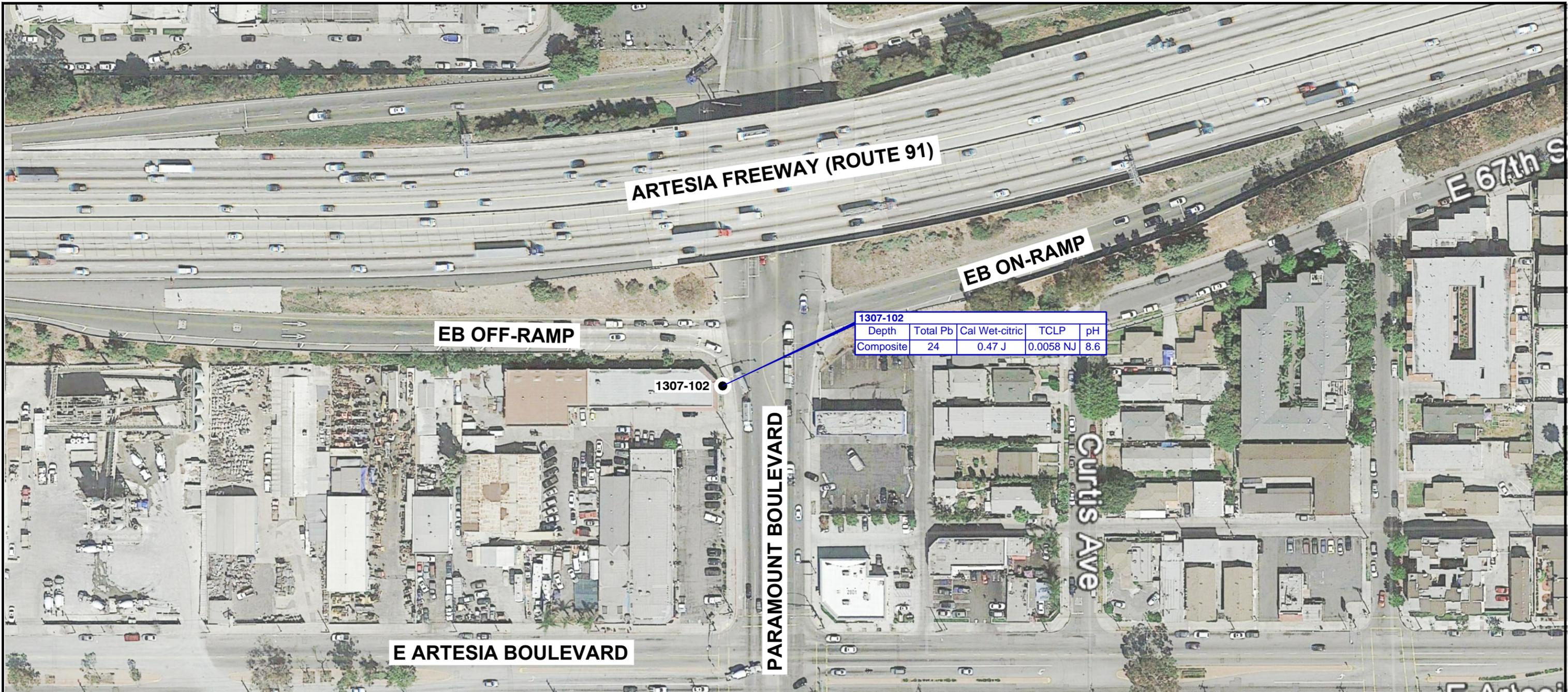
Sample Depth in Feet Below Ground Surface and Analytical Concentrations

- Total Pb = Total Lead milligrams per kilogram (mg/kg)
- Cal Wet-citric = Soluble Lead by California Waste Extraction Test (Cal Wet) milligrams per liter (mg/L)
- TCLP = Soluble Lead Toxicity Characteristic Leaching Procedure milligrams per liter (mg/L)
- pH = Determined with EPA Method 9045B
- Composite = Laboratory composited sample from the following five depth intervals : surface to 0.5, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12 feet bgs.
- bgs = below ground surface



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 290 CONEJO RIDGE AVENUE THOUSAND OAKS, CA. 91361 PHONE: (805) 230-1266 FAX: (805) 230-1277	FOR: CALIFORNIA DEPARTMENT OF TRANSPORTATION ADL SITE INVESTIGATION AGREEMENT No. 07A3321 TASK ORDER No. 26 LA-91 PM 12.9/13.7 PNE-FIS: 0715000172-1 EA NUMBER: 07-417701		<b>STUDY AREA BORING          LOCATION MAP          (CHERRY AVENUE)</b>		FIGURE: <div style="font-size: 2em; font-weight: bold; text-align: center;">2</div>
	JOB NUMBER: 185831026.200.0001	DRAWN BY: STA	CHECKED BY: KE	APPROVED BY: KM	DATE: 01/12/16



1307-102				
Depth	Total Pb	Cal Wet-citric	TCLP	pH
Composite	24	0.47 J	0.0058 NJ	8.6

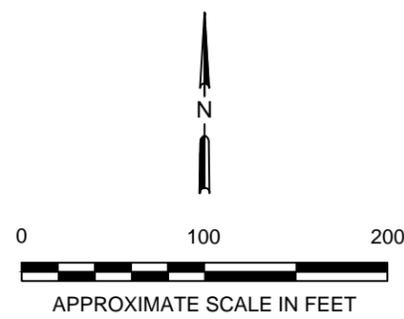
**LEGEND:**

● SAMPLE LOCATION

1307-102				
Depth	Total Pb	Cal Wet-citric	TCLP	pH
Composite	24	0.47 J	0.0058 NJ	8.6

Sample Depth in Feet Below Ground Surface and Analytical Concentrations

- Total Pb = Total Lead milligrams per kilogram (mg/kg)
- Cal Wet-citric = Soluble Lead by California Waste Extraction Test (Cal Wet) milligrams per liter (mg/L)
- TCLP = Soluble Lead Toxicity Characteristic Leaching Procedure milligrams per liter (mg/L)
- pH = Determined with EPA Method 9045B
- 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
- Composite = Laboratory composited sample from the following five depth intervals : surface to 0.5, 1.5 to two feet, 4.5 to five feet, and 11.5 to 12 feet bgs.
- bgs = below ground surface



No warranty is made by Stantec Consulting Services Inc. 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.

<p>290 CONEJO RIDGE AVENUE THOUSAND OAKS, CA. 91361 PHONE: (805) 230-1266 FAX: (805) 230-1277</p>	FOR: CALIFORNIA DEPARTMENT OF TRANSPORTATION ADL SITE INVESTIGATION AGREEMENT No. 07A3321 TASK ORDER No. 26 LA-91 PM 12.9/13.7 PN/E-FIS: 0715000172-1 EA NUMBER: 07-417701	<b>STUDY AREA BORING LOCATION MAP (PARAMOUNT BOULEVARD)</b>	<b>3</b>
	JOB NUMBER: 185831026.200.0001	DRAWN BY: STA	CHECKED BY: KE
		DATE: 01/12/16	

**APPENDIX A**  
**HASP and Permits**



**SITE-SPECIFIC HEALTH AND SAFETY  
PLAN (HASP)  
TASK ORDER NO. 26  
SITE INVESTIGATION FOR ROADSIDE  
IMPROVEMENT PROJECT  
07A3321-26  
LA-91, PM 12.9/13.7  
Los Angeles County, California  
PN: 0715000172-1  
EA: 07-4T7701**

**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

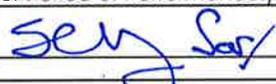
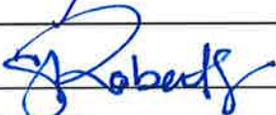
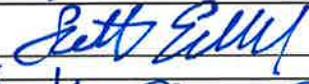
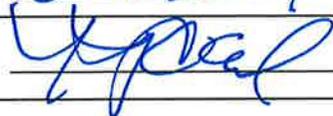
November 24, 2015

## Purpose and Approval

**Our work can be hazardous, and it is imperative that we never forget that!** It is the purpose of this Health and Safety Plan (HASP) to proactively aid Stantec employees in:

- Identifying and understanding the potential risks/hazards they may encounter at the site.
- Mitigating those potential risks/hazards.

Stantec's policy is to complete our work on this site without any type of incident (injury, illness, impact to the environment, impact to property and equipment). In order to achieve this goal, the project team will work together to perform an effective hazard assessment. The team will then establish appropriate precautions and communicate these daily among project staff. Staff will be responsible for communicating changing field conditions to the project management so these conditions and appropriate precautions may be re-evaluated as needed. Staff will implement **STOP WORK AUTHORITY** at any time they believe that conditions may be inherently unsafe or might cause damage to property or harm to the environment. Staff may refuse to participate in work they believe will be unsafe. If it is believed that such conditions exist, staff will communicate immediately with the Project Manager to resolve the situation. We expect all subcontractors and project personnel to share this goal.

<b>Client:</b> <u>The State of California, Department of Transportation – 07A3321</u>		<b>Site Name:</b> LA-91, PM 12.9/13.7, Los Angeles County
<b>Project Name:</b> <u>TASK ORDER NO. 26 – ADL SI</u>		<b>Project Number:</b> <u>185831026</u>
<b>Start Date:</b> <u>December 2, 2015</u>		<b>End Date:</b> <u>January 30, 2016</u>
<b>Plan Review Date*:</b> <u>June 2, 2016</u>		
<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 no 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>		
<u>Kevin Miskin</u> Project Manager	Signature: <u></u>	Date: <u>11-30-15</u>
<u>Dan Feldt, MPH, CIH</u> Health and Safety Manager, Certified Industrial Hygienist (CIH) HASP review	Signature: <u></u>	Date: <u>11-24-15</u>
<u>StephAnnie Roberts</u> Office Safety Environmental Coordinator (OSEC)	Signature: <u></u>	Date: <u>11-30-15</u>
<u>Scott Edblad</u> Site Health and Safety Officer (SHSO)	Signature: <u></u>	Date: <u>11-30-15</u>
<u>Jason Stagno</u> Peer Reviewer	Signature: <u></u>	Date: <u>11/30/15</u>
<u>Kristy Edblad</u> HASP Originator	Signature: <u></u>	Date: <u>11-30-15</u>



The health and safety guidelines in this HASP were prepared exclusively for this site. This HASP will be amended (**with changes recorded on the Health and Safety Plan Modification Log located in Attachment A**) if site conditions, scope of work, training dates, personnel, or other critical items change during the field work or before the scheduled HASP review date above. This HASP is intended to be available on site. Elements of the HASP shall be reviewed during daily tailgate meetings conducted by the Site Health & Safety Officer.



## Acknowledgement and Agreement Form

### **"Zero Tolerance for Incidents of ANY Kind. Work Together to Ensure a SAFE and High Quality Project"**

All parties conducting site activities are required to coordinate their activities and practices with the Stantec Site Health and Safety Officer (SHSO). Stantec has provided a copy of this HASP to site contractors in the interest of disclosure of potential risks/hazards of which Stantec may be aware. Similarly, contractors shall inform Stantec of any potential site risks/hazards of which they are aware including the contractor's work, equipment, procedures and chemicals.

This HASP has been developed for the purpose of proactively aiding Stantec employees in identifying, understanding, and mitigating the potential risks/hazards they are may encounter at the site. This HASP may also be used as a reference document by properly trained and experienced Stantec subcontractors and clients. However, subcontractors and other contractors at the site must develop their own HASP to address the potential risks/hazards faced by their own employees.

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.

**\*\*Note:** 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.

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

Name	Signature	Company	Date
Erik Alvarez		Interphase	12-15-15
Rudy Alvarez		ATG concrete	12/15/15
JOHN SINDSUN		INTERPHASE	12/15/15
SCOTT EDWARDS		STANTEC	12/15/15
ANM CHOUDHURY		Caltran	12/15/15



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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/Heat Illness Prevention Plan
- 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: Scott Edblad (Stantec – SHSO) (661) 754-0862 cell. Additional personnel who may be on-site are listed below:

1. Daantje Meijer (Field Staff): (562) 618-6340 (cell phone)
2. Jason Stagno (Field Staff): (805) 630-8648 (cell phone)
3. Mike Gunby (Field Staff): (805) 455-5320 (cell phone)
4. Anuya Sawant (Field Staff): (805) 341-9514 (cell phone)
5. Tommy Fardig (Field Staff): (805) 341-2396 (cell phone)

Emergency Response			
	Name	Telephone	Verification
<b>Hospital</b>	<b>Long Beach Memorial Medical Center 2801 Atlantic Avenue Long Beach, CA 90806</b>	<b>911 or Non-emergency 562-933-1400</b>	<b>11/23/2015</b>
Ambulance	LifeLine Ambulance	911 or Non-emergency 800-700-9344	11/23/2015
<b>Police</b>	<b>Long Beach Police Department Dispatch</b>	<b>911 or Non-emergency 562- 435-6711</b>	<b>11/23/2015</b>
Fire Department	Long Beach Fire Department Dispatch	911 or Non-emergency 562- 436-8211	11/23/2015
<b>Spill Response</b>	<b>Belshire Environmental</b>	<b>(800)-995-8220</b>	<b>11/23/2015</b>
Environmental Response	National Response Center (24-hour hotline)	(800) 424-8802	11/23/2015
<b>Environmental Protection</b>	<b>US Environmental Protection Agency (24-hour hotline)</b>	<b>(800) 424-9346</b>	<b>11/23/2015</b>
Emergency Services	Office of Emergency Services (24- hour hotline)	(800) 852-7550	11/23/2015
<b>Poison Control</b>	<b>California/U.S. National Poison Control Center (24-hour hotline)</b>	<b>(800) 222-1222</b>	<b>11/23/2015</b>
Agency / Line Locator			
National Line Locator	National 811 Call-Before-You-Dig Hotline (24-hour hotline)	811	11/23/2015
Public Utility Locator	DIG ALERT	811	11/23/2015

**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. **Kristy Edblad (TO Support and 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)	11/23/2015
<b>Field Staff #1:</b> Stantec Site Health and Safety Officer (SHSO)	Scott Edblad	661-754-0862	11/23/2015
<b>Field Staff #2:</b> Stantec Project Staff	Daantje Meijer	562-618-6340	11/23/2015
<b>Field Staff #2:</b> Stantec Project Staff	Jason Stagno	805-630-8648	11/23/2015
<b>Field Staff #3:</b> Stantec Project Staff	Anuya Sawant	805-341-9514	11/23/2015
<b>Field Staff #4:</b> Stantec Project Staff	Tommy Fardig	805-341-2396	11/23/2015
Senior Certified Industrial Hygienist (CIH)	Dan Feldt	414-305-1984	11/23/2015
Stantec West Region Health, Safety, Environment (HSE) Coordinator	Clint Reuter	818-395-8556 Cell 626-584-1599 Office	11/23/2015
Stantec Human Resources Representative	Peggy Ramos	949-923-6061	11/23/2015
OSEC (Stantec Office Safety & Environmental Coordinator)	StephAnnie Roberts	805-427-4873	11/23/2015

*(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 on the following page.

**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: Scott Edblad	11/04/2000	02/17/2015	06/14/2013	12/22/2014	09/12/2013	12/22/2014
FIELD STAFF: Jason Stagno	07/07/2004	09/27/2015	06/14/2013	01/12/2015	09/06/2012	01/12/2015
FIELD STAFF: Daantje Meijer	10/15/2004	06/06/2015	02/25/14	03/16/2015	10/27/2014	03/16/2015
FIELD STAFF: Anuya Sawant	07/30/2010	07/28/2015	06/14/2013	09/28/2015	04/09/2013	09/28/2015
FIELD STAFF: Tommy Fardig	03/15/2012	03/03/2015	06/14/2013	06/30/2015	09/17/2014	06/30/2015
<b>List Staff Changes/Additions Below</b>						

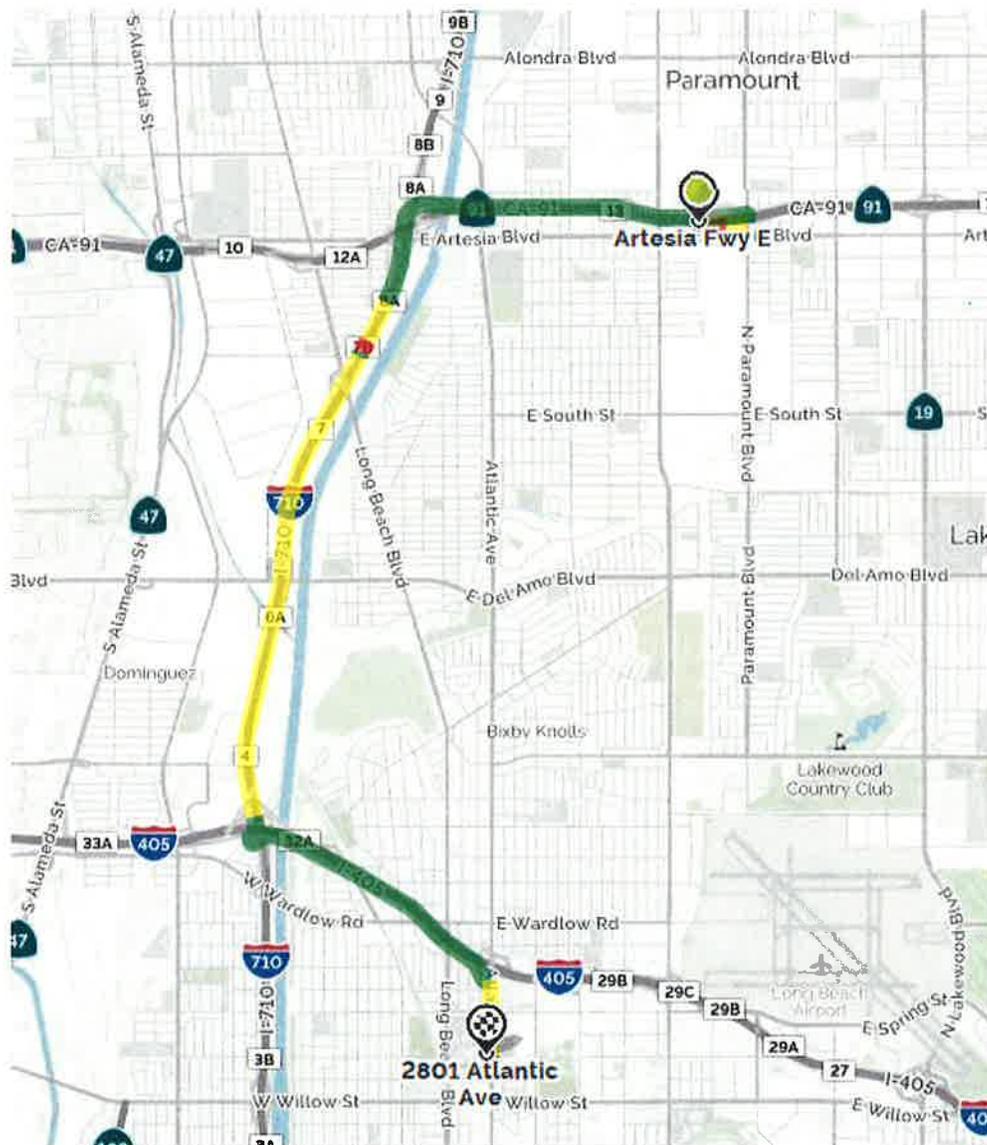
Copies of the OSHA 8-Hour Refresher Certificates are included in Attachment B.

## DIRECTIONS AND MAP TO THE HOSPITAL

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

### Long Beach Memorial Medical Center (562-933-1400):

1. Head **EAST** on Interstate 91
2. Merge onto Interstate 710 **SOUTH**
3. Merge onto Interstate 405 **SOUTH**
4. **EXIT** Atlantic Avenue
5. Turn **RIGHT** onto Atlantic Avenue
6. Hospital is on the **RIGHT** side at 2801 Atlantic Avenue



## 3.0 Scope of Work

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The scope of this project is described in the Task Order No. 26 Proposal, dated November 23, 2015 (revised).

According to the Task Order No. 26 request, Caltrans proposes to add an optional left turn and through lane and protected left turn phasing on northbound Cherry Avenue to the westbound State Route 91 (SR91) on-ramp and on southbound Paramount Boulevard to the eastbound SR91 on-ramp in the city of Long Beach. In addition, at the westbound SR91 on-ramp from Cherry Avenue, the existing high-occupancy vehicle (HOV) lane will be converted to a metered lane to handle high volume demands for dual left-turn lanes. A portion of the improvement project includes the installation of new traffic signals, street lights and Type 1-A ramp metering signals, upgrade existing signal heads, pedestrian buttons, audible pedestrian signals, countdown pedestrian signals, and bicycle detection at the subject intersections, and remove existing and delineate new yellow and white pavement markings at the intersections to accommodate the planned improvements. The proposed construction will include disturbance of the existing soils.

This proposed scope of work is intended to evaluate whether excavated soil and groundwater generated during the proposed construction activities will result in the need for special handling or disposal (as defined by Title 22 of the California Code of Regulations). Stantec will review the analytical results of the soil samples from this investigation to determine the proper management of excavated soil, if any. Stantec will report the analytical results and will issue recommendations based on the findings of the SI.

### Geophysical Investigation

A geophysical survey will be conducted at each of the proposed boring locations. Three complementary surface geophysical techniques (ground penetrating radar, electromagnetics, and magnetics) will be used to evaluate the potential presence of buried objects in the vicinity of the borehole locations. Should the geophysical survey detect subsurface anomalies, that boring will be relocated to an unobstructed location.

### SITE INVESTIGATION

As part of the SI, soil samples will be collected from hand auger and Direct Push Technology (DPT) borings for laboratory analysis. Excess soil removed from the borings will be containerized in 5-gallon buckets, labeled, and stored at the nearest Caltrans Maintenance Station/Yard. After characterization of the waste, the buckets of soil will be properly transported and disposed off-site.

