LOWNEYASSOCIATES
Environmental/Geotechnical/Engineering Services

May 7, 1993
P5215, MV050705

Mr. Charles W. Wren
UNITED STATES POSTAL SERVICE
c/o DANIEL, MANN, JOHNSON & MENDENHALL
222 Kearny Street, Suite 500
San Francisco, California 94108

RE: WORK PLAN FOR ENVIRONMENTAL SERVICES EMERYVILLE POSTAL FACILITY EMERYVILLE, CALIFORNIA

Dear Mr. Wren:

We are pleased to present this work plan to perform environmental services at the referenced site located at 6121 Hollis Street in Emeryville, California.

Site Description

The site currently consists of approximately 1.7 acres of undeveloped land located in a primarily industrial area. The site is proposed to be developed as a United States Postal Service facility by June 1994. The proposed facility, including the building and surrounding pavements, will cover 95 percent of the ground surface. Construction is expected to take approximately 200 days.

Site Background

As you know, we have recently performed a preliminary soil quality evaluation at the site and presented the results of our investigation in our April 16, 1993 report. As discussed in this report, petroleum hydrocarbons were detected in shallow on-site soils, mainly from 2 to 3 feet below grade to the top of the ground water table at 4 to 6 feet. Concentrations detected generally average near 1,000 parts per million (ppm). On the southeast corner of the site, soil impacted with a "heavy" oil (up to 13,000 ppm), was encountered. This oil appeared different from the lighter gasoline and diesel hydrocarbons encountered on other portions of the site.

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What appeared to be diesel fuel was also observed floating on the ground water at several locations. The thickness of this free product ranged from a sheen to approximately 1/8 inch.

The site was historically used as an oil distribution facility. Fourteen storage tanks, presumably above ground, were reportedly used to store petroleum fuels. This facility is the suspected source of petroleum hydrocarbons detected at the site.

Several hundred feet of piping, most of which appears to be old utility lines, are present on-site. In addition, two approximately 600-gallon underground storage tanks are currently located on-site.

Purpose

In our opinion, the petroleum hydrocarbon concentrations detected at the site warrant remedial actions to reduce contaminant concentrations and the potential for further migration.

The purpose of our proposed services is to better evaluate the extent of impacted soil and ground water; evaluate the potential effectiveness, applicability, and costs of various remedial technologies; and develop a cost-effective remedial approach. In addition, we would prepare a document to aid in obtaining bids from experienced contractors for the removal of the existing underground storage tanks, utility/product piping, and existing concrete debris. We have also proposed to perform a boundary and topographic survey of the property to assist the Postal Service in obtaining a new construction contract for the facility.

SCOPE OF WORK

Task A: Soil Vapor Survey

Based on site data collected to date, it appears that most of the impacted soil is located on the southern half of the site. Although no specific source areas have been identified, the former above ground fuel storage tanks were also reportedly located on this portion of the property. To better evaluate the extent of impacted soil and any source areas or "hot spots," we would perform a soil vapor survey at the site. This survey would consist of advancing approximately 43 half-inch diameter steel probes to a depth of between 4 and 6 feet using a hand-held pneumatic driver. The probes would be located in a grid with spacings of approximately 30 feet over the southern half of the site.

The bottom 3 feet of each probe would be perforated with 3/16-inch holes. Soil vapor would be drawn from each probe using a 1 horsepower regenerative blower with a maximum vacuum capacity of 5 inches Hg, and maximum flow rate of 100 cfm. The extracted vapor from each probe would be analyzed on-site using a Beckman 400 total hydrocarbon analyzer. Representative vapor samples would be collected in tedlar bags and analyzed at a state certified laboratory for TPH as gasoline and BTEX compounds. Rough contours of equal hydrocarbon concentrations would be developed following the soil vapor survey to help identify the extent of contamination.

Task B: Vapor Extraction Feasibility Evaluation

Most of the impacted soil at the site appears to be within a silty clay stratum, with varying amounts of sand and gravel, located just above the ground water table. The effectiveness of several potentially applicable remedial techniques is, at least in part, dependant on the degree of permeability of the impacted material, which affects both vapor and water flow.

