UNION PACIFIC RAILROAD COMPANY

W. E. (BILL) WIMMER
ASSISTANT VICE PRESIDENT
ENVIRONMENTAL MANAGEMENT

MAILING ADDRESS
ROOM 930
1416 DODGE STREET
OMAHA, NEBRASKA 68179

FAX NO (402) 271-4461

R. C. (BOB) KUHN
GEN DIR -ENVIRONMENTAL OPERATIONS
S W. (STEVE) BERKI
DIR -ENVIRONMENTAL OPERATIONS-CENTRAL
G. A. (AVERY) GRIMES
DIR -ENVIRONMENTAL OPERATIONS-WESTERN
L. A. (LANNY) SCHMID
DIR -ENVIRONMENTAL OPERATIONS-SOUTHERN
R. L (RICK) EADES
DIR -ENVIRONMENTAL SITE REMEDIATION
N. D. (NORM) SILER
DIR -ENVIRONMENTAL TECHNOLOGIES

October 30, 1991

Environmental
CA, Oakland

NOV 04 1991
QUALITY CONTROL BOARD

Mr. Tom Paulson
East Bay Municipal Utility District
Source Control Division, MS 702
P O Box 24055
Oakland, CA 94623

RE: Groundwater Discharge Permit Application
Oakland TOFC Railyard
1717 Middle Harbor Road
Oakland, CA

Dear Mr. Paulson:

Enclosed is the permit application and supporting material for the proposed discharge of treated groundwater at the subject site. An industrial water discharge permit number 233-90851 has been obtained for the currently operating treatment system. This document is to be considered for an additional discharge permit. Pursuant to the requirements of the East Bay Municipal Utility District (EBMUD), the following materials have been enclosed with this document:

- A permit application fee for the amount of $2,000
- Completed permit application
- Schematic flow diagram
- Site building layout plan
- Description of treatment system
- Self-monitoring method
- Analytical reports for EPA 624, EPA 625, and metals

A "list of all environmental permits" was requested by EBMUD. A permit for the oil/water separator will be filed with the Bay Area Air Quality Management District. The permit consists of completing and submitting forms "Data Form G", "P101B", and "P201". The existing oil recovery tank has been permitted. The groundwater recovery wells have been permitted and installed. Additional permitting will be performed if additional recovery wells are installed. An air discharge permit will not be required by the Bay Area Management District, because the groundwater treatment system will not create any significant emissions. Non-environmental permits will be obtained to install the groundwater treatment system, which will include a sewer extension permit and an electrical permit.

An oil and grease analysis was requested by EBMUD. On July 10, 1991, a composite sample from recovery wells ORW-1, ORW-2, and ORW-3 was collected and analyzed for total petroleum hydrocarbons as diesel using the modified 8015 method (reports enclosed), which should be capable of identifying any petroleum product constituent of concern. An oil and grease analysis was not performed, because the presence of oil and grease or a constituent, that would not be identified with the modified 8015 method, was not anticipated. In a telephone conversation between Mr. Bill Meckel of EBMUD and Mr. Denton Mauldin of USPCI, on September 25, 1991, the oil and grease analysis was discussed. Mr. Meckel informed Mr. Mauldin that the absence of the oil and grease analysis would not be a problem, due to the source of the water to be treated. However, if you feel that an oil and grease analysis should be included in the "Self-Monitoring Method", then please notify me. Otherwise, oil and grease will not be included in the monitoring (except for the first sample taken during the first day of operation).

Please review the permit at your earliest possible convenience. If you have any questions, please call Harry Patterson at (402) 271-4078.

Yours truly,

W. E. WIMMER
AVP Environmental Management

CC: Mr. Ray Balcon
California Regional Water Quality
2101 Webster - 5th Floor
Oakland, CA 94612

EBMUD

WASTEWATER DISCHARGE PERMIT APPLICATION

PERMIT NUMBER

APPLICANT BUSINESS NAME

Union Pacific Railroad

ADDRESS OF PREMISE DISCHARGING WASTEWATER	BUSINESS MAILING ADDRESS
1717 Middle Harbor Road (STREET ADDRESS)	1416 Dodge Street, Rm. 930 (STREET ADDRESS)
Oakland, CA (CITY) 94607 (ZIP CODE)	Omaha, NE (CITY) 68179 (ZIP CODE)

CHIEF EXECUTIVE OFFICER

R.K. Davidson (NAME)	President (TITLE)
1416 Dodge Street (STREET ADDRESS)	Omaha, NE (CITY) 68179 (ZIP CODE)

PERSON TO BE CONTACTED ABOUT THIS APPLICATION	PERSON TO BE CONTACTED IN EVENT OF EMERGENCY
Mr. Denton Mauldin (NAME)	Mark Schafer (NAME)
Engineer II (TITLE) (303) 938-5539 (PHONE)	402 271 2453 (DAY PHONE) 402 468 5294 (NIGHT PHONE)

DOCUMENTATION TO BE RETURNED WITH THE PERMIT APPLICATION:

- ☒ PROCESS DESCRIPTION
- ☒ DESCRIPTION OF TREATMENT SYSTEM
- ☐ WATER BALANCE CALCULATIONS
- ☑ SELF-MONITORING METHOD
- ☐ WASTEWATER STRENGTH DATA BASE
- ☐ SPILL PREVENTION AND CONTAINMENT PLAN
- ☒ SCHEMATIC FLOW DIAGRAM
- ☑ A LIST OF ALL ENVIRONMENTAL PERMITS (E.G. Air, Hazardous Waste)
- ☒ SITE BUILDING LAYOUT PLAN
- ☑ OTHER LAB ANALYSES for EPA 624, EPA 625 (SPECIFY) Oil & Grease, Metals

PROVISIONS

Applicant will comply with the EBMUD Wastewater Control Ordinance and all applicable rules and regulations.

Applicant will report to EBMUD, Wastewater Department any changes, permanent or temporary, to the premise or operations that significantly change the quality or volume of the wastewater discharge or deviation from the terms and conditions under which this permit is granted.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that the qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

William E Wimmer
NAME (See certification requirements on reverse)

Wille E Wimmer
SIGNATURE

AVP Environmental Management
TITLE

10/30/91
DATE

INSTRUCTIONS FOR COMPLETING THE APPLICATION

CLEARLY TYPE OR PRINT THE INFORMATION REQUESTED AND RETURN THE SIGNED ORIGINAL TO EAST BAY MUNICIPAL UTILITY DISTRICT, WASTEWATER DEPARTMENT, MS #59, P.O. BOX 24055, OAKLAND, CA.