As directed in the Task Order No. 26 Request, Stantec proposes to advance a total of four (4) borings as outlined below (locations illustrated in the Task Order Request):

- Cherry Avenue/Westbound SR91 Off-Ramp boring
  - Concrete core the proposed boring location
  - Advance one boring to 12 feet below ground surface (bgs)
    - Soil samples will be collected at surface (0-0.5), two (1.5-2.0), five (4.5-5.0), and twelve (11.5-12.0) feet bgs).
      - A discrete sample will be collected from 5' and 12' following EPA Method 5035 (Terracores), after which all depths will be delivered to the laboratory and composited into one sample for analysis.

- Surface and 2 foot depths: Collect discrete samples by EPA Method 5035 only if there are visible signs of staining or odiferous soil at the surface and 2'.
  - If groundwater is encountered above the twelve foot depth, the twelve foot soil sample will not be collected and a groundwater grab sample will be collected and submitted for analysis.
- Paramount Boulevard/Westbound SR91 Off-Ramp
  - Concrete core the proposed boring location
  - Advance one boring to 12 feet below ground surface (bgs)
    - Soil samples will be collected at surface (0-0.5), two (1.5-2.0), five (4.5-5.0), and twelve (11.5-12.0) feet bgs).
      - A discrete sample will be collected from 5' and 12' following EPA Method 5035 (Terracores), after which all depths will be delivered to the laboratory and composited into one sample for analysis.
        - Surface and 2 foot depths: Collect discrete samples by EPA Method 5035 only if there are visible signs of staining or odiferous soil at the surface and 2'.
      - If groundwater is encountered above the twelve foot depth, the twelve foot soil sample will not be collected and a groundwater grab sample will be collected and submitted for analysis.

A total of 4 soil samples from the Cherry Avenue boring and a total of 4 soil samples from the Paramount Boulevard boring will be collected and submitted to a stationary laboratory for analysis (either as discrete Terracore samples or to be composited into a single sample for each boring location). Initially, Terracore samplers will be used to collect soil from 5' and 12' bgs following EPA Method 5035. Following Terracore sampling, the remainder of the soil will be discharged to a clean ziplock one (1) gallon bag, manually homogenized, then discharged to eight-ounce laboratory certified clean glass jars. Upon reaching the 5 foot depth, each boring will be further advanced using the DPT rig. Soil samples will be collected from a Geoprobe sampler lined with acetate sample liners. At the selected sample depth, a six-inch section of sample liner will be cut from the soil-filled liner, 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 the collection of each sample at each depth using the three bucket system. If groundwater is encountered, the DPT rig will be used to obtain a grab groundwater sample. No soil samples will be collected from or below the saturated zone.

Observed soil and groundwater conditions in the borings will be recorded on field boring logs by the field staff and will include a description of the soil, classified in accordance with the latest edition of the Soil & Rock Logging Classification Manual (Field Guide), State of California, Department of Transportation, Engineering Service Center, Office of Structural Foundations (following USCS classification system), including color, moisture content, consistency, odor, staining, and groundwater depth (if encountered/observed).

All samples will be labeled with 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.

All IDW will be disposed of in accordance with U.S. EPA publication OSWER Directive 9345.3-02 entitled "Management of Investigation-Derived Waste During Site Inspections" as specified in Contract 07A3321, Method 17. Excess soil removed from the boring will be containerized in 5-gallon buckets, labeled, and stored at the nearest Caltrans Maintenance Station/Yard (located at Long Beach Maintenance Station 22101 Santa Fe Ave, Long Beach, Ca, 90810; Contact: Joe Johnson at (310) 233-7427). After characterization of the waste, buckets of soil will be properly transported and disposed off-site. Used personal protective equipment (PPE) will be bagged and disposed to a permitted disposal facility. Decontamination water and IDW disposal shall conform with provisions stipulated in Contract Agreement 07A3321.

The scope of work will be conducted in a manner consistent with the methods and assumptions outlined in **TASK ORDER NO. 26.**

The scope of work 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) or Task Manager, Kristy Edblad (661-754-0863), should they have any questions that are not specifically addressed in the HASP or the signed Task Order.

## 4.0 Site Background, Potential Hazards and Mitigation Measures

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### PROJECT BACKGROUND INFORMATION

The Site background is described in the Task Order Request and summarized below.

#### *Project Background*

The purpose of the work described in the Task Order is to conduct a detailed SI to determine the presence of hazardous waste contamination in soils within the project limits at Cherry Avenue to westbound State Route 91 (SR91) on-ramp and Paramount Blvd to eastbound SR91 on-ramp in the City of Long Beach, in Los Angeles County. All work will be done within the State Right of Way.

### POTENTIAL HAZARDS

#### Chemical:

Historical reports were provided which indicate the presence of ADL at the Site area during previous investigations. Therefore, potential chemical hazards at this site may include:

- ADL and other heavy metals in soil.

#### Physical:

The project area is located at Cherry Avenue to westbound SR91 on-ramp and Paramount Blvd to eastbound SR91 on-ramp in the City of Long Beach, in Los Angeles County within Caltrans Right-of-Way. Other potential site specific hazards may include:

- Traffic
  - Vehicles are driving into and out of the property throughout the day.
    - When sampling outside, set cones up in your immediate work area to provide visibility to the vehicles traveling into/out of the area of the work zone. Whenever possible, don't place your back to traffic.
    - Use the work vehicle as an added buffer for your work area (DO NOT BLOCK TRAFFIC). Consider traffic lane closure or re-routing if necessary.
- Wind/debris
  - Should weather conditions change and become a hindrance to performing the task safely, stop work and contact the project manager.
- 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 shade so be sure to take breaks to cool down.
    - At 95 degrees, employees should take 10 minute breaks every hour in the shade.
    - DRINK WATER (not soft drinks or Gatorade). Don't wait until you are thirsty.
    - If an employee is feeling nauseated, dizziness or has any symptoms attributable to heat, remove the employee immediately from the work area and get them into the shade so they can cool down and drink

water. If symptoms worsen (i.e. if the employee appears to be losing consciousness or has trouble breathing, etc., call 911.

- Trips/falls
  - To protect yourself, always look before you step. Take care walking and standing working in all areas of the site.
- Noise
  - The Site is located off the highway on Caltrans right-of-way property – wear the proper hearing protection if found to be necessary [rule of thumb: if you need to raise your voice above regular talking intensity at a distance of 3 feet (one arm length) hearing protection should be worn]
- PPE
  - Wear the proper PPE for the tasks involved – minimum: gloves, hard hat, safety glasses, steel toed boots, safety vest and possibly a dust respirator (ACM/LBP). Additional safety wear may need to be used if site conditions change.

## **HAZARD MITIGATION**

Attachment A provides information for 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, safety glasses, reflective high visibility vests, steel toed shoes, and disposable sampling gloves.

**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.

These JMPs apply 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**

Heat, traffic, 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. <b>**SHOULDER CLOSURE of immediately adjacent shoulder to work activity should be considered utilizing cones and signage**</b>
--

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

The Site is located along the right-of way of SR91 in Los Angeles County. Access may be gained along the highway off-ramp/on-ramp shoulder or from the applicable streets/properties adjacent to where the samples are being collected. 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**

Merge onto the SR91 and continue traveling on freeway.
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#### **Site Specific Restrictions and Controls**

None noted
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This Journey Management Plan is approved for use:

From: 12/02/2015	Time: 0500	To: 01/31/2016	Time: 1900
------------------	------------	----------------	------------

Journey Management Plan Maintained by

Field Manager : Scott Edblad	Cell: 661-754-0862
------------------------------	--------------------

Contract Project Manager: Kevin Miskin	Cell: 909-224-3406
--	--------------------

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 red arrow points to the sampling section SR91 off-ramps, where the ADL SI will occur.

(Site view provided from Google Earth, 2015.)



## **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.
- Call 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 (unlikely on this project):
  - 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 1.6 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 1.6 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 Emergency Medical Services (EMS) and notify the SHSO.
- Administer First Aid until EMS arrives and relieved by them or other qualified first air 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 1.6 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.

### 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 (e.g. 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
  - Stantec Senior HSE Team Member (Clint Reuter);
  - The Account Manager (TBD)
  - **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 have been 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 Caltrans'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.



**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.
<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>Incident Type</b>	<b>Definition (Current Stantec Corporate Definitions)</b>
<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>For Consideration</b>	
<b>High Potential Incident</b>	<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>

Incident Type	Definition (Current Stantec Corporate Definitions)
<b>Critical Risk Control</b>	<p style="text-align: center;"><b>TBA</b></p> <ol style="list-style-type: none"> <li>1. Vehicles and Mobile Equipment</li> <li>2. Hazardous Materials Management</li> <li>3. Equipment Safeguarding</li> <li>4. De-Energizing, Isolation, Lock-Out, and Tagging</li> <li>5. Working at Heights</li> <li>6. Lifting Operations</li> <li>7. Confined Space</li> <li>8. Excavations and Trenching</li> <li>9. Ergonomic &amp; Manual Handling</li> <li>10. Working on Ice or water</li> <li>11. Wildlife Interactions</li> </ol>

## **2.0 Potential Airborne Concerns and Air Monitoring Action Levels**

An air purifying respirator or masking with high-efficiency particulate air (HEPA) filtering capability shall be used while sampling suspect ADL materials. Given that the proposed work will take place adjacent to I-10, the following is a list of chemicals that may be present in the work area but are not planned to be monitored on a continual basis given that minimal soil disturbance is planned.

The list below includes lead and carbon monoxide.

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: 8 hr, TWA 0.050 mg/m <sup>3</sup>  ACGIH TLV: 8 hr, TWA 0.050 mg/m <sup>3</sup>	NIOSH REL, 0.05 mg/m <sup>3</sup> 8 hr. TWA	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
Carbon Monoxide	OSHA PEL 50 ppm 8 hr. TWA  CalOSHA PEL 25 ppm 8 hr. TWA CalOSHA 200 ppm-ceiling  ACGIH TLV 25 ppm 8 hr. TWA	NIOSH REL = 35 ppm 8 hr, TWA  IDLH = 1200 ppm	Colorless, odorless gas	Inhalation	headache, drowsiness, lassitude (weakness, exhaustion), narcosis; dyspnea, heart palpitation, unconsciousness, death	None established *

<b>Abbreviation</b>	<b>Explanation</b>
<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 (unless other time period specifically identified)
<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 of Occupational Safety and Health
<b>CNS</b>	Central Nervous System
<b>CVS</b>	Cardiovascular System

## 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 LIGHTHEADEDNESS; 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.

## The Heat Equation

**HIGH TEMPERATURE + HIGH HUMIDITY  
+ PHYSICAL WORK = HEAT ILLNESS**

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, **heat exhaustion** could progress to **heat stroke** and possible **death**.

Relative Humidity	Temperature
70%	100°F 37.8°C
60%	95°F 35°C
50%	90°F 32.2°C
40%	85°F 29.4°C
30%	80°F 26.7°C

■ Danger  
■ Caution  
■ Less Hazardous

U.S. Department of Labor  
 Occupational Safety and Health Administration

OSHA 3154  
 2002

### 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 ( $\pm 0.3\%$  sodium chloride), 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°C to +100°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.

### **Heat Illness Prevention**

The California Occupational Safety and Health Standards Board confirmed that new major changes to the state's heat illness prevention regulations will take effect on **May 1, 2015**.

Outlined below are the current California requirements for outdoor projects (as of May 1, 2015):

#### **REQUIREMENTS FOR OUTDOOR PLACES OF EMPLOYMENT**

- **Water** – Must Be Fresh, Pure, Suitably Cool, Free And As Close As Practicable To Work Areas
  - PM's must ensure that employees have access to potable drinking water that is fresh, pure, suitably cool, and provided to employees free of charge.
  - A new requirement is that the water must be "located as close as practicable to the areas where the employees are working."
- **Shade** – Required If Above 80 Degrees; Still Required If 80 Degrees Or Below Upon Employee Request
  - Access to shade is required when the temperature exceeds 80 degrees Fahrenheit (previously, the standard was 85 degrees).
  - The area of shade now must be large enough to accommodate the number of employees on cool-down periods, rest breaks, and must accommodate the number of employees who remain onsite during meal periods.
  - **Please note** – Employers must provide shade upon an employee's request, regardless of the temperature.
- **Cool-Down Periods** – Employees Must Be Monitored, Asked About Heat Illness Symptoms, And Provided A Minimum Of Five Minutes Of Net Resting Time
  - Employees must be allowed and encouraged to take a cool-down period when they feel the need to do so to protect themselves from overheating.
  - However, an employee who takes a cool-down period:
    1. Must be monitored and asked if he or she is experiencing symptoms of heat illness;
    2. Must be encouraged to stay in the shade;
    3. Must not be ordered back to work before he/she has had at least five minutes of net resting time
    4. Must not be ordered back to work "until any signs or symptoms of heat illness have abated," even if this abatement period takes longer than five minutes.
  - When an employee, on cool-down period exhibits or reports symptoms of heat illness, the employer must provide appropriate first aid or implement emergency response procedures.
- **High-Heat Procedures** – Pre-Shift Meetings, Day-Long Monitoring, and Emergency Preparedness

- o Employers must have high-heat procedures, triggered at 95 degrees. There are several new additions to the high-heat requirements.
  1. When the temperature reaches or exceeds 95 degrees, the PM's must now conduct meetings with employees before commencing work.
    - During these "pre-shift" meetings, which are on paid time, the PM must review the high-heat procedures, encourage employees to drink plenty of water, and remind employees of their right to take cool-down periods when necessary.
  2. During the workday, the PM must ensure effective monitoring/observation for signs of heat illness, such as through adopting a buddy system, tasking a supervisor with monitoring crews of 20 or fewer employees, or any other "effective means of observation."
  3. The PM must now designate at least one employee at each worksite as being a person who is authorized to call for emergency medical services if the need arises.

For projects in agriculture, when the temperature reaches or exceeds 95 degrees, the PM must do more than make cool-down periods available. Instead, the PM must "ensure" that the employees take a 10-minute cool-down period every two hours.

- These 10-minute cool-down periods for agricultural employees may be taken concurrently with any other meal period or rest breaks required by law so long as their timing coincides with the timing of meal period and/or rest breaks.

- **Emergency Response Procedures** – Ensuring That Employees Can Call For Help, Receive Immediate Onsite Attention From Supervisors, And Attention From Emergency Medical Responders:

- o The revised regulations now specifically require "effective" emergency response procedures in heat illness prevention programs. Such requirements include:
  1. All employees at the worksite must be able to contact (through "effective communication") a supervisor or summon emergency medical services.
  2. When an onsite supervisor observes or receives a report of heat illness symptoms, he or she must take immediate action, including offering the affected employee first aid or emergency medical services if the symptoms are severe.
  3. A PM must transport, if necessary, an affected employee to a location where he/she can be reached by an emergency medical provider.
  4. A PM must be able to provide emergency medical providers with clear and precise directions to the worksite.
    - Please note that using a cellular phone for calling or texting is considered "effective communication" only if reception in the work area is reliable.

- **Acclimatization Procedures** – Monitoring Employees Who Work During Heat Waves and in High-Heat Areas

- o During a "heat wave" a supervisor or designee is required to closely observe all employees at the worksite. A "heat wave" is any day in which the predicted high temperature for the day is at least 80 degrees and at least ten degrees higher than the "average high daily temperature in the preceding five days."
- o In addition, an employee who has been "newly assigned" to a high heat area must be closely observed by a supervisor or designee for the first 14 days of the employee's work.

**The California Heat Illness Prevention Plan is included with the RMS-2 in Attachment 3 of this document.**

**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.

### 1.3 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

---

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. The Daily Production Health and Safety Briefing Log and example meeting topics are included in Attachment 3.

### Driving

- Review the Stantec Safe Driving Procedures provided on-site.
- Utilize the Daily Vehicle Checklist at least once a day for each vehicle driven for Stantec business to identify potential vehicle issues/hazards. Copies of the Daily Vehicle Inspection Checklist are included in this HASP as Attachment 4.
- 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.

### 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 subcontractor'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 Mr. Hung Pham at (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 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:

- Lane closures with proper signing
- 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 likely be conducted between the hours of 0700 to 1500.

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

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

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

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

**B. Characteristics** (Expected): **NA**

Corrosive  Flammable/Combustible  Radioactive  Toxic

Reactive  Unknown

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

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

- DOT-approved Drums YES - 1
- Baker Tanks (possibly tankers if trucked off-site) NO
- Lined Waste Bins NO
- Temporary Stockpile NO

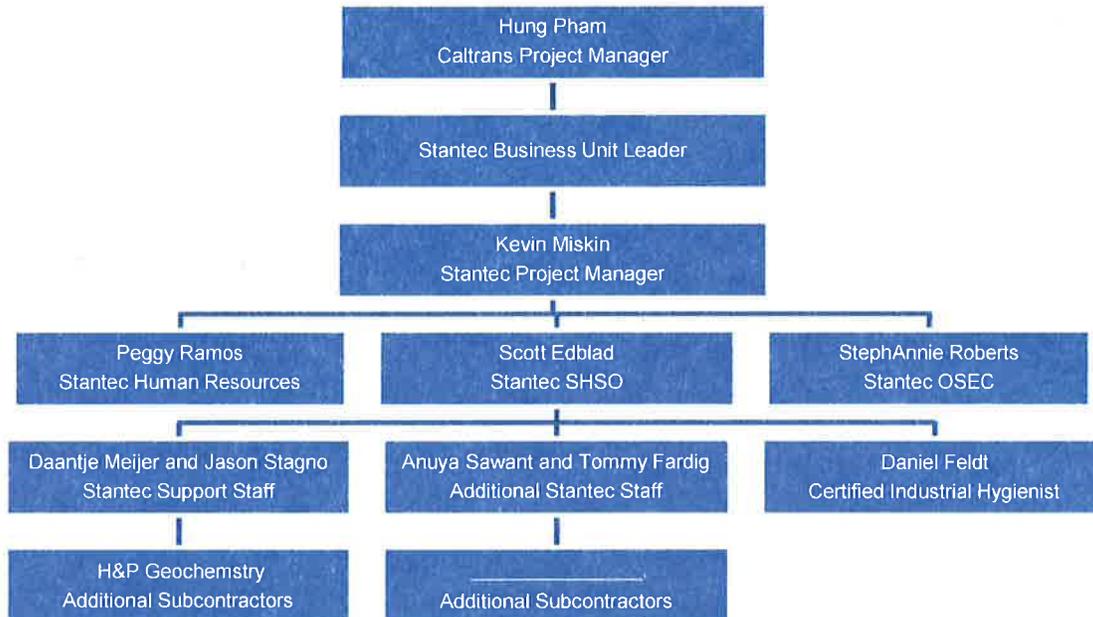
**D. Disposal and/or Treatment Methods Proposed** (Expected): **NA**

There are no waste materials expected to be generated during the SI sampling work.

When/If applicable: All wastes will be labeled, sampled, and analyzed for all applicable chemicals of potential concern and physical properties (e.g., pH, vapor pressure, etc.) to ensure proper waste characterization. Results of analysis will determine how and where impacted materials may be disposed. 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.

<b>Project Job Title</b>	<b>General Project Responsibilities</b>
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*

**Scott Edblad**

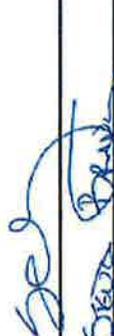
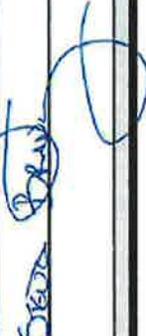
*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

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

**Dated: 02-17-2015**

  
\_\_\_\_\_  
  
\_\_\_\_\_



# *Certificate of Completion*

*Presented to*

**Anuya Sawant**

*of*

**Stantec Inc.**

*for successful completion of*

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

**Dated: 07-28-2015**

A handwritten signature in black ink, appearing to read 'Richard Allen Phillips'.

**HSE Systems Coordinator**



# *Certificate of Completion*

*Presented to*

**Jason Stagno**

*of*

**Stantec Inc.**

*for successful completion of*

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

**Dated: 09-27-2015**

  
**HSE Systems Coordinator**



# ***Certificate of Completion***

*Presented to*

**Daantje Meijer II**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

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

**Dated: 06-06-2015**

  
\_\_\_\_\_  
DOUGLAS HAGON, OSEC.



# *Certificate of Completion*

*Presented to*

**Thomas Fardig**

*of*

**Stantec Consulting Services Inc.**

*for successful completion of*

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

A handwritten signature in black ink, appearing to read 'Thomas Fardig', is written over two horizontal lines.

**Dated: 03-03-2015**

**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			Site-Specific Workplan / Written Scope	1	
			Project Management Checklist	1	
X			Field and Safety Supplies Checklist	5	
X			Sampling Procedures	1	
X			Permits		
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	
			Waste Management Form	10	
<b>Oil &amp; Gas Subsector</b>					
<b>HSE Monitoring</b>					
			Equipment Calibration Sheet	5	
			Air Monitoring Logs	10	
			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>		
			SWP 102a - Workplace Violence		



## 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	
X			<a href="#">SWP 124b - Journey Management Plan</a>	1	
<b>Ground Disturbance</b>					
			<a href="#">SWP 213a - Pre-Ground Disturbance Worksheet Approval</a>	3	
			<a href="#">SWP 213c - Site Management and Post-Disturbance Checklist</a>	3	
			<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>					
<p>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.</p>					
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

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**WORK SITE INSPECTION FIELD – RMS 5**

	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"/>						

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



**WORK SITE INSPECTION FIELD – RMS 5**

	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

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

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

<b>Table 1: Severity Result Criteria</b>				
<b>Severity Level</b>	<b>People Impacts</b>	<b>Property Impacts</b>	<b>Liability/Cash Flow Impacts</b>	<b>Environmental Impacts</b>
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.

<b>Table 2: Probability Result Criteria</b>	
<b>Likelihood Level</b>	<b>Result Criteria (where Likelihood = Frequency x Probability)</b>
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>

<b>Table 3: Required Action For Each Risk Level</b>		
<b>Risk Level</b>	<b>Category</b>	<b>Action Required</b>
<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 D is optional; procedures and controls must be verified.
<b>D</b>	Acceptable as is	No risk mitigation required.

