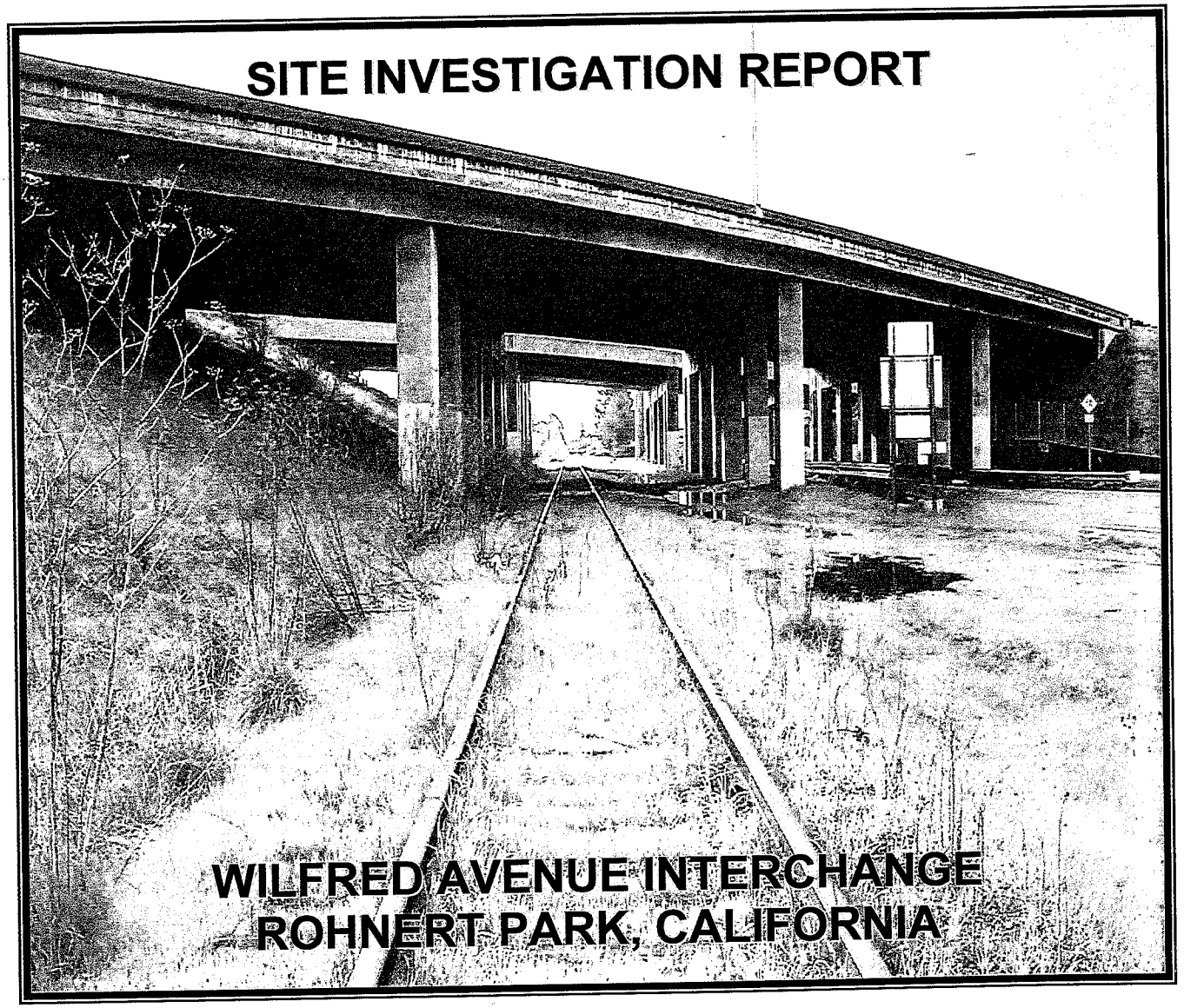
SITE INVESTIGATION REPORT



WILFRED AVENUE INTERCHANGE
ROHNERT PARK, CALIFORNIA

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EXECUTIVE SUMMARY

This Site Investigation Report was prepared for the Wilfred Avenue interchange project in Rohnert Park, Sonoma County, California. This report documents the investigation sampling methods laboratory analytical data.

Caltrans proposes to widen Route 101 from four to six lanes. The work will be performed from Rohnert Park Expressway to Santa Rosa Avenue in Rohnert Park, California. As part of the project, Caltrans will tunnel through the existing freeway embankment at Wilfred Avenue to construct a new undercrossing. The existing Wilfred Avenue overhead structure that crosses the Northern Pacific Railroad tracks will be demolished and replaced with a new structure. Local streets and freeway ramps will be modified or reconfigured. Additionally, there will be new right-of-way acquired by the state on the west side of Route 101 north of Commerce Boulevard. The project limits are depicted on the Vicinity Map, Figure 1.

