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GENERAL CORRESPONDENCE

YEAR(S): 2000 - 1997

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ENTACT

October 11, 2000



Mr. William C. Olson State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 S. Pacheco Santa Fe, New Mexico 87505 505-827-7131

Re: Well Closure Report Farmington, New Mexico

Dear Mr. Olson:

Halliburton HSE has completed the closure of the four monitor wells at this former Wellex facility on September 23, 2000. The wells were plugged and abandoned by filling the wellbores with a bentonite cement grout. A backhoe then cut the wells approximately 2 feet below ground surface. This hole was filled with concrete to ground surface.

If you should have any questions concerning the closure of these well or require any further information please contact me at 972-580-1323 at your earliest convenience.

Sincerely,

Marty Cox

Marty Cox

cc: Denny Foust, OCD Aztec District Office Joe Larkin, Halliburton HSE

4040 W. ROYAL LANE SUITE 136 IRVING, TEXAS 75063 972.580.1323 FAX972.550.7464 WWW.ENTACT.COM

HALLIBURTON . FARMINGTON - NEWMEXICO . MCLCLOBURE REPORT. SEPTEMBER 2000



ENTACT, Inc. completed four quarters of groundwater sampling, as requested by the Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD), at the former Wellex facility located at 2600 Bloomfield Highway in Farmington, New Mexico. Four monitor wells were installed to assess the vertical extent and potential impacts to the upper groundwater aquifer following a removal of impacted soil. The results of the quarterly sampling indicate that concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) have been below New Mexico WOCC regulatory limits during each sampling event. Groundwater samples were also required to be analyzed for WQCC

metals, major cations and anions, and TDS during one quarterly sampling event. These analytes were below New Mexico WQCC regulatory limits. The quarterly groundwater sampling results were presented to the OCD in the <u>Annual Groundwater Report</u> dated June 7, 2000. Halliburton fulfilled the regulatory requirements set forth by the OCD and requested closure of the site on June 9, 2000.

The OCD approved the Halliburton request for site closure on August 14, 2000 with the following conditions:

 The wells shall be plugged and abandoned by either pulling the casing or cutting the casing off below ground surface and filling the



North of building prior to excavation

hole with a cement grout; and

 Halliburton shall submit a final abandonment report to the OCD Santa Fe and Aztec offices.

Monitor Well Installation

Monitor wells were installed to a maximum depth of 45 feet and completed with 15 to 20 feet of 2-inch diameter monitor well screen and 25 to 30 feet of 2-inch diameter PVC casing. A sand pack filter was placed between the borehole wall and monitor well screen to approximately 2 feet above the monitor well screen and PVC casing interface. A bentonite seal was placed from the top of the sand pack to approximately 10 feet below ground surface. Bentonite cement grout was then placed above the bentonite seal to ground surface. The wells were completed flush to ground surface with an 8-inch diameter bolt down steel cover set in a 3 foot diameter concrete pad.

Monitor Well Closure

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Due to the site lithology that consisted of cobbles overlain by sandy clay and clayey sand, monitor well borings were advanced using the ODEX drilling method which simultaneously installs casing as the well is advanced. The lithology made abandonment by pulling casing prohibirive. On September 22, 2000, monitor wells MW-1 through MW-4 were closed and abandoned by filling the wellbore with a bentonite cement grout. Prior to closure, each monitor well was gauged with a water level meter to determine the depth to water. Bentonite chips were then added above the top of the water bearing zone in each well. A 93% Portland cement and 7% bentonite gel mix was then placed on top of the bentonite chips. A backhoe was finally utilized to cut each well to approximately 2 feet below ground surface. The excavated well bore was then filled with concrete flush to grade at ground surface. The areas surrounding the former wells were cleaned, and demobilization activities were completed on September 23, 2000.

Conclusions

The abandonment and closure activities at the site were completed on September 23, 2000. These activities were conducted on monitor wells that were installed on the property during June and July 1998.

- Four monitor wells were installed to assess the vertical extent and potential impacts to the upper groundwater aquifer following a removal of impacted soil.
- Groundwater was collected from the wells and monitored for four quarters for concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbon (TPH), and during one quarterly sampling event for WQCC metals, major cations, anions, and TDS.
- The results of the quarterly sampling indicated that concentrations of BTEX, TPH, WQCC metals, major cations, and anions have been below New Mexico WQCC regulatory limits during each event.
- The OCD approved the Halliburton request for site closure on August 14, 2000, and requested that the monitor wells be properly closed and abandoned.



- The wells were closed by filling each well above the saturated interval with bentonite chips and to two feet below ground surface with a Portland cement and bentonite gel mix.
- Each well was then cut two feet below ground surface and filled with concrete flush to grade.

Based upon the following site observations and assessment findings, no further action is anticipated at this former Wellex site.

Olson, William

| Olson, W | illiam |
|----------|---|
| From: | mcox@entact.com [SMTP:mcox@entact.com] |
| Sent: | Thursday, September 14, 2000 9:32 AM |
| То: | Olson, William |
| Cc: | Foust, Denny |
| Subject: | Well closure - former Wellexfacility Farmington, NM |

Bill, as discussed, there have been unanticipated delays in the closure of the four monitor wells at the facility located at 2600 Bloomfield Highway in Farmington, NM. The contractor should complete the well closures, as described in your letter dated August 14, 2000, within the next three weeks. A closure report will be delivered to your office by October 31, 2000 describing the details of the well abandonment.

28 1 6 6 5

Thank you for your patience. If you should have any questions please call me at 800-255-2771 at your earliest convience.

Marty Cox

June 9, 2000

Mr. William C. Olson State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 S. Pacheco Santa Fe, New Mexico 87505 505-827-7131

RECEIVED

JUN 1 2 2000

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Re: Request for closure of Former Wellex Facility Farmington, New Mexico

Dear Mr. Olson:

Halliburton HSE has completed four quarterly groundwater sampling events at the former Wellex Facility as requested by the Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD). The results of the quarterly sampling indicate that concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) have been below New Mexico WQCC regulatory limits during each event. A previous groundwater sampling event indicated that WQCC metals, major cations and anions, and TDS were also below New Mexico WQCC regulatory limits. Halliburton has fulfilled the regulatory requirements set forth by the OCD and request closure of this site located at 2600 Bloomfield Highway in Farmington, NM.

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If you should have any questions concerning this request or require any further information please contact me at 972-580-1323 at your earliest convenience.

Sincerely,

Marty Cox

cc: Denny Foust, OCD Aztec District Office Joe Larkin, Halliburton HSE

ENTACT' 4040 W. ROYAL LANE SUITE 136 IRVING, TEXAS 75063 www.ontact.com Bill, Denny read the final uport and some that TABLE 2-4 was missing. Please replace P. 6 with the Jalle have maked Thanks Marty

HALLIBURTON FARMINGTON, NEW MEXICO • ANNUAL GROUNDWATER MONITORING REPORT

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| TABLE | 2-4 | | | | | | | |
|---------|--------------|--------------------|--------------------|--|-----------------------------|----------------------|--------------------|--|
| CUMU | LATIVE ANALY | TICAL DAT | A FOR BTEX | , mg/l | | | | a da serie da serie Serie da serie da ser |
| HER.L | SAMPLE DATE | EE NJE NE | TOLUENE | ETHYLBENZENE | p.m-XYLBÆ | O-XYLENE | TOTAL XYLENE | TOTAL BTEX |
| CTR-01 | MARCH 99 | 0.0025 | 0.0042 | ` <0.0002 | 0.0033 | 0.004 | 0.0073 | 0.014 |
| | JUNE 99 | 0.0021 (0.0020) | 0.0069 (0.0068) | 0.0046 (0.0046) | 0.06 <i>2</i> 2 (0.0621) | 0.026 (0.026) | 0.0882 (0.0881) | 0.102 (0.102) |
| | Nousmber 99 | 0.0003 (0.0003) | 0.0028 (0.0027) | ⁽ <0.0002 (<0.00 <i>0</i> 2) | 0.00 07 (0.0007) | <0.0001 (<0.0001) | 0.0007 (0.0007) | 0.0038 (0.0 037) |
| | FEBRUARY CO | 0.0029 | 0.0031 | 0.0076 | 0.0076 | 0.0029 | 0.0105 | 0.0241 |
| NRH-02 | MARCH 99 | 0.0045 | 0.0004 | 0.0019 | 0.00 19 | 0.0007 | 0.0026 | 0.0094 |
| | IUNE 99 | (<0.0002 | 0.0035 | 0.0005 | 0.00.04 | 0.0016 | 0.0020 | 0.0060 |
| | NOVEMBEB 99 | 0.0003 | 0.0039 | ر < 0.000 2 | 0.00 08 | <0.0001 | 0.0008 | 0.0050 |
| | FREBUARY OO | 0.0036 | 0.0037 | 0.0049 | 0.0081 | 0.0026 | 0.0107 | 0.0229 |
| NIN-03 | NABCH 99 | 0.0022 | 0.0014 | 0.0015 | 0.0059 | 0.0013 | 0.0072 | 0.0123 |
| | JUNE 99 | 0.0018 | 0.0038 | 0.0006 | 0.00 46 | 0.0020 | 0.0066 | 0.0128 |
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| MRY-04 | MARCH 99 | 0.0005 | 0.0002 | 0.0005 | 0.0022 | 0.0007 | 0.0029 | 0.0041 |
| | JUNE 99 | `<0.0002 | 0.0014 | 0.0004 | 0.00 38 | 0.0017 | 0.0055 | 0.0073 |
| | November 99 | 0.0003 | 0.0022 | < 0.0002 | <0.0002 | 0.0002 | 0.0002 | 0.0027 |
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Duplicate samples are shown in ()

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RECEIVED APR C 1 (303 ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Introduction

This Groundwater Sampling Plan presents the procedures for groundwater sampling of monitor wells at the former Wellex facility located at 2600 Bloomfield Highway (the Site) in Farmington, New Mexico. Groundwater monitor well inspections, purging, sampling, sample management, quality assurance/quality control, sample custody control, sample shipment and waste handling are described in this Plan.

The site consists of a 6,000 square foot corrugated sheet metal building situated on approximately one acre of land. This former Wellex facility operated as a support facility for the oil and gas industry in northwest New Mexico and southwest Colorado. During operation the facility consisted of one main building with six work bays and an office, washrack, an oil water separator, and a storage building.

Description of Monitoring Wells

Due to the site lithology, monitor well borings were advanced using the ODEX drilling method which simultaneously installs casing as the well is advanced. Monitor well MW-01 was installed north of the existing building, near the northern limits of the former separator area. Monitor wells MW-02 and MW-03 were installed north of the existing building upgradient and downgradient of the former separator area, respectively. Monitor well MW-04 was installed west of the existing building, just south of the former separator area.

Monitor wells were installed to a maximum depth of 45 feet. The wells were completed with 15 to 20 feet of 2-inch diameter, 0.010-inch slot monitor well screen and 25 to 30 feet of 2-inch diameter PVC casing. A sand pack filter was placed between the borehole wall and monitor well screen to approximately 2 feet above the monitor well screen and PVC casing interface. A bentonite seal was placed from the top of the sand pack to approximately 10 feet below ground surface. Bentonite cement grout was then placed above the bentonite seal to ground surface. The wells were completed flush to ground surface with an 8-inch diameter bolt down steel cover set in a 3 foot diameter concrete pad. A lockable expandable cap was placed on top of the PVC casing.

Sample Schedule

Groundwater samples will be collected from monitor wells MW-01 through MW-04 on a quarterly basis until analytical results are below New Mexico Water Quality Control Commission (WQCC) standards for four consecutive sampling events. Groundwater samples collected from these wells during the first quarterly sampling event will be analyzed for concentrations of WQCC metals; cations and anions; benzene, toluene, ethylbenzene, xylenes (BTEX); total petroleum hydrocarbon (TPH); and total dissolved solids (TDS). If after the first sampling event, concentrations of WQCC metals, cations and anions, and TDS are below regulatory limits, subsequent samples will be analyzed for concentrations of BTEX and TPH.

ng Plan • March 31, 1999

Groundwater Sampling Equipment and Procedures Equipment Assembly and Preparation

Activities that will occur during each groundwater sampling event are summarized below:

- Prearrangement of sample analytical requests with analytical testing laboratory;
- Assembly and preparation of sampling equipment and supplies;
- Groundwater sampling;
- Inspection of well,
- Water-level measurements,
- Well purging,



M.A. BELL COMPANY ST LOUIS • JANUARY 12, 19

PHASE I ENVIRONMENTAL SITE ASSESSMENT

- Field parameter measurements,
- Sampling,
- Waste handling,
- Sample preservation;
- Sample labeling;
- Completion of sample records (field log book);
- · Completion of chain-of-custody records; and
- Sample shipment or delivery

Prior to the sampling event, all record-keeping materials will be prepared. Detailed sampling procedures are presented in the following sections.

Equipment Check

This activity includes the verification that all equipment is in proper operating condition. Also, arrangements for repair or replacement of any equipment, which is inoperative, are made.

Equipment Decontamination

All portions of sampling equipment, which could contact the interior well casing, will be thoroughly cleaned before use. This includes water-level probes, tubing, and pumps. It should be noted that most equipment would be dedicated and disposed after use at each well. Thus, the potential for cross-contamination is minimized. The procedure for equipment cleaning is as follows:

- clean with tap water and low phosphate detergent, brush if necessary;
- rinse thoroughly with tap water;
- rinse thoroughly with distilled water;
- equipment cleaned prior to field use will be recleaned after transfer to the sampling site unless carefully wrapped for transport.

Any necessary deviation from these procedures should be documented. Laboratory-supplied sample containers will be cleaned and sealed by the laboratory before shipping. Groundwater Sampling Procedures Wall Insuration

Each well will be inspected for signs of damage to the well

protector, well casing, and well pad. The lock on each well will be checked to make sure it is present and operable. The well numbering on each well will also be checked for legibility. Observations of each well condition will be noted on the Groundwater Sample Record Form.

Prevention of Cross-contamination

Special care will be exercised to prevent contamination of the groundwater and extracted samples during the sampling activities. The primary way in which such contamination can occur is contact with improperly cleaned equipment. To prevent such contamination, all non-dedicated sampling equipment will be thoroughly cleaned before and between uses at different sampling locations. In addition to the use of properly cleaned equipment, a clean pair of new, disposable latex (or similar) gloves will be worn each time during well sampling.

Groundwater Level and Total Depth Measurements

Groundwater levels and the total depths will be measured in each well before well purging. Using a pre-cleaned water level meter, the groundwater surface will be measured from the casing datum to the nearest 1/8 inch (0.01-foot). The probe will then be lowered to measure the well total depth. These measurements will be recorded on the Groundwater Sample Record Form.

Well Purging and Sampling

The monitor wells will be purged using an electric pump or by hand bailing. The purge time or purge volume is independent of well depth or well volumes, using instead water quality indicator parameters to determine purging needs. The field parameter specific conductance will be used to determine when the well has been adequately purged (stabilized). Stabilization will be confirmed when three successive specific conductance readings are within _ 10%. Additional field parameters, pH and temperature will also be collected to characterize water quality conditions. Each field instrument will be calibrated according to manufacturer instructions. The parameter measurements will be recorded on the Purge Record Form. Sample extraction will be accomplished by using a dedicated

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disposal bailer.

Container and Labels

The analytical testing laboratory will provide all sampling containers and appropriate container lids. Sample labels will be attached to each sample container with the following information legibly and indelibly written on each label:

- Sample identification,
- Sampling date,
- Sampling time,
- Sample collector's initials,
- · Preservatives used,
- Type of sample, and
- Analysis to be performed.

The sample identification system for monitor well samples will be the well number followed by a designator to indicate the number of times this well has been sampled. For example, if this was the fourth sampling event for monitor well MW-02, the sample identification for this well on this occasion would be MW-02-04. A duplicate groundwater sample will be identified by using a "D" next to the monitor well identifier (i.e. MWD-02-04). The duplicate will also be identified in the field logbook as a duplicate sample.

Sample Shipment/Delivery and Laboratory

The following packaging and labeling requirements for the sample materials are usually appropriate for shipping the sample to the testing laboratory:

- Preserve samples with ice;
- Package sample so that is does not leak from its packaging; and
- Attach chain-of-custody forms inside sample shipment container.

Chain-of-Custody Control

After samples have been obtained, chain-of-custody procedures will be followed to establish a written record



concerning sample movement between the sampling site and the testing laboratory. Each shipping container will have a chain-of- custody form completed by the site sampling personnel packing the samples. The chain-ofcustody form for each container will be completed in duplicate. The project manager will maintain one copy of this form, and the other copy will be submitted to the laboratory. The laboratory copy will become a part of the permanent record for the sample.

Sampling Records

To provide complete documentation of sampling, detailed records will be maintained in a logbook.. The logbook will contain the Groundwater Sampling Record and the Purge Record. These records will provide for the collection of the information listed below:

- Sample location (facility name);
- Sample identification (well number and/or sample number);
- Sample location map or detailed sketch;
- Date and time of sampling;
- Sampling analysis and method;
- Field measurements;
- Weather conditions;
- Sampler's identification; and
- Any other pertinent information.
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Quality Assurance and Control

Groundwater QA/QC includes the collection of duplicate samples and matrix spike/matrix spike duplicate (MS/

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MSD) samples. The QA/QC samples will be analyzed for concentrations of TPH. One duplicate sample will be collected during each sampling event. The duplicates will be collected by alternately filling two, appropriate and identical sample containers. The MS/MSD samples will be analyzed at a frequency of one for every 20 groundwater samples at the laboratory.

Field instrumentation will include a pH/temperature/ specific and a conductance meter.

Derived Waste Management

The following procedures are consistent with procedures previous used at the Farmington Site to handle investigation derived wastes (IDW). IDW will include purged groundwater, decontamination wastewater, personal protective equipment (PPE), and pump tubing from the peristaltic pump. The liquid wastes from each monitor well will be collected in a unique 55-gallon drum. If analytical results indicated that concentrations are below regulatory limits, water in this drum will be discharged to the ground within the limits of the Former Wellex Site. No liquid wastes will be allowed to flow into any surface water. PPE and pump tubing will be collected in trash bags and disposed as solid waste in an offsite dumpster.

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STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE, NEW MEXICO 87505 (505) 827-7131

January 22, 1999

CERTIFIED MAIL RETURN RECEIPT NO. Z-274-520-598

Mr. Joe Larkin Halliburton Energy Services 4100 Clinton Dr., Bldg 3, 1107E Houston, Texas 77020

RE: OLD WELLEX FACILITY FARMINGTON, NEW, MEXICO

Dear Mr. Larkin:

The New Mexico Oil Conservation Division (OCD) has reviewed Halliburton Energy Services (HES) September 25, 1998 "FORMER WELLEX FACILITY, FARMINGTON, NEW MEXICO" which was submitted on behalf of HES by their consultant ENTACT. This document contains the results of HES's investigation and remediation of contamination related to a waste disposal pit at the old Wellex/Otis Engineering facility in Farmington, New Mexico. The document also contains HES's request for closure of the site remedial actions.

The investigation and remediation actions taken to date are satisfactory. However, the OCD has the following comments and requests:

- 1. The OCD's March 26, 1998 approval of HES's work plan required that ground water also be sampled for New Mexico Water Quality Control Commission (WQCC) metals and cations and anions due to their presence in the sump area. The above referenced document does not contain this data. Please provide the OCD with this data.
- 2. Due to the elevated levels of total petroleum hydrocarbons remaining in the base of the excavation, the OCD requires that HES demonstrate that ground water from the monitor wells be show to be below WQCC standards for 4 consecutive quarters prior to issuing final closure approval. Please provide a ground water monitoring plan to achieve this requirement.

The OCD requires that HES provide the OCD with the above items by April 1, 1999. Please submit these items to the OCD Santa Fe Office with a copy provided to the OCD Aztec District Office.

Mr. Joe Larkin January 22, 1999 Page 2

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If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson Hydrologist Environmental Bureau

xc: Denny Foust, OCD Aztec District Office Marty Cox, ENTACT

US Postal Service Receipt for Certified Mail No Insurance Coverage Provided. Do not use for International Mail (See reverse) Sent to Street & Number Post Office, State, & ZIP Code

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Special Delivery Fee Restricted Delivery Fee

Return Receipt Showing to Whom & Date Delivered

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September 25, 1998

Mr. Bill Olson Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 South Pacheco Santa Fe, New Mexico 87505

RECEIVED

SEP 281998

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Re: Former Wellex Facility Farmington, New Mexico

Dear Mr. Olson:

Enclosed is a copy of the Remediation Assessment Report for the former Wellex site located at 2600 East Bloomfield Highway in Farmington, New Mexico. Copies of this report have been forwarded to Mr. Denny Foust and to Mr. Joe Larkin, Halliburton, Houston, Texas. Please review this report and call me at (972) 580-1323 should you have any questions concerning its contents.

