PROBLEM DEFINITION REPORT

JULY 1984

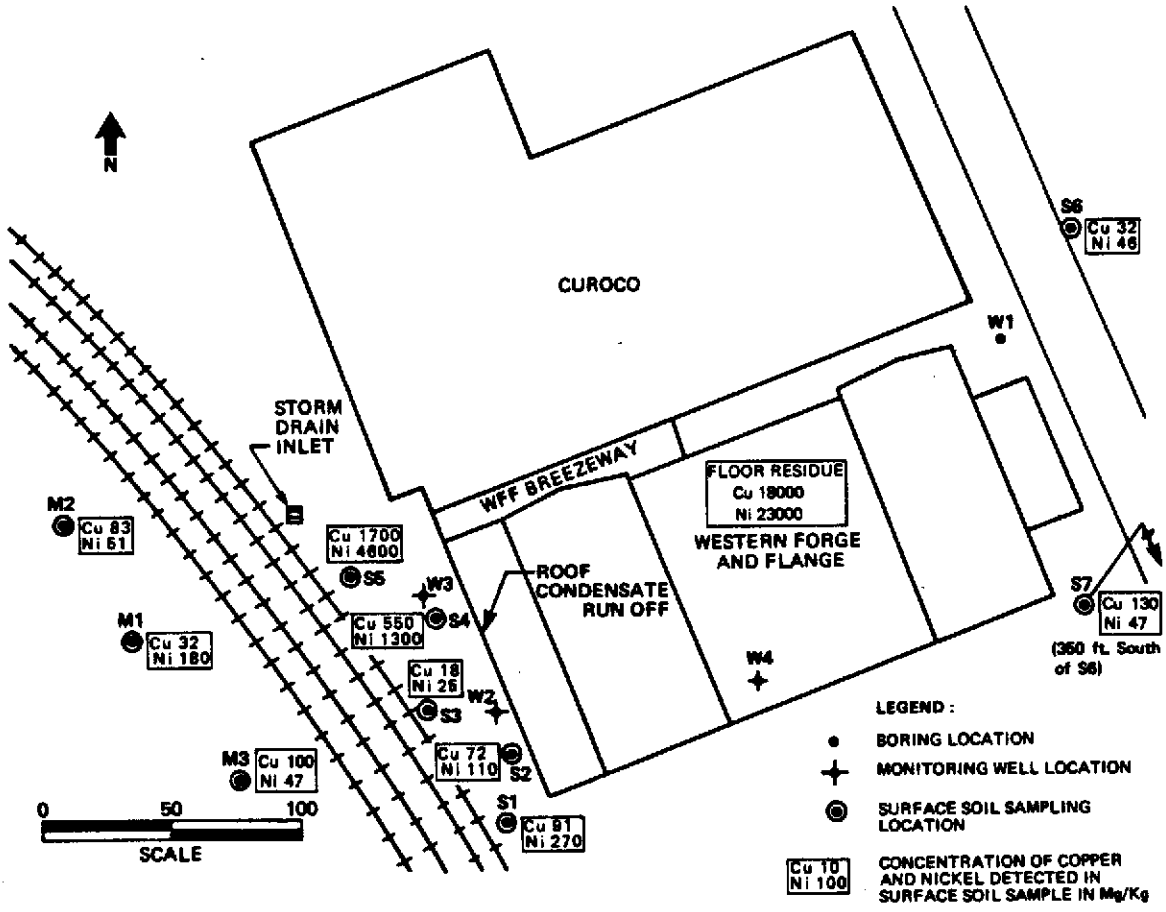


Figure 2-1 Albany Site Map

CHAPTER 4

DISCUSSION OF FIELD AND ANALYTICAL RESULTS

Field observations and results of analyses performed on the WFF samples were used to characterize the potential contaminant sources, to confirm data collected previously, and to determine if the soil and groundwater behind the WFF have been contaminated by metals and/or grease. Soil and water samples were also collected and sent to the Brown and Caldwell laboratory for analyses in February 1984. Table 4-1 summarizes results of these analyses. A discussion of the results of the ensuing investigation follows.

Geologic and Hydrologic Conditions

Regionally, the plant site lies on Quaternary alluvium between the older southeast-northwest trending Berkeley Hills and the San Francisco Bay. The Mesozoic Franciscan Formation outcrops locally east and northeast of the site. Local stratigraphy underlying the plant site consists of sandstone overlain by 0 to 14 feet of clay. Figure 4-1 is a generalized cross section constructed from logs of three boreholes drilled on site. Borehole W1, drilled on the eastern portion of the site, towards the Albany Hill outcrop, contains less than 1 foot of clay and is primarily composed of weathered sandstone. Horizontally, the clay bed increases in thickness to the west to a maximum of 14 feet at borehole W3. Vertically, the underlying weathered sandstone grades into unweathered sandstone.

Water level elevations were measured at 5 to 6 feet beneath the ground surface in monitoring wells W2 (5.93 feet), W3 (5.48 feet), and W4 (6.11 feet) on July 11, 1984. These data indicate groundwater flows in a north-northwesterly direction beneath the plant site. The local groundwater gradient is approximately 1×10^{-2} ft/ft.

Potential Sources of Contamination

Potential sources of site contamination are (1) the floor residue material and (2) process water. The results of the metals analyses performed on the floor residue sample are presented in Attachment B and summarized in Table 4-2. The floor residue material contained concentrations of nickel and copper above the January 1984 draft 22 CAC 66699 total threshold limit concentration (TTLC). The concentrations of trivalent chromium, lead, and zinc were detected at elevated concentrations, but less than the TTLC. Hexavalent chromium was not detected in the sample.