- **APPLICANT BUSINESS NAME** - Enter the name or title of your business.
- **ADDRESS OF PREMISES DISCHARGING WASTEWATER** - Enter the full street address of the building or premise which is discharging the wastewater pertinent to this application.
- **BUSINESS MAILING ADDRESS** - Enter the complete mailing address.
- **CHIEF EXECUTIVE OFFICER** - Enter the full name and title of the Principle Executive or Authorized Agent of the Business.
- **PERSON TO BE CONTACTED ABOUT THIS APPLICATION** - Provide the name, title and phone number of the person who is thoroughly familiar with the facts reported in the application and who can be contacted by the staff of EBMUD.
- **PERSON TO BE CONTACTED IN EVENT OF EMERGENCY** - Give the name and phone number(s) of the responsible person who can be contacted in case of an emergency (e.g., spill to the sanitary sewer).
- **DOCUMENTATION TO BE RETURNED WITH THE PERMIT APPLICATION** - Return with the Wastewater Discharge Permit Application all documentation as requested. Documentation requirements are indicated by an "x" marked in the box along side a specific item. Permits cannot be processed without this information.
- **CERTIFICATION** - Type or print the name and title of the person signing the application. All applications, reports, or information requested by the District must contain the following certification statement and be signed as required in sections (a), (b), (c), or (d) below. (Use whichever alternative best applies).

  a. By a responsible corporate officer, if the Permit Holder submitting the reports is a corporation. For the purpose of this paragraph, a responsible corporate officer means:

     i. a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy - or decision-making functions for the corporation, or;

     ii. the manager of one or more manufacturing, production, or operation facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

  b. By a general partner or proprietor if the Permit Holder submitting the reports is a partnership or sole proprietorship respectively.

  c. By a duly authorized representative of the individual designated in paragraph (a) or (b) of this section if:

     i. the authorization is made in writing by the individual described in paragraph (a) or (b);

     ii. the authorization specifies either an individual or a position having responsibility for the overall operation of the facility from which the wastewater discharge originates, such as the position of plant manager, a field superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the company; and

     iii. the written authorization is submitted to the District.

  d. If an authorization under paragraph (c) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility for the environmental matters for the company, a new authorization satisfying the requirements of paragraph (c) of this section must be submitted to the District prior to or together with any reports to be signed by an authorized representative.

EBMUD

Union Pacific Railroad
BUSINESS NAME

Process Description

PURPOSE – The Process Description is intended to provide a description of the primary business activities and the substances which may enter into the wastewater from the business activity.

EBMUD USE
Permit Number
Business Classification Code

BUSINESS ACTIVITY

Ground Water Recovery and Treatment

DESCRIPTION OF PRODUCT

TYPE OF PRODUCT OR BRAND NAME	QUANTITIES	
	Past Calendar Year	Estimated This Year
Any additional business activities at this		
address would be covered in EBMUD permit #233-		
90851		
(Not Applicable)		

PROCESS DESCRIPTION

PROCESS DESCRIPTION List all wastewater generating operations	CHARACTERISTICS List all substances that may be discharged to the sewer.
Example: Rinsewater from electroplating bath	**Cr, Cu, Ni, Zn**
Example: Washdown of milk filling area	**fatty acids, milk**
Product/water separation and granular activated carbon adsorption. Refer to Description of Treatment System	Treated groundwater

DISCHARGE PERIOD

a. Time of day from 8 am to 8am
b. Days of the week 7

BATCH DISCHARGE(S) Intermittent Discharge

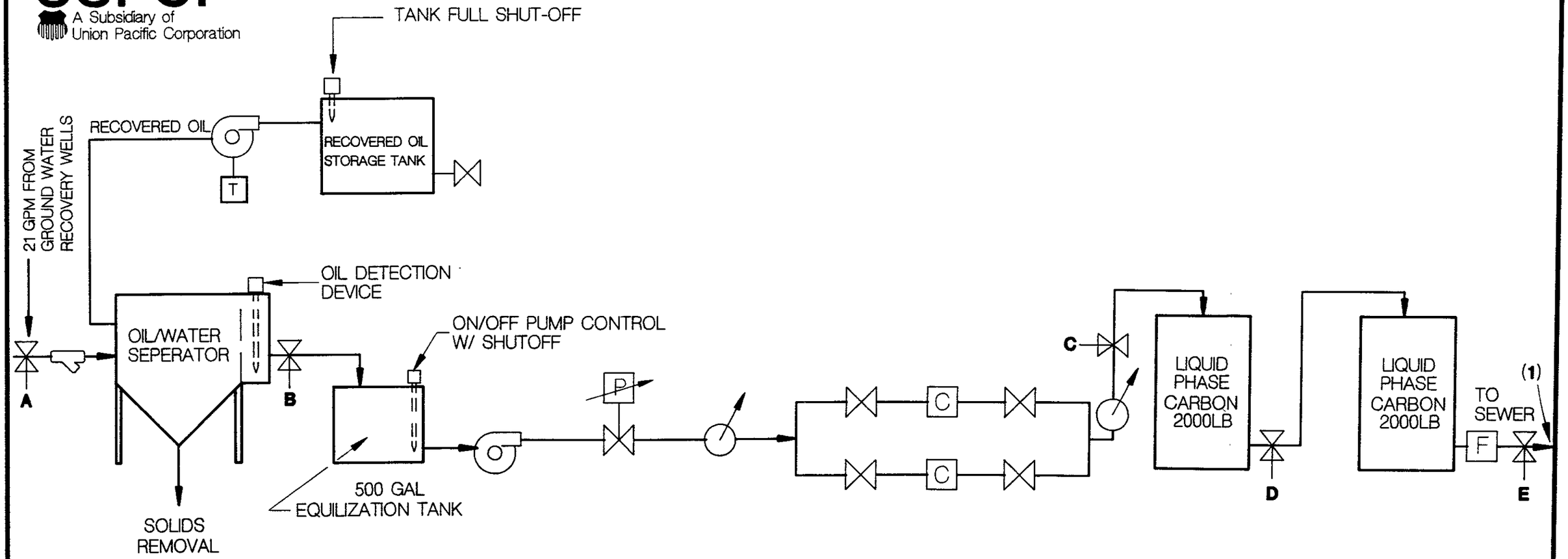
a. Day(s) of the week 7 b. Time(s) of the day unknown
c. Volume discharged 30,000 GPD d. Rate of discharge 50gal/min

OTHER WASTES – List the type and volume of liquid waste and sludges removed from the premises by means other than the community sewer.