Sincerely,

Marty Cox

972/580-1323 FAX: 972/550-7464 METRO: 972/751-0057

1616 Corporate Court Suite #150 Texis Invine

Health, Safety and Environmental

4100 Clinton (77020-6299) / Post Office Box 3 / Houston, TX 77001-0003

May 19, 1998

Mr. William C. Olsen State of New Mexico Energy, Minerals, and Natural Resources Dept. Oil Conservation Division 2040 South Pacheco Sante Fe, New Mexico 87505

OIL CUNSERVATION DIVI

Dear Mr. Olsen:

Subject: Old Wellex Facility, Farmington, New Mexico

It was enjoyable meeting you (by telephone) last week. Your cooperation in resolving the issues at the above-referenced property is appreciated.

As we discussed, we have had some administrative issues on this project which have resulted in a delayed start-up. You indicated that there would be no problem with an extension, but a written request would be necessary. Consequently, we would like to request an extension of time to complete the work originally scheduled for completion on June 5, 1998. The new anticipated completion date for the proposed work is July 31, 1998. I hope this does not cause any inconvenience to you.

Our consultant representative and I will be visiting the site on Thursday, May 21. We would like to stop by your office later in the afternoon and say hello, if time permits.

Thank you for your assistance on this project.

Very truly yours.

Joseph J. Larkin, P.E.

cc: Ruth Pierce, Halliburton Law Department Harry Stollmack, Halliburton HSE



2300 Buena Vista S.E., Suite 110 ■ Albuquerque, New Mexico 87106 (505) 247-4933 ■ FAX (505) 247-8151 ■ www.tetratech.com

ABQ-98-0042

March 16, 1998

Project Number HX20

William C. Olson State of New Mexico Energy, Mineral and Natural Resources Department Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505

OIL CONSERVATION DIVISION Verleal confumation with Steve Pulley 3/26/98

Reference: Project No. HX20 Task Authorization 003

Dear Mr. Olson:

On behalf of Halliburton Energy Services, Tetra Tech NUS has prepared this response to your February 18, 1998 letter concerning the presence of 4,4 DDD in soil at the Former Wellex Facility in Farmington New Mexico. The compound 4,4 DDD is a break down product of DDT, a commonly used pesticide in the 1950's and 1960's. The persistence of DDT and its breakdown products in the environment is one of the properties which led to its eventual ban. The tentatively identified concentration of 4 parts per billion 4,4 DDD is what would be expected from routine application of DDT for pest control purposes.

We argue that a concentration of 4 parts per billion is not consistent with DDT disposal or abandonment at the site. Therefore, it does not meet the definition of solid waste under 40 CFR, 261.2 and should not be considered a RCRA-listed waste. The definition of solid waste under 40 CFR, 261.2 c also states that "commercial chemical products listed in 261.33 are not solid wastes if they are applied to the land and that is their ordinary manner of use." I have spoken with Steve Pullen of the Hazardous and Radioactive Materials Bureau at the New Mexico Environment Department and he concurs with this position.



TETRA TECH NUS, INC.

2300 Buena Vista S.E., Suite 110
Albuquerque, New Mexico 87106 (505) 247-4933
FAX (505) 247-8151
www.tetratech.com

The contamination at the former Wellex Facility is an issue of soil impacted with BTEX in excess of the OCD guideline of 50 mg/kg. With OCD's permission, Tetra Tech NUS would like to move forward with the removal and disposal of these BTEX-impacted soils from the site. If you would like to discuss the DDD issue further, please feel free to call me or Steve Pullen at NMED.

Very Truly Yours,

Jeff Johnston Senior Hydrologist

cc: Joe Larkin, HES Project Manager Denny G. Foust, OCD Aztec District Office Steve Pullen, NMED Harlan Brown, Envirotech Inc. file STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE, NEW MEXICO 87505 (505) 827-7131

February 18, 1998

CERTIFIED MAIL RETURN RECEIPT NO. Z-235-437-234

Mr. Joe Larkin Halliburton Energy Services 4100 Clinton Dr., Bldg 3, 1107E Houston, Texas 77020

RE: OLD WELLEX FACILITY FARMINGTON, NEW, MEXICO

Dear Mr. Larkin:

The New Mexico Oil Conservation Division (OCD) has reviewed Halliburton Energy Services (HES) January 27, 1998 "WORK PLAN FOR SOURCE REMOVAL AND GROUNDWATER MONITORING WELL INSTALLATION, FORMER WELLEX FACILITY, FARMINGTON, NEW MEXICO" and October 30, 1997 "SITE INVESTIGATION REPORT FOR WELLEX/OTIS ENGINEERING FACILITY, HALLIBURTON ENERGY SERVICES, 2600 EAST BLOOMFIELD HIGHWAY, FARMINGTON, NEW MEXICO" which were submitted on behalf of HES by their consultant Tetra Tech NUS, Inc.. These documents contain the results of HES's investigation of contamination related to a waste disposal pit at the old Wellex/Otis Engineering facility in Farmington, New Mexico. The documents also contain HES's work plan for remediation of contaminated soils and installation of ground water monitoring wells to determine potential ground water impacts.

A review of the analytical data in the October 30, 1997 investigation report shows that 4,4' - DDD was present in soils from the pit. This compound is a listed RCRA hazardous waste. However, the laboratory analyses also indicate that this compound could not be confirmed as being present. As a result, the OCD defers comment on HES's above referenced work plan and requires that HES address whether listed RCRA hazardous wastes are present in the former pit. Submission of the above information will allow the OCD to continue a review of HES's work plan.

If you have any questions, please call me at (505) 827-7154.

Sincerely.

William C. Olson Hydrologist Environmental Bureau

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xc: Denny Foust, OCD Aztec District Office Jeff Johnston. Tetra Tech NUS, Inc.

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TETRA TECH NUS, INC.

2300 Buena Vista SE Suite 110 Albuquerque, NM 87106 Telephone: (505) 247-4933

ABQ-98-0014

Project Number HX20

JAN 29 CHOSENVATION PLACE

January 27, 1998

William C. Olson State of New Mexico Energy, Mineral and Natural Resources Department Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505

Reference: Project No. HX20 Task Authorization 003

Subject:Work Plan for Source Removal and Groundwater Monitoring WellInstallation, Former Wellex Facility, Farmington, New Mexico

Dear Mr. Olson:

On behalf of Halliburton Energy Services, Tetra Tech NUS is submitting the enclosed Work Plan for Source Removal and Groundwater Monitoring Well Installation at the Former Wellex Facility, 2600 East Bloomfield Highway in Farmington, New Mexico. The work plan was developed in response to the site characterization performed in September 1997 and conversations with the Oil Conservation Division. Please review this work plan at your earliest convenience. With your concurrence, we are planning to mobilize for the source removal activites during the week of February 23, 1998.



TETRA TECH NUS, INC.

2300 Buena Vista SE Suite 110 Albuquerque, NM 87106 Telephone: (505) 247-4933

If you have any questions or comments regarding the Farmington Site please contact me or Bryan Wolfe at (505)247-4933.

. . ..

Very Truly Yours,

Jeff Johnston Senior Hydrologist

Enclosure

cc: Joe Larkin, HES Project Manager (w/enclosure) Denny G. Foust, OCD Aztec District Office (w/enclosure) file

4100 Clinton Mr. Built, 3, 1107E Howton, TX 77020

WORK PLAN

for

SOURCE REMOVAL

AND

GROUNDWATER MONITORING WELL INSTALLATION

at

HALLIBURTON ENERGY SERVICES WELLEX FACILITY 2600 BLOOMFIELD HWY FARMINGTON, NEW MEXICO

Submitted to:

State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division

> 2040 S. Pacheco Santa Fe, New Mexico 87505

> > January 27, 1998

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| 2-2 | Site Plan of 2600 East Bloomfield Hwy., Farmington, New Mexico | • |

1. INTRODUCTION

This workplan has been prepared for Halliburton Energy Services to remediate impacted soils associated with a former oil/water separator (OWS) located at 2600 Bloomfield Highway, Farmington, New Mexico. The workplan also outlines site assessment activities which will determine if groundwater has been impacted by the former OWS. The New Mexico Energy, Minerals and Natural Resources Department (NMEMNR), Oil Conservation Division (OCD) is the state regulatory agency having jurisdiction over cleanup related to the former OWS at this site.

1.1 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

1.1.1 <u>Site Description</u>

The facility is located on a 150 ft by 290 ft fenced parcel identified as Section 14 of Township 29 North and Range 13 West in San Juan County, New Mexico. The address of the site is 2600 East Bloomfield Highway, Farmington, New Mexico. The facility consists of a building approximately 50 feet by 150 feet containing service bays and a small office space. The working area of the site is enclosed within an eight foot tall chain link fence. The site formerly operated as both a Wellex and an Otis Engineering facility and has been abandoned since 1993. While in operation, an oil/water separator (OWS) was located on site. The OWS consisted of a cinderblock enclosure located below grade with no floor. The OWS was demolished in 1995.

No records are available that document operations at this site. It is known that this facility supported well logging activities. Waste streams discharged into the former OWS are unknown.

1.1.2 Environmental Setting

The HES facility is approximately 1.5 miles southeast of Farmington, New Mexico within a commercial zone. Site elevation is 5338 ft above MSL on a southwest trending slope approximately 1 mile north of the San Juan river. The facility is situated on soils of the Garland series which is formed from mixed alluvial sediments. Typical horizons in this series consist of a upper layer of brown loam 4 inches thick. The subsoil is brown clay loam about 20 inches thick underlain by light brown gray very gravely loamy sand. These characteristics were evident during the site investigation. Groundwater is encountered at 25 to 27 feet below ground surface (ft bgs). Groundwater was not encountered during the previous investigations.

1-1

1.2

PREVIOUS INVESTIGATIONS

A preliminary site investigation was conducted by OVAC Engineering in 1993. Their effort included soil sampling and analysis and a general site review. Eleven soil samples were collected and analyzed for volatile organic compounds (VOCs), toxicity characteristic leaching procedure (TCLP) metals, total petroleum hydrocarbons (TPH) and pH. Samples were collected at depths varying from 2 ft to 12 ft bgs at locations throughout the facility. Sample results indicate that TPH is present in the vicinity of the former OWS. A sample collected along the east side of the OWS at 9 ft bgs detected a TPH at a concentration of 4,200 mg/kg. A second sample collected approximately 20 ft southeast of the OWS at 3 ft bgs detected TPH at a concentration of 26.3 mg/kg. The 1993 investigation concluded that the OWS was the source of the petroleum hydrocarbons. An estimated 4 cubic yards of sludge was observed within the OWS enclosure. The investigation report concluded that approximately 75 to 80 cubic yards of soil had been impacted with TPH by the OWS

In 1995, a cosmetic clean-up of the site was performed consisting of cleaning and policing of the site and the building. The OWS was demolished and sludge within the excavation was left in place. No remediation of the OWS facility was performed. In addition, no formal report was generated by OVAC. This operation was documented in a letter from Halliburton to the New Mexico Department of Energy, Minerals and Natural Resources, Oil Conservation Division (OCD).

Soil sampling activities were performed on September 4 and 5, 1997 at the project site (HES, 1997). A long reach excavator was employed in the attempt to sample down to a depth of 20 feet in and around the former OWS location. Because of unstable soil conditions, the maximum depth attained was 15 feet below ground surface (bgs). The soil consists of sandy, gravelly loam with little or no structure. Excavations tended to cave-in easily during the course of the work. Six excavations were installed to delineate the affected area along with a background sample (Figure 1-1).

Several of the excavations, numbers 2, 3, 4, and 6, exhibited dark black staining of the soils with a strong petroleum odor. The staining continued to the bottom of the excavations in all cases. Excavation numbers 1 and 5 exhibited no visible staining of the soils.

Soil samples were collected at 15 feet bgs from excavation numbers 2, 3, 4, 5 and 6 (Figure 1-2). In excavation number 1, a sample was collected from 10 ft bgs. The background sample, excavation number 7, was sampled at a depth of 4 feet. All samples were analyzed for volatile organic compounds

1-2

(EPA Method 8260A), semi-volatile organic compounds (EPA Method 8270B), and target analyte metals (EPA Methods 6010, 6020, and 7000). The results are summarized in Table 1-1.

The soil from excavation number 4 was also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds, semi-volatile organic compounds, and RCRA metals. The sample was also tested for ignitibility, reactivity and corrosivity. The analytical results indicate that the soil is not considered a RCRA-Characteristic waste and are summarized in Tables 1-2 and 1-3.

The extent of the contamination appeared to encompass an area 25 feet long (east-west) by 33 feet wide (north-south). As previously discussed, the maximum depth of excavation was 15 feet. The heavy black staining and odor were apparent in the bottom of excavations 2, 3,4, and 6. It is possible that the affected area extends down to the groundwater surface, assumed to be at approximately 27 feet bgs. The calculated volume of affected soil is approximately 1000 cubic yards assuming a 20% increase due to expansion during excavation.

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TABLE 1-1. Results of Soil Analyses for Semi-Volatile Organic Compounds, Volatile Organic Compounds and Metals for Samples Collected at 2600 East Bloomfield Hwy., Farmington, NM

| | EXC | VATION | SAMPL | | BER and | SAMPLE | E DEPTH | | |
|--------------------------|-------|--------|-------|-------|---------|--------|----------|------------------------|-------------------------|
| | SB01- | SB02- | SB03- | SB04- | SB05- | SB06- | SB07-04 | OCD | EPA |
| | | | | 1 | | | backgrnd | GUIDELINE ¹ | HHRB LEVEL ² |
| Analysis Parameter | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | |
| VOCs EPA 8260A | | | | | | | | | |
| Ethylbenzene | nd | nd | 160 | 320 | nd | 170 | nd | | 2900 |
| Xylenes (total) | nd | nd | 1200 | 1700 | nd | 1000 | nd | BTEX | 980 |
| TOTAL | | | 1360 | 2020 | | 1170 | | 50 | |
| | | | | | | | | | |
| SVOCs EPA 8270B | | | | | | | | | |
| 2-Methylnaphthalene | nd | 2.4 | 15 | 30 | nd | 9.9 | nd | | NA |
| Naphthalene | nd | 0.41 | nd | 5 | nd | 2 | nd | | 800 |
| Phenanthrene | nd | 0.4 | nd | nd | nd | nd | nd | | NA |
| | | | | | | | | | |
| Metals EPA 6020 (ICP/MS) | | | | | | | | | |
| Arsenic | 1.2 | 1.6 | 2.7 | 1.4 | 1.4 | 1.2 | 2.3 | | 22N |
| Beryllium | 0.13 | 0.15 | 0.24 | 0.17 | 0.14 | 0.15 | 0.19 | | 0.14 |
| Selenium | nd | nd | nd | nd | nd | nd | nd | | 380 |
| Thallium | nd | nd | nd | nd | nd | nd | nd | | NA |
| | | | | | | | | | |
| Total Metals EPA 6010 | | | | | | | | | |
| Aluminum | 3520 | 3350 | 6130 | 6030 | 2960 | 6590 | 5360 | | 77000 |
| Antimony | nd | nd | nd | nd | nd | nd | nd | | 31 |
| Barium | 74.1 | 63.6 | 224 | 289 | 69.5 | 120 | 103 | | 5300 |
| Cadmium | nd | nd | 1.8 | 1.2 | nd | nd | nd | | 38 |
| Calcium | 24400 | 35300 | 23900 | 34400 | 34800 | 60100 | 41600 | | NA |
| Chromium | 4.1 | 4.4 | 7.1 | 7 | 3.7 | 6.8 | 4.2 | | 210 |
| Cobalt | 3.2 | 3.1 | 4.3 | 3.2 | 2.9 | 4.4 | 3.9 | | 4700 |
| Copper | 49.8 | 11.8 | 155 | 116 | 8.2 | 30.2 | 15 | | 2800 |
| Iron | 6830 | 6890 | 10400 | 8640 | 6330 | 11200 | 10200 | | 23000 |
| Lead | 14.7 | 5.7 | 84.2 | 61.4 | nď | 22.3 | 7.8 | | 400 |
| Magnesium | 2630 | 3520 | 3120 | 3740 | 3300 | 6180 | 9280 | | NA |
| Manganese | 226 | 352 | 295 | 304 | 276 | 479 | 375 | | 380 |
| Mercury (EPA 7471) | 0.022 | 0.04 | 0.079 | nd | nd | nd | 0.02 | | 23 |
| Molybdenum | nd | nd | 2.4 | nd | nd | nd | nd | | 380 |
| Nickel | nd | nd | 7.1 | 5.8 | nd | 6.6 | 4.5 | | 1500 |
| Potassium | 606 | 620 | 1200 | 891 | nd | 998 | 866 | | NA |
| Silver | 1.4 | nd | 16.5 | 14.4 | nd | 3.2 | nd | | 380 |
| Sodium | nd | nd | nd | nd | nd | nd | nd | | NA |
| Vanadium | 10.3 | 9.7 | 13.8 | 11.7 | 8.4 | 16 | 15.3 | | 540 |
| Zinc | 40.8 | 27.1 | 505 | 1230 | 20.1 | 325 | 28.5 | | 23000 |

1) Oil Conservation Division, Guidelines for Remediation of Leaks, Spills, and Releases (OCD, 1993)

2) EPA Region 6 Human Health Media-Specific Screening Levels (EPA, 1996)

Table 1-2. Results of TCLP Leachate Analysis for Sample SB04 Collected at 2600 East Bloomfield Hwy., Farmington, NM

| Parameter | RCRA-Characteristic Standard | Sample SB04 |
|---------------------------|------------------------------|-------------|
| | (mg/L) | (mg/L) |
| Volatile Organic Toxicity | | |
| Benzene | 0.5 | ND |
| Carbon Tetrachloride | 0.5 | ND |
| Chlorobenzene | 100 | ND |
| Chloroform | 6.0 | ND |
| 1,2-Diclhoroethane | 0.5 | ND |
| 1,1-Dichloroethene | 0.7 | ND |
| 2-Butanone | 200.0 | ND |
| Vinyl Chloride | 0.2 | ND |
| Trichloroethene | 0.5 | ND |
| Tetrachloroethene | 0.7 | ND |
| Semi-Volatile Organics | | |
| 1,4-Dichlorobenzene | 7.5 | ND |
| 2,4-Dinitrotoluene | 0.13 | ND |
| Hexachlorobenzene | 0.13 | ND |
| Hexachlorobutadiene | 0.5 | ND |
| Hexachloroethane | 3.0 | ND |
| 2-Methylphenol | 200.0 | ND |
| %-Methylphenol | 200.0 | ND |
| Nitrobenzene | 2.0 | ND |
| Pentachlorophenol | 100.0 | ND |
| Pyridine | 5.0 | 5.0 |
| 2,4,5-Trichlorophenol | 400.0 | ND |
| 2,4,6-Trichlorophenol | 2.0 | ND |
| Metals | | |
| Arsenic | 5.0 | ND |
| Barium | 100.0 | ND |
| Cadmium | 1.0 | ND |
| Chromium | 5.0 | ND |
| Lead | 5.0 | ND |
| Selenium | 1.0 | ND |
| Silver | 5.0 | ND |
| Mercury | 0.2 | ND |

Table 1-3. Results of Ignitibility, Reactivity, and Corrosivity Test on Sample Collected at 2600 EastBloomfield Hwy., Farmington, NM

| Parameter | Qualitative Result |
|-------------------|--------------------|
| Cyanide, Reactive | ND |
| Ignitability | NO |
| pH | 8.5 |
| Sulfide, Reactive | ND |



Sampling Location and Excavation Areas

Figure 1-1



Site Plan of 2600 East Bloomfield Hwy Farmington, New Mexico

Figure 1-2

2. WORK PLAN AND RATIONALE

A combination of soil remediation through excavation and disposal and groundwater assessment is proposed to address the impacted soil associated with the former OWS. The September 1997 investigation clearly identified impacted soils to a depth of 15 ft. Impacted soils will be excavated to the depth of the shallow water table or to a depth that is feasibly obtainable with an excavator to complete the source abatement. The lateral extent of excavation will be determined in the field by a soil screening method. Abatement confirmation samples will be collected at the boundaries of the excavation. Groundwater conditions will be assessed by installing two monitor wells at the site. Details of the proposed remediation and assessment are presented below.

2.1 SOURCE REMOVAL

A source removal action is planned for the contaminated soil at this site to the extent practical. The work area is constrained on the north and east by the property boundary and on the south by an existing building. The property boundary is approximately 10 feet east of the proposed eastern limit of excavation and approximately 17 feet north of the northern excavation boundary. Immediately east of the site is a trailer park occupied by mobile homes. North of the project site is an established residence. The existing building on site is only 12 feet south of the excavation. It is apparent from the investigation that contamination extends to an appreciable depth in and around the former OWS location.

Substantial engineering controls may be required to stabilize the sides of the excavation.

Contaminated soil will be removed until groundwater is encountered or to a depth that is feasibly obtainable with an excavator, which ever occurs first. A long reach excavator will be employed to remove the contaminated media. Temporary shoring might be employed to stabilize the excavation due to limited work area available to slope the sides of the excavation.

