BY

TIERRA

Environmental Company, Inc.
909 West Apache
Farmington, New Mexico 87401

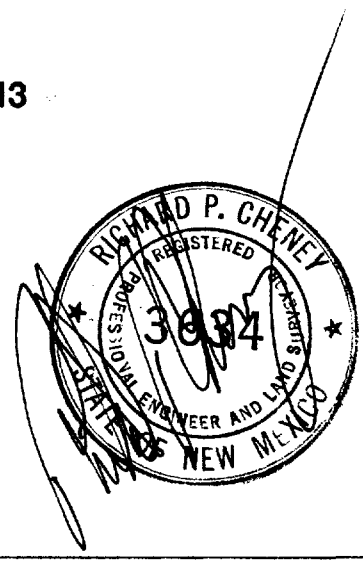
APPLICATION FOR DISCHARGE PLAN MODIFICATION GW-1
AND
APPLICATION FOR AUTHORIZATION TO INJECT OCD FORM C-108
CLASS 1 NON-HAZARDOUS INJECTION WELL

Prepared for

BLOOMFIELD REFINERY

89 ROAD 4990

BLOOMFIELD, NEW MEXICO 87413



SEPTEMBER 16, 1992

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September 16, 1992

Mr. Roger Anderson, Bureau Chief
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

RE: APPLICATION FOR AUTHORIZATION TO INJECT / MODIFICATION OF DISCHARGE PLAN GW-1, FOR BLOOMFIELD REFINING COMPANY:

Dear Mr. Anderson:

Enclosed please find, the application for authorization to inject, OCD Form 108 with all required attachments and the application for modification of discharge plan GW-1, also with all required attachments.

As per our previous meeting in Santa Fe, we have extended the surface casing string to 830 feet as you had requested. The deep water well near the Bloomfield Refinery property, that belongs to Carol Wooten, according to a phone conversation I had with him, has been plugged and abandoned. Therefore we could not obtain a sample. In the meeting you indicated that the other wells, that were basically river gravel were of no interest, so I did not sample them. I will if you so request and immediately forward the results.

Also in the meeting you instructed us to reference the existing discharge plan GW-1 for Bloomfield Refining rather than re-copy and include it in the application for modification. We have constructed a letter of application for modification referencing GW-1 Sections VI (C) and Attachment 8 (Final Closure Plan for RCRA).

We have also modified the testing requirements also pursuant to your recommendations.

I'm sure you or your staff will have additional questions and we will be available to respond.

On behalf of Tierra Environmental Company, Inc. and our Client, Bloomfield Refining, I thank you and your professional staff for the excellent cooperation we have received.

Sincerely,

Phillip C. Nobis
Vice President

909 WEST APACHE
FARMINGTON, NEW MEXICO 87401

TELEPHONE (505) 325-0924
FAX (505) 327-3303

State of New Mexico
Energy, Minerals and Natural Resources Department
OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87501

DISCHARGE PLAN APPLICATION FOR NATURAL GAS PROCESSING PLANTS, OIL REFINERIES AND GAS COMPRESSOR STATIONS

(Refer to OCD Guidelines for assistance in completing the application.)

I. TYPE: Modification GW-1 for addition of Class I Injection Well

II. OPERATOR: Bloomfield Refining Company

ADDRESS: P.O. Box 159, Bloomfield, New Mexico 87413

CONTACT PERSON: Tierra Environmental Co. (Phil Nobis) PHONE: (505) 325-0924

III. LOCATION: (see Attached for legal discription) ___/4 ___/4 Section ____ Township _____ Range _____
Submit large scale topographic map showing exact location.

IV. Attach the name and address of the landowner(s) of the disposal facility site.

V. Attach description of the facility with a diagram indicating location of fences, pits, dikes, and tanks on the facility.

VI. Attach a description of sources, quantities and quality of effluent and waste solids.

VII. Attach a description of current liquid and solid waste transfer and storage procedures.

VIII. Attach a description of current liquid and solid waste disposal procedures.

IX. Attach a routine inspection and maintenance plan to ensure permit compliance.

X. Attach a contingency plan for reporting and clean-up of spills or releases.

XI. Attach geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water. Depth to and quality of ground water must be included.

XII. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

XIII. CERTIFICATION

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: David Roderick Title: Refinery Manager

Signature: David Roderick Date: September 10, 1992

DISTRIBUTION: Original and one copy to Santa Fe with one copy to appropriate Division District Office.

DISCHARGE PLAN APPLICATION

(Supplement)

I. Type of Operation:

Modification of existing Discharge Plan GW-1 for addition of Class I Non-Hazardous Injection Well.

II. Operator:

Bloomfield Refining Company
P.O. Box 159
Bloomfield, New Mexico 87413

Contact Person: Tierra Environmental Company
909 West Apache
Farmington, New Mexico 87401

Phil Nobis
(505) 325-0924

III. Location (See enclosure B) Survey by Brewer Associates

IV. Attach name and address of the landowner(s) of the disposal facility site.

Bloomfield Refining Company
89 Road 4990
Bloomfield, New Mexico 87413

V. Attach a description of the facility with a diagram indicating location of fences, pits dikes and tanks.

See GW-1 and Enclosure B.

VI. Attach a description of sources, quantities and quality of effluent.

See GW-1 and Enclosure H

VII. Attach a description of current liquid and solid waste transfer and storage procedures.

See GW-1

VIII. Attach a description of the current liquid and solid waste disposal procedures.

See GW-1

IX. Attach a routine inspection and maintenance plan to ensure permit compliance.

See GW-1

X. Attach a contingency plan for reporting and clean up of spills or releases.

See GW-1

XI. Attach geological/hydrological evidence demonstrating that the disposal of oil field wastes will not adversely impact fresh water. Depth to groundwater must be included.

See GW-1 and OCD Form 108 and Enclosure E.

XII. Attach such other information as is necessary to demonstrate compliance with other OCD rules, regulations, and/or orders.

See GW-1, Letter of Application for discharge plan modification,
OCD Form 108 and all enclosures.

TIERRA Environmental Company, Inc.
909 West Apache
Farmington, New Mexico 87401
(505) 325-0924

APPLICATION FOR DISCHARGE PLAN MODIFICATION

Discharge Plan GW-1

Bloomfield Refinery
P.O. Box 159
Bloomfield, New Mexico 87413

The Bloomfield Refining Company (BRC) is applying for a modification of groundwater discharge plan (GW-1) for the Company's Bloomfield Refinery located in the NW/4 SE/4 and the S/2 NE/4 and the N/2 NE/4 SE/4 of Section 27, and the S/2 NW/4 and N/2 NW/4 SW/4 and the SE/4 NW/4 SW/4 and the NE/4 SW/4 of Section 26, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico.

The current discharge plan GW-1 expires on June 7, 1994.

BRC has applied for authorization to inject OCD form C-108 for a Class I (non-hazardous) disposal well and facilities to be located adjacent to and north of Pond 2, further identified in (Enclosure B) facility drawing.

The proposed zone of injection is at approximately 3400 to 3600 feet in depth and into the "Cliff House" Geological formation. A thorough geological investigation indicates that the proposed injection zone does not intersect any fresh water aquifer. TDS concentration within the Cliff House Formation are in excess of 10,000 ppm. (Source OCD Report at BLM Oil and Gas Conference, Albuquerque, N.M. May 22-23, 1986 by David Boyer, Hydrogeologist/Environmental Bureau, New Mexico Oil Conservation Division as revised September, 1987). A copy of OCD form C-108 describing the proposed well construction and all required technical data pursuant to OCD and WQCC Regulations is enclosed as addendum to Section VI (C), Proposed Modifications of the current discharge plan. It will replace C 3, Installation Schedule, "a third pond could be constructed in 1991 and a forth in 1992."

The proposed Class I Injection well and facilities adjacent to Pond 2, would preclude the necessity of construction of additional surface impoundments and therefore also allow BRC to abandon any spray irrigation practices completely.

The proposed injection well and facilities would draw waste water from Pond 2 by a below grade pumping system, for transfer to two (2) above ground storage tanks. From the tanks the wastewater would then be run through a filtration system and injected pursuant to the design information contained in Section VI C addendum OCD form C-108.

Pond 1 and Pond 2 would be kept at a moderate level in order to allow for emergency repairs of the injection system in the event of breakdown. In the event of a prolonged failure of the injection facility, high-rate portable aeration equipment could be installed to assist in the evaporation rate in both ponds 1 and 2, until necessary repairs are completed.

Testing of the effluent waste stream will be conducted at pond 2 prior to injection and will comply with OCD and WQCC Regulations.
The following constituents will be analyzed yearly;

1. Aromatic and halogenated hydrocarbon scan by EPA method, 8210, 8220, and 8240.

2. General water chemistry, to include calcium, magnesium, potassium, sodium, bicarbonate, chloride, sulfate, carbonate, TDS, pH and conductivity.

3. Heavy metals (by ICAP Scan) to include aluminum, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, silver, strontium, and zinc.

4. Heavy metals by atomic absorption to include As, Hg.

The following constituents will be analyzed quarterly;

1. pH, TDS, and metals including chromium and lead by ICAP.

2. Aromatic and halogenated hydrocarbon scan by EPA Methods 8010 and 8020.

The proposed Class I Injection well and facilities will only be accepting BRC effluent waste stream. It will not accept any other waste from commercial or private sources.

BRC agrees to comply with the following regulatory requirements:

1. To prevent corrosion and provide maximum protection for the casing, injection shall be through plastic lined tubing with a packer set no more than 100 feet from the bottom of the long-string casing.

2. The casing-tubing annulus shall be filled with an inert fluid, and a minimum pressure of 100 psi maintained pursuant to WQCC 5-206.B.2.

3. Continuous monitoring devices shall be installed to provide a record of injection pressure, (vacuum) flow rate, flow volume and annular pressure, pursuant to WQCC 5-207. B.@. such devices shall be installed prior to injection of any industrial effluent.

4. Monthly reports of the disposal of produced water shall be submitted in accordance with Rules 704 and 1120 of the Division Class II Rules and Regulations.

5. The operator shall provide a representative analysis of the injected fluids quarterly pursuant to WQCC 5-208.A.2.(a).

6. Mechanical integrity for the effluent disposal well shall be demonstrated yearly during the life of the well pursuant to WQCC 5-207A. The type of test shall be approved by the Division and witnessed by an OCD representative.

7. The injection well or system shall be equipped with a pressure limiting switch or acceptable substitute which will limit the wellhead pressure on the injection well to no more than the hydrostatic pressure from the injection storage tanks exerted at the wellhead.

8. BRC shall immediately notify the supervisor of the OCD Division Office in Aztec, New Mexico of the failure of the tubing, casing, or packer in the well or leakage of water from around said well or associated surface facility and take such steps as may be timely and necessary to correct such failure or leakage pursuant to WQCC 5-208A.1.

9. Pursuant to WQCC 5-208.2, the following quarterly reports will be submitted to the Director:

    a) The analyses as required in (5) above.

    b) Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure.

    c) Any well workover.

Closure Plan for Injection Well and facilities

The Closure plan will be an addendum to Attachment 8 of the current Bloomfield Refining Company Discharge Plan entitled "Final Closure Plan for RCRA".

Should the injection well and facilities be abandoned for any reason, pumping equipment, storage tanks and necessary equipment will be removed from the location. The well, with casing left in place, will be plugged from top to bottom with approximately 700 sacks of Class B "Neat Cement" using a mixture ratio of 5.2 gallons of water per sack with total weight of 15.6 lbs per gallon and volume of 1.18 cu. ft per sac.. see attached well plugging schematic by Brewer Associates, Engineers.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Bloomfield Refining Company

Address: P.O. Box 159, Bloomfield New Mexico 87413

Contact party: Tierra Environmental Company Phone: (505) 325-0924

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☒ yes ☐ no
If yes, give the Division order number authorizing the project GW-1

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

• VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

•VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

• X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: David Roderick Title Refinery Manager

Signature: David Roderick Date: September 10, 1992

• If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

TIERRA Environmental Company, Inc.
909 West Apache
Farmington, New Mexico 87401

APPLICATION FOR AUTHORIZATION TO INJECT

(Class I Disposal Well, non-hazardous)

I. Purpose: Disposal of refinery waste stream

II. Operator: Bloomfield Refining Company
P.O. Box 159
Bloomfield, New Mexico 87413

Contact Party: Tierra Environmental Company, Inc.
909 West Apache
Farmington, New Mexico 87401
Phillip C. Nobis
(505) 325-0924

III. WELL DATA

IIIA. The following well data must be submitted for each injection well covered by this application. The data must be in tabular and schematic form and shall include:

(1) Lease Name: Bloomfield Refining Well No. 1

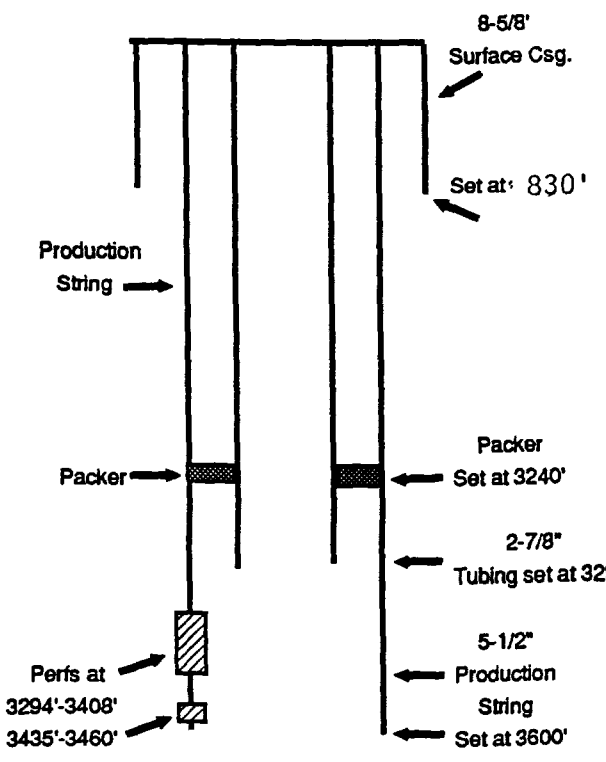
Location: SW ¼ Section 26, T29N, R11W; San Juan County

III. WELL DATA

IIIA. The following well data must be submitted for each injection well covered by this application. The data must be in tabular and schematic form and shall include:

(1) **Lease Name:** Bloomfield Refining WD-1 **Well No.** 1
Location: NW, SW, Section 26, T29N, R11W; San Juan County; FWL and FSL

(2) WELL SCHEMATICS DATA



(2) Surface Casing:

Size: 8-5/8", 48# Csg., cemented with 200 sx.
TOC: Surface, feet determined by circulation.
Hole Size: 11.0"
Set at: 830 feet

(2) Production String:

Size: 5.5", 15.5# Csg., cemented with 550 sx.
TOC: Surface, feet determined by circulation.
Hole Size: 7-7/8"
Set at: 3600 feet
Perforated interval: 3294'-3408' & 3435'-3460' at 4 JSPF, .5 EHD

(3) Tubing:

Size: 2-7/8", 4#, plastic lined
Set at: 3250'

(4) Packer:

Model: Guiberson, Uni-6: set at 50 feet above perforations or similar model.

IIIB. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well.

(1) **Name of Injection formation:** Cliff House Formation and Menefee Formation.
(2) **Name of field or Pool (if applicable):** N/A
(3) **Is this a new well drilled for injection?** Yes,
(4) **Has the well ever been perforated in any zone(s)?** No.
(5) **Give depth to and name of any overlying or overlying oil or gas zones (pools) in this area.**

Oil and Gas Zones

Producing Formation/Member	Type of Production	Formation Tops
Kirtland Shale (Farmington Sandstone)	Oil some Gas	734'
Fruitland Formation (sand and coal)	Gas	1419'
Pictured Cliffs Sandstone	Gas	1729'
Lewis Shale (Chacra Sand)	Gas	1804'
Cliff House Sandstone (injection zone)	Brine Water	3294'
Point Lookout Sandstone	Gas some Oil	4000'
Gallup Sandstone	Oil some Gas	5336'
Graneros/Dakota Formations	Gas	6196'

IV. Is this an expansion of an existing project? YES
If yes, give the Division order number authorizing the project: GW1, Bloomfield Refining.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around the proposed injection well. This circle identifies the well's "area of review". Map attached showing all wells within two miles of the proposed injection well and the location of the proposed injection well.

