

## 9.4 Conclusions and Recommendations

Based on the laboratory analytical results of soil samples S-1 through S-6 and arsenic background soil samples AS-1 and AS-2, *GeoSolve, Inc.* recommends conducting an Additional Phase II ESA to evaluate the vertical extent of arsenic, lead and organochloride pesticides within the surficial soil at the site.

## 10.0 ADDITIONAL PHASE II ENVIRONMENTAL SITE ASSESSMENT

### 10.1 Fieldwork

On May 13, 2016, a *GeoSolve, Inc.* field geologist observed Penecore Drilling, Inc. of Woodside, a State licensed drilling contractor (C57-906899) advance 16 shallow borings (B-1 through B-16) at random locations around the subject property in order to evaluate the lateral and vertical extent of arsenic, lead and organochloride pesticides within the subsurface soil from ground surface to 2 feet bgs. The borings were drilled and sampled using a GeoProbe 6600 track-mounted direct-push drilling rig, equipped with a stainless steel, dual-tube acetate lined sampling system, to obtain continuous shallow soil cores at the site. Acetate liners were extracted from all borings for laboratory analysis. Soil samples were hand collected at 0.5-, 1-, 1.5-, and 2-feet bgs by hand using a hack saw, in which the sample lengths were measured using a ruler, and the cut sample ends were covered with Teflon tape, capped, labeled and placed within a pre-chilled ice-chest for temporary storage. The locations of borings B-1 through B-16 are shown on Figure 3.

Once sampling activities were completed in all the borings, the borings were backfilled with neat cement to grade.

### 10.2 Laboratory Analytical Methods and Results

All soil samples collected from borings B-1 through B-16 were submitted under chain-of-custody documentation to McCampbell Analytical, Inc. for potential analysis. Soil samples collected from borings B-1 through B-16 at depths of 0.5-, and 1-foot bgs were analyzed for arsenic, lead and organochloride pesticides using EPA Methods SW3050B/SW6010B and SW8080. The laboratory analytical results are shown on Table 2, Analytical Results of Additional Soil Samples and a copy of the McCampbell Analytical, Inc. laboratory analytical report and chain-of-custody document are attached to the appendix.



**Table 2**  
**Analytical Results of Additional Soil Samples**  
**Caltrans Property – B Street, Chestnut Street and 4<sup>th</sup> Street**  
**Hayward, California**  
**May 13, 2016**

| Sample ID | Depth (feet) | Arsenic (mg/Kg) | Lead (mg/Kg) | Dieldrin (mg/Kg) | Chlordane (mg/Kg) | DDT (mg/Kg) | DDE (mg/Kg) | DDD (mg/Kg) |
|-----------|--------------|-----------------|--------------|------------------|-------------------|-------------|-------------|-------------|
| B1-0.5    | 0.5          | 6.2             | 250          | 0.008            | 0.43              | 0.034       | <0.005      | <0.005      |
| B1-1      | 1            | 6.4             | 270          | 0.0069           | 0.351             | 0.024       | 0.0056      | <0.005      |
| B2-0.5    | 0.5          | 20              | 250          | 0.090            | 0.578             | 0.029       | 0.013       | <0.005      |
| B2-1      | 1            | 21              | 130          | 0.0061           | 0.055             | 0.0037      | 0.0024      | <0.001      |
| B3-0.5    | 0.5          | 7.7             | 22           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B3-1      | 1            | 5.7             | 8.0          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B4-0.5    | 0.5          | 4.3             | 310          | 0.0051           | 0.311             | 0.10        | 0.032       | 0.0029      |
| B4-1      | 1            | 6.3             | 8.0          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B5-0.5    | 0.5          | 4.3             | 9.4          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B5-1      | 1            | 4.5             | 6.9          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B6-0.5    | 0.5          | 7.9             | 32           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B6-1      | 1            | 6.4             | 7.4          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B7-0.5    | 0.5          | 8.1             | 18           | <0.001           | <0.025            | 0.0012      | <0.001      | <0.001      |
| B7-1      | 1            | 6.5             | 11           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B8-0.5    | 0.5          | 8.6             | 21           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B8-1      | 1            | 9.2             | 17           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B9-0.5    | 0.5          | 6.6             | 590          | 0.004            | 0.167             | 0.013       | 0.0038      | <0.001      |
| B9-1      | 1            | 4.7             | 6.7          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B10-0.5   | 0.5          | 8.9             | 380          | <0.001           | <0.025            | 0.0098      | <0.001      | <0.001      |
| B10-1     | 1            | 2.9             | 24           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B11-0.5   | 0.5          | 9.3             | 280          | <0.001           | 0.002             | 0.018       | 0.026       | 0.0014      |
| B11-1     | 1            | 5.5             | 7.1          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B12-0.5   | 0.5          | 5.0             | 420          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B12-1     | 1            | 5.7             | 200          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B13-0.5   | 0.5          | 8.4             | 110          | <0.01            | <0.25             | 0.022       | 0.034       | <0.01       |
| B13-1     | 1            | 6.8             | 7.3          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B14-0.5   | 0.5          | 5.5             | 20           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B14-1     | 1            | 7.3             | 10           | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B15-0.5   | 0.5          | 6.5             | 96           | <0.001           | <0.025            | 0.0077      | 0.0036      | <0.001      |
| B15-1     | 1            | 11              | 120          | 0.0012           | <0.025            | 0.0062      | 0.012       | <0.001      |
| B16-0.5   | 0.5          | 5.8             | 39           | <0.005           | <0.12             | 0.021       | 0.0074      | <0.005      |
| B16-0.5D  | 1            | 5.3             | 40           | <0.005           | <0.12             | 0.021       | 0.0076      | <0.005      |
| B16-1     | 0.5          | 6.5             | 7.8          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| B16-1D    | 1            | 5.4             | 6.4          | <0.001           | <0.025            | <0.001      | <0.001      | <0.001      |
| ESLs      | ---          | 0.067*          | 80           | 0.038            | 0.48              | 1.9         | 1.9         | 2.7         |