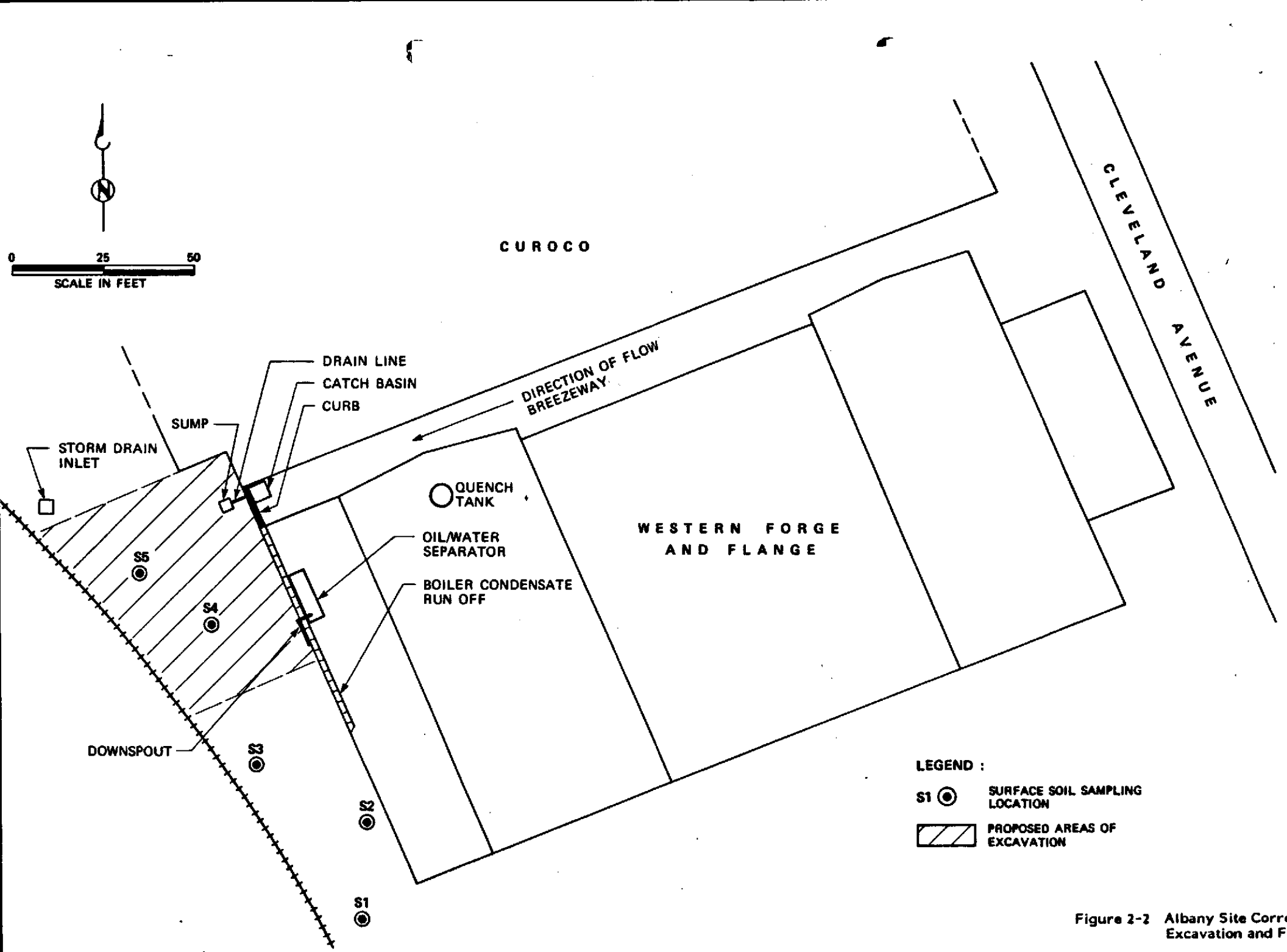


Figure 2-2 Albany Site Corr
Excavation and F

SITE CORRECTION REPORT

JULY 1984

CHAPTER 1

PROBLEM SUMMARY AND CORRECTION APPROACH

This report describes the correction approach, correction plan elements, and implementation schedule for the contamination problem defined in the July 12, 1984, Problem Definition Report for the Western Forge and Flange Company, Albany, California, facility. The property will continue to be used by Western Forge and Flange for flange manufacture. Consideration was given to this long term land use in developing the correction plan.

PROBLEM SUMMARY

The Albany site is contaminated with heavy metals and oil in the residue which results from the production of flanges. This residue has contaminated the work floor area and site soils. Runoff from the site enters a catch basin adjacent to railroad tracks bordering the property. Stormwater has apparently washed through a portion of the building, carrying heavy metals and oily water to the rear of the property.

The floor residue material exceeds the January 1984, draft total threshold limit concentrations (TTLCs) for copper and nickel. The floor residue is a mixture of metal shavings, oil drippings, dirt, and water.

The soils on the northern half of the property between the railroad tracks and the building have more significant metal concentrations than the southern half of the property. Four metals are of concern: copper, lead, nickel, and zinc. Soil samples from one location in the northern half exceed the TTLC for nickel (based on a total analysis) and the soluble threshold limit concentrations (STLCs) for copper, nickel, and lead (based on a California Assessment Manual (CAM) waste extraction test analysis). No samples show metal concentrations above TTLC levels in the southern half of the property. Two locations in the southern half exceed STLCs based on CAM waste extraction tests: one location for lead and the second location for nickel.