VI. Attach a tabulation of data on all wells of public record within the "area of review" which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging details. The list of wells below represents all wells within the "area of review" and D&A wells within the "area of review". Attached are PI completion reports or photo copies of plugging reports from OCD files in Aztec, NM on those wells found within 1/2 mile of the proposed injection well.

PRODUCING WELLS (OCD 4/2/92)

Location	Pool	Operator	Lease
1F26 29N11W	Basin Dakota	Amoco Production	Sullivan Gas Com
1F26 29N11W	Otero Chacra	Amoco Production	Davis Gas Com J
1F26 29N11W	Blanco Mesa Verde	Amoco Production	Davis Gas Com J
3K26 29N11W	Armenta Gallup	Meridian Oil	Calvin
1M26 29N11W	Basin Dakota	Meridian Oil	Calvin
9N26 29N11W	Otero Chacra	Meridian Oil	Congress
1H 27 29N11W	Otero Chacra	Amoco Production	Davis Gas Com F
1H 27 29N11W	Basin Dakota	Amoco Production	Davis Gas Com F
1I 27 29N11W	Otero Chacra	Amoco Production	Davis Gas Com G
1I 27 29N11W	Basin Dakota	Amoco Production	Davis Gas Com F
9A34 29N11W	Otero Chacra	Meridian Oil	Summit
16A34 29N11W	Armenta Gallup	Meridian Oil	Congress

PLUGGED AND ABANDONED WELLS (PI)

1M26 29N11W	D&A in 1950 (Kpc)	Big Chief Western	Davis
2H27 29N11W	D&A in 1953 (Kpc)	Umbarger FB Trust	Davis PU
1I27 29N11W	D&A in 1953 (Kpc)	Umbarger FB Trust	Davis Pooled

VII. Attach data on the proposed operation, including:

(1) Average daily injection is anticipated to be approximately 2228 BPD.

(2) Whether the system is open or closed; Closed system.

(3) Proposed average and maximum injection pressures; Pressures projected at 1200-1500 psi.

(4) Sources and appropriate analysis of fluids to be injected are explained thoroughly in Section II of the Bloomfield Refining Company Discharge Plan GW-1, which was renewed by OCD, on February 4, 1992 and will expire on June 7, 1994. Constituent concentrations to be injected meet NMWQ & RCRA standards with the exception of Total Dissolved Solids (TDS), which are 2,136ppm. Under GW-1 the waste stream has been approved by OCD for land application.

The proposed injection zone ie: Cliff House, part of the Mesa Verde Group gave TDS concentrations above 10,000 ppm, TDS, The formation, pursuant to Section (70-2-12,B (15), NMSA 78 would not be considered fresh water and therefore would not be used for any purpose that would be impaired by contamination. Analysis of the Mesa Verde, Cliff House is discussed in item (5) below, and would appear to be compatible with the waste stream proposed for injection.

(5) If injection is for disposal purposes into a zone not productive of oil and gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc. A chemical analysis of the disposal zone (Cliff House) is attached and is from the Basin Disposal well in Section 3, T29N, R11W. see appendix.

VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological names, thickness, and depths. Give the geological name and depth to bottom of all underground sources of drinking water (aquifer containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying and underlying the proposed injection zone. The proposed injection interval for the subject well are sandstones of the Cliff House Formation and upper most sands of the Menefee Formation. The Cliff House and Menefee are the two upper most units of the Mesaverde Group.

Cliff House Sandstone Formation (injection zone); The Cliff House Sandstone is the upper most unit in the Mesaverde Group. West of Farmington, it forms the top or eastern flank of the Hogback monocline. This coastal marine, transgressive sandstone consists of very fine to fine-grained sand interbedded with thin gray shale units, and has an estimated thickness of about 114 feet at the proposed injection site.

Formation	Depth	Thickness
Cliff House	3294'	114'

Sandstone beds range in thickness from several feet to 30+ feet in the general area of Bloomfield and are separated by shales and siltstones. At the proposed injection well site sandstone beds in the lower part of the unit are commonly 4-8 feet in thickness. A 15-20 foot thick sand is projected to occur near the top of the Cliff House. Cliff House sandstone porosities range from 10-18 percent, which is considered normal for most Mesaverde sands. The Cliff House unconformably overlies the Menefee Formation. Produced water from Cliff House gas production is saline (high TDS) in the deeper portions of the basin and the unproductive areas around Bloomfield.

Upper Menefee Formation (potential injection zone):

The Menefee Formation, middle unit of the Mesaverde Group, consists of interbedded claystone, shale, sandstone, and coal beds. Sandstones are fine-grained, immature, lithic arkoses indicative of continental deposition. The thickness of the Menefee is estimated at 600 feet in the Bloomfield area.

Formation	Depth	Thickness
Menefee	3408'	600'

Some hydrocarbon production comes from the lower most sands of the unit and may be associated with the underlying Point Lookout. Upper sands within the Menefee may be potential injection zones if the sands can be shown to have some lateral extent and thickness, since most of these sands were deposited in channel or deltaic environments.

Water Wells:

New Mexico State Engineer's Office water well records in Albuquerque, New Mexico were reviewed, duplicated, and plotted, see attached Water Wells Map. Several additional wells were found in a Hydrologic Report 6, a 1983 New Mexico Bureau of Mines and Mineral Resources publication.

The known fresh water zones for this area of the San Juan Basin are the Nacimiento and the Ojo Alamo Formations of Tertiary Age. The Nacimiento occurs at the surface and is about 570 feet thick in the immediate area. The Ojo Alamo is about 165 thick at a depth of 569 to 734 feet. Most of the water wells in the area are completed in Quaternary sand and gravels at a depth of 25 to 75 feet. These sand and gravels rest on the underlying Nacimiento Formation along the San Juan River flood plain and terraces north of the river and the Bloomfield Refinery. One well in SE1/4 of Section 27, T29N, R11W, owned by C. W. Wooten, was drilled to a depth of 305 feet intersecting a water sand within the Nacimiento at 225 to 285 feet with an estimated yield of 10 gpm. This is the deepest water well drilled in the study area according to the State Engineer's Office records.

Ground Water/Aquifers:

The principal water yielding strata (low conductance-fresh water) of the San Juan Basin and in particular the Bloomfield area are sandstones associated with Quaternary sediments and the Nacimiento. Some sand lenses occur within the Nacimiento as evidenced by the cliffs along the south side of the San Juan River near the Bloomfield Refinery. These sands are recharged by the San Juan River and to a lesser extent through percolation from normal rain fall. The water table is most likely very near the surface in the Bloomfield area as evidenced by the shallow water wells. There are no Ojo Alamo water wells reported in the area.

These water wells and ground water tables in the general area should have no bearing on the proposed Cliff House injection horizon, some 2500-3000 feet below these horizons. Deeper sandstone strata associated with the Kirtland/Fruitland, Pictured Cliffs, Lewis, Cliff House, Menefee, Point Lookout, Mancos, Gallup, Dakota, and deeper Jurassic Formations contain brackish, saline or brine waters, based on the produced saline waters associated with oil and gas production from all of these referenced horizons. The total dissolved solids (TDS) increases with depth in these formation as they occur stratigraphically deeper within the San Juan Basin.

The Mesaverde field to the north and west of Bloomfield has been analyzed and contains 38,800 TDS. TDS in the sandstone strata underlying the Ojo Alamo Formation in the Bloomfield area are projected to contain at least 10,000 mg/l and as much as 100,000 mg/l. The Basin Disposal well in Section 3 of T29N, R11W, some 4 miles to the north contained over 25,000 TDS in the Cliff House as do most of the Fruitland Coal gas wells. There are no known reported fresh water aquifers stratigraphically below the Cliff House or directly above the Cliff House in the Bloomfield area.

IX. Describe the proposed stimulation program, if any. The Cliff house and sands of the upper Menefee will be perforated between 3294' - 3408 and possibly between 3435'-3460'. These intervals will be tested for infectivity and evaluated. At that time it will be determined if fracture stimulation is necessary. If the horizons are stimulated the job will be performed using a sand/water treatment system of 40,000+ gallons of water and 60,000 lbs of sand and possibly HCL., if needed.

X. Attach appropriate logging and test data on the well. Electric well logs, induction/bulk density, will be submitted upon completion of the proposed injection well. A CBL-VDL will be run prior to the completion of the proposed injection well.

XI. Attach a chemical analysis of fresh water from two or more fresh water wells within one mile of any injection or disposal well showing location of wells and dates samples were taken.

A well location map is attached, as well as well records from the NM State Engineers Office.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geological and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any under ground source of drinking water. The Mesaverde interval, in particular the Cliff House and Menefee Formations, is a complex section of interbedded sands and shales. The section is overlain by a thick section of Lewis Shales which is considered virtually impermeable to vertical water flow under existing overburden pressures. There are no known faults in the area, nor are faults common within the basin. The bentonitic content of shales overlying the Cliff House are not conducive to permitting open fractures or faults should they exist. Known fresh water zones for the Bloomfield are the Nacimiento and possibly the Ojo Alamo, as there are no water wells in the immediate area that draw water from the Ojo Alamo. The Ojo Alamo is found at approximately 569'-734' and is about 165 feet thick depending upon the location of the upper contact with the Nacimiento. Open faulting or fractures from the Cliff House through the Lewis shale, the already saline Pictured Cliffs and Fruitland Formations is highly uncommon and highly improbable. Off-setting well records within the "area of review" indicated adequate cement isolation between the proposed injection interval and known sources of drinking water or producing intervals. There is no other evidence indicating a hydrological connection between the Cliff House interval and known sources of near surface drinking water reported in the area.

XIII. PROOF OF NOTICE

The landowner on which the well is to be located is the applicant. Enclosed please find copies of letters to Amoco Production and Meridian Oil the two (2) leasehold operators within a half mile. Also enclosed is a copy of the legal add that had appeared in the Farmington Daily Times News Paper on August 26, 1992.

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

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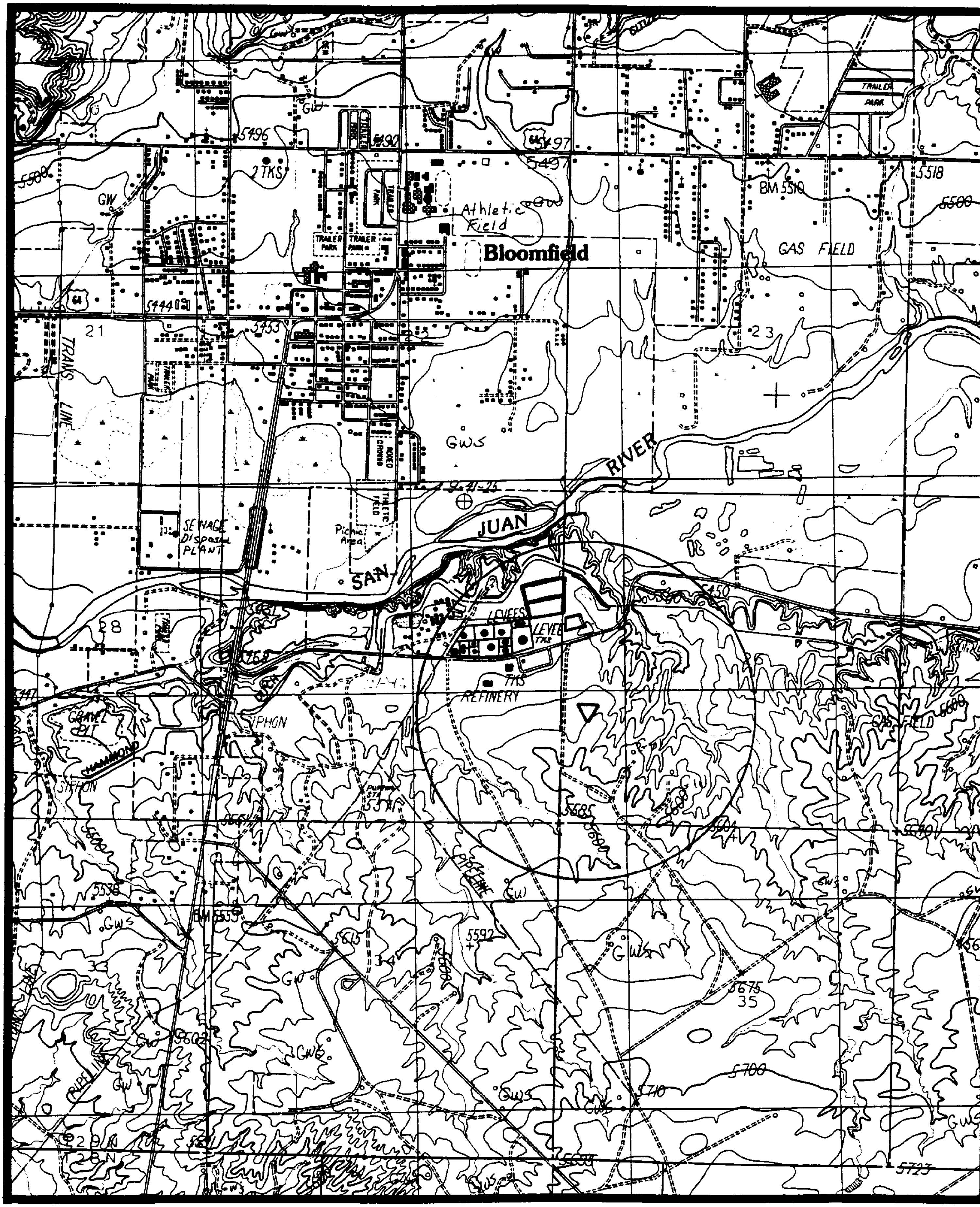
LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE



Bloomfield
SAN
JUAN
RIVER
Athletic Field
GAS FIELD
TRAILER PARK
SEWAGE DISPOSAL PLANT
Picnic Area
RODEO GROUND
ATHLETIC FIELD
LEVEES
LEVEE
TKS
REFINERY
2 TKS
SIPHON
GRAVEL PIT
HAMMOND
TRANS. LINE
PIPELINE
PIPE LINE
PUMPING STA
GW
GWS
BM 5510
BM 5555
5496
5490
5497
5500
5518
5444
5453
5450
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5600
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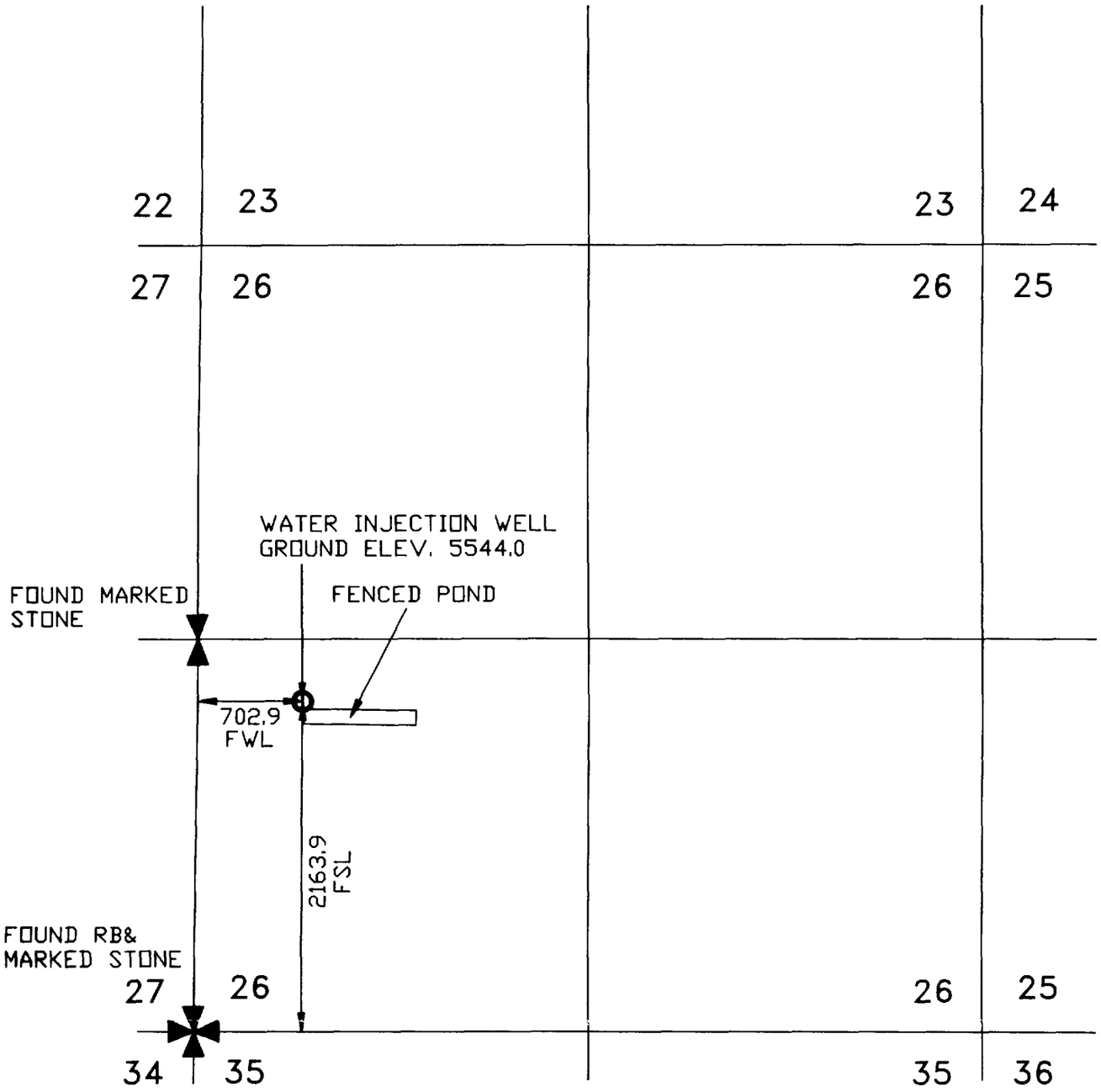
T 29 N
T 28 N

WATER INJECTION WELL SURVEY IN THE SW1/4 OF SECTION 26, T29N R11W, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO

FOR: TIERRA ENVIRONMENTAL CO., INC.
FARMINGTON, NEW MEXICO



I, DARYL D. NORTHUP , A REGISTERED PROFESSIONAL SURVEYOR UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SCALE: 1"=1000'

PROFESSIONAL SURVEYOR 10474

CHENEY — WALTERS — ECHOLS

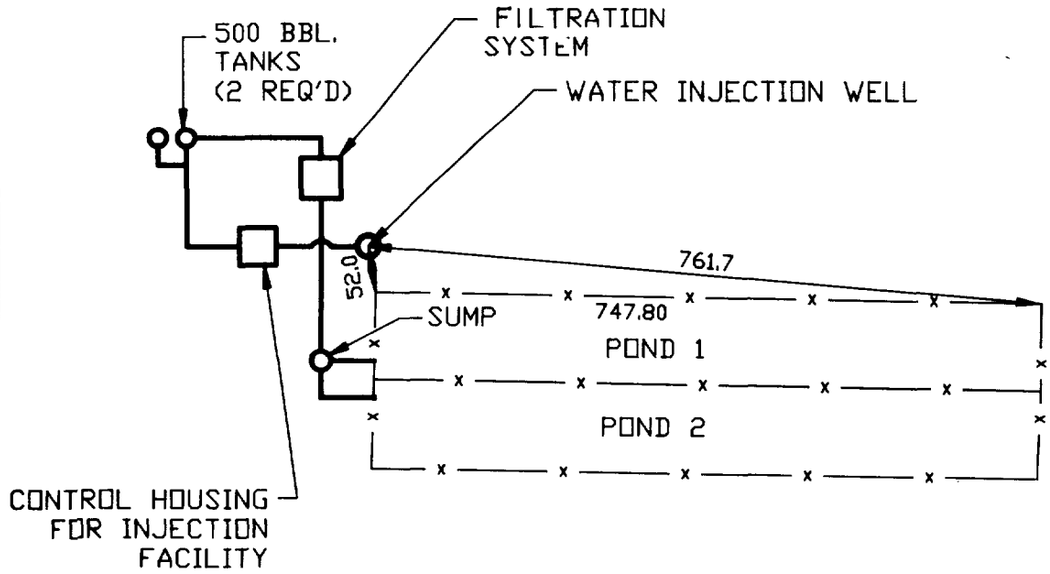
BREWER ASSOCIATES, INC.
909 W. APACHE, FARMINGTON, N.M.

PROJECT: 92530
DATE: 9/14/92

DRAWN BY: DDN
FILE: 2530

WATER INJECTION WELL SURVEY IN THE SW1/4 OF SECTION 26, T29N R11W, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO

FOR:TIERRA ENVIRONMENTAL CO., INC.
FARMINGTON, NEW MEXICO



CHENEY — WALTERS — ECHOLS
BREWER ASSOCIATES, INC.
909 W. APACHE, FARMINGTON, N.M.

FILE: 2530A
REVISION DATE: 9/14/92

SCALE: 1"=200'

PRODUCING WELLS

FULL WELL REPORT FOR FAR WEST RESOURCES

API Nbr: 30045240830000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: AMOCO PROD Oper Code: 065005
Lease: SULLIVAN GAS COM-D Well: 1-E Lease Code:
Field: BASIN Field Code: 003000

T029N R011W SEC26 Spot: NW SE NW
FOOTAGES: 1475FNL 1500FWL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5447GR RIG HT: Log Td:
Form@TD: 602DKOT

Other Depths: DRLR 6329 WSTD PBTD 6286 OLDTD
Permit: Proj Depth: Proj Form: 602DKOT

Status: GAS Spud Date: 01 19 1980
Hole Dir: VERTICAL Comp Date: 04 02 1980
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 602DKOT

Latitude: 36.70002 Source: USGS NAD27 Longitude: 107.96414

CASING:
9 5/8 @ 293 W/ 365SX
4 1/2 @ 6329 W/ 1570SX

TUBING INFO: 2 3/8" @ 6231

Contr: ARAPAHOE Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	1298MCFD		CUT %	48/64CK	HRS
602DKOT	PERF		2/FT	6086-6242	GROSS
PERF	6086-6105	6149-6187	6218-6242	-	
SWFR	6086-6242	156000 GALS	420000 LBS SAND	FBRKP:	
TP: 100	CP: 612	SITP:	SICP:	CAOF: 1684 MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
6040JAM 360 604FRLD 560 604PCCF 1620
604CLFH 3230 604MENF 3325 604PNLK 3950
603MNCS 4180 603GLLP 5210 603GRNR 6030
602DKOT 6065

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

LOG SURVEYS:

#	IL	#	#	EL	#

#	GR	#	#	NE	#
#	DNC	#			

OTHER WELL INFO:

DEVIATION DATA:

Meas. Depth	Drift Angle	Meas. Depth	Drift Angle	Meas. Depth	Drift Angle
832	000.50	1304	000.50	2338	000.70
2810	001.00	3305	001.00	3809	001.20
4315	001.20	4818	001.50	5319	001.70
5822	002.00	6326	002.20		

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

FULL WELL REPORT FOR FAR WEST RESOURCES

API Nbr: 30045253290000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: AMOCO PROD Oper Code: 065005
Lease: DAVIS GAS COM-J Well: 1 Lease Code:
Field: BLANCO Field Code: 008500

T029N R011W SEC26 Spot: NW SE NW
FOOTAGES: 1480FNL 1450FWL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5460KB 5447GR RIG HT: Log Td:
Form@TD: 604MVRD

Other Depths: DRLR 4331 WSTD PBTD 4237 OLDTD
Permit: Proj Depth: 4000 Proj Form: 604MVRD

Status: 2 GAS Spud Date: 10 29 1982
Hole Dir: VERTICAL Comp Date: 01 13 1983
Numeric Class: INL-6 FNL-5
Alpha Class: INL-D FNL-DG
Prod Form: 604CHCR 604MVRD

Latitude: 36.70001 Source: USGS NAD27 Longitude: 107.96431

CASING:
9 5/8 @ 316 W/ 413SX SET PKR @ 3500
7 @ 4330 W/ 1437SX 2 1/16 TBG @ 2765

TUBING INFO: 2 3/8" @ 4020

Contr: AZTEC DRLG Tools: ROTARY RIG Nbr: 171

INITIAL POTENTIAL TESTS:

IPF	1126MCFD		CUT %	48/64CK	HRS
604CHCR	PERF JET		2/FT	2631-2772	GROSS
PERF	2631-2670	2734-2772	-	-	
SFFR	2631-2772	127000 GALS	191000 LBS SAND	FBRKP:	
RATE: B/MIN	ADDTV: NTGN	STAGES:	1691 SCF/BBL		
TP: 82	CP: 360	SITP:	SICP:	CAOF: MCFD	

NARRATIVE: FRACT W/20#, 2%KCL, 20/40 SD

IPF	749MCFD		CUT %	/64CK	HRS
604MVRD	PERF		2/FT	3970-4030	GROSS
PERF	3970-4002	4008-4030	-	-	
SGFR	3970-4030	94500 GALS	135000 LBS SAND	FBRKP:	
RATE: 52B/MIN	ADDTV:	STAGES:	1000 PSI		
TP: 55	CP:	SITP:	SICP:	CAOF: MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
6040JAM 486 604FRLD 1175 604PCCF 1644
604CHCR 2274 604CLFH 3224 604MENF 3330
604PNLK 3970 603MNCS 4196

FORMATION BASES: (Base & Depth)

6040JAM 575

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

LOG SURVEYS:

#	GR	#	#	CORL	#
#	CORL	#	#	ILD	#
#	EL	#	#	DN	#
#	NEC	#	#	CA	#

OTHER WELL INFO:

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

FULL WELL REPORT FOR FAR WEST RESOURCES

API Nbr: 30045256120000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: UNION TEXAS PET Oper Code: 091214
Lease: CALVIN Well: 3 Lease Code:
Field: ARMENTA Field Code: 001300

T029N R011W SEC26 Spot: SE NE SW
FOOTAGES: 1722FSL 2209FWL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5556KB 5544GR RIG HT: Log Td:
Form@TD: 603GLLP

Other Depths: DRLR 5970 WSTD PBTD 5923 OLDTD
Permit: Proj Depth: 5940 Proj Form: 603GLLP

Status: OIL Spud Date: 04 29 1983
Hole Dir: VERTICAL Comp Date: 06 29 1983
Numeric Class: INL-6 FNL-1
Alpha Class: INL-D FNL-DO
Prod Form: 603GLLP

Latitude: 36.69442 Source: USGS NAD27 Longitude: 107.96165

CASING:
9 5/8 @ 314 W/ #SX
7 @ 5155 W/ #SX

LINER: 4 1/2" # 4939- 5967 W/ # SX

Contr: FOUR CORNERS DRLG Tools: ROTARY RIG Nbr: 9

INITIAL POTENTIAL TESTS:

IPP	30BOPD 278MCFD		CUT %	/64CK	HRS
603GLLP	PERF		16/IT	5295-5870	GROSS
PERF	5295-5618	5673-5870	-	-	
ACID	5673-5870	1200 GALS	FBRKP:		
RATE: B/MIN	ADDTV:	STAGES:	15% HCL		
SFFR	5673-5870	138677 GALS	85000 LBS SAND	FBRKP:	
ACID	5295-5618	2500 GALS	FBRKP:		
RATE: B/MIN	ADDTV:	STAGES:	15% HCL		
SFFR	5295-5618	139330 GALS	200000 LBS SAND	FBRKP:	
GTY: 40.0	GOR: 9267	COND:	B/MMCF		

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
6040JAM 550 604KRLD 660 604PCCF 1720
604CLFH 3410 604PNLK 4030 603MNCS 4210
603GLLP 5290

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

FULL WELL REPORT FOR FAR WEST RESOURCES

API Nbr: 30045245720000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: SUPRON ENERGY Oper Code: 081740
Lease: CONGRESS Well: 9 Lease Code:
Field: BLOOMFIELD Field Code: 010000

T029N R011W SEC26 Spot: NW SE SW
FOOTAGES: 800FSL 1725FWL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5606KB 5595GR RIG HT: Log Td: 2962
Form@TD: 604CHCR

Other Depths: DRLR 2960 WSTD PBTD 2927 OLDTD
Permit: Proj Depth: 2930 Proj Form: 604CHCR

Status: GAS Spud Date: 03 01 1981
Hole Dir: VERTICAL Comp Date: 04 15 1981
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 604CHCR

Latitude: 36.69189 Source: USGS NAD27 Longitude: 107.96327

CASING:
7 5/8 @ 216 W/ 75SX
2 7/8 @ 2959 W/ 550SX

Contr: AZTEC Tools: ROTARY RIG Nbr: 56

INITIAL POTENTIAL TESTS:

IPF	1122MCFD		CUT %	/64CK	3HRS
604CHCR	PERF		/	2746-2869	GROSS
PERF	2746-2746	2748-2748	2750-2750	2753-2753	
PERF	2756-2756	2840-2840	2846-2846	2849-2849	
PERF	2851-2851	2865-2865	2867-2867	2869-2869	
ACID	2746-2869	500 GALS	FBRKP:		
RATE: B/MIN	ADDTV: HCL	STAGES:	7 1/2%		
SFFR	2746-2869	47500 GALS	60000 LBS SAND	FBRKP:	
RATE: 20B/MIN	ADDTV:	STAGES:	20/40 SD		
TP:	CP: 83	SITP:	SICP: 922	CAOF: 1135 MCFD	
	FPCAOF: MCFD	ATP: 3800	ISP: 1600		

NARRATIVE: ACIDIZED W/10 BALL SEALERS
10 MIN/1400 PSI

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
6040JAM 568 604FRLD 1480 604PCCF 1750
604CHCR 2735

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

LOG SURVEYS:

00218-02962 IL # # DNC #
GR

OTHER WELL INFO:

DRILLING FLUIDS
TYPE DEPTH:
DEPTH,WT: 2960 8.6

DEVIATION DATA:

Meas. Depth	Drift Angle	Meas. Depth	Drift Angle	Meas. Depth	Drift Angle
220	000.30	775	000.50	1335	001.50
2450	000.70				

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

LOG SURVEYS:

00314-05960	ILSF	#	00314-05951	NEC	#
00314-05951	DNC	#	05156-05969	TM	#
05156-05960	ILSF	#	#	NEC	#
#	DN	#	#	TM	#

OTHER WELL INFO:

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 159

API Nbr: 30045120030000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: SOUTHERN UNION PROD Oper Code: 081740
Lease: CALVIN Well: 1 Lease Code:
Field: BASIN Field Code: 003000

T029N R011W SEC26 Spot: SW SW
FOOTAGES: 1190FSL 1150FWL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5588DF RIG HT: Log Td:
Form@TD: 602DKOT

Other Depths: DRLR 6450 WSTD PBTD 6414 OLDTD

Status: GAS Spud Date: 10 24 1962
Hole Dir: VERTICAL Comp Date: 12 02 1962
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 602DKOT

