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Woodward-Clyde Consultants

February 1, 1990
8810220A

Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94021

Attention: Mr. Lowell Miller

Subject: Remediation of Soil and Groundwater Contamination
187 North L Street, Livermore, California

Ladies and Gentlemen:

This letter is in response to discussions at a meeting with Mr. Miller in the County Offices on January 23, 1990, attended by representatives of the City of Livermore and the undersigned. The purpose of that meeting was to receive comments from the County regarding the Analysis of Remediation Alternatives report for the subject site, dated December 22, 1989, prepared by Woodward-Clyde Consultants. During the meeting Mr. Miller requested that a letter be prepared summarizing the results of the meeting, and outlining the steps for Site Characterization, and the proposed Soil Vapor Extraction and Groundwater Extraction remediation efforts at the site. In addition Mr. Miller requested a clarification of the cleanup goals and a reference to a regulation or standard.

The outline of the site remediation steps is shown in the attached Tables 1, 2, and 3. Table 1 is an outline of the Site Characterization effort. Tables 2 and 3 are outlines of the Soil Vapor Extraction and Groundwater Extraction programs. Table 4 presents the cleanup goals.

CLEANUP GOALS

The cleanup goals were included in the Remediation Alternatives report. The groundwater cleanup goals shown in Table 4 are the same as those shown in the report. They are the California Department of Health Services (CDHS) 1989 Maximum Contaminant Levels (Title 22 California Administrative Code, Article 5.5, Chapter 15, Section 64444.5), and the CDHS Drinking Water Action Levels.

The cleanup goals for contaminated soil are based on the State Water Resources Control Board Leaking Underground Fuel Tanks (LUFT) Field Manual revised April 5, 1989, and the Guidelines for Addressing Fuel Leaks, September 1985, from the California Regional Water Quality Control Board, San Francisco Bay Region. The 100 ppm goal for TPH in soil is based upon

Table 2-1 in the LUFT Manual. The 100 ppm criteria would likely not apply in the deeper zone of overage soil contamination nearer to the groundwater table where a 10 ppm or lower concentration might be required. The goals for Benzene, Toluene, Ethylbenzene, and Xylenes in soil will be based upon a risk appraisal using tables 2-3 through 2-7 in the LUFT Manual. Tables 2-3 through 2-7 consider rainfall, depth to groundwater, and site soil conditions.

TERMINATION OF REMEDIAL ACTIVITIES

As discussed in the meeting the termination of Soil Vapor Extraction and Groundwater Extraction will be based upon a Risk Assessment to be completed towards the end of the remediation activities. The Risk Assessment will address the possible pathways to humans and the concentrations of contaminants that remain in the soil and water at the site.

CONCLUSIONS

We conclude that the most appropriate method of site remediation is Soil Vapor Extraction and Groundwater Extraction and treatment with granulated activated carbon filters. We hope that this supplemental information is sufficient for you to provide a letter stating the County's approval of the proposed methods.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

Albert P. Ridley, C.E.G.
Senior Consultant

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Attachments: Tables 1 to 4

TABLE 1
SITE CHARACTERIZATION OUTLINE

1. Work Plan Approval

2. Site Exploration

   A. On-Site Borings

      1. One boring at existing 1,000 gallon underground tank, near reported spill at vapor monitoring well, to depth of groundwater.

      2. One boring between existing underground tank and upgradient of former underground tank and monitoring well W-1. This boring will be converted to a monitoring well.

      3. One boring near north site boundary downgradient of W-1, to be converted to a monitoring well.

   B. Off-Site Wells

      1. One well will be located upgradient of the existing 1,000 gallon underground tank, either in street or on adjacent property.

      2. One well will be located, off-site, downgradient of W-1, either on railroad property, or north of railroad property.

      3. One well will be located downgradient of W-3 either on railroad property or north of railroad property.

3. Groundwater Sampling

   A. Collect groundwater samples from each groundwater monitoring well. Survey well locations and elevations, measure groundwater elevations, establish groundwater gradient.

4. Laboratory Analysis

   A. Analyse soil samples from borings and wells for TPH as gasoline and BTEX using EPA Method 8020/8015 modified, and as diesel and BTEX using EPA Method 3550/8015 modified, organic lead, fuel fingerprint of soil samples from well downgradient of 1,000 gallon tank, fuel fingerprint and organic lead from samples of fuel from 1,000 gallon tank. Examine TPH analyses chromotograms to establish the aging condition of petroleum in soil.