To aid in evaluating the permeability of the impacted stratum and estimate the influence or capture radius that could be expected from vapor extraction wells, an air permeability study would be performed. During this study, a vacuum would be applied to one probe and the vacuum influence on surrounding probes would be measured using magnehelic gauges. If no influence is recorded on probes located at the 30-foot spacings, additional probes would be advanced closer to the extraction point to evaluate the influence radius. This process would be repeated at a second on-site location to establish the consistency across the site.

In addition, parameters such as vapor flow rates and vacuum levels would be recorded during the vapor survey to provide additional data on subsurface conditions.

The data obtained would be used to evaluate the applicability of vapor extraction techniques at the site as well as aid in sizing of equipment such as vacuum blowers and establishing appropriate well spacing requirements. As we have previously discussed, vapor extraction alone is likely to be insufficient for site remediation due to the presence of heavier diesel and oil range hydrocarbons. However, combined with other techniques such as steam injection, vapor extraction may be applicable.

Task C: Additional Soil Quality Evaluation

As you know, soil impacted by a heavy petroleum oil was encountered near the southeast corner of the site. Remedial options that are potentially applicable for the lighter, typically diesel range hydrocarbons, detected on other portions of the site would be difficult to apply to the heavy oil detected at this location.

Similarly, oil and low levels of PCBs were detected in gravelly fill which extend to a depth of approximately 1 foot beneath a former railroad spur near the western border of the site.

Although based on very limited data, we expect the volume of oil impacted soil at these locations to be relatively small. Thus, excavation and off-site disposal may be the most cost effective remedial method.

We understand that the excavation and off-site disposal of approximately 2,000 cubic yard of soil is needed to accommodate construction of the proposed facility. On a preliminary basis, we expect that only several hundred cubic yards of oil impacted soil are present. We recommend that this soil be removed prior to construction activities in order to avoid possible construction delays.

Soil Sampling/Analysis

To better evaluate the extent of oil impacted soil near the southeast corner of the site and along the western border of the property, as well as to establish excavation boundaries to aid obtaining contractor bids for the work, if warranted, we would collect 15 soil samples using a truck-mounted drill rig from depths ranging from 1 to 5 feet. The samples collected would be analyzed for total oil and grease

(Standard Method 5520EF). As typically required by local landfills, two composite samples (one from each area) would also be analyzed for 17 California Assessment Manual (CAM) metals, volatile organic compounds (EPA Test Method 8240), PCBs (EPA Test Method 8080), reactivity, corrosivity, and ignitability. The sampling protocol is discussed under Task E.

In addition, to better evaluate soil quality in other areas as established from the soil vapor survey results, we would collect soil samples from six additional borings. These borings would be drilled to ground water at a maximum depth of 6 feet. Two of the borings would be extended through the water-bearing zone to a maximum depth of 15 feet.

Eight soil samples would be analyzed for TPH as gasoline with BTEX (EPA Test Method 8015/8020), TPH as diesel/kerosene (Fuel Fingerprint EPA 8015M), and total oil and grease (Standard Method 5520EF).

Task D: Ground Water Monitoring Well Installation

One ground water monitoring well is currently present on-site. Analysis of ground water samples collected in January 1992 detected diesel hydrocarbons at 22,000 parts per billion (ppb). Subsequent work has also indicated that free product is present on the ground water at various locations.

To better evaluate ground water quality, four additional ground water monitoring wells would be installed. These wells would be constructed using 4-inch diameter casing to enable the wells to be used for ground water extraction, if warranted. The soil vapor survey data would aid in selection of the most desirable well locations; however, we expect that one well would be located near the down-gradient (western) site boundary, one near the up-gradient site boundary, and two in the south-central portion of the site.

Subsurface Exploration

Our field engineer or geologist would direct a subsurface exploration program, supervise, log, and sample four exploratory borings to maximum depths of approximately 20 feet. Soil samples would be obtained at approximately 5-foot depth intervals and monitored with an organic vapor meter (OVM). The borings would be converted to 4-inch diameter "permanent" monitoring wells and would be permitted and constructed according to regulatory guidelines. The wells would be completed with locked well caps and steel stove pipe security boxes extending approximately 3 feet above grade.

Soil cuttings and purged ground water would be stored on-site in EPA approved drums. Our costs do not include handling or disposal of this material.