Latitude: 36.69296 Source: USGS NAD27 Longitude: 107.96525

CASING:
10 3/4 @ 265 W/ 225SX
4 1/2 @ 6450 W/ 459SX

Contr: GARDNER Tools: RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	5931MCFD		CUT %	48/64CK	HRS
602DKOT	PERF		1/FT	6176-6348	GROSS
PERF	6176-6176	6184-6184	6196-6196	6210-6210	
PERF	6204-6204	6211-6211	6258-6258	6262-6262	
PERF	6268-6268	6272-6272	6275-6275	6284-6284	
PERF	6289-6289	6295-6295	6336-6336	6339-6339	
PERF	6342-6342	6345-6345	6348-6348	-	
SDFR	6176-6348		FBRKP:		
TP:	CP:	SITP:	SICP: 1934	CAOF: MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
604PCCF 1750 604CLFH 3320 604PNLK 4100
603GLLP 5315 603GRNR 6070 603GRRS 6134
602DKOT 6175

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

OTHER WELL INFO:

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 165

API Nbr: 30045240840000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: AMOCO PROD Oper Code: 065005
Lease: DAVIS GAS COM-F Well: 1-E Lease Code:
Field: BASIN Field Code: 003000

T029N R011W SEC27 Spot: NW SE NE
FOOTAGES: 1490FNL 1110FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5509GR RIG HT: Log Td:
Form@TD: 602DKOT

Other Depths: DRLR 6386 WSTD PBTD 6310 OLDTD
Permit: Proj Depth: 6430 Proj Form: 602DKOT

Status: 2 GAS Spud Date: 09 07 1980
Hole Dir: VERTICAL Comp Date: 02 25 1981
Numeric Class: INL-6 FNL-5
Alpha Class: INL-D FNL-DG
Prod Form: 604CHCR 603GRRS

Latitude: 36.69996 Source: USGS NAD27 Longitude: 107.97305

CASING:
8 5/8 @ 300 W/ 300SX
5 1/2 @ 6386 W/ #SX

TUBING INFO: 1 1/4" @ 2808

Contr: ARAPAHOE Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	2472MCFD		CUT %	48/64CK	HRS
604CHCR	PERF		2/FT	2701-2810	
SFFR	2701-2810	125000 GALS	225000 LBS SAND	FBRKP:	
RATE: 9B/MIN	ADDTV:	STAGES:			
TP: 192	CP:	SITP:	SICP:	CAOF: MCFD	
IPF	391MCFD		CUT %	48/64CK	HRS
603GRRS	PERF		2/FT	6163-6170	GROSS
602DKOT	PERF		2/FT	6224-6262	GROSS
PERF	6163-6170	6224-6262	-	-	
ACID	6163-6262	17262 GALS	FBRKP:		
RATE: B/MIN	ADDTV: KCL	STAGES:	2%		
SGFR	6163-6262	64000 GALS	257000 LBS SAND	FBRKP:	
RATE: 31B/MIN	ADDTV:	STAGES:			
TP: 22	CP:	SITP:	SICP:	CAOF: MCFD	

NARRATIVE: COMMINGLED

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG

604KRLD 1464	604PCCF 1704	604CHCR 2692
604MVRD 3272	603MNCS 4292	603GLLP 5882
603GRNR 6046	603GRRS 6160	602DKOT 6222

5½" CEMENT VOLUMES?

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 172

API Nbr: 30045078250000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: PAN AMERICAN PETROLEUM Oper Code: 065005
Lease: DAVIS GAS UNIT-F Well: 1 Lease Code: 796
Field: BASIN Field Code: 003000

T029N R011W SEC27 Spot: SW NE SE
FOOTAGES: 1850FSL 1190FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5565KB 5554GR RIG HT: Log Td: 6365
Form@TD: 602DKOT

Other Depths: DRLR 6365 WSTD PBTD 6332 OLDTD
Permit: Proj Depth: 6400 Proj Form: 602DKOT

Status: GAS Spud Date: 10 04 1960
Hole Dir: VERTICAL Comp Date: 11 07 1960
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 602DKOT

Latitude: 36.69477 Source: USGS NAD27 Longitude: 107.97325

CASING:
8 5/8 @ 332 W/ 225SX
4 1/2 @ 6365 W/ 375SX

TUBING INFO: 2" @ 6189

Contr: BRINKERHOFF DRLG Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	4490MCFD		CUT %	48/64CK	3HRS
602DKOT	PERF		6/FT	6215-6240	GROSS
PERF	6215-6219	6227-6229	6236-6240	-	
SWFR	6215-6240	40000 GALS	40000 LBS SAND	FBRKP: 1500	
RATE: 39B/MIN	ADDTV:	STAGES:	TREAT PRESS 2500		
TP: 407	CP:	SITP:	SICP: 2089	CAOF: 5083 MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
604PCCF 1716 603GLLP 5304 603GRNR 6060
602DKOT 6156

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

PTF	3477MCFD		CUT %	48/64CK	3HRS
602DKOT	PERF		6/FT	6215-6240	GROSS
PERF	6215-6219	6227-6229	6236-6240	-	
SWFR	6215-6240	40000 GALS	40000 LBS SAND	FBRKP: 1500	
RATE: 39B/MIN	ADDTV:	STAGES:	TREAT PRESS 2500		

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 174

API Nbr: 30045235540000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: AMOCO PROD Oper Code: 065005
Lease: DAVIS GAS COM-G Well: 1 Lease Code:
Field: BLOOMFIELD Field Code: 010000

T029N R011W SEC27 Spot: SW NE SE
FOOTAGES: 1805FSL 1135FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5554GR RIG HT: Log Td:
Form@TD: 604CHCR

Other Depths: DRLR 2951 WSTD PBTD 2890 OLDTD
Permit: Proj Depth: 2950 Proj Form: 604CHCR

Status: GAS Spud Date: 10 11 1979
Hole Dir: VERTICAL Comp Date: 12 18 1979
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 604CHCR

Latitude: 36.69465 Source: USGS NAD27 Longitude: 107.97306

CASING:
8 5/8 @ 295 W/ 350SX
4 1/2 @ 2951 W/ 825SX

TUBING INFO: 2 3/8" @ 2853

Contr: LAMA Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	3570MCFD		CUT %	48/64CK	HRS
604CHCR	PERF		/	2827-2839	GROSS
PERF	2827-2833	2835-2839	-	-	
SWFR	2827-2839	53125 GALS	100000 LBS SAND	FBRKP:	
TP: 280	CP: 580	SITP:	SICP:	CAOF: 4949 MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
604FRLD 1510 604PCCF 1688 604CHCR 2350

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

LOG SURVEYS:

#	DNC	#	#	NE	#
#	IL	#			

OTHER WELL INFO:

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 203

API Nbr: 30045256570000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: UNION TEXAS PET Oper Code: 091214
Lease: CONGRESS Well: 16 Lease Code:
Field: UNNAMED Field Code: 099999

T029N R011W SEC34 Spot: C NE NE
FOOTAGES: 660FNL 660FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5609KB 5595GR RIG HT: Log Td: 6183
Form@TD: 603GLLP

Other Depths: DRLR 6200 WSTD PBTD 6160 OLDTD
Permit: Proj Depth: 6200 Proj Form: 603GLLP

Status: OIL Spud Date: 05 07 1983
Hole Dir: VERTICAL Comp Date: 07 04 1983
Numeric Class: INL-6 FNL-1
Alpha Class: INL-D FNL-DO
Prod Form: 603GLLP

Latitude: 36.68788 Source: USGS NAD27 Longitude: 107.97139

CASING:
9 5/8 @ 306 W/ #SX
7 @ 5200 W/ #SX

LINER: 4 1/2" # 5016- 6200 W/ # SX

Contr: ARAPAHOE DRLG Tools: ROTARY RIG Nbr: 10

INITIAL POTENTIAL TESTS:

IPP	20BOPD	262MCFD	3BW	CUT %	/64CK HRS
603GLLP	PERF			/	5328-6148 GROSS
PERF	5328-5688		5764-5916	6086-6148	-
ACID	6086-6148		10000 GALS	FBRKP:	
RATE: B/MIN	ADDTV:		STAGES:	15% HCL	
ACFR	6086-6148		13000 GALS	FBRKP:	
RATE: B/MIN	ADDTV:		STAGES:	20% HCL	
ACID	5764-5916		4000 GALS	FBRKP:	
RATE: B/MIN	ADDTV:		STAGES:	15% HCL	
SFFR	5764-5916		82960 GALS	70000 LBS SAND FBRKP:	
ACID	5328-5688		3000 GALS	FBRKP:	
RATE: B/MIN	ADDTV:		STAGES:	15% HCL	
TP: 40	CP: 139		SITP:	SICP:	CAOF: MCFD
GTY: 42.0	GOR: 13100		COND:	B/MMCF	

NARRATIVE: PERFD 5328-5688 W/24 IT, 5764-5916 W/16 IT, 6086-6148 W/25 IT

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
6040JAM 520 604KRLD 720 604FRLD 1450
604PCCF 1750 604LWIS 1810 604CHCR 2340
604CLFH 3330 604PNLK 4080 603MNCS 4300

CEMENT VOLUMES ?

603GLLP 5318

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

LOG SURVEYS:

#	DNC	#	#	NEC	#
#	GR	#	#	ILD	#
00308-05151	ILDL	#	05194-06182	ILDL	#

OTHER WELL INFO:

BHT: 122 F @ 5152 TIME.SINCE.CIRC 3 LOG: ILDL RUN: 1
BHT: 156 F @ 6183 TIME.SINCE.CIRC 4 LOG: ILDL RUN: 2
DRILLING FLUIDS
TYPE DEPTH:
DEPTH,WT: 5152 9.4
TYPE DEPTH:
DEPTH,WT: 6183 9.0

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 216

API Nbr: 30045076720000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: SOUTHERN UNION PROD Oper Code: 081740
Lease: CONGRESS Well: 5 Lease Code: 803
Field: BASIN Field Code: 003000

T029N R011W SEC34 Spot: SW NE
FOOTAGES: 2510FNL 1570FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 6619DF 6610GR RIG HT: Log Td: 6470
Form@TD: 553MRSN

Other Depths: DRLR WSTD PBTD 6430 OLDTD
Permit: Proj Depth: 6475 Proj Form: 602DKOT

Status: GAS Spud Date: 09 05 1962
Hole Dir: VERTICAL Comp Date: 10 18 1962
Numeric Class: INL-6 FNL-2
Alpha Class: INL-D FNL-DG
Prod Form: 602DKOT

Latitude: 36.68279 Source: USGS NAD27 Longitude: 107.97451

CASING:
8 5/8 @ 285 W/ 200SX
4 1/2 @ 6462 W/ 610SX

TUBING INFO: 2" @ 6275

Contr: ASPEN DRLG Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

IPF	6306MCFD		CUT %	48/64CK	3HRS
602DKOT	PERF		4/FT	6171-6380	GROSS
PERF	6171-6179	6190-6204	6250-6286	6340-6380	
SWFR	6340-6380	50000 GALS	40000 LBS SAND	FBRKP: 1000	
RATE: 43B/MINADDTV:		STAGES:	TREAT PRESS 2200		
SWFR	6250-6286	64000 GALS	60000 LBS SAND	FBRKP: 1200	
RATE: 49B/MINADDTV:		STAGES:	TREAT 2600-2000		
SWFR	6171-6204	27500 GALS	25000 LBS SAND	FBRKP: 800	
RATE: 40B/MINADDTV:		STAGES:	TREAT 3100-2400		
TP: 522	CP: 1213	SITP: 2016	SICP: 2024	CAOF: 8844 MCFD	

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG

604PCCF 1720	604CLFH 3290	604PNLK 4060
603GLLP 5308	603GRNR 6080	603GRRS 6128
602DKOT 6170	553MRSN 6450	

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

D&A (PLUGGED WELLS)

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 171

API Nbr: 30045078120000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: UMBARGER F B TRUSTEE Oper Code: 099999
Lease: DAVIS POOLED Well: 1 Lease Code: 4570
Field: FULCHER KUTZ Field Code: 028000

T029N R011W SEC27 Spot: SW NE SE
FOOTAGES: 1650FSL 990FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5564GR RIG HT: Log Td:
Form@TD: 604PCCF

Other Depths: DRLR 1804 WSTD PBTD OLDTD
Permit: Proj Depth: Proj Form: 604PCCF

Status: D&A Spud Date: 12 10 1952
Hole Dir: VERTICAL Comp Date: 03 15 1953
Numeric Class: INL-6 FNL-0
Alpha Class: INL-D FNL-D

Latitude: 36.69422 Source: USGS NAD27 Longitude: 107.97256

CASING:
5 1/2 @ 1717 W/ #SX

Contr: Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
604PCCF 1710

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

PTS	OBO OMCFD		CUT %	/64CK	HRS
604PCCF	OPENHOLE		/	1727-1790	
XPLO	1727-1790	140 QTS	FBRKP:		
XPLO	1732-1790	78 QTS	FBRKP:		

OTHER WELL INFO:

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

(Form C-103)
(Revised 7/1/52)

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

MISCELLANEOUS REPORTS ON WELLS

Submit this report in TRIPLICATE to the District Office, Oil Conservation Commission, within 10 days after the work specified is completed. It should be signed and filed as a report on Beginning Drilling Operations, Results of test of casing shut-off, result of plugging of well, result of well repair, and other important operations, even though the work was witnessed by an agent of the Commission. See additional instructions in the Rules and Regulations of the Commission.

Indicate Nature of Report by Checking Below

REPORT ON BEGINNING DRILLING OPERATIONS		REPORT ON RESULT OF TEST OF CASING SHUT-OFF		REPORT ON REPAIRING WELL	
REPORT ON RESULT OF PLUGGING WELL	X	REPORT ON RECOMPLETION OPERATION		REPORT ON (Other)	

March, 17, 1953 (Date) Aztec, New Mexico (Place)

Following is a report on the work done and the results obtained under the heading noted above at the

Umberger Trustee (Company or Operator) Umberger Trustee Davis #1 (Lease)

F. B. Umberger (Contractor), Well No. 1 in the SE¼ ¼ of Sec. 27

T. 29N, R. 11W, NMPM., Pooled Unit Pool, San Juan County.

The Dates of this work were as folows: 3/17/53 to 3/25/53

Notice of intention to do the work (was) (~~was not~~) submitted on Form C-102 on December 10 (Cross out incorrect words), 19 53,

and approval of the proposed plan (was) (~~was not~~) obtained.

DETAILED ACCOUNT OF WORK DONE AND RESULTS OBTAINED

We run 2" tubing to a depth of 1740' and poured 50 sacks of cement into the Pictured Cliff Sands which would fill all open holes. Then we pulled 960' of 5½" casing, filling the hole with drilling mud as we came up. After 5½" casing was removed we used 17 sacks of cement, filling the top and setting 4" Marker as required by law.

I, hereby, request that the Bond on this job be released.

Witnessed by F. B. Umberger (Name) F. B. Umberger Trustee (Company) Trustee (Title)

Approved:
OIL CONSERVATION COMMISSION

Eugene C. Chenault (Name)

Inspector Dist. #3. (Title) 7-10-53 (Date)

I hereby certify that the information given above is true and complete to the best of my knowledge.