WASTE REMOVED BY (Name, address and State Transporter ID No.)	TYPE OF WASTE (Example: alkaline cleaners, organic solvents, treatment sludge)	WASTE I.D. No.	VOLUME (lbs)(gal)/mo
California Oil Recyclers CAO 980695961	Diesel Product (fuel oil)	NA 1993	to be determined

SD-31 • 2/88

USPCI
A Subsidiary of
Union Pacific Corporation

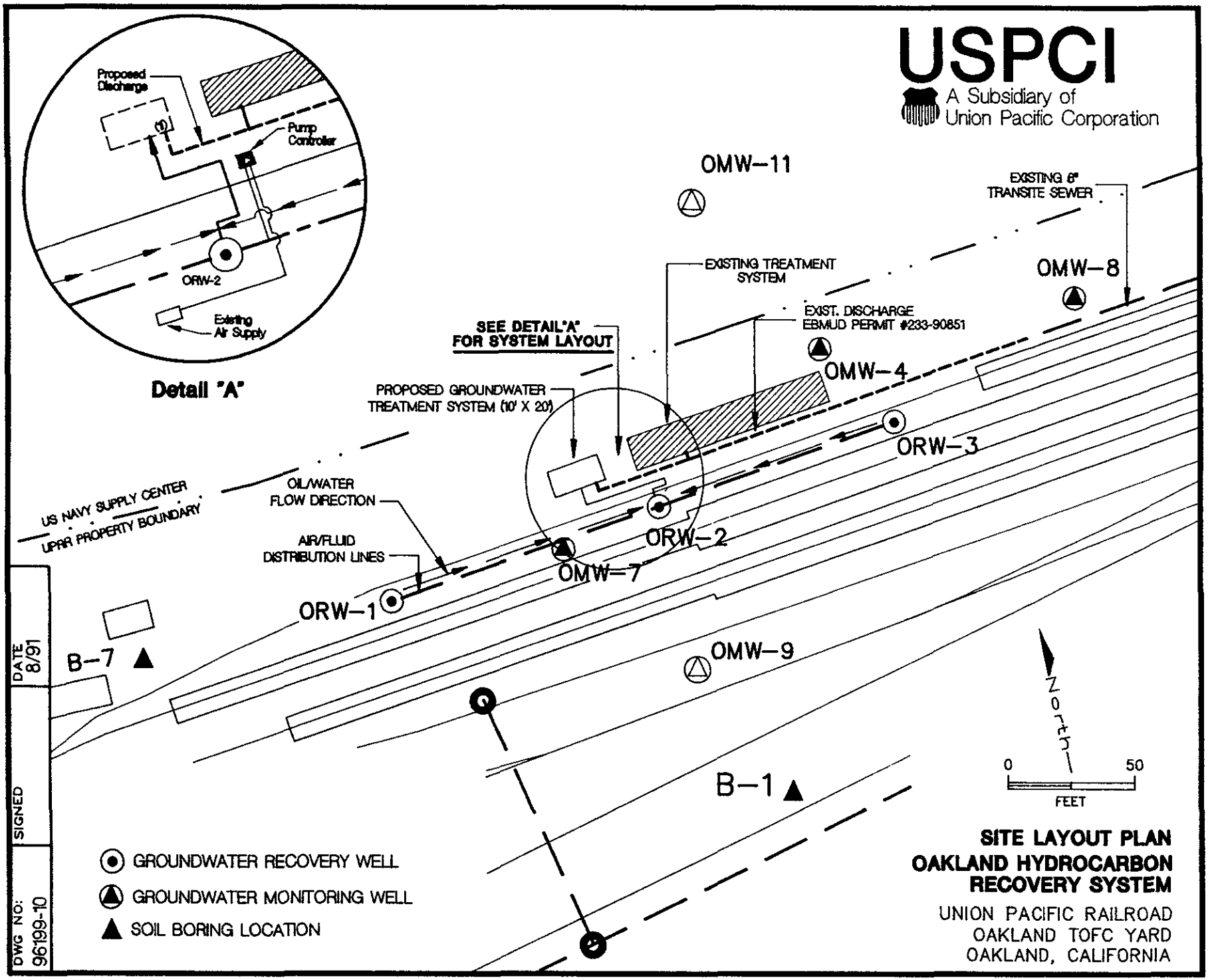


LEGEND

- CENTRIFUGAL PUMP
- PRESSURE CONTROL SWITCH
- TOTALIZING FLOW METER
- PRESSURE GUAGE
- TIME METER
- SAMPLING PORT
- VALVE
- CARTRIDGE FILTER
- "Y" STRAINER

OAKLAND GROUND WATER TREATMENT SYSTEM

SCHEMATIC FLOW DIAGRAM


USPCI
A Subsidiary of
Union Pacific Corporation
Proposed Discharge
Pump Controller
ORW-2
Existing Air Supply
Detail "A"
OMW-11
EXISTING 6" TRANSITE SEWER
EXISTING TREATMENT SYSTEM
OMW-8
SEE DETAIL "A" FOR SYSTEM LAYOUT
EXIST. DISCHARGE EBMUD PERMIT #233-90851
OMW-4
PROPOSED GROUNDWATER TREATMENT SYSTEM (10' X 20')
ORW-3
US NAVY SUPPLY CENTER
UPRR PROPERTY BOUNDARY
OIL/WATER FLOW DIRECTION
AIR/FLUID DISTRIBUTION LINES
ORW-2
OMW-7
ORW-1
B-7
OMW-9
B-1
North
0
50
FEET
GROUNDWATER RECOVERY WELL
GROUNDWATER MONITORING WELL
SOIL BORING LOCATION
DATE 8/91
SIGNED
DWG NO: 96199-10
SITE LAYOUT PLAN
OAKLAND HYDROCARBON RECOVERY SYSTEM
UNION PACIFIC RAILROAD
OAKLAND TOFC YARD
OAKLAND, CALIFORNIA

DESCRIPTION OF TREATMENT SYSTEM

The proposed treatment system is designed to remove free hydrocarbon product (weathered diesel) and low levels of dissolved contaminates from influent produced by a groundwater remediation system. The system is located at Union Pacific Railroad's Oakland, California rail yard, and includes three recovery wells equipped with individual total fluid pumps. The pneumatically operated total fluid pumps depress the groundwater surface beneath the rail yard and discharge a mixture of weathered diesel and water to the surface treatment system. The treatment system consists of an oil/water separator to remove the free hydrocarbon product and an activated carbon unit to remove low levels of dissolved contaminates in the groundwater. Effluent from the treatment system will be discharged to the EBMUD sanitary sewer.