The purposes of the scope of services performed were to: 1) evaluate whether impacts due to aerially deposited lead (ADL) exist in the surface and near surface soil within unpaved areas of the project boundaries, 2) characterize concentrations of organics and metals in soil and groundwater of the northbound on- and off-ramps, the proposed new state right-of-way, and near the existing abutments under the Wilfred Avenue overhead, and 3) survey the Wilfred Avenue overhead structure for asbestos-containing materials. The information obtained from this investigation will be used by Caltrans to coordinate widening and improvement activities, determine soil and groundwater disposal costs, and identify health and safety concerns during improvements.

Geocon performed the asbestos survey in March 2006. The survey results were reported under separate cover in the *Asbestos Survey Report,* dated March 28, 2006.

The following field activities were performed during soil sampling efforts between March 7 and May 4, 2006.

- Advanced 41 soil borings using hand auger and direct push methods
- Collected 138 soil samples from the hand auger and direct push borings.
- Collected 14 grab-groundwater samples from the direct push borings.
- Transported samples to a California-certified environmental laboratory.

The boring locations were surveyed using Differential Global Positioning System (DGPS) equipment and are shown on the Site Plans, Figures 2a through 2d. Boring coordinates are presented in Table 1.

The hand auger soil borings were advanced to a maximum depth of approximately 0.75 meter (2.5 feet) below ground surface (bgs) using hand auger methods. Samples were collected at approximate depth intervals of 0 to 0.15 meter (0 to 0.5 foot), 0.3 to 0.45 meter (1 to 1.5 feet), and 0.6 to 0.75 meter (2 to 2.5 feet). Refusal condition was encountered in one of the hand auger borings.

Fourteen borings were further advanced to first-encountered groundwater using a direct push rig. In addition to the three soil samples collected in the upper 0.75 meter, deeper soil samples were collected at 1.5-meter (5-foot) intervals until groundwater was encountered. The deepest soil sample was collected from 4.6 meters (15 feet) bgs. Boring logs for these 14 borings are included as Appendix A.

Groundwater samples were collected from the direct push borings by installing a 1-inch-diameter slotted PVC casing into each borehole. Grab-groundwater samples were collected from within the casing using new disposable tubing and a waterri foot valve. The grab-groundwater samples were decanted directly from the disposable tubing into laboratory-supplied sample bottles.

The laboratory testing performed is summarized below:

Soil Samples

- All soil samples (79 total) collected from the hand auger borings advanced along the northbound shoulders (NBS), southbound shoulders (SBS), and southbound ramps (SBR) were analyzed for total lead using EPA Test Method 6010.
- All soil samples (42 total) collected from the upper 0.75 meter (2.5 feet) of the borings advanced at the abutments (AB) and northbound ramps (NBR) were analyzed for total CAM-17 metals using EPA Test Method 6010/7000.
- Thirty-two soil samples collected from the AB and NBR borings were analyzed for total petroleum hydrocarbons as gasoline (TPHg), as diesel (TPHd), and as motor oil (TPHmo) using EPA Test Method 8015; and for semi-volatile organic compounds (SVOCs) using EPA Test Method 8270.
- Seventeen soil samples collected from the AB and NBR borings were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and fuel oxygenate compounds (FOCs), including methyl tert butyl ether (MTBE), using EPA Test Method 8260.
- Forty-two soil samples collected from the AB and NBR borings were analyzed for polychlorinated biphenyls (PCBs) using EPA Test Method 8082.
- A total of 28 soil samples exhibited total lead concentrations greater than or equal to 50 mg/kg (i.e., greater than ten times the lead Soluble Threshold Limit Concentration [STLC] of 5 mg/l) and were analyzed for soluble (Waste Extraction Test [WET]) lead.
- A total of 11 soil samples were further analyzed for soluble lead using the Waste Extraction Test procedure with deionized water as the extractant (WET-DI).
- The two soil samples with the highest total lead concentrations were analyzed for soluble lead using the Toxicity Characteristic Leaching Procedure (TCLP).

- Three soil samples exhibited total arsenic concentrations greater than 50 mg/kg (i.e., greater than ten times the arsenic STLC of 5 mg/l) and were analyzed for soluble (WET) arsenic.