   B. Analyze one water sample from each well for TPH as gasoline with BTEX (EPA 8020/8015) and one water sample from each well for TPH as diesel using EPA 8015. Fuel fingerprint for each water sample. Also, test each water sample for organic lead and 2-methylnaphthalene, 2-naphthalene, and phenol.

5. Aquifer Tests

   Hydraulic characteristics of shallow water bearing zone will be tested by performing slug tests in two on-site wells.

6. Analysis and Report

   Evaluate extent of soil and groundwater contamination and the source(s) of petroleum contamination. Upgradient groundwater quality will be evaluated. Possible remedial measures will be assessed.

Table 2
SOIL VAPOR EXTRACTION OUTLINE

1. Perform on-site pilot test of vapor extraction methods.

2. Review effectiveness of vapor extraction method, lateral distance of soil vapor extraction, rate of extraction and content of organic vapors in gases extracted.

3. Prepare and Submit Vapor Extraction Plan

4. Vapor extraction Plan Approval

5. Permit approval From Air Quality Management District, and other agencies as required. Provide public notification if required.

6. Install one or two vapor extraction wells in unsaturated zone.

7. Construct, and install, vapor extraction pump and piping system, and exhaust gas treatment system, if required.

8. Start up system, measure pressure drop in monitoring wells, sample and analyse vapors extracted, for oxygen, carbon dioxide, and volatile organic vapors. Evaluate production rates (pounds of petroleum removed per day).

9. Establish monitoring program for operations of system, and evaluation effectiveness, submit results to agencies.

10. Operate and monitor system until soil vapor extraction goals have been reached.

11. Perform post extraction soil exploration and analytical testing program to document effectiveness of soil remediation. Acceptable residual concentrations to be based upon risk analysis. Request and receive permission to discontinue vapor extraction from regulatory agencies.

Table 3

GROUNDWATER EXTRACTION OUTLINE

1. Review results of site characterization studies.

2. Prepare and submit groundwater extraction plan.

3. Groundwater extraction plan approval.

4. Permit sanitary sewer discharge. Permit construction. File Hazardous Materials Management Plan (HMMP), if required.

5. Install pumps, wells, and on-site treatment plan.

6. Start up extraction system, perform sampling and analysis of inflow and discharged water to evaluate effectiveness and document discharge concentrations. Provide operations data to regulatory agencies and sanitary district.

7. Perform piezometric surface measurements and the sampling and analysis of groundwater from wells to evaluate effectiveness of extraction. Submit results to regulatory agencies.

8. Operate system until groundwater concentration goals have been reached or as asymtotically approached, final concentrations to be established by a risk assessment. Request, and receive approval to shut down system.

9. Groundwater monitoring program for specified period after completion of remediation program. Submit results to regulatory agencies. Request and receive approval to discontinue monitoring.

Table 4. ASSUMED CLEANUP CONCENTRATIONS

SOIL:		
Total Petroleum Hydrocarbons	Less than 100 mg/kg (ppm) (3)	
GROUNDWATER:		
compound	cleanup concentration in µg/L (ppb)	
Benzene	1	(1)
Toluene	100	(2)
Ethylbenzene	680	(1)
Xylenes	1750	(1)

(1) 1989 DOHS Maximum Contaminant Levels

(2) California Drinking Water Limit

(3) Guidelines for residual soil contamination, will be lower concentration nearer to water table (LUFT Manual guidance)

10/26/89

ASSUMED CLEANUP CONCENTRATIONS

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Total Petroleum Hydrocarbons   Less than 100 ppm

GROUNDWATER:

compound	cleanup concentration in ppb
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Toluene	100
Ethylbenzene	680
Xylenes	1750

REMEDIATION OPTIONS --
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Soil:
1-Soil excavation and removal to a ClassI Waste Site
2-Soil Excavation and On-Site Bioremediation Treatment
3-Soil Vapor Extraction*
Groundwater:
1-Groundwater Extraction and on-site treatment*
2-Groundwater extraction and bioremediation and re-injection^R

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