## **Attachment 2**

### **Job Safety Analyses**



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 (LMIRA) 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
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>unfamiliar territory – STANTEC _____.</li> <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> <li>For cold weather areas the inventory should also include a bag of sand, a bag of salt, gloves, wool socks, wool caps, wool blankets, fire chains, small shovel and matches – STANTEC _____.</li> </ul>
Perform perimeter walk around of vehicle for damage or unusual conditions, and complete the SWP-124a - Vehicle Pre-Use 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 SWP-124a - Vehicle Pre-Use 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 –</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.	STANTEC _____ ● Do not touch metal with moist or wet skin – STANTEC _____ ● Scrape windows, front and rear windshields – STANTEC _____ ● Be aware of footing, handholds, and head room when entering vehicle – STANTEC _____ ● Adjust seat so back is fully supported, upper arms close to body, and pedals within easy reach – STANTEC _____ ● Lower steering wheel so hands are below shoulders and shoulders are relaxed – STANTEC _____ ● Check mirror adjustments each time vehicle is re-started – STANTEC _____ ● Locate and test operations of front and rear turn signals, headlamps, wipers, and washer fluid – STANTEC _____ ● Verify proper operation of climate controls – STANTEC _____ ● Fasten seat belt – STANTEC _____ ● Lock doors – STANTEC _____ ● Driver's cell phone shall be turned off – STANTEC _____ ● Turn on headlights if vehicle is not equipped with day-time running lights – STANTEC _____

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
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 shoulder – STANTEC _____.</li> <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> </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 (LMIRA) 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
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>● <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> <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> <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>

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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
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>
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				
	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. 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		
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 4</b>).</li> <li>Coordinate with Site Manger (or designee) 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. (Refer to <b>Attachment 2</b>).</li> </ul>	<ul style="list-style-type: none"> <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	Gather necessary PPE. Reflective vest for traffic, steel toed and shank shoes, hard hat, safety glasses with	Vehicle accident. Lifting hazards. Delay or improper performance of	<ul style="list-style-type: none"> <li>Start project with Production Safety Meeting (<b>Attachment 6</b>).</li> <li>Follow safe driving procedures.</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
sampling.	side shields, ear plugs/muffs, 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 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).	work due to improper equipment onsite.	<ul style="list-style-type: none"> <li>● Employ safe lifting procedures.</li> <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 4</b>) and adjust hand augering locations as necessary.</li> </ul>
Set up necessary traffic guidance and control equipment. See <b>Attachment 2</b> for detailed plan.	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> </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
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 or as directed. (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 it's equivalent).	Back strain, exposure to chemical hazards, hitting an underground utility, repetitive motion.	<ul style="list-style-type: none"> <li>● If utilizing Visqueen, (sheet plastic), for sampling area, completely secure Visqueen to the pavement, dirt, etc. with duct tape, delineators, etc. Do not use objects that are hard to notice or could become a trip hazard themselves.</li> <li>■ Initiate air quality monitoring as outlined in <b>Section 12 if required.</b></li> <li>■ Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available.</li> <li>■ Stand upwind to avoid exposure whenever possible.</li> <li>■ Use the organic vapor monitor 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.</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 (see above) if needed or as directed.	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 12.</b></li> <li>■ Have appropriate respirator with combination organic vapor/P-100 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>

**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
	Joceelyn 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					
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. 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
Clear drilling locations.	Wear hi-viz 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>

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
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.	Gather necessary PPE. Hi-viz 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/ HEPA/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).	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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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
Visually clear proposed drilling locations.	Wear hi-viz 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.	<ul style="list-style-type: none"> <li>containers during transport – STANTEC</li> <li>Use the right tools to open and close well boxes. Wear leather gloves when opening/closing well boxes – STANTEC/Contractor.</li> <li>Adjust drilling locations as necessary – STANTEC/Contractor.</li> </ul>
Set up necessary traffic guidance and control equipment.	Wear hi-viz 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.	<ul style="list-style-type: none"> <li>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.</li> <li>Adhere to approved Traffic Control Plans when working in roadways – 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> </ul>
Set up exclusion zone(s) and workstations.	Wear hi-viz 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.	<ul style="list-style-type: none"> <li>Implement exclusion zone set-up – STANTEC/Contractor.</li> <li>It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up – STANTEC.</li> <li>Set up workstations with clear walking paths to and from rig. Use delineators, with caution tape and/or construction fence – STANTEC/Contractor.</li> </ul>
Assist with set up of drill rig.	Wear hi-viz 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.	<ul style="list-style-type: none"> <li>All staff should know where the kill switch is for the drilling rig – STANTEC/Contractor.</li> <li>Verify clear pathway to drilling location and clearance for raising mast – STANTEC/Contractor.</li> <li>Provide as-needed hand signals and guidance to driver to place rig – STANTEC/Contractor.</li> <li>Visually inspect drill rig (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition,</li> </ul>

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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
Clear upper five feet of direct push location using hand auger. Follow the JSA for hand augering.	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, hi-viz 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/ HEPA/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. Eye injury from airborne debris. Personal injury from compressed air.	<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> <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/HEPA/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>

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
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, hi-viz safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Use a North 7700 series half face respirator or its equivalent 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 (stored onsite until waste is characterized) - 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/HEPA/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, hi-viz safety vest, and leather gloves for the non-chemical aspects of work as necessary. Use a North 7700 series half face respirator or its equivalent if necessary. 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/HEPA/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
Collect samples in accordance with sampling plan.	Steel toed and shank shoes, long sleeved shirts, hardhat, safety glasses with side shields, hearing protection, hi-viz safety vest, and leather gloves for the non-chemical aspects of work as necessary. Use a North 7700 series half face respirator or its equivalent if necessary.	Cross-contamination, improper labeling or storage, exposure to site contaminants.	<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>
			<ul style="list-style-type: none"> <li>● Conduct air monitoring as necessary - STANTEC.</li> <li>● Have appropriate respirator with combination organic vapor/HEPA/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 (onsite until waste is characterized) - 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, 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
Proper clean up and disposal of broken sample container.	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).	Exposure to broken glass and acid (from water preservation acids) Injury	<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>
			<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>

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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. 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 boring. For the deeper borings (greater than 5 feet), borings will be backfilled with a bentonite grout. The borings will all be capped to match the existing surface. Pursuant to Contract 07A3321, Method 17d, the excess soils removed from the deeper borings will be containerized in 5-gallon buckets, labeled, and stored at the nearest Caltrans Maintenance Station/Yard. After characterization of the waste, the buckets of soil will be properly transported and disposed off-site.</p>	<p>Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, hi-viz 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. Use a North 7700 series half face respirator or its equivalent if necessary.</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/HEPA/P-100 cartridges within 3-5 feet of work area, readily available - STANTEC/Contractor.</li> </ul>
<p>Backfill borehole. 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 boring. For the deeper borings (greater than 5 feet),</p>	<p>Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, hi-viz 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</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>

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>borings will be backfilled with a bentonite grout. The borings will all be capped to match the existing surface. Pursuant to Contract 07A3321, Method 17a, the excess soils removed from the deeper borings will be containerized in 5-gallon buckets, labeled, and stored at the nearest Caltrans Maintenance Station/Yard. After characterization of the waste, the buckets of soil will be properly transported and disposed off-site.</p>		<p>causes extra work.</p>	
<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, hi-viz safety vest, and chemical resistant gloves as necessary. Use a North 7700 series half face respirator or its equivalent if necessary.</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/HEPA/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 tools and equipment. - STANTEC</li> </ul>
<p>Perform personal decontamination procedures.</p>	<p>As worn in exclusion zone.</p>	<p>Slips/trips/falls. Splashes, chemical contamination. Contact with contaminated materials.</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> </ul> </li> </ul>

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1 Job Steps	2 Personal Protective Equipment	3 Potential Hazard	4 Critical Actions
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, hi-viz 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>■ Remove inner/outer gloves and dispose of properly - STANTEC/Contractor.</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> <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, hi-viz 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> <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: \_\_\_\_\_ 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**



**aily 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.



- 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 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>
<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> <p>1. Stop and think</p> <p>2. Look around</p> <p>3. Assess risk</p> <p>4. Control risks</p> <p>5. Begin/resume work</p> </div>	<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>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>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 all injuries to your supervisor <input type="checkbox"/></p>

**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: \_\_\_\_\_

## HEALTH, SAFETY, AND ENVIRONMENT

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



#### 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: 70-26 Project No: 185831026  
 Client: CALTRANS  
 Location: LA-91 PM 12.9/13.7  
 Start Date: 12/15/15

**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.**

ADL SAMPLE COLLECTION; GPS

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

- Head Protection Type: HARD HAT  Hearing Protection: \_\_\_\_\_  Gloves Type: LEATHER/NITRILE
- Foot Protection Type: SAFETY TOE  Respiratory Protection: \_\_\_\_\_  Water Safety Gear: \_\_\_\_\_
- Eye Protection Type: SAFETY GOGGLES  Fire Retardant Coveralls: \_\_\_\_\_
- High Visibility Vest: REFLECTIVE  Fall Protection: \_\_\_\_\_

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

- HAND AUGER  GPS
- NAWET  IPHONE CAMERA



**HEALTH, SAFETY, AND ENVIRONMENT  
RMS2 – FIELD LEVEL RISK ASSESSMENT (FIT FOR DUTY), 5 day  
05.1 DAILY TAILGATE DISCUSSIONS/SUBCONTRACTOR INPUT**

<b>Date:</b> 12/15/15	<b>Time:</b> 0530 / 0800	<b>Weather:</b> CND 36°F / 51°F
<b>Start</b>	LOAD EQUIPMENT / 0800 - HEALTH AND SAFETY MEETING / TRAFFIC CONTROL	
<b>Mid-Day</b>	RELOCATED TO 1307-102; SET-UP TRAFFIC CONTROL	
<b>Post-Day</b>	DEPARTURE FROM SITE	
<b>Date:</b>	<b>Time:</b>	<b>Weather:</b>
<b>Start</b>		
<b>Mid-Day</b>		
<b>Post-Day</b>		
<b>Date:</b>	<b>Time:</b>	<b>Weather:</b>
<b>Start</b>		
<b>Mid-Day</b>		
<b>Post-Day</b>		
<b>Date:</b>	<b>Time:</b>	<b>Weather:</b>
<b>Start</b>		
<b>Mid-Day</b>		
<b>Post-Day</b>		
<b>Date:</b>	<b>Time:</b>	<b>Weather:</b>
<b>Start</b>		
<b>Mid-Day</b>		
<b>Post-Day</b>		



**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												
Individual Name/Company Name/Signature	Team Lead to contact Project Manager for any personnel identified as AP			Date:			Date:			Date:		
	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	
SCOTT BOGUSLAP / Stantec / 800-251-1000	1100F	1315F										
Erik Alvarez / Durgades / AT&T	0800F	F	F									
RUDY ALVAREZ / AT&T	0800F	F	F									
JOHN SINGHUR / WATSON	0800F	F	F									
ANM CHOUDHURY / Caltrans	0800F	F	1140F									

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: [Signature] Date: 12/15/15  
 Signature of Crew Lead: \_\_\_\_\_ Date: \_\_\_\_\_  
 Signature of Crew Lead: \_\_\_\_\_ Date: \_\_\_\_\_  
 Signature of Crew Lead: \_\_\_\_\_ Date: \_\_\_\_\_  
 Signature of Crew Lead: \_\_\_\_\_ Date: \_\_\_\_\_



HEALTH, SAFETY, AND ENVIRONMENT



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

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

Basic Job Steps	Potential Hazards	Controls to Reduce or Eliminate Hazard	Person Responsible
LOAD / UNLOAD EQUIPMENT	SLIPS, TRIPS, FALLS; CARGO FALLING OUT OF BED	PROPER LIFTING; SECURE CARGO	S. EDBLAD
DRIVING TO AND FROM SITE	TRAFFIC ACCIDENTS; PROBLEMS	DEFENSIVE DRIVING	
SAMPLE COLLECTION	UTILITIES; BIOLOGICAL; HEAT STRESS	USA AND PRIVATE CLEARANCE; PPE; HYDRATION	

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 lift/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>	<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> <p>Are you ready to work safely?</p> </div>	<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 all injuries 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 Section 1.8 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

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



**HEAT STRESS PREVENTION (California addendum) SWp 113c**

**CALIFORNIA OUTDOOR PROJECT HEAT ILLNESS PREVENTION PLAN**

**Scope**

This plan is to ensure all employees working outdoors are properly protected from heat related illness risks and that projects are compliant with Cal/OSHA Heat Illness Prevention standards. This applies to all employees regardless of their duration at the project sites in California when temperatures are expected to be above 80 °F.

This plan is to be reviewed and agreed upon with all onsite staff prior to the start of work, including any subcontractors not operating under their own plan.

Complete this 6 Step plan for all outdoor projects within California.

**Project Info:**

Jobsite Address: \_\_\_\_\_

Today's Task(s): \_\_\_\_\_ Expected Job Duration: \_\_\_\_\_

**1. PROJECT MANAGEMENT RESPONSIBILITIES & STAFF MEMBERS**

The following supervisors have authority and responsibility for implementing the provisions of this plan at this worksite.(List all staff and responsible supervisors).

Project Manager: \_\_\_\_\_ Phone: \_\_\_\_\_

Site Supervisor: \_\_\_\_\_ Phone: \_\_\_\_\_

Site Health & Safety Officer: \_\_\_\_\_ Phone: \_\_\_\_\_

<b>All crew members and subcontractors operating off of this plan (print and sign)</b>	
<b>Name (Print):</b>	<b>Signature:</b>

Use more sheets if necessary.

Review Staff Expectations:

- All Onsite employees to be aware of this plan and its provisions.
- Any employees not in agreement with or not following this plan shall not be allowed to work at this jobsite.
- Discuss "Fit for Duty" aspects; are employees well-rested, hydrated, and acclimatized?

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



### 2. WATER PROVISION PLAN

Each employee must have available at least 1 quart of clean, cool water per hour before the start of each shift, maintained throughout the day.

Describe how adequate water supplies will be maintained throughout the day for all employees:

Person(s) responsible for water: \_\_\_\_\_ How often checked? \_\_\_\_\_

#### Review Water Provisions Expectations:

- Reusable containers/bottles are to be uniquely marked or identified to avoid potential health exposure between coworkers.
  - Non-water (chemical/industrial) containers are to be clearly labeled to prevent inadvertent consumption.
- Water to be replenished before supplies drop below 1 quart/employee/hour.
- Water to be readily accessible (as close as practical) with multiple stations, if necessary.
- Electrolyte replacement fluids are also suitable. Water must also be maintained.
- Caffeinated/sugary drinks are discouraged. Water consumption is expected regardless.

### 3. ACCESS TO SHADE

Describe how shade will be provided and maintained throughout the day for all employees:

Person(s) responsible for shade: \_\_\_\_\_

#### Review Shade Access Expectations:

- Shade is required at 80 °F.
- Shade is to be available at any time (or temperature) if requested by any employee or subcontractor.
- For crews of 4 or more, shade should be provided by pop up canopy, tent, or other appropriate shade structure.
  - Crews of 4 or fewer can utilize vehicle cabs with working A/C as effective means of shade and rest.
  - Multiple vehicles can accommodate up to 4 employees each, rotating if necessary).
- Work must be stopped and rescheduled if access to water or shade is insufficient.
- Employees who are not from the local area and acclimatized are to be closely monitored and given additional breaks. Every employee can take breaks as needed.

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



## 4. WEATHER MONITORING

Start of project temperature: \_\_\_\_\_ Today's Forecasted High Temperature: \_\_\_\_\_  
Describe how temperatures will be monitored throughout the day:

Person(s) responsible for weather monitoring: \_\_\_\_\_

### Review Weather Monitoring Expectations:

- **Check forecasts prior to the start of work.**
  - On or Offsite PM/Supervisor Monitoring and Communication expected.
- Shade is required at 80 °F.
- High Heat Procedures go into effect at 95 °F or during a Heat Wave (defined below).

## 5. HIGH HEAT AND HEAT WAVE PROCEDURES

These High Heat Procedures go into effect at 95 °F and above, or during a "Heat Wave".

- Heat Waves are defined as: Temperatures above 80 °F, and when temperatures are at least 10°F higher than average high daily temperature of the preceding 5 days.

### **Record time of High Heat or Heat Wave Plan Implementation.**

\_\_\_\_\_ : Stopped Work once temperatures reach 95 °F for a mandatory 10 minute cool-down, rest period and High Heat/Heat Wave procedure discussion.

1. Breaks to be:
  - At least 10 minutes, repeated at least every 2 hours,
  - encouraged to be taken individually by request,
  - Taken as often as employees need based on signs and symptoms.
2. Establish employee buddy system or monitoring plan with frequent communication to be on the lookout for signs and symptoms of heat illness.
  - Direct or electric means of communication will be maintained, so that employees can contact a supervisor when needed.
  - If the supervisor is unable to be near all workers to effectively communicate in person, electronic devices such as cell phone, text messaging, or satellite phone may be used if reception in the area is reliable.

3. Record Break times: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
/ \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

**Note - Any employees who are not acclimatized to the local environment must be closely monitored and directed to take additional rest breaks.**

## 6. EMERGENCY RESPONSE PLANNING

For any heat related illness, dial 911 immediately.

1. Call AllOne Health (800) 350-4511 for any work related injuries/questions/concerns.
2. Notify the project Supervisor/PM once the situation is stabilized and care has begun.
3. Follow Stantec's Injury Reporting protocol, report the incident to the RSEC within 1 hour, with a RMS3 (Incident Report) to be submitted to [HSE@stantec.com](mailto:HSE@stantec.com) within 24 hours.

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

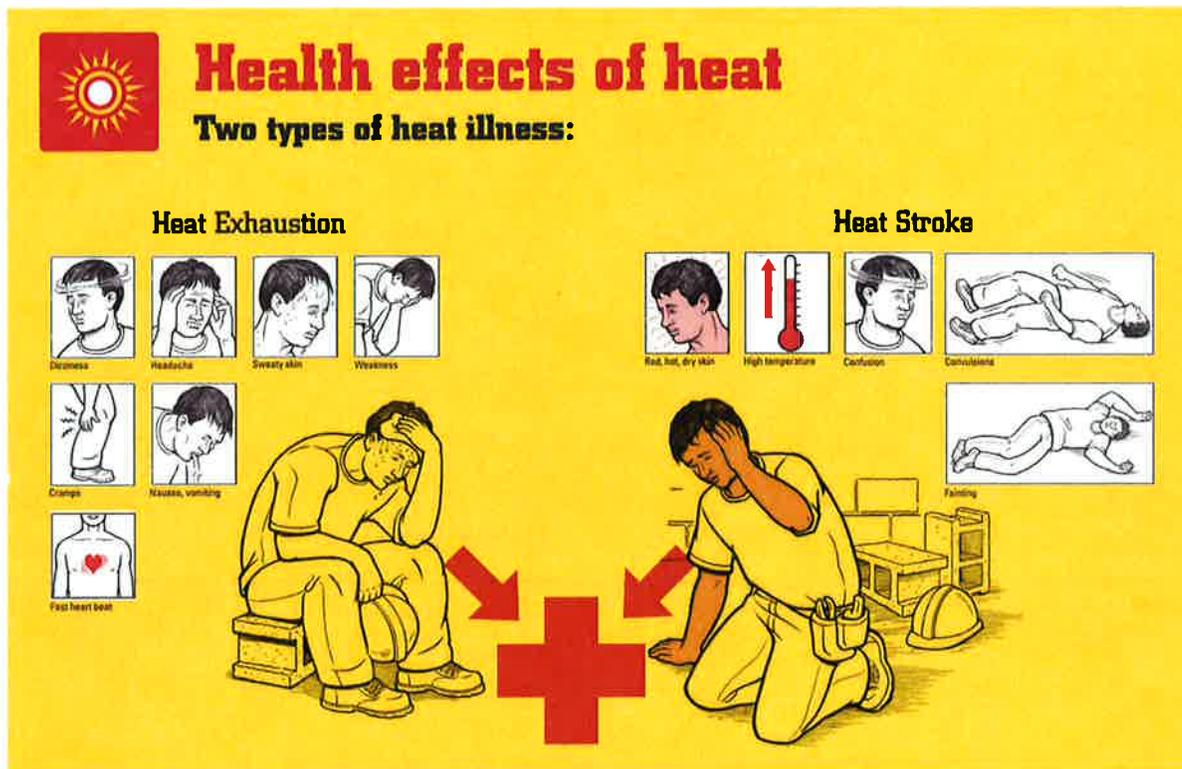


## Record time of Emergency Planning step.

\_\_\_\_\_ Daily Tailgate/RMS2 Emergency planning discussion held.

## Review Heat Illness Signs and Symptoms, and Emergency Response Plan expectations:

- Review site layout and emergency protocols as described in the HASP, or RMS1.
- Review each step of this plan with all site workers regardless of arrival time or duration onsite when temperatures are expected to be above 80 °F.
- **Review Heat Illnesses Signs and Symptoms.**



## 6.0 REVISION HISTORY

Date	Change	Acknowledgments
20150617	Created	Clint Reuter/Brandon Barnes
	Reviewed	Pending
	Posted to StanNet	Pending

**Attachment 4**

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

# 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.**

Have you been getting full nights of restful sleep over the past week?

*When you don't get enough sleep you acquire sleep debt. The only way to repay the debt is by sleeping.*

Are you setting off on a trip after a good night's sleep, rather than after a full day at work?

*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.*

Are you planning to start your trip after 6am, rather than starting out earlier when you would normally be asleep?

*Your body naturally wants to sleep between about 1am and 6am greatly increasing your risk of crashing, at those times.*

Have you allowed time in your trip to stop and rest if you feel tired?

*Regular breaks every 2 hours will help maintain vigilance, however, the only way to combat fatigue is to sleep.*

Do you stop and have a Powernap if you feel tired while driving?

*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.*

Are you sure that you do not suffer from a sleeping disorder, such as sleep apnoea?