The monitoring well on the northern half of the property contains nickel and lead above point source discharge requirements and the U.S. Environmental Protection Agency's ambient water quality criteria. A second well, 50 feet to the south, shows metal concentrations in water below these requirements and

FMB

STATE OF CALIFORNIA—HEALTH AND WELFAR ENCY

GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HEALTH SERVICES
2151 BERKELEY WAY
BERKELEY, CA 94704
(415) 540-2043

Robin Brewer

July 19, 1984

Received 7-24-84 FMB

CALIFORNIA REGIONAL WATER

JUL 24 1984

QUALITY CONTROL BOARD

Mr. Peter Zaklan
Western Forge and Flange Co.
540-A Cleveland Street
Albany, CA 94706

Dear Mr. Zaklan:

We have received your Problem Definition Report and Correction Plan dated July 10, 1984. After reviewing these documents, we find that the plans are acceptable to the Department and the clean-up process can begin.

The final judgment will stipulate that all work on the soils (including post-excavation samples) must be completed by November 1, 1984. Please notify this Department at least 48 hours prior to the beginning of excavation. At least six post-excavation samples must be collected to verify that all contamination has been remedied.

In addition, please submit a report when the cleanup and modifications to the water collector and treatment system and oily water discharge has been completed. This should also be completed by November 1, 1984. In preparing the design of the correction plan you should note the following:

1) Soil residues shall be transported as a hazardous waste by a registered hauler. The hauler will carry a hazardous waste manifest with each load of earth that ststes the soil contains nickel, copper and lead.

2) The soil shall be transported in a covered container approved by the California Highway Patrol pursuant to Section 34500 and 34501, Vehicle Code and Titles 40 and 49, Code of Federal Regulations.

3) The soil shall be disposed of at a Class I (or Class II-1) disposal site with the prior approval of this agency and the Regional Water Quality Control Board.

4) Compliance is required of all applicable regulations in Subchapter 8, Chapter 4, Title 8, CAC for worker protection during the cleanup operation.

PROBLEM DEFINITION REPORT FOR WESTERN FORGE AND FLANGE ALBANY, CALIFORNIA, FACILITY

DRAFT

Approved
7-3-84

INTRODUCTION

On May 21 and 22, 1984, Brown and Caldwell conducted a field investigation at Western Forge and Flange (WFF) in Albany, California. Previous sampling by the Department of Health Services (DHS) and Brown and Caldwell at the site has identified the presence of chromium, copper, lead, nickel, and zinc in the soils behind the WFF facility. The purpose of this investigation was to characterize the potential sources of metals in the soil, determine the extent of soil contamination by the metals, and determine if groundwater contamination by metals has occurred. This information is used by Brown and Caldwell to develop a correction plan for the site.

With the exceptions noted below, all of the samples described in the work plan were collected and analyzed. Originally, it was planned to install three groundwater monitoring wells and collect samples from each. The upgradient well could not be installed because sandstone was encountered near the land surface at this location, and the borehole was dry. Additional surface and near-surface soil samples were also collected from a location approximately 120 feet east of WFF operations to determine background metals concentrations in the soils. Field activities and analytical results are described below.

Field Methods and Procedures

Several sampling methods were utilized in collecting samples at WFF. This section describes each sampling method as well as equipment decontamination and sample handling procedures.

Floor Residue Sampling. Discrete floor residue samples were collected from seven locations inside the WFF facility. Each discrete sample was collected by hand and placed directly into the sample container. They were composited at the laboratory on an equal-weight basis into one sample for metals analysis.

Process Water Sampling. Water samples were collected from the quench tank, oil water separator, and roof condensate runoff. The separator and quench tank samples were collected by siphoning water through a 3-foot length of typon tubing directly into the sample containers. Water was allowed to run through the tubing for approximately 10 to 15 seconds before collecting the sample. The roof condensate was collected through a plastic funnel into the sample containers. There was no visible oil in any of the samples.

Surface and Near Surface Soil Sampling. Fourteen surface and near-surface soil samples were collected from eight locations at WFF (Figure 1). A representative of DHS was present during the collection of samples S1 through S5 to designate these sampling locations. Surface soil samples were generally collected from a depth of 0 to 6 inches using a manual soil sampler equipped with a 6-inch-long by 2-inch-diameter sampling tube. Near-surface samples were collected from six surface sampling locations by lowering the sampler through the orignial sampling hole and driving the sampler to a depth of 12 inches. Approximately 1/4 to 1/2 inch of loose soil was considered slough from the surface and discarded from the top of each 6- to 12-inch sample.

Each surface and near-surface sample was extruded from the sampler into the sample container. A field split of sample S4 6 to 12 inches was provided to DHS. This sample was homogenized in a plastic bag before being split into two sample containers.

Monitoring Well Installation

On May 21, 1984, three shallow soil boreholes were completed in the locations shown on Figure 1. The boreholes were drilled using a CME 55 drilling rig equipped with 6-1/2-inch-outside-diameter, hollow-stem, continuous-flight augers. Representative soil samples were collected either by pushing a 2- or 2-1/2-foot-long, 2-inch-diameter, Shelby tube ahead of the auger or in a standard penetration sampler pushed ahead of the auger. Once the sampler was retrieved, the auger was generally advanced to the depth of penetration and sampling was repeated. All soil samples were visually examined to produce the borehole logs, and those collected in Shelby tubes were retained but not submitted for analyses. Samples collected in the standard penetration sampler were discarded at the site. The borehole logs and records of sample collection are presented in Attachment A.