Contaminated material will be disposed of at an OCD permitted land treatment facility. The material will be disposed of as oilfield non-exempt waste. The excavation will be sampled on the sides and bottom to document post-excavation conditions. Soil analyses for BTEX (EPA Method 8020) and TPH (EPA Method 8015 Mod) will be performed. The site characterization soil analyses indicate that the soil is not a RCRA-characteristic waste, therefore no additional soil samples will be analyzed for TCLP compounds. The excavation will be backfilled with clean soil.

2-1

If site conditions do not allow for implementation of this removal strategy, an alternative strategy will be developed in consultation with OCD personnel on site.

2.2 GROUNDWATER MONITORING

Three monitoring wells will be installed to determine if groundwater contamination exists at the site (Figure 1-2). These wells will be installed in accordance with New Mexico Environment Department (NMED) Ground Water Section guidelines. The wells will be installed with oversight by an experienced geologist to ensure compliance with regulatory requirements.

One well will be installed in the contaminant source area after removal of contaminated soil. The second and third wells will be installed in the apparent down gradient locations from the contaminant source area adjacent to the property boundary.

The well construction will consist of one fifteen-foot section of factory-cut 0.010 inch slotted screen in each well casing screened 10 ft below the water table and 5 ft above. A two-inch diameter, schedule 40 PVC screen and riser pipe will be placed into each borehole, with the bottom cap of the well screen resting on the bottom of the borehole. The annulus will be backfilled with clean 10/20 silica sand to a depth approximately two feet above the screen. An approximate two foot thick granular bentonite seal will be placed above the sand and the remaining annular space will be backfilled with bentonite chips or grout depending on depth. The riser pipes will be terminated below grade, sealed with lockable water-tight caps and covered with bolt-down flush-mounted protective well covers. Each monitor well will be developed by surging and bailing. Bailing will continue until pH and specific conductivity have stabilized and the turbidity has been reduced to the greatest extent or until bailed dry.

Prior to sample collection each well will be purged of three casing volumes or purged dry. A dedicated disposable bailer will be used for sample collection from each well. Groundwater samples will be packed in chilled coolers with a complete chain-of-custody form and delivered to an approved laboratory. Groundwater samples will be analyzed for BTEX (EPA Method 8020) and TPH (EPA Method 8015 Mod). Analytical results for groundwater samples collected from these wells will be used to determine if an abatement plan is required..

3. REMEDIATION/ASSESSMENT REPORT

A report will be prepared to document the site activities at the conclusion of soil excavation/disposal and groundwater assessment. The report will contain information concerning the quantity of excavated soil, abatement confirmation sampling results, and soil manifests documenting the final disposition of impacted soils. Groundwater assessment data will also be presented to document compliance or violation of OCD groundwater standards. The report will be submitted to the NMEMNR/OCD to provide them with the soil and groundwater characterization data and determine if any further remedial action is required at the site.

4. TENTATIVE SCHEDULE

Schedule

The following is proposed for the source removal and monitor well installation.

Project/Task

| Remediation Work Plan | Week of 1/19/98 |
|------------------------------------|-----------------|
| Field Work (Excavation Activities) | Week of 2/23/98 |
| Monitor Well Installations | Week of 3/9/98 |
| Remediation/Assessment Report | Week 4/20/98 |
Halliburton Energy Services 2600 East Bloomfield Hwy. Farmington, NM

REFERENCES

EPA, 1996. *EPA Region 6 Human Health Media-Specific Screening Levels*, U.S. Environmental Protection Agency, Region 6, Dallas, Texas, October 1996.

HES, 1997. *Site Investigation Report*, Wellex/Otis Engineering Facility, Halliburton Energy Services, 2600 East Bloomfield Hwy, Farmington, New Mexico, October 30, 1997.

OCD, 1993. Guidelines for Remediation of Leaks, Spills and Releases, New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division, Santa Fe, New Mexico, August 13, 1993.

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Brown & Root

Services

2300 Buena Vista S.E., / Suite 110 / Albuquerque, NM 87106 / (505) 247-4933 / Fax: (505) 247-8151

October 30, 1997

State of New Mexico Energy, Minerals and Natural Resources Department **Oil Conservation Division** 2040 S. Pacheco Santa Fe, New Mexico 87505

ABQ-97-0206

RECEIVED William C. Olson, Hydrogeologist Attention: OCT 3 1 1997 **Environmental Bureau** Environmental Bureau Oil Conservation Division Old Wellex Yard Reference:

Farmington, New Mexico

Subject: Transmittal of Site Investigation Report

Dear William Olson,

On behalf of Halliburton Energy Services (HES), Brown and Root Environment (B&RE) is submitting the attached Site Investigation Report to document findings associated with the former oil water separator at the Old Wellex Yard, 2600 Bloomfield Hwy, Farmington, New Mexico. This report addresses the requirements specified in your August 13, 1997.

If additional information is required, I can be reached at (505) 247-4933 during business hours.

Sincerely,

Brad Sumrall, E.I.T.

cc: Joe Larkin, HSE Regional Manager Denny Faust, OCD Aztec Area Office **Project Files**

Brown & Root Environmental A Halliburton Company

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District I - (505) 393-6161 New Mexico Form C-138 P. O. Box 1980 Energy Minerals and Natural Resources Department Originated 8/8/95 Hobbs, NM 88241-1980 District II - (505) 748-1283 Oil Conservation Division 811 S. First 2040 South Pacheco Street Submit Original Artesia, NM 88210 Plus I Čopy Santa Fe. New Mexico 87505 trict III - (505) 334-6178 to appropriate Rio Brazos Road (505) 827-7131 District Office .c. NM 87410 District IV - (505) 827-7131 Env JN: REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE 4. Generator Wellow 1. RCRA Exempt: Non-Exempt: 🔀 5. Originating Site Main Yard Verbal Approval Received: Yes 🗌 No 🕅 2. Management Facility Destination Envirotech Soil RemediationFac Landfarm #2 6. Transporter TBA 5796 U.S. Highway 64 8. State New Mexico 3. Address of Facility Operator Farmington, NM 87401 2650 Bloomtreld Heir. 7. Location of Material (Street Address or ULSTR) Formington Westylopico 9. Circle One: A. All requests for approval to accept oilfield exempt wastes will be accompanied by a certification of waste from the Generator; one certificate per job. B. All requests for approval to accept non-exempt wastes must be accompanied by necessary chemical analysis to PROVE the material is not-hazardous and the Generator's certification of origin. No waste classified hazardous by listing or testing will be approved. All transporters must certify the wastes delivered are only those consigned for transport. BRIEF DESCRIPTION OF MATERIAL: Former all /water Separator Sump Hydrocarbon Impactor Soil 4,4 DDD U Listed Waste RECEIVED DECEIVEN OCT 2 0 1937 U 060 OIL CON. DIV. DIST. 3 OCT 21 1997 40 CFR 261.33 Environmental Bureau MX **Oil Conservation Division** Estimated Volume -Kuris TITLE: Landfarm Manager DATE: 10 20 27 SIGNATURE: Waste Management FacilityAuthorized Agent TYPE OR PRINT NAME: Harlan M. Brown TELEPHONE NO. (505)632-0615 (This space for State Use) TLE: FEBTOGIS APPROVED BY:

| AP | P | R | ΟV | Έľ | D | B١ | /: | |
|----|---|---|----|----|---|----|-----------|--|

| EU | mk | |
|----|----|--------|
| | | TITLE: |

10/22/37

DATE:

CERTIFICATE OF WASTE STATUS

| 1. Generator Name and Address: | 2. Destination Name: |
|--|--|
| Halliburton Energy Services | Envirotoch Soil Remediation Facility |
| 4109 E. Main Street | Landfarm #2 |
| Farmington, NM 87499 | Hilltop, New Mexico |
| 3. Originating Site (name): | Location of the Waste (Street address &/or ULSTR): |
| Wellex Site | 2600 East Bloomfield Highway Farmington, NM 87401 |
| Attach list of originating sites as appropriate | |
| 4. Source and Description of Waste | |
| Remark Odd /Water Conceptor | |
| Former Ull/water Seperator Hydrogarbon Impacted Soil | |
| mydrocarbon impacoca boli | |
| | |
| | |
| · · · · · · · · · · · · · · · · · · · | |
| L. Bradford Sumrall | representative for: |
| (Print Name) | · · · · · · · · · · · · · · · · |
| Halliburton Energy Services | do hereby certify that, |
| according to the Resource Conservation and Rec 1988, regulatory determination, the above describ | overy Act (RCRA) and Environmental Protection Agency's July, Ded waste is: (Check appropriate classification) |
| EXEMPT oilfield waste XX NON-EX analysi | XEMPT oilfield waste which is non-hazardous by characteristic s or by product identification |
| and that nothing has been added to the exempt or | r non-exempt non-hazardous waste defined above. |
| For NON-EXEMPT waste only the following do MSDS Information XX RCRA Hazardous Waste Analysis Chain of Custody | s |
| Name (Original Signature): | selfumal/ |
| Title: <u>Environmental Engineer</u> | / |
| Data: 10/16/97 | |

| , | Waste Stream Constituent | Conce | ntration /iter.mg/l) | EPA HW NO. | Waste Stream Constituent | Concentration (milligrans/lifer mg/!) | EPA HW NO |
|--------------|-----------------------------|-----------|-------------------------|--------------|------------------------------|--|-------------------|
| • | • Arsenic | | 5.0 | 1)()()4 | Hexachlorobenzene | C1.0 | 250X1 |
| ~ | Barium | | 00.0 | 10005 | Hexachlorobutadien | e 0.5 | 12033 |
| | Benzene | | 0.5 | 81001 | Mexachloroethane | 3.0 | D034 |
| ç | Cadmium | | 1.0 | 1006 | ∽ Lead | 5.0 | DXXI8 |
| | VCarbon Tetrachle | oride | 0.5 | 61001 | 🗸 Lindane | 0.4 | [)()] ? Pesticine |
| Pesticide | Chlordane | | 0.03 | 12020 | ~ Mercury | 0.2 | 10009 |
| | Chlorobenzene | | 00.0 | 12021 | Methoxychlor | 10.0 | [X)]4 Posticioe |
| | Chloroform | | 6.0 | D022 | Methyl ethyl ketone | 2(X).() | D035 |
| ~ | " Chromium | | 5.0 | 10007 | ✓Nitrobenzene | 2.0 | D036 |
| | Cresol | 2 | 00.0 | D026 | Pentachlorophenol | 100.0 | 10037 |
| | ∽m-Cresol | 2 | 00.0 | D()24 | ~ Pyridine | 5.0 | 86001 |
| | vo Cresol | 2 | 00.0 | 12023 | ✓ Selenium | 1.0 | 0100 |
| | (ieso) | 2 | 00.0 | 12025 | Silver | 5.0 | |
| HEAR I A IOR | • 2,4-D | | 10.0 | D016 | ~~2,4,5-TT (Silvex) | 1.0 | [X)]7 HERBICIDE |
| | A,4-Dichloroben: | zene | 7.5 | 1)()27 | ✓ Tetrachloroethylene | 0.7 | D(139 |
| | M,2-Dichloroetha | INP | 0.5 | 12028 | C Toxaphene | 0.5 | [X)15 Permicine |
| | パ;1-Dichloroethy | rlene | 0.7 | 1)(1)29 | \sim Trichloroethylene | 0.5 | 1)()(1) |
| | V2,4-Dinitrotoluei | <u>ne</u> | 0.13 | 12030 | \sim 2,4,5-Trichlorophenol | 4(0).() | 13/41 |
| Posticide | ✓Endrin | | 0.02 | 1)112 | V2,4,6-Trichlorophenol | 2.0 | 1)(42 |
| Pesticipi | L-Heptachlor | | 0.008 | D(131 | √Vinyl chloride | 0.2 | 1)()43 |
| | | _ | -EP Toxic | wastes: TCTP | must now be utilized for cha | tracterizing these wa | stix |
| | | | | | | | |

Maximum Contaminant Concentrations For Toxicity Characteristic Wastes

1

ALL HIDSTROM (AC DUIL Zed for characterizing on

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iii uanterra Environmental Services

Chlorinated Pesticides and PCB's Target Compound List (TCL) Method 8080

| Client Name: | Brown and Root | Environmental | | | | |
|--------------|----------------|---------------|----|-----|----|---------------------|
| Client ID: | HX20-SB04-15 | | | | | |
| Lab ID: | 056857-0009-SA | <i>,</i> | | | | |
| Matrix: | SOLID | Sampled: | 04 | SEP | 97 | Prepared: 18 SEP 97 |
| Authorized: | 08 SEP 97 | Received: | 06 | SEP | 97 | Analyzed: 28 SEP 97 |

| | | | Dry Weight | Reporting |
|-------------|--------------------------|----------|------------|-----------|
| • | Parameter | Result | Units | Limit |
| | Aldrin | ND | ua/ka | 1.9 |
| | Aroclor 1016 | ND | ug/kg | 36 |
| * | Aroclor 1221 | ND | ug/kg | 36 |
| | Aroclor 1232 | ND | ug/kg | 36 |
| | Aroclor 1242 | ND | ug/kg | 36 |
| | Aroclor 1248 | ND | ug/kg | 36 |
| | Aroclor 1254 | ND | ug/kg | 36 |
| | Aroclor 1260 | ND | ug/kg | 36 |
| | alpha-BHC | ND | ug/kg | 1.9 |
| | beta-BHC | ND . | ug/kg | 1.9 |
| | delta-BHC | ND | ug/kg | 1.9 |
| | gamma-BHC (Lindane) | . ND | ug/kg | 1.9 |
| -1-0 | alpha-Chlordane | ND ND | ug/kg | 1.9 |
| listed nous | gamma-Chiordane | NU | ug/kg | 1.9 |
| | | 4.1 | ug/kg | 3.6 |
| | | 4.0 | ug/kg | 3.0 |
| | $4,4 \cdot 001$ | NU | ug/kg | 3.0 |
| | Dielarin Federulfen I | | ug/kg | 3.0 |
| | Endosulfan II | | uy/ky | 1.9 |
| ~ | Endocultan sultato | | ug/kg | 3.0 |
| | Endosurran surrace | ND | ug/kg | 3.0 |
| | Endrin ketone | | ug/kg | 3.0 |
| | Hentachlor | ND | ug/kg | 1 9 |
| | Heptachlor enoxide | ND | ug/kg | 1.9 |
| | Methoxychlor | ND | ug/kg | 19 |
| | Toxaphene | ND | ug/kg | 190 |
| | Surrogate | Recovery | | Limits |
| | Tetrachloro-m-xylene | 71 | * | 39-105 |
| | Dibutyl chlorendate | 45 | x | 51-115 |
| | Decachlorobiphenyl | 43 | * | 70-126 |

Percent moisture is 8.8%. All results and limits are reported on a dry weight basis. Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dianna Link

Approved By: Audrey Cornell



110

11 22 22

5500

5500

Limits

39-113

ug/kg

ug/kg ug/kg

uğ/kğ

ug/kg

ug/kg

*

Chlorinated Herbicides SW-846 List Method 8150

| Client ID: Lab ID: Matrix: Authorized: | HX20-SB04-15 056857-0009-SA SOLID 08 SEP 97 | Sampled: Received: | 04 SE 06 SE | P 97 P 97 | Prepared: 1 Analyzed: 2 | 8 SEP 97 5 SEP 97 |
|---|--|-----------------------|----------------|----------------------------------|----------------------------|----------------------|
| Parameter | | Res | ult | Dry Weigh Units | it Reportin Limit | g |
| 2,4-D 2,4-DB 2,4,5-T 2,4,5-TP (Si | lvex) | . N N N N | | ug/kg ug/kg ug/kg ug/kg | 44 110 11 11 | |

ND

ND

ND

ND

ND

ND

127

Recovery

1.....

Percent moisture is 8.8%. All results and limits are reported on a dry weight basis. Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Dalapon

Dicamba

Dinoseb

Surrogate

MCPA MCPP

DCAA

Dichlorprop

Reported By: Andy Burcham

Approved By: Audrey Cornell



Wuanterra

Environmental Services



| Client ID: HX20-SB04-15 Lab ID: 056857-0009-SA Matrix: SOLID Authorized: 08 SEP 97 | Sampled: 04 SEP Received: 06 SEP | 97 97 | Leached: 11 S Prepared: 11 S Analyzed: 15 S | iep 97 iep 97 iep 97 |
|--|--|--|---|----------------------------|
| Parameter | Result | Units | Reporting Limit | |
| Benzene 2-Butanone Carbon tetrachloride Chlorobenzene Chloroform 1.2-Dichloroethane 1.1-Dichloroethene Tetrachloroethene Trichloroethene Vinyl chloride | ND ND ND ND ND ND ND ND ND ND | mg/L mg/L mg/L mg/L mg/L mg/L mg/L | 0.050 0.20 0.050 0.050 0.050 0.050 0.050 0.050 0.050 0.050 0.10 | |
| Surrogate | Recovery | | Limits | |
| 1.2-Dichloroethane-d4 4-Bromofluorobenzene Toluene-d8 | 92 102 97 | * * * | 80-120 86-115 88-110 | |

Dilution factor is 1.0.

All results and limits are corrected for dilution.

ND = Not Detected

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and D

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Reported By: Sandra Jones

Approved By: Lynn S. Calvin



Semivolatile Organics / TCLP TCLP Leachate Method 8270B

| Client Name: | Brown and Root | Environmental | |
|--------------|----------------|---------------------|---------------------|
| CITENT ID: | HX20-2804-15 | | |
| Lab ID: | 056857-0009-SA | | Leached: 18 SEP 97 |
| Matrix: | SOLID | Sampled: 04 SEP 97 | Prepared: 21 SEP 97 |
| Authorized: | 08 SEP 97 | Received: 06 SEP 97 | Analyzed: 25 SEP 97 |

| Parameter | Result | Units | Réporting Limit |
|--|--|--|---|
| 1,4-Dichlorobenzene 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane 2-Methylphenol 3/4-Methylphenol Nitrobenzene Pentachlorophenol Pyridine 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol | ND ND ND ND ND ND ND ND ND ND ND ND | mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L | $\begin{array}{c} 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.050\\ 0.25\\ 0.10\\ 0.050\\ 0.050\\ 0.050\end{array}$ |
| Surrogate | Recovery | | Limits |
| Nitrobenzene-d5 2-Fluorobiphenyl Terphenyl-d14 2-Fluorophenol Phenol-d5 2,4,6-Tribromophenol | 72 69 64 74 77 81 | X X X X X | 57-102 43-116 43-128 26-104 33-117 37-117 |

ing the second s

Dilution factor is 1.0.

All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Tom Claeys

Approved By: Audrey Cornell

Quanterra Environmental Services

Metals TCLP Leachate

| Client Name: Client ID: Lab ID: Matrix: Authorized: | Brown and Root E HX20-SB04-15 056857-0009-SA SOLID 08 SEP 97 | nvi ronn | Sampled: Prepared: | 04 SEP 97 See Below | · · · · · · · · · · · · · · · · · · · | Received: Analyzed: Leached: | 06 Se 18 | SEI e Bo SEI | 97 97 97 97 | |
|---|--|---|---|--|---|--|--|--|--|--|
| Parameter | Result Qual | Dil | RL | Units | Test Method | Prepare Date | ed | Ana [| alyz Date | ed |
| Arsenic Barium Cadmium Chromium Lead Selenium Silver Mercury | ND ND ND ND ND ND ND ND | 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 0.50 10.0 0.10 0.50 0.50 0.25 0.50 0.00020 | mg/L mg/L mg/L mg/L mg/L mg/L mg/L | 6010A 6010A 6010A 6010A 6010A 6010A 6010A 7470 | 19 SEP 19 SEP 19 SEP 19 SEP 19 SEP 19 SEP 19 SEP 23 SEP | 97 97 97 97 97 97 97 97 | 22 22 22 22 22 22 22 22 22 22 | SEP SEP SEP SEP SEP SEP SEP SEP | 97 97 97 97 97 97 97 97 |

ND = Not Detected

Reported By: Harvey Pierre

Approved By: Richard Persichitte

| | | | | | | Quan | terra |
|---|--|--------------------------|----------------------|--------------------------|--|---|--|
| -sta Taragetara Gana - G | | Gene | eral Inorga | anics | | | Environmental ervices |
| Client Name: Client ID: Lab ID: Matrix: Authorized: | Brown and Root E HX20-SB04-15 056857-0009-SA SOLID 08 SEP 97 | nvironn | Sampled: Prepared | 04 SEP 97 : See Below | Re | eceived: 06 malyzed: Se | SEP 97 e Below |
| Parameter | Result Qual | Dil | RL | Units | Test Method | Prepared Date | Analyzed Date |
| Cyanide, Reactive Ignitability pH Sulfide, Reactive | e ND NO 8.5 e ND | 1.0 1.0 1.0 2.0 | 0.10 50.0 | mg/kg units mg/kg | 9010A/901 SW846 Cha 9045B 9030A | 17 SEP 97 NA 24 SEP 97 17 SEP 97 | 18 SEP 97 23 SEP 97 24 SEP 97 17 SEP 97 |

ND = Not Detected

Reported By: Cheryl Jones

Approved By: Roxanne Sullivan



Brown & Root

2300 Buena Vista S.E., / Suite 110 / Albuquerque, NM 87106 / (505) 247-4933 / Fax: (505) 247-8151

June 27, 1997

State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 S. Pacheco Santa Fe, New Mexico 87505

Attention: William C. Olson, Hydrogeologist Environmental Bureau

Reference:

Old Wellex Yard Farmington, New Mexico

Subject: Transmittal of Work Plan

ABQ-97-0140



Dear William Olson,

On behalf of Halliburton Energy Services (HES), Brown and Root Environment (B&RE) is submitting the attached Investigative Work Plan to determine the extent of hydrocarbon impacted soil associated with the former presence of an oil water separator at the Old Wellex Yard at 2600 Bloomfield Hwy in Farmington, New Mexico. The Work Plan was developed in response to the NMEMNRD letter dated March 11, 1997.