Name F. B. Umberger

Position Trustee

Representing F. B. Umberger Trustee

Address Box 878, Aztec, New Mexico

(VI.) D&A Plugged Well Schematic

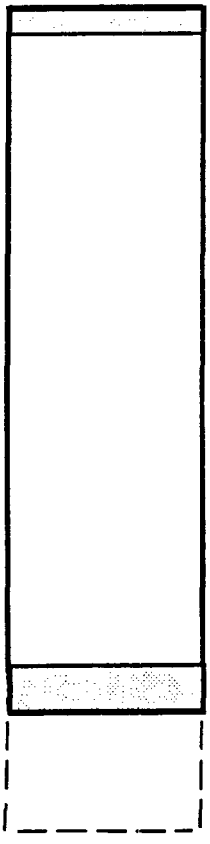
Well: Davis Pooled No. 1

Operator: Umbarger F B Trustee
Location: 1I27 29N11W; San Juan County, NM
Date Completed: 03-15-53
Date D&A: 03-25-53
Pool: Dry hole (Pictured Cliffs)

Plugging Operations

GR - 5564'

Completion Operations



4' dry hole marker
17 sx cement plug at surface

XXX
Surface Casing

Set at XXX'

Pulled 960' of 5-1/2" Csg.
Filled hole with drill mud

5-1/2"
Production String

50 sx plug at 1740'

Set at 1717' with X sx cement

Open Hole1727' - 1790'

TD 1804'

"Well completed in lower Pictured Cliffs"

FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 146

API Nbr: 30045077760000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: BIG CHIEF WESTERN Oper Code: 099999
Lease: DAVIS Well: 1 Lease Code: 4570
Field: FULCHER KUTZ Field Code: 028000

T029N R011W SEC26 Spot: NE SW SW

Oper Elev: 5590DF RIG HT: Log Td:
Form@TD: 604PCCF

Other Depths: DRLR 1870 WSTD PBTD OLDTD
Permit: Proj Depth: Proj Form: 604PCCF

Status: D&A Spud Date: 04 18 1950
Hole Dir: VERTICAL Comp Date: 10 25 1950
Numeric Class: INL-6 FNL-0
Alpha Class: INL-D FNL-D

Latitude: 36.69239 Source: USGS NAD27 Longitude: 107.96585

CASING:
8 5/8 @ 86 W/ #SX
5 1/2 @ 1758 W/ #SX

Contr: Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

FORMATION TOPS: (Source,Names,Depths,Shows)

DLR
604PCCF 1750

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

PTF	OBO		CUT %	/64CK	HRS
604PCCF	OPENHOLE		/	1762-1827	
XPLO	1762-1827	320 QTS	FBRKP:		

OTHER WELL INFO:

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

NEW MEXICO OIL CONSERVATION COMMISSION

FORM C-103
(Rev 3-55)

MISCELLANEOUS REPORTS ON WELLS

(Submit to appropriate District Office as per Commission Rule 1106)

Name of Company	Address
Big Chief Western and Al Greer	

Lease	Well No.	Unit Letter	Section	Township	Range
Davis	1	M	26	29 North	11 West

Date Work Performed	Pool	County
see below	Fulcher-Kutz PC	San Juan County

THIS IS A REPORT OF: *(Check appropriate block)*

- [ ] Beginning Drilling Operations
- [ ] Casing Test and Cement Job
- [ ] Other *(Explain)*:
- [X] Plugging
- [ ] Remedial Work

Detailed account of work done, nature and quantity of materials used, and results obtained.

Commenced operation for plugging of the Davis #1 well 11-7-58. Completed plugging operation 11-11-58. Work performed as follows:

11-8-58 - Shot pipe at 1408' & 1198'
11-9-58 - Shot pipe at 1017', 927' & 823' - pulled pipe at 150'
11-10-58- Screwed back in pipe with die nipple at 150'. Shot pipe at 744' and recovered same at that point. Pipe had previously been shot by some other company at 300'but they had failed to shot pipe off.
11-11-58- Pumped in 35 sks cement on top of nub at 744'
pumped in 10 sks cement in top of 9 5/8"surface pipe and placed 4" dry hole marker, leaving 4' above ground level.

RECEIVED
NOV 14 1958
OIL CONSERVATION COMMISSION

Witnessed by	Position	Company

FILL IN BELOW FOR REMEDIAL WORK REPORTS *ONLY*

ORIGINAL WELL DATA

D F Elev.	T D	P B T D	Producing Interval	Completion Date

Tubing Diameter	Tubing Depth	Oil String Diameter	Oil String Depth

Perforated Interval(s)

Open Hole Interval	Producing Formation(s)

RESULTS OF WORKOVER

Test	Date of Test	Oil Production BPD	Gas Production MCFPD	Water Production BPD	GOR Cubic feet/Bbl	Gas Well Potential MCFPD
Before Workover						
After Workover						

OIL CONSERVATION COMMISSION

Approved by
Original Signed Emery C. Arnold

Title Supervisor Dist. # 3

Date NOV 18 1958

I hereby certify that the information given above is true and complete to the best of my knowledge.

Name Al Greer (Owner)

Position

Company

(Form C-102)
(Revised 7/1/52)

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

MISCELLANEOUS NOTICES

Submit this notice in TRIPLICATE to the District Office, Oil Conservation Commission, before the work specified is to begin. A copy will be returned to the sender on which will be given the approval, with any modifications considered advisable, or the rejection by the Commission or agent, of the plan submitted. The plan as approved should be followed, and work should not begin until approval is obtained. See additional instructions in the Rules and Regulations of the Commission.

Indicate Nature of Notice by Checking Below

Notice of Intention to Change Plans		Notice of Intention to Temporarily Abandon Well		Notice of Intention to Drill Deeper	
Notice of Intention to Plug Well	X	Notice of Intention to Plug Back		Notice of Intention to Set Liner	
Notice of Intention to Squeeze		Notice of Intention to Acidize		Notice of Intention to Shoot (Nitro)	
Notice of Intention to Gun Perforate		Notice of Intention (Other)		Notice of Intention (Other)	

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Aztec, New Mexico (Place) 5 November 1958 (Date)

Gentlemen:

Following is a Notice of Intention to do certain work as described below at the Big Chief Western and Al Greer (Company or Operator) Davis Well No. 1 in M (Unit)

SW ¼ SW ¼ (40-acre Subdivision) of Sec. 26, T. 29N, R. 11W NMPM., Fulcher-Kutz PC Pool

San Juan County.

FULL DETAILS OF PROPOSED PLAN OF WORK
(FOLLOW INSTRUCTIONS IN THE RULES AND REGULATIONS)

This well originally drilled in 1950 by M. J. Florence and later transferred to Big Chief Western and Al Greer. Well was completed in Pictured Cliffs SS for 100 MCFPD and has been temporarily abandoned since completion. 8 3/4" csg was set at 86' and cemented with 55 sks. 5½" csg was set at 1758 and cemented with 120 sks. Intend to set 50' cement plug across csg shoe and cut and pull 5½" csg. 50' cement plug will be set across top of 5½" csg after cutting. 50' plug will be set at 600'. 10 sks cement plug will be set in top of surface csg and 4" marker 4' high installed. Location will be leveled.

RECEIVED
NOV 13 1958
OIL CON. COM.
DIST. 3

Approved NOV 18 1958, 19
Except as follows:

Al Greer
Company or Operator

By

Position Owner

Send Communications regarding well to:

Name United Casing Pullers Inc

Address % F O Barnett Pres
Box 2055 Farmington

Approved
OIL CONSERVATION COMMISSION

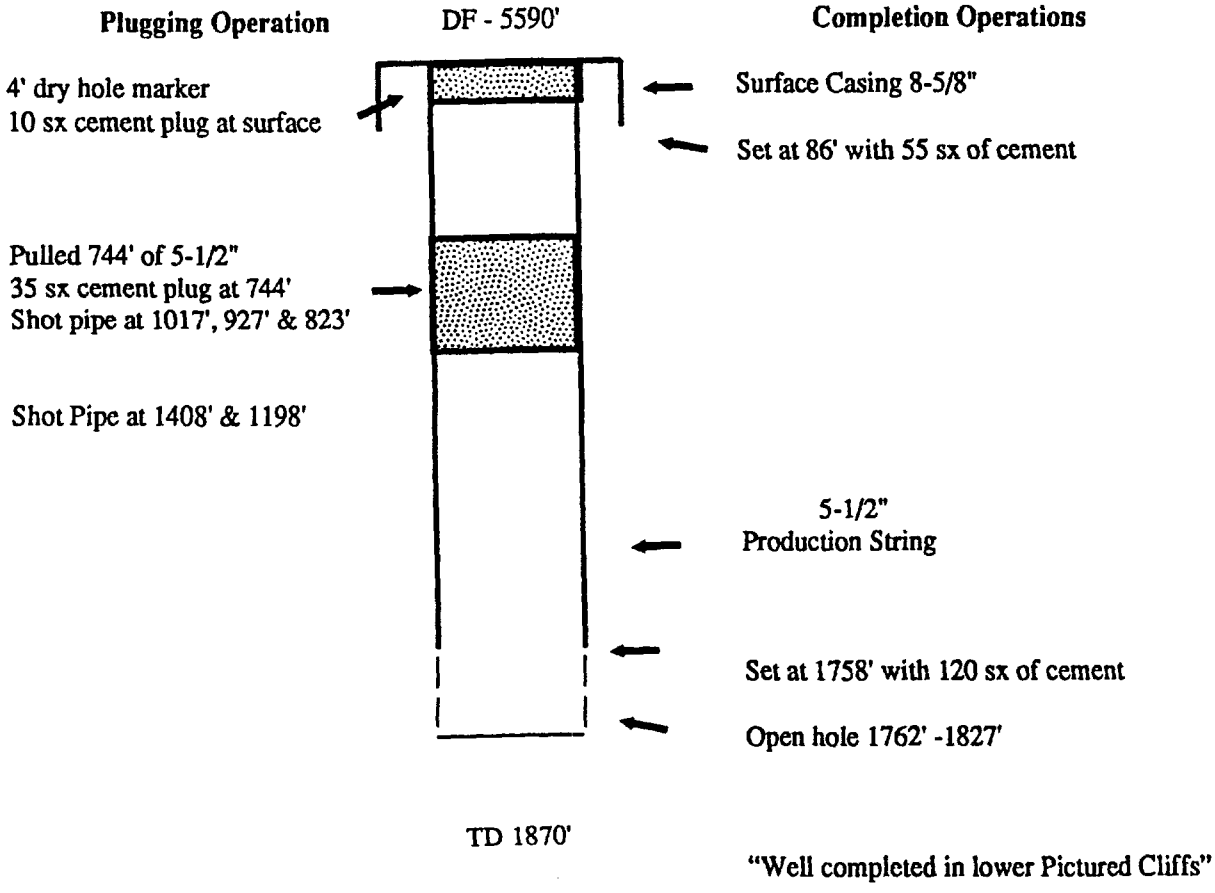
By Original Signed Emery C. Arnold

Title Supervisor Dist. # 3

(VI.) D&A Plugged Well Schematic

Well: Davis No. 1

Operator: Big Chief Western and Al Greer
Location: 1M26 29N11W; San Juan County, NM
Date Completed: 10-25-50
Date D&A: 11-11-58
Pool: Fulcher Kutz (Pictured Cliffs Production)



FULL WELL REPORT FOR FAR WEST RESOURCES

CUST30 ********** JUN 05, 1992 12:49:14 ********** WELL 164

API Nbr: 30045078830000 State: NMEX County: SAN JUAN
Meridian: NEW MEXICO Meridn Code: 21
Province: SAN JUAN BASIN Prov Code: 202
Oper: UMBARGER F B TRUSTEE Oper Code: 099999
Lease: DAVIS P U Well: 2 Lease Code: 4570
Field: FULCHER KUTZ Field Code: 028000

T029N R011W SEC27 Spot: NW SE NE
FOOTAGES: 1450FNL 1120FEL CNGRS T-R-SEC /FULL SEC

Oper Elev: 5509GR RIG HT: Log Td:
Form@TD: 604PCCF

Other Depths: DRLR 1804 WSTD PBTD OLDTD
Permit: Proj Depth: Proj Form: 604PCCF

Status: D&A Spud Date: 01 03 1953
Hole Dir: VERTICAL Comp Date: 09 03 1953
Numeric Class: INL-6 FNL-0
Alpha Class: INL-D FNL-D

Latitude: 36.70007 Source: USGS NAD27 Longitude: 107.97308

CASING:
8 1/4 @ 110 W/ #SX
5 1/2 @ 1717 W/ #SX

Contr: Tools: ROTARY RIG Nbr:

INITIAL POTENTIAL TESTS:

FORMATION TOPS: (Source,Names,Depths,Shows)

LOG
604FMNG 793 604PCCF 1710

CORE DESCRIPTIONS:

FORMATION TESTS:

PRODUCTION TESTS:

PTS	OBO OMCFD	CUT %	/64CK	HRS
604FMNG	PERF	/	1463-1483	
SWFR	1463-1483	FBRKP:		

OTHER WELL INFO:

*** Proposed Bottom Hole Location ***

*** Actual Bottom Hole Location ***

*** Horizontal Drilling Data ***

(Form C-103)
(Revised 7/1/52)

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

MISCELLANEOUS REPORTS ON WELLS

Submit this report in TRIPLICATE to the District Office, Oil Conservation Commission, within 10 days after the work specified is completed. It should be signed and filed as a report on Beginning Drilling Operations, Results of test of casing shut-off, result of plugging of well, result of well repair, and other important operations, even though the work was witnessed by an agent of the Commission. See additional instructions in the Rules and Regulations of the Commission.

Indicate Nature of Report by Checking Below

REPORT ON BEGINNING DRILLING OPERATIONS		REPORT ON RESULT OF TEST OF CASING SHUT-OFF		REPORT ON REPAIRING WELL	
REPORT ON RESULT OF PLUGGING WELL	X	REPORT ON RECOMPLETION OPERATION		REPORT ON (Other)	

August 25, 1955 (Date) Aztec, New Mexico (Place)

Following is a report on the work done and the results obtained under the heading noted above at the

Basin Natural Gas Corporation (Company or Operator) Umberger-Trustee (Lease)

F. B. Umberger (Contractor), Well No. 2 in the SE ¼ NE ¼ of Sec. 27,

T. 29-N, R. 11-W, NMPM., Pool, San Juan County.

The Dates of this work were as folows: August 18 and August 19, 1955

Notice of intention to do the work (was) (~~was not~~) submitted on Form C-102 on December 10 (Cross out incorrect words), 19 52

and approval of the proposed plan (was) (~~was not~~) obtained.

DETAILED ACCOUNT OF WORK DONE AND RESULTS OBTAINED

Shot off 775' of 5½" casing, pulling 34 joints. Plugged well with 20 ~~gumm~~ sacks of cement, 10 in the bottom and 10 in the top. Left 4' marker, 6' high.

It is hereby requested that the bond on this well be released.

RELEIVED
AUG 25 1955
OIL CON. COM.
DIST. 3

Witnessed by L. B. Vaught (Name) Basin Natural Gas Corp. (Company) Field-Supt.

Approved: OIL CONSERVATION COMMISSION

A. R. Kelly (Name)

PETROLEUM ENGINEER DIST. NO. 3 (Title) AUG 29 1955 (Date)

I hereby certify that the information given above is true and complete to the best of my knowledge.

Name M. Crawford

Position Asst. Treas

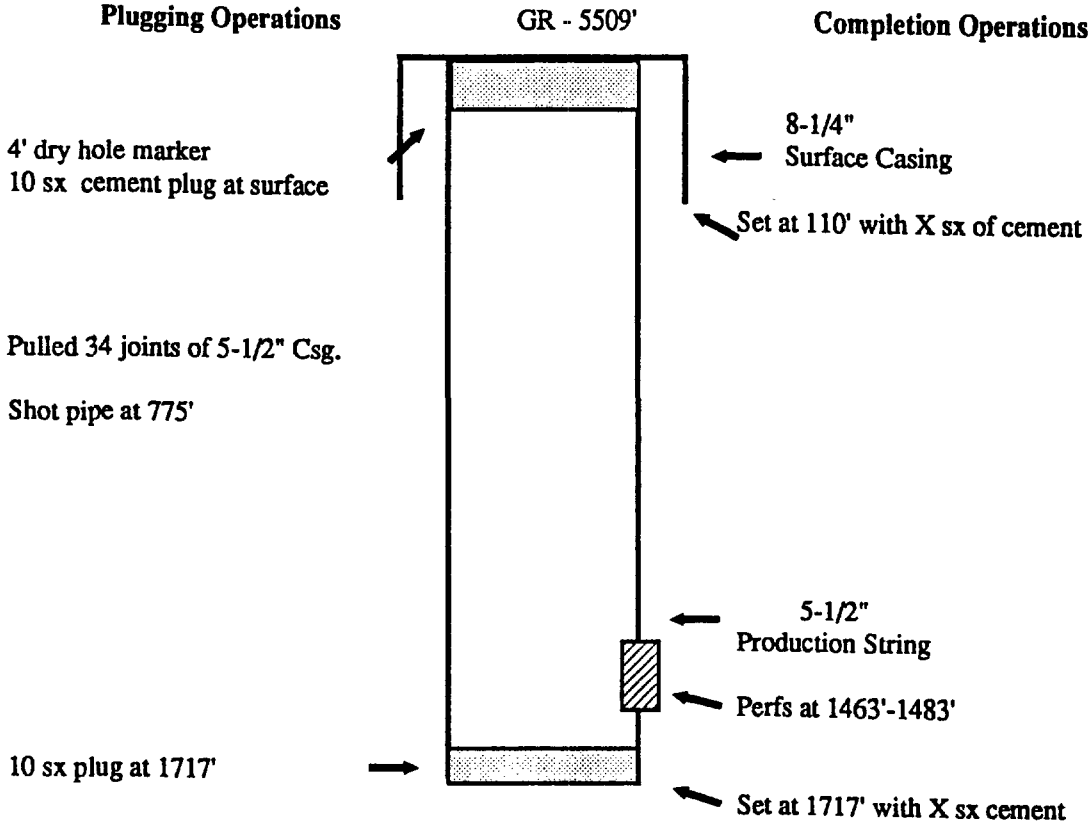
Representing Basin Natural Gas Corp.

