

1255-130

WEST
ASSOCIATES
ENVIRONMENTAL ENGINEERS, INC.

December 5, 1994

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Suite 250
Alameda, CA 94502-6577
Attn: Eva Chu
Hazardous Materials Specialist

**SUBJECT: SITE INVESTIGATION REPORT SUBMITTAL, SWI PROJECT, DEL VALLE
WATER TREATMENT FACILITY, 601 E. VALLECITOS ROAD, LIVERMORE;
StID 4138**


Dear Ms. Chu,

West & Associates Environmental Engineers, Inc. is pleased to submit our Site Investigation Report for the Del Valle Water Treatment plant in Livermore. This site investigation was conducted essentially as proposed in our workplan of June 1994 (with revisions) and approved by your office in correspondence of August 1, 1994.

As described in the report, we found no detectable contamination in any of three soil borings completed around the former tank pit. Additionally, no detectable contamination was found in a groundwater sample bailed from one of the borings. We have concluded that only minor residual contamination remains on-site, that there is no existing or future threat to groundwater and that this site is eligible for case closure.

For any additional information please contact me at (707) 451-1360. We look forward to receiving any comments you may have regarding our report.

Yours truly,



Brian W. West PE
West & Associates Environmental Engineers, Inc.

BWW/es

cc: Mr. Jaime Rios PE, Zone 7 Water Agency

CLOSURE REPORT

**ZONE 7 WATER AGENCY
DEL VALLE WATER TREATMENT PLANT
601 EAST VALLECITOS ROAD
Livermore, California
STID 4138**

Submitted to:

**ALAMEDA COUNTY
HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
Oakland**

Prepared for:

**ZONE 7 WATER AGENCY
5997 PARKSIDE DRIVE
Pleasanton, California**

Prepared by:

**WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.
Vacaville**

December 1994

ACKNOWLEDGEMENTS

This report was prepared under authorization of the Zone 7 Alameda County Flood Control and Water Conservation District. The Zone 7 project contact is Mr. Jaime Rios; 5997 Parkside Drive, Pleasanton, CA 94588, (510) 484-2600, ex 245.

At the Del Valle Water Treatment Plant, Mr. Gerald De Witt is the site contact; 601 E. Vallecitos Road, Livermore, CA 94588, (510) 447-6772.

The lead regulatory agency for the Del Valle Water Treatment plant is the Alameda County Health Care Agency, Department of Environmental Health. Ms. Eva Chu, Hazardous Materials Specialist, is the staff person assigned. The Department of Environmental Health is located at 1131 Harbor Bay Parkway, Suite 250, Alameda CA 94502-6577; (510) 567-6700.

In the preparation of this report reliance was made on past site work performed by; Woodward-Lundgren & Associates (Oakland); Light Air & Space (Morgan Hill) and All Chemical Disposal, Inc. (San Jose).

This report was prepared by West & Associates Environmental Engineers, Inc. West & Associates is located at 112 Pepperell Court, Vacaville, CA 95688; mailing address, PO Box 5891, Vacaville 95696; (707) 451-1360. Principal author is Mr. Brian W. West PE. (Registered California Civil Engineer No. 32319 - expires 12/31/96).



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BORING PERMITS
SOIL BORING LOGS
CHAIN OF CUSTODY
&
ORIGINAL LABORATORY REPORT FORMS

1.0 INTRODUCTION

This closure report describes site conditions at the Del Valle Water Treatment Plant in Livermore. A site investigation was performed there at the former underground diesel fuel tank location. In this Section, the project scope and objectives are described along with a presentation of selected background material.

1.1 Scope

Performance of a sub-surface soils investigation comprised the scope of this project.

Specific scope items included in the project are:

- Completion of soils borings and associated soil sampling
- Laboratory analysis of soil samples
- Preparation of a written report of findings

The scope of work also includes specific recommendations for closure, further site investigation or remedial action, as appropriate.

1.2 Objectives

It is the objective of the Zone 7 Water Agency to comply with all local, Regional, State and Federal regulations pertaining to environmental protection and remediation. The overall objective of investigative work at the former underground tank installation was to develop sufficient technical data to either justify closure or plan a remedial program.

The specific objectives of site investigation included:

- Fully define the extent of soil contamination near the former underground diesel tank
- Determine the proximity to groundwater at the former diesel tank location
- Assess the potential for possible groundwater impact
- Develop recommendations for further action

1.3 Summarized Background

The Del Valle Water Treatment Facility in Livermore was formerly equipped with an underground fuel tank to supply diesel to an emergency generator and to a building space heater. The tank was of 2,000 gallon capacity, fiberglass and approximately 18 years old.

In 1993 the Zone 7 Water Agency decided to replace the underground tank with an above ground tank. The underground tank was not thought to be leaking. A precision leak test was performed on the underground tank in April 1993. The tank and piping successfully passed the precision test. There was no unexplained product loss based on inventory monitoring.

Based on fuel delivery records it appears that product throughput was approximately 10,000 gallons per year. An average of 12 product deliveries per year were recorded. More deliveries took place during the winter months than during the summer.

The underground tank was removed on December 21, 1993. No visual holes or cracks were noted in the tank or piping. Two soil samples (SS-1 & SN-2) were obtained from the tank pit bottom at 9 feet below ground surface (BGS). A diesel odor and staining were noted in soil obtained from the north end of the tank pit.

Both tank pit bottom soil samples contained detectable concentrations of diesel fuel contaminants. In an attempt at remediation, 80 yd³ of soil was overexcavated from the tank pit. One soil sample (S-1) was collected from the bottom of the overexcavation at 16 feet BGS. S-1 also contained a detectable concentration of TPH-diesel (75 PPM).

The tank excavation has now been backfilled with clean imported soil. An above ground diesel tank has been installed near where the former underground tank was located.

In June 1994 West & Associates Environmental Engineers, Inc. submitted a site investigation workplan to the Alameda Health Care Agency. Based on correspondence from the County dated July 8, 1994, revisions to the workplan were submitted July 21, 1994. The revised workplan was approved and a site investigation performed on October 28, 1994.