Monitoring wells were constructed in boreholes W-2 and W-3 by inserting flush-threaded, 2-inch-diameter, Schedule 40, PVC casing and screen through the hollow-stem augers. Number 3 sand was used as the gravel pack, and bentonite pellets were used to seal the annulus after the augers had been removed. A cement seal and 6-inch protective steel casing were installed at the surface. Well completion records for the wells are included in Attachment A. Borehole W-1 was backfilled with drill cuttings because it was a dry hole.

Monitoring Well Development and Sampling

Immediately following construction, each well was developed by bailing with a Teflon bailer and pumping. A Masterflex peristaltic pump was used on well W-2, and an ISCO Model 1680 peristaltic pump

was used in well W-3. Each pump was equipped with Tygon tubing as intake and discharge line. A record of the quantity of water removed from each well is included on the well construction summaries. A total of 4.6 and 4.1 well volumes were removed from wells W-2 and W-3, respectively.

Immediately after development, groundwater samples were collected from each well with the pump used for development. Samples for metals analyses were filtered through a 0.45-micron filter, acidified with 2 milliliters of nitric acid, and cooled with ice at the site. Samples for hexavalent chromium were not filtered or preserved.

Sample Handling Procedures

Proper sample handling procedures are essential in the collection of a representative sample and ensuring its integrity. A summary of the container and preservation method for each type of sample collected is included in Table 1. Each sample was maintained under strict chain of custody protocol throughout delivery at the laboratory and analysis.

Equipment Decontamination

To prevent cross-contamination of samples, all sampling equipment was decontaminated before use. The augers and Shelby tubes were steam-cleaned prior to drilling, and other sampling equipment was washed with Alconox and tap water then rinsed with tap water between uses.

DISCUSSION OF FIELD AND ANALYTICAL RESULTS

Field observations and results of analyses performed on the WFF samples were used to characterize the potential contaminant

Table 1 Sample Containers and Methods of Field Preservation

Parameter	Container	Method of preservation
Soil samples		
Metals[a]	16-ounce glass jar	None
Process water samples		
Metals[a]	500-ml plastic bottle	2 ml 1:1 nitric acid, cool to 4 degrees C
Hexavalent chromium	500-ml plastic bottle	Cool to 4 degrees C
Oil and grease	16-ounce glass jar	Cool to 4 degrees C
Groundwater samples		
Metals[a]	500-ml plastic bottle	Filter through 0.45-micron filter 2 ml nitric acid
Hexavalent chromium	500-ml plastic bottle	Cool to 4 degrees C

[a]The metals analyzed were trivalent chromium, copper, lead, nickel, and zinc.

sources and determine if the soil and groundwater behind the WFF have been contaminated by metals. A discussion of the results follows.

Potential Sources of Contamination

The results of the metals analyses performed on the floor residue sample are presented in Attachment B and summarized in Table 2. The floor residue material contained concentrations of nickel and copper above the draft total threshold limit concentration (TTLC). The concentrations of trivalent chromium, lead, and zinc were detected at elevated concentrations, but less than the TTLC. Hexavalent chromium was not detected in the sample.

The results of the metals and oil and grease analyses performed on the process water samples are included in Attachment B and summarized in Table 3. Measurements of the temperature, pH, and conductivity of the samples were obtained in the field, and these values are included in Table 4.

Liquid from the quench tank and roof condensate runoff were sampled as potential sources of contamination. Overflow from the quench tank has historically drained from the plant onto the soil behind the plant, and the roof condensate runs off from the roof to the soil sporadically each day. The roof condensate results from steam venting from the boiler. The oil-water separator discharges water to the municipal sewer; this is not a potential source of soil contamination.

Liquid from the quench tank contained high concentrations of trivalent chromium, copper, and nickel, but these metals were not detected in the roof condensate sample. Concentrations of copper and nickel were 0.7 and 1.2 mg/l as compared to effluent quality requirements for ocean discharges of 0.2 and 0.1 mg/l,

Table 2 Concentration of Metals Detected in Floor Residue and Soils

Sample identification	Concentration, mg/kg Chromium, trivalent	Copper	Lead	mg/l Wet	Nickel	mg/l Wet	Zinc
Floor residue	610	18,000	84		23,000		320
S1							
0 to 6 inches	160	91	190	5.9	270	3.5	780
6 to 12 inches	200	63	61	~~7.2~~	240	7.2	48
S2							
0 to 6 inches	47	72	140		110	52	820
6 to 12 inches	71	72	94		140	3.1	220
S3							
0 to 6 inches	15	18	95		25		120
6 to 12 inches	22	51	160		42		230
S4							
0 to 6 inches	270	550 49	370	24	1,300	130	420
6 to 12 inches	120	240 12	710	81	370	15	620
S5							
0 to 6 inches	410	1,700	200		4,600		630
6 to 12 inches	16	15	76		19		90
(Background Sample) S6							
0 to 6 inches	24	32	150		46		190
6 to 12 inches	12	16	100		23		250
M1							
0 to 6 inches	99	32	100		180		91
M2							
0 to 6 inches	35	83	310		51		83
TTLC[a]	2,500	2,500	1,000		2,000		5,000
STLC[b]	560	25	5.0		20		250

[a]TTLC, 22 CAC 66699, January 11, 1984, CAM criteria.
[b]STLC, 22 CAC 66699, January 11, 1984, CAM criteria.