In that letter, you also requested HES provide information related to the type, nature, volume and disposition of wastes generated during the August 1995 removal of the oil water separator. Conversations with OVAC personnel, the company that performed the oil water separator removal, indicated that the separator consisted of cinderblock walls and an earthen bottom. The cinderblocks from the separator walls were removed and discarded as construction debris in the local landfill. The lines to the separator were capped and no wastes were removed from the separator. Clean fill was placed in the location of the separator. Neither sampling and analysis nor remediation of the soil surrounding the oil water separator was performed.

If additional information is required, you can contact Todd Dean at (405) 257-4353 or me at (505) 247-4933.

Sincerely,

Clekr

Charles A. Remkes, P.E.

cc: Todd Dean, HSE Regional Manager

Brown & Root Environmental

方 A Halliburton Company

INVESTIGATIVE WORK PLAN

to

DETERMINE THE EXTENT OF

HYDROCARBON IMPACTED SOIL

at

HALLIBURTON ENERGY SERVICES 2600 BLOOMFIELD HWY FARMINGTON, NEW MEXICO

Submitted to:

State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division

> 2040 S. Pacheco Santa Fe, New Mexico 87505

> > June 27, 1997

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|-----------|----------------------------------|---|
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Acronyms

| bgs | below ground surface |
|---------|---|
| HES | Halliburton Energy Services |
| MSL | mean sea level |
| NMEMNRD | New Mexico Energy, Minerals, and Natural Resources Department |
| OWS | oil water separator |
| SVOCs | semi-volatile organic compounds |
| TCLP | toxicity characteristic leaching procedures |
| TPH | total petroleum hydrocarbons |
| VOCs | volatile organic compounds |

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Introduction

This work plan was prepared to determine the extent of petroleum and metals contamination associated with the former presence of an oil/water separator at the Halliburton Energy Services (HES) facility located at 2600 Bloomfield Highway, Farmington, New Mexico. The need to determine the extent of contamination at the facility was identified by the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD) in a March 11, 1997, letter. The NMEMNRD is the state regulatory agency having jurisdiction on the past and present operations at this facility.

Site Description and Environmental Setting

Site Description

The facility is located on a 150 ft by 290 ft fenced parcel identified as Section 14 of Township 29 North and Range 13 West in San Juan County, New Mexico. The facility is no longer operating. The HES facility formerly operated as both a Wellex and an Otis Engineering facility. While operating under Otis Engineering, an oil/water separator (OWS) was present at the facility. The OWS was removed during remedial activities in August 1995 and was not replaced. The walls of the OWS were constructed from cinder blocks; the OWS did not, however, have a bottom. Contamination associated with the OWS is the focus of the investigation for this work plan.

Environmental Setting

The HES facility is approximately 1.5 mi southeast of Farmington, New Mexico within a commercial complex. It is approximately 5,338 ft above MSL. The facility is underlain by Garland series soil. Garland soil is formed in mixed alluvial sediments. Typically, the surface layer is brown loam about 4 in thick. The subsoil is brown clay loam about 20 in thick. The substratum is light brownish gray very gravelly loamy sand and multicolored very gravelly sand. Permeability of this soil is moderate to a depth of 24 in and rapid below this depth. According to regulatory personnel, the area in the immediate vicinity of the HES facility is underlain by boulders and groundwater for this area is approximately 28 ft bgs. The closest perennial surface water is the Animas River approximately 1 mi to the northwest.

Previous Investigations

Investigations have been performed at the facility in 1993 and 1995. In August 1993, OVAC, Inc. performed an investigation at the facility which included soil sampling and analysis. Eleven soil samples were collected and analyzed for volatile organic compounds (VOCs), toxicity characteristic leaching procedure (TCLP) metals, total

petroleum hydrocarbons (TPH) and pH. Samples were collected at depths varying from 2 ft to 12 ft bgs and at locations throughout the facility. Results of the investigations showed petroleum hydrocarbons were present in samples collected in the vicinity of the OWS; one sample collected along the east side of OWS at a depth of 9 ft bgs had TPH concentrations of 4,200 ppm; one sample collected approximately 20 ft southeast of the OWS at 3 ft bgs had TPH concentrations of 807 ppm. The 1993 investigation concluded that the OWS was the source of the petroleum hydrocarbons to the east and southeast. The investigation also estimated that between 75 to 80 yards of soil had been impacted.

As a result of the 1993 investigation, OVAC performed a cosmetic cleanup at the facility in August 1995, during which the OWS was removed and the lines were plugged. The presence of petroleum hydrocarbons in the surrounding soil was visually confirmed, however no sampling was performed to quantify concentrations. Neither impacted soil nor wastes from the OWS were removed. According to OVAC personnel, the cinderblock walls were excavated and the cinderblocks were disposed as construction wastes in the local landfill.

Data Gaps

Though sampling and analysis has identified petroleum hydrocarbons to be present in the soil surrounding the former location of the OWS, neither the horizontal nor the vertical extent of petroleum hydrocarbons in the soil has been determined. Groundwater samples have not been collected to determine if groundwater has been impacted.

Work Plan and Rationale

A phased approach is proposed for this investigation. Soil samples will be collected first. If soil analyses indicate that groundwater may be impacted, a monitor well will be installed and groundwater samples will be collected and analyzed

Sampling and Analysis

Sampling and analysis will be used to define the horizontal and vertical extent of petroleum hydrocarbons and metals in the soil. To determine the vertical extent of contamination, samples will be collected from locations where hydrocarbons were previously detected. This includes the soil directly beneath the former location of the OWS and locations east and southeast of it (see Figure 1). To determine the horizontal extent of hydrocarbons, soil samples will be collected from locations approximately 10 ft east and southeast of where contamination was previously detected and 10 ft north of the OWS (see Figure 1).

Samples will be collected using an excavator since, according to regulatory officials, drilling or hydropunching (i.e., hollow stem augers or geoprobes) would not be feasible due to the presence of large boulders. The soil will be excavated in 5 ft intervals.



Excavated soil from each interval will be field examined for stains and odors indicative of petroleum hydrocarbons. A flame ionization detector (FID) will also be used for field detection of petroleum hydrocarbons in the soil. Samples from each interval will be collected from the portion of the excavated soil having the highest FID readings using zero headspace and/or having the heaviest stains or strongest odors. Excavation will continue down to a depth of 20 ft bgs or to where no staining or odors are observed and/or FID readings are below 100 ppm, whichever is deeper. These samples will be properly preserved and stored before being submitted to an approved laboratory and analyzed for VOCs, semi-volatile organic compounds (SVOCs), and TCLP metals. Analytical results will be evaluated to determine if additional soil sampling and/or groundwater sampling is required.

Excavated Materials Management

Analytical results will also be used to characterize excavated materials. The excavated material will be managed as potentially impacted soil until analytical results indicate otherwise. The excavated material will be placed on and covered by 10-mil polyethylene sheeting during field activities. After sampling is completed the excavation will be lined with 10-mil polyethylene sheeting and the excavated soil will be placed in the lined excavation. After being characterized, the material will, if allowable, remain onsite in the lined excavation or, if required, be disposed off-site in an approved manner.

Assessment Report

After sampling and analysis, an assessment report will be prepared and submitted to the NMEMNRD for review and comments. The report will provide a description of the investigative activities and will include general site characteristics, soil characteristics, ground water quality (if required).

REFERENCES

- OVAC, 1995. Environmental Assessment Report of Otis Engineering 2600 Bloomfield Highway Farmington, N. Mexico, Kirby Odell Vinson and Praveen Udtha, OVAC, Inc., Lake Charles, LA.
- New Mexico Energy, Minerals and Natural Resources Department, 1997. March 11, 1997 Letter Referencing Old Wellex Yard Farmington, New Mexico, William C. Olson, Hydrogeologist Environmental Bureau, NMEMNRD, Santa Fe, NM.
- Remkes, Charles A., 1997. Personal Communications with Herb McMullom, OVAC Project Manager. June 23 and 27, 1997.
- Oil Conservation Division, NMEMNRD, 1993. Guidelines for Remediation of Leaks, Spills and Releases. August 13, 1993.



HALLIBURTON ENERGY SERVICES

Post Office Drawer 1431 / 1015 Bois D'Arc Street / Duncan, Oklahoma 73536-0108 / Tel: 405-251-4358 / Fax: 405-251-3969

May 23, 1997



Mr. William Olson New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 S. Pacheco Santa Fe, NM 87505

RE: Time Extension Request for workplan development at Halliburton's Old Wellex Yard, Farmington, NM

Dear Mr. Olson,

On April 10, 1997 you granted Halliburton a time extension for development and submittal of a workplan for further investigation around the oil/water separator at the referenced facility. Since that time, we have switched environmental consulting companies and the ensuring transition period has caused a short delay in developing the workplan for this facility. Therefore, I would like to request another time extension - until June 30, 1997. Our new consultant has the pertinent information, is familiar with the facility and should have no trouble meeting this new date. Once again, I thank you for your patience.

I am available at your convenience if you have any questions or comments on this matter. I can be reached at (405) 251-4353.

Sincerely,

Todd J. Dean, P.E. Environmental Engineer

Verbal approval to voice mail on 6/6/97 at 1530



HALLIBURTON ENERGY SERVICES

Post Office Drawer 1437/1015 Bois D' Arc Street / Dunçan, Oklahoma 73536-0108 / Tel: 405-251-4358 / Fax: 405-251-3969

April 3, 1997

Mr. William C. Olson New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 S. Pacheco Santa Fe, NM 87505

RE: NM OCD letter of March 11, 1997 pertaining to Halliburton's Old Wellex Yard, Farmington, NM

Dear Mr. Olson,

In accordance with our telephone conversation today, I would like to request a time extension for submitting the information you requested in the referenced letter. I intend to have the disposal information and a complete workplan (for further investigation around the separator) to you by May 30, 1997. I appreciate your patience.

I am available at your convenience if you have any questions or comments on this matter. I can be reached at (405) 251-4353.

Sincerely,

Todd J. Dean, P.E. Environmental Engineer

1430 hrs. approved to Jorba Decar + HADDor

STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE, NEW MEXICO 87505 (505) 827-7131

March 11, 1997

CERTIFIED MAIL RETURN RECEIPT NO. P-269-269-277

Mr. Matt D. Ratliff Environmental Coordinator Halliburton Energy Services P.O. Drawer 1431 Duncan, Oklahoma 73536-0108

RE: OLD WELLEX YARD FARMINGTON, NEW MEXICO

Dear Mr. Ratliff:

The New Mexico Oil Conservation Division (OCD) has reviewed Halliburton Energy Services (HES) January 14, 1997 "OLD WELLEX YARD, FARMINGTON, NEW MEXICO" and undated "ENVIRONMENTAL ASSESSMENT OF OTIS ENGINEERING, 2600 BLOOMFIELD HIGHWAY, FARMINGTON, N.MEXICO". These documents contain the results of HES's 1993 investigation of contamination and 1995 remedial actions related to the Old Wellex/Otis Engineering facility.

Please provide the OCD with the following information by April 30, 1997:

- 1. The type, nature (including hazardous characteristic laboratory analyses of liquid and solid wastes), volume, and disposition of all wastes generated during the August 1995 remedial actions.
- 2. A work plan to determine the extent of petroleum (ie. total petroleum hydrocarbon and 1,2 dichloroethane) and metals (ie. lead) contamination which exceeds either OCD guidelines or New Mexico Water Quality Control Commission standards.

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A,

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson Hydrogeologist Environmental Bureau

xc: OCD Aztec District Office

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| , Apri | Return Receipt Showing to Whom, Date, & Addressee's Address | | | | | | | |
| 008 | TOTAL Postage & Fees | \$ | | | | | | |
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HALLIBURTON ENERGY SERVICES

Post Office Drawer 1431 / 1015 Bois D' Arc Street / Duncan, Oklahoma 73536-0108 / Tel: 405-251-4358 / Fax: 405-251-3969

January 14, 1997

NM Energy Minerals & Natural Resources Department Oil Conservation Division Aztec District Office Attn: Denny G. Foust 100 Rio Brazos Rd. Aztec, NM 87410

RE: Old Wellex Yard, Farmington, New Mexico

DECENSO JAN 16 1997

Dear Mr. Foust,

As per your request in your letter dated December 20, 1996, I am forwarding a copy of the Environmental Assessment which was performed for the Halliburton excess property site located at 2600 Bloomfield Highway in Farmington. The assessment shows that a small area of contamination was defined in and around the old oil/water separator. As stated on page 8, Section 4.0 of the report, and again on page 12, Section 5.0, approximately 75 to 80 yards of soil is estimated to be impacted with Total Petroleum Hydrocarbons and small amounts of other BTEX compounds.

Our records show that in August, 1995, additional cosmetic work was done on the facility. The cosmetic work consisted of cleaning out the sump, pressure washing the floors inside the shop, removing any and all trash or debris, cleaning walls, triple rinsing and disposing of a poly tank, and general policing of the area in preparation of possibly leasing the site. Radioactive source storage silos were also plugged with concrete or removed from the ground and disposed. At the time the cosmetic clean-up was undertaken, the oil/water separator on the north side of the building was also removed. When the separator was removed, the small amount of contamination noted in the assessment was confirmed, however, no remediation took place. The source of the contamination was removed and all drain lines leading to the sump were plugged and abandoned. No formal report was forwarded by OVAC for this cosmetic clean-up.

Halliburton does not believe that the small amount of contamination present at the site poses a threat to human health or the environment, however if you believe additional assessment is necessary, please do not hesitate to contact me.

Sincerely

Matt D. Ratliff // Environmental Coordinator

MDR1.97doc/tcd



OVAC, Inc.

P.O. Box 16584 Lake Charles. Louisiana 70616 (318) 433-1602 FAX (318) 436-4144



ENVIRONMENTAL ASSESSMENT

OF:

OTIS ENGINEERING 2600 BLOOMFIELD HIGHWAY FARMINGTON, N.MEXICO

PREPARED FOR:

Mr. LARRY SIMS

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PRAVEEN UDTHA ENVIRONMENTAL ENG.



OVAC, Inc.

P.O. Box 16584 Lake Charles. Louisiana 70616 (318) 433-1602 FAX (318) 436-4144

ENVIRONMENTAL ASSESSMENT

OF:

OTIS ENGINEERING 2600 BLOOMFIELD HIGHWAY FARMINGTON, N.MEXICO

LIMITATIONS AND SERVICE RESTRAINTS

This report is submitted with the understanding that the assessment may yield inconclusive results in all areas due to available information and/or records. The information furnished by others is believed to be reliable, but no warranty is given for its accuracy.

All professional opinions presented in this report are based on information made available to OVAC. Inc. either by review of data provided by others or data gathered by OVAC, Inc. personnel.

OVAC, Inc. affirms that data gathered and presented by OVAC, Inc. in this report were collected in an appropriate manner in accordance with generally accepted methods and practices. OVAC, Inc. cannot be responsible for decisions made solely on the basis of economic factors.

Conditions reported in this assessment are as found at the time of assessment, unless otherwise stated.

OVAC. Inc. analyzed only the substances, conditions, and locations described in the report at the time indicated. No references regarding other substances, conditions, location or time can be made unless specifically stated in this report.

All engineering designs are assumed to be correct. Plot plan and illustrative materials in this report are included only to assist the reader in visualizing the property.

Possession of this report, or a copy thereof, does not carry with it the right of publication. It may not be used for any purpose by any party other than the party to whom it is addressed without the expressed written consent of OVAC. Inc.

The environmental assessors herein by reason of this report are not required to give further consultation, testimony, or be in attendance in court with reference to the property in question unless arrangements have been previously made.

This report may identify, apply or advise as to environmental laws and regulations, However, it must be understood that the environmental personnel involved in this project are not attorneys.

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1.0 EXECUTIVE SUMMARY

Ovac. Inc. was contracted to perform a phase II study on Otis Engineering's facility at Farmington. N. Mexico. As recorded in the San Juan County's tax accessors office at Aztec, N. Mexico the subject property is located in section 14 of township 29 north and range 13 west. The physical address of the property is 2600 Bloomfield Hwy, Farmington, N. Mexico. This report describes the sampling procedures, analyzes the environmental conditions, and details the best applicable remedial action.

On August 4. 1993 OVAC. Inc. performed a detailed investigation on the property. No UST's existed on the property. An above ground chemical storage tank was located in the southwest portion of the property on the asphalt parking lot. Otis's office to the east, a separator to the northeast. an earthen parking lot to the northwest, and a storage shed to the northeast were situated on the property. Apart from a few areas of surface contamination and oily sludge inside the separator. no significant signs of leaks or spills were visible on the property. Sampling was performed to confirm or deny the presence of any subsurface contamination.

During the assessment Otis Engineering's facility was divided into a grid and eleven soil samples were collected from different locations and depths. Samples collected were analyzed for VOC's. TCLP metals, Total Petroleum Hydrocarbons, and pH. Sample analysis showed minor subsurface environmental concerns around the separator. A total of 75 to 80 yds of soil is estimated to be impacted. Remediation is recommended. Based on volume estimates direct landfill is the most economically feasible remedial action.

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2.0 INTRODUCTION

OVAC, Inc. was contracted to investigate the environmental conditions at Otis Engineering's facility in Farmington, N. Mexico. The physical description of the property is beginning at a point 1980 feet west and 38 feet north of the southeast corner of section 14. T. 29 N., R. 13 W., N.M.P.M., on the north right of way line of N.M. Highway No. 17, thence west 150 feet, thence north 290.4 feet, thence east 150 feet, thence south 290.4 feet to the point of beginning, containing 1.0 acres, more or less, said land being located in the southeast corner of the east 10 acres of the west one-half of the southwest quarter of the southeast quarter (W^{1,2}SW^{1,4}SE^{1,4}) of section 14, township 29 north, range 13 west, N.M.P.M., including water and ditch rights appurtenant there to, and EXPECTING all oil, gas, or minerals in, under, or a part of said tract. The copy of warranty deed is in the analytical section. Figure 1 shows the property location in the City of Farmington. Figure 2 shows the location of the property on the U.S.G.S. Topographical Map. Otis Engineering currently operates this facility. The oil water separator contains approximately 4 yds of sludge. A detailed study of the property shows minor surface and subsurface environmental concerns. Table 1 shows the site lithology on the property during the investigation. The lithology consists of rocks and dark brown sand. No groundwater was encountered during the investigation.



Figure 1. Property Identification in the City of Farmington


| Tabl | le 1. | Site | Litho | logy |
|------|-------|------|-------|------|
|------|-------|------|-------|------|

| SAMPLE | TIME | DEPTH (feet) | LITHOLOGY |
|--------------------|------------|-----------------|-----------------------|
| IAH | 7:48 A.M. | 8-9 | Rocks/Dark Brown Sand |
| 2BF 8 | 8:50 A.M. | 8 | Rocks/Dark Brown Sand |
| 2BF 12 | 11:18 A.M. | 12 | Rocks/Dark Brown Sand |
| 3CF 10 | 12:10 P.M. | 10 | Rocks/Dark Brown Sand |
| 3CF 12 | 12:18 P.M. | 12 | Rocks/Dark Brown Sand |
| 4DF. | 12:24 P.M. | 8-9 | Sludge |
| 4DF _{w.v} | 12:28 P.M | 8-9 | Water/Oil |
| 5EF | 1:20 P.M | 3-3.5 | Rocks/Dark Brown Sand |
| 6FF | 1:37 P.M | 3-3.5 | Rocks/Dark Brown Sand |
| 7GF | 2:00 P.M | 3-3.5 | Dark Brown Sand |
| 8HF | 2:03 P.M | 2-3 | Dark Brown Sand |
| 91F | 2:20 P.M | 2-3 | Dark Brown Sand |

3.0 SOIL CLASSIFICATION

According to Soil Survey Map of Aztec County. N.Mexico the soil within section 14 of township 29 north and range 13 west is of Garland series. This soil in the Garland series are classified as Typic Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic. These deep, well drained soils are on intermediate terraces and side slopes. The soil is formed in mixed alluvium. Slope is 0 to 3 percent. Elevation is 4,800 to 6,000 feet. The subdivision of soil in this area can be classified as Garland loam. Garland loam is a deep, well drained soil and is on terraces and sides of valleys. It formed in alluvium derived from mixed sources. Typically, the surface layer is brown loam about 4 inches thick. The subsoil is brown clay loam about 20 inches thick. The substratum to a depth of 60 inches or more is light brownish gray very gravelly loamy sand and multicolored very gravelly sand. Permeability of this Garland soil is moderate to a depth of 24 inches and rapid below this depth. Available water capacity is moderate. The soil profile of Garland series is shown in Table 2. Figure 3 shows the area enclosed in section 14 of township 29 north and range 13 west.