Address 119 W. Chaco, Aztec, N.M.

(VI.) D&A Plugged Well Schematic

Well: Davis PU No. 2

Operator: Umbarger F B Trustee
Location: 2H27 29N11W; San Juan County, NM
Date Completed: 09-03-53
Date D&A: 08-25-55
Pool: Dry hole (Pictured Cliffs)



TD 1804'

"Well completed in lower Pictured Cliffs"

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

WATER WELLS

1 MILE RADIUS

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Author R. Carpenter Owner's Well No. 1

Street or Post Office Address 700 South Tuner Box 16

City and State Bloomfield N.M.

Well was drilled under Permit No. SJ-1974 and is located in the:

a. ___ ¼ ___ ¼ ___ ¼ ___ ¼ of Section 22 Township 29N Range 11W N.M.P.M.

b. Tract No. ___ of Map No. ___ of the ___

c. Lot No. 2 of Block No. 4 of the Southside Addition Subdivision, recorded in San Juan County.

d. X= ___ feet, Y= ___ feet, N.M. Coordinate System ___ Zone in the ___ Grant.

(B) Drilling Contractor Brown's Drilling Co. License No. WD-1084

Address P.O. Box 273 Farm.

Drilling Began June 21-85 Completed June 24-85 Type tools Cable Size of hole 6 in.

Elevation of land surface or ___ at well is ___ ft. Total depth of well 47 ft.

Completed well is ☑ shallow ☐ artesian. Depth to water upon completion of well 11 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
27'	29'	2'	Brown Sand, some blue Clay	13 GPM

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6"	18.97	welded			30'		27'	31'
5"	Sch. 40	PVC	30'	47'	17'		30'	47'

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

85 JUL 22 AM 8:16
ALBUQUERQUE, N. MEX.
STATE ENGINEER OFFICE

Section 5. PLUGGING RECORD

Plugging Contractor ___

Address ___

Plugging Method ___

Date Well Plugged ___

Plugging approved by:

___
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received July 22, 1985

Quad ___ FWL ___ FSL ___

File No. SJ-1974 Use domestic Location No. 29N.11W.22.433 (San Juan

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well ~~Walter N. Wampler~~ Owner's Well No. ______
Street or Post Office Address ~~Box 2336~~
City and State ~~Bloomfild~~ ~~Bloomfield, N.Mex.~~

Well was drilled under Permit No. SJ- 696 and is located in the:

a. ______ ¼ SW ¼ SE ¼ ______ ¼ of Section 22 Township 29N. Range 11 W. N.M.P.M.

b. Tract No. ______ of Map No. ______ of the ______

c. Lot No. 14 of Block No. 2 of the Bloomfield Southside Addition
Subdivision, recorded in San Juan County.

d. X= ______ feet, Y= ______ feet, N.M. Coordinate System ______ Zone in the ______ Grant.

(B) Drilling Contractor WILLIAM J. [illegible] License No. WD-717

Address [illegible]

Drilling Began 6/27/73 Completed 7/1/ 73 Type tools CableTool Size of hole 6 in.

Elevation of land surface or ______ at well is 5300 ft. Total depth of well 34 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 12 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
24	34	10	WaterBearing Sand& Gavel	15

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
6	.139		0	34	34	Drive Shoe	2[illegible]	34

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

8 JUL 17 A 8:10 [stamp: STATE ENGINEER OFFICE ALBUQUERQUE, N. MEX.]

Section 5. PLUGGING RECORD

Plugging Contractor ______
Address ______
Plugging Method ______
Date Well Plugged ______
Plugging approved by:

______
State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 7/3/78

Quad ______ FWL ______ FSL ______

File No. RG-696 Use Dom. Location No. 29N.11W.22 430
San Juan Co.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Martin and Claire Gilbert Owner's Well No. 1
Street or Post Office Address 309 S. Johnson
City and State Bloomfield, N.M. 87413

Well was drilled under Permit No. SJ-2138 and is located in the:

a. NE ¼ SE ¼ ¼ ¼ of Section 22 Township 29N Range 11W N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. 6 of Block No. 5 of the Turner, No.2 Subdivision, recorded in San Juan County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Chivers Drilling Co. License No. WD-809
Address P.O. Box 663 Bloomfield N.M. 87413

Drilling Began 6-24-87 Completed 6-25-87 Type tools Cabletool Size of hole 7" in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 40' ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 7' ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
34	39	5	River Rocks	7gpm

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
3"	15 lbs.	welded	0	40	40	standerd	35	39

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

STATE ENGINEER OFFICE
DISTRICT III
ALBUQUERQUE, N. MEX.
88 OCT 11 A 8:46

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 10-11-88

Quad _____ FWL _____ FSL _____

File No. SJ-2138 Use Dom Location No. 29N.11W.22.420

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Carroll W. Wooten Owner's Well No. _____
Street or Post Office Address Box 1841
City and State Bloomfield, N.M. 87413

Well was drilled under Permit No. SJ-2148 and is located in the:

a. S½ ● NE ¼ SE ¼ ¼ of Section 27 Township 29 N Range 11 W N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Bob Savage License No. WD-847
Address P.O. Box 2434 Farmington, NM. 87499

Drilling Began Oct-20-87 Completed Nov. 16-87 Type tools Rotary Size of hole 7 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 305 ft.

Completed well is ☑ shallow ☐ artesian. Depth to water upon completion of well 186 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
225	285	60	water Sand Mixed with Bentonite	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
7	21	welded			39½	None		
4	PVC				306	None	266	306

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

87 NOV 19 AM 8 52
STATE ENGINEER OFFICE
DISTRICT I
ALBUQUERQUE, N. MEX.

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received Nov 19, 1987.

Quad _____ FWL _____ FSL _____

File No. SJ-2148 Use Dom Location No. 29N.11W.27.SENWNE
(San Juan)

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

A) Owner of well Udd H. BRown Owner's Well No. #1
Street or Post Office Address Rt. #1 Box 248
City and State Aztec N.Mexico,

Well was drilled under Permit No. S.J. 700 and is located in the:

a. SW ¼ SW ¼ NW ¼ ¼ of Section 27 Township 29 N. Range 11 W. N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in San Juan County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor John C. Hargis License No. W.D. 724

Address Rt. #1 Box 260-B Aztec N. Mex.

Drilling Began July 9 Completed July 10 Type tools Cable Size of hole 7 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 20 ft.

Completed well is ☑ shallow ☐ artesian. Depth to water upon completion of well 7 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
10	20	10	Boulders & Sand	20

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
7	14	weld	0	20	20	Weld On Butler Larken	none	

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 7/13/78

Quad _____ FWL _____ FSL _____

File No. SJ-700 Use Dom. Location No. 29N.11W.27 133
San Juan Co.

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

Legals

LEGAL
NOTICE OF PUBLICATION

Intent to dispose of (non-hazardous) waste water sub-surface produced as a result of refining operations:

Bloomfield Refining Company, is requesting approval to construct and operate a Class I (Non-Hazardous) Injection well, on Bloomfield Refining Company property located at 50 Road 4900, NW/4, SE/4 and the S/2, NE/4 and the N/2, NE/4, SE/4 of Section 27, and the S/2, NW/4 and N/2, NW/4 SW/4 and the SE/4, NW/4, SW/4 and the NE/4 SW/4 of Section 28, Township 29 North, Range 11 West, N.M.P.M., San Juan County, New Mexico, for the purpose of refinery wastewater disposal.

The proposed injection interval is with in the Mesa Verde Group in the Cliff House and Mentefee formations. (3,200 to 3,600 feet). The average daily injection rate is expected to be 2228 Barrels per day. The surface injection pressure is estimated to be at or below 1800 psi.

Tierra Environmental Company, Inc. 909 West Apache, Farmington, New Mexico 87401 has been retained by Bloomfield Refining Company as the Project Permit Consultant. Questions regarding this notice should be directed to Phillip C. Nobis, Tierra Environmental Company, Inc. at the above address or call (505) 325-0924.

Interested parties must file objections or request for hearing with the Oil Conservation Division P.O. Box 2088, Santa Fe, New Mexico 87504 with in fifteen days.

Legal No 29949 published in the Farmington Daily Times Farmington, New Mexico on Wednesday, August 26, 1992.

August 27, 1992

Mr. Richard Farley, Engineering Manager
Meridian Oil
3535 East 30th Street
Farmington, New Mexico 87401

RE: NOTIFICATION UNDER OCD REGULATIONS OF APPLICATION FOR AUTHORITY TO INJECT:

Dear Mr. Farley:

Tierra Environmental Company, Inc., on behalf of Bloomfield Refining Company (BRC) of Bloomfield, New Mexico, has applied to the New Mexico Oil Conservation Division asking permission for BRC to construct and operate a Class I (Non-hazardous) Injection well and facilities. The well will be located on BRC property and used exclusively for disposal of their refinery wastewater stream. The operation will not be a commercial facility.

Pursuant to OCD Regulations, leasehold operators with in one-half mile of the proposed site are to be notified and furnished with a copy of the application (enclosed). Meridian Oil is one of the operators with in the area of review.

If you or Meridian Oil have any questions or require additional information, please call me at (505) 325-0924 or write to Tierra Environmental Company, Inc. 909 West Apache, Farmington, New Mexico 87401.

Please file comments with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87504-2088.

Thank you for your cooperation.

Sincerely,

Phillip C. Nobis
Vice President

August 27, 1992

Mr. Gary Munson, Operations Center Foreman
Amoco Production
200 Amoco Court
Farmington, New Mexico 87401

RE: APPLICATION FOR AUTHORIZATION TO INJECT, NOTIFICATION PURSUANT TO OCD REGULATIONS:

Dear Mr. Munson:

Tierra Environmental Company, Inc., on behalf of Bloomfield Refining Company (BRC), Bloomfield, New Mexico has applied to the State of New Mexico Oil Conservation Division asking authorization for BRC to construct and operate a Class I (Non-hazardous) Injection Well and facilities. The well will be located on Bloomfield Refinery property and used exclusively for disposal of their refinery wastewater stream. It will not be a commercial facility.

OCD regulations require that leasehold operators with in one-half mile of the site be notified by the applicant and furnished with a copy of the application. (enclosed) Amoco Production does have wells with in the half mile area of review.

If you or Amoco have any questions regarding the application or require additional information, please call me at (505) 325-0924 or write to Tierra Environmental Company, Inc., 909 West Apache, Farmington, New Mexico 87401.

Please direct any comments to the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501-2088.

Thank you for your cooperation.

Sincerely,

Phillip C. Nobis
Vice President

909 WEST APACHE
FARMINGTON, NEW MEXICO 87401

TELEPHONE (505) 325-0925
FAX (505) 327-3303

P 671 262 168

Certified Mail Receipt

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Richard Farley, Eng. Mgr	
Street & No.: Meridian Oil 3535 E 30th	
P.O., State & ZIP Code: Farmington NM 87401	
Postage	$1.90
Certified Fee	1.00
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$4.00
Postmark or Date	

PS Form 3800, June 1990

P 671 262 169

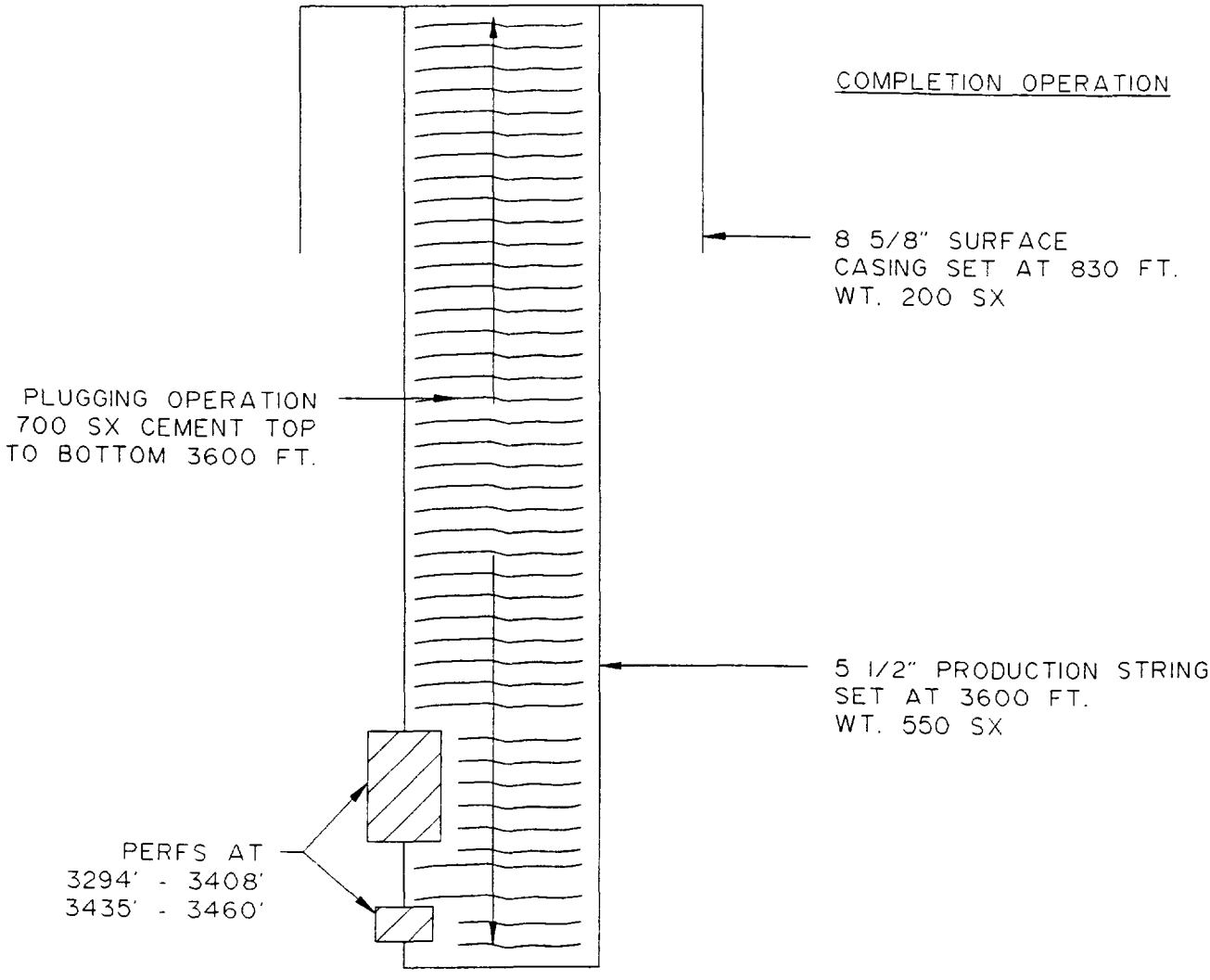
Certified Mail Receipt

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Operation Foreman Gary Munson	
Street & No.: Amoco Prod.	
P.O., State & ZIP Code	
Postage	$1.90
Certified Fee	1.00
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$4.00
Postmark or Date	