On July 10, 1991, a composite sample from groundwater recovery wells ORW-1, ORW-2, and ORW-3 was collected and submitted to a State certified laboratory. The sample was analyzed for volatile organics, semivolitale organics, total petroleum hydrocarbons, total metals, and oil and grease. Groundwater contaminants, which exceed the East Bay Municipal Utility District (EBMUD) acceptance limits (based on the "Influent and Effluent Toxics Summary 1990), are listed in Table 1. The analytical reports are provided with the permit application.

The groundwater treatment system was primarily designed to reduce the levels of the contaminants found in Table 1. In addition, the system will be capable of reducing levels of the groundwater treatment system influent concentrations of other organics not listed in Table 1. For discharge compliance, the treated water will be metered and sampled in accordance to the "Self Monitoring Method", prior to discharge to the sanitary sewer.

USPCI estimates groundwater will be discharged under pressure from the recovery wells to the treatment system at a rate of approximately 21 gallons per minute (gpm). The actual flow rate is dependant on aquifer characteristics, degree of groundwater depression, and number of operating recovery wells. With the currently installed pumps, the existing three recovery wells can collectively discharge up to 21 gpm. Depending on the radius of influence for the three existing recovery wells, additional recovery wells may be required in the future. EBMUD will be notified if is determined that a discharge rate of greater than 21 gpm is required. Due to the possibility of increasing the system flow rate in the future, the oil/water separator, the equalization tank, and the GAC units will be capable of handling higher flow rates.

The groundwater treatment system will be located to the west of the existing industrial waste water treatment facility and to the east of the air compressor building (Site Layout Plan). The system will primarily consist of an oil/water separator, two

liquid phase granular activated carbon (GAC) units, plus the necessary controls to allow continuous and automatic operation of the system. Information from a vendor indicates that the carbon usage will be 58 pounds of GAC per day (see enclosure). The treatment system will be skid-mounted and surrounded by a locked security fence. The system will be designed to operate automatically, with a minimum of maintenance and support. The system description is illustrated in the schematic flow diagram.

Prior to the oil/water separator, the groundwater/oil mixture from the recovery wells will flow through a "Y" strainer to remove coarse sediment and debris. From the "Y" strainer the groundwater/oil mixture will flow into a 100 gpm oil/water separator. Oil recovered by the oil/water separator will be discharged by a oil transfer pump to an existing buried 10,000 gallon product recovery tank. The recovery tank also receives waste oil from the permitted oil/water separator associated with the industrial waste water treatment system at the railyard. To estimate the volume of oil pumped from the separator to the recovery tank, the oil transfer pump will be connected to an electrical hour meter, which will record the duration of pumping. By knowing the pumping duration and the flow rate of the oil transfer pump, the volume of oil pumped to the existing 10,000 gallon recovery tank can be estimated. The recovery tank will be equipped with a tank full shut off switch. The tank full switch will automatically stop the operation of the recovery system if oil levels in the recovery tank approach near full conditions.

A conductivity probe will be added to the oil/water separator to detect the presence of oil in the clean water outlet chamber of the separator. Normally, water flows over a weir and into a clean water outlet chamber, near the effluent side of the separator. If oil is not separated in the oil/water separator, then it will collect in the clean water outlet chamber and float on the effluent water. Oil floating on the water in the clean water outlet chamber will cause the oil/water interface to lower. The conductivity probe will be able to detect when the oil/water interface is lowered by a specific amount. If the conductivity probe detects the lowering of the oil/water interface, a solenoid valve on the air supply line to the groundwater pumps will be activated. This will stop the pumping of the groundwater pumps and shut down the operation of the recovery system until the problem with the oil/water separator has been rectified.

After the oil/water separator, the water will eventually flow through the two GAC vessels in series. However, water will not flow from the oil/water separator to the GAC vessels without the aid of a pump. Therefore, a transfer pump will be placed between the two devices. Rather than matching flows of the groundwater recovery pumps and the transfer pump, an equalization tank will be used to store the flow from the separator. The addition of an equalization tank and a transfer pump will create intermittent flow from the equalization tank to the remainder of the treatment system. The size of the 500 gallon equalization tank is based on a retention time of 5 minutes (100 gallons/minute times 5 minutes equals 500 gallons). The equalization tank will be equipped with on/off transfer pump float control and a high

level shut off. The flow rate of the transfer pump will be controlled with a pressure control valve and the on/off float controls.

After the transfer pump, there will be two cartridge filters piped in parallel. The cartridge filters will be equipped with pressure gauges before and after to determine the pressure differential caused by friction losses from the filter. One filter will be used during operation and the other will be used for a change-out bypass.

There will be two 2,000 pound liquid phase GAC vessels piped in series. A totalizing flow meter will be installed after the GAC vessels. The measured flow of the treatment system will be used to determine discharge fees. The piping used adjacent to the carbon vessels will have quick disconnect fittings and be made of 2 inch flexible polyethylene hose.

The groundwater treatment system will be equipped with a remote monitoring system (Dial "UP MODEM"). The monitoring system will be able to provide information about the status of float controls and pumps.

Table 1. Treatment Basis Summary
Sample Collected on July 10, 1991

GROUNDWATER CONTAMINANTS DETECTED ABOVE LIMIT: CONSTITUENT	GROUNDWATER CONCENTRATION (ppb)	EBMUD DISCHARGE LIMIT (ppb)
Naphthalene	100	5
2-Methylnaphthalene	170	5
Fluorene	14	5
Phenanthrene	29	5
Bis(2-Ethylhexyl)phthalate	39	17
Benzene	27	5
Toluene	44	22
Ethylbenzene	53	5
Xylenes	160	23

WESTATES CARBON, INC.
2130 LEO AVE.
LOS ANGELES, CA. 90040-1634
(213)722-7500

ISOTHERM REPORT CREATED ON 08/09/91 AT 09:07 BY
CUSTOMER:

LIQUID PHASE DESIGN PARAMETERS

Total Flow of Water [gpm] 50.000

LIQUID PHASE DESIGN

Component	Concentration [ppm]	#GAC/1000 gal water
TRICHLOROETHANE,1,1,1-	.007	.22
NAPHTHALENE	.270	.05
FLUORENE	.014	.00
PHENANTHRENE	.029	.01
BIS(ETHYLHEXYL-2) PHTHALATE	.039	.06
BENZENE	.027	.19
TOLUENE	.044	.10
ETHYLBENZENE	.053	.15
XYLENE,p-	.160	.04

TOTAL CARBON NEEDED

58.41 #GAC/day
.81 #GAC/1000 gal water - ASC-2000

SELF MONITORING METHOD

Monitoring of the groundwater treatment system, by USPCI, will be performed to assess the discharge compliance and measure the amount of discharged water. Additionally, information obtained from the monitoring procedures will be used for the following reasons:

- To establish a trend of the aquifer characteristics.
- To estimate the effectiveness of the treatment system.
- To estimate when a granular activated carbon (GAC) vessel will require replacement.