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| Table 2. | Soil | Profile | of Gar | land Series |
|----------|------|---------|--------|-------------|
| | | | | |

| DEPTH | PROFILE |
|-----------------|--|
| 0 to 4 inches | Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots: few fine continuous pores; noneffervescent; moderately alkaline: clear smooth boundary. |
| 4 to 11 inches | Brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak medium and fine sub-angular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine and medium continuous pores; slightly effervescent; moderately alkaline; clear smooth boundary. |
| 11 to 24 inches | Brown 97.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; weak medium and fine angular blocky structure; hard, friable, sticky and plastic; few fine and medium roots; few fine and medium continuous pores; slightly effervescent; moderately alkaline; clear wavy boundary. |
| 24 to 45 inches | Light brownish gray (10YR 6/2) extremely gravelly loamy sand, brown (10YR 4/3) moist: single grained: loose dry and moist: few fine roots; common medium interstitial pores: disseminately alkaline; gradual wavy boundary. |
| 45 to 81 inches | Multicolored extremely gravelly sand: single grained: loose dry ;and moist; common medium interstitial pores; disseminated calcium carbonate: strongly effervescent; moderately alkaline. |

4.0 SITE ASSESSMENT

Eleven soil samples were collected on the subject property during the investigation. Figure 3 shows soil sample locations on site. Table 3 shows the sample 1.D., depth, and direction. Figure 4 shows the locations of environmental concerns on the property. Soil sample 1AF collected east of the separator and soil sample 8HF collected 20 ft southeast of the separator had minor TPH concerns. Soil sample 2BF 8 collected south of the separator had a minor toluene concentration. Soil sample 9IF was collected to verify the background concentrations. No environmental concerns were discovered from the other samples.

SITE ANALYSIS

Analytical results show that sample 1AF had a TPH concentration of 4200 ppm. Soil sample 8HF. a composite to 3 ft, collected 20 ft southeast of the separator had a TPH concentration of 805 ppm. Sample 2BF 8 had a toluene concentration of 26.3 ppm. The separator depth was 8 ft. As shown in Table 3. samples 1AF and 2BF 8 were collected at a depth of 9 ft. The TPH and toluene concentrations in these samples are the result of leaks in the separator. The metal concentrations are not leachable and consequently are not an environmental concern. The analytical results identify the migration of contaminants from the separator towards the east and the southeast. No other sources of contamination have been located on the property. Estimates of the impacted soil around sample 1AF are 20 ft long by 4 ft wide by 15 ft deep. Estimates around sample 8HF are 15 ft long by 10 ft wide by 5 ft deep. The sludge volume inside the separator is estimated at approximately 4 yds. A total of 75 to 80 yards of soil is estimated to be impacted.

| SAMPLE | TIME | DEPTH (feet) | POSITION (in field) |
|-------------------|------------|-----------------|------------------------|
| IAH | 7:48 A.M. | 8-9 | East of Separator |
| 2BF 8 | 8:50 A.M. | 8 | South of Separator |
| 2BF 12 | 11:18 A.M. | 12 | South of Separator |
| 3CF 10 | 12:10 P.M. | 10 | West of Separator |
| 3CF 12 | 12:18 P.M. | 12 | West of Separator |
| 4DF, | 12:24 P.M. | 8-9 | Inside Separator |
| 4DF _{wo} | 12:28 P.M | 8-9 | Inside Separator |
| 5EF | 1:20 P.M | 3-3.5 | North End Rock Bed |
| 6FF | 1:37 P.M | 3-3.5 | North End Rock Bed |
| 7GF | 2:00 P.M | 3-3.5 | West of Warehouse |
| 8HF | 2:03 P.M | 2-3 | South of Separator |
| 9IF | 2:20 P.M | 2-3 | West Levee Bank |

Table 3. Sample Depth and Distances

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Otis Engineering, 2600 Bloomfield Hwy. Farmington N.M.



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Otis Engineering, 2600 Bloomfield Hwy. Farmington N.M.



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5.0 CONCLUSIONS AND RECOMMENDATIONS

This report summarizes the phase II of Otis Engineering's facility located in Farmington, N.Mexico. The chemical tank to the southwest had no signs of leakage. The separator in the northeast corner appears to be the only source of contamination. Soil samples show TPH concentrations towards the east and the southeast of the separator. These concentrations are due to a breach of structural integrity in the separator. TCLP volatiles, semi-volatiles, and metals tests should be performed to confirm the waste classification. A total of 75 to 80 yds, around and inside the separator, is estimated to be impacted. No other environmental concerns were discovered at this site.

The contaminated soil and separator sludge requires remediation. Based on volume estimates direct landfill is the most economically feasible alternative. The use of the separator on this site should be discontinued to prevent further environmental damage and the separator should be removed. Soil sample 1AF collected at the property line showed TPH concentrations. Soil samples should be collected from the adjacent property to confirm or deny off site migration. The separator sludge requires dewatering and solidification. The cost estimates to excavate and dispose of contaminated soils are detailed in the later chapter.

6.0 COST ESTIMATES

The estimated costs to remove the oil/water separator, excavate and dispose of the impacted soil, and to backfill the excavated section with clean soil are shown below:

| Remediation: | = | 10500.00 |
|--------------|---|----------|
| Trucking: | = | 1000.00 |
| Disposal: | = | 1120.00 |
| Backfill: | = | 1000.00 |
| Engineering: | = | 500.00 |
| Analytical: | = | 1200.00 |
| Total | = | 15320.00 |

The information above reflects remediation costs for an estimated 80 yards of soil, and the costs are contingent upon that amount.

REFERENCES

- 1) United States Department of Agriculture: Soil Conservation Service. "Soil Survey of San Juan County, N.Mexico. Eastern Part". Aztec, N.Mexico.
- 2) Tax Accessors Office. Aztec, N.Mexico.

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ANALYTICAL





Harpe-Signature

Name: DANA L. HARPER

Core Laboratories 3645 Arizona Street Sulphur, LA 70663

<u>08-18-93</u> Date:

Title: LABORATORY MANAGER

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CORE LABORATORIES

LABORATORY TESTS RESULTS

08/18/93

OB HUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

LIENT I.D..... 1AF ATE SAMPLED...... 08/04/93 TIME SAMPLED...... 07:48 WORK DESCRIPTION...: FARMINGTON/#430 LABORATORY I.D...: 932944-0001 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

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| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECH |
|----------------------------------|--------------|------------------|------------------|---------------------|----------|------|
| Yolatile Organics - Solid | Ι. | *1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone | ND ND | 12500 | uo/ko | SH 846 8240 | } | |
| Acrolein | ND | 12500 | | SU 8/6 82/0 | | |
| Acrylonitrile | | 12500 | | SU 8/6 82/0 | | |
| 2-Butanone (MEK) | ND | 12500 | | SU 8/6 82/0 | | |
| Repzene | ND | 630 | | SW 040 0240 | | |
| Bromodichloromethane | | 630 | | SU 8/6 82/0 | | |
| Bromoform | ND | 630 | | | | |
| Bromomethane | ND ND | 1300 | | SW 040 0240 | | |
| Carbon disulfide | NO | 12500 | | SW 040 0240 | | |
| Carbon tetrachloride | ND | 630 | | SW 040 0240 | | |
| s Chlorobenzene | ND ND | 630 | | SW 840 0240 | | |
| Chlocoethene | ND | 1300 | | SW 040 0240 | | |
| 2-Chlocoethylyinyl ether | ND | 1300 | | SW 040 0240 | | |
| Chlocoform | ND ND | 470 | | SW 040 0240 | 1 | |
|) Chloromothana | | 1700 | Ug/Kg | SW 040 0240 | | |
| Dichlorodifluoromethene | ND | 430 | lug/kg | SW 040 8240 | | |
|) Dibromochloromethane | ND | 630 | | SW 040 0240 | | |
| 1 1-Dichloroethane | ND | 470 | lug/kg | SW-040/0240 | } | |
| 1 2-Dichloroethene | ND | 470 | | SW 040 0240 | | |
| 1 1-Dichloroethone | ND | 470 | | 15W 040 0240 | 1 | |
| trange 1 2-Dichloroothano | ND | 630 | | SW 040 0240 | | |
| 1 2-Dichloroosonano | ND | 470 | ug/kg | 15W 040 0240 | | |
| rie-1 7-Dichloppropane | ND ND | 630 | ug/kg | SW 846 8240 | | |
| cis-i,S-Dichtoropropene | NU | 030 | ug/kg | SW 846 8240 | | |
| | NU | 030 | ug/kg | SW 846 8240 | | |
| | NU | 030 | ug/kg | SW 846 8240 | | |
| 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | | |
| Metnylene chloride | ND | 1300 | ug/kg - | SW 846 8240 | | |
| Styrene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| Tetrachloroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| Toluene | 5520 | 630 | ug/kg | SV 846 8240 |] | |
| 1,1,1-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| TrichLoroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Trichlorofluoromethane(FREON TF) | ND | 630 | ug/kg | SW 846 8240 | | |
| Total Xylenes | ND | 630 | ug/kg | SW 846 8240 | | |
| Vinyl acetate | ND | 6300 | ug/kg | SW 846 8240 | 1 | |
| Vinyl chloride | ND | 1300 | lug/kg | SW 846 8240 | | |
| 1,2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,3-Dichlorobenzene | ND | 630 | ug/kg | SV 846 8240 | 1 | |
| 1,4-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| Total Petroleum Hydrocarbons | 4200 | 1750 | mg/kg | EPA 418.1 | 08/17/93 | HJD |
| | | | 3 3 | | • | |

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LABORATORY TESTS RESULTS

08/18/93

JOB NUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

CLIENT I.D.....: 28F8 1 DATE SAMPLED.....: 08/04/93 TIME SAMPLED.....: 08:50 WORK DESCRIPTION...: FARMINGTON/#430

.

| LABORATORY I.D: | 932944-0002 | | |
|-----------------|-------------|-----|------------|
| DATE RECEIVED: | 08/06/93 | | |
| TIME RECEIVED: | 15:00 | | |
| REMARKS | SAMPLED BY: | JOE | DELVECCH10 |

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| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|----------------------------------|--------------|------------------|---|--|----------|-------|
| Volatile Organics - Solid | | *1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone | ND | 12500 | ua/ka | SW 846 8240 | | |
| Acrolein | ND | 12500 | ua/ka | SU 846 8240 | 1 | |
| Acrylonitrile | ND | 12500 | | SU 846 87/0 | 1 | |
| 2-Butanone (HEK) | NO | 12500 | | SU 8/4 82/0 | 1 | |
| Benzene | ND | 630 | | SW 8/4 82/0 | 1 | |
| Bromodichloromethane | NO | 630 | | SW 040 0240 | | |
| Bromoform | NO | 630 | | SU 8/6 82/0 | 1 | |
| Bromomethane | ND | 1300 | | SU 8/4 92/0 | 1 | |
| Carbon disulfide | ND | 12500 | | SW 040 0240 | | |
| Carbon tetrachioride | NO | 630 | | SW 040 0240 | 1 | |
| - Chlorobenzene | ND | 630 | | 13W 040 0240 | | |
| Chloroethane | ND | 1300 | | SW 040 0240 | | |
| 2-Chloroethylvinyl ether | ND | 1300 | | SW 040 0240 | [| |
| Chloroform | ND | 630 | | SW 040 0240 | 1 | |
| Chloromethane | NO | 1300 | | SW 040 0240 | 1 | |
| Dichlorodifluoromethane | ND | 630 | | SW 040 0240 | 1 | |
| Dibromochloromethane | ND | 630 | | SW 040 0240 | 1 . | |
| 1.1-Dichloroethane | ND | 630 | | SU 8/6 82/0 | | |
| 1.2-Dichloroethane | 1110 | 630 | | SU 8/6 82/0 | | |
| 1.1-Dichloroethene | ND | 630 | | ISU 8/4 82/0 |) | |
| trans-1.2-Dichloroethene | ND | 630 | | SW 846 8240 | 1 | |
| 1.2-Dichloropropane | ND | 630 | | SU 8/6 82/0 | | |
| cis-1.3-Dichloropropene | D ND | 630 | | SW 040 0240 | 1 | |
| Ethylbenzene | NO | 630 | | SW 040 0240 | | |
| 2-Hexanone | ND | 630 | | SW 846 8240 | 1 | |
| 4-Methyl-2-pentanone | ND | 6300 | | SU 8/6 82/0 | { | |
| Methylene chloride | ND | 1300 | | SW 040 0240 | 1 | |
| Styrene | ND | 630 | | SW 040 0240 | | |
| 1.1.2.2-Tetrachloroethane | ND | 630 | | SW 040 0240 | 1 | |
| Tetrachloroethene | ND | 630 | | SW 040 0240 | | |
| Toluene | 26300 | 630 | | SW 040 0240 | | |
| 1.1.1.Trichloroethane | NO | 630 | | SH 040 0240 | 4 | |
| 1.1.2-Trichloroethane | ND | 630 | | SW 040 0240 | 1 | |
| Trichloroethene | ND | 630 | | SW 040 0240 | 1 | |
| Trich(orofluoromethane(FREON_TF) | ND | 630 | | SW 846 8240 | ļ | |
| Total Xylenes | ND | 630 | | SU 9/6 92/0 | t | |
| Vinvi acetate | ND | 6300 | | SU 8/6 82/0 | | |
| Vinvl chloride | NO | 1300 | | SW 040 0240 | Į | • . |
| 1.2-Dichlorobenzene | | 630 | | SW 040 0240 | | |
| 1.3-Dichlorobenzene | ND | 630 | | SW 040 0240 | 1 | |
| 1.4-Dichlorobenzene | NO | 630 | | SW 040 0240 | | |
| | | | | J# 040 0240 | | |
| | <u> </u> | l | 13; \$; ;;;;;;;;;;;;;;;;;;;;;;;;;;;;; | 1 645 Arizona Street ulphur, LA 70663 318) 583-6926 | 1 | |

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LABORATORY TESTS RESULTS 08/18/93

DOB NUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

CLIENT I.D..... 2BF8 2 PATE SAMPLED..... 08/04/93 TIME SAMPLED..... 08:50 WORK DESCRIPTION...: FARMINGTON/#430 LABORATORY I.D...: 932944-0003 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS..... SAMPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | | TEST METHOD | DATE | TECHN |
|------------------------------|--------------|------------------|------------------|----------------|--|----------|------------------|
| Arsenic (As), TCLP | <0.1 | 0.1 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Barium (Ba), TCLP | 1.20 | 0.05 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Cadmium (Cd), TCLP | <0.05 | 0.05 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Chromium (Cr), TCLP | <0.05 | 0.05 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Lead (Pb), TCLP | <0.05 | 0.05 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Mercury (Hg), TCLP | <0.002 | 0.002 | mg/L | | SW-846/7470 | 08/11/93 | HJD |
| Selenium (Se), TCLP | <0.1 | 0.1 | mg∕L | | SW-846/6010 | 08/11/93 | DJC |
| Silver (Ag), TCLP | <0.05 | 0.05 | mg/L | | SW-846/6010 | 08/11/93 | DJC |
| Matrix QC ID Job Number | 932943 | | | | | 08/09/93 | CPG |
| Total Petroleum Hydrocarbons | <35 | 35 | mg/kg | i | EPA 418.1 | 08/10/93 | HJD |
| Soil pH Measured in Water | 8.5 | ļ | pH units | 4 | SW-846/9045 | 08/10/93 | JAF |
| X Solid | 100 | 0.5 | X wt. | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| X Aqueous Liquid | <0.5 | 0.5 | % wt. | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| X Non-aqueous Liquid | <0.5 | 0.5 | % wt. | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Digestion for Metals | COMPLETE | | | • | SW-846/3010 | 08/10/93 | ND F |
| TCLP Glass Jar Extraction | COMPLETE | | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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| [| | <u> </u> | | 36 Su (3 | 45 Arizona Street lphur, LA 70663 18) 583-4926 | | |
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LABORATORY TESTS RESULTS 08/18/93

108 NUMBER: 932944

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LIENT I.D..... 2BF12 ATE SAMPLED.....: 08/04/93 TIME SAMPLED.....: 11:18 WORK DESCRIPTION...: FARMINGTON/#430

CUSTOMER: OVAC INC.

LABORATORY I.D...: 932944-0004 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

ATTN: KIRBY VINSON

| <0.1 1.34 <0.05 <0.05 <0.05 | 0.1 0.05 0.05 0.05 | mg/L mg/L mg/L mg/L | SW-846/6010 SW-846/6010 SW-846/6010 | 08/11/93 08/11/93 08/11/93 | DIC DIC |
|---|---|--|---|---|------------|
| 1.34 <0.05 <0.05 <0.05 | 0.05 0.05 0.05 | mg/L mg/L | SW-846/6010 SW-846/6010 | 08/11/93 08/11/93 | DIC DIC |
| <0.05 <0.05 <0.05 | 0.05 | mg/L mg/L | sw-846/6010 | 08/11/93 | DJC |
| <0.05 <0.05 | 0.05 | mg/L | | | |
| <0.05 | | 1 | SW-846/6010 | 08/11/93 | DJC |
| | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| <0.002 | 0.002 | mg/L | sw-846/7470 | 08/11/93 | HJD |
| <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DIC |
| 932943 | | | i | 08/09/93 | CPG |
| | +1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| ND ND ND ND ND ND ND ND ND ND ND ND ND N | 12500 12500 12500 630 630 630 1300 12500 630 630 630 630 630 630 630 630 630 6 | ug/kg ug | SW 846 8240 SW 846 8240 | | |
| | <0.05 932943 ND ND ND ND ND ND ND ND ND ND ND ND ND | <0.05 <0.05 932943 *1 ND 12500 ND 12500 ND 12500 ND 12500 ND 430 ND 1300 ND 430 ND< | <0.05 | <0.11 ug/t subscription <0.05 | |

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ATTN: KIRBY VINSON

LABORATORY TESTS RESULTS 08/18/93

B NUMBER: 932944 CUSTOMER: OVAC INC.