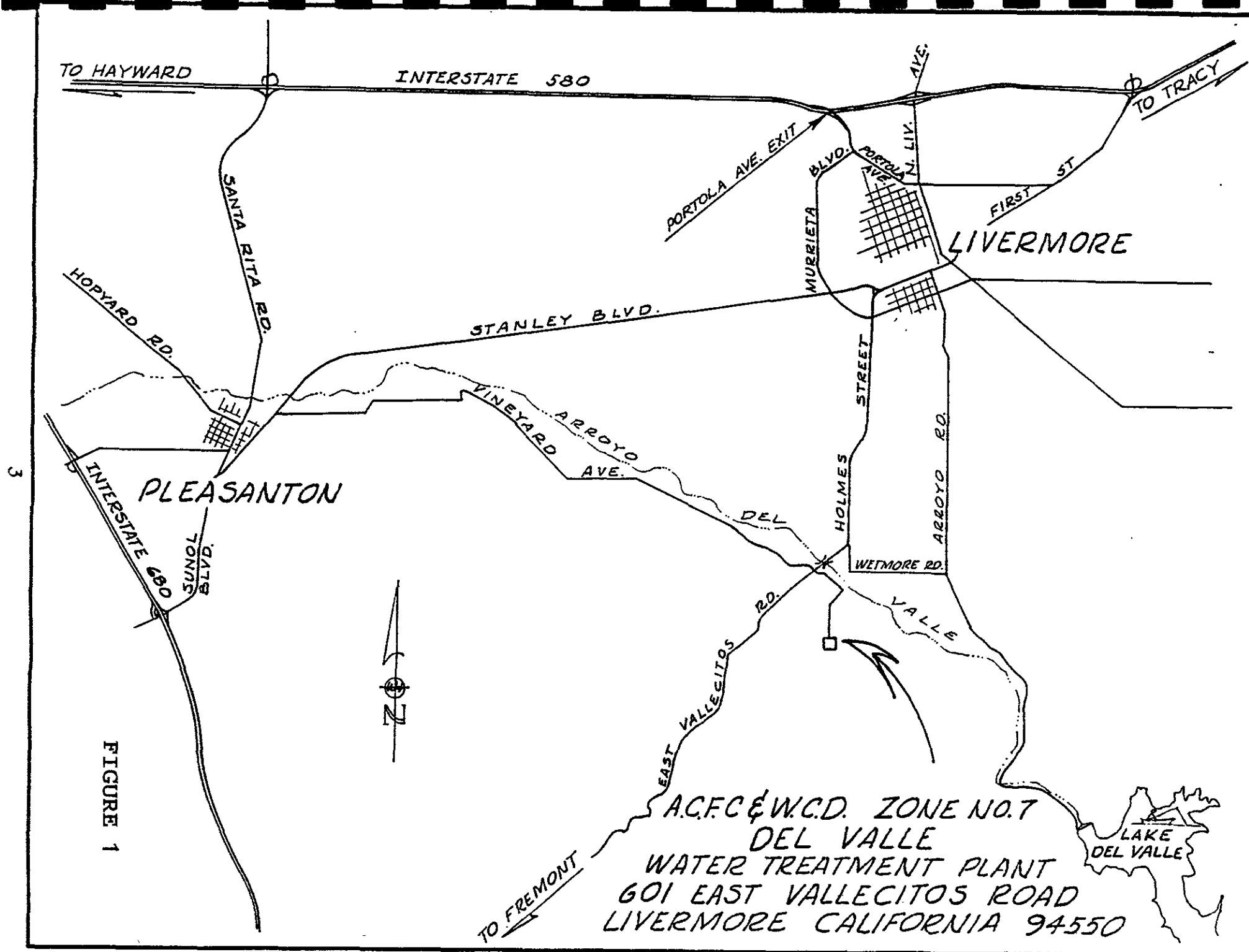
2.0 SITE CHARACTERISTICS

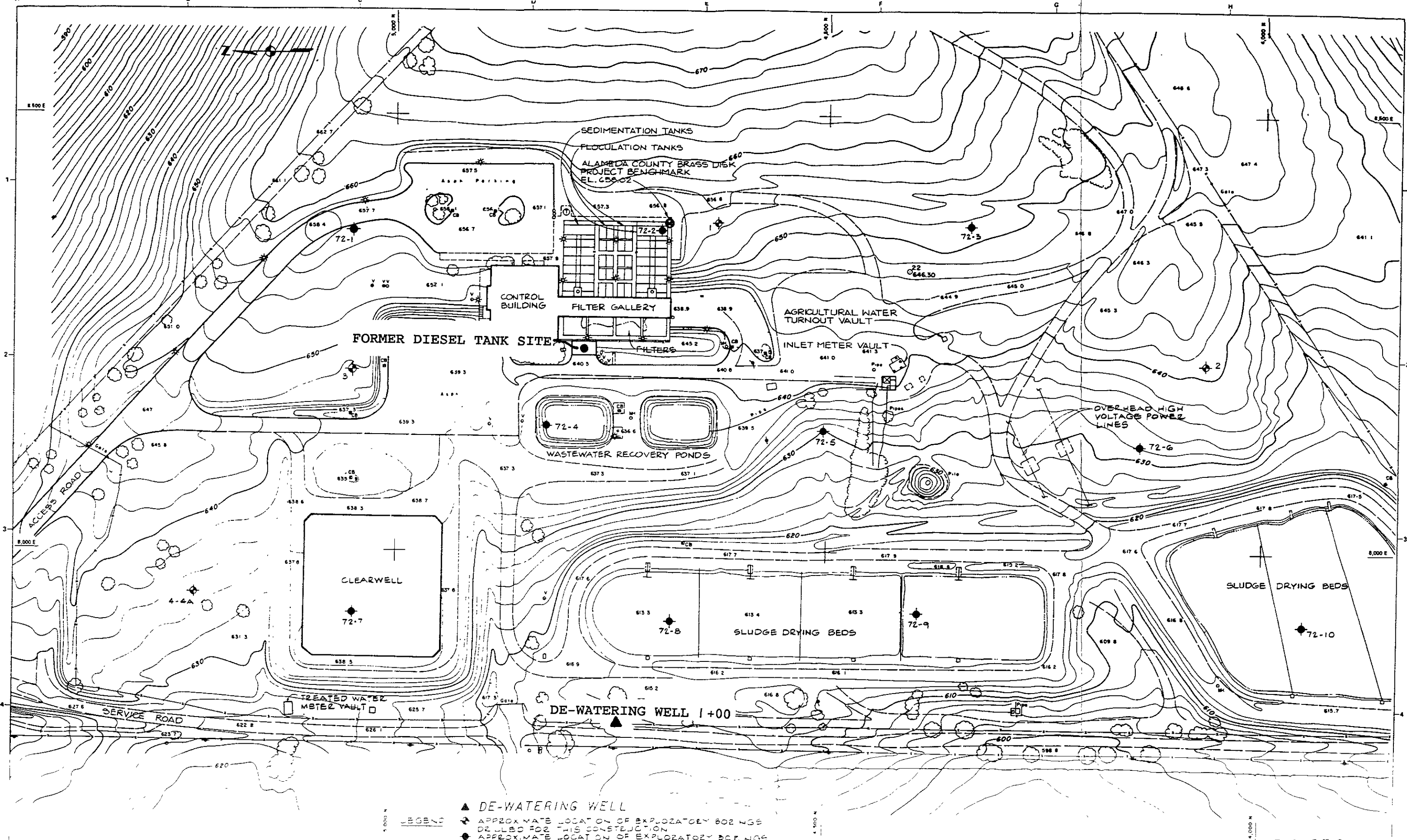
In this Section, physical site characteristics pertinent to the proposed site investigation are presented.