Table 3 Concentration of Metals and Oil and Grease Detected in Liquid Samples

Sample identification	Concentration, mg/l					
	Chromium, trivalent	Copper	Lead	Nickel	Zinc	Oil and grease
Quench tank	0.7	0.70	ND[a]	1.2	0.06	5
Separator tank	ND	ND	0.008	0.12	0.22	20
Roof condensate	ND	ND	ND	ND	0.26	69
W2	ND	ND	ND	0.03	0.03	-[b]
W3	ND	ND	0.5	0.42	0.03	-
Ambient water quality criteria[c]	10.3	0.004 0.023	0.025	0.071 0.14	0.058 0.17	-
Effluent quality requirements[d]	0.005	0.2	0.1	0.1	0.3	10

[a]ND indicates parameter was not detected. The detection limits for each parameter in mg/l are trivalent chromium, 0.02/0.04; hexavalent chromium, 0.01; copper, 0.01/0.02; lead, 0.1/0.002; nickel, 0.02/0.04; zinc, 0.01; and oil and grease, 1. First number indicates detection limit for groundwater samples, second number represents detection limit for process water.

[b]Dash (-) indicates parameter was not analyzed in sample or criteria has not been established.

[c]Ambient water quality criteria for the maximum protection of saltwater aquatic life. 79318 Federal Register, Volume 45, No. 231, Friday, November 28, 1980. Upper number represents criteria for 24-hour average, lower number represents maximum criteria at any time.

[d]Water Quality Control Plan for Ocean Waters of California, July 6, 1972.

Table 4 Field Measurements Obtained for Liquid Samples

Sample identification	Parameter		
	Temperature, degrees C	pH[a]	Electrical conductivity, umhos/cm
Quench tank	63	6.0	4,850
Separator tank	39	10.0	460
Roof condensate	42	6.0	400
W-2	18	6.5	9,700
W-3	18	6.5	42,000

[a]pH was determined using Color Phast pH paper.

respectively. Trivalent chromium measured 0.7 mg/l in the quench tank sample. Low concentrations of zinc were detected in both samples. Hexavalent chromium and lead were not detected in either of the samples.

Based on these findings, trivalent chromium, copper, and nickel are potential contaminants resulting from WFF operations. These metals will be more thoroughly discussed in the remainder of this report.

Soil Samples

The results of the metals analyses performed on the soil samples are presented in Attachment B and summarized in Table 2. The floor residue material and quench tank runoff are potential sources of trivalent chromium, copper, and nickel in the soil behind the WFF facility. If these materials are the source of some metals in the soil, it would be expected that metals mentioned above would be present at elevated concentrations in the soils affected by the plant operations. The following trends in metals concentrations were observed:

1. Nickel was detected at a concentration greater than the TTLC in sample S5 (0 to 6 inches). No other metals were detected above the TTLC in any of the soil samples.

2. The concentrations of copper and nickel were as much as 113 and 242 times greater in samples S4 (0 to 6 and 6 to 12 inches) and S5 (0 to 6 inches) than in any of the other soil samples collected.

3. The concentrations of lead in all of the samples and zinc in one sample were detected at elevated concentrations, but they were detected at similar concentrations in the background soil sample (S6, 0 to 6 and 6 to 12 inches).

4. The concentration of trivalent chromium was low in all of the samples, and hexavalent chromium was not detected in any of the samples.

Based on these observations, several soil samples were submitted to the laboratory for the waste extraction test (WET) to determine if they are hazardous by California Assessment Manual (CAM) criteria. The results of the WET are not presently available but will be included in the final report.

Discrete soil samples were collected from the depths of 0 to 6 and 6 to 12 inches to determine the depth of contaminated soil behind the facility. In general, the concentration of metals decreased in the deeper sampling interval. Results of the WETs performed on samples S1 6 to 12 inches, S2 6 to 12 inches, and S4 6 to 12 inches will determine if the soils at this depth are hazardous materials as defined by CAM criteria.

At the request of DHS, two soil samples (M1 and M20-- 6 1/2 inches) were collected from the marsh area west of the railroad tracks. Drainage from the facility enters a storm drain inlet west of the facility, and materials containing metals may be transported through the storm drain inlet to the marsh. These samples exhibited similar concentrations of most metals as samples S1, S2, and S3.

Groundwater Samples

Results of the metals analyses performed on the groundwater samples are included in Attachment B and summarized in Table 3. Field measurements of the temperature, pH, and electrical conductivity of the samples are included in Table 4. Ambient water quality criteria for aquatic life and effluent quality requirements

for the metals analyzed are also included in Table 3. When the concentrations of metals detected in the groundwater are compared to these criteria, the following observations can be made:

1. Neither sample contained detectable levels of trivalent chromium, hexavalent chromium, or copper.

2. Sample W2 contained very low concentrations of zinc and nickel.

3. Sample W3 contained concentrations of nickel and lead above effluent quality requirements for waste discharges as specified in the California Ocean Plan. However, these criteria are established for point discharge and do not apply directly to groundwater. The sample also contains a very low concentration of zinc.

CONCLUSIONS

Based on the above discussion, the following conclusions can be made:

1. Soils in the vicinity of the WFF breezeway contain elevated concentrations of copper and nickel. Others above background Detection Lit. + Wet. Chem.