IENT I.D..... 2BF12 TE SAMPLED..... 08/04/93 ME SAMPLED..... 11:18 "ORK DESCRIPTION...: FARMINGTON/#430

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LABORATORY I.D...: 932944-0004 DATE RECEIVED: 08/06/93 TIME RECEIVED....: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

| IE | ST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|--------------|---------------------------------------|--------------|------------------|------------------|--------------------------------------|----------|-------|
| - | 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | 1 | |
| 1 | Nethylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| 11 | Styrene | ND | 630 | ug/kg | SW 846 8240 | | |
| • | 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| , | Tetrachloroethene | ND | 630 | ug/kg | SW 846 8240 | } | |
| | Toluene | 7560 | 630 | ug/kg | SW 846 8240 | 1 | |
| | 1,1,1-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| 1 | 1,1,2-Irichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| | Trichlosofius and the strength of the | ND | 630 | ug/kg | SW 846 8240 | | |
| | Total Vulance | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| 1 | Vipvi sectore | NU | (700 | ug/kg | SW 846 8240 | | |
| 1 | Vinyl acetate | NU | 0300 | ug/kg | SW 846 8240 | | |
| - | 1 2-Dichlorobenzone | ND | 1300 | ug/kg | SW 846 8240 | ì | |
| 7 | 1 3-Dichlorobenzene | ND | 630 | Ug/kg | SW 846 8240 | | |
| | 1 A-Dichlorobenzene | | 630 | ug/kg | SW 846 8240 | ł | |
| | 1,4°0 TCATOLOBENZENE | NU | 020 | ug/kg | SW 840 8240 | | |
| •. | Solid | 100 | 0.5 | % wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| 1 | Aqueous Liquid | <0.5 | 0.5 | % wt. 4 | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| 12 | Non-aqueous Liquid | <0.5 | 0.5 | % wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| , | gestion for Metals | COMPLETE | | | SW-846/3010 | 08/10/93 | ND F |
| 1.1 | LP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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CORE LABORATORIES

LABORATORY TESTS RESULTS

08/18/93

B NUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

LENT I.D...... 3CF10 E SAMPLED..... 08/04/93 ME SAMPLED..... 12:10 "ORK DESCRIPTION...: FARMINGTON/#430

| LABORATORY I.D: | 932944-0005 | | |
|-----------------|-------------|-----|------------|
| DATE RECEIVED: | 08/06/93 | | |
| TIME RECEIVED: | 15:00 | | |
| REMARKS | SAMPLED BY: | JOE | DELVECCHIO |

| EST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE TECH |
|--|--------------|------------------|------------------|---------------------|--------------|
| Latile Organics - Solid | | +1 | | SW-846 8240/Hi Meth | 08/10/93 AJD |
| Acetope | חא | 12500 | | SH 846 8240 | |
| Acrolein | NO | 12500 | | SU 846 8240 | |
| Acrylonitrile | | 12500 | | SU 8/6 82/0 | |
| 2-Putapapa (NEK) | | 12500 | | SW 040 0240 | |
| | NO | 630 | | SW 040 0240 | |
|) benzene Reemodiahieremothere | ND | 430 | | SW 040 0240 | |
| Bronodichtoronethane | | 470 | ug/kg | SW 040 0240 | |
| | *** | 1700 | Ug/kg | SW 040 0240 | |
| sromomethane | NU | 1300 | Ug/kg | ISW 840 8240 | |
| Carbon disulfide | ND | 12500 | lnavka | SW 640 8240 | |
| 4 Carbon tetrachloride | ND | 030 | ug/kg | SW 846 8240 | |
| Chlorobenzene | ND | 650 | ug/kg | SW 846 8240 | |
| Chloroethane | ND | 1300 | ug/kg | SW 846 8240 | |
| 2-Chldroethylvinyl ether | ND | 1300 | ug/kg | SW 846 8240 | |
| Chloroform | ND | 630 | ug/kg | SW 846 8240 | 1 |
| Chloromethane | ND | 1300 | ug/kg | SW 846 8240 | |
| Dichlorodifluoromethane | ND | 630 | ug/kg | SW 846 8240 | |
| } Dibromochloromethane | ND | 630 | ug/kg | SW-846/8240 | |
| 1,1-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | |
|) 1,2-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 |
| 1,1-Dichloroethene | ND DA | 630 | ug/kg | SW 846 8240 | |
| trans-1,2-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 |
| 1,2-Dichloropropane | ND | 630 | ug/kg | SW 846 8240 | |
| cis-1,3-Dichloropropene | ND | 630 | ug/kg | SW 846 8240 | 1 |
| Ethylbenzene | ND | 630 | ug/kg | SW 846 8240 | 1 |
| 2-Hexanone | ND | 630 | ug/kg | SV 846 8240 | |
| 3 4-Methyl-2-pentanone | ND | 6300 | ua/ka | SV 846 8240 | |
| Methylene chloride | ND | 1300 | lug/kg | SV 846 8240 | |
| Styrene | ND | 630 | ug/kg | SU 846 8240 | |
| 1 1 2 2-Tetrachioroethane | ND | 630 | | SU 844 8240 | |
| Tetrachloroothono | | 430 | | SU 9/4 92/0 | |
| Telupo | (050 | 430 | Ug/kg | SW 040 0240 | |
| | 4030 | 630 | | SW 040 0240 | |
| 1,1,1°1°1°1°1°1°1°1°1°1°1°1°1°1°1°1°1°1 | NU | 670 | | SW 040 0240 | |
| This is a set of the s | NU | 630 | ug/kg | | |
| Trichloroethene | UN UN | 630 | ug/kg | SW 846 8240 | |
| Intentorontuoromethane(FREUN IF) | NU | 630 | ug/kg | SW 840 8240 | |
| lotal Xylenes | ND | 630 | ug/kg | SW 846 8240 | 1 |
| J Vinyl acetate | ND | 6300 | ug/kg | SW 846 8240 | |
| Vinyl chloride | ND | 1300 | lug/kg | SW 846 8240 | |
| 1,2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | 1 |
| 1,3-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | |
| 1,4-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | |
| otal Petroleum Hydrocarbons | <35 | 35 | mg/kg | EPA 418.1 | 08/10/93 HJD |
| J | 1 | | 3 | 645 Arizona Street | , |

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LABORATORY TESTS RESULTS 08/18/93

DB NUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

LIENT I.D...... 3CF10 ATE SAMPLED.....: 08/04/93 IME SAMPLED.....: 12:10 WORK DESCRIPTION...: FARMINGTON/#430

LABORATORY I.D...: 932944-0005 DATE RECEIVED....: 08/06/93 TIME RECEIVED....: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

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| I EST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE TECHN |
|-------------------|--------------|------------------|------------------|-------------------|------------|
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LABORATORY TÉSTS RESULTS

OB NUMBER: 932944 CUSTOMER: OVAC INC.

08/18/93

ATTN: KIRBY VINSON

LABORATORY I.D...: 932944-0006 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS..... SAMPLED BY: JOE DELVECCHIO

| EST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|---|-----------------------------------|------------------|------------------|--|----------|-------|
| Trsenic (As), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DIC |
| Jarium (Ba), TCLP | 1.09 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Cadmium (Cd), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| hromium (Cr), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Lead (Pb), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ercury (Hg), TCLP | <0.002 | 0.002 | mg/L | sw-846/7470 | 08/11/93 | HJD |
| Iselenium (Se), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ilver (Ag), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| j ¹ Matrix QC ID Job Number | 932943 | | | | 08/09/93 | CPG |
| j solid | 100 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Aqueous Liquid | <0.5 | 0.5 | X wt. 4 | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| % Non-aqueous Liquid | <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| igestion for Metals | COMPLETE | | | SW-846/3010 | 08/10/93 | NDF |
| TCLP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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CORE LABORATORIES

ATTN: KIRBY VINSON

LABORATORY TESTS RESULTS 08/18/93

OB NUNBER: 932944

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LIENT I.D.....: 4DF 1 ATE SAMPLED.....: 08/04/93 TIME SAMPLED.....: 12:24 WORK DESCRIPTION...: FARMINGTON/#430

CUSTOMER: OVAC INC.

LABORATORY I.D...: 932944-0007 DATE RECEIVED....: 08/06/93 TIME RECEIVED....: 15:00 REMARKS...... SANPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHI |
|--|---|--|---|---|----------|-------|
| rsenic (As), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Sarium (Ba), TCLP | 1.44 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Çadmium (Cd), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| hromium (Cr), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Lead (Pb), TCLP | 0.36 | 0.05 | mg/L | sw-846/6010 | 08/11/93 | DJC |
| ercury (Hg), TCLP | <0.002 | 0.002 | mg/L | SW-846/7470 | 08/11/93 | HJD |
| , Selenium (Se), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ilver (Ag), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
|) Matrix QC ID Job Number | 932943 | | | | 08/09/93 | CPG |
| folatile Organics - Solid | | +1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone Acrolein Acrylonitrile 2-Butanone (MEK) Benzene Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroethane 2-Chloroethylvinyl ether Chloroform Chloromethane Dichlorodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloropropane cis-1,3-Dichloropropene Ethylbenzene 2-Hexanone | ND ND ND ND ND ND ND ND ND ND ND ND ND N | 12500 12500 12500 630 630 630 1300 12500 630 630 1300 1300 630 630 630 630 630 630 630 630 630 | ug/kg ug/kg | SW 846 8240 SW 846 8240 | | |

3645 Arizona Street Sulphur, LA 70663 (318) 583-4926

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LABORATORY TÉSTS RESULTS

08/18/93

OB NUNBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

LIENT I.D.....: 4DF 1 ATE SAMPLED.....: 08/04/93 TIME SAMPLED.....: 12:24 WORK DESCRIPTION...: FARMINGTON/#430

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LABORATORY I.D...: 932944-0007 DATE RECEIVED....: 08/06/93 TIME RECEIVED....: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|---|---------------------------------------|--------------------------|------------------|--------------------|------------|---------|
| - 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | | <u></u> |
| Methylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| , Styrene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| ., Tetrachloroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| Toluene | 2330 | 630 | ug/kg | SW 846 8240 | | |
| 1,1,1-Trichloroethane | NO | 630 | ug/kg | SW 846 8240 | 1 | |
| 1,1,2-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Trichloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| <pre>} Trichlorofluoromethane(FREON TF)</pre> | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Total Xylenes | ND | 630 | ug/kg | SW 846 8240 | | |
| Vinyl acetate | ND | 6300 | ug/kg | SW 846 8240 | | |
| Vinyl chloride | ND | 1300 | | SW 846 8240 | | |
| 1.2rDichlorobenzene | ND | 630 | ug/kg | SV 846 8240 | | |
| 1.3-Dichlorobenzene | ND | 630 | lug/kg | SH 846 8240 | | |
| 1.4-Dichlorobenzene | ND | 630 | | SH 846 8240 | | |
| | 2000 | 075 | | | 00 (17 (07 | |
| Total Petroleum Rydrocarbons | 2000 | 8/5 | mg/kg | EPA 418.1 | 08/1//25 | HJD |
| Solid | 100 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| 1% Aqueous Liquid | <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Non-aqueous Liquid | <0.5 | 0.5 | % wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Digestion for Metals | COMPLETE | | | SW-846/3010 | 08/10/93 | NDF |
| TCLP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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CORE LABORATORIES

LABORATORY TESTS RESULTS 08/18/93

DB NUMBER: 932944 CUSTOMER: OVAC INC.

LIENT I.D...... 4DF 2 ATE SAMPLED...... 08/04/93 INE SAMPLED...... 12:28 WORK DESCRIPTION...: FARMINGTON/#430

LABORATORY I.D...: 932944-0008 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

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| I ST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|------------------------------------|--------------|------------------|------------------|---|----------|-------|
| volatile Organics - Solid | | *1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone | ND | 12500 | ua/ka | SW 846 8240 | | |
| l Acrolein | ND | 12500 | ug/kg | SW 846 8240 | | |
| Acrylonitrile | ND | 12500 | ug/kg | SV 846 8240 | | |
| 2-Butanone (MEK) | ND | 12500 | ug/kg | SV 846 8240 | | |
| Benzene | ND | 630 | ug/kg | SW 846 8240 | | |
| Bromodichloromethane | ND | 630 | ug/kg | SW 846 8240 | | |
| Bromoform | ND | 630 | ug/kg | SW 846 8240 | | |
| Bromomethane | ND | 1300 | ug/kg | SW 846 8240 | | |
| Carbon disulfide | ND | 12500 | ug/kg | SW 846 8240 | 1 | |
| <pre>Carbon tetrachloride</pre> | ND | 630 | ug/kg | SV 846 8240 | | |
| , Chlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| Chlproethane | ND | 1300 | ug/kg | SW 846 8240 | | |
| 2-Chloroethylvinyl ether | ND | 1300 | ug/kg | SW 846 8240 | | |
| Chloroform | ND | 630 | ug/kg | SH 845 8240 | 1 | |
| t ¹ Chloromethane | ND | 1300 | ua/ka | SH 846 8240 | 1 | |
| Dichlorodifluoromethane | ND | 630 | ug/kg | SH 846 8240 | | |
| Dibromochloromethane | ND | 630 | | SW-846/8240 | | |
| 1,1-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| 1,2-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1-Dichloroethene | ND | 630 | lug/kg | SW 846 8240 | | |
| trans-1,2-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
|] 1,2-Dichloropropane | ND | 630 | ug/kg | SW 846 8240 | | |
| cis-1,3-Dichloropropene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Ethylbenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 2-Hexanone | ND | 630 | ug/kg | SW 846 8240 | | |
| 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | | |
| Methylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| Styrene | ND | 630 | | SW 846 8240 | | |
| 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| Tetrachloroethene | ND | 630 | ug/kg | SV 846 8240 | 1 | |
|] Toluene | 1735 | 630 | ug/kg | SH 846 8240 | | |
| 1,1,1-Trichloroethane | ND | 630 | ug/kg | SH 846 8240 | | |
| 1,1,2-Trichloroethane | ND | 630 | uo/ko | SU 846 8240 | 1 | |
| Trichloroethene | ND | 630 | uo/ka | SU 846 8240 | | |
| , Trich(orofluoromethane(FREON TF) | ND | 630 | ug/kg | SH 846 8240 | | |
| Total Xylenes | ND | 630 | | SH 846 8240 | | |
| Vinyl acetate | ND | 6300 | ua/ka | SH 846 8240 | | |
| I Vinyl chloride | ND | 1300 | lug/kg | SH 846 8240 | | |
| 1,2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,3-Dichlorobenzene | ND | 630 | | SH 846 8240 | 1 | |
| 1,4-Dichlorobenzene | ND | 630 | ug/kg | SV 846 8240 | 1 | |
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| } | | | | <u> </u> | | |
| r [}] | | | 36 Su (1 | 545 Arizona Street Jiphur, LA 70663 118) 583-4926 | | |

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LABORATORY TESTS RESULTS

OB NUMBER: 932944

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08/18/93

ATTN: KIRBY VINSON CUSTOMER: OVAC INC.

LIENT I.D...... 5EF 1 ATE SAMPLED...... 08/04/93 JIME SAMPLED...... 13:20 WORK DESCRIPTION ...: FARMINGTON/#430

| LABORATORY I.D: DATE RECEIVED: | 932944-0009 08/06/93 | | |
|-----------------------------------|-------------------------|-----|------------|
| TIME RECEIVED: | 15:00 | | |
| REMARKS | SAMPLED BY: | JOE | DELVECCHIO |

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| FEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE TECHN |
|----------------------------------|--------------|------------------|------------------|---------------------|--------------|
| Jolatile Organics - Solid | | +1 | | SW-846 8240/Hi Meth | 08/10/93 AJD |
| Acetone | ND | 12500 | ug/kg | SH 846 8240 | |
| Acrolein | ND | 12500 | | SH 846 8240 | |
| Acrylonitrile | ND | 12500 | ug/kg | SW 846 8240 | |
| 2-Butanone (MEK) | ND | 12500 | ug/kg | SW 846 8240 | |
| Benzene | ND | 630 | ug/kg | SW 846 8240 | |
| Bromodichloromethane | ND | 630 | ug/kg | SW 846 8240 | |
| Bromoform | ND | 630 | ug/kg | SW 846 8240 | |
| Bromomethane | ND | 1300 | ug/kg | SW 846 8240 | |
| Carbon disulfide | ND | 12500 | ug/kg | SW 846 8240 | |
| Carbon tetrachloride | ND | 630 | ug/kg | SW 846 8240 | ľ |
| Chlorobenzene | ND | 630 | ug/kg | SW 846 8240 | |
| Chloroethane | ND | 1300 | ug/kg | SW 846 8240 | |
| 2-Chldroethylvinyl ether | ND | 1300 | ug/kg | SH 846 8240 | |
| Chloroform | ND | 630 | ug/kg | SW 846 8240 | |
| Chloromethane | ND | 1300 | ug/kg | SW 846 8240 | |
| Dichlorodifluoromethane | ND | 630 | ug/kg | SW 846 8240 | |
| In Dibromochloromethane | ND | 630 | ug/kg | SW-846/8240 | |
| 1,1-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | |
| 1,2-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | |
| 1,1-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | |
| trans-1,2-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | |
| 1,2-Dichloropropane | ND | 630 | ug/kg | SW 846 8240 | |
| cis-1,3-Dichloropropene | ND | 630 | ug/kg | SW 846 8240 | |
| Ethylbenzene | ND | 630 | ug/kg | SW 846 8240 | |
| 2-Nexanone | ND | 630 | ug/kg . | SW 846 8240 | |
| 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | |
| Hethylene chloride | ND | 1300 | ug/kg | SW 846 8240 | |
| J Styrene | ND | 630 | ug/kg | SW 846 8240 | |
| i, i, 2, 2-letrachloroethane | ND | 630 | ug/kg | SW 846 8240 | |
| 1 Teluero | ND | 630 | ug/kg | SW 846 8240 | |
| | 1160 | 630 | ug/kg | SW 846 8240 | |
| 1 1 2-Trichloroethane | NU | 030 | ug/kg | SW 846 8240 | |
| Trichloroothone | NU | 030 | Ug/kg | ISW 846 8240 | |
| Trichlorofiuoromethane(EREON_TE) | ND | 630 | lug/kg | SW 846 8240 | |
| Total Yvienes | NO | 630 | | SW 040 8240 | |
| Vinvi acetate | ND ND | 4300 | | 15W 040 024U | |
| Vinyl chloride | ND | 1300 | | SW 040 8240 | |
| 1.2-Dichlorobenzene | ND | 630 | | SW 040 0240 | |
| 1.3-Dichlorobenzene | ND | 630 | | SW 040 6240 | |
| 1.4-Dichlorobenzene | ND | 630 | | SU 8/4 82/0 | |
| | | | | 34 040 0240 | |
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CORE LABORATORIES

LABORATORY TESTS RESULTS 08/18/93

OB NUMBER: 932944 CUSTOMER: OVAC INC.

ATTN: KII

ndex. 736744 CUBIUMER, VIAL INC.

ATTN: KIRBY VINSON

LABORATORY I.D...: 932944-0010 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00

REMARKS SAMPLED BY: JOE DELVECCHIO

LIENT I.D.....: 5EF 2 ATE SAMPLED.....: 08/04/93 TIME SAMPLED.....: 13:21 VORK DESCRIPTION...: FARMINGTON/#430

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHI |
|------------------------------|--------------|------------------|------------------|--|----------|-------|
| Irsenic (As), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Jarium (Ba), TCLP | 1.14 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| admium (Cd), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| hromium (Cr), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ead (Pb), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DIC |
| ercury (Hg), TCLP | <0.002 | 0.002 | mg/L | SW-846/7470 | 08/11/93 | HJD |
| İselenium (Se), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ilver (Ag), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Hatrix QC ID Job Number | 932943 | | | | 08/09/93 | CPG |
| Total Petroleum Hydrocarbons | <35 | 35 | mg/kg | EPA 418.1 | 08/10/93 | HJD |
| Joil pH Measured in Water | 8.2 | | pH units | SW-846/9045 | 08/10/93 | JAF |
| solid | 100 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Aqueous Liquid | <0.5 | 0.5 | X ut. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| "& Non-aqueous Liquid | <0.5 | 0.5 | X ut | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| igestion for Metals | COMPLETE | | | SW-846/3010 | 08/10/93 | NDF |
| TCLP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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LABORATORY TESTS RESULTS 08/18/93

58 NUMBER: 932944 ATTN: KIRBY VINSON CUSTOMER: OVAC INC.

VORK DESCRIPTION ...: FARMINGTON/#430

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LABORATORY 1.D...: 932944-0012 DATE RECEIVED....: 08/06/93 TIME RECEIVED....: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|--|---|--|--|--|----------|-------|
| -)senic (As), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Larium (Ba), TCLP | 0.87 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| pdmium (Cd), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| fromium (Cr), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| ead (Pb), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| proury (Hg), TCLP | <0.002 | 0.002 | mg/L | SW-846/7470 | 08/11/93 | HJD |
| celenium (Se), TCLP | <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| lver (Ag), TCLP | <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| Matrix QC ID Job Number | 932943 | 1 | | | 08/09/93 | CPG |
| platile Organics - Solid | | +1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone Acrolein Acrylonitrile 2-Butanone (MEK) Benzene Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroethane 2-Chloroethylvinyl ether Chloroform Chloromethane Dichlarodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloropropane cis-1,3-Dichloropropane Ethylbenzene 2-Hexanone | ND ND ND ND ND ND ND ND ND ND ND ND ND N | 12500 12500 12500 630 630 630 1300 12500 630 630 1300 630 630 630 630 630 630 630 630 630 | ug/kg ug | SW 846 8240 SW 846 8240 | | |
| 2-Hexanone | ND | 630 | ug/kg 36 | SW 846 8240 45 Arizona Street | | |

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CUSTOMER: OVAC INC.

CORE LABORATORIES

ATTN: KIRBY VINSON

T E S T S 08/18/93 LABORATORY RESULTS

NUMBER: 932944

ENT I.D...... 7GF LE SAMPLED...... 08/04/93 LINE SAMPLED...... 14:00 WORK DESCRIPTION...: FARMINGTON/#430

LABORATORY I.D...: 932944-0012 DATE RECEIVED: 08/06/93 TIME RECEIVED....: 15:00 REMARKS...... SAMPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|----------------------------------|--------------|------------------|------------------|-------------------------------------|----------|---------|
| -) 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | | |
| Nethylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| 3 Styrene | , ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| t Tetrachloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Toluene | 890 | 630 | ug/kg | SW 846 8240 | | |
| ∫ 1,1,1-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2-Trichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| ' Trichloroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| Trichlorofluoromethane(FREON TF) | ND | 630 | ug/kg | SW 846 8240 | | |
| Total Xylenes | ND | 630 | ug/kg | SW 846 8240 | | |
| ' Vinyl acetate | ND | 6300 | ug/kg | SW 846 8240 | | |
| Vinyl chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| Ty2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,3-Dichlorobenzene | DM | 630 | ug/kg | SW 846 8240 | | |
| } 1,4-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| Total Petroleum Hydrocarbons | <35 | 35 | mg/kg | EPA 418.1 | 08/10/93 | DLH |
|)l pH Measured in Water | 8.0 | | pH units | SW-846/9045 | 08/10/93 | JAF |
| X solid | 100 | 0.5 | % wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| Aqueous Liquid | <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| X Non-aqueous Liquid | <0.5 | 0.5 | % wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| pestion for Hetals | COMPLETE | | | SW-846/3010 | 08/10/93 | NDF |
| . AP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
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| I | | | | Sulphur, LA 70663 (318) 583-4926 | | |
| | | PAGE:16 | | | | |

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CUSTOMER: OVAC INC.