2.1 Topography and Surface Runoff

The Del Valle Water Treatment facility location is indicated on Figure 1. The site is within Alameda County and is located in the San Francisco Bay Water Quality Control Region.

The site is in the hills bordering the south side of the Livermore Valley. Site topography slopes moderately from ~~northeast to southwest~~. Local topography has been modified by ~~grading for construction of the water treatment facility~~. The Del Valle plant is at an elevation of 640 feet MSL. Figure 2 illustrates the site layout.





- LEGEND**
- ▲ DE-WATERING WELL
 - ◆ APPROXIMATE LOCATION OF EXPLORATORY BORINGS DRILLED FOR THIS CONSTRUCTION
 - APPROXIMATE LOCATION OF EXPLORATORY BORINGS DRILLED FOR THE 1973 CONSTRUCTION

FIGURE 2

Reference Information and Notes
 GRID IS BASED ON CALIFORNIA COORDINATE SYSTEM ZONE 3 CGF + 0999000
 FIELD SURVEY CONTROL BY TOW LINE
 ELEVATIONS ARE BASED ON 1929N G.V.D.
 SCALE = 1" = 50' CONTOUR INTERVAL: 2 FEET
 DATE OF PHOTOGRAPHY: JULY 30, 1987
 2 FOR ADDITIONAL FEATURES OF THE EXISTING FACILITIES AND PIPING, SEE SITE PLANS OF ORIGINAL PLANT CONSTRUCTION DATED AUGUST, 1973, THE PLANT EXPANSION DATED 1977, AND THE SLUDGE DRYING BEDS ADDITIONS DATED FEBRUARY 1981, IN ZONE OFFICES

SOIL BORINGS FOR SPECIFIC BORING DESCRIPTIONS, SEE THE SOIL BORING LOGS ATTACHED IN THE SPECIFICATIONS

Zone 7 of Alameda County Flood Control and Water Conservation District
 Kennedy Jenks Chilton
 San Francisco
 Checked: ZAR
 Date: JULY 88
 Signed: [Signature]

Del Valle Water Treatment Plant Expansion
 EXISTING SITE PLAN
 SOIL BORING LOCATION
 Scale: 1" = 50'
 Job No.: 870143
 Sheet: C-1
 File No: CC-42

Drawn by: [Name]
 Refer to tracing for latest revision

The site is in a rural area. Surrounding land use includes a vineyard and grazing land. High voltage transmission line right of ways bisect the locality.

Drainage in and around the project site has been modified to promote runoff around water detention basins and buildings. Storm water eventually drains to Arroyo Del Valle and thence to Alameda Creek and the San Francisco Bay.

2.2 Soils

In 1972 a geotechnical investigation¹ was performed at the site as a part of the facility design process. In the course of the geotechnical investigation, ten soils borings were completed. Two borings (No. 4 & 5) were close to the former underground diesel tank location (50 & 150 feet, respectively). The location of geotechnical borings No. 4 & 5 are indicated on Figure 2 (coded 72-4 & 72-5).

The following description of site soils is excerpted from the Woodward-Lundgren report:

"The upper 1 to 2 feet of surface soils are medium dense dry gravelly silts, then very stiff to hard gravelly clays to dense coarse sandy silty gravels."

"The permeability of the on-site soils is probably about 10^{-3} to 10^{-4} cm/sec, and all soils have a balanced clay, silt and sand content."

Boring No. 4 was advanced to 20.5 feet BGS and No. 5 to 41 feet BGS. Copies of the boring logs for borings 4 & 5 appear as Figures 3 & 4.

Soils types encountered during the site investigation were similar to those described in the Woodward-Lundgren report. Soil boring logs from the site investigation are presented in the appendix.

2.3 Hydrology

Hydrology at the site is influenced by percolation from the facility sludge drying beds. A series of de-watering wells have been installed downgradient from the sludge drying beds to maintain groundwater levels below the root zone of the adjacent vineyard.

No groundwater was encountered at 41 feet BGS during the 1972 geotechnical investigation (boring 5), however groundwater was encountered at 25-30 feet BGS during the site investigation. It appears a local groundwater dome has formed due to infiltration from the sludge drying beds.

¹ "Soil Investigation for the Proposed Del Valle Water Treatment Plant" Woodward-Lundgren Associates, Oakland, 1973

Date Drilled: 8-25-72 & 8-27-72

Hammer Weight: 140 Lbs.

Type of Boring: 6" AUGER

Remarks:

Depth, Ft	Samples	Blows/Ft.	DESCRIPTION	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength, psf
Surface Elevation:						
1		23	SILTY CLAY VERY STIFF, DRY, BROWN-GRAY ↓ DAMP	15	112	15,930
5	2	52	CLAYEY GRAVEL DENSE, DRY, GRAY-BROWN ↓ SILTY GRAVEL	3	126	
10	3	60	SAND & GRAVEL DENSE, DRY, BROWN	3	119	
15	4	80	↓ SILTY			
			CLAYEY GRAVEL VERY DENSE, MOIST, BROWN			
20	5	100+				
			↙ BOTTOM OF HOLE @ 20.5', DRY			

Project:
DEL VALLE WATER TREATMENT PLANT

Log of Boring No. 5

Date Drilled: 8-25-72 Hammer Weight: 140 LBS.
 Type of Boring: 6" AUGER Remarks: _____

Depth, Ft.	Samples	Blows/Ft.	DESCRIPTION	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength, psf
Surface Elevation:						
			FINE SANDY SILT MEDIUM DENSE, DRY, BROWN			
1		62	CLAYEY SILT DENSE, DRY TO DAMP, BROWN, WITH TRACES OF GRAVEL	7	115	5485
5			CLAYEY GRAVEL DENSE, DAMP, BROWN			
2		96	VERY DENSE ↓	5	134	5975
10						
3		80	MOIST ↓	9	127	2965
5						
4		57	CLAYSTONE DENSE, DAMP TO MOIST, OLIVE-GRAY	23	106	10,160
0			SILTSTONE VERY DENSE, DAMP, GRAY TO OLIVE-GRAY			
5		72		23	106	10,770

Job No S-12669

WOODWARD-LUNDGREN & ASSOCIATES

Figure 4

Samples	Blows/Ft	DESCRIPTION (CONTINUED)	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength, psf
6	56	CLAYSTONE DENSE, DAMP, OLIVE-GRAY	25	103	11,255
7	80		22	107	8330
8	48	SILTY SANDSTONE ↓ BOTTOM OF HOLE @ 41', DRY	24	103	4225

If a groundwater dome has indeed formed, the natural groundwater gradient is undoubtedly affected. Groundwater flow may be occurring in a radial pattern from the facility.