The following information pertains to the proposed sampling parameters, the proposed sampling frequency, and the associated documentation and reporting that will be performed. The enclosed schematic flow diagram illustrates the location of the sampling ports. The influent and effluent sampling ports of the groundwater treatment system are sampling locations "C" and "E", respectively. Additional samples will be collected from location "D". The influent and effluent concentrations of the first carbon vessel will be monitored to determine breakthrough. Once breakthrough occurs, the second carbon vessel will become the first vessel and a vessel with virgin carbon will be placed behind it. To estimate the carbon usage, system influent samples ("C") will be collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). To confirm that breakthrough has not occurred, samples will be collected from the effluent of the first GAC vessel ("D").

MONITORING PARAMETERS

Influent and effluent samples from the groundwater treatment system will be collected and submitted to a State of California certified laboratory. The samples will be analyzed for volatile and semivolatile organics, total petroleum hydrocarbons as diesel (TPH/D), BTEX, and total metals using Environmental Protection Agency Methods 624, 625, 8015, 8020, and 200.7 and 245.1, respectively. Oil and grease will be analyzed using Standard Method 503. The analyses will provide concentrations of the constituents listed in Table 1. Additionally, the analyses will provide information about compounds that have not been detected above the East Bay Municipal Utility District (EBMUD) acceptance limits.

Water meter readings will be recorded during site visits to assess the monthly discharge fee.

MONITORING FREQUENCY

A summary of the sampling frequency with the associated analysis has been presented in a tabular format. The sampling frequency is provided as Table 2.

In accordance to EBMUD requirements, influent and effluent samples ("C" and "E") of the groundwater treatment system will be collected and analyzed for volatile and semivolatile organics, TPH/D, BTEX, oil and grease, and total metals, during the first day of operation. These two samples will be analyzed with a 24 hour turn around time to demonstrate the effectiveness of the groundwater treatment system. The results of the influent sample will be used to estimate the GAC loading.

During the first month of operation, samples will be collected from the locations "C", "D", and "E" on a weekly basis. Samples collected from "C" and "E" will be analyzed for semivolatile organics, TPH/D, and BTEX. Metals will be analyzed on an annual basis, unless the initial sampling indicates the need to increase the sampling frequency. The sample collected from "D" will be analyzed for BTEX.

During months two through six of operation, samples will be collected from locations "C", "D", and "E" on a monthly basis. The associated analyses for the individual samples are shown in Table 2.

USPCI proposes to collect samples from locations "C" and "E" on a bi-monthly basis, during months seven through twelve of operation. After one year of operation, samples from "C" and "E" will be collected on a quarterly basis. The sampling frequency of the samples collected from location "D" is determined by the GAC loading. It is anticipated that samples will be collected on a quarterly basis after the first six months of operation.

Water meter readings will be collected during each site visit.

REPORTING

Reports will be submitted on a quarterly basis. Information included in the report will consist of analytical reports with chain of custodies, meter readings, and information regarding the disposal of diesel for three calendar months. The first report will contain information, about the first calendar month of operation and the two following calendar months, and will be submitted prior to 30 days after the end of the third calendar month.

Table 2
Sampling Frequency

Location	Code	Duration	Constituents[a]	Frequency
System Influent	C	Week 1	VO,SVO, TPH/D, BTEX, Oil and Grease, total metals	N/A
		Month 1	SVO, TPH/D, BTEX	Weekly
		Month 2-6	SVO, TPH/D, BTEX	Monthly
		Month 7-12	SVO, TPH/D, BTEX	Bi-Monthly
		Remainder of Project	VO, SVO, TPH/D, BTEX	Quarterly
			Total Metals	Annually
System Effluent	E	Week 1	VO,SVO, TPH/D, BTEX, Oil and Grease, Total Metals	N/A
		Month 1	SVO, TPH/D, BTEX	Weekly
		Month 2-6	SVO, TPH/D, BTEX	Monthly
		Month 7-12	SVO, TPH/D, BTEX	Bi-Monthly
		Remainder of Project	VO, SVO, TPH/D, BTEX	Quarterly
			Total Metals	Annually
First GAC Effluent	D	Month 1	BTEX	Weekly
		Remainder of Project	BTEX	To be Determined
Flow Meter	N/A	Length of Project	N/A	During Site Visit

[a] VO - volatile organics; SVO - semivolatile organics; TPH/D - total petroleum hydrocarbons as diesel; BTEX - benzene, toluene, ethylbenzene, xylenes

ANALYTICA
INCORPORATED
an Analytica Group company

18000 W. Highway 72, Golden, CO 80403, (303) 420-4449. (800) 873-8707, FAX: (303) 420-1434

July 30, 1991

Mr. Steve Brinkman
USPCI
5665 Flatiron Parkway
Boulder, CO 80301

Re: LGN: 91-07-072
Project: 96199 Oakland

Dear Mr. Brinkman:

Enclosed are the analytical results for the one (1) water sample submitted to Analytica on July 12, 1991.

Please call if there are any questions.

Sincerely,

Monique Spee
Project Manager

Reviewed by:

Lynne Bidwell
Organic Manager

AP:LB:jmm
Enclosures

ANALYTICA
INCORPORATED
an Analytica Group company

18000 W. Highway 72, Golden, CO 80403, (303) 420-4449. (800) 873-8707, FAX: (303) 420-1434

RESULTS AND DISCUSSION
FOR
USPCI

LGN: 91-07-072

The sample was prepared and analyzed for inorganic and organic parameters according to the methods referenced below.