CORE LABORATORIES

LABORATORY TESTS RESULTS 08/18/93

DB NUMBER: 932944

ATTN: KIRBY VINSON

LIENT I.D...... 8HF 1 ATE SAMPLED...... 08/04/93 IME SAMPLED...... 14:01 IVORK DESCRIPTION...: FARMINGTON/#430

LABORATORY I.D...: 932944-0013 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

| TEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|--|--------------|------------------|------------------|--------------------------------------|----------|-------|
| platile Organics - Solid | | *1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| Acetone | ND | 12500 | uo/ka | SU 846 8240 | | |
| Acrolein | ND | 12500 | | SH 846 8240 | | |
| Acrylonitrile | ND | 12500 | | SH 846 8240 | | |
| 2-Butanone (MEK) | ND | 12500 | | SU 846 8240 | 1 | |
| Benzene | ND | 630 | ug/kg | SW 846 8240 | | |
| Bromodichloromethane | ND | 630 | ug/kg | SH 846 8240 | | |
| Bromoform | ND | 630 | ug/kg | SW 846 8240 | | |
|] Bromomethane | ND | 1300 | ug/kg | SW 846 8240 | | |
| Carbon disulfide | ND | 12500 | ug/kg | SW 846 8240 | | |
| Carbon tetrachloride | ND | 630 | ug/kg | SW 846 8240 | | |
| Chlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| . Chloroethane | ND | 1300 | ug/kg | SW 846 8240 | | |
| 2-Chloroethylvinyl ether | ND | 1300 | ug/kg | SW 846 8240 | | |
|) Chloroform | ND | 630 | ug/kg | SW 846 8240 | | |
| Chloromethane | ND | 1300 | ug/kg | SW 846 8240 | | |
| Dichlorodifluoromethane | ND | 630 | ug/kg | SW 846 8240 | | |
| Dibromochloromethane | ND | 630 | ug/kg | SW-846/8240 | | |
| 1,1-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| / 1,2-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| trans-1,2-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,2-Ulchloropropane | ND | 630 | ug/kg | SW 846 8240 | | |
| C18-1, S-D1chloropropene | ND | 630 | ug/kg | SW 846 8240 | | |
| 2. Maxanana | ND | 630 | ug/kg | SW 846 8240 | | |
| | ND | 630 | ug/kg | SW 846 8240 | | |
| 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SW 846 8240 | | |
| Methylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| J Styrene | ND | 630 | ug/kg | SW 846 8240 | | |
| The second secon | ND | 630 | ug/kg | SW 846 8240 | | |
| Tetrachtoroethene | ND | 630 | ug/kg | SW 846 8240 | | |
| | 630 | 630 | ug/kg | SW 846 8240 | | |
| 1 1 2 Trichlonothers | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| Trichioneethone | NU | 630 | ug/kg | SW 846 8240 | | |
| Trichlorofluoromathana(EREAN TE) | NU | 630 | ug/kg | SW 846 8240 | | |
| Total Yvienes | NU | 630 | ug/kg | SW 846 8240 | | |
| Visul acatata | NU | 030 | ug/kg | SW 846 8240 | 1 | |
| Vinyl chloride | NU | 6300 | Ug/kg | SW 846 8240 | | |
| 1 2-Dichlorobenzene | NU | 1500 | Ug/Kg | SW 846 8240 | | |
| 1 3-Dichlorobenzene | NU | 030 | ug/kg | SW 846 8240 | | |
| 1 4-Dichlorobenzene | 10 | 630 | ug/kg | SW 846 8240 | | |
| 1,4 Dicitor Obertzene | NU | 050 | l nð / kð | SW 846 8240 | | |
| Total Petroleum Hydrocarbons | 805 | 70 | mg/kg | EPA 418.1 | 08/10/93 | HJD |
| , } | 1 | I | 136 Su | 45 Arizona Street lphur, LA 70663 | <u> </u> | |

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| 1 | LABORATO | RY TESTS 08/18/93 | RESULTS | | | | | |
|---|---|----------------------|------------------|--|----------|--|--|--|
| B NUMBER: 932944 CUSTOMER: | OVAC INC. | | ATTN: K | IRBY VINSON | | | | |
| LIENT I.D 8HF 1 ATE SAMPLED: 08/04/93 INE SAMPLED: 14:01 WORK DESCRIPTION: FARMINGTON/#430 | LABORATORY I.D: 932944-0013 DATE RECEIVED: 08/06/93 TIME RECEIVED: 15:00 REMARKS: SAMPLED BY: JOE DELVECCHIO | | | | | | | |
| EST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE TEC | | | |
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| } | | | 36 Su (3 | 45 Arizona Street Iphur, LA 70663 18) 583-4926 | | | | |
| | | PAGE:18 | | | | | | |

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ATTN: KIRBY VINSON

LABORATORY TESTS RESULTS 08/18/93

5 NUMBER: 932944

CUSTOMER: OVAC INC.

IENT I.D.....: 8HF 2 TE SAMPLED.....: 08/04/93 ME SAMPLED.....: 14:03 MORK DESCRIPTION...: FARMINGTON/#430

1

LABORATORY I.D...: 932944-0014 DATE RECEIVED....: 08/06/93 TIME RECEIVED....: 15:00 REMARKS......: SAMPLED BY: JOE DELVECCHIO

| FINAL RESULT | LIMITS/#DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|--------------|--|--|---|---|--|
| <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| 1.36 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DIC |
| 0.38 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DIC |
| <0.002 | 0.002 | mg/L | su-846/7470 | 08/11/93 | ИJD |
| <0.1 | 0.1 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/11/93 | DJC |
| 932943 | | | | 08/09/93 | CPG |
| 100 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | Ç CPG |
| <0.5 | 0.5 | X wt. 1 | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| COMPLETE | | | sw-846/3010 | 08/10/93 | NDF |
| COMPLETE | | | 40 CFR Pt.261/1311 | 08/09/93 | CPG |
| | | | | | |
| | | | | | |
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| | | | | | |
| | 1 |] | 645 Arizona Street | | |
| | FINAL RESULT <0.1 1.36 <0.05 <0.05 0.38 <0.002 <0.1 <0.05 932943 100 <0.5 <0.5 COMPLETE COMPLETE COMPLETE | FINAL RESULT LINITS/*DILUTION <0.1 | FINAL RESULT LIMITS/#DILUTION UNITS OF MEASURE <0.1 | FINAL RESULT LINITS/PDILUTION UNITS OF MEASURE TEST METHOD <0.1 | FINAL RESULT LINITS/PDILUTION UNITS OF MEASURE TEST METHOD PATE <0.1 |

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LABORATORY TESTS RESULTS

DE NUMBER: 932944

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08/18/93

CUSTOMER: OVAC INC.

ATTN: KIRBY VINSON

LABORATORY I.D...: 932944-0015 DATE RECEIVED: 08/06/93 TIME RECEIVED....: 15:00 REMARKS SAMPLED BY: JOE DELVECCHIO

| FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECH |
|---|--|---|---|---|--|
| <0.1 | 0.1 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| 0.95 | 0.05 | mg/L | SW-846/6010 | 08/12/93 | ÐJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| <0.002 | 0.002 | mg/L | sw-846/7470 | 08/11/93 | HJD |
| <0.1 | 0.1 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| <0.05 | 0.05 | mg/L | SW-846/6010 | 08/12/93 | DJC |
| 932943 | | | | 08/10/93 | CPG |
| | +1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| ND ND ND ND ND ND ND ND ND ND ND ND ND N | 12500 12500 12500 630 630 1300 12500 630 630 630 630 630 630 630 630 630 6 | ug/kg | SW 846 8240 SW 846 8240 | | |
| | FINAL RESULT <0.1 0.95 <0.05 <0.05 <0.05 <0.002 <0.1 <0.05 932943 ND ND ND ND ND ND ND ND ND ND | FINAL RESULT LIMITS/*DILUTION <0.1 | FINAL RESULT LIMITS/*DILUTION UNITS OF MEASURE <0.1 | FINAL RESULT LIMITS/*DILUTION UNITS OF MEASURE TEST METHOD <0.1 | FINAL RESULT LIMITS/*DILUTION UNITS OF MEASURE TEST METHOD DATE <0.1 |

Sulphur, LA 70663 (318) 583-4926

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LABORATORY TESTS RESULTS 08/18/93

CUSTOMER: OVAC INC.

08 NUMBER: 932944

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LABORATORY 1.D...: 932944-0015 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

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ATTN: KIRBY VINSON

| LEST DESCRIPTION | FINAL RESULT | LIMITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE T | ECHN |
|---|--------------|------------------|------------------|--------------------|----------|------|
| | ND | 6300 | ug/kg | SW 846 8240 | | |
| Methylene chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| Styrene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,1,2,2-Tetrachloroethane | ND | 630 | ug/kg | SW 846 8240 | | |
| Tetrachloroethene | ND (OOO | 630 | ug/kg | SW 846 8240 | | |
| Toluene | 4900 | 630 | ug/kg | SW 846 8240 | | |
| 1,1,1-Trichlerethene | | 630 | lug/kg | SW 040 0240 | 1 | |
| Trichlocoethene | | 630 | | SW 040 0240 | | |
| <pre>Trichlorofluoromethane(FREON_TE)</pre> | | 630 | | SU 846 8240 | | |
| Total Xylenes | ND | 630 | | SW 846 8240 | ļ | |
| Vinyl acetate | ND | 6300 | | SW 846 8240 | 1 | |
| Vinyl chlaride | ND | 1300 | ug/kg | SW 846 8240 | } | |
| 1,2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1,3-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | Į | |
| 1,4-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| l-otal Petroleum Hydrocarbons | <35 | 35 | mg/kg | EPA 418.1 | 08/10/93 | DLH |
| Solid | 100 | 0.5 | % wt | 40 CFR Pt.261/1311 | 08/10/93 | CPG |
| 1X ⁷ Aqueous Liquid | <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/10/93 | CPG |
| Non-aqueous Liquid | <0.5 | 0.5 | X wt. | 40 CFR Pt.261/1311 | 08/10/93 | CPG |
| J ^{_l} gestion for Metals | COMPLETE | | | SW-846/3010 | 08/11/93 | ND F |
| CLP Glass Jar Extraction | COMPLETE | | | 40 CFR Pt.261/1311 | 08/10/93 | CPG |
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| | | | 36 | 45 Arizona Street | | |
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CUSTOMER: OVAC INC.

CORE LABORATORIES

ATTN: KIRBY VINSON

LABORATORY TESTS RESULTS 08/18/93

58 NUMBER: 932944

LIENT I.D.....: 6FF ATE SAMPLED.....: 08/04/93 I.IME SAMPLED.....: 13:37 FORK DESCRIPTION...: FARMINGTON/#430

LABORATORY I.D...: 932944-0016 DATE RECEIVED...: 08/06/93 TIME RECEIVED...: 15:00 REMARKS.....: SAMPLED BY: JOE DELVECCHIO

| ÌŢ | EST DESCRIPTION | FINAL RESULT | LINITS/*DILUTION | UNITS OF MEASURE | TEST METHOD | DATE | TECHN |
|----|---------------------------------------|--------------|------------------|--|---------------------|----------|-------|
| | platile Organics - Solid | | *1 | | SW-846 8240/Hi Meth | 08/10/93 | AJD |
| | Acetone | ND | 12500 | ua/ka | SH 846 8240 | | |
| ŀ | Acrolein | ND | 12500 | ug/kg | SH 846 8240 | | |
| | , Acrylonitrile | ND | 12500 | | SV 846 8240 | • | |
| | 2-Butanone (MEK) | ND | 12500 | ug/kg | SW 846 8240 | | |
| | Benzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1 | Bromodichloromethane | ND | 630 | ug/kg | SV 846 8240 | | |
| | Bromoform | ND | 630 | ug/kg | SV 846 8240 | | |
| | Bromomethane | ND | 1300 | ug/kg | SV 846 8240 | | |
| | Carbon disulfide | ND | 12500 | ug/kg | SW 846 8240 | 1 | |
| | ^j Carbon tetrachloride | ND | 630 | ug/kg | SV 846 8240 | | |
| • | -Chlorobenzene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | - Chloroethane | ND | 1300 | ug/kg | SV 846 8240 | | |
| | 2-Chloroethylvinyl ether | ND | 1300 | | SV 846 8240 | | |
| |) Chloroform | ND | 630 | ug/kg | SV 846 8240 | 1 | |
| Ì. | Chloromethane | ND | 1300 | ug/kg | SW 846 8240 | 1 | |
| | Dichlorodifluoromethane | ND | 630 | | SV 846 8240 | 1 | |
| |] Dibromochloromethane | ND | 630 | ug/kg | SW-846/8240 | | |
| |] 1,1-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | 1,2-Dichloroethane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| 1 | 1,1-Dichloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | <pre>strans-1,2-Dichloroethene</pre> | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | 1,2-Dichloropropane | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | <pre>\$ cis-1,3-Dichloropropene</pre> | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| L | Ethylbenzene | ND | 630 | ug/kg | SV 846 8240 | 1 | |
| | 2-Hexanone | ' ND | 630 | ug/kg | SW 846 8240 | ł | |
| • | 4-Methyl-2-pentanone | ND | 6300 | ug/kg | SU 846 8240 | 1 | |
| | Y Methylene chloride | ND | 1300 | ua/ka . | SH 846 8240 | | |
| r* | 1 Styrene | ND | 630 | ua/ka | SH 846 8240 | | |
| 1 | 1,1,2,2-Tetrachloroethane | ND | 630 | uo/ka | SH 846 8240 | | |
| | Tetrachloroethene | ND | 630 | ug/kg | SH 846 8240 | | |
| | Toluene | ND | 630 | | SH 846 8240 | | |
| | 1,1,1-Trichloroethane | ND | 630 | ua/ka | SH 846 8240 | | |
| 1 | 1,1,2-Trichloroethane | ND | 630 | ug/kg | SV 846 8240 | 1 | |
| | Trichloroethene | ND | 630 | ug/kg | SW 846 8240 | 1 | |
| | Trichlorofluoromethane(FREON TF) | ND | 630 | ug/kg | SW 846 8240 | | |
| | Total Xylenes | ND | 630 | ug/kg | SW 846 8240 | | |
| 1 | / Vinyl acetate | ND | 6300 | ug/kg | SW 846 8240 | | |
| • | Vinyi chloride | ND | 1300 | ug/kg | SW 846 8240 | | |
| | 1,2-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| | 1,3-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| | 1,4-Dichlorobenzene | ND | 630 | ug/kg | SW 846 8240 | | |
| 1 | - | | | | | | |
| | L. | | | | | | |
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| | 1 | | | 364 | STATIZONA Street | | |
| | | | | SU | LPNUE, LA 70663 | | |
| | ` | | | (3) | 107 203-4720 | | |

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| 1 | | | QUA | LITY | SSURA) 08/18/93 | ICE RE | PORT | | | |
|--|---|---|---|--------------------------------------|------------------------------|----------------------------------|--------------------------|---------------------------|-------------------------|--------------------------------|
| .58 NUMBER: | 932944 | CUSTOME | R: OVAC IN | | | | ATTN: KIR | Y VINSON | | |
| 1 | ANAL | YSIS | | DUPLI | CATES | REFERENC | E STANDARDS | | MATRIX SPIKE | S |
| NALYSIS TYPE | ANALYSIS SUB-TYPE | ANALYSIS I.D. | ANALYZED VALUE (A) | DUPLICATE VALUE (B) | RPD or ([A-B]) | TRUE VALUE | PERCENT RECOVERY | ORIGINAL VALUE | SP I KE ADDED | PERCENT RECOVERY |
| NRAMETER:S | oil pH Measur 1W1T/DF: | ed in Water UNITS:pH u | nits | DATE/TIME AN METHOD REFEN | IALYZED:08/10 RENCE :SW-8 | 0/93 13:23 46/9045 | | | QC BATCH N Te | UMBER:96026 CHNICIAN:JA |
| STANDARD UPLICATE UPLICATE | REFERENCE ANALYTICAL ANALYTICAL | WC930219 932943-001 932944-003 | 4.0 4.7 8.5 | 4.7 8.6 | 0 | 4.0 | 100 | | | |
| PARAMETER:T | otal Petroleu IMIT/DF: 35 | m Hydrocarbo UNITS:mg/k | ns 9 | DATE/TIME A | NALYZED:08/1 RENCE :EPA | 0/93 18:42 418.1 | . | | QC BATCH N | UMBER: 960304 CHNICIAN: HJI |
| LANK SPIKE SPIKE JUPLICATE UPLICATE | MB/P196 MS MS MD MD | 081093 081093-01 081093-02 932943-01 932944-03 | <35 422 423 <35 <35 | <35 <35 | NC NC | | | 0.0 0.0 | 431 422 | 98 100 |
| PARAMETER : | lercury (Hg), .IMIT/DF: 0.00 | TCLP D2 UNITS:mg/L | | DATE/TINE A | NALYZED:08/1 RENCE :SW-8 | 1/93 15:34 46/7470 | | | QC BATCH N | UMBER: 96037 |
| LANK LANK BLANK STANDARD TANDARD SANDARD SANDARD SANDARD SANDARD SPIKE PIKE DIFLICATE DUPLICATE DUPLICATE | MB/7470 TCLP/BLK-1 TCLP/BLK-1 LCS REFERENCE REFERENCE REFERENCE MS MS MS MD MD MD | 081193 080993 081093 HGL657 HGL658 HGL659 HGL660 932943-01 932944-04 932972-04 932944-04 932972-04 | <0.002 <0.002 <0.002 0.005 0.002 0.002 0.002 0.005 0.005 0.005 <0.002 <0.002 <0.002 <0.002 | <0.002 <0.002 <0.002 <0.002 | NC NC NC | 0.005 0.002 0.002 0.002 | 100 100 100 100 | 0.0 0.0 0.0 | 0.005 0.005 0.005 | 100 100 100 |
| ARAMETER: | Arsenic (As), .1MIT/DF: 0.1 | TCLP UNITS:mg/L | | DATE/TINE A METHOD REFE | NALYZED:08/1 RENCE :SW-8 | 1/93 13:31 46/6010 | • | | QC BATCH) TI | IUMBER:96037 CHNICIAN:DJ |
| ILANK LANK LANK STANDARD STANDARD TANDARD PIKE SPIKE DUPLICATE UPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MS MD MD | 081193 081093 080993 93293 932936-001 932936-001 932936-001 932936-001 | <0.1 <0.1 <.8 0.9 1.0 0.8 0.9 <0.1 <0.1 | <0.1 <0.1 | NC NC | 5.0 1.0 1.0 | 96 90 100 | <0.1 <0.1 | 1.0 1.0 | 80 90 |
| | | <u> </u> | ·, | <u> </u> | | <u> </u> | 3645 Sulp | Arizona Sti hur, LA 70 | reet 0663 | |
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| OB NUMBER: | 932944 | CUSTOME | R: OVAC IN | C. | | | ATTN: KIRI | BY VINSON | | |
|---|--|--|---|------------------------------|---|------------------------|-----------------------|-------------------|------------------|------------------------------|
| | ANAL | YSIS | | DUPL | ICATES | REFEREN | CE STANDARDS | | MATRIX SPIK | ES |
| WALYSIS TYPE | ANALYSIS SUB-TYPE | ANALYSIS I.D. | ANALYZED VALUE (A) | DUPLICATE VALUE (B) | RPD or (A-B) | TRUE VALUE | PERCENT RECOVERY | ORIGINAL VALUE | SP I KE ADDED | PERCENT RECOVERY |
| ARAMETER:B | arium (Ba), 1 IMIT/DF: 0.05 | CLP UNITS:mg/L | | DATE/TIME AI METHOD REFEI | NALYZED:08/1 RENCE :SW-8 | 1/93 13:31 46/6010 | | • | QC BATCH I | NUMBER:96038 ECHNICIAN:DJ |
| SLANK SLANK BLANK STANDARD STANDARD STANDARD SPIKE SPIKE SPIKE SUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MS MD MD | 081193 081093 08093 0CS7 081093 ICAP7 932936-001 932943-001 932943-001 932936-001 | <0.05 <0.05 5.02 0.95 1.02 1.64 2.18 1.15 U.73 | 1.25 0.77 | 85 | 5.00 1.00 1.00 | 100 95 102 | 0.73 1.15 | 1.00 1.00 | 91 103 |
| ARAMETER:C REPORTING L | admium (Cd), 1MIT/DF: 0.05 | TCLP UNITS:mg/L | | DATE/TIME AN METHOD REFE | NALYZED:08/1 RENCE :SW-8 | 1/93 13:31 46/6010 | | | QC BATCH T | NUMBER:96038 ECHNICIAN:D. |
| BLANK BLANK STANDARD STANDARD STANDARD STANDARD STANDARD SPIKE UPLICATE OUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MS MD MD MD | 081193 081093 080993 aCS19 081093 aC19N 932936-001 932943-001 932943-001 932936-001 | <0.05 <0.05 <0.05 5.03 0.95 1.02 0.87 0.92 <0.05 <0.05 | <0.05 <0.05 | NC NC | 5.00 1.00 1.00 | 101 95 102 | <0.05 <0.05 | 1.00 1.00 | 87 92 |
| ARAMETER : C | hromium (Cr) IMIT/DF: 0.05 | TCLP UNITS:mg/L | | DATE/TIME A | NALYZED:08/1 RENCE :SW-8 | 1/93 13:31 46/6010 | | | QC BATCH | NUMBER:96038 ECHNICIAN:D |
| BLANK BLANK BLANK TANDARD STANDARD STANDARD STANDARD SPIKE SPIKE SPIKE SUPLICATE DUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MS MD MD | 081193 081093 080993 0CS19 081093 0C19N 932936-001 932943-001 932943-001 932936-001 | <0.05 <0.05 <0.05 5.04 0.94 1.03 0.84 0.91 <0.05 <0.05 | <0.05 <0.05 | NC | 5.00 1.00 1.00 | - 101 94 103 | <0.05 , <0.05 | 1.00 | 84 91 |
| ARAMETER:L | ead (Pb), TCL IMIT/DF: 0.05 | .P UNITS:mg/L | | DATE/TINE AN METHOD REFEN | NALYZED:08/1 RENCE :SW-8 | 1/93 13:31 346/6010 | | | QC BATCH | NUMBER:96038 ECHNICIAN:DJ |
| BLANK BLANK BLANK STANDARD | ICB MB/3010 MB/TCLP#1 ICV | 081193 081093 080993 QCS19 | <0.05 <0.05 <0.05 5.01 | | | 5.00 | 100 | | | |
| | | | | | · <u>·</u> ·································· | | | Arizona Str | eet | • |