Grab-groundwater Samples

- All grab-groundwater samples (14 total) were analyzed for TPHg using EPA Test Method 8015; BTEX, FOCs, and volatile organic compounds (VOCs) using EPA Test Method 8260; and SVOCs using EPA Test Method 8270.
- Thirteen grab-groundwater samples were analyzed for TPHd and TPHmo using EPA Test Method 8015. The grab-groundwater sample collected from boring AB3 could not be analyzed for TPHd or TPHmo due to insufficient sample volume.

A summary of the analytical laboratory test results for lead and pH is presented as Table 2, for CAM-17 metals as Table 3, and for organics in soil as Table 4. Grab-groundwater sample results are summarized on Table 5. The laboratory analyses indicated the following:

- Soil samples analyzed for total lead exhibited concentrations ranging from less than the laboratory reporting limit of 1.0 mg/kg (<1.0 mg/kg) to 541 mg/kg.
- Soil samples analyzed for soluble (WET) lead exhibited concentrations ranging from 0.251 mg/l to 31.7 mg/l.
- Soil samples analyzed for soluble (WET-DI) lead exhibited concentrations of <0.050 mg/l to 0.26 mg/l.
- Soil samples analyzed for soluble (TCLP) lead exhibited concentrations of 0.419 mg/l and 2.69 mg/l.
- Soil pH values ranged from 5.96 to 8.02.
- Arsenic was the only other CAM-17 metal (other than lead) detected at concentrations greater than 50 mg/kg (i.e., greater than ten times the STLC of 5 mg/l). The reported arsenic concentrations ranged from <8.0 mg/kg to 86 mg/kg.
- Soil samples analyzed for soluble (WET) arsenic exhibited concentrations ranging from 1.32 mg/l to 2.23 mg/l.
- TPHg, TPHd, TPHmo, BTEX, FOCs, PCBs, or SVOCs were not detected above the laboratory reporting limits in the soil samples.
- The common laboratory contaminants acetone and 2-butanone (MEK) were the only VOCs detected in the soil samples.
- TPHg, TPHd, TPHmo, BTEX, FOCs, SVOCs, or VOCs were not detected above the laboratory reporting limits in the grab-groundwater samples.

Northbound Shoulders (Borings NBS1 through NBS8)

Soil generated from excavations to 0.3 meter (1 foot) in depth would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 0.3 meter (1 foot) of excavated soil would require offsite disposal as a hazardous waste or onsite reuse under the DTSC variance. Based on the soluble (TCLP) results, the top 0.3 meter (1 foot) of soil would not be considered a federal hazardous waste. Based on the soluble (WET-DI) lead results, the top 0.3 meter (1 foot) of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under clean fill or a pavement structure. Underlying soil (i.e., deeper than 0.3 meter bgs) will not be considered hazardous and can be reused onsite without restriction based on lead content.

If soil excavations are 0.75 meter (2.5 feet) in depth, the excavated soil would be not be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is less than the lead STLC of 5.0 mg/l. The top 0.75 meter (2.5 feet) of excavated soil will not be considered hazardous and can be reused onsite without restriction based on lead content.

Southbound Ramps (Borings SBR1 through SBR7)

Soil generated from all excavation depths would not be classified as a California hazardous waste since the total lead 90% UCL concentration is less than 50 mg/kg (i.e., less than ten times the STLC value). Excavated soil will not be considered hazardous and can be reused onsite without restriction based on lead content.

Southbound Shoulders (Borings SBS1 through SBS12)

Soil generated from excavations to 0.3 meter (1 foot) in depth would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentration is greater than the lead STLC of 5.0 mg/l. Consequently, the top 0.3 meter (1 foot) of excavated soil would require offsite disposal as a hazardous waste. Based on the soluble (TCLP) results, the top 0.3 meter (1 foot) of soil would not be considered a federal hazardous waste. Based on the soluble (WET-DI) lead results, the top 0.3 meter (1 foot) of soil may be reused in accordance with the DTSC variance by placing the lead-impacted soil under clean fill or a pavement structure. Underlying soil (i.e., deeper than 0.3 meter bgs) will not be considered hazardous and can be reused onsite without restriction based on lead content.

Based on the soluble (WET) arsenic concentrations, the material will not be considered a hazardous waste since the reported soluble concentrations are less than 5 mg/l.

Organics

Organic compounds (with the exception of common laboratory contaminants acetone and 2-butanone [MEK]) were not detected in soil or grab-groundwater samples above the laboratory reporting limits.

Worker Protection

Per Caltrans requirements, contractor(s) should prepare a project-specific Health and Safety Plan to prevent or minimize worker exposure to lead-impacted soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other appropriate health and safety protocols and procedures for the handling of lead-impacted soil. The plan should also address the elevated arsenic concentrations encountered near the abutments.