INORGANIC NARRATIVE

Methods for Chemical Analysis of Water and Wastes, USEPA-600/4-79-020, March 1983, was used as the source for the analytical methods.

A method blank, was digested and analyzed with your samples. No contamination was found. Quality control data are indicative of acceptable method and instrument performance.

ORGANIC NARRATIVE

Methods 624 and 625 from Methods of Organic Chemical Analysis of Municipal and Industrial Wastewater, USEPA-600/4-82-057, July 1982, were used for the analysis of volatile and semivolatile organics. Method 8080 from Test Methods for Evaluating Solid Waste, USEPA SW-846, third edition, November 1986, was used for the analysis of chlorinated pesticides/polychlorinated biphenyls (PCB's).

A method blank, prepare and analyzed concurrently with your sample, showed no analytes above the detection limits for the 624 and 625 target lists. No pesticides were found in the sample.

The EPA recommended analytical and extraction holding times are met for all of the samples. The quality control (QC) data are from other sample set of similar matrix prepared and analyzed concurrently with your samples. The heptachlor spike recoveries are outside of 8080 method specifications (34-111%), but are reproducible. The prep blank and the spiked sample show no heptachlor above the detection limit. Method 8080 does not specify recovery ranges for dibutylchlorendate.

ANALYTICA
INCORPORATED
an Analytica Group company

18000 W. Highway 72, Golden, CO 80403, (303) 420-4449. (800) 873-8707, FAX: (303) 420-1434

QUALITY CONTROL

General

Analytica routinely analyzes preparation blanks (PB) and laboratory control samples (LCS). The PB is taken through the entire preparative procedure to monitor the contamination of reagents and glassware. The LCS serves as a verification of method performance.

Organic

Controls utilized on a regular basis include:

1. Matrix spike/matrix spike duplicate: One sample is analyzed in duplicate with a known amount of analyte added to measure replicate precision.

2. Surrogates and/or internal standards: Matrix effects are monitored through the use of surrogates added to all samples, controls, and blanks. Depressed recoveries generally reflect matrix interferences.

Inorganic

Controls listed are routinely followed:

1. Duplicate: One sample is prepared and analyzed in duplicate to demonstrate method precision.

2. Spike: One sample is spiked with a known amount of analyte. The percent recovery monitors matrix effects.

3. Certified standards: A certified reference material is analyzed prior to any samples as a check on instrument calibration.

ANALYTICA
INCORPORATED
an Analytica Group company

18000 W. Highway 72, Golden, CO 80403, (303) 420-4449. (800) 873-8707, FAX: (303) 420-1434

ANALYTICAL RESULTS

FOR

USPCI

Client ID: M-1
Analytica ID: 91-07-072-1

Date Sampled: 7-10-91
Date Received: 7-12-91

Total Metals, mg/L	Concentration
Arsenic	ND (0.1)
Barium	0.07 (0.03)
Cadmium	ND (0.01)
Chromium	ND (0.01)
Lead	ND (0.05)
Mercury	ND (0.0002)
Selenium	ND (0.1)
Silver	ND (0.01)

ND = Not Detected
Detection Limits in Parentheses

ANALYTICA INCORPORATED
an Analytica Group company
18000 W. Highway 72, Golden, CO 80403, (303) 420-4449. (800) 873-8707, FAX: (303) 420-1434

ANALYTICAL RESULTS

FOR

USPCI

Client ID: M-1
Analytica ID: 91-07-072-1
Units: µg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-17-91

Volatile Organics	Concentration	
Chloromethane	ND	(10)
Bromomethane	ND	(10)
Vinyl Chloride	ND	(10)
Chloroethane	ND	(10)
Methylene Chloride	ND	(5)
Acetone	ND	(10)
Carbon Disulfide	15	(5)
1,1-Dichloroethene	ND	(5)
1,1-Dichloroethane	ND	(5)
trans-1,2-Dichloroethene	ND	(5)
cis-1,2-Dichloroethene	ND	(5)
Chloroform	ND	(5)
1,2-Dichloroethane	ND	(5)
2-Butanone	ND	(10)
1,1,1-Trichloroethane	7	(5)
Carbon Tetrachloride	ND	(5)
Bromodichloromethane	ND	(5)
1,2-Dichloropropane	ND	(5)
trans-1,3-Dichloropropene	ND	(5)
Trichloroethene	ND	(5)
Dibromochloromethane	ND	(5)
1,1,2-Trichloroethane	ND	(5)
Benzene	25	(5)
cis-1,3-Dichloropropene	ND	(5)
Bromoform	ND	(5)
4-Methyl-2-Pentanone	ND	(10)
2-Hexanone	ND	(10)
Tetrachloroethene	ND	(5)
1,1,2,2-Tetrachloroethane	ND	(5)
Toluene	34	(5)

ND = Not Detected
Detection Limit in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M-1
Analytica ID: 91-07-072-1
Units: µg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-17-91

Volatile Organics - Continued	Concentration	
Chlorobenzene	ND	(5)
Ethylbenzene	24	(5)
Styrene	ND	(5)
Total Xylenes	45	(5)

Surrogates	% Recovery
1,2-Dichloroethane d-4	100
Toluene d-8	97
Bromofluorobenzene	93

ND = Not Detected
Detection Limit in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M1
Analytica ID: 91-07-072-1
Units: µg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-18-91
Date Extracted: 7-15-91

Semivolatile Organics	Concentration	
Phenol	ND	(11)
bis(2-Chloroethyl)ether	ND	(11)
2-Chlorophenol	ND	(11)
1,3-Dichlorobenzene	ND	(11)
1,4-Dichlorobenzene	ND	(11)
Benzyl alcohol	ND	(11)
1,2-Dichlorobenzene	ND	(11)
2-Methylphenol	ND	(11)
bis(2-Chloroisopropyl) ether	ND	(11)
4-Methylphenol	ND	(11)
N-Nitroso-di-n-propylamine	ND	(11)
Hexachloroethane	ND	(11)
Nitrobenzene	ND	(11)
Isophorone	ND	(11)
2-Nitrophenol	ND	(11)
2,4-Dimethylphenol	ND	(11)
Benzoic acid	ND	(53)
bis(2-Chloroethoxy)methane	ND	(11)
2,4-Dichlorophenol	ND	(11)
1,2,4-Trichlorobenzene	ND	(11)
Naphthalene	100	(11)
4-Chloroaniline	ND	(11)
Hexachlorobutadiene	ND	(11)
4-Chloro-3-methylphenol	ND	(11)
2-Methylnaphthalene	170	(11)
Hexachlorocylopentadiene	ND	(11)
2,4,6-Trichlorophenol	ND	(11)
2,4,5-Trichlorophenol	ND	(53)
2-Chloronaphthalene	ND	(11)
2-Nitroaniline	ND	(53)