3.0 CONTAMINANT PROFILE

In this Section, a summary of information available before completion of the site investigation describing soil and groundwater contamination is presented.

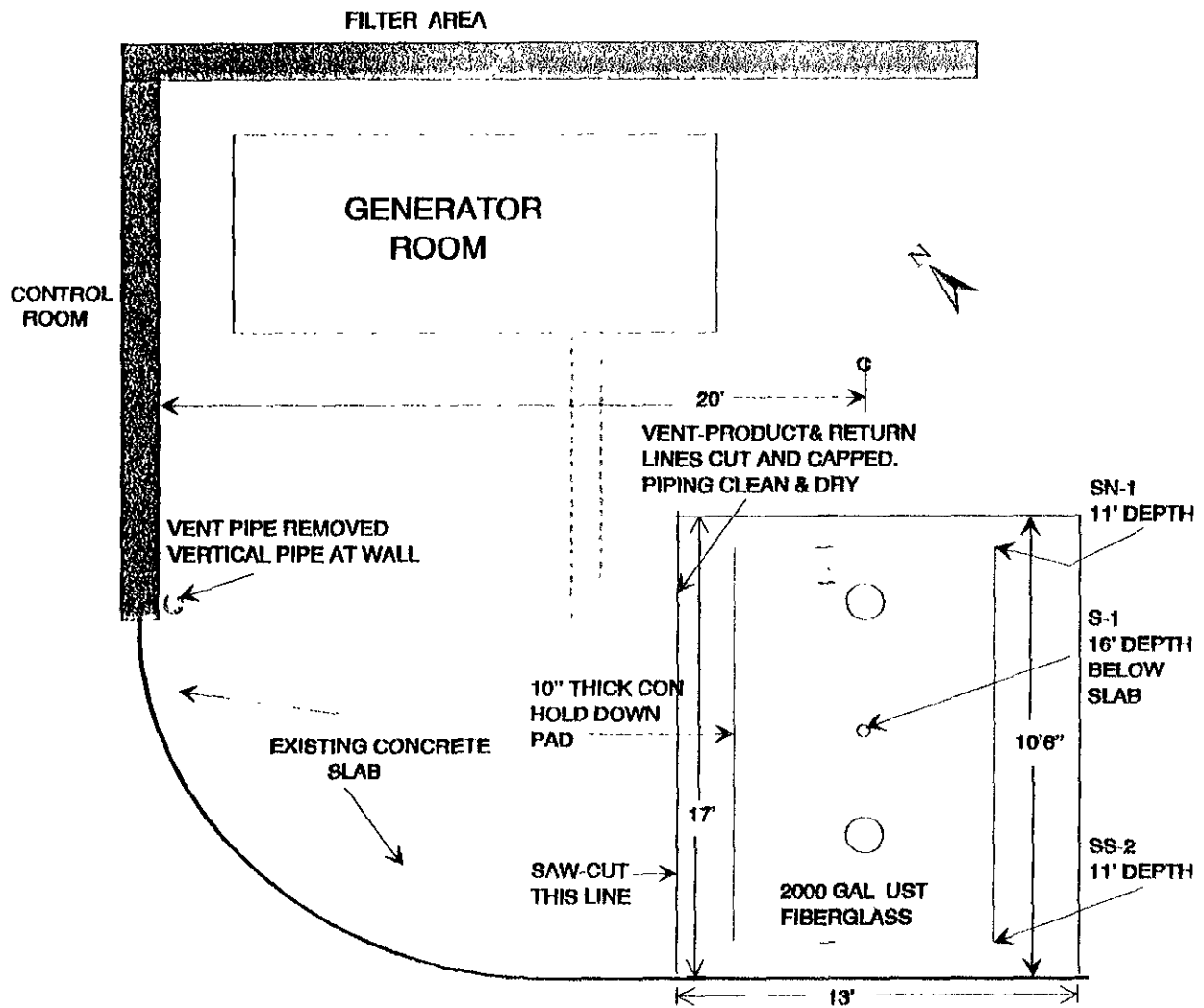
3.1 Soil

During the tank removal project, three soil samples were collected from the former underground tank excavation. In addition, two soil samples were collected from the excavated soil stockpile. Figure 5 (from All Chemical Disposal) illustrates the pit soil sample locations. Table 1 summarizes the soil sample analytical results.

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
DEL VALLE WATER TREATMENT FACILITY
DIESEL TANK REMOVAL - DECEMBER 1993

Soil sample location	STP-1 stock pile	STP-2 stock pile	SS-1 South end of tank	SN-2 North end of tank	S-1 North end of tank
depth	6"	6"	11' bgs	11' bgs	16' bgs
TPH D	5.3ppm	6.3ppm	2.5ppm	120ppm	75ppm
Benzene	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	11ppb	N.D.	N.D.	27ppb	N.D.
Ethyl Benzene	N.D.	N.D.	N.D.	N.D.	N.D.
Xylene	N.D.	N.D.	N.D.	N.D.	N.D.
method detect limit	TPH D 1ppm BTEX 5ppb	TPH D 1ppm BTEX 5ppb	TPH D 1ppm BTEX 5ppb	TPH D 1ppm BTEX 5ppb	TPH D 1ppm BTEX 5ppb
date of sampling	12-21-93	12-21-93	12-21-93	12-21-93	01-03-94
date of extract	12-21-93	12-21-93	12-21-93	12-21-93	01-04-94
date of analysis	12-21-93	12-21-93	12-21-93	12-21-93	01-04-94

N.D. = Non-detect



ZONE 7 WATER AGENCY

PROJECT LAYOUT & SOIL SAMPLING LOCATIONS

**PROJECT # 35458 601 EAST VALLECITOS ROAD
LIVERMORE, CALIF. 94550**

NOTE ; FINAL EXCAVATION DIMENTIONS 13' W / 17' L / 15' D

FIGURE 5

ZONE 7DFW

All five soil samples contained detectable concentrations of diesel contaminants. Highest concentrations were found at the north end of the excavation. Between 11 feet BGS and 16 feet BGS, TPH diesel concentrations attenuated from 120 PPM to 75 PPM.