*2% of people suffer from the most common sleep disorder, sleep apnoea. Men over 50, particularly those overweight, are most at risk.*

Yes	No
<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 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

**HEALTH, SAFETY AND ENVIRONMENT**

**SAFE DRIVING – VEHICLE PRE-USE CHECKLIST**

SWP 124A

Employee Name: *SCOTT EARLAD*

Region/Business Unit: *185B*

Date: *12/15/15*

Time: *0530*

Vehicle Color: *DK GRAY*

Vehicle Make/Model: *DODGE / RAM*

Vehicle License Plate Number: *02876W1*

Job: *185B31026*

Job #: # of Km or Mi Driven

Job:

Job #: # of Km or Mi Driven

Odometer Start:

Odometer Stop:

Total Km or Mi Driven:

Stantec Vehicle

Rental

Personal Vehicle

**Perimeter Walk Around:**

**Item is OK**

**Item is NOT OK**

Check for signs of vandalism, negligence, damage or unusual conditions	<i>X</i>	
Check all tires for excessive and unusual wear and proper inflation – include the spare tire if accessible	<i>X</i>	
Check under vehicle for signs of leaking fluids	<i>X</i>	
Check wiper blades (Do they work? Do they need replacement?)	<i>X</i>	
Check all light systems – brake, head, back-up, running, turn signals, emergency flashers	<i>X</i>	
Check to make sure doors, truck/toolbox lids, tailgates all open and close properly	<i>X</i>	
(Make sure you have keys to any toolboxes that you may need to access)	<i>X</i>	

**Check Gauges on Dashboard:**

Fuel Level	<i>X</i>	
Oil light	<i>X</i>	
Engine Coolant Temperature Gauge	<i>X</i>	
Service Indicator Lights	<i>X</i>	
Battery Charge Indicator	<i>X</i>	

**HEALTH, SAFETY AND ENVIRONMENT**

**SAFE DRIVING – VEHICLE PRE-USE CHECKLIST**

**SWP 124A**

**Inside Vehicle:**

Make sure seatbelts are present for all who will be riding in the vehicle	X	
Secure all cargo in the vehicle so that items will not become projectiles in the event of sudden stops or collisions	X	
Adjust the seat position, rearview and side mirrors	X	
Adjust temperature controls, vents, radio, etc.	X	

**If Pulling a Trailer:**

*NA*

Is trailer properly hitched to the vehicle (including safety chains)		
All lights are working properly		
Proper trailer for the load (check weight specifications) and load is balanced. If you anticipate the load is near the trailer weight limit, weigh the trailer at a weigh station		
Are tires in good condition and properly inflated?		

Notify the vehicle manager or rental company if you feel that any deficiencies are unsafe and DO NOT drive the vehicle

Signature:

  
\_\_\_\_\_

**HEALTH, SAFETY AND ENVIRONMENT**

**SAFE DRIVING – VEHICLE PRE-USE CHECKLIST**

**SWP 124A**

**1 REVISION HISTORY**

<b>Date</b>	<b>Change</b>	<b>Acknowledgments</b>
2010/02/23	Changed HSE to SWP; reformatted header and footer; added revision history	GD
20121015	Updated and reviewed by PS	KDR

**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 Incident Type Definitions</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)

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# INCIDENT REPORT – RMS 3

SECTION 4: MEDICAL INFORMATION																																																																																	
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 <input type="checkbox"/> Face <input type="checkbox"/> Neck <input type="checkbox"/> Lower back <input type="checkbox"/> Eye(s) <input type="checkbox"/> Chest <input type="checkbox"/> Abdomen <input type="checkbox"/> Ear(s) <input type="checkbox"/> Other    Specify _____	<table border="1"> <tr> <td>Left</td> <td>Right</td> <td>Left</td> <td>Right</td> <td>Left</td> <td>Right</td> <td>Left</td> <td>Right</td> </tr> <tr> <td><input type="checkbox"/></td> </tr> <tr> <td>Shoulder</td> <td></td> <td>Wrist</td> <td></td> <td>Hip</td> <td></td> <td>Ankle</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> </tr> <tr> <td>Arm</td> <td></td> <td>Hand</td> <td></td> <td>Thigh</td> <td></td> <td>Foot</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> </tr> <tr> <td>Elbow</td> <td></td> <td>Finger(s)</td> <td></td> <td>Knee</td> <td></td> <td>Toe(s)</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> </tr> <tr> <td>Forearm</td> <td></td> <td></td> <td></td> <td>Lower Leg</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> </table>	Left	Right	Left	Right	Left	Right	Left	Right	<input type="checkbox"/>	Shoulder		Wrist		Hip		Ankle		<input type="checkbox"/>	Arm		Hand		Thigh		Foot		<input type="checkbox"/>	Elbow		Finger(s)		Knee		Toe(s)		<input type="checkbox"/>	Forearm				Lower Leg				<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>																														
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<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>																																																																												
Has the injured employee had a previous similar injury or disability? Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																	

SECTION 5: PROPERTY OR VEHICLE DAMAGE: STANTEC	
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)
PROPERTY OR VEHICLE DAMAGE: 3 <sup>RD</sup> PARTY	
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"/>

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

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

SECTION 6: SPILL OR RELEASE	
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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# INCIDENT REPORT – RMS 3

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

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**Contact information.**

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

Health, Safety & Environment: Call:

Clint Reuter                      Office (626) 584-1599      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 SLC): 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

Clint Reuter

Office (626) 584-1599

Cell (818) 395-8556





# CITY OF LONG BEACH

DEPARTMENT OF PUBLIC WORKS

Website: [www.longbeach.gov/pw](http://www.longbeach.gov/pw)

333 W. OCEAN BLVD, 10TH FLOOR • LONG BEACH, CALIFORNIA 90802 • (562) 570 - 6784

I hereby make application for a permit to construct the following improvements or to temporarily occupy the following street(s) in the City of Long Beach subject to the applicable provisions of the Long Beach Municipal Code in consideration of the execution of a permit, the applicant hereby agrees to indemnify, hold harmless and defend the City of Long Beach, its boards and commissions, and their official, employees, and agents against all liability, costs, losses, suits, claims, demands, settlements, damages, actions and causes of action including attorneys fees sustained as a result of, or arising out of, or in any manner connected with any and all operations authorized or permitted by this permit. Applicant further agrees to comply with all applicable insurance requirements of the Long Beach Municipal Code.

Job Address: 6637 CHERRY AVE

Permit Number: **PWP35270**

Type of Permit: EXCAVATION

Description: Perform one soil boring at each of the following two locations:  
1.) East sidewalk of Cherry Avenue ±33-feet north of the north curb of the westbound off-ramp of the 91 Freeway.  
2.) West sidewalk of Paramount Boulevard ±39-feet south of the south curb of the eastbound off-ramp of the 91 Freeway.  
These soil borings are for a Caltrans project.

24 HOUR ADVANCE NOTICE IS REQUIRED FOR INSPECTION  
BUSINESS HOURS ARE: 7:30 AM TO 4:00 PM

For Street/Excavation Call: (562) 570-5160  
For Sewers Call: (562) 570-2382, (562) 570-5160

Government Code Section 4216.2 requires a "DIG ALERT IDENTIFICATION NUMBER" be issued before a "permit to excavate" is valid. For DIG ALERT I.D. NO. call underground service alert at (800) 422-4133 two (2) days before you dig.

SEE SPECIAL CONDITIONS ATTACHED

Approved by: \_\_\_\_\_

  
(For City Engineer)

Signed: \_\_\_\_\_

  
(Permittee)

Date Issued: December 09, 2015

Permit Expires: \_\_\_\_\_

This permit is only valid through the expiration date as long as your state license and liability insurance are current.

Property Owner

Name: SOUTH CHERRY LLC

Mailing Address: PO BOX 71765, LONG BEACH CA 90805

Permittee

Name: Stantec Consulting Services, Inc. (PW)

Office: (805)230-1266

Address: 290 Conejo Ridge Avenue, Thousand Oaks, CA 91361

2.00

City License No: 21203230 9/22/2015

Jobsite Contact: SCOTT EDBLAD (661)754-0862

24hr Emergency Contact: SAME (714)612-5859

No Fee Permit

Inspectors Comments: \_\_\_\_\_

# **SPECIAL CONDITIONS**

To be attached and made a part of

**Excavation Permit Number PWP35270**

**Issued – 12/9/2015**

**Permittee – Stantec Consulting Services, Inc.**

**Work Location – 6637 Cherry Avenue**

**Project Description – Perform one soil boring at each of the following two locations:**

- 1.) East sidewalk of Cherry Avenue ±33-feet north of the north curb of the westbound off-ramp of the 91 Freeway.**
- 2.) West sidewalk of Paramount Boulevard ±39-feet south of the south curb of the eastbound off-ramp of the 91 Freeway.**

**These soil borings are for a Caltrans project.**

**\*\*Permittee is responsible for making all required notifications\*\***

1. The permittee's insurance provided for this permit expires at midnight on 5/1/2016. Should this insurance expire before the completion of the work under this permit, then on the day this insurance expires, permittee shall stop all work, make the work site safe, then vacate the area. (Should the expiration date be a Sunday, then on the Saturday before, all work shall stop and the work site shall be made safe.) In accordance with the LBMC Section 2.84.040 (C), work may resume only after an insurance renewal has been submitted and has been approved by both the Risk Manager and the City Attorney's office.
2. Permittee shall notify the City of Long Beach, Public Works, Construction Inspection at (562) 570-5160, 48 hours prior to the start of any work. Please provide the following information:
  - Name of the permittee.
  - The permit number.
  - Type of construction.
  - Starting date and time of construction.
  - The name and telephone number of the permittee's representative who will be present at the work site.
  - The Underground Service Alert ticket number.
  - The permittee shall notify the City inspector of the daily work in progress and the type of inspection required.
3. After work begins, the permittee shall notify the City inspector of the daily work in progress and the type of inspection required. Failure to contact the City inspector or the use of unacceptable materials or unacceptable work shall result in a "Stop Construction Notice," being issued. Work shall not resume until corrections have been made.
4. California Government Code Section 4216.9 (a state law) requires you to obtain a DigAlert identification number before this "permit to excavate" can be valid. To get your DigAlert identification number, call Underground Service Alert of Southern California a.k.a. DigAlert at 8-1-1 or visit [www.digalert.org](http://www.digalert.org) at least two working days, but not more than 14 days before digging. In the case of an emergency, call 1 (800) 922-3459 (24-hrs) or 1 (800) 227-2600 your State One-Call Center Number.
5. Permittee shall comply with all applicable laws, ordinances, rules and regulations of and obtain permits from all federal, state and local governmental authorities having jurisdiction over the permit area and Permittee's use thereof.
6. If for any reason the City determines that these permit fees (if any) are considered to be inadequate to cover its costs, the City reserves the right to collect additional fees.
7. If and when temporary "NO PARKING" signs are used for this work, they shall be placed at least twenty-four (24) hours before hand and have the following information printed on them:



one of the Cal/OSHA Enforcement Unit district office nearest you: **Los Angeles:** 320 West 4th Street, Ste. 850, Los Angeles 90013, (213) 576-7451, fax (213) 576-7461; **Santa Ana:** 2000 E. McFadden Ave., Ste 122, Santa Ana 92705, (714) 558-4451, fax (714) 558-2035; **Torrance:** 680 Knox Street, Ste. 100, Torrance, 90502, (310) 516-3734, fax (310) 516-4253. Or check the web at: <http://www.dir.ca.gov/dosh/DistrictOffices.htm>.

17. Any changes made to the approved plan issued with this permit (such as a change in the permitted facility's location or its route) shall require approval by the City Engineer before starting or continuing any work. Provide seven sets of revised plans for approval before starting or continuing any work.
18. Removal, adjustment or relocation of utilities or any work on the area of their recorded easements shall be done only with the approval of the utility owners, obtained before starting the work.
19. No water or liquids, except potable water, shall be discharged onto city streets at anytime for any reason without proof of a National Pollutant Discharge Elimination System (NPDES) permit. To obtain a NPDES permit call (213) 576-6600.
20. The contractor is required to perform self-inspections to evaluate if minimum appropriate controls to reduce pollutant discharges from entering the storm drain system are being met. Frequent self-inspections are the most effective method to verify implementation of the Best Management Practices (BMP). The contractor shall make weekly self-inspections during the dry season and daily during the rainy season, October 1st through April 15th.
21. Best Management Practices (BMP's) are attached and are made a part of this permit. If the City Engineer, a Public Works inspector or an authorized city representative determines that additional BMP's or corrective steps for existing ones are necessary, permittee shall immediately comply with the requests.
22. The discharge of liquids from concrete truck washouts into storm drains, open ditches, streets, gutters or catch basins is strictly **prohibited**.
23. Paving, street saw cutting and sidewalk saw cutting are prohibited during a storm event of 0.25 inches or greater (except during emergency conditions).
24. When saw cutting P.C.C. sidewalks, do so on the score marks or as directed. **There shall be full sidewalk panel replacements only-no partial panel replacements.** Replace 3-inch thick sidewalks to match existing.
25. Concrete thrust blocks exist at all tees, bends, crosses and other water main fittings. Contractor shall work with caution when excavating in the vicinity of any thrust block. Contractor shall not disturb thrust blocks.
26. A minimum of 12-inches clearance shall be provided between the installation and any City of Long Beach facility crossed, including concrete encasement or sand cement slurry used as backfill. No part of any City of Long Beach facility is to be included within any concrete encasement or sand cement slurry backfill.
27. If 12-inches of separation cannot be made between the installation and any existing City of Long Beach, Gas & Oil Department gas line, the permittee shall contact the Long Beach Gas & Oil-Corrosion Prevention Section at (562) 570-2083 for specific procedures.
28. Extreme caution shall be exercised to avoid breaking sewer house and gas service lateral connections. In case of accidental or unavoidable breakage or disturbance, reconstruction shall be in accordance with the City of Long Beach Standard Specifications.
29. Any landscaping or sprinklers disturbed by the construction shall be restored by the permittee.
30. A "Notice of Construction" shall be written by the permittee, and then shall be approved by a City of Long Beach, Public Works Inspector. After such approval, the notice shall then be delivered to the affected residences, property owners and businesses at least one (1) week in advance of any work. An outline for the notice is attached.
31. Provide roadway access for emergency vehicles at all times.
32. The permittee shall be responsible for resetting any disturbed or destroyed centerline monuments, benchmarks, or property line corners to the satisfaction of the City Engineer. Replace brass cap, spike & washer, etc... with same. See City Standard No. 202 for replacing Type "C" monuments.
33. Notify Long Beach Transit, of any work affecting public bus stops. Contact John Carlson at (562) 808-8801, 48 hours prior to start of work.

- 34. If work is within three blocks of a Long Beach Elementary School, notify Paul B. Bailey, Transportation Director of the Long Beach Unified School District, (562) 426-6176, 48 hours prior to start of work.
- 35. If work is within a block of a pedestrian school crossing, notify Cathy Medina, Crossing Guard Supervisor, Long Beach Police Department, (562) 570-7240, 48 hours prior to start of work.
- 36. If work is within three blocks of a Long Beach Fire Station, notify the fire station at the non-emergency dispatch number (562) 570-9400 of your working location and work schedule, 48 hours prior to start of work.
- 37. Should any work covered under this permit or should any part of the traffic control for work under this permit extend into the jurisdiction of another city or governmental agency, then a permit or some other form of approval for your work or traffic control shall be required before any work may start. This excavation permit is issued pending that permit or approval.
- 38. This permit is issued in association with the Department of Health & Human Services Permit # 2162, issued December 7, 2015.

39. **PARTIAL LIST OF AGENCIES TO CALL IN THE EVENT OF A HAZARDOUS MATERIAL SPILL/RELEASE:**

You are required by law to report all significant releases or suspected significant releases of hazardous materials including oil.

- To report a spill, call the following agencies:
  1. Dial 911.
  2. Call County of Los Angeles Hotline (800) 303-0003.
  3. Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).
  4. Call City of Long Beach Department of Public Works Inspection (562) 570-6150.
  5. For spills only on Airport property Airport Dispatch (562) 570-2640.
- For spills of "Federal Reportable Quantities" of oil, chemicals, or other hazardous materials to land, air, or water, notify the National Response Center (800-424-8802). If you are not sure whether the spill is of a "reportable quantity," call the federal Environmental Protection Agency (800) 424-9346 for clarification.
- Agencies to call if you find or suspect contaminated soil or groundwater  
 Regional Water Quality Control Board:  
 Los Angeles Basin (213) 266-7500, California Environmental Protection Agency (Cal EPA), Department of Toxic Substances Control (DTSC) (510) 540-3732

- 40. Either when the permit is issued or at any time thereafter until the completion of work or end of the temporary occupancy, the City Engineer may require additional conditions as he finds reasonably necessary for the protection of the right-of-way or highway, for the prevention of undue interference with traffic, or to assure the safety of persons using the right-of-way or highway.
- 41. The City Engineer reserves the right to adjust the working days and/or working hours as he finds reasonably necessary for the elimination of operational impacts to any school affected by the work allowed under this permit.
- 42. In accordance with Long Beach Municipal Code Sections 14.08.120(A.5), 14.08.130 & 14.08.320, the City Engineer reserves the right to: revoke the permit if work does not begin within sixty days, refuse to issue a permit if the permittee has previously failed or refused to comply with Chapter 14.08, or may stop any work if it is dangerous, unsafe, or a menace to life, health or property.

\*\*\*\*\***42 SPECIAL CONDITIONS ISSUED**\*\*\*\*\*

# CONTRACTOR'S LETTERHEAD

(INCLUDING ADDRESS AND PHONE NUMBER)

Date

Dear Resident/Property Owner/Business Owner:

The City of Long Beach has issued a revocable permit to CONTRACTOR'S NAME to DESCRIBE THE WORK TO BE DONE IN DETAIL. The following street(s) will be impacted NAME STREET(S) BOUND BY CROSS STREETS.

Construction work is scheduled to begin on PROPOSED DATE and to end on PROPOSED DATE. Working hours will be restricted to between 7:30 A.M. AND 3:30 P.M. (OR) 8:30 A.M. AND 3:30 P.M. (SEE THE SPECIAL CONDITIONS AND THE TRAFFIC CONTROL REQUIREMENTS FOR ALLOWED TIMES.)

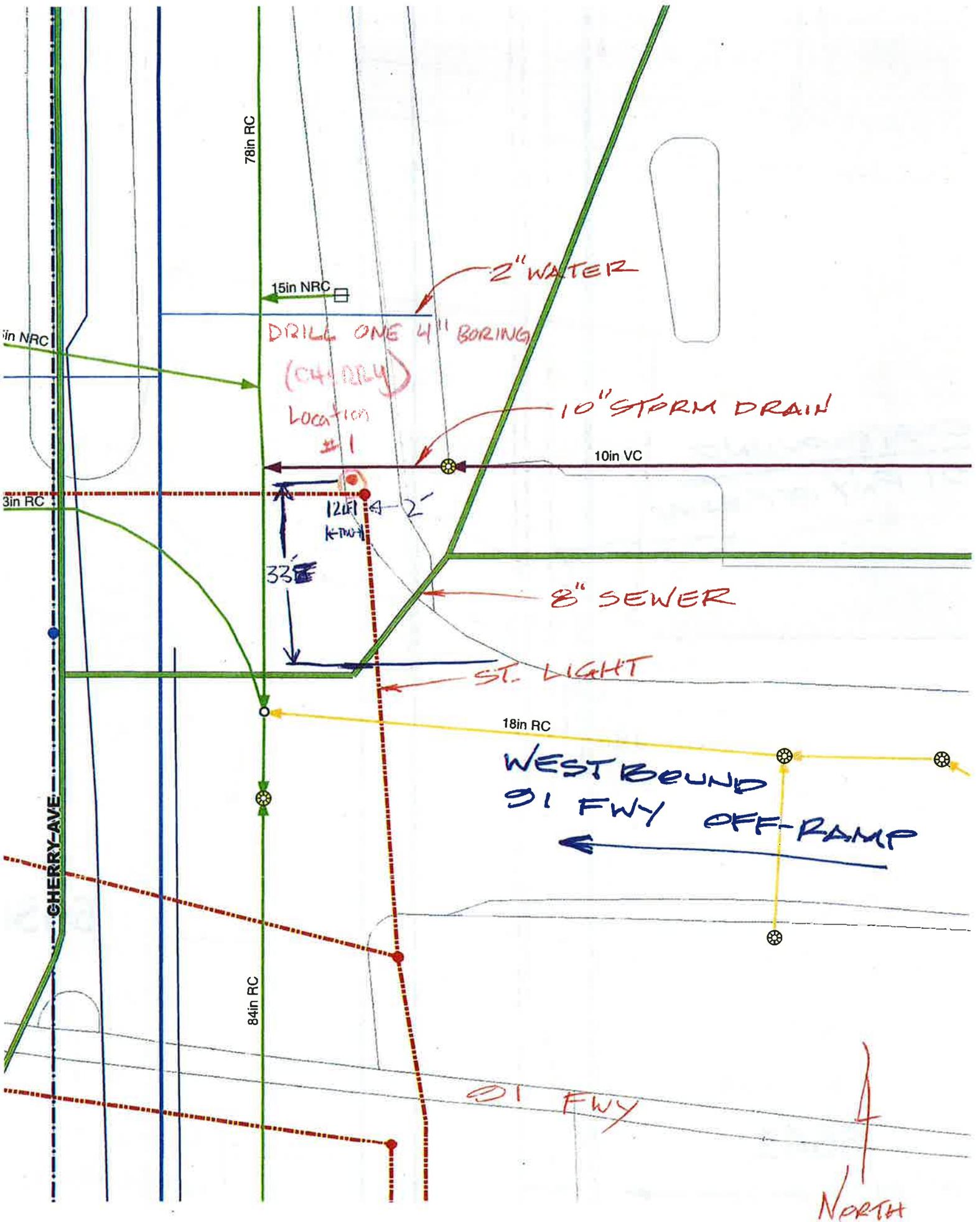
Please use caution when driving in the construction area and obey all construction signs, including the temporary "No Parking" signs. Your help in the prevention of sprinkler run-off from your property into the construction area would be greatly appreciated.