Surveying/Gradient Evaluation

The lateral locations of the monitoring wells would be approximately established using a metered wheel. To evaluate the ground water flow direction at the site, the relative elevations of the monitoring wells and ground water would then be surveyed. Ground water depths would be measured using an electronic depth sounder. The survey would consist of a two-person crew using a Leitz level and an engineer's graduated rod.

Well Development and Sampling

Forty-eight hours after well completion, the static water levels would be measured, and the wells would be checked for floating product. The wells would then be developed by pumping to flush fine-grained material from the well and surrounding soil. Development would be accomplished by pumping several well volumes of ground water.

Approximately 48 hours after development, the wells would be sampled. Prior to sampling, several additional well casing volumes of ground water would be purged using a submersible pump or teflon bailer so that samples collected would be representative. Field water quality tests would consist of measuring the pH, conductivity, and temperature of the ground water. After purging a minimum of three well volumes and after stabilization of measured parameters is observed, ground water samples would be collected. A ground water sample would also be collected from the existing on-site well. Each well would be sampled using state and EPA approved sampling techniques.

Laboratory Analysis

Two soil samples collected from each boring (one from just above and one below the shallow water-bearing zone), in addition to one ground water sample from each well, would be submitted for analysis at a Department of Health Services certified analytical laboratory for total petroleum hydrocarbons (TPH) as gasoline with BTEX (EPA Test Method 8015/8020), TPH as diesel/kerosene (Fuel Fingerprint EPA 8015M), and total oil and grease (Standard Test Method 5520EF). In addition, to evaluate grain size distribution of the shallow water-bearing zone, a sieve/hydrometer analysis would be performed on four selected soil samples.

The remedial system selected for the site is likely to include ground water extraction and treatment. The most cost effective disposal method for treated ground water is typically to discharge the water to the sanitary sewer system. To satisfy East Bay Municipal Utility District (EBMUD) permit requirements for discharges to the sanitary sewer system, ground water samples from the two wells would also be analyzed for volatile organic compounds (EPA Test Method 8240), 13 priority pollutant metals (by atomic adsorption spectrometry), and PCBs (EPA Test Method 8080).

All analyses would be performed on a one-week laboratory response time.

Sampling Protocol

All sampling equipment would be thoroughly cleaned with an aqueous solution of tri-sodium phosphate and distilled water or steam cleaned. All soil samples would be collected in brass liners, the ends covered with aluminum foil and plastic end caps, securely taped, and placed on ice for transportation to the laboratory. Ground water samples would be collected in the appropriate bottles, labeled, and also placed on ice for transportation to the laboratory. Chain of custody documentation would be maintained for all samples.

Task E: Aquifer Parameter Evaluation

To estimate the hydraulic conductivity of the aquifer, we would perform slug tests on four of the on-site monitoring/extraction wells. Combining the resulting values of hydraulic conductivity, the estimated porosity of the aquifer, and the gradient information would permit an estimation of ground water velocities and, hence, the rate of movement of the ground water. The information would be used to evaluate the effectiveness of ground water extraction wells in controlling the migration of contaminants. It would also help evaluate whether the installation of additional extraction wells would be necessary and, if so, what well spacing would be most beneficial.

Task F: Remedial Investigation/ Feasibility Study Report

We would prepare a technical report comparing several remedial alternatives and providing our conclusions and recommendations for the preferred remedial alternative.

The report would also summarize the results of the soil vapor survey/feasibility evaluation, the additional soil quality data, as well as the ground water quality and aquifer data. The report would include a discussion of the site background, vicinity and adjacent land use, local topography, and local geology and hydrogeology. We would also perform a search of Department of Water Resources (DWR) files for the location of nearby water supply wells. Figures would be presented summarizing the vertical and horizontal extent of oil and ground water contamination and site maps of the proposed remediation areas would be provided. In addition, a preliminary cost estimate for each alternative would be presented in table format.