3.2 Groundwater

There is no known impact to groundwater. No groundwater was encountered in the tank pit. No samples for chemical analysis were collected from any of the wells on-site.

4.0 SITE INVESTIGATION

In this Section, action completed to investigate known soil contamination and potential groundwater contamination at the former underground diesel tank site is presented.

4.1 Soil

It is known that minor residual soil contamination is present at 16 feet BGS in the former underground tank excavation. Site investigation was conducted to define the extent and magnitude of any lateral soil contamination.

Objectives

- Define the lateral and vertical extent of soil contamination
- Acquire data to justify a recommendation of closure or to design an effective and efficient remediation project, as appropriate

Scope

- Complete soils borings and associated soil sampling
- Analyze soil samples in a DHS certified testing laboratory
- Abandon borings

Approach

Soil borings were constructed utilizing a powered, continuous flight, hollow stem auger drill rig. Undisturbed soil samples were collected using a split spoon sampler fitted with new brass inserts. Drilling and soil sampling specifications complied with State Water Board and Tri-Regional Board Staff Recommendations For Preliminary Evaluation and Investigation of Underground Tank Sites.

Drill cuttings and recovered soil samples were field screened by appearance, odor and with a calibrated photoionization detector (PID).

A total of three borings were completed around the former underground diesel tank excavation. In order to maintain consistency with the site investigation workplan, the borings were numbered B-3, B-4 & B-5. Figure 6 illustrates the boring locations.

Due to the recent construction of bollards around the above ground tank spill slab, drill rig access on the north side of the former tank excavation was blocked. Borings were successfully drilled on the east, west and south sides of the former excavation.

Boring No. B-3 was sited on the west side of the former tank excavation. Boring B-3 was drilled vertically through undisturbed soil. A total of four soil samples were collected from boring B-3; the first at 5 feet BGS and thereafter every five feet to 20 feet BGS. It was attempted to collect a soil sample from 25 feet BGS however due to soil saturation, no sample was recovered. No evidence of contamination was encountered in Boring B-3 based on field screening techniques.

Boring No. B-4 was drilled vertically on the north side of the former tank excavation. Boring B-4 penetrated inside the footprint of the tank overexcavation. Six soil samples were collected from boring B-4; the first at 5 feet BGS and then every 5 vertical feet to 30 feet BGS. The boring was terminated at 30 feet BGS upon encountering groundwater. No evidence of contamination was encountered in Boring B-4 based on field screening techniques.

Boring B-5 was drilled on the south side of the former tank excavation. Boring B-5 was drilled vertically through undisturbed soil. Five soil samples were collected from boring B-5; the first at 5 feet BGS and then every 5 vertical feet to 25 feet BGS. The boring was terminated at 25 feet BGS without encountering groundwater. No evidence of contamination was encountered in Boring B-5 based on field screening techniques. Boring logs for all three borings are presented in the appendix.

All soil samples were sealed, labeled, chilled and entered on a chain of custody form as specified in the workplan. Soil samples were hand carried to a DHS certified laboratory for analytical testing.

All borings were permitted in accordance with prevailing Alameda County Flood Control District (Zone 7) regulations (a copy of the boring permit is presented in the appendix). Soil cuttings were containerized, labeled and stored on-site pending receipt of laboratory analysis and arrangements for proper disposal. Each boring was abandoned at the conclusion of soil sampling by filling with hydrated bentonite hole plug.

4.2 Groundwater

There is no evidence of impact to groundwater from the former diesel tank. In this Section, proposed measures to assess the possible impact to groundwater from known soil contamination are presented.

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.

PO Box 5891, Vacaville, California 95696

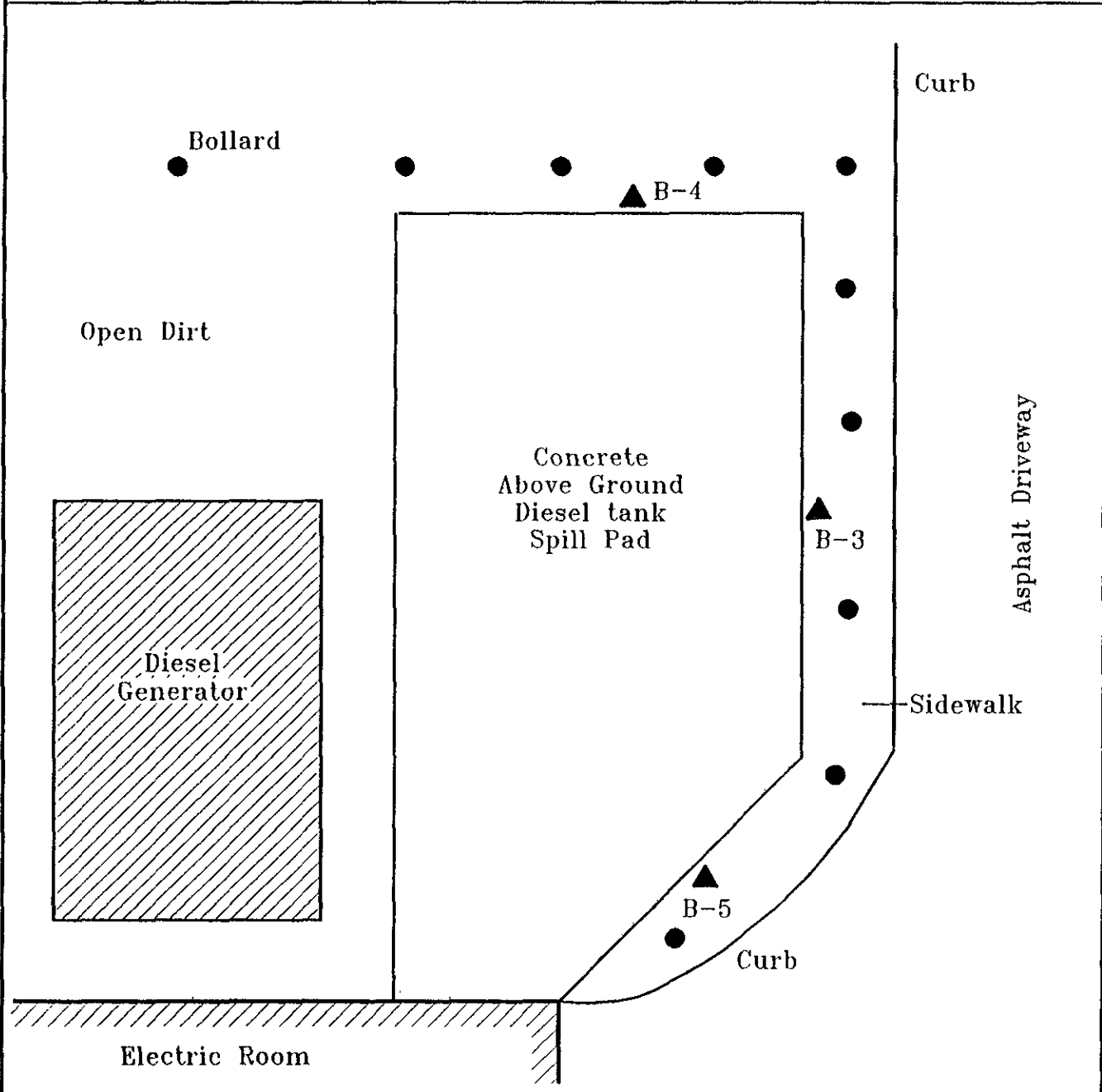
Project Name: Zone 7 Water Agency - Del Valle Plant