Thank you for your cooperation and patience during construction. We will make every attempt to reduce any inconvenience you may experience.

If you have any inquiries, please call CONTACT NAME AND PHONE NUMBER or the City of Long Beach, Public Work's Inspection Section at (562) 570-5160.

Sincerely,

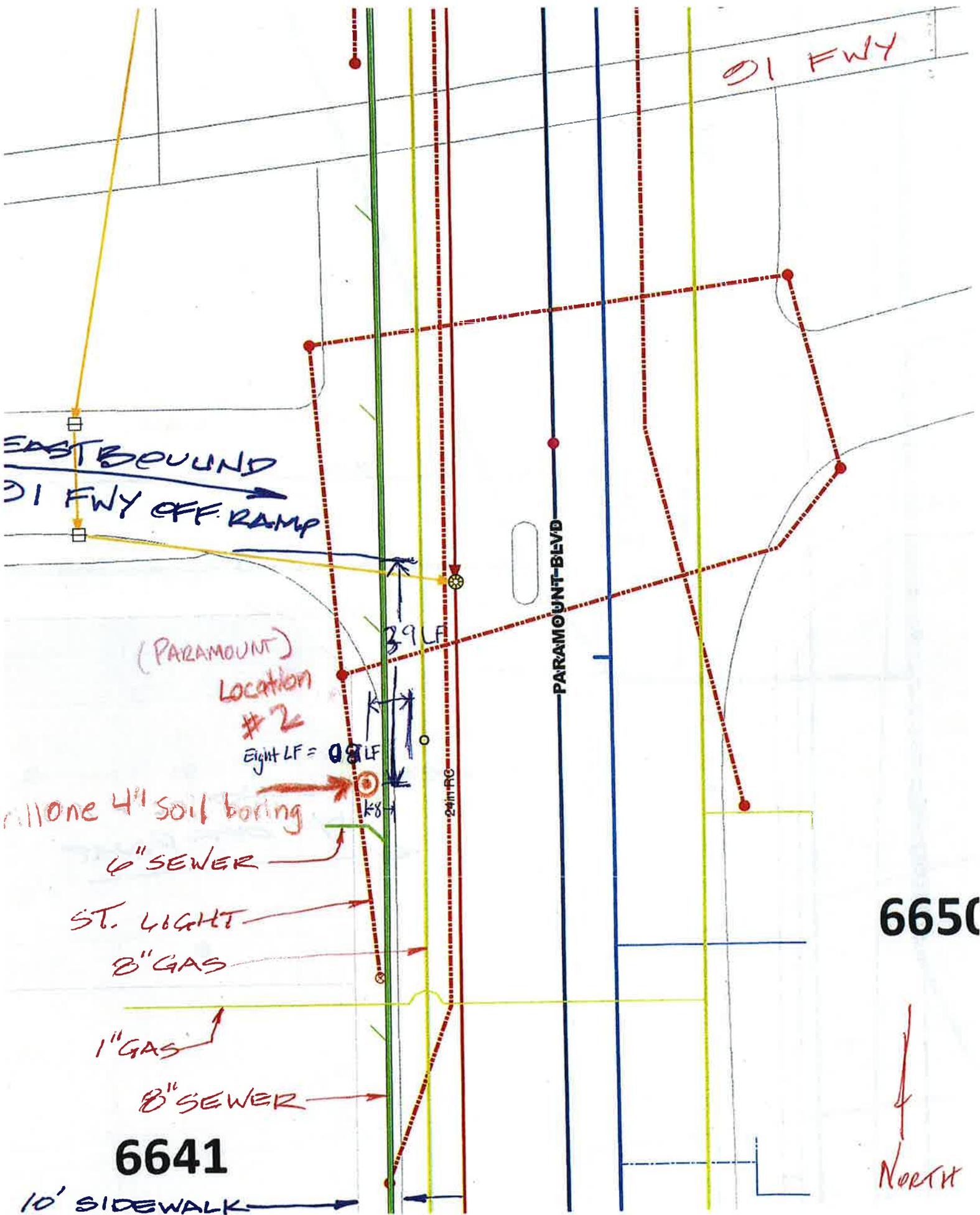
CONTRACTOR NAME AND TITLE



DRILL ONE 4" BORING  
(CHERRY)  
LOCATION #1

WEST BOUND  
91 FWY OFF-RAMP

NORTH



EAST BOUND  
01 FWY OFF RAMP

01 FWY

PARAMOUNT-BEVD

(PARAMOUNT)  
Location #2

Eight LF = 08 LF

one 4" soil boring

6" SEWER

ST. LIGHT

8" GAS

1" GAS

8" SEWER

6641

10' SIDEWALK

6650

North

- The name of the permittee/company or City Department performing the work.
- The type of work being done.
- The phone number to call for information about the work.
- The starting date and ending date of the parking restriction.
- The starting time and ending time of the parking restriction.
- The emergency phone number of the permittee or contractor.
- The applicable excavation permit number.

Temporary "NO PARKING" signs can be obtained from the City of Long Beach, Public Works, Construction Inspection Section on the 10<sup>th</sup> Floor of City Hall.

8. Long Beach Municipal Code (LBMC) Chapter 14.08 states that:
  - This permit is not transferable.
  - This permit shall be kept at the work site and be shown on demand to a City representative.
  - The permittee shall comply with California Government Code Section 4216, and following, concerning Underground Service Alert paint markings (and any other construction related markings). These markings shall not be made more than 14 days prior to the start of work and the markings shall be removed upon completion of the work. Consult with the Public Works Inspector for an approved removal method.
  - The City Engineer may revoke this permit unless the work begins within (60) sixty days after its issuance and is diligently performed to completion, in the sole opinion of the City Engineer.
  - All spoils, debris and excess materials shall be removed from the work site within 3 days after the completion of the work.
  - Permittee shall, at their sole expense, within ten (10) days after receipt of written notification from the City Engineer to do so, remove any improvement or facilities or, with the prior approval of the City Engineer, relocate them to a site designated by the City Engineer if at any time the improvement or facilities interfere with the use, repair, improvement, widening, change in grade, or relocation of any right-of-way or highway, or interfere with the construction of any subway, viaduct or other underground conduit or structure of any kind.
  - Any pavement restored by the permittee shall be maintained by permittee for a period of one (1) year after the completion of the work. If the permittee fails to maintain the pavement during this period, the permittee will be given a 5-day notice to repair or restore the pavement. If the permittee does not repair or restore the pavement, the City may have the work done and charge its cost plus 25% to the permittee.
9. **Standard working hours** shall be restricted to between 7:30 a.m. and 3:30 p.m. Additional work hour restrictions for certain streets may be stated further below in these special conditions, in the attached "Traffic Control Requirements" and/or in the attached traffic control plan(s).
10. Work is not permitted on Sundays.
11. Non-standard work hours, including work on Saturday, must be pre-approved by the Public Works Inspection office (562) 570-5160 and will include additional fees.
12. The City's noise ordinance restricts pre-approved work days and hours to Monday-Friday from 7:00a.m. to 7:00p.m. and on Saturdays from 9:00a.m. to 6:00p.m.
13. If noise from this work is not in compliance with the City's noise ordinance, Daniel Philips, Environmental Health Bureau, (562) 570-4297, shall be notified and the work hours shall be revised so that the noise is in compliance.
14. The Contractor shall become familiarized with all existing installations, both public and private, on the work site and shall provide adequate safeguards to prevent damage to existing structures and improvements. Any damage to property from any cause, which might have been prevented by the Contractor, the Contractor's employees, agents or subcontractors, shall be repaired within 10 calendar days after such damage at the Contractors own cost and expense. Any and all water service breaks shall be repaired the same day.
15. Approval of the attached plans by the City of Long Beach does not constitute a representation as to the accuracy of the location or the existence or non-existence of any underground utility pipe or structure within the limits of this project. The contractor is required to take due precautionary measures to protect the utility lines shown and any other line not on record or not shown on these plans. All utility lines and structures that may be damaged on account to the contractor's operations shall be repaired or replaced at the contractor's expense, to the satisfaction of the City.
16. The Contractor shall obtain a permit from California Division of Industrial Safety for the construction of trenches or excavations which are five feet or deeper. Sheeting, shoring and bracing for the trench excavation shall conform to the requirements of "Construction Safety Orders," Title 8, Division of Industrial Safety, State of California. Contact



**CITY OF LONG BEACH**  
DEPARTMENT OF HEALTH AND HUMAN SERVICES  
**BUREAU OF ENVIRONMENTAL HEALTH**  
**WATER PROGRAM**  
2525 GRAND AVENUE, ROOM 220, LONG BEACH, CALIFORNIA CA 90815  
562-570-4132

**WELL PERMIT**

PERMIT#: **2162**

DATE: **December 7, 2015**

**All work must be completed in accordance with Water Well Bulletin 74-81 and 74-90**

Site Address: **91 freeway WB off ramp at Cherry and EB off ramp at  
Paramount  
Long Beach, CA  
805-719-9331**

Owner: **California Department of Transportation**

Owner Address: **100 S. Main Street  
Los Angeles, CA 90012**

Consulting Firm: **Stantee**

Consulting Firm Address **290 Conejo Ridge Ave  
Thousand Oaks, CA**

Drilling Company: **Interphase Environmental Inc.**

Drilling Co. Address: **6200 Peachtree Street  
Long Beach, CA 90040  
800-457-3300**

Type Of Permit: **Borings**

Type Of Well:

Total Number Of Well/Soil Boring: **2 Borings**

**This permit valid for one year from date above**

Vanna Kho, R.E.H.S.  
Cross-Connection/Water Program

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

**APPENDIX B**  
**BORING GPS COORDINATES**  
**ADL SITE INVESTIGATION**  
**LA-91 (PM 12.9/13.7)**  
**LOS ANGELES COUNTY, CALIFORNIA**  
**EFIS:0715000172-1 (EA#07-4T7701)**  
**TASK ORDER #26**  
**CONTRACT 07A3321**

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)
1307-101	33 ° 52 ' 36.100	118 ° 10 ' 06.731	33.87669444	118.16853639
1307-102	33 ° 52 ' 31.960	118 ° 9 ' 36.599	33.87554444	118.16016639

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

**APPENDIX C  
PHOTOGRAPHIC LOG**

STANTEC CONSULTING SERVICES  
PHOTOGRAPHIC RECORD

Client: Caltrans (07A3321-26)

Job Number: 185831026

Site Name: Task Order No. 26

Location: LA-91, PM 12.9/13.7

Photographer: S. Edblad

Date: December 15, 2015

Photograph No. 1 & 2



Borings 1307-101 (proposed light post) located at the northwest corner of the westbound off-ramp from the 91 Freeway (LA-91) to Cherry Avenue, and 1307-102 (proposed light post.) located at the southeast corner of the eastbound off-ramp from LA-91 to Paramount Boulevard.

Photograph No. 3



Soil cuttings (two 5-gallon orange buckets) collected greater than five feet below ground surface at borings 1307-101 and 1307-102 (stored in hazmat shed at the Cal Trans yard located at 22101 Santa Fe Avenue, Long Beach).

**APPENDIX D**  
**BORING LOGS AND FIELD NOTES**

Project: Caltrans, Contract No. 07A3321, Task Order No. 26	Boring ID: 1307 - 101	
Location: LA-91, PM 12.9/13.7	Page: 1 of 1	
Project #: 185831026.200	Northing: 33° 52' 36.100" N	Easting: 118° 10' 06.731" W
Drilling Start: 0815 <sup>12/15/15</sup> Completed: 0900	Latitude: _____	Longitude: _____
Installation Start: NA Completed: NA	Ground Elev (ft): 20.53M	TOC Elev (ft): _____
Drilling Company: INTERPHASE	Initial DTW (ft): NA	Borehole Depth (ft): 12'
Drilling Equipment: HAND AUGER (HA)	Static DTW (ft): NA	Well Depth (ft): NA
Drilling Method: HA	Well Casing DIA (in): NA	Borehole Dia (in): 3-4"
Sampling Equipment: HA / 808 / TERCO CORAS	Logged By: S. GOBLAD	Checked By: _____

1307-101

Time & Depth (ft)	Graphic Log	USCS	Description:	Sample	Time/ Sample ID/ Method	Measured Recovery (%)	Blow Counts	Penetration (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			BARRE SOIL @ SURFACE		0820				0	BENTONITE CHIPS
0-1		SM	SILTY SAND (SM); DARK YELLOWISH BROWN (10YR 4/6); ~30% SILT; FINE TO MEDIUM GRAINED SAND; ROOTS; MOIST; NO STAINS OR ODORS; NON-PLASTIC; MICACEOUS.		1307-101-0				1	
1-2					0825				2	
2-3					1307-101-2				3	
3-4									4	
4-5		ML	SANDY SILT <del>SILTY SAND</del> (ML); YELLOWISH BROWN (10YR 5/6); ~50% SILT; ~10% CLAY; FINE TO MEDIUM GRAINED SAND; MOIST; LOW PLASTICITY; NO STAINS OR ODORS; MICACEOUS.		0835				5	
5-6					1307-101-5				6	
6-7									7	
7-8									8	
8-9									9	
9-10									10	
10-11		SM	SAME AS SURFACE TO 3' BGS; INCREASED MOISTURE WITH DEPTH.		0855				11	
11-12					1307-101-12				12	
12			BOREHOLE TERMINATED @ 12' BGS; NO GW ENCOUNTERED.						12	

Project: Caltrans, Contract No. 07A3321, Task Order No. 26  
 Location: LA-91, PM 12.9/13.7  
 Project #: 185831026.200  
 Drilling Start: 1100 12/15/15 Completed: 1130  
 Installation Start: NA Completed: NA  
 Drilling Company: INTERPHASE  
 Drilling Equipment: HAND AUGER (HA)  
 Drilling Method: HPA  
 Sampling Equipment: HA / BOZ / TERRA CORAS

Boring ID: 1307 - 102  
 Page: 1 of 1  
 Northing: 33° 52' 31.960" N Easting: 118° 09' 36.599" W  
 Latitude: Longitude:  
 Ground Elev (ft): 16.55 M TOC Elev (ft):  
 Initial DTW (ft): NA Borehole Depth (ft): 12'  
 Static DTW (ft): NA Well Depth (ft): NA  
 Well Casing DIA (in): NA Borehole Dia (in): 3-4"  
 Logged By: S. BOBLAD Checked By:



Time & Depth (ft)	Graphic Log	USCS	Description:	Sample	Time/ Sample ID/ Method	Pressure Recor...	Blow Counts	Resistance and (psi)	Depth (ft)	Well Construction or Dorehole Deckfill
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			BARRETT @ SURFACE							
0	SM		SILTY SAND (SM); DARK TANNISH BROWN (10YR 4/4); ~20% SILT; FINE TO MEDIUM GRAINED SAND; MOIST; NO STAINS OR ODORS; WOOD DEBRIS; MICACEOUS	1101	1307-102-0					
1				1105	1307-102-2					
3										
4	SP		POORLY GRADED SAND (SP); TRACE SILT; FINE TO MEDIUM GRAINED SAND (DUNE); MOIST; NO STAINS OR ODORS; MICACEOUS; LIGHT TANNISH BROWN (10YR 6/4)	1111	1307-102-6					
10			SAMPLES @ 3' BGS; INCREASED SILT WITH DEPTH AND MOISTURE							
12			ML SILETY SANDY SILT (ML); YELLOWISH BROWN (10YR 5/4); ~50% SILT; ~10% CLAY; FINE TO MEDIUM GRAINED SAND; LOW PLASTICITY; MOIST; NO STAINS OR ODORS; MICACEOUS	1128	1307-102-12					
12			BOREHOLE TERMINATED @ 12' BGS							

BENTONITE CHIPS



# Field Report

GEO-301

Page 1 of 1

Rev. 0 Apr 2005

### CHRONOLOGY OF FIELD ACTIVITIES/ISSUES/OBSERVATIONS

0500 - LOADED EQUIPMENT / DEPARTURE FROM OFFICE @ 0530

0750 - ARRIVED ON-SITE (HEALTH AND SAFETY MEETING - TRAFFIC CONTROL INTERPHASE AND CALTRANS ON-SITE)

0815 - BEGAN COLLECTING SAMPLES @ 1307-101

- STEPPED OUT TO SOIL WITH CALTRANS (WASIM)

APPROVAL - NO GW ENCOUNTERED - TOTAL DEPTH 12' BOW

- CITY (LONG BEACH) INSPECTOR ON-SITE - APPROVED

1307 - ~~1058~~ SAMPLE LOCATIONS AND REQUESTED REMOVAL OF UTILITIES MARKING PAINT FROM SIDEWALK

- INTERPHASE REMOVED PAINT (SPECTRUM AND STANTEC PAINT ONLY [WHITE, NEON GREEN AND PINK])

1050 - ~~1058~~ SET-UP TRAFFIC CONTROL AND BEGAN COLLECTING SAMPLES @ 1307-102

- STEPPED OUT TO SOIL WITH CALTRANS (WASIM)

APPROVAL - NO GW ENCOUNTERED - TOTAL DEPTH 12' BOW

1140 - CALTRANS (WASIM) DEPARTURE FROM SITE

~~1230~~ ~~1205~~ - INTERPHASE REMOVED PAINT (SPECTRUM / STANTEC)

1255 - DEPARTURE FROM SITE / DELIVERED (2) 5-GALLON SOIL CUTTING BUCKETS TO LONG BEACH YARD

1335 - DEPARTURE FROM YARD / RETURNED TO OFFICE TO UNLOAD EQUIPMENT AND DROP OFF SAMPLES.



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



December 24, 2015

Anne Perez  
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 : 1504292  
Client Reference : 185831026, Task: 200.0005, Caltrans 07A3321-26

Enclosed are the results for sample(s) received on December 16, 2015 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 : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1307-101-5	1504292-03	Soil	12/15/15 8:35	12/16/15 13:40
1307-101-12	1504292-04	Soil	12/15/15 8:55	12/16/15 13:40
1307-102-5	1504292-07	Soil	12/15/15 11:11	12/16/15 13:40
1307-102-12	1504292-08	Soil	12/15/15 11:28	12/16/15 13:40
1307-101-5D	1504292-09	Soil	12/15/15 8:35	12/16/15 13:40
1307-EB121515	1504292-10	Aqueous	12/15/15 9:10	12/16/15 13:40
1307-101	1504292-11	Soil	12/15/15 0:00	12/16/15 13:40
1307-102	1504292-12	Soil	12/15/15 0:00	12/16/15 13:40

### CASE NARRATIVE

All volatile analyses were performed using 5035 preservation requirements. Any high level dilutions were performed on a preserved methanol sample unless otherwise noted.