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M1
Analytica ID: 91-07-072-1
Units: µg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-18-91
Date Extracted: 7-15-91

Semivolatile Organics - Continued	Concentration	
Dimethylphthalate	ND	(11)
Acenaphthylene	ND	(11)
2,6-Dinitrotoluene	ND	(11)
3-Nitroaniline	ND	(53)
Acenaphthene	ND	(11)
2,4-Dinitrophenol	ND	(53)
4-Nitrophenol	ND	(53)
Dibenzofuran	ND	(11)
2,4-Dinitrotoluene	ND	(11)
Diethylphthalate	ND	(11)
4-Chlorophenyl-phenylether	ND	(11)
Fluorene	14	(11)
4-Nitroaniline	ND	(53)
4,6-Dinitro-2-methylphenol	ND	(53)
N-Nitrosodiphenylamine	ND	(11)
4-Bromophenyl-phenylether	ND	(11)
Hexachlorobenzene	ND	(11)
Pentachlorophenol	ND	(53)
Phenanthrene	29	(11)
Anthracene	ND	(11)
Di-n-butylphthalate	ND	(11)
Fluoranthene	ND	(11)
Pyrene	ND	(11)
Butylbenzylphalate	ND	(11)
3,3'-Dichlorobenzidine	ND	(21)
Benzo(a)Anthracene	ND	(11)
Chrysene	ND	(11)
bis(2-Ethylhexyl)phthalate	39	(11)
Di-n-octylphthalate	ND	(11)
Benzo(b)fluoranthene	ND	(11)

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M1
Analytica ID: 91-07-072-1
Units: µg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-18-91
Date Extracted: 7-15-91

Semivolatile Organics - Continued	Concentration	
Benzo(k)fluoranthene	ND	(11)
Benzo(a)pyrene	ND	(11)
Indeno(1,2,3-cd)pyrene	ND	(11)
Dibenz(a,h)anthracene	ND	(11)
Benzo(g,h,i)perylene	ND	(11)

Surrogates	% Recovery
2-Fluorophenol	46
d6-Phenol	58
d5-Nitrobenzene	55
2-Fluorobiphenyl	44
2,4,6-Tribromophenol	57
d14-Terphenyl	44

ND = Not Detected
Detection Limits in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M-1
Analytica ID: 91-07-072-1
Units: mg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
Date Analyzed: 7-24-91
Date Extracted: 7-16-91

Pesticides	Concentration
Aldrin	ND (0.00008)
alpha - BHC	ND (0.00006)
beta-BHC	ND (0.00008)
delta-BHC	ND (0.00008)
gamma - BHC (Lindane)	ND (0.00006)
alpha-Chlordane	ND (0.00008)
gamma-Chlordane	ND (0.00008)
4,4'-DDD	ND (0.00008)
4,4'-DDE	ND (0.00008)
4,4'-DDT	ND (0.00022)
Dieldrin	ND (0.00008)
Endosulfan I	ND (0.00008)
Endosulfan II	ND (0.00022)
Endosulfan Sulfate	ND (0.00022)
Endrin	ND (0.00022)
Endrin Aldehyde	ND (0.0003)
Heptachlor	ND (0.00008)
Heptachlor Epoxide	ND (0.00008)
Methoxychlor	ND (0.0006)
Toxaphene	ND (0.005)
PCB-1221	ND (0.01)
PCB-1232	ND (0.005)
PCB-1242	ND (0.0005)
PCB-1248	ND (0.0005)
PCB-1254	ND (0.0005)
PCB-1260	ND (0.0005)

Surrogates	% Recovery
Dibutylchlorendate	27

ND = Not Detected
Detection Limits in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: Trip Blank
Analytica ID: 91-07-072-2B
Units: µg/L

Date Received: 7-12-91
Date Analyzed: 7-17-91

Volatile Organics	Concentration	
Chloromethane	ND	(10)
Bromomethane	ND	(10)
Vinyl Chloride	ND	(10)
Chloroethane	ND	(10)
Methylene Chloride	ND	(5)
Acetone	ND	(10)
Carbon Disulfide	ND	(5)
1,1-Dichloroethene	ND	(5)
1,1-Dichloroethane	ND	(5)
trans-1,2-Dichloroethene	ND	(5)
cis-1,2-Dichloroethene	ND	(5)
Chloroform	ND	(5)
1,2-Dichloroethane	ND	(5)
2-Butanone	ND	(10)
1,1,1-Trichloroethane	ND	(5)
Carbon Tetrachloride	ND	(5)
Bromodichloromethane	ND	(5)
1,2-Dichloropropane	ND	(5)
trans-1,3-Dichloropropene	ND	(5)
Trichloroethene	ND	(5)
Dibromochloromethane	ND	(5)
1,1,2-Trichloroethane	ND	(5)
Benzene	ND	(5)
cis-1,3-Dichloropropene	ND	(5)
Bromoform	ND	(5)
4-Methyl-2-Pentanone	ND	(10)
2-Hexanone	ND	(10)
Tetrachloroethene	ND	(5)
1,1,2,2-Tetrachloroethane	ND	(5)
Toluene	ND	(5)

ND = Not Detected
Detection Limit in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: Trip Blank
Analytica ID: 91-07-072-2B
Units: µg/L

Date Received: 7-12-91
Date Analyzed: 7-17-91

Volatile Organics - Continued	Concentration	
Chlorobenzene	ND	(5)
Ethylbenzene	ND	(5)
Styrene	ND	(5)
Total Xylenes	ND	(5)

Surrogates	% Recovery
1,2-Dichloroethane d-4	102
Toluene d-8	102
Bromofluorobenzene	101

ND = Not Detected
Detection Limit in Parentheses

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QUALITY CONTROL SUMMARY

SPIKE ANALYSIS

LGN: 91-07-072

Total Metals, mg/L	Sample Result	Spike Result	Spike Added	% R
Arsenic	ND (0.1)	1.9	2.0	95
Barium	0.07 (0.03)	0.56	0.50	98
Cadmium	ND (0.01)	0.46	0.50	92
Chromium	ND (0.01)	0.46	0.50	92
Lead	ND (0.05)	0.49	0.50	98
Mercury	ND (0.0002)	0.0008	0.0010	80
Selenium	ND (0.1)	1.9	2.0	95
Silver	ND (0.01)	0.46	0.50	92