Date: Dec. 1994

Location: Former Underground Diesel Tank

Drawing By: BWW

Scale: 1" = 5'



LEGEND

▲ Soil Boring Locations

Figure 6

Objectives

- Assess the potential for impact to groundwater from residual soil contamination

Scope

- Determine the proximity to first groundwater under the former underground tank location
- Determine the proximity and concentration of soil contamination to groundwater
- Collect a groundwater sample for laboratory analysis

Approach

Boring No. 4 was advanced 2 feet into the saturated zone (auger bit at 30 feet BGS). After twenty minutes, approximately 2 feet of groundwater accumulated inside the hollow stem. Using a new, disposable bailer, a groundwater sample was retrieved from inside the auger.

The groundwater was transferred into laboratory supplied 40 ml VOA vials containing a suitable preservative. The samples were labeled and chilled pending transport to the testing laboratory under chain of custody.

for diesel, should it be in 1 l amber bottles?

5.0 REPORT OF FINDINGS

In this Section, results of the site investigation are presented.

5.1 Soils

A total of eleven soil samples were submitted for laboratory analysis. Each soil sample was analyzed for total petroleum hydrocarbons in the diesel range (TPH-d) as well as for aromatic hydrocarbons (benzene, toluene, xylene and ethyl benzene; BTXE). The schedule of soil samples, location and depth is presented in Table 2.

No detectable contamination was found in any of the eleven soil samples submitted for analysis. Minimum detection limit for TPH-d was mg/Kg and for BTXE was 5.0 ug/Kg. Copies of the chain of custody and original laboratory report forms are presented in the appendix.

5.2 Groundwater

One groundwater sample (GW-1), bailed from boring B-4, was submitted for laboratory analysis. The sample was analyzed for TPH-d and BTXE. No detectable contamination was found in the groundwater sample. Minimum detection limit for TPH-d was 200 ug/L and for BTXE was 1.0 ug/L. Copies of the chain of custody and original laboratory report forms are presented in the appendix.

TABLE 2
SOIL SAMPLE SCHEDULE
DEL VALLE SITE INVESTIGATION

SAMPLE ID	BORING NUMBER	SAMPLE DEPTH (feet)
B3-2	3	10
B3-3	3	15
B3-4	3	20
B4-2	4	10
B4-3	4	15
B4-4	4	20
B4-6	4	30
B5-1	5	5
B5-2	5	10
B5-3	5	15
B5-4	5	20

5.3 Conclusions

Total petroleum hydrocarbon concentrations at 11 feet BGS in the former tank pit were 120 PPM and at 16 feet BGS were 75 PPM. Thus, it appears contaminant concentrations were attenuating with depth within the area overexcavated.

No lateral or vertical barriers to contaminant migration were encountered during the drilling program. If significant diesel leakage had occurred, it would have migrated in a symmetrical pattern.

The absence of soil contamination in any of the three borings spaced around the former tank pit indicates there has been no lateral contaminant migration.

Based on the non-detectable groundwater sample analysis, it appears there has been no major impact to groundwater. Apparently contamination has not migrated through the 12 vertical feet of soil between the bottom of the overexcavation and the top of the saturated zone.

In summary, although there is some residual soil contamination in the former diesel tank vicinity it appears to be of minor extent and magnitude. There does not appear to have been any impact to groundwater nor does it appear that the remaining soil contamination poses a future threat to groundwater. It is recommended that the Del Valle Water Treatment Plant underground tank site be closed.



ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2600
FAX (510) 462-3014

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT Del Valle Water Treatment Plant: 601 E. Vallecitos Road, Livermore

PERMIT NUMBER 94672
LOCATION NUMBER _____

CLIENT
Name Zone 7 Water Agency
Address 5997 Parkside Voice 484-2600
City Pleasanton Zip 94588

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT
Name WEST & Associates Engineers Fax 707 451 0631
Address PO Box 5891 Voice 707 451-1360
City Vacaville CA Zip 95696

A. GENERAL

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

TYPE OF PROJECT

Well Construction	_____	Geotechnical Investigation	_____
Cathodic Protection	_____	General	_____
Water Supply	_____	Contamination	<u>X</u>
Monitoring	_____	Well Destruction	_____

B. WATER WELLS, INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

PROPOSED WATER SUPPLY WELL USE

Domestic	_____	Industrial	_____	Other	_____
Municipal	_____	Irrigation	_____		

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

DRILLING METHOD

Mud Rotary	_____	Air Rotary	_____	Auger	<u>✓</u>
Cable	_____	Other	_____		

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

DRILLER'S LICENSE NO. C-57 # 484288

E. WELL DESTRUCTION. See attached.

WELL PROJECTS

Drill Hole Diameter	_____ in.	Maximum	
Casing Diameter	_____ in.	Depth	_____ ft.
Surface Seal Depth	_____ ft.	Number	_____

GEOTECHNICAL PROJECTS

Number of Borings	<u>3</u>	Maximum	
Hole Diameter	<u>8</u> in.	Depth	<u>50</u> ft.

ESTIMATED STARTING DATE OCT 28, 1994
ESTIMATED COMPLETION DATE OCT 28, 1994

Approved Wyman Hong Date 19 Oct 94
Wyman Hong

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Brian Ward Date 10-19-94

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.