2. The surface soil at location S5 is a hazardous material, as defined by CAM criteria, because it contains nickel at a concentration greater than TTLC.

TTLC + STLC does not apply.

3. The nickel detected in the groundwater may be a result of WFF operations, but the presence of lead is unexplained

GW gradient?
GW extent, flat + wet??

because lead was not identified as a major metal in the potential source materials. The actual source of both metals cannot be determined because there is no background water quality data available, and the direction and gradient of groundwater flow cannot be accurately determined, without a third monitoring well.

4. Results of the WET will be submitted immediately upon completion of the laboratory analysis.

5 - Any soil extraction with "rain" should be TCLP !!

ATTACHMENT A

BOREHOLE LOGS AND WELL CONSTRUCTION SUMMARIES

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-1	PROJECT: Western Forge JOB NO.: 1928-07	SHEET: 1 / 1

__X__ BACKFILLED SOIL BORING ___ MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/split spoon
DRIVE ENERGY: pushed

	TIME	DATE
START:	1030	5/21/84
FINISH:	1140	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS

DATUM:
GROUND SURFACE:
TOP WELL CASING:

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE

DRAFT

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1		pushed 24"		3" asphalt and base rock 0.25 - 1.35' sand, light brown/rust, fine grained. locally oxidized, gravel at top
2				2.0~ 3.5' sand, brown, fine grained, contains some large gravel, slightly silty.
3		pushed 24"		3.5 - 4.0' sand, very fine grained, rust, very silty
4				4.0 4.5' dark brown clay, dry
5		pushed 30"		4.5 -6.1' sandstone, rust, very fine grained, very silty.
6				
7		pushed 18"		6.5 - 7.6' sandstone as above, medium grained at bottom, black staining locally, dry
8				Could not push sampler through 8' Drill to 13.5' - sandstone as above could not push sampler.
9				
10				
11				
12				
13				BOH 13.5' DRY HOLE
14				
15				

BORING WELL NO. W-1

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-2	PROJECT: Western Forge	JOB NO.: 1928-07	SHEET: 1 / 3

___ BACKFILLED SOIL BORING X MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/split spoon
DRIVE ENERGY: pushed

	TIME	DATE
START:	1205	5/21/84
FINISH:	1250	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS
DATUM:
GROUND SURFACE:
TOP WELL CASING:

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1		pushed 30"		clay, brown, visible oil intermixed, moist
2				
3		pushed 30"		clay, brown, slightly sandy, moist
4				
5				
6		pushed 30"		as above
7				pushed standard penetration sampler
8		pushed 18"		~7.5 - 9.0' clay, brown, sandy micaceous moist dryer, consistency of modelling clay at 8.4-8.7', dirty green
9				
10				10.0 - 10.5' clay, brown, as above
11		pushed 30"		10.5 - 12.0' clay, green, intermixing with rust sandstone
12				12.0 - 12.5' fine grained sandstone, rust, silty, dry
13				12.5 - 14.4' Sand, fine grained, rust color, silty clayey at top
14		pushed 24"		
15				

BORING WELL NO. W-2

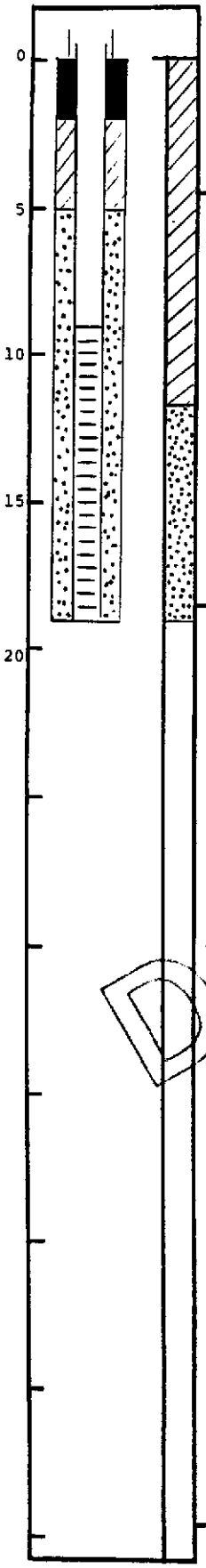
BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL (CONTINUED)

BORING / WELL: W-2	PROJECT: Western Forge	SHEET: 2 / 3

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
15		pushed 24"		15.0- 16.9' sand to sandstone, Fine grained, rust color, silty, wet
		pushed 12"		hard drilling at 17.5' pushed standard penetration sampler could not push through 19'
20				sandstone as above, fine-medium grained, rust color mottled with tan, dry BOH 20'

BORING WELL NO. W-2



WELL W-2

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Western Forge and Flange - Albany

ELEVATION: GROUND LEVEL _____

TOP OF CASING _____

DRILLING SUMMARY:

TOTAL DEPTH 19'

BOREHOLE DIAMETER 6½"

DRILLER J.H. Kleinfelder and Associates

RIG CME 55

BIT(S) Hollow Stem Auger

DRILLING FLUID None

SURFACE CASING 6" steel

WELL DESIGN:

BASIS: GEOLOGIC LOG X GEOPHYSICAL LOG ___

CASING STRING(S): C=CASING S=SCREEN

+1	9	C1	
9	19	S1	

CASING: C1 schedule 40 2" ø PVC flush threaded joints

SCREEN: S1 schedule 40 2" ø PVC, 0.020" slots, flush threaded joints

CENTRALIZERS _____

FILTER MATERIAL #3 Monterey sand 5-19'

CEMENT 0-2'

OTHER 3/8" bentonite pellet seal 2-5'

CONSTRUCTION TIME LOG:

TASK	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING:	5/21/84		5/21/84	
GEOPHYS. LOGGING:				
CASING:	5/21/84		5/21/84	
FILTER PLACEMENT:	5/21/84		5/21/84	
CEMENTING:	5/21/84		5/21/84	
DEVELOPMENT:	5/21/84		5/23/84	
OTHER: sample			5/23/84	

WELL DEVELOPMENT

Removed 40 gallons, using bailer and masterflex peristaltic pump. Slightly cloudy water, no sediment.