% R = Percent Recovery
ND = Not Detected
Detection Limits in Parentheses

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QUALITY CONTROL SUMMARY

DUPLICATE ANALYSIS

LGN: 91-07-072

Total Metals, mg/L	Sample	Duplicate	RPD
Arsenic	ND (0.1)	ND (0.1)	NC
Barium	0.07 (0.03)	0.06 (0.03)	NC
Cadmium	ND (0.01)	ND (0.01)	NC
Chromium	ND (0.01)	ND (0.01)	NC
Lead	ND (0.05)	ND (0.05)	NC
Mercury	ND (0.0002)	ND (0.0002)	NC
Selenium	ND (0.1)	ND (0.1)	NC
Silver	ND (0.01)	ND (0.01)	NC

RPD = Relative Percent Difference
NC = Not Calculated
ND = Not Detected
Detection Limits in Parentheses

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QUALITY CONTROL SUMMARY

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

LGN: 91-07-072
Units: µg/L

Volatile Organics	Sample Result	Spike Result	Spike Added	% R
1,1-Dichloroethene	ND (5)	52	50	104
Trichloroethene	ND (5)	43	50	86
Benzene	ND (5)	48	50	96
Toluene	ND (5)	46	50	92
Chlorobenzene	ND (5)	44	50	88

Volatile Organics	Spike Duplicate Result	Spike Added	% R	RPD
1,1-Dichloroethene	44	50	88	17
Trichloroethene	41	50	82	5
Benzene	47	50	94	2
Toluene	44	50	88	2
Chlorobenzene	44	50	88	0

ND = Not Detected
% R = Percent Recovery
RPD = Relative Percent Difference
Detection Limit in Parentheses

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QUALITY CONTROL SUMMARY

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

LGN: 91-07-072
Units: µg/L

Semivolatile Organics	Sample Result	Spike Result	Spike Added	% R
Phenol	ND (11)	160	200	80
2-Chlorophenol	ND (11)	160	200	80
1,4-Dichlorobenzene	ND (11)	73	100	73
N-Nitroso-Di-n-Propylamine	ND (11)	65	100	65
1,2,4-Trichlorobenzene	ND (11)	64	100	64
4-Chloro-3-Methylphenol	ND (11)	180	200	90
Acenaphthene	ND (11)	99	100	99
4-Nitrophenol	ND (53)	273	200	136
2,4-Dinitrotoluene	ND (11)	111	100	111
Pentachlorophenol	ND (53)	172	200	86
Pyrene	ND (11)	66	100	66

Semivolatile Organics	Spike Duplicate Result	Spike Added	% R	RPD
Phenol	140	200	70	13
2-Chlorophenol	150	200	75	6
1,4-Dichlorobenzene	68	100	68	8
N-Nitroso-Di-n-Propylamine	59	100	59	10
1,2,4-Trichlorobenzene	62	100	62	3
4-Chloro-3-Methylphenol	172	200	86	5
Acenaphthene	82	100	82	19
4-Nitrophenol	252	200	126	8
2,4-Dinitrotoluene	86	100	86	25
Pentachlorophenol	162	200	81	6
Pyrene	63	100	63	5

RPD = Relative Percent Difference
% R = Percent Recovery
ND = Not Detected
Detection Limit in Parentheses

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ANALYTICAL RESULTS

FOR

USPCI

Client ID: M-1
Analytica ID: 91-07-072-1
Units: mg/L

Date Sampled: 7-10-91
Date Received: 7-12-91
(BTEX) Date Analyzed: 7-22-91
(TPH) Date Extracted: 7-16-91

Volatile Aromatic Organics	Concentration	
Benzene	0.027	(0.010)
Toluene	0.044	(0.010)
Ethylbenzene	0.053	(0.010)
Xylenes, Total	0.16	(0.010)

Petroluem Hydrocarbons	Concentration	
TPH	41	(0.5)[1]

Internal Standards	% Recovery
p-Bromofluorobenzene	84
Difluorobenzene	73

TPH Surrogate	% Recovery
o-Terphenyl	115

[1] Diesel
ND = Not Detected
Detection Limits in Parentheses
TPH = Total Petroleum Hydrocarbons

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QUALITY CONTROL SUMMARY

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

LGN: 91-07-072
Units: mg/L

Parameter	Sample Result	Spike Result	Spike Added	% R
Benzene	0.027 (0.010)	10.9	10.0	109
Toluene	0.044 (0.010)	10.9	10.0	109
Ethylbenzene	0.053 (0.010)	10.1	10.0	100
Xylene	0.16 (0.010)	10.2	10.0	100
TPH	-----	55.3	50.0	111

Parameter	Spike Duplicate Result	Spike Added	% R	RPD
Benzene	11.0	10.0	110	1
Toluene	10.7	10.0	107	2
Ethylbenzene	10.1	10.0	100	0
Xylene	10.3	10.0	101	1
TPH	57.5	50.0	115	4

Surrogate [1]	% Recovery
Spike	93
Spike Duplicate	97

[1] Surrogate = o-Terphenyl
RPD = Relative Percent Difference
% R = Percent Recovery
ND = Not Detected
TPH = Total Petroleum Hydrocarbons

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QUALITY CONTROL SUMMARY

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

LGN: 91-070-072
Units: mg/L

Pesticides	Sample Result	Spike Result	Spike Added	% R
Lindane	ND (0.00006)	0.00021	0.00020	105
Aldrin	ND (0.00006)	0.00024	0.00020	120
Heptachlor	ND (0.00006)	0.00024	0.00020	120*
DDT	ND (0.00006)	0.00056	0.00050	112
Dieldrin	ND (0.00006)	0.00071	0.00050	142
Endrin	ND (0.00006)	0.00051	0.00050	102

Pesticides	Spike Duplicate Result	Spike Added	% R	RPD
Lindane	0.00020	0.00020	100	5
Aldrin	0.00024	0.00020	120	0
Heptachlor	0.00023	0.00020	115*	4
DDT	0.00050	0.00050	100	11
Dieldrin	0.00068	0.00050	136	4
Endrin	0.00049	0.00050	98	4

* Outside of 8080 QC limits, 24-111% recovery
RPD = Relative Percent Difference
% R = Percent Recovery
ND = Not Detected
Detection Limits in Parentheses