PO Box 5891, Vacaville CA 95696

Project: Zone 7 Water Agency - Del Valle Water Plant

Location: Former emergency generator diesel tank

Date: Dec. 1994

Boring Designation: B-3

Driller: Exploration Geoservices

Logged by: BWW

Base: San Jose

Boring Location: See Figure 6

Drill Equipment: Mobile B-40

Soils Classification System: USCS

Diameter & Type Well Casing:

Sample type: BRASS TUBE - SPLIT SPOON

NA

Soil Matrix: YES

Elevation & Datum: NA

Date Started: 10-28-94 Finished: 10-28-94

Completion Depth: 25 feet BGS

Number of Samples: Five

Depth to Groundwater: 25 feet BGS

Depth (feet)	Time	Sample Number	Lithology	Observations	Field Analysis
0	1:30	B3-1	CL	Dry unconsolidated, medium grained, brown sandy silt intermixed gravel with some large cobbles	Clean - No odor PID = 0 PPM
5			BC:24/54/30	Uncohesive, poorly graded fewer cobbles and gravel	PID = 0 PPM
10	2:15 PM	2	BC:22/30/50	coarse grained sand in sample	PID = 0 PPM
			CL		
15		3	BC: 31/50	increasing moisture increasing clay and cohesion	PID = 0 PPM
			CL	difficult drilling	Clean - No odor
20		4	BC: 33/50	wet gravels	
	CL		Contiued clayey silt with poorly graded gravels and cobbles		
25	5	BC: 50	water dripping from sampler	PID = 0 PPM	
		EOB	no recovery in sample 5		
30				<i>why no water sample collected?</i>	

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.

PO Box 5891, Vacaville CA 95696

Project: Zone 7 Water Agency - Del Valle Water Plant

Location: Former emergency generator diesel tank

Date: Dec. 1994

Boring Designation: B-4

Driller: Exploration Geoservices

Logged by: BWW

Base: San Jose

Boring Location: See Figure 6

Drill Equipment: Mobile B-40

Soils Classification System: USCS

Diameter & Type Well Casing:

Sample type: BRASS TUBE - SPLIT SPOON

NA

Soil Matrix: YES

Elevation & Datum: NA

Date Started: 10-28-94 Finished: 10-28-94

Completion Depth: 30 feet BGS

Number of Samples: Six

Depth to Groundwater: 28 feet BGS

Depth (feet)	Time	Sample Number	Lithology	Observations	Field Analysis
0	11:15	B4-		Open Dirt	
5	11:40	1	CL BC: 21/50	Dry unconsolidated, medium grained, brown sandy silt intermixed gravel with some larger cobbles	Clean - No odor
10		2	CL BC: 23/38/26	Continued cobbly backfill Uncohesive, poorly graded	PID = 0 PPM
15		3	CL BC: 21/50	Continued fill material slightly moister more cohesive	
20		4	CL BC: 41/50	Native interface Harder drilling more and larger cobbles increasing clay	Clean - No odor
25		5	CL BC: 30/50	Continued clayey silt with poorly graded gravels and cobbles increasing moisture	PID = 0 PPM
30		12:30	6	CL BC: 50	increasing clay water dripping from sampler Standing water in auger to 28 feet BGS @ 12:30 PM

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.

PO Box 5891, Vacaville CA 95696

Project: Zone 7 Water Agency - Del Valle Water Plant

Location: Former emergency generator diesel tank

Date: Dec. 1994

Boring Designation: B-5

Driller: Exploration Geoservices

Logged by: BWW

Base: San Jose

Boring Location: See Figure 6

Drill Equipment: Mobile B-40

Soils Classification System: USCS

Diameter & Type Well Casing:
NA

Sample type: BRASS TUBE - SPLIT SPOON

Soil Matrix: YES

Elevation & Datum: NA

Date Started: 10-28-94 Finished: 10-28-94

Completion Depth: 25 feet BGS

Number of Samples: Five

Depth to Groundwater: Not Encountered

Depth (feet)	Time	Sample Number	Lithology	Observations	Field Analysis
0	12:45	B5 -		Open Dirt	
5		1	CL BC: 11/13/12	Dry unconsolidated, medium grained, brown sandy silt intermixed gravel with some larger cobbles	Clean - No odor
10		2	CL BC: 12/13/13	stringers of grey clay Uncohesive, poorly graded fewer cobbles and gravel	PID = 0 PPM
15		3	CL BC: 13/50	some grey stringers some clay adhering to sampler	PID = 0 PPM
20	1:05 PM	4	CL BC: 50	increasing moisture difficult drilling	Clean - No odor
25		5	CL BC: 50	Contiued clayey silt with poorly graded gravels and cobbles increasing moisture	PID = 0 PPM
		EOB		Bottom of hole dry	
30					

5.80c

441031-505

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client West & Associates
Address PO Box 5891
Vacaville CA 95696
Phone 707 451 1360

Report To: Same
Bill To: Same
P.O. # / Billing Reference _____
Project Name / No. Zone 7

Pace Client No. _____
Pace Project Manager _____
Pace Project No. _____
*Requested Due Date: _____

Sampled By (PRINT):
Brian West 10-28-94
Sampler Signature Brian West Date Sampled _____

NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST
	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA	COLD	
						TPH-diesel BTXE

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PAGE NO.	NO. OF CONTAINERS	PRESERVATIVES	ANALYSES REQUEST	REMARKS
1	B3-2	PM	soil	434173	1	✓	✓	
2	B3-3			434181	1	✓	✓	
3	B3-4			434190	1	✓	✓	
4	B4-2			434203	1	✓	✓	
5	B4-3			434211	1	✓	✓	
6	B4-4			434220	1	✓	✓	
7	B4-6			434238	1	✓	✓	
8	B5-1	↓	↓	434246	1	✓	✓	

COOLER NOS.	BAILERS	SHIPMENT METHOD		ITEM NUMBER
		OUT DATE	RETURNED DATE	

RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
<u>Brian West</u>	<u>Ed Kelly</u>	<u>10/31/94</u>	<u>5:20</u>
<u>Ed Kelly</u>	<u>David Cundy</u>	<u>10/31/94</u>	<u>6:20</u>

Additional Comments

Regular Turnaround

441031-505

5.8°C

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client West & Associates
Address PO Box 5891
Vacaville CA 95696
Phone 707-451-1360

Report To: Same
Bill To: Same
P.O. # / Billing Reference _____
Project Name / No. Zone 7

Pace Client No. _____
Pace Project Manager _____
Pace Project No. _____
*Requested Due Date: _____

Sampled By (PRINT): Brian West 10-28-94
Sampler Signature Brian West Date Sampled _____

NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST
	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA	HCL	
						TPH-diesel BTX/E

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PAGE NO.	NO. OF CONTAINERS	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA	HCL	Cold	ANALYSES REQUEST	REMARKS
1	B5-2	PM	Soil	43425.4	1						✓	✓	
2	B5-3	↓	↓	43426.2	1						✓	✓	
3	B5-4	↓	↓	43427.0	1						✓	✓	
4	GW-1	↓	GW	43428.9	2						✓	✓	MARKed - Det Valve B-4 SUDAS
5													
6													
7													
8													