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 : 185831026, Task: 200.0005, Caltrans 07A3321-26

Report To : Anne Perez

Reported : 12/24/2015

### 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
									Analyzed		
1504292-11	1307-101	ND	mg/L	0.050	0.0019	1	B5L0528	12/22/2015	12/22/15 11:36		
1504292-12	1307-102	0.0058	mg/L	0.050	0.0019	1	B5L0528	12/22/2015	12/22/15 11:45		J

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

Analyte: Lead

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1504292-11	1307-101	0.21	mg/L	0.050	0.0019	1	B5L0497	12/21/2015	12/21/15 15:01		
1504292-12	1307-102	0.47	mg/L	0.050	0.0019	1	B5L0497	12/21/2015	12/21/15 15:20		

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

Analyte: Mercury

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1504292-10	1307-EB121515	ND	ug/L	0.20	0.15	1	B5L0488	12/21/2015	12/21/15 15:55		

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

Analyte: Mercury

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analyzed		
1504292-11	1307-101	0.05	mg/kg	0.10	0.009	1	B5L0482	12/21/2015	12/21/15 14:27		J
1504292-12	1307-102	0.04	mg/kg	0.10	0.009	1	B5L0483	12/21/2015	12/21/15 14:50		J



# Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
 Report To : Anne Perez  
 Reported : 12/24/2015

## pH by EPA 9045C

Analyte: pH

Analyst: PT

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1504292-11	1307-101	8.5	pH Units	0.10	0.10	1	B5L0549	12/22/2015	12/22/15 16:37	
1504292-12	1307-102	8.6	pH Units	0.10	0.10	1	B5L0549	12/22/2015	12/22/15 16:37	

### Client Sample ID 1307-101-5

Lab ID: 1504292-03

## Gasoline Range Organics by EPA 8015B (Modified) (5035)

Analyst: BT

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	0.81	0.16	1	B5L0573	12/15/2015	12/23/15 14:48	
Surrogate: 4-Bromofluorobenzene	79.0 %	37 - 153			B5L0573	12/15/2015	12/23/15 14:48	

## Diesel Range Organics by EPA 8015B

Analyst: MFR

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 10:58	
ORO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 10:58	
Surrogate: p-Terphenyl	79.8 %	26 - 123			B5L0495	12/23/2015	12/23/15 10:58	

## BTEX/MTBE by EPA 8021 (5035)

Analyst: BT

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Benzene</b>	<b>5.0</b>	4.0	0.23	1	B5L0573	12/15/2015	12/23/15 14:48	
<b>Toluene</b>	<b>3.1</b>	4.0	0.47	1	B5L0573	12/15/2015	12/23/15 14:48	J
Ethylbenzene	ND	4.0	0.60	1	B5L0573	12/15/2015	12/23/15 14:48	
m,p-Xylene	ND	8.1	0.39	1	B5L0573	12/15/2015	12/23/15 14:48	
o-Xylene	ND	4.0	0.58	1	B5L0573	12/15/2015	12/23/15 14:48	
Surrogate: 4-Bromofluorobenzene	94.2 %	62 - 128			B5L0573	12/15/2015	12/23/15 14:48	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-101-12**  
**Lab ID: 1504292-04**

### Gasoline Range Organics by EPA 8015B (Modified) (5035)

**Analyst: BT**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	0.82	0.16	1	B5L0573	12/15/2015	12/23/15 15:04	
<i>Surrogate: 4-Bromofluorobenzene</i>	77.5 %		37 - 153		B5L0573	12/15/2015	12/23/15 15:04	

### Diesel Range Organics by EPA 8015B

**Analyst: MFR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:08	
ORO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:08	
<i>Surrogate: p-Terphenyl</i>	67.2 %		26 - 123		B5L0495	12/23/2015	12/23/15 11:08	

### BTEX/MTBE by EPA 8021 (5035)

**Analyst: BT**

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	4.1	0.23	1	B5L0573	12/15/2015	12/23/15 15:04	
Toluene	ND	4.1	0.48	1	B5L0573	12/15/2015	12/23/15 15:04	
Ethylbenzene	ND	4.1	0.62	1	B5L0573	12/15/2015	12/23/15 15:04	
m,p-Xylene	ND	8.2	0.40	1	B5L0573	12/15/2015	12/23/15 15:04	
o-Xylene	ND	4.1	0.60	1	B5L0573	12/15/2015	12/23/15 15:04	
<i>Surrogate: 4-Bromofluorobenzene</i>	92.3 %		62 - 128		B5L0573	12/15/2015	12/23/15 15:04	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-102-5**

**Lab ID: 1504292-07**

**Gasoline Range Organics by EPA 8015B (Modified) (5035)**

**Analyst: BT**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.1	0.22	1	B5L0573	12/15/2015	12/23/15 15:20	
<i>Surrogate: 4-Bromofluorobenzene</i>	76.1 %		37 - 153		B5L0573	12/15/2015	12/23/15 15:20	

**Diesel Range Organics by EPA 8015B**

**Analyst: MFR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:19	
ORO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:19	
<i>Surrogate: p-Terphenyl</i>	78.1 %		26 - 123		B5L0495	12/23/2015	12/23/15 11:19	

**BTEX/MTBE by EPA 8021 (5035)**

**Analyst: BT**

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	5.4	0.30	1	B5L0573	12/15/2015	12/23/15 15:20	
Toluene	ND	5.4	0.63	1	B5L0573	12/15/2015	12/23/15 15:20	
Ethylbenzene	ND	5.4	0.81	1	B5L0573	12/15/2015	12/23/15 15:20	
m,p-Xylene	ND	11	0.52	1	B5L0573	12/15/2015	12/23/15 15:20	
o-Xylene	ND	5.4	0.78	1	B5L0573	12/15/2015	12/23/15 15:20	
<i>Surrogate: 4-Bromofluorobenzene</i>	89.4 %		62 - 128		B5L0573	12/15/2015	12/23/15 15:20	



## Certificate of Analysis

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Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-102-12**

**Lab ID: 1504292-08**

**Gasoline Range Organics by EPA 8015B (Modified) (5035)**

**Analyst: BT**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	0.74	0.15	1	B5L0573	12/15/2015	12/23/15 15:36	
<i>Surrogate: 4-Bromofluorobenzene</i>	74.1 %		37 - 153		B5L0573	12/15/2015	12/23/15 15:36	

**Diesel Range Organics by EPA 8015B**

**Analyst: MFR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:30	
ORO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:30	
<i>Surrogate: p-Terphenyl</i>	67.6 %		26 - 123		B5L0495	12/23/2015	12/23/15 11:30	

**BTEX/MTBE by EPA 8021 (5035)**

**Analyst: BT**

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Benzene</b>	<b>5.1</b>	3.7	0.21	1	B5L0573	12/15/2015	12/23/15 15:36	
Toluene	ND	3.7	0.43	1	B5L0573	12/15/2015	12/23/15 15:36	
Ethylbenzene	ND	3.7	0.55	1	B5L0573	12/15/2015	12/23/15 15:36	
m,p-Xylene	ND	7.4	0.36	1	B5L0573	12/15/2015	12/23/15 15:36	
o-Xylene	ND	3.7	0.54	1	B5L0573	12/15/2015	12/23/15 15:36	
<i>Surrogate: 4-Bromofluorobenzene</i>	86.8 %		62 - 128		B5L0573	12/15/2015	12/23/15 15:36	



## Certificate of Analysis

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Thousand Oaks, CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-101-5D**  
**Lab ID: 1504292-09**

### Gasoline Range Organics by EPA 8015B (Modified) (5035)

**Analyst: BT**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	0.73	0.15	1	B5L0573	12/15/2015	12/23/15 14:32	
<i>Surrogate: 4-Bromofluorobenzene</i>	70.9 %	37 - 153			B5L0573	12/15/2015	12/23/15 14:32	

### Diesel Range Organics by EPA 8015B

**Analyst: MFR**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:41	
ORO	ND	1.0	1.0	1	B5L0495	12/23/2015	12/23/15 11:41	
<i>Surrogate: p-Terphenyl</i>	69.9 %	26 - 123			B5L0495	12/23/2015	12/23/15 11:41	

### BTEX/MTBE by EPA 8021 (5035)

**Analyst: BT**

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
<b>Benzene</b>	<b>4.7</b>	3.6	0.20	1	B5L0573	12/15/2015	12/23/15 14:32	
<b>Toluene</b>	<b>3.0</b>	3.6	0.42	1	B5L0573	12/15/2015	12/23/15 14:32	J
Ethylbenzene	ND	3.6	0.55	1	B5L0573	12/15/2015	12/23/15 14:32	
<b>m,p-Xylene</b>	<b>0.80</b>	7.3	0.35	1	B5L0573	12/15/2015	12/23/15 14:32	J
o-Xylene	ND	3.6	0.53	1	B5L0573	12/15/2015	12/23/15 14:32	
<i>Surrogate: 4-Bromofluorobenzene</i>	80.6 %	62 - 128			B5L0573	12/15/2015	12/23/15 14:32	



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Thousand Oaks, CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-EB121515**  
**Lab ID: 1504292-10**

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

Analyst: SB

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	0.010	0.0073	1	B5L0487	12/21/2015	12/22/15 10:26	
Arsenic	ND	0.010	0.0084	1	B5L0487	12/21/2015	12/22/15 10:26	
<b>Barium</b>	<b>0.0025</b>	0.0030	0.0003	1	B5L0487	12/21/2015	12/22/15 10:26	J
<b>Beryllium</b>	<b>0.0008</b>	0.0030	0.0002	1	B5L0487	12/21/2015	12/22/15 10:26	J
<b>Cadmium</b>	<b>0.0019</b>	0.0030	0.0004	1	B5L0487	12/21/2015	12/22/15 10:26	J
<b>Chromium</b>	<b>0.0063</b>	0.0030	0.0004	1	B5L0487	12/21/2015	12/22/15 10:26	
<b>Cobalt</b>	<b>0.0023</b>	0.0030	0.0004	1	B5L0487	12/21/2015	12/22/15 10:26	J
<b>Copper</b>	<b>0.0041</b>	0.0090	0.0014	1	B5L0487	12/21/2015	12/22/15 10:26	J
Lead	ND	0.0050	0.0019	1	B5L0487	12/21/2015	12/22/15 10:26	
<b>Molybdenum</b>	<b>0.0028</b>	0.0050	0.0006	1	B5L0487	12/21/2015	12/22/15 10:26	J
<b>Nickel</b>	<b>0.0021</b>	0.0050	0.0011	1	B5L0487	12/21/2015	12/22/15 10:26	J
Selenium	ND	0.010	0.0065	1	B5L0487	12/21/2015	12/22/15 10:26	
Silver	ND	0.0030	0.0012	1	B5L0487	12/21/2015	12/22/15 10:26	
<b>Thallium</b>	<b>0.0084</b>	0.015	0.0037	1	B5L0487	12/21/2015	12/22/15 10:26	J
Vanadium	ND	0.0030	0.0017	1	B5L0487	12/21/2015	12/22/15 10:26	
Zinc	ND	0.025	0.0087	1	B5L0487	12/21/2015	12/22/15 10:26	

### Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	0.05	0.05	1	B5L0478	12/15/2015	12/21/15 14:23	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>106 %</i>		<i>70 - 130</i>		B5L0478	12/15/2015	<i>12/21/15 14:23</i>	

### Diesel Range Organics by EPA 8015B

Analyst: MFR

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	ND	0.05	0.05	1	B5L0510	12/21/2015	12/23/15 09:20	
ORO	ND	0.05	0.05	1	B5L0510	12/21/2015	12/23/15 09:20	
<i>Surrogate: p-Terphenyl</i>	<i>81.8 %</i>		<i>20 - 141</i>		B5L0510	12/21/2015	<i>12/23/15 09:20</i>	

### BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	0.50	0.18	1	B5L0478	12/15/2015	12/21/15 14:23	
Toluene	ND	0.50	0.08	1	B5L0478	12/15/2015	12/21/15 14:23	
Ethylbenzene	ND	0.50	0.12	1	B5L0478	12/15/2015	12/21/15 14:23	
m,p-Xylene	ND	1.0	0.25	1	B5L0478	12/15/2015	12/21/15 14:23	
o-Xylene	ND	0.50	0.13	1	B5L0478	12/15/2015	12/21/15 14:23	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### Client Sample ID 1307-EB121515

Lab ID: 1504292-10

#### BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/L)	PQL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: 4-Bromofluorobenzene	110 %	70 - 130		B5L0478	12/15/2015	12/21/15 14:23	

### Client Sample ID 1307-101

Lab ID: 1504292-11

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

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.21	1	B5L0479	12/21/2015	12/21/15 15:01	
Arsenic	4.1	1.0	0.55	1	B5L0479	12/21/2015	12/21/15 15:01	
Barium	87	1.0	0.04	1	B5L0479	12/21/2015	12/21/15 15:01	
Beryllium	0.23	1.0	0.05	1	B5L0479	12/21/2015	12/21/15 15:01	J
Cadmium	ND	1.0	0.06	1	B5L0479	12/21/2015	12/21/15 15:01	
Chromium	15	1.0	0.19	1	B5L0479	12/21/2015	12/21/15 15:01	
Cobalt	6.7	1.0	0.11	1	B5L0479	12/21/2015	12/21/15 15:01	
Copper	20	2.0	0.12	1	B5L0479	12/21/2015	12/21/15 15:01	
Lead	11	1.0	0.16	1	B5L0479	12/21/2015	12/21/15 15:01	
Molybdenum	0.22	1.0	0.04	1	B5L0479	12/21/2015	12/21/15 15:01	J
Nickel	12	1.0	0.10	1	B5L0479	12/21/2015	12/21/15 15:01	
Selenium	ND	1.0	0.32	1	B5L0479	12/21/2015	12/22/15 13:06	
Silver	ND	1.0	0.12	1	B5L0479	12/21/2015	12/21/15 15:01	
Thallium	3.2	1.0	0.36	1	B5L0479	12/21/2015	12/21/15 15:01	
Vanadium	28	1.0	0.20	1	B5L0479	12/21/2015	12/21/15 15:01	
Zinc	63	1.0	0.49	1	B5L0479	12/21/2015	12/21/15 15:01	



### Certificate of Analysis

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Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

**Client Sample ID 1307-102**

**Lab ID: 1504292-12**

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

**Analyst: SB**

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	0.21	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Arsenic</b>	<b>3.0</b>	1.0	0.55	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Barium</b>	<b>76</b>	1.0	0.04	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Beryllium</b>	<b>0.16</b>	1.0	0.05	1	B5L0481	12/21/2015	12/21/15 15:20	J
<b>Cadmium</b>	<b>0.14</b>	1.0	0.06	1	B5L0481	12/21/2015	12/21/15 15:20	J
<b>Chromium</b>	<b>12</b>	1.0	0.19	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Cobalt</b>	<b>5.3</b>	1.0	0.11	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Copper</b>	<b>19</b>	2.0	0.12	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Lead</b>	<b>24</b>	1.0	0.16	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Molybdenum</b>	<b>0.46</b>	1.0	0.04	1	B5L0481	12/21/2015	12/21/15 15:20	J
<b>Nickel</b>	<b>10</b>	1.0	0.10	1	B5L0481	12/21/2015	12/21/15 15:20	
Selenium	ND	1.0	0.32	1	B5L0481	12/21/2015	12/21/15 15:20	
Silver	ND	1.0	0.12	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Thallium</b>	<b>2.2</b>	1.0	0.36	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Vanadium</b>	<b>23</b>	1.0	0.20	1	B5L0481	12/21/2015	12/21/15 15:20	
<b>Zinc</b>	<b>110</b>	1.0	0.49	1	B5L0481	12/21/2015	12/21/15 15:20	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### QUALITY CONTROL SECTION

#### Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B5L0479 - EPA 3050B\_S**

**Blank (B5L0479-BLK1)**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	ND	2.0				NR			
Arsenic	ND	1.0				NR			
Barium	0.040510	1.0				NR			J
Beryllium	ND	1.0				NR			
Cadmium	ND	1.0				NR			
Chromium	ND	1.0				NR			
Cobalt	ND	1.0				NR			
Copper	ND	2.0				NR			
Lead	ND	1.0				NR			
Molybdenum	ND	1.0				NR			
Nickel	ND	1.0				NR			
Selenium	ND	1.0				NR			
Silver	ND	1.0				NR			
Thallium	ND	1.0				NR			
Vanadium	ND	1.0				NR			
Zinc	ND	1.0				NR			

**LCS (B5L0479-BS1)**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	47.5066	2.0	50.0000		95.0	80 - 120			
Arsenic	45.7592	1.0	50.0000		91.5	80 - 120			
Barium	49.6539	1.0	50.0000		99.3	80 - 120			
Beryllium	47.0201	1.0	50.0000		94.0	80 - 120			
Cadmium	46.4109	1.0	50.0000		92.8	80 - 120			
Chromium	50.3542	1.0	50.0000		101	80 - 120			
Cobalt	48.7750	1.0	50.0000		97.6	80 - 120			
Copper	46.4803	2.0	50.0000		93.0	80 - 120			
Lead	48.0698	1.0	50.0000		96.1	80 - 120			
Molybdenum	47.1023	1.0	50.0000		94.2	80 - 120			
Nickel	47.5104	1.0	50.0000		95.0	80 - 120			
Selenium	43.9869	1.0	50.0000		88.0	80 - 120			
Silver	47.8727	1.0	50.0000		95.7	80 - 120			
Thallium	49.2050	1.0	50.0000		98.4	80 - 120			
Vanadium	50.9094	1.0	50.0000		102	80 - 120			
Zinc	45.4527	1.0	50.0000		90.9	80 - 120			

**Duplicate (B5L0479-DUP1)**

Source: 1504289-01

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	ND	2.0		ND	NR			20	
Arsenic	7.91254	1.0		7.59038	NR		4.16	20	
Barium	124.162	1.0		142.617	NR		13.8	20	
Beryllium	0.302557	1.0		0.308923	NR		2.08	20	J
Cadmium	0.189460	1.0		0.245135	NR		25.6	20	R, J
Chromium	50.6956	1.0		47.9283	NR		5.61	20	
Cobalt	11.4336	1.0		10.9300	NR		4.50	20	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### 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 B5L0479 - EPA 3050B\_S (continued)**

**Duplicate (B5L0479-DUP1) - Continued**

**Source: 1504289-01**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Copper	31.6304	2.0		42.6215	NR		29.6	20	R
Lead	26.9134	1.0		28.0486	NR		4.13	20	
Molybdenum	0.308806	1.0		0.252589	NR		20.0	20	R, J
Nickel	38.8163	1.0		40.1344	NR		3.34	20	
Selenium	0.667324	1.0		ND	NR			20	J
Silver	ND	1.0		ND	NR			20	
Thallium	3.01457	1.0		5.28726	NR		54.8	20	R
Vanadium	46.5831	1.0		41.3944	NR		11.8	20	
Zinc	58.1178	1.0		58.7126	NR		1.02	20	

**Matrix Spike (B5L0479-MS1)**

**Source: 1504289-01**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	72.8203	2.0	125.000	ND	58.3	28 - 106			
Arsenic	96.8540	1.0	125.000	7.59038	71.4	57 - 109			
Barium	212.065	1.0	125.000	142.617	55.6	18 - 159			
Beryllium	91.3855	1.0	125.000	0.308923	72.9	61 - 107			
Cadmium	78.6402	1.0	125.000	0.245135	62.7	53 - 104			
Chromium	142.652	1.0	125.000	47.9283	75.8	53 - 121			
Cobalt	94.1513	1.0	125.000	10.9300	66.6	55 - 109			
Copper	136.639	2.0	125.000	42.6215	75.2	58 - 124			
Lead	111.792	1.0	125.000	28.0486	67.0	35 - 129			
Molybdenum	87.9006	1.0	125.000	0.252589	70.1	57 - 108			
Nickel	121.109	1.0	125.000	40.1344	64.8	44 - 122			
Selenium	87.1272	1.0	125.000	ND	69.7	54 - 104			
Silver	98.3077	1.0	125.000	ND	78.6	60 - 112			
Thallium	83.9094	1.0	125.000	5.28726	62.9	50 - 103			
Vanadium	140.765	1.0	125.000	41.3944	79.5	54 - 123			
Zinc	138.376	1.0	125.000	58.7126	63.7	29 - 132			

**Matrix Spike Dup (B5L0479-MSD1)**

**Source: 1504289-01**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	72.9472	2.0	125.000	ND	58.4	28 - 106	0.174	20	
Arsenic	101.812	1.0	125.000	7.59038	75.4	57 - 109	4.99	20	
Barium	217.379	1.0	125.000	142.617	59.8	18 - 159	2.47	20	
Beryllium	93.2529	1.0	125.000	0.308923	74.4	61 - 107	2.02	20	
Cadmium	81.4841	1.0	125.000	0.245135	65.0	53 - 104	3.55	20	
Chromium	147.390	1.0	125.000	47.9283	79.6	53 - 121	3.27	20	
Cobalt	96.2135	1.0	125.000	10.9300	68.2	55 - 109	2.17	20	
Copper	139.819	2.0	125.000	42.6215	77.8	58 - 124	2.30	20	
Lead	121.317	1.0	125.000	28.0486	74.6	35 - 129	8.17	20	
Molybdenum	90.5690	1.0	125.000	0.252589	72.3	57 - 108	2.99	20	
Nickel	125.315	1.0	125.000	40.1344	68.1	44 - 122	3.41	20	
Selenium	88.5015	1.0	125.000	ND	70.8	54 - 104	1.57	20	
Silver	99.3322	1.0	125.000	ND	79.5	60 - 112	1.04	20	
Thallium	86.2900	1.0	125.000	5.28726	64.8	50 - 103	2.80	20	
Vanadium	141.138	1.0	125.000	41.3944	79.8	54 - 123	0.264	20	
Zinc	144.781	1.0	125.000	58.7126	68.9	29 - 132	4.52	20	



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26

Report To : Anne Perez

Reported : 12/24/2015

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	% Rec Limits	RPD	RPD Limit	Notes
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**Batch B5L0481 - EPA 3050B\_S**

**Blank (B5L0481-BLK1)**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	ND	2.0			NR				
Arsenic	ND	1.0			NR				
Barium	0.163680	1.0			NR				J
Beryllium	ND	1.0			NR				
Cadmium	ND	1.0			NR				
Chromium	0.216822	1.0			NR				J
Cobalt	ND	1.0			NR				
Copper	0.127419	2.0			NR				J
Lead	ND	1.0			NR				
Molybdenum	ND	1.0			NR				
Nickel	ND	1.0			NR				
Selenium	ND	1.0			NR				
Silver	ND	1.0			NR				
Thallium	ND	1.0			NR				
Vanadium	ND	1.0			NR				
Zinc	ND	1.0			NR				

**LCS (B5L0481-BS1)**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	45.9181	2.0	50.0000	91.8	80 - 120
Arsenic	44.2497	1.0	50.0000	88.5	80 - 120
Barium	47.6607	1.0	50.0000	95.3	80 - 120
Beryllium	45.2360	1.0	50.0000	90.5	80 - 120
Cadmium	44.5641	1.0	50.0000	89.1	80 - 120
Chromium	48.3936	1.0	50.0000	96.8	80 - 120
Cobalt	46.8125	1.0	50.0000	93.6	80 - 120
Copper	44.9926	2.0	50.0000	90.0	80 - 120
Lead	46.5883	1.0	50.0000	93.2	80 - 120
Molybdenum	45.2628	1.0	50.0000	90.5	80 - 120
Nickel	45.5742	1.0	50.0000	91.1	80 - 120
Selenium	42.4666	1.0	50.0000	84.9	80 - 120
Silver	46.1304	1.0	50.0000	92.3	80 - 120
Thallium	47.6551	1.0	50.0000	95.3	80 - 120
Vanadium	48.5827	1.0	50.0000	97.2	80 - 120
Zinc	43.6821	1.0	50.0000	87.4	80 - 120

**Duplicate (B5L0481-DUP1)**

Source: 1504233-05

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	0.993408	2.0	1.33531	NR	29.4	20	R, J
Arsenic	5.93564	1.0	6.25433	NR	5.23	20	
Barium	108.765	1.0	104.084	NR	4.40	20	
Beryllium	0.290592	1.0	0.281526	NR	3.17	20	J
Cadmium	1.43042	1.0	1.27864	NR	11.2	20	
Chromium	24.9810	1.0	26.7097	NR	6.69	20	
Cobalt	5.33753	1.0	5.47482	NR	2.54	20	
Copper	34.4632	2.0	32.7579	NR	5.07	20	
Lead	238.293	1.0	251.190	NR	5.27	20	
Molybdenum	2.87378	1.0	2.56601	NR	11.3	20	
Nickel	20.0904	1.0	18.5745	NR	7.84	20	



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Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
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 Reported : 12/24/2015

### 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 B5L0481 - EPA 3050B\_S (continued)**

**Duplicate (B5L0481-DUP1) - Continued**

**Source: 1504233-05**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Selenium	1.67809	1.0		1.47514	NR		12.9	20	
Silver	ND	1.0		ND	NR			20	
Thallium	1.73122	1.0		1.74347	NR		0.705	20	
Vanadium	25.8603	1.0		27.5434	NR		6.30	20	
Zinc	266.079	1.0		252.221	NR		5.35	20	