COMMENTS:

Gravel pack is slightly bridged.

BROWN AND CALDWELL CONSULTING ENGINEERS

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-3	PROJECT: Western Forge	JOB NO.: 1928-07	SHEET: 1 /3

___ BACKFILLED SOIL BORING —x— MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/standard penetration
DRIVE ENERGY: pushed

	TIME	DATE
START:	1340	5/21/84
FINISH:	1410	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS
DATUM:
GROUND SURFACE:
TOP WELL CASING:

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE

DRAFT

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1				rubble - drill to 3'. silt, sandy, brown, contains pieces of brick and rock.
2				
3				
4		pushed 24"		clay, green , sandy. contact with silt at top
5				
6		pushed 24"		clay, green gray - sandy. Bay Mud
7				
8		pushed 24"		clay, green as above, damp on bottom of sampler
9				
10				
11				drill to 15'
12				
13				
14				hard drilling at 14'
15				

BORING WELL NO. _____

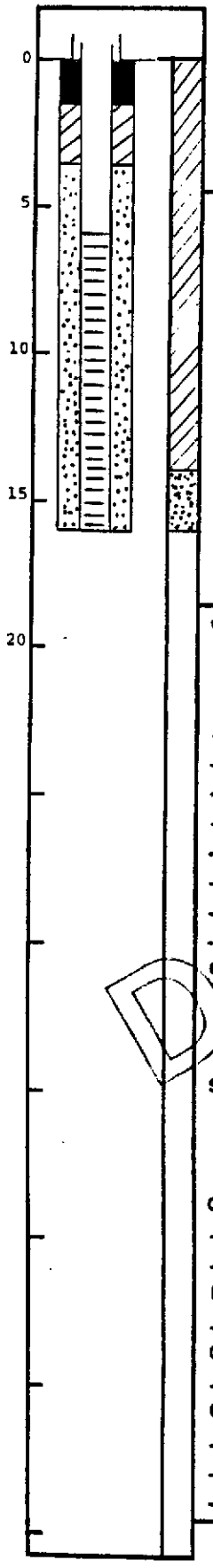
BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL (CONTINUED)

BORING / WELL: W-3	PROJECT: Western Forge	SHEET: 2 / 3

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
		pushed 18"		used standard penetration sampler sand, fine grained, rust color intermixed with tan, very silty/clayey in areas
17				BOH 16'

BORING WELL NO. W-3



WELL W-3

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Western Forge and Flange - Albany

ELEVATION: GROUND LEVEL

TOP OF CASING

DRILLING SUMMARY:

TOTAL DEPTH 16'

BOREHOLE DIAMETER 6¼"

DRILLER J.H. Kleinfelder and Associates

RIG CME 55

BIT(S) Hollow stem auger

DRILLING FLUID None

SURFACE CASING 6" steel

WELL DESIGN:

BASIS: GEOLOGIC LOG X GEOPHYSICAL LOG

CASING STRING(S): C=CASING S=SCREEN

+1	6	Cl	
6	16	Sl	

CASING: Cl schedule 40 2" ø PVC flush threaded joints

SCREEN: Sl schedule 40 2" ø PVC 0.020 inch slots, flush threaded joints

CENTRALIZERS

FILTER MATERIAL #3 Monterey sand 3½ - 16'

CEMENT 0-1½'

OTHER 3/8" bentonite pellet seal 1½ - 3½'

CONSTRUCTION TIME LOG:

TASK	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING:	5/21/84		5/21/84	
GEOPHYS. LOGGING:				
CASING:	5/21/84		5/21/84	
FILTER PLACEMENT:	5/21/84		5/21/84	
CEMENTING:	5/21/84		5/21/84	
DEVELOPMENT:	5/21/84		5/23/84	
OTHER: sample			5/23/84	

WELL DEVELOPMENT

Removed 24 gallons using bailer and ISCO pump. Clear water.