COOLER NOS.	BAILERS	SHIPMENT METHOD		ITEM NUMBER	RELINQUISHED BY - AFFILIATION	ACCEPTED BY - AFFILIATION	DATE	TIME
		OUT DATE	RETURNED DATE					
					Brian West	Edith Lee	10/29/94	1520
					Edith Lee	Yvonne Limmy	10/31/94	1620

Additional Comments
Regular Turn around



REPORT OF LABORATORY ANALYSIS

West & Associates
112 Pepperell Ct.
P.O. Box 5891
Vacaville, CA 95696

November 15, 1994
PACE Project Number: 441031505

Attn: Mr. Brian West

Client Reference: Zone 7

PACE Sample Number:
Date Collected:
Date Received:

70 0434173
10/28/94
10/31/94
B3-2 (6)

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015
Extractable Fuels, as Diesel
Date Extracted

mg/kg	5.0	ND	11/07/94
		11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene
Toluene
Ethylbenzene
Xylenes, Total

ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
Page 2

November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434181
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B3-3 5^t

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015				
Extractable Fuels, as Diesel	mg/kg	5.0	ND	11/07/94
Date Extracted			11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene	ug/kg wet	5.0	ND	11/02/94
Toluene	ug/kg wet	5.0	ND	11/02/94
Ethylbenzene	ug/kg wet	5.0	ND	11/02/94
Xylenes, Total	ug/kg wet	5.0	ND	11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434190
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B3-4 20`

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015				
Extractable Fuels, as Diesel	mg/kg	5.0	ND	11/07/94
Date Extracted			11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020				
Benzene	ug/kg wet	5.0	ND	11/02/94
Toluene	ug/kg wet	5.0	ND	11/02/94
Ethylbenzene	ug/kg wet	5.0	ND	11/02/94
Xylenes, Total	ug/kg wet	5.0	ND	11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
Page 4

November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434203
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B4-2 10'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015			
Extractable Fuels, as Diesel	mg/kg	5.0	ND
Date Extracted			11/07/94

PURGEABLE AROMATIC COMPOUNDS, EPA 8020			
Benzene	ug/kg wet	5.0	ND
Toluene	ug/kg wet	5.0	ND
Ethylbenzene	ug/kg wet	5.0	ND
Xylenes, Total	ug/kg wet	5.0	ND



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number:
Date Collected:
Date Received:
Client Sample ID:
Parameter

70 0434211
10/28/94
10/31/94
B4-3 IS

Units MDL DATE ANALYZED

ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015
Extractable Fuels, as Diesel
Date Extracted

mg/kg 5.0 ND 11/07/94
11/02/94

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene
Toluene
Ethylbenzene
Xylenes, Total

ug/kg wet 5.0 ND 11/02/94
ug/kg wet 5.0 ND 11/02/94
ug/kg wet 5.0 ND 11/02/94
ug/kg wet 5.0 ND 11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
Page 6

November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number:
Date Collected:
Date Received:
Client Sample ID:
Parameter

70 0434220
10/28/94
10/31/94
B4-4 2'

<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015
Extractable Fuels, as Diesel
Date Extracted

mg/kg	5.0	ND	11/07/94
		11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene
Toluene
Ethylbenzene
Xylenes, Total

ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94
ug/kg wet	5.0	ND	11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
Page 7

November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434238
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B4-6 30'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015			
Extractable Fuels, as Diesel	mg/kg	5.0	ND
Date Extracted			11/07/94
			11/02/94

PURGEABLE AROMATIC COMPOUNDS, EPA 8020			
Benzene	ug/kg wet	5.0	ND
Toluene	ug/kg wet	5.0	ND
Ethylbenzene	ug/kg wet	5.0	ND
Xylenes, Total	ug/kg wet	5.0	ND



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434246
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B5-1 5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015			
Extractable Fuels, as Diesel	mg/kg	5.0	ND
Date Extracted			11/07/94

PURGEABLE AROMATIC COMPOUNDS, EPA 8020			
Benzene	ug/kg wet	5.0	ND
Toluene	ug/kg wet	5.0	ND
Ethylbenzene	ug/kg wet	5.0	ND
Xylenes, Total	ug/kg wet	5.0	ND



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434254
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B5-2 to

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015			
Extractable Fuels, as Diesel	mg/kg	5.0	ND
Date Extracted			11/07/94
			11/02/94

PURGEABLE AROMATIC COMPOUNDS, EPA 8020			
Benzene	ug/kg wet	5.0	ND
Toluene	ug/kg wet	5.0	ND
Ethylbenzene	ug/kg wet	5.0	ND
Xylenes, Total	ug/kg wet	5.0	ND



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434262
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: B5-3 15'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015				
Extractable Fuels, as Diesel	mg/kg	5.0	ND	11/07/94
Date Extracted			11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene	ug/kg wet	5.0	ND	11/02/94
Toluene	ug/kg wet	5.0	ND	11/02/94
Ethylbenzene	ug/kg wet	5.0	ND	11/02/94
Xylenes, Total	ug/kg wet	5.0	ND	11/02/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number:
Date Collected:
Date Received:
Client Sample ID:
Parameter

70 0434270
10/28/94
10/31/94
B5-4 20

<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

EXTRACTABLE FUELS EPA 3550/8015
Extractable Fuels, as Diesel
Date Extracted

mg/kg	5.0	ND	11/07/94
		11/02/94	

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene
Toluene
Ethylbenzene
Xylenes, Total

ug/kg wet	5.0	ND	11/03/94
ug/kg wet	5.0	ND	11/03/94
ug/kg wet	5.0	ND	11/03/94
ug/kg wet	5.0	ND	11/03/94



REPORT OF LABORATORY ANALYSIS

Mr. Brian West
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November 15, 1994
PACE Project Number: 441031505

Client Reference: Zone 7

PACE Sample Number: 70 0434289
Date Collected: 10/28/94
Date Received: 10/31/94
Client Sample ID: GW-1

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

FUEL FINGERPRINT, EPA 8260m

Benzene	ug/L	1.0	ND	11/08/94
Toluene	ug/L	1.0	ND	11/08/94
Ethylbenzene	ug/L	1.0	ND	11/08/94
Xylenes, Total	ug/L	1.0	ND	11/08/94
Diesel	ug/L	200	ND	11/08/94
1,2-Dichloroethane-d4 (surrogate)	%		87	11/08/94
Toluene-d8 (surrogate)	%		95	11/08/94
4-Bromofluorobenzene (surrogate)	%		89	11/08/94

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director