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| | } | | | QUA | LITY A | SSURAN 08/18/93 | CERE | PORT | | | |
|------------------|--|--|---|---|------------------------------|------------------------------|-------------------------|------------------------|---------------------------------------|------------------|---------------------------------------|
| ∎≫? | B NUMBER: | 932944 | CUSTOME | R: OVAC INC | • | | | AITN: KIRB | Y VINSON | | |
| 1 | 3 | ANAL | YSIS | | DUPLI | CATES | REFERENCI | E STANDARDS | 1 | MATRIX SPIKE | S |
| ١ | ALYSIS TYPE | ANALYSIS SUB-TYPE | ANALYSIS I.D. | ANALYZED VALUE (A) | DUPLICATE VALUE (B) | RPD or (A-B) | TRUE VALUE | PERCENT RECOVERY | ORIGINAL VALUE | SP I KE ADDED | PERCENT RECOVERY |
| ŗ | ARAMETER:Le PORTING LI | ad (Pb), TCL MIT/DF: 0.05 | P UNITS:mg/L | | DATE/TIME AN METHOD REFER | ALYZED:08/11 RENCE :SW-84 | /93 13:31 6/6010 | | | OC BATCH N Te | UMBER:960383 CHNICIAN:DJC |
| 15 | TANDARD TANDARD JIKE JIKE JPLICATE UPLICATE | LCS ICV MS MS MD MD | 081093 9C19N 932936-001 932943-001 932943-001 932936-001 | 0.96 1.03 0.86 0.92 <0.05 <0.05 | <0.05 <0.05 | NC NC | 1.00 1.00 | 96 103 | <0.05 <0.05 | 1.00 1.00 | 86 92 |
| 1≚ | RAMETER: Se | lenium (Se), MIT/DF: 0.1 | TCLP UNITS:mg/L | | DATE/TIME AN METHOD REFER | ALYZED:08/11 RENCE :SW-84 | /93 13:31 6/6010 | | | QC BATCH N | IUMBER:960384 CHNICIAN:DJC |
| 12 | LANK ANK ANK TANDARD TANDARD TANDARD | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS | 081193 081093 080993 QCS19 081093 QC19N 932936-001 | <0.1 <0.1 <0.1 5.0 0.9 1.0 | | | 5.0 1.0 1.0 | 100 90 100 | | and a second | |
| ļu | IKE UPLICATE UPLICATE | HS MD MD | 932943-001 932943-001 932943-001 932936-001 | 0.9 0.9 <0.1 <0.1 | <0.1 <0.1 | NC NC | | and a second | <0.1 <0.1 | 1.0 | 90 90 |
| 12 | RAMETER:SI | lver (Ag), T MIT/DF: 0.05 | CLP UNITS:mg/L | | DATE/TIME AN METHOD REFER | ALYZED:08/11 RENCE :SW-84 | /93 13:31- 6/6010-** | | | OC BATCH N Te | UMBER:960385 CHNICIAN:DJC |
| : s | LAHK ANK ANK ANK TANDARD TANDARD IKE JIKE UPLICATE UPLICATE | 1CB MB/3010 MB/TCLP#1 ICV LCS ICV MS MS MD MD | 081193 081093 080993 0CS7 081093 ICAP7 932936-001 932943-001 932943-001 932936-001 | <0.05 <0.05 <0.05 5.00 0.95 1.02 0.87 0.93 <0.05 <0.05 | <0.05 <0.05 | NC | 5.00 1.00 1.00 | 100 95 - 102 | <0.05 <0.05 | 1.00 | 87 93 |
| 1 | RAMETER: AT | senic (As), MIT/DF: 0.1 | TCLP UNITS:mg/L | | DATE/TIME AN METHOD REFER | ALYZED:08/12 RENCE :SW-84 | /93 14:44 6/6010 | | | QC BATCH N | UMBER:960445 CHNICIAN:DJC |
| s | ANK ANK ANK TANDARD TANDARD ANDARD JIKE OPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MD | 081293 081193 081093 0C19N 081193 0C519 932944-011 932944-011 | <0.1 <0.1 <c.1 1.0 4.8 0.9 <0.1</c.1 | <0.1 | NC | 1.0 1.0 5.0 | 100 100 96 | <0.1 | 1.0 | 90 |
| | } | | | | | | - ur | 3645 Sulph (318) | Arizona Str Jur, LA 70 583-4926 | et 663 | , , , , , , , , , , , , , , , , , , , |
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| DR. MIMREP | 932044 | CIISTONE | | C | | | ATTN. KID | | | |
|--|--|--|--|----------------------------|---------------------------|-------------------------|----------------------------|---|------------------|--------------------------------|
| yo NUNDER. | ANAL | .YSIS | | DUPL | ICATES | REFERENC | CE STANDARDS | | MATRIX SPIKE | S |
| ALYSIS | ANALYSIS SUB-TYPE | ANALYSIS 1.D. | ANALYZED VALUE (A) | DUPLICATE VALUE (B) | RPD or (A-B) | TRUE VALUE | PERCENT | ORIGINAL VALUE | SP I KE ADDED | PERCENT |
| ARAMETER: A | INIT/DF: 0.1 | TCLP UNITS:mg/L | . | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :SW- | 12/93 14:44 846/6010 | <u> </u> | • | QC BATCH) TI | NUMBER:960445 ECHNICIAN:DJC |
| PARAMETER : | Barium (Ba), 1 | | I | DATE/TIME A | NALYZED:08/ | 12/93 14:44 | | 1 | QC BATCH | 11MBER:960446 |
| EPOKITNG L | .IMI1/DF: 0.05 | | | METHOU KEPE | KENLE ISW- | 84676010 | | T | | CHNICIAN:DJC |
| LANK BLANK 3LANK FANDARD FANDARD ISTANDARD SPIKE UPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MD | 081293 081193 081093 1CAP7 081193 QCS7 932944-011 932944-011 | <0.05 <0.05 <0.05 0.97 0.95 4.93 1.93 1.03 | 1.02 | 1 | 1.00 1.00 5.00 | 97 95 99 | 1.03 | 1.00 | 90 |
| ARAMETER: | Cadmium (Cd), LIMIT/DF: 0.0 | TCLP 5 UNITS:mg/L | | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :SW- | 12/93 14:44 846/6010 | | | QC BATCH I | NUMBER:960447 ECHNICIAN:DJC |
| ANK ANK STANDARD TANDARD JANDARD JIKE DUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MD | 081293 081193 081093 0219N 081193 0C519 932944-011 932944-011 | <0.05 <0.05 <0.05 1.03 1.00 5.05 0.94 <0.05 | <0.05 | NC | 1.00 1.00 5.00 | 103 100 101 ' | <0.05 | 1.00 | 94 |
| ARAMETER; | Chromium (Cr) .IMIT/DF: 0.0 | TCLP UNITS:mg/L | 1 | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :SW- | 12/93 14:44 846/6010 | | • | QC BATCH Ti | NUMBER:960448 ECHNICIAN:DJO |
| IgCARK STANDARD TAMDARD ICV ICV CC19H CC19H CCV C0.05 CC19H CC1 | 92 | | | | | | | | | |
| | QC BATCH | NUMBER:960449 ECHNICIAN:DJ(| | | | | | | | |
| | 1.00 1.00 5.00 | 103 95 100 | | | | | | | | |
| • | • <u> </u> | · | - - | · | | | ' 3645 \$ulp (318 | Arizona Sti hur, LA 70) 583-4926 | eet)663 | |

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|---|--|--|--|----------------------------|-----------------------------|------------------------|---------------------|-------------------|----------------|------------------------------|
| | ANA | | T | DUPL | | REFERE | NCE STANDARDS | | MATRIX SPIK | ES |
| ANALYSIS TYPE | ANALYSIS SUB-TYPE | ANALYSIS I.D. | ANALYZED VALUE (A) | DUPLICATE VALUE (8) | RPD or (A-B) | TRUE VALUE | PERCENT RECOVERY | ORIGINAL VALUE | SP1KE ADDED | PERCENT RECOVERY |
| PARAMETER:L REPORTING L | ead (Pb), TC IMIT/DF: 0.0 | LP 5 UNITS:mg/L | | DATE/TIME A METHOD REFE | NALYZED:08/' RENCE :SW-1 | 2/93 14:44 46/6010 | • | | QC BATCH | NUMBER:96044 ECHNICIAN:DJ |
| SPIKE DUPLICATE | MS MD | 932944-011 932944-011 | 0.85 <0.05 | <0.05 | NC | | | <0.05 | 1.00 | 85 |
| PARAMETER:S REPORTING L | elenium (Se) IMIT/DF: 0.1 | , TCLP UNITS:mg/L | | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :SW-0 | 12/93 14:44 46/6010 | 6 | • | OC BATCH | NUMBER:96045 ECHNICIAN:DJ |
| BLANK BLANK BLANK STANDARD STANDARD STANDARD SPIKE DUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MD | 081293 081193 081093 90198 081193 9081193 932944-011 932944-011 | <0.1 <0.1 <0.1 1.0 1.0 5.0 1.0 <0.1 | <0.1 | NC | 1.0 1.0 5.0 | 100 100 100 | <0.1 | 1.0 | 100 |
| PARAMETER:S | ilver (Ag), IMIT/DF: 0.0 | TCLP 5 UNITS:mg/L | | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :SW-1 | 12/93 14:44 46/6010 | • | | QC BATCH | NUMBER:96045 ECHNICIAN:DJ |
| BLANK BLANK STANDARD STANDARD STANDARD SPIKE DUPLICATE | ICB MB/3010 MB/TCLP#1 ICV LCS ICV MS MD | 081293 081193 081093 ICAP7 081193 QCS7 932944-011 932944-011 | <0.05 <0.05 <0.05 0.98 0.96 4.98 0.91 <0.05 | <0.05 | NC | 1.00 1.00 5.00 | 98 / 96 1 100 | <0.05 | 1.00 | 91 |
| PARAMETER:T REPORTING L | otal Petrole IMIT/DF: 35 | um Hydrocarbo UNITS:mg/k | ns g | DATE/TIME A METHOD REFE | NALYZED:08/ RENCE :EPA | 7/93 13:30 418.1 |) | | QC BATCH | UMBER:96067 ECHNICIAN:HJ |
| BLANK SPIKE DUPLICATE | MB/P196 MS MD | 081793 081793-01 932944-01 | <35 401 4200 | 5000 | 17 | | · | 0.0 | 413 | 97 |
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CUSTOMER: OVAC INC.



QUALITY ASSURANCE REPORT 08/18/93

B NUMBER: 932944

ATTN: KIRBY VINSON

Vac SW 846 8240

DATE ANALYZED: 08/10/93 TIME ANALYZED: 18:11 METHOD: SW-846 8240/Hi Meth QC NUMBER:960409

| ST DESCRIPTION | ANALY SUB-TYPE | ANALYSIS I.D. | DILUTION FACTOR | ANALYZED VALUE | DETECTION LIMIT | UNITS OF MEASURE |
|--------------------------------|----------------|---------------|-----------------|---|---------------------------------------|------------------|
| Benzene | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| ,1-Dichloroethene | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| lorobenzene | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| luene | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| ^j ichloroethene | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| ^f cetone | METHOD | 081093 | 1 | <100 | 100 | ug/L |
| grolein | METHCO | 081093 | 1 | <100 | 100 | ug/L |
| rylonitrile | METHOD | 081093 | 1 | <100 | 100 | ug/L |
| Butanone (MEK) | METHCO | 081093 | 1 | <100 | 100 | ug/L |
| Bromodichloromethane | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| romoform | METHCO | 081093 | 1 | <5 | 5 | ug/L |
| pmomethane | METHOD | 081093 | 1 | <10 | 10 | ug/L |
| promochloromethane | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| . The disulfide | METHOD | 081093 | 1 | <100 | 100 | ug/L |
| "arbon tetrachloride | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| loroethane | METHCO | 081093 | 1 | <10 | 10 | ug/L |
| fhloroethylvinyl ether | METHOD | 081093 | 1 | <10 | 10 | ug/L |
| Loroform | METHOD | 081093 | 1 | <5 | 5 | ug/L |
| Chloromethane | METHOD | 081093 | 1 | <10 | 10 | ug/L |
| d-Dichlenesthere | METHOD | 081093 | | <5 | 5 | ug/L |
| P-Dichleneethane | METHOD | 081093 | 1 | <5 . | 5 | ug/L |
| Posel 2-Dichleneethere | METHOD | 081093 | | | 5 | ug/L |
| 1 2-Dichlosopsopane | METHOD | 091093 | | | | ug/L |
| is-1 3-Dichloropropane | METHOD | 081093 | | 5 4 | 2 | ug/L |
| hylbenzene | METHOD | 081093 | | 0 | | ug/L |
| l Hexanone | METHOD | 081093 | | <5 <50 | 2 | Ug/L |
| 4-Methyl-2-pentanone | METHOD | 081003 | | <5U -50 | 50 | Ug/L |
| ethylene chlocide | METHOD | 081093 | | <10 | 50 | ug/L |
| Vrene | METHOD | 081003 | | | | |
| 1.2.2-Tetrachioroethane | METHOD | 001075 | | | | Ug/L |
| trachloroethene | METHOD | 081003 | | | | |
| 1.1.1-Trichloroethane | METHOD | 001075 | | | | ug/L |
| .1.2-Trichloroethane | METHOD | 081093 | | | | |
| ichlorofluoromethane(FREON TF) | METHOD | 081093 | 1 | | | |
| tal Xylenes | METHOD | 081093 | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | | |
| vinyl acetate | METHOD | 081093 | i i | <50 | 50 | |
| inyl chloride | METHOD | 081093 | 1 i | <10 | 10 | |
| 2-Dichlorobenzene | METHOD | 081093 | i i | <5 | 5 | |
| β-Dichlorobenzene | METHOD | 081093 | 1 | <5 | Š | |
| _&-Dichlorobenzene | METHOD | 081093 | 1 | <5 | Š | |
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QUALITY ASSURANCE REPORT 08/18/93

CUSTOMER: OVAC INC.

DB NUMBER: 932944

ATTN: KIRBY VINSON

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NOC SH 846 8240

DATE ANALYZED: 08/10/93 TIME ANALYZED: 18:11 METHOD: SW-846 8240/Hi Meth QC NUMBER:960409

| | | R | EFEREN | CE ST | ANDARD | s | | | |
|----------|--|---|--|----------|---|---|---|---|--|
| ، است | EST ESCRIPTION | ANALYSIS SUB-TYPE | ANALYSIS I. D. | DILUTION | ANALYZED VALUE | TRUE VALUE | PERCENT RECOVERY | DETECTION | UNITS OF MEASURE |
| | <pre>,2-Dichloroethane-d4 pluene-d8 promofluorobenzene }</pre> | SURROGATE | 932944-1 932944-2 932944-5 932944-7 932944-7 932944-12 932944-13 932944-15 932944-16 932944-1 932944-2 932944-2 932944-2 932944-5 932944-7 932944-12 932944-12 932944-13 932944-15 932944-15 932944-5 932944-5 932944-5 932944-5 932944-5 932944-7 932944-5 932944-15 932944-15 932944-15 932944-15 932944-15 | | 22 19 22 27 22 19 20 18 20 25 19 21 25 21 16 18 19 20 24 19 21 20 24 19 21 20 22 5 21 18 19 20 25 21 19 21 25 21 19 20 25 21 19 21 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 22 25 21 19 20 22 25 21 19 20 22 25 21 19 20 24 19 20 22 25 21 19 20 24 19 20 24 25 21 19 20 24 25 21 19 20 24 25 21 19 20 22 25 21 19 20 24 25 21 19 20 22 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 19 20 25 21 21 20 25 21 21 20 25 21 21 20 25 21 21 20 25 21 21 20 22 25 21 21 20 25 21 21 20 25 21 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 21 20 25 25 20 25 20 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 21 20 25 25 21 20 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 25 25 21 20 20 25 21 20 20 25 21 20 20 25 21 20 20 25 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | 25 25 25 25 25 25 25 25 25 25 25 25 25 2 | 88 76 88 108 88 76 80 72 80 100 76 84 76 84 100 84 64 72 76 80 96 76 84 80 88 100 84 72 76 80 96 76 84 100 84 72 | 5 | ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L |
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QUALITY ASSURANCE REPORT 08/18/93

B NUMBER: 932944 CUSTOMER: OVAC INC. ATTN: KIRBY VINSON

| T CRIPTION | ANALYSIS SUB-TYPE | ANALYSIS I. D. | DILUTION FACTOR | ANALYZED VALUE | ORIGINAL VALUE | SPIKE ADDED | PERCENT | DETECTION | UNITS OF MEASURE |
|---|--|--|-----------------------|----------------------------|-------------------|----------------------------|-----------------------------|-----------------------|--------------------------------------|
| zene -Dichloroethene orobenzene uene chloroethene | MATRIX MATRIX MATRIX MATRIX MATRIX | 932943-4 932943-4 932943-4 932943-4 932943-4 932943-4 | 1 1 1 1 1 | 48 47 50 46 48 | 0 0 0 0 | 50 50 50 50 50 | 96 94 100 92 96 | 5 5 5 5 5 | ug/L ug/L ug/L ug/L ug/L |
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QUALITY ASSURANCE REPORT 08/18/93

DB NUMBER: 932944 CUSTOMER: OVAC INC. AT

ATTN: KIRBY VINSON

1/0C SN 846 8240

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DATE ANALYZED: 08/10/93 TIME ANALYZED: 18:11 METHOD: SW-846 8240/Hi Meth QC NUMBER:960409

| EST ESCRIPTION | ANALYSIS SUB-TYPE | ANALYSIS I. D. | DILUTION FACTOR | ANALYZED VALUE (A) | DUPLICATE VALUE (B) | RPD or (A-B) | DETECTION LIMITS | UNITS OF MEASURE |
|---|---|--|-----------------------|----------------------------|----------------------------|---|-----------------------|--------------------------------------|
| enzene , 1-Dichloroethene hlorobenzene bluene Trichloroethene | SPIKE/DUP SPIKE/DUP SPIKE/DUP SPIKE/DUP SPIKE/DUP | 932943-4 932943-4 932943-4 932943-4 932943-4 | 1 1 1 1 1 | 48 47 50 46 48 | 51 44 53 44 51 | 6 7 6 4 6 | 5 5 5 5 5 | ug/L ug/L ug/L ug/L ug/L |
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NC = Not Calculable due to values lower than the reporting limit ND = Analyte Not Detected above the quantitation limit

The detection limit and units reported in the Quality Assurance (QA) Report may not coincide with the values reported in the Analytical Report because the data presented in the QA Report may not account for sample preparation and dilutions performed.

The date and time analyzed on the Quality Assurance Report may not reflect the actual date and/or time of analysis.

Cited Methods are obtained from the following documents: EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, March 1983 Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989 Federal Register, Friday, October 26, 1984 (40 CRF Part 136) Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985

Numerical values expressed in the "LIMITS/*DILUTION" column are Method Quantitation Limits (MQL). A final result of "ND" should be considered as "less than the MQL" (<MQL) unless it is noted otherwise.

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| | • | • | ER Rush | NA Ol | | D 10 DAYS | C SDAYS | T2 HOURS | 48 HOURS | | SAME DAY | RAWROUND: | RECURRED TU |
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