**Matrix Spike (B5L0481-MS1)**

**Source: 1504233-05**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	79.9941	2.0	125.000	1.33531	62.9	28 - 106			
Arsenic	98.9185	1.0	125.000	6.25433	74.1	57 - 109			
Barium	198.588	1.0	125.000	104.084	75.6	18 - 159			
Beryllium	92.9419	1.0	125.000	0.281526	74.1	61 - 107			
Cadmium	84.5180	1.0	125.000	1.27864	66.6	53 - 104			
Chromium	120.700	1.0	125.000	26.7097	75.2	53 - 121			
Cobalt	95.4752	1.0	125.000	5.47482	72.0	55 - 109			
Copper	136.652	2.0	125.000	32.7579	83.1	58 - 124			
Lead	355.818	1.0	125.000	251.190	83.7	35 - 129			
Molybdenum	95.4138	1.0	125.000	2.56601	74.3	57 - 108			
Nickel	107.023	1.0	125.000	18.5745	70.8	44 - 122			
Selenium	88.7382	1.0	125.000	1.47514	69.8	54 - 104			
Silver	95.0178	1.0	125.000	ND	76.0	60 - 112			
Thallium	87.9370	1.0	125.000	1.74347	69.0	50 - 103			
Vanadium	119.819	1.0	125.000	27.5434	73.8	54 - 123			
Zinc	363.693	1.0	125.000	252.221	89.2	29 - 132			

**Matrix Spike Dup (B5L0481-MSD1)**

**Source: 1504233-05**

Prepared: 12/21/2015 Analyzed: 12/21/2015

Antimony	78.5440	2.0	125.000	1.33531	61.8	28 - 106	1.83	20	
Arsenic	96.0369	1.0	125.000	6.25433	71.8	57 - 109	2.96	20	
Barium	195.986	1.0	125.000	104.084	73.5	18 - 159	1.32	20	
Beryllium	94.7742	1.0	125.000	0.281526	75.6	61 - 107	1.95	20	
Cadmium	85.6254	1.0	125.000	1.27864	67.5	53 - 104	1.30	20	
Chromium	119.843	1.0	125.000	26.7097	74.5	53 - 121	0.713	20	
Cobalt	93.8609	1.0	125.000	5.47482	70.7	55 - 109	1.71	20	
Copper	134.360	2.0	125.000	32.7579	81.3	58 - 124	1.69	20	
Lead	302.216	1.0	125.000	251.190	40.8	35 - 129	16.3	20	
Molybdenum	95.4147	1.0	125.000	2.56601	74.3	57 - 108	0.00100	20	
Nickel	106.750	1.0	125.000	18.5745	70.5	44 - 122	0.255	20	
Selenium	91.0782	1.0	125.000	1.47514	71.7	54 - 104	2.60	20	
Silver	94.8372	1.0	125.000	ND	75.9	60 - 112	0.190	20	
Thallium	86.1509	1.0	125.000	1.74347	67.5	50 - 103	2.05	20	
Vanadium	118.409	1.0	125.000	27.5434	72.7	54 - 123	1.18	20	
Zinc	348.478	1.0	125.000	252.221	77.0	29 - 132	4.27	20	



## Certificate of Analysis

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Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26

Report To : Anne Perez

Reported : 12/24/2015

### Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	% Rec Limits	RPD	RPD Limit	Notes
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#### Batch B5L0487 - EPA 3010A\_W

##### Blank (B5L0487-BLK1)

Prepared: 12/21/2015 Analyzed: 12/22/2015

Antimony	ND	0.010			NR				
Arsenic	ND	0.010			NR				
Barium	0.000470	0.0030			NR				J
Beryllium	ND	0.0030			NR				
Cadmium	ND	0.0030			NR				
Chromium	0.001948	0.0030			NR				J
Cobalt	ND	0.0030			NR				
Copper	0.005900	0.0090			NR				J
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	9.8302E-3	0.015			NR				J
Vanadium	ND	0.0030			NR				
Zinc	ND	0.025			NR				

##### LCS (B5L0487-BS1)

Prepared: 12/21/2015 Analyzed: 12/22/2015

Antimony	1.00234	0.010	1.00000	100	80 - 120				
Arsenic	0.972364	0.010	1.00000	97.2	80 - 120				
Barium	1.02234	0.0030	1.00000	102	80 - 120				
Beryllium	1.00721	0.0030	1.00000	101	80 - 120				
Cadmium	0.985842	0.0030	1.00000	98.6	80 - 120				
Chromium	1.02297	0.0030	1.00000	102	80 - 120				
Cobalt	1.00426	0.0030	1.00000	100	80 - 120				
Copper	0.990234	0.0090	1.00000	99.0	80 - 120				
Lead	1.00153	0.0050	1.00000	100	80 - 120				
Molybdenum	1.00370	0.0050	1.00000	100	80 - 120				
Nickel	0.981758	0.0050	1.00000	98.2	80 - 120				
Selenium	0.935209	0.010	1.00000	93.5	80 - 120				
Silver	0.985956	0.0030	1.00000	98.6	80 - 120				
Thallium	1.05994	0.015	1.00000	106	80 - 120				
Vanadium	0.992415	0.0030	1.00000	99.2	80 - 120				
Zinc	0.961006	0.025	1.00000	96.1	80 - 120				

##### Duplicate (B5L0487-DUP1)

Source: 1504336-01

Prepared: 12/21/2015 Analyzed: 12/22/2015

Antimony	0.020247	0.010		0.023242	NR	13.8	20		
Arsenic	ND	0.010		0.011400	NR		20		
Barium	0.056768	0.0030		0.055369	NR	2.50	20		
Beryllium	ND	0.0030		ND	NR		20		
Cadmium	ND	0.0030		ND	NR		20		
Chromium	0.019232	0.0030		0.018700	NR	2.81	20		
Cobalt	0.000810	0.0030		0.000757	NR	6.74	20	J	
Copper	0.005976	0.0090		0.006230	NR	4.15	20	J	
Lead	ND	0.0050		ND	NR		20		
Molybdenum	0.035706	0.0050		0.033851	NR	5.33	20		
Nickel	0.003369	0.0050		0.003145	NR	6.88	20	J	



## Certificate of Analysis

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Thousand Oaks, CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### 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 B5L0487 - EPA 3010A\_W (continued)**

**Duplicate (B5L0487-DUP1) - Continued**

**Source: 1504336-01**

Prepared: 12/21/2015 Analyzed: 12/22/2015

Selenium	0.008683	0.010		ND	NR			20	J
Silver	ND	0.0030		ND	NR			20	
Thallium	0.003858	0.015		ND	NR			20	J
Vanadium	0.021835	0.0030		0.020923	NR		4.27	20	
Zinc	0.017642	0.025		0.017534	NR		0.616	20	J

**Matrix Spike (B5L0487-MS1)**

**Source: 1504336-01**

Prepared: 12/21/2015 Analyzed: 12/22/2015

Antimony	2.41529	0.010	2.50000	0.023242	95.7	71 - 129			
Arsenic	2.41392	0.010	2.50000	0.011400	96.1	80 - 128			
Barium	2.35241	0.0030	2.50000	0.055369	91.9	77 - 124			
Beryllium	2.44084	0.0030	2.50000	ND	97.6	88 - 116			
Cadmium	2.23369	0.0030	2.50000	ND	89.3	83 - 116			
Chromium	2.33541	0.0030	2.50000	0.018700	92.7	86 - 116			
Cobalt	2.29148	0.0030	2.50000	0.000757	91.6	83 - 117			
Copper	2.38915	0.0090	2.50000	0.006230	95.3	87 - 121			
Lead	2.26410	0.0050	2.50000	ND	90.6	85 - 114			
Molybdenum	2.43681	0.0050	2.50000	0.033851	96.1	81 - 117			
Nickel	2.24854	0.0050	2.50000	0.003145	89.8	76 - 121			
Selenium	2.33402	0.010	2.50000	ND	93.4	77 - 125			
Silver	2.32235	0.0030	2.50000	ND	92.9	77 - 129			
Thallium	2.28471	0.015	2.50000	ND	91.4	51 - 140			
Vanadium	2.30807	0.0030	2.50000	0.020923	91.5	86 - 120			
Zinc	2.22676	0.025	2.50000	0.017534	88.4	75 - 123			

**Matrix Spike Dup (B5L0487-MSD1)**

**Source: 1504336-01**

Prepared: 12/21/2015 Analyzed: 12/22/2015

Antimony	2.39416	0.010	2.50000	0.023242	94.8	71 - 129	0.879	20	
Arsenic	2.34523	0.010	2.50000	0.011400	93.4	80 - 128	2.89	20	
Barium	2.29738	0.0030	2.50000	0.055369	89.7	77 - 124	2.37	20	
Beryllium	2.43880	0.0030	2.50000	ND	97.6	88 - 116	0.0834	20	
Cadmium	2.15668	0.0030	2.50000	ND	86.3	83 - 116	3.51	20	
Chromium	2.29996	0.0030	2.50000	0.018700	91.3	86 - 116	1.53	20	
Cobalt	2.23720	0.0030	2.50000	0.000757	89.5	83 - 117	2.40	20	
Copper	2.35335	0.0090	2.50000	0.006230	93.9	87 - 121	1.51	20	
Lead	2.21398	0.0050	2.50000	ND	88.6	85 - 114	2.24	20	
Molybdenum	2.38969	0.0050	2.50000	0.033851	94.2	81 - 117	1.95	20	
Nickel	2.19994	0.0050	2.50000	0.003145	87.9	76 - 121	2.19	20	
Selenium	2.30231	0.010	2.50000	ND	92.1	77 - 125	1.37	20	
Silver	2.27974	0.0030	2.50000	ND	91.2	77 - 129	1.85	20	
Thallium	2.24983	0.015	2.50000	ND	90.0	51 - 140	1.54	20	
Vanadium	2.26999	0.0030	2.50000	0.020923	90.0	86 - 120	1.66	20	
Zinc	2.17550	0.025	2.50000	0.017534	86.3	75 - 123	2.33	20	



## Certificate of Analysis

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Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
 Report To : Anne Perez  
 Reported : 12/24/2015

### 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 B5L0528 - EPA 3010A_S</b>								
<b>Blank (B5L0528-BLK1)</b>				Prepared: 12/22/2015 Analyzed: 12/22/2015				
Lead	ND	0.050			NR			
<b>LCS (B5L0528-BS1)</b>				Prepared: 12/22/2015 Analyzed: 12/22/2015				
Lead	0.894619	0.050	1.00000		89.5    80 - 120			
<b>Duplicate (B5L0528-DUP1)</b>				Source: 1504292-11 Prepared: 12/22/2015 Analyzed: 12/22/2015				
Lead	ND	0.050		ND	NR			20
<b>Matrix Spike (B5L0528-MS1)</b>				Source: 1504292-11 Prepared: 12/22/2015 Analyzed: 12/22/2015				
Lead	2.08962	0.050	2.50000	ND	83.6    77 - 121			
<b>Matrix Spike Dup (B5L0528-MSD1)</b>				Source: 1504292-11 Prepared: 12/22/2015 Analyzed: 12/22/2015				
Lead	2.04962	0.050	2.50000	ND	82.0    77 - 121	1.93		20



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Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
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 Reported : 12/24/2015

### 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 B5L0497 - STLC_S Extraction</b>								
<b>Blank (B5L0497-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Lead	ND	1.0			NR			
<b>LCS (B5L0497-BS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Lead	1.95682		2.00000		97.8	80 - 120		
<b>Duplicate (B5L0497-DUP1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Lead	0.936668			0.473942	NR	65.6	20	R, J
<b>Matrix Spike (B5L0497-MS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Lead	3.08372		2.50000	0.473942	104	44 - 130		
<b>Matrix Spike Dup (B5L0497-MSD1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Lead	3.11440		2.50000	0.473942	106	44 - 130	0.990	20



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Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
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 Reported : 12/24/2015

### 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 B5L0488 - EPA 245.1/7470_W</b>								
<b>Blank (B5L0488-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	ND	0.20			NR			
<b>LCS (B5L0488-BS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	10.3533	0.20	10.0000		104 80 - 120			
<b>Duplicate (B5L0488-DUP1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	ND	0.20		ND	NR		20	
<b>Matrix Spike (B5L0488-MS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	10.3770	0.20	10.0000	ND	104 70 - 130			
<b>Matrix Spike Dup (B5L0488-MSD1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	10.3664	0.20	10.0000	ND	104 70 - 130	0.102	20	
<b>Post Spike (B5L0488-PS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	5.43958		5.00000	0.002881	109 85 - 115			



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### Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0482 - EPA 7471_S</b>									
<b>Blank (B5L0482-BLK1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	ND	0.10			NR				
<b>LCS (B5L0482-BS1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.761318	0.10	0.833333		91.4	80 - 120			
<b>Duplicate (B5L0482-DUP1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.125758	0.10		0.095839	NR		27.0	20	R
<b>Matrix Spike (B5L0482-MS1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.837702	0.10	0.833333	0.095839	89.0	70 - 130			
<b>Matrix Spike Dup (B5L0482-MSD1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.866904	0.10	0.833333	0.095839	92.5	70 - 130	3.43	20	
<b>Post Spike (B5L0482-PS1)</b>					Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.006633		5.00000E-3	0.001150	110	85 - 115			



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26

Report To : Anne Perez

Reported : 12/24/2015

### 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 B5L0483 - EPA 7471_S</b>								
<b>Blank (B5L0483-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	ND	0.10			NR			
<b>LCS (B5L0483-BS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.825787	0.10	0.833333		99.1	80 - 120		
<b>Duplicate (B5L0483-DUP1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.163529	0.10		0.235119	NR		35.9	20 R
<b>Matrix Spike (B5L0483-MS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	1.01649	0.10	0.833333	0.235119	93.8	70 - 130		
<b>Matrix Spike Dup (B5L0483-MSD1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	1.02832	0.10	0.833333	0.235119	95.2	70 - 130	1.16	20
<b>Post Spike (B5L0483-PS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Mercury	0.008238		5.00000E-3	0.002821	108	85 - 115		



## Certificate of Analysis

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 Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
 Report To : Anne Perez  
 Reported : 12/24/2015

### Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0478 - GCVOA_W</b>								
<b>Blank (B5L0478-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Gasoline Range Organics	ND	0.05			NR			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.09706</i>		<i>0.100000</i>		<i>97.1</i>	<i>70 - 130</i>		
<b>LCS (B5L0478-BS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Gasoline Range Organics	1.05600	0.05	1.00000		106	70 - 130		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1090</i>		<i>0.100000</i>		<i>109</i>	<i>70 - 130</i>		
<b>LCS Dup (B5L0478-BSD1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Gasoline Range Organics	1.07200	0.05	1.00000		107	70 - 130	1.50	20
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1089</i>		<i>0.100000</i>		<i>109</i>	<i>70 - 130</i>		
<b>Duplicate (B5L0478-DUP1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Gasoline Range Organics	ND	0.05		ND	NR			20
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1068</i>		<i>0.100000</i>		<i>107</i>	<i>70 - 130</i>		



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26

Report To : Anne Perez

Reported : 12/24/2015

### Gasoline Range Organics by EPA 8015B (Modified) (5035) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0573 - GCVOA_S</b>								
<b>Blank (B5L0573-BLK1)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Gasoline Range Organics	ND	1.0			NR			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1658</i>		<i>0.200000</i>		<i>82.9</i>	<i>37 - 153</i>		
<b>LCS (B5L0573-BS1)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Gasoline Range Organics	4.92200	1.0	5.00000		98.4	70 - 130		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1814</i>		<i>0.200000</i>		<i>90.7</i>	<i>37 - 153</i>		
<b>LCS Dup (B5L0573-BSD1)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Gasoline Range Organics	5.24900	1.0	5.00000		105	70 - 130	6.43	20
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1857</i>		<i>0.200000</i>		<i>92.9</i>	<i>37 - 153</i>		
<b>Duplicate (B5L0573-DUP1)</b>		<b>Source: 1504292-09</b>			Prepared: 12/23/2015 Analyzed: 12/23/2015			
Gasoline Range Organics	ND	0.77		ND	NR			20
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.1448</i>		<i>0.200000</i>		<i>72.4</i>	<i>37 - 153</i>		



## Certificate of Analysis

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 Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
 Report To : Anne Perez  
 Reported : 12/24/2015

### Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0495 - GCSEMI_DRO_LL_S</b>									
<b>Blank (B5L0495-BLK1)</b>					Prepared: 12/23/2015 Analyzed: 12/23/2015				
DRO	ND	1.0			NR				
ORO	ND	1.0			NR				
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.747		2.94500		93.3	26 - 123			
<b>LCS (B5L0495-BS1)</b>					Prepared: 12/23/2015 Analyzed: 12/23/2015				
DRO	25.8710	1.0	33.3333		77.6	47 - 127			
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.550		2.94500		86.6	26 - 123			
<b>Duplicate (B5L0495-DUP1)</b>					Prepared: 12/23/2015 Analyzed: 12/23/2015				
		<b>Source: 1504292-03</b>							
DRO	ND	1.0		ND	NR			20	
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.340		2.94500		79.5	26 - 123			
<b>Matrix Spike (B5L0495-MS1)</b>					Prepared: 12/23/2015 Analyzed: 12/23/2015				
		<b>Source: 1504292-03</b>							
DRO	30.4227	1.0	33.3333	ND	91.3	16 - 123			
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.714		2.94500		92.2	26 - 123			
<b>Matrix Spike Dup (B5L0495-MSD1)</b>					Prepared: 12/23/2015 Analyzed: 12/23/2015				
		<b>Source: 1504292-03</b>							
DRO	30.9730	1.0	33.3333	ND	92.9	16 - 123	1.79	20	
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.748		2.94500		93.3	26 - 123			



## Certificate of Analysis

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 Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
 Report To : Anne Perez  
 Reported : 12/24/2015

### Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0510 - GCSEMI_DRO_W</b>								
<b>Blank (B5L0510-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
DRO	ND	0.05			NR			
ORO	ND	0.05			NR			
<hr/>								
<i>Surrogate: p-Terphenyl</i>	<i>0.07692</i>		<i>8.83500E-2</i>		<i>87.1</i>	<i>20 - 141</i>		
<b>LCS (B5L0510-BS1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
DRO	1.02635	0.05	1.00000		103	29 - 135		
<hr/>								
<i>Surrogate: p-Terphenyl</i>	<i>0.07834</i>		<i>8.83500E-2</i>		<i>88.7</i>	<i>20 - 141</i>		
<b>LCS Dup (B5L0510-BSD1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
DRO	1.00388	0.05	1.00000		100	29 - 135	2.21	20
<hr/>								
<i>Surrogate: p-Terphenyl</i>	<i>0.07749</i>		<i>8.83500E-2</i>		<i>87.7</i>	<i>20 - 141</i>		



## Certificate of Analysis

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Thousand Oaks , CA 91361

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0478 - GCVOA_W</b>								
<b>Blank (B5L0478-BLK1)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Benzene	ND	0.50			NR			
Toluene	0.106000	0.50			NR			J
Ethylbenzene	ND	0.50			NR			
m,p-Xylene	ND	1.0			NR			
o-Xylene	ND	0.50			NR			
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>101.2</i>		<i>100.000</i>		<i>101</i>	<i>70 - 130</i>		
<b>LCS (B5L0478-BS2)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Benzene	36.7650	0.50	50.0000		73.5	70 - 130		
Toluene	37.4230	0.50	50.0000		74.8	70 - 130		
Ethylbenzene	38.7760	0.50	50.0000		77.6	70 - 130		
m,p-Xylene	82.3060	1.0	100.000		82.3	70 - 130		
o-Xylene	38.8230	0.50	50.0000		77.6	70 - 130		
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>109.6</i>		<i>100.000</i>		<i>110</i>	<i>70 - 130</i>		
<b>LCS Dup (B5L0478-BSD2)</b>				Prepared: 12/21/2015 Analyzed: 12/21/2015				
Benzene	39.8270	0.50	50.0000		79.7	70 - 130	8.00	20
Toluene	40.4580	0.50	50.0000		80.9	70 - 130	7.79	20
Ethylbenzene	41.9430	0.50	50.0000		83.9	70 - 130	7.85	20
m,p-Xylene	89.3170	1.0	100.000		89.3	70 - 130	8.17	20
o-Xylene	42.2050	0.50	50.0000		84.4	70 - 130	8.35	20
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>111.0</i>		<i>100.000</i>		<i>111</i>	<i>70 - 130</i>		
<b>Duplicate (B5L0478-DUP1)</b>			<b>Source: 1504292-10</b>		Prepared: 12/21/2015 Analyzed: 12/21/2015			
Benzene	ND	0.50		ND	NR			20
Toluene	ND	0.50		ND	NR			20
Ethylbenzene	ND	0.50		ND	NR			20
m,p-Xylene	ND	1.0		ND	NR			20
o-Xylene	ND	0.50		ND	NR			20
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>111.5</i>		<i>100.000</i>		<i>112</i>	<i>70 - 130</i>		



## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### BTEX/MTBE by EPA 8021 (5035) - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
<b>Batch B5L0573 - GCVOA_S</b>								
<b>Blank (B5L0573-BLK1)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Benzene	ND	5.0			NR			
Toluene	1.43800	5.0			NR			J
Ethylbenzene	ND	5.0			NR			
m,p-Xylene	1.11300	10			NR			J
o-Xylene	ND	5.0			NR			
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>202.8</i>		<i>200.000</i>		<i>101</i>	<i>62 - 128</i>		
<b>LCS (B5L0573-BS2)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Benzene	111.857	5.0	100.000		112	70 - 130		
Toluene	108.939	5.0	100.000		109	70 - 130		
Ethylbenzene	107.461	5.0	100.000		107	70 - 130		
m,p-Xylene	224.375	10	200.000		112	70 - 130		
o-Xylene	109.920	5.0	100.000		110	70 - 130		
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>219.0</i>		<i>200.000</i>		<i>110</i>	<i>62 - 128</i>		
<b>LCS Dup (B5L0573-BSD2)</b>				Prepared: 12/23/2015 Analyzed: 12/23/2015				
Benzene	100.426	5.0	100.000		100	70 - 130	10.8	20
Toluene	98.0260	5.0	100.000		98.0	70 - 130	10.5	20
Ethylbenzene	97.4300	5.0	100.000		97.4	70 - 130	9.79	20
m,p-Xylene	202.924	10	200.000		101	70 - 130	10.0	20
o-Xylene	99.3170	5.0	100.000		99.3	70 - 130	10.1	20
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>220.4</i>		<i>200.000</i>		<i>110</i>	<i>62 - 128</i>		
<b>Duplicate (B5L0573-DUP1)</b>		<b>Source: 1504292-09</b>			Prepared: 12/23/2015 Analyzed: 12/23/2015			
Benzene	6.39401	3.8		4.66376	NR		31.3	20 R
Toluene	4.16129	3.8		2.98253	NR		33.0	20 R
Ethylbenzene	0.753456	3.8		ND	NR			20 J
m,p-Xylene	1.10061	7.7		0.798399	NR		31.8	20 R, J
o-Xylene	ND	3.8		ND	NR			20
<hr/>								
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>167.4</i>		<i>200.000</i>		<i>83.7</i>	<i>62 - 128</i>		



# Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

## 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 B5L0549 - Prep\_WC1\_S

Duplicate (B5L0549-DUP1)

Source: 1504292-12

Prepared: 12/22/2015 Analyzed: 12/22/2015

pH	8.56000	0.10		8.58000	NR		0.233	20	
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## Certificate of Analysis

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

Project Number : 185831026, Task: 200.0005, Caltrans 07A3321-26  
Report To : Anne Perez  
Reported : 12/24/2015

### Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
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 # \_\_\_\_\_  
Page 1 of 2

FIELD OFFICE INFORMATION			PROJECT INFORMATION			ANALYSES / METHOD REQUEST						REMARKS / PRECAUTIONS		
OFFICE: Stantec - Thousand Oaks			Project No.: 185831026 Task: 200.0005			Title 22 Metals - 6010/7000						TAT		
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361 Telephone: (805) 230-1266 Fax/E-Mail: scott.edblad@stantec.com / kristy.edblad@stantec.com anne.perez@stantec.com			Project Name: Caltrans 07A3321-26 Project Manager: Anne Perez Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755			TPH - GRO & BTEX (5035)						Normal <input checked="" type="checkbox"/> MB & SURGS		
Sample No. / Identification			SAMPLE Time		Container Matrix * & Size **		Preservative		TPH - DRO & -MRO					
1307-101-0			12/15/15		0820 SO 8 OZ		NONE		1					
1307-101-2									LAB COMPOSITE					
1307-101-5									INTD 1307-101					
1307-101-12														
1307-102-0														
1307-102-2														
1307-102-5									LAB COMPOSITE					
1307-102-12									INTD 1307-102					
1307-101-085									3					
1307-101-50														
1307-102-5														

Number of Containers

TPH - GRO & BTEX (5035)

TPH - DRO & -MRO

Cal-WET Citric (other)

Cal-WET Citric (LEAD)

TCLP - 1311 (LEAD)

PH - 9045

REPORTING REQUIREMENTS

Normal  MB & SURGS

Rush  Dup/IMS/MSD

Other:  Raw Data

CLP Rpt

EDD

Other

Note: Cal-WET Citric (other) shall be done on any metal that exceeds 10 times their respective STLC

Possible Hazard Identification

Non-Hazardous  Flammable  Skin Irritant  Poison B  Unknown  Sample Disposal  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Sampled by: SCOTT EOBLOD Shipment Method: LAB PICK-UP Airbill Number: \_\_\_\_\_

Signature	Print Name	Company	Date	Time
1(a) Relinquished by: <u>[Signature]</u>	SCOTT EOBLOD	STANTEC	12/15/15	18:00
1(b) Received by: <u>[Signature]</u>	Edward Rodriguez	ATC	12-16-15	13:40
2(a) Relinquished by: <u>[Signature]</u>	Edward Rodriguez	ATC	12-16-15	18:15
2(b) Received by: <u>[Signature]</u>	FERNANDO DIVER	ATC	12/16/15	18:15
3(a) Relinquished by:				
3(b) Received by:				

\*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste  
 \*\*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 #

Page 2 of 2

FIELD OFFICE INFORMATION				PROJECT INFORMATION				ANALYSES / METHOD REQUEST				REMARKS/ PRECAUTIONS	
OFFICE: Stantec - Thousand Oaks				Project No.: 185831026 Task: 200.0005				Title 22 Metals - 6010/7000				TAT	
Send Report to: Stantec 290 Conejo Ridge Avenue Thousand Oaks, CA 91361 Telephone: (805) 230-1266 Fax/E-Mail: scott.edbiac@stantec.com / krisly.edbiac@stantec.com anne.perez@stantec.com				Project Name: Caltrans 07A3321-26 Project Manager: Anne Perez Laboratory: Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755				TPH - GRO & -MRO				Normal <input checked="" type="checkbox"/>	
Sample No. / Identification				SAMPLE		Container & Size **		Preservative		MB & SURGS <input type="checkbox"/>			
				Time		Matrix *		Matrix		Dup/MS/MSD <input type="checkbox"/>			
1307-101-12				0855		SO		VOA 4 L NPL NG-HSO4		Raw Data <input type="checkbox"/>			
1307-102-12				1128		↓		↓		CLP Rpt <input type="checkbox"/>			
1307-EB121515				↓		AQ		A 320Z P 160Z NONE		CLP Rpt <input type="checkbox"/>			
										EDD <input checked="" type="checkbox"/>			
										Other <input type="checkbox"/>			
										Note: Cal-WET Citric (other) shall be done on any metal that exceeds 10 times their respective STLC			
										Disposal by Lab <input type="checkbox"/>			
										Archive for _____ Months			

Number of Containers

TPH - GRO & BTEX (6035)  TPH - DRO & -MRO  Cal-WET Citric (other)  Cal-WET Citric (LEAD)  TCLP - 1311 (LEAD)  PH - 9045

Possible Hazard Identification  
 Non-Hazardous  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Sample Disposal

Shipment Method: LAB PICK-UP      Airbill Number:

Sampled by: SCOTT EOBIAO      Print Name      Company

1(a) Relinquished by: *Scott Ebiac*      SCOTT EOBIAO      STANTEC      Date: 12/15/15      Time: 1800

1(b) Received by: *Edward Rodriguez*      Edward Rodriguez      ATL      Date: 12/16/15      Time: 1340

2(a) Relinquished by: *Edward Rodriguez*      Edward Rodriguez      ATL      Date: 12/16/15      Time: 1815

2(b) Received by: *Edwards Owa*      EDWARDS OWA      ATL      Date: 12/16/15      Time: 1815

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

  
**ADVANCED TECHNOLOGY**  
 LABORATORIES

**Sample Receipt Acknowledgement**

**Work Order # 1504292**

<b>Client:</b> Stantec - Thousand Oaks	<b>Project Manager:</b> Rachele Arada
<b>Project:</b> 185831026, Task: 200.0005, Caltrans 07A3321-26	<b>Project Number:</b> 185831026, Task: 200.0005, Caltrans 07A3321-26

<b>Report To:</b> Stantec Anne Perez 290 Conejo Ridge Avenue, Suite 200 Thousand Oaks, CA 91361 Phone: (805) 230-1266 Fax: (805) 230-1277	<b>Invoice To:</b> Stantec Anne Perez 290 Conejo Ridge Avenue, Suite 200 Thousand Oaks, CA 91361 Phone : (805) 230-1266 Fax: (805) 230-1277
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Date Due: 12/23/15 17:00 (5 day TAT)	Date Received: 12/16/15 13:40
Received By: Ron Diwa	Date Logged In: 12/16/15 16:58
Logged In By: Carmen Aguila	Shipped by: ATL

Please review the checklist below. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues. If you have any questions or further instructions, please contact your Project Manager at (562) 989-4045.

Sample(s) received on ice?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Default Cooler      Temp: 5.4 °C
Sample(s) received on blue ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Cooler temperature within acceptance limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Shipping container received in good condition?	Not Applicable		
Custody seals present on shipping container?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Custody seals intact on shipping container?	Not Applicable		
Custody seals present on sample bottles?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Custody seals intact on sample bottles?	Not Applicable		
Chain of Custody (COC) present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sampler name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample amount for indicated tests?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Water for VOC -- Were VOA vials submitted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Water samples submitted?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
VOA vials for VOC meet headspace criteria?	Not Applicable		
Water samples meet preservation criteria?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

**Sample Receipt Comments:**  
 See correspondence for issues on samples received. Sample for metals (water) filtered and preserved per client's instruction.

# CLIENT CORRESPONDENCE LOG

Client Name: Stantec - Thousand Oaks

ATL Workorder No.: 1504292



Date	Contact	Call in/Out Issue / Problem	Comments / Corrective Action	Initial
12/17/2015 2:01:08 PM	Scott	OUT -No 8oz jar sample was received for 1307-101-5D -No vov vials received for 1307-EB121515	-transfer from 1307-101-5 and label as -5D -okay to transfer some samples from the amber container submitted to vov vials.	carmen

**APPENDIX F**  
**DATA VALIDATION RECORDS**

## APPENDIX F

### DATA VALIDATION REPORT

#### SITE INVESTIGATION REPORT

UPGRADE TRAFFIC SIGNALS AT CHERRY AVENUE TO WB SR91 ON-RAMP AND  
PARAMOUNT BLVD TO EB SR91 ON-RAMP  
LA-91 PM 12.9/13.7,  
Caltrans Contract Number 07A3321, Task Order #26  
EA Number: 07-4T7701  
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, STLC Lead and TCLP Lead by SW 846 6010B, Mercury by 7471A/7470A, Gasoline Range Organics by 8015B modified, Diesel Range Organics by 8015B, Volatile Organic Compounds by 8021 and pH by EPA 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. One analytical report and associated addenda were validated:

- 1504292.

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);
- Surrogate recoveries;
- Laboratory control sample (LCS) recovery;
- Laboratory duplicate sample precision;
- Matrix spike/matrix spike duplicate (MS/MSD) recovery;
- Field duplicate precision, and
- Overall data assessment.

The following summarizes the results of the validation:

1. Data Completeness: Data for 7 solid samples and 1 equipment blank were collected December 15, 2015 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 and thallium), toluene and m&p-xylene were reported in method blanks 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, field artifact associated with dust, incomplete decontamination or artifact from contact with metal sampling equipment.
6. Surrogate recoveries are within limits for all analyses for all samples.
7. Laboratory Control Samples: All LCS samples reported percent recoveries within method and/or laboratory limits.
8. Laboratory Duplicate Samples: Laboratory duplicate samples were reported within the relative percent difference (RPD) control limit of 20 percent except for the following:
  - a. 6010B batch B5L0497 – Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for STLC Lead (66%). Sample site specific. Associated result flagged "J" for 1307-102 only.
  - b. 8021 batch B5L0573 - Laboratory duplicate RPD above limits ( $\pm 20\%$ ) for Benzene (31%) and Toluene (33%). Sample site specific. Associated result flagged "J" for 1307-101-5D only.

Reason Code – LDUP

The discrepancy appears to be related to natural sample heterogeneity and the data were qualified as indicated above.

9. 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.

10. One pair of Field Duplicates was collected. All RPDs are within the control limit of 20%.
11. 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 Table 1.

**Stantec Analytical Validation Report/Checklist**

**Report No. 010516-EC-01**

Project Name: Caltrans 07A TO-26	Project Number: 185831026		
Stantec Validator: Elizabeth Crowley	Laboratory: ATL, Signal Hill, CA		
Date Validated: 12/30/15	Laboratory Project Numbers: 1504292		
Sample Start-End Date: 12/15/15	Laboratory Report Dates: 12/24/15		
Parameters Validated: Total Metals, STLC Lead and TCLP Lead by EPA SW-846 6010B, Mercury by 7471A/7470A, Gasoline Range Organics (GRO) by 8015B modified, Diesel Range Organics (DRO) by 8015B, Volatile Organic Compounds (BTEX) by 8021 and pH by 9045C			
Samples Validated: 7 solid field samples 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>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:			
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:			
6.	Were correct concentration units reported?	Yes X	No
Comments: Results reported in both mg/Kg and mg/L depending on the analytical method and/or matrix.			
7.	Were detections found in laboratory blank samples?	Yes X	No

<p>Comments: 6010B batch B5L0479 – Barium = 0.04 mg/Kg. Batch B5L0481 – Barium = 0.16 mg/Kg, Chromium = 0.22 mg/Kg and Copper = 0.13 mg/Kg.</p> <p>8021 batch B5L0478 – Toluene = 0.106 mg/L. Associated sample results greater than 10 times the blank concentration. No qualifying action required.</p> <p>6010B batch B5L0487 – Barium = 0.0005 mg/L, Chromium = 0.0019 mg/L, Copper = 0.0059 mg/L and Thallium = 0.0010 mg/L.</p> <p>8021 batch B5L0573 – Toluene = 1.44 mg/Kg and m &amp; p Xylene = 1.11 mg/Kg. 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: 1307-EB121515 – Barium = 0.0025 mg/L, Beryllium = 0.0008 mg/L, Cadmium = 0.0019 mg/L, Chromium = 0.0063 mg/L, Cobalt = 0.0023 mg/L, Copper = 0.0041 mg/L, Molybdenum = 0.0028 mg/L, Nickel = 0.0021 mg/L and Thallium = 0.0084 mg/L. Associated sample results are 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 X	No
<p>Comments:</p>		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
<p>Comments:</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 B5L0497 – Laboratory duplicate RPD above ±20% limit for STLC Lead (66%). Associated sample result flagged “J” for 1307-102 only.</p> <p>8021 batch B5L0573 – Laboratory duplicate RPD above ±20% limit for Benzene (31%), Toluene (33%). Associated result flagged “J” for 1307-101-5D only. Reason Code – LDUP</p>		
14. Were dilutions required on any samples?	Yes X	No
<p>Comments: No qualifying action required.</p>		

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: Level II data package, no data provided.			
17. Were GC/MS internal standards within method criteria?	Yes	No	
	NA		
Comments: Level II data package, no data provided.			
18. Were inorganic system performance criteria met?	Yes	No	
	X		
Comments:			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No	
	X		
Duplicate Sample Nos. 1307-101-5 1307-101-5D			
Comments: All RPDs are within limits.			
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	Unacceptable	Initials EAC
	X		
Comments: Data usable as qualified.			
Sensitivity:	Acceptable	Unacceptable	Initials EAC
	X		
Comments: Samples analyzed at lowest levels possible to achieve required screening limits.			
Accuracy:	Acceptable	Unacceptable	Initials EAC
	X		
Comments: Data usable as qualified.			
Representativeness:	Acceptable	Unacceptable	Initials EAC
	X		

Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments: No data are rejected.			



DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	LA	91	6.5/14.6	69	127

**Albachew Bekele**  
 REGISTERED ELECTRICAL ENGINEER  
 No. E15331  
 Exp. 6/30/01  
 STATE OF CALIFORNIA

6-15-98  
 PLANS APPROVAL DATE  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

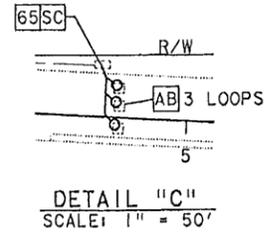
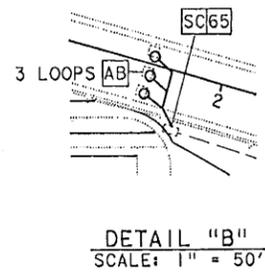
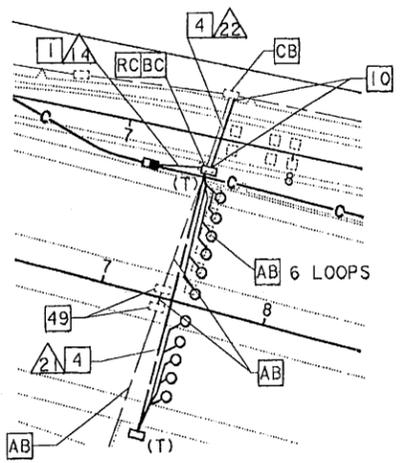
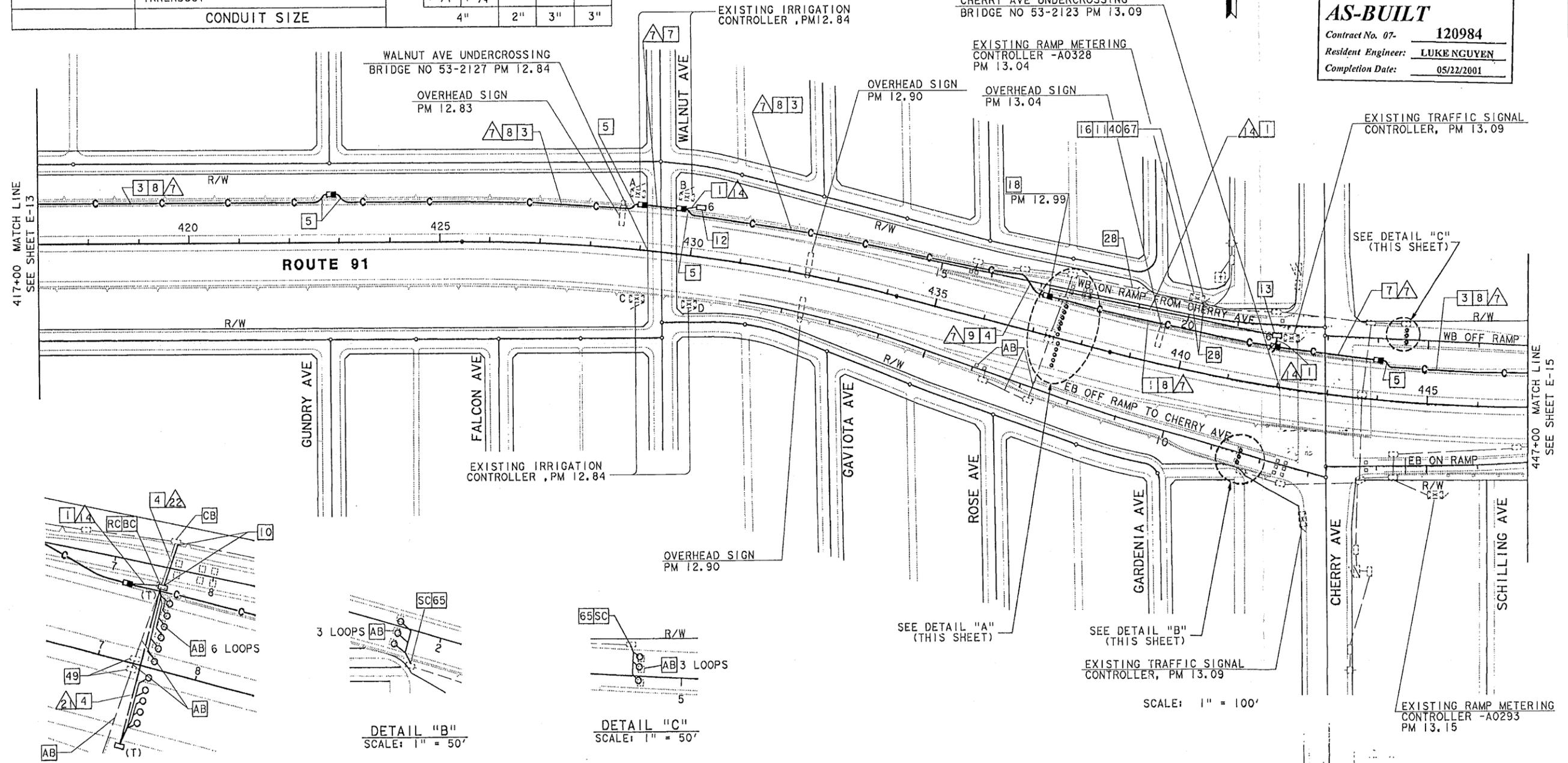
### CONDUIT AND CONDUCTOR SCHEDULE (THIS SHEET ONLY)

CONDUCTOR TYPE	FUNCTION	RUN			
		7	14	21	22
6P22 CABLE	DATA/PHONE				
50P22 CABLE	DATA/PHONE				
36SMFO CABLE	VIDEO/DATA				
12SMFO CABLE	VIDEO/DATA				
DLC	DETECTOR LEAD-IN CABLE			5	11
	INNERDUCT	1 1/4"	1 1/4"		
	CONDUIT SIZE	4"	2"	3"	3"

- #### CONSTRUCTION NOTES (THIS SHEET ONLY)
- 28 ADD 1-6P22 CABLE & 11 DLC, REMOVE 6 DLC IN EXISTING CONDUIT.
  - 40 TERMINATE 11 DLC IN EXISTING CABINET & INSTALL 5 STATE-FURNISHED LOOP DETECTOR SENSOR UNITS.
  - 49 REMOVE AND DISPOSE OF PULL BOX/HANDHOLE. FILL OPENING WITH PCC AND AC TO MATCH EXISTING (0.1' MIN AC).
  - 65 REUSE EXISTING DLC.
  - 67 REUSE AND RE-TAG EXISTING DLC. RECONFIGURE LOOP DETECTOR CABLES IN CABINET TO PROVIDE REVISED DETECTOR LOOP OPERATION.

**AS-BUILT**

Contract No. 07- **120984**  
 Resident Engineer: **LUKE NGUYEN**  
 Completion Date: **05/22/2001**



NOTE: THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY. SEE SHEET E-1 FOR LEGEND AND PROJECT NOTES. SEE SHEET U-14 FOR EXISTING UTILITIES.

## DETECTOR LOOP AND COMMUNICATIONS SYSTEM ROUTING

SCALE AS SHOWN

PROJECT ENGINEER - DEPARTMENT OF TRANSPORTATION  
 PAT SULLIVAN  
 STATE OF CALIFORNIA - Caltrans

LAST REVISION  
 08-12-97