Task G: Remedial System Design

Based on the site data obtained and our evaluation of various remedial alternatives, our staff environmental and chemical engineers would design a remedial system for the property. The goal would be to design a system that could be installed prior to or concurrent with planned construction activities. The system could then be operated as construction proceeds and/or after completion of the new facility. Our system design would include sizing of equipment and would evaluate optimal extraction rates/locations for the most efficient operation of the system. We would estimate influent contaminant concentrations, flow rates, contaminant recovery rates, and treatment efficiencies. We would also specify maximum allowable effluent contaminant concentrations per regulatory guidelines. A report would be issued discussing system operation, required permits, and verification monitoring. An implementation schedule, as well as cost estimates would also be provided.

Task H: Removal of Tanks, Piping, Debris, and Oil Impacted Soil

To assist the Postal Service in obtaining contractor bids for the removal and disposal of the two existing underground storage tanks, the buried utility/product piping, the existing concrete debris, and the oil impacted soil near the southeast corner of the site and beneath the former railroad spur (if warranted), we would prepare a brief document discussing site conditions and work to be performed by the contractor. The depths, sizes, and locations of the tanks and piping would be discussed and estimates of the volume of impacted soil requiring excavation would be presented. As part of this work, we would evaluate which of several disposal facilities would be the most cost effective for the disposal of the impacted soil. We understand that this document would be incorporated into a bid document prepared by the Postal Service.

Engineering Oversite of Tank and Piping Removal

Our environmental engineer or geologist would be on-site for four days during the removal of the two underground storage tanks and the product/utility piping. The tanks and piping would be removed by the selected contractor and transported off-site for disposal at a permitted facility. The work would be coordinated with and permits obtained from all applicable regulatory agencies by the tank pull contractor.

We would observe contractor activities as well as photograph the work. After removal of the tank, we would collect two soil samples from native soil at the base of each tank excavation. In addition, a ground water sample would be collected from each excavation, if encountered. An OVM would be available on-site to screen soil samples prior to analytical testing.

The soil and ground water samples would be analyzed at a state certified laboratory for total petroleum hydrocarbons (TPH) as gasoline/BTEX (EPA Test Method 8015/8020), TPH as diesel and kerosene (Fuel Fingerprint EPA 8015M), total petroleum oil (Standard Method 5520EF), halogenated volatile organic compounds (EPA Test Method 8010), and metals including cadmium, chromium, lead, zinc, and nickel. These analyses are typically required by regulatory agencies. Additional analyses, if required, would be performed on a time and expense basis.

Soil encountered during removal of the buried piping at the site would be monitored using an OVM. Since most of the piping is located in areas to be included in future remedial plans for the site, we have not included costs to collect and analyze soil samples from below the piping. Most of the piping is suspected to be former utility lines, thus, we would not expect such sampling to be required by regulatory agencies.

Engineering Oversite of Soil Excavation

Our environmental engineer or geologist would be on-site for three days during the excavation of oil impacted soil from the southeast corner of the site and along the western site boundary. Based on laboratory data obtained as part of Task D, we would establish excavation boundaries and guide the contractor in the excavation of impacted soil. After completion of the excavation work, ten confirmatory samples would be collected from the base and/or sidewalls of the excavated areas. These samples would be analyzed for total oil and grease (Standard Method 5520EF).

Tank Closure Report

After the completion of field work, we would prepare a closure report discussing the tank and piping removal activities. A discussion of the excavation and disposal of oil impacted soil would also be included. This report would present the results of our investigation, summarizing the field and laboratory data, and presenting our conclusions and recommendations. Our conclusions and recommendations would be based on available information, observations of existing conditions, site history, and our interpretation of the analytical data.

Task I: Boundary and Topographic Surveys

After removal of the tanks, piping, soil, and concrete debris, we would obtain the services of a licensed land surveyor to perform a boundary and topographic survey of the site. The purpose of this work would be to assist the postal service in negotiating a new construction contract for the proposed facility. The survey information would be presented along with a brief transmittal letter.

SCHEDULE

We are prepared to begin work upon receipt of a signed agreement. A tentative work schedule is attached.

WARRANTY

We make no warranty, expressed or implied, except that our services would be performed in accordance with geoenvironmental engineering principles generally accepted at this time and location.

If you have any questions concerning the scope of work or another aspect of this proposal, please call.

Very truly yours,

LOWNEY ASSOCIATES

Ron L. Helm, C.E.G.
Project Manager

Glenn A. Romig, P.E.
Project Director

Copies: Addressee (4)

Attachment: Tentative Project Schedule