COMMENTS:

BROWN AND CALDWELL CONSULTING ENGINEERS

ATTACHMENT B

ANALYTICAL RESULTS

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 6/07/84

Job# 1928-01

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

cc. Ms. Mary Lucas

Laboratory Director

Log No.	SOLID SAMPLES Sample Description
5-258-1	Floor; Composite of Discretes - 1 through 7
5-258-2	S-1; 0-6"
5-258-3	S-1; 6-12"
5-258-4	S-2; 0-6"
5-258-5	S-2; 6-12"

Concentration: mg/Kg; as received

	5-258-1	5-258-2	5-258-3	5-258-4	5-258-5
Chromium, Trivalent	610	160	200	47	71
Chromium, Hexavalent	< 0.2	< 5	< 4	< 1	< 5
Copper	18,000	91	63	72	72
Lead	84	190	61	140	94
Nickel	23,000	270	240	110	140
Zinc	320	780	48	820	220

ht

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Brown and Caldwell

cc. Ms. Mary Lucas

Laboratory Director

DRAFT

Log No.	SOLID SAMPLES Sample Description
5-258-6	S-3; 0-6"
5-258-7	S-3; 6-12"
5-258-8	S-4; 0-6"
5-258-9	S-4; 6-12"
5-258-10	S-5; 0-6"
5-258-11	S-5; 6-12"

Concentration: mg/Kg; as received

	5-258-6	5-258-7	5-258-8	5-258-9	5-258-10	5-258-11
Chromium, Trivalent	15	22	270	120	410	16
Chromium, Hexavalent	< 5	< 4	< 2	< 2	< 5	< 5
Copper	18	51	550	240	1700	15
Lead	95	160	370	710	200	76
Nickel	25	42	1300	370	4600	19
Zinc	120	230	420	620	630	90

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Brown and Caldwell

cc.

Laboratory Director

Log No.	SOLID SAMPLES Sample Description
5-258-12	S-6; 0-6"
5-258-13	S-6; 6-12"

Concentration: mg/Kg; as received

	5-258-12	5-258-13				
Chromium, Trivalent	24	12				
Chromium, Hexavalent	< 5	< 5				
Copper	32	16				
Lead	150	100				
Nickel	46	23				
Zinc	190	250				

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Job# 1928-01

Reported To: Mr. John Bouey
Brown and Caldwell

Laboratory Director

cc.

Log No.	AQUEOUS SAMPLES	Sample Description
5-258-14	Roof Condensate	
5-258-15	Quench Tank	
5-258-16	Separator Tank	

Concentration: mg/L; as received

	5-258-14	5-258-15	5-258-16			
Chromium, Trivalent	< 0.04	< 0.04	< 0.04			
Chromium, Hexavalent	< 0.01	< 0.01	< 0.01			
Copper	< 0.02	0.70	< 0.02			
Lead	< 0.002	< 0.002	0.008			
Nickel	< 0.04	1.2	0.12			
Zinc	0.26	0.06	0.22			
Oil and Grease	69	5	20			

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

June 7, 1984 E84-5-258

Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523 JOB#1928-01

Subject: Sample E84-5-258-1 through 5

Dear Mr. Bouey:

We have a chain-of-custody card on file for your sample (s). Our customary procedure is to hold all samples for 30 days, then discard or return them to the client. If we do not hear from you within 30 days from the date of this letter, we will discard your sample (s) and mail your chain-of-custody card to you. Other arrangements can be made for your sample (s) by contacting myself or our laboratory director, Jim Hatfield, before our intended discard date.

Very truly yours,

BROWN AND CALDWELL

Carol Trent - csm

Carol Trent
Sample Receptionist

CT: csm

DRAFT

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-6-63

Date Sampled 5/23/84
Date Received 6/06/84
Date Reported 6/18/84

Revised 6/20/84

1928-02

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas - BC, Pleasant Hill

Log No.	Sample Description
6-63-1	M-1; Marsh west of breezeway
6-63-2	M-2; Marsh at outlet

DRAFT

Concentration: mg/kg

	6-63-1	6-63-2				
Chromium, Trivalent	99	35				
Chromium, Hexavalent	< 2	< 2				
Copper	32	83				
Lead	100	310				
Nickel	180	51				
Zinc	91	83				

csm

BROWN AND CALDWELL
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Log No. E84-6-63

Date Sampled 5/23/84
Date Received 6/06/84
Date Reported 6/18/84

Revised 6/20/84

1928-02

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas - BC, Pleasant Hill

Log No.	Sample Description
6-63-1	M-1; Marsh west of breezeway
6-63-2	M-2; Marsh at outlet

Concentration: mg/Kg

	6-63-1	6-63-2				
Chromium, Trivalent	99	35				
Chromium, Hexavalent	< 2	< 2				
Copper	32	83				
Lead	100	310				
Nickel	180	51				
Zinc	91	83				

csm

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PHONE (415) 428-2300

Log No. E84-5-273

Date Sampled 5/23/84
Date Received 5/23/84
Date Reported 6/07/84

1928-03

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas BC, - Pleasant Hill

Log No.	Sample Description
5-273-1	WESTERN FORGE AND FLANGE W-2 4:20 p.m.
5-273-2	W-3 4:30 p.m.

Concentration: mg/L

	5-273-1	5-273-2
Chromium, Hexavalent	< 0.01	< 0.01
Chromium, Trivalent	< 0.02	< 0.02
Copper	< 0.01	< 0.01
Lead	< 0.1	0.5
Nickel	0.03	0.42
Zinc	0.03	0.03

ht

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EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-273

Date Sampled 5/23/84
Date Received 5/23/84
Date Reported 6/07/84

1928-03

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

cc. Ms. Mary Lucas BC, - Pleasant Hill

Laboratory Director

Log No.	Sample Description
5-273-1	WESTERN FORGE AND FLANGE W-2 4:20 p.m.
5-273-2	W-3 4:30 p.m.

Concentration: mg/L

	5-273-1	5-273-2				
Chromium, Hexavalent	< 0.01	< 0.01				
Chromium, Trivalent	< 0.02	< 0.02				
Copper	< 0.01	< 0.01				
Lead	< 0.1	0.5				
Nickel	0.03	0.42				
Zinc	0.03	0.03				

ht