mg/Kg = milligrams per kilogram, equivalent to parts per million (ppm).



|      |   |   |
|------|---|---|
| NA   | = | Not analyzed.   |
| ESLs | = | Environmental Screening Levels, RWQCB, February 2016. |
| *    | = | CalEPA uses background concentrations from arsenic.   |

### 10.3 Discussion

The laboratory analytical results of the subsurface soil samples collected and analyzed from borings B-1 through B-16 at the site indicated elevated concentrations of arsenic in boring B-2 at 20 mg/Kg and 21 mg/Kg at 0.5 foot and 1 foot bgs. All other arsenic concentrations were detected within background concentrations at the site. Elevated concentrations of chlordane and Dieldrin were detected in soil sample B2-0.5 at 0.578 mg/Kg and 0.090 mg/Kg, which were detected above the ESL for residential development of 0.48 mg/Kg and 0.038 mg/Kg, respectively. All other organochloride pesticides were detected below the ESLs for residential development (RWQCB, February 2016).

Lead was detected above the ESL for residential development of 80 mg/Kg in soil samples B1-0.5, B1-1, B2-0.5, B2-1, B4-0.5, B9-0.5, B10-0.5, B11-0.5, B12-0.5, B12-1, B13-0.5, B15-05, and B15-1. The highest concentration of lead was detected in boring B9 at 590 mg/Kg at 0.5-foot bgs.

Based on the laboratory analytical results, *GeoSolve, Inc.* concludes approximately 5,100 tons of Class I Hazardous Waste as soil are present on the property at depths ranging from 0.5- foot to 1.5-feet bgs, especially around borings B-1, B-2, B-12 and B-15. Table 3 below summarizes the disposal costs associated with the subject property.

**Table 3**  
**Estimate Soil Disposal Fees**  
**Caltrans Property – B Street, Chestnut Street and 4<sup>th</sup> Street**  
**Hayward, California**

| Soil Volume<br>(tons) | California Class I Waste Rate<br>(\$165 per ton) | Federal Class I Waste Disposal Rate<br>(\$500 per ton) |
|-----------------------|--|--|
| 5,100                 | \$841,500.00                                     | \$2,550,000.00   |

Therefore, the disposal fee cost will most likely range between \$0.85 million to \$2.6 million and \$0.4 million for consulting and subcontractor fees. These costs do not include backfilling and compacting of imported soil, and/or proper destruction of groundwater supply wells discovered during site grading.



## 10.4 Conclusions and Recommendations

Based on the laboratory analytical results of soil samples S-1 through S-6 and additional soil samples B1-0.5 through B16-1, the subject property requires remediation prior to development. The excavated soil will be at least a California Hazardous Waste or a Federal Hazardous Waste, where costs for disposal will range between \$1.2 million to \$3 million, without importing clean fill and compaction of the clean fill, and/or property destruction of any discovered groundwater supply wells.

*GeoSolve, Inc.* recommends this property must be remediated through the California Environmental Protection Agency due to the very high concentrations of lead and soluble lead prior to development of the property. In addition, a magnetometer survey should be conducted on the property to identify any metallic anomalies, which could indicate the presence of unknown USTs and/or groundwater supply wells prior to development of the property. This work should be conducted after demolition of all structures to remove metallic objects on ground surface.

## 11.0 LIMITATIONS

This environmental site assessment was performed according to the recommended guidelines established by ASTM designation E1527-2013 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. This report has been prepared for the specific application to this project in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. This report contains information reported to *GeoSolve, Inc.*, by other sources, accordingly, and errors or omissions may be present that *GeoSolve, Inc.* cannot be responsible for. The findings of this report apply to the present condition of the subject property only (as of May 9, 2016); the opinions expressed herein are subject to revision in light of new information relevant to the site and/or in its immediate surroundings. Results from Phase I environmental investigations are based on surficial evidence and public records and databases only. Subsurface conditions of the site cannot be properly evaluated without performing a subsurface environmental investigation and actually testing of the soil, and groundwater for potential contaminants.

## 12.0 INFORMATION SOURCES

Alameda County Assessor's Office.