PS Form 3800, June 1990



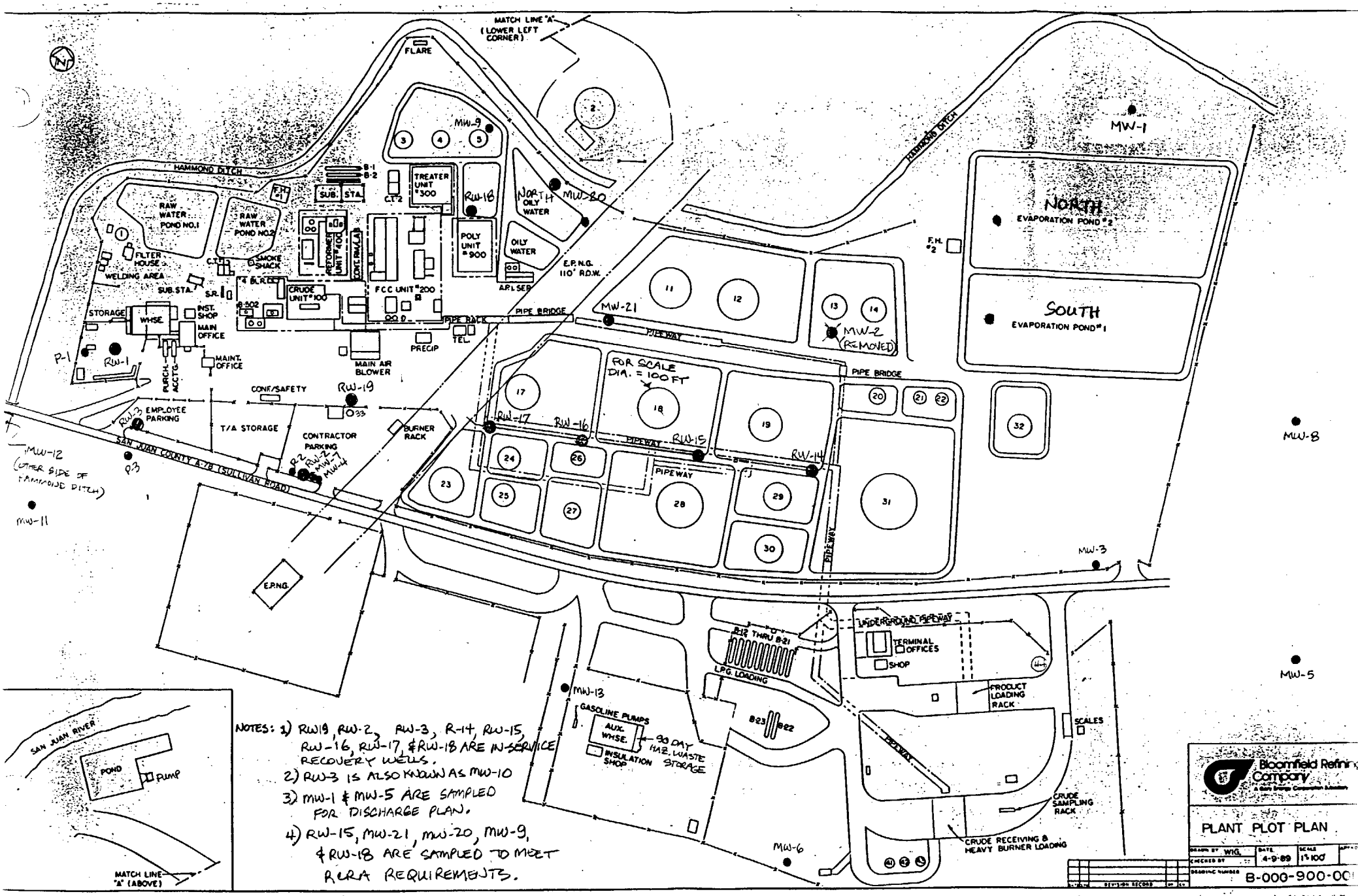
CLOSURE PLAN - CLASS I WELL (INJECTION)
BLOOMFIELD REFINING COMPANY BRC - 1

SUMMARY OF TOXICITY CHARACTERISTIC RESULTS OF BLOOMFIELD REFINERY WASTEWATER

7-30-92

	PARAMETER	UNITS	2 REGULATORY LIMITS	3 DETECTION LIMITS	4 NORTH OILY WATER POND DISCHARGE	5 SOUTH EVAPORATION POND	6 NORTH EVAPORATION POND
2	ARSENIC	mg/l	5.0	0.1	<0.1	<0.1	<0.1
3	BARIUM	mg/l	100.0	0.5	0.5	0.5	0.5
4	CADMIUM	mg/l	1.0	0.005	<0.005	<0.005	<0.005
5	CHROMIUM	mg/l	5.0	0.01	0.01	<0.01	<0.01
6	LEAD	mg/l	5.0	0.2	<0.2	<0.2	<0.2
7	MERCURY	mg/l	0.2	0.001	<0.001	<0.001	<0.001
8	SELENIUM	mg/l	1.0	0.1	<0.1	<0.1	<0.1
9	SILVER	mg/l	5.0	0.01	<0.01	<0.01	<0.01
12	1,1- DICHLOROETHENE	mg/l	0.7	0.02	ND	ND	ND
13	1,2- DICHLOROETHANE	mg/l	0.5	0.02	ND	ND	ND
14	2- BUTANONE	mg/l	200.0	0.1	ND	ND	ND
15	BENZENE	mg/l	0.5	0.02	ND	ND	ND
16	CARBON TETRACHLORIDE	mg/l	0.5	0.02	ND	ND	ND
17	CHLOROBENZENE	mg/l	100.0	0.02	ND	ND	ND
18	CHLOROFORM	mg/l	6.0	0.02	ND	ND	ND
19	TETRACHLOROETHENE	mg/l	0.7	0.02	ND	ND	ND
20	TRICHLOROETHENE	mg/l	0.5	0.02	ND	ND	ND
21	VINYL CHLORIDE	mg/l	0.2	0.02	ND	ND	ND
24	1,4- DICHLOROBENZENE	mg/l	7.5	0.02	ND	ND	ND
25	HEXACHLOROETHANE	mg/l	3.0	0.02	ND	ND	ND
26	NITROBENZENE	mg/l	2.0	0.02	ND	ND	ND
27	HEXACHLORO-1,3-BUTADIENE	mg/l	0.5	0.02	ND	ND	ND
28	2,4,6- TRICHLOROPHENOL	mg/l	2.0	0.02	ND	ND	ND
29	2,4,5- TRICHLOROPHENOL	mg/l	400.0	0.02	ND	ND	ND
30	2,4- DINITROTOLUENE	mg/l	0.13	0.02	ND	ND	ND
31	HEXACHLOROBENZENE	mg/l	0.13	0.02	ND	ND	ND
32	PENTACHLOROPHENOL	mg/l	100.0	0.02	ND	ND	ND
33	O-CRESOL	mg/l	200.0	0.02	ND	ND	ND
34	M&P-CRESOL	mg/l	200.0	0.02	ND	ND	ND
35	PYRIDINE	mg/l	5.0	0.2	ND	ND	ND

ND = NOT DETECTED AT STATED DETECTION LIMIT.



NOTES: 1) RW19, RW-2, RW-3, R-14, RW-15, RW-16, RW-17, & RW-18 ARE IN-SERVICE RECOVERY WELLS.
2) RW-3 IS ALSO KNOWN AS MW-10
3) MW-1 & MW-5 ARE SAMPLED FOR DISCHARGE PLAN.
4) RW-15, MW-21, MW-20, MW-9, & RW-18 ARE SAMPLED TO MEET RCRA REQUIREMENTS.

Bloomfield Refining Company

PLANT PLOT PLAN

DRAWN BY WTG | DATE 4-9-89 | SCALE 1" = 100'
CHECKED BY | DRAWING NUMBER B-000-900-00

- SAMPLE POINTS
- MONITOR WELLS OR EVAPORATION PONDS

Inter·Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

CASE NARRATIVE

On 6 August 1992, six TCLP extracts were received by Inter-Mountain Laboratories, Inc. at 1633 Terra Ave., Sheridan, Wyoming. The sample custody document indicated request for analysis of parameters from the TC Rule analyte list. The samples arrived cool and intact, custody sheets remained with the extract.

The TCLP preparation and extraction was performed following the steps defined by the EPA using Method 1311, SW-846, November 1990, and found in the Federal Register, 40 CFR 261, Volume 55, No. 126, June 1990. A duplicate analysis was prepared to evaluate the extraction reproducibility. Relative percent differences were reported only if the analyte concentrations exceeded five times the detection levels. A matrix spike was used to determine matrix effect on the recovery of the target analytes. Matrix spike information was used, via the TC Rule, for the final calculation of the analyte concentrations. Method blanks were used to determine any method induced contamination.

Limits of detection for each instrument or analysis were determined with respect to matrix effect, instrument performance under standard operating conditions and sample dilution. TCLP results were reported as mass per unit volume of leachate. Data qualifiers may have been used in accordance with USEPA data validation guidelines.

Reviewed by: _____
Thomas Bury
Laboratory Manager/IML-Sheridan

Data File ID: _____00-600_____

Inter·Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

TCLP REFERENCE LIST:

1.0 Date of Sampling: ___30 July 1992_____

Date of Laboratory Receipt: ___31 July 1992_____

Date of TCLP Extraction: ___4 August 1992_____

2.0 Quality Control Parameters:

Holding Times Maintained: ____X_____ Yes _____ No

Method Blank Data: ____X_____ Yes _____ No

Matrix Spike Data: ____X_____ Yes _____ No

Data Qualifiers: ____X_____ Yes _____ No

J = Estimated Quantity; B = Present in Blank; R = Data Unusable;
UJ = Analyzed but Not Detected, Sample Detection Value.

3.0 Analyte Information:

Parameter:	CAS #:	Regulatory Level (mg/L)	Detection Level (mg/L)	Method
Arsenic	7440-38-2	5.0	0.1	6010A
Barium	7440-39-3	100	0.5	6010A
Cadmium	7440-43-9	1.0	0.005	6010A
Chromium	7440-47-3	5.0	0.01	6010A
Lead	7439-92-1	5.0	0.2	6010A
Mercury	7439-97-6	0.2	0.001	7470A
Selenium	7782-22-4	1.0	0.1	6010A
Silver	7440-22-4	5.0	0.01	6010A

4. 0 Comments: _____

_____

_____

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE Discharge	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923346	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted TCLP:	08/06/92
Preservation:	HCl	Date Analyzed:	08/06/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE Discharge	Date Reported:	08/21/92
Laboratory ID:	B923346	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/06/92

Tentative Identification	Retention Time (min)	Concentration	Units
Unknown Ogranic Acid	27.10	0.2	mg/L
Unknown Ogranic Acid	27.35	0.7	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	121
Toluene-d8	105
Bromofluorobenzene	104

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, *Test Methods for Evaluating Solid Wastes*, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

Reviewed

Inter Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE Discharge	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923346	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/10/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE Discharge	Date Reported:	08/24/92
Laboratory ID:	B923346	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/10/92

Parameter	Retention Time(min.)	Concentration	Units
Hydrocarbon envelope	10 - 38		
Unknown hydrocarbon	16.75	0.01	mg/L
Unknown hydrocarbon	18.47	0.02	mg/L
Unknown hydrocarbon	20.00	0.03	mg/L
Unknown hydrocarbon	20.68	0.02	mg/L
Unknown hydrocarbon	23.18	0.03	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	56
Phenol-d6	52
Nitrobenzene-d5	79
2-Fluorobiphenyl	86
2,4,6-Tribromophenol	94
Terphenyl-d14	98

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

Reviewed

Inter·Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	1 NOWPE Discharge	Date Sampled:	07/30/92
Lab ID:	B923346/5658	Date Received:	07/31/92
Matrix:	Water	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	0.5	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.

Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by:

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923347	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted TCLP:	08/06/92
Preservation:	HCl	Date Analyzed:	08/06/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/21/92
Laboratory ID:	B923347	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/06/92

Tentative Identification	Retention Time (min)	Concentration	Units
Unknown Organic Acid	21.90	0.2	mg/L
Unknown Organic Acid	27.10	0.2	mg/L
Unknown Organic Acid	27.35	0.5	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	116
Toluene-d8	102
Bromofluorobenzene	102

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923347	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/24/92
Laboratory ID:	B923347	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units
Hydrocarbon envelope	12 - 34		
Unknown hydrocarbon	13.71	0.02	mg/L
Unknown hydrocarbon	19.13	0.03	mg/L
Unknown hydrocarbon	21.56	0.01	mg/L
Unknown hydrocarbon	22.32	0.02	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	34
Phenol-d6	37
Nitrobenzene-d5	57
2-Fluorobiphenyl	67
2,4,6-Tribromophenol	68
Terphenyl-d14	63

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

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Inter·Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	2 South Evap Pond	Date Sampled:	07/30/92
Lab ID:	B923347/5659	Date Received:	07/31/92
Matrix:	Water	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	0.5	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	<0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.

Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by: _____

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
- Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923348	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted TCLP:	08/06/92
Preservation:	HCl	Date Analyzed:	08/06/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/21/92
Laboratory ID:	B923348	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/06/92

Tentative Identification	Retention Time (min)	Concentration	Units
Unknown Organic Acid	21.94	0.4	mg/L
Unknown Organic Acid	27.13	0.1	mg/L
Unknown Organic Acid	27.36	0.4	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	119
Toluene-d8	103
Bromofluorobenzene	104

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923348	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/24/92
Laboratory ID:	B923348	Date Sampled:	07/30/92
Sample Matrix:	Water	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units
Unknown hydrocarbon	12.94	0.02	mg/L
Unknown hydrocarbon	13.72	0.03	mg/L
Unknown aromatic	13.11	0.03	mg/L
Unknown hydrocarbon	19.11	0.03	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	20
Phenol-d6	30
Nitrobenzene-d5	64
2-Fluorobiphenyl	67
2,4,6-Tribromophenol	44
Terphenyl-d14	70

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	3 North Evap Pond	Date Sampled:	07/30/92
Lab ID:	B923348/5660	Date Received:	07/31/92
Matrix:	Water	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	0.5	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	<0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.

Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by: _____

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923349	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted TCLP:	08/04/92
Preservation:	None	Date Analyzed:	08/05/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE	Date Reported:	08/21/92
Laboratory ID:	B923349	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/05/92

Tentative Identification	Retention Time (min)	Concentration	Units
Toluene	17.15	0.02	mg/L
Xylene(total)	19.80,20.26	0.9	mg/L
Unknown Organic Acid	17.18	0.2	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	105
Toluene-d8	103
Bromofluorobenzene	100

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923349	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	1 NOWPE	Date Reported:	08/24/92
Laboratory ID:	B923349	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units
Unknown substituted aromatic	9.51	0.02	mg/L
Unknown substituted phenol	13.05	0.02	mg/L
Naphthalene	13.41	0.018	mg/L
2-Methylnaphthalene	15.36	0.019	mg/L
1-Methylnaphthalene	15.63	0.02	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	47
Phenol-d6	54
Nitrobenzene-d5	60
2-Fluorobiphenyl	61
2,4,6-Tribromophenol	83
Terphenyl-d14	72

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	1 NOWP-E	Date Sampled:	07/30/92
Lab ID:	B923349/5661	Date Received:	07/31/92
Matrix:	Sludge	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	0.6	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	<0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.

Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923350	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted TCLP:	08/04/92
Preservation:	None	Date Analyzed:	08/05/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	0.05	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/21/92
Laboratory ID:	B923350	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/05/92

Tentative Identification	Retention Time (min)	Concentration	Units
Toluene	17.15	0.14	mg/L
Ethylbenzene	19.65	0.06	mg/L
Xylene(total)	19.80,20.26	0.25	mg/L
Unknown Hydrocarbon	14.99	0.1	mg/L
Unknown Aromatic	21.95	0.07	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	109
Toluene-d8	103
Bromofluorobenzene	101

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923350	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter·Mountain Laboratories, Inc.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/24/92
Laboratory ID:	B923350	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units
Unknown ketone	7.29	0.02	mg/L
Unknown substituted aromatic	9.50	0.03	mg/L
Naphthalene	13.41	0.018	mg/L
2-Methylnaphthalene	15.36	0.018	mg/L
1-Methylnaphthalene	15.63	0.01	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	46
Phenol-d6	44
Nitrobenzene-d5	65
2-Fluorobiphenyl	69
2,4,6-Tribromophenol	83
Terphenyl-d14	69

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

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1633 Terra Avenue
Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	2 South Evap Pond	Date Sampled:	07/30/92
Lab ID:	B923350/5662	Date Received:	07/31/92
Matrix:	Sludge	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	1.5	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	<0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.

Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by: _____

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923351	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted TCLP:	08/04/92
Preservation:	None	Date Analyzed:	08/05/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene	ND	0.02	0.7
Trichloroethene	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/21/92
Laboratory ID:	B923351	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/05/92

Tentative Identification	Retention Time (min)	Concentration	Units
Carbon Disulfide	5.72	0.035	mg/L
Unknown Hydrocarbon	17.48	0.4	mg/L

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	105
Toluene-d8	104
Bromofluorobenzene	98

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923351	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	3 North Evap Pond	Date Reported:	08/24/92
Laboratory ID:	B923351	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	42
Phenol-d6	40
Nitrobenzene-d5	68
2-Fluorobiphenyl	70
2,4,6-Tribromophenol	78
Terphenyl-d14	79

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	3 North Evap Pond	Date Sampled:	07/30/92
Lab ID:	B923351/5663	Date Received:	07/31/92
Matrix:	Sludge	TCLP Extract:	08/04/92
Preservation:	Cool/Intact	Date Analyzed:	08/08/92

Parameter:	Analytical Result	Regulatory Level	(Units)
Arsenic	<0.1	5.0	mg/L
Barium	1.0	100	mg/L
Cadmium	<0.005	1.0	mg/L
Chromium	<0.01	5.0	mg/L
Lead	<0.2	5.0	mg/L
Mercury	<0.001	0.20	mg/L
Selenium	<0.1	1.0	mg/L
Silver	<0.01 UJ	5.0	mg/L

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.
Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.
Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by: 

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Trip Blank	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	B923352	Date Received:	07/31/92
Sample Matrix:	Water	Date Extracted TCLP:	NA
Preservation:	None	Date Analyzed:	08/06/92
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.005	0.7
1,2-Dichloroethane	ND	0.005	0.5
2-Butanone	ND	0.02	200
Benzene	ND	0.005	0.5
Carbon Tetrachloride	ND	0.005	0.5
Chlorobenzene	ND	0.005	100
Chloroform	ND	0.005	6
Tetrachloroethene	ND	0.005	0.7
Trichloroethene	ND	0.005	0.5
Vinyl Chloride	ND	0.005	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Trip Blank	Date Reported:	08/21/92
Laboratory ID:	B923352	Date Sampled:	NA
Sample Matrix:	Water	Date Analyzed:	08/06/92

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	118
Toluene-d8	108
Bromofluorobenzene	102

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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QUALITY ASSURANCE / QUALITY CONTROL

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS
METHOD BLANK

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Method Blank	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	Q217A	Date Received:	NA
Sample Matrix:	Water	Date Extracted TCLP:	NA
Preservation:	NA	Date Analyzed:	08/05/92
Condition:	NA		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.005	0.7
1,2-Dichloroethane	ND	0.005	0.5
2-Butanone	ND	0.02	200
Benzene	ND	0.005	0.5
Carbon Tetrachloride	ND	0.005	0.5
Chlorobenzene	ND	0.005	100
Chloroform	ND	0.005	6
Tetrachloroethene	ND	0.005	0.7
Trichloroethene	ND	0.005	0.5
Vinyl Chloride	ND	0.005	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Method Blank	Date Reported:	08/21/92
Laboratory ID:	Q217A	Date Sampled:	NA
Sample Matrix:	Water	Date Analyzed:	08/05/92

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	96
Toluene-d8	104
Bromofluorobenzene	92

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS
METHOD BLANK

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Method Blank	Date Reported:	08/21/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	Q218A	Date Received:	NA
Sample Matrix:	Water	Date Extracted TCLP:	NA
Preservation:	NA	Date Analyzed:	08/06/92
Condition:	NA		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.005	0.7
1,2-Dichloroethane	ND	0.005	0.5
2-Butanone	ND	0.02	200
Benzene	ND	0.005	0.5
Carbon Tetrachloride	ND	0.005	0.5
Chlorobenzene	ND	0.005	100
Chloroform	ND	0.005	6
Tetrachloroethene	ND	0.005	0.7
Trichloroethene	ND	0.005	0.5
Vinyl Chloride	ND	0.005	0.2

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in Method Blank.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Method Blank	Date Reported:	08/21/92
Laboratory ID:	Q218A	Date Sampled:	NA
Sample Matrix:	Water	Date Analyzed:	08/06/92

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	107
Toluene-d8	104
Bromofluorobenzene	94

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS
METHOD BLANK ANALYSIS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Method Blank	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	TMB - 217	Date Received:	NA
Sample Matrix:	Water	Date Extracted-TCLP:	NA
Preservation:	NA	Date Analyzed:	08/06/92
Condition:	NA	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result	Detection Limit	Units
1,4-Dichlorobenzene	ND	0.02	mg/L
Hexachloroethane	ND	0.02	mg/L
Nitrobenzene	ND	0.02	mg/L
Hexachloro-1,3-butadiene	ND	0.02	mg/L
2,4,6-Trichlorophenol	ND	0.02	mg/L
2,4,5-Trichlorophenol	ND	0.02	mg/L
2,4-Dinitrotoluene	ND	0.02	mg/L
Hexachlorobenzene	ND	0.02	mg/L
Pentachlorophenol	ND	0.02	mg/L
o-Cresol	ND	0.02	mg/L
m & p-Cresol *	ND	0.02	mg/L
Pyridine	ND	0.2	mg/L

ND - Compound not detected at stated Detection Limit.
* - Compounds coelute by GCMS.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS
METHOD BLANK ANALYSIS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Method Blank	Date Reported:	08/24/92
Laboratory ID:	TMB - 217	Date Sampled:	NA
Sample Matrix:	Water	Date Analyzed:	08/06/92

Parameter	Retention Time(min)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	41
Phenol-d6	32
Nitrobenzene-d5	51
2-Fluorobiphenyl	47
2,4,6-Tribromophenol	48
Terphenyl-d14	61

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS
METHOD BLANK ANALYSIS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Method Blank	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	Blank 70	Date Received:	NA
Sample Matrix:	Extraction Fluid	Date Extracted-TCLP:	08/03/92
Preservation:	NA	Date Analyzed:	08/10/92
Condition:	NA	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result	Detection Limit	Units
1,4-Dichlorobenzene	ND	0.02	mg/L
Hexachloroethane	ND	0.02	mg/L
Nitrobenzene	ND	0.02	mg/L
Hexachloro-1,3-butadiene	ND	0.02	mg/L
2,4,6-Trichlorophenol	ND	0.02	mg/L
2,4,5-Trichlorophenol	ND	0.02	mg/L
2,4-Dinitrotoluene	ND	0.02	mg/L
Hexachlorobenzene	ND	0.02	mg/L
Pentachlorophenol	ND	0.02	mg/L
o-Cresol	ND	0.02	mg/L
m & p-Cresol *	ND	0.02	mg/L
Pyridine	ND	0.2	mg/L

ND - Compound not detected at stated Detection Limit.
* - Compounds coelute by GCMS.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS
METHOD BLANK ANALYSIS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Method Blank	Date Reported:	08/24/92
Laboratory ID:	Blank 70	Date Sampled:	01/19/00
Sample Matrix:	Extraction Fluid	Date Analyzed:	08/10/92

Parameter	Retention Time(min)	Concentration	Units

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	70
Phenol-d6	56
Nitrobenzene-d5	96
2-Fluorobiphenyl	89
2,4,6-Tribromophenol	101
Terphenyl-d14	118

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS
MATRIX SPIKE SUMMARY

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Matrix Spike	Date Reported:	08/21/92
Laboratory ID:	W3349	Date Sampled:	NA
Sample Matrix:	Extraction Fluid	Date Received:	NA
Preservation:	NA	Date Extracted TCLP:	08/04/92
Condition:	NA	Date Analyzed:	08/05/92

Parameter	Spike Added (ug/L)	Sample Concentration (ug/L)	Matrix Spike Concentration (ug/L)	Matrix Spike Recovery (%)
Vinyl Chloride	100	0	69	69
1,1-Dichloroethene	100	0	102	102
1,2-Dichloroethane	100	0	126	126
Chloroform	100	0	108	108
Carbon Tetrachloride	100	0	108	108
Trichloroethene	100	0	99	99
Benzene	100	0	90	90
Tetrachloroethene	100	0	99	99
Chlorobenzene	100	0	98	98
Methyl Ethyl Ketone	100	0	66	66

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS
Quality Control/Blank Analysis

Client:	**Bloomfield Refining**	Report Date:	08/23/92
Sample ID:	IML Blank 70	Date Analyzed:	08/08/92
Lab ID:	5664		
Matrix:	Fluid		

Parameter:	Analytical Result	(Units)
Arsenic	<0.1	mg/L
Barium	<0.5	mg/L
Cadmium	<0.005	mg/L
Chromium	<0.01	mg/L
Lead	<0.2	mg/L
Mercury	<0.001	mg/L
Selenium	<0.1	mg/L
Silver	<0.01	mg/L

Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.
Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Reviewed by: 

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL VOLATILE COMPOUNDS
MATRIX SPIKE SUMMARY

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	TCLP Matrix Spike	Date Reported:	08/21/92
Laboratory ID:	W3349	Date Sampled:	NA
Sample Matrix:	Extraction Fluid	Date Received:	NA
Preservation:	NA	Date Extracted TCLP:	08/04/92
Condition:	NA	Date Analyzed:	08/05/92

Parameter	Spike Added (ug/L)	Sample Concentration (ug/L)	Matrix Spike Concentration (ug/L)	Matrix Spike Recovery (%)
Vinyl Chloride	100	0	69	69
1,1-Dichloroethene	100	0	102	102
1,2-Dichloroethane	100	0	126	126
Chloroform	100	0	108	108
Carbon Tetrachloride	100	0	108	108
Trichloroethene	100	0	99	99
Benzene	100	0	90	90
Tetrachloroethene	100	0	99	99
Chlorobenzene	100	0	98	98
Methyl Ethyl Ketone	100	0	66	66

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS
MATRIX SPIKE SUMMARY

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	Blank Matrix Spike	Date Reported:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	NA
Laboratory ID:	TBS-217	Date Received:	NA
Sample Matrix:	Extraction Fluid	Date Extracted:	08/05/92
Preservation:	NA	Date Analyzed:	08/10/92
Condition:	NA		

Parameter	Matrix Spike Conc.	Sample Conc.	Matrix Spike Recovery	Spike Amount	Percent Recovery
1,4-Dichlorobenzene	63	0	63	100	63
Hexachloroethane	54	0	54	100	54
Nitrobenzene	94	0	94	100	94
Hexachloro-1,3-butadiene	66	0	66	100	66
2,4,6-Trichlorophenol	120	0	120	100	120
2,4,5-Trichlorophenol	114	0	114	100	114
2,4-Dinitrotoluene	86	0	86	100	86
Hexachlorobenzene	91	0	91	100	91
Pentachlorophenol	59	0	59	100	59
o-Cresol	92	0	92	100	92
m,p-Cresol	85	0	85	100	85
Pyridine	61	0	61	100	61

All values are total nanograms.

Reference:

Method 8270, Semivolatile Organics - GC/MS, Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency, SW-846, Vol. IB, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

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Sheridan, Wyoming 82801

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS
Quality Control/Matrix Spike

Client: **Bloomfield Refining**
Sample ID: 1 NOWPE Discharge
Lab ID: B923346/5658
Date: 08/23/92

Parameter:	Spiked Sample Result mg/L	Sample Result mg/L	Spike Added mg/L	Percent Spike Recovery
Arsenic	2.5	<0.1	2.5	100.0
Barium	2.4	0.5	2.0	95.0
Cadmium	0.517	<0.005	0.500	103.4
Chromium	0.98	0.01	1.00	97.0
Lead	1.8	<0.2	2.0	90.0
Mercury	0.0100	<0.001	0.010	100.0
Selenium	2.4	<0.1	2.5	96.0
Silver *	0.06	<0.01	0.50	12.0

* Low recovery due to the percipitation of silver with inorganic chlorides.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.
Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.
Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Laboratory Data Validation, Functional Guidelines for Evaluating Inorganics Analyses, USEPA, July 1988.

Reviewed by: 

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Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
HSL SEMI-VOLATILE COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Report Date:	08/24/92
Project ID:	Bloomfield/NM	Date Sampled:	07/30/92
Laboratory ID:	B923350 Duplicate	Date Received:	07/31/92
Sample Matrix:	Sludge	Date Extracted-TCLP:	08/03/92
Preservation:	None	Date Analyzed:	08/13/92
Condition:	Intact	Date Extracted-BNA:	08/05/92

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.02	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.02	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.02	2
2,4,5-Trichlorophenol	ND	0.02	400
2,4-Dinitrotoluene	ND	0.02	0.13
Hexachlorobenzene	ND	0.02	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.02	200 **
m & p-Cresol *	ND	0.02	200 **
Pyridine	ND	0.2	5

ND - Compound not detected at stated Detection Limit
B - Compound detected in Method Blank.
* - Compounds coelute by GCMS.
** - Regulatory Limit of combined Cresols.

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	BLOOMFIELD REFINING COMPANY		
Sample ID:	2 South Evap Pond	Date Reported:	08/24/92
Laboratory ID:	B923350 Duplicate	Date Sampled:	07/30/92
Sample Matrix:	Sludge	Date Analyzed:	08/13/92

Parameter	Retention Time(min.)	Concentration	Units
Unknown substituted aromatic	9.51	0.02	mg/L
Unknown substituted aromatic	10.08	0.01	mg/L
Naphthalene	13.39	0.015	mg/L
2-Methylnaphthalene	15.37	0.016	mg/L
1-Methylnaphthalene	15.62	0.01	mg/L

Unknown concentrations calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	39
Phenol-d6	40
Nitrobenzene-d5	55
2-Fluorobiphenyl	64
2,4,6-Tribromophenol	81
Terphenyl-d14	69

References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, Wyoming 82801

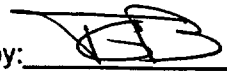
TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL CONCENTRATIONS
Quality Control/Duplicate Analysis

Client: **Bloomfield Refining**
Sample ID: 1 NOWPE Discharge
Lab ID: B923346/5658
Date: 08/23/92

Parameter:	Initial Sample Result mg/L	Second Sample Result mg/L	Relative Percent Difference
Arsenic	<0.1	<0.1	
Barium	0.5	0.5	0.0
Cadmium	<0.005	<0.005	
Chromium	0.01	0.01	0.0
Lead	<0.2	<0.2	
Mercury	<0.001	<0.001	
Selenium	<0.1	<0.1	
Silver	<0.01	<0.01	

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, EPA Vol. 55, No. 126 June 29, 1990.
Method 6010A : Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, Nov. 1990.
Method 7470A : Mercury in Liquid Waste (Manual Cold Vapor Technique), SW-846, Nov. 1990.

Laboratory Data Validation, Functional Guidelines for Evaluating Inorganics Analyses, USEPA, July 1988.

Reviewed by: 

iml
Inter-Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
IML - Farmington	BR

Sampler: (Signature)	Chain of Custody Tape No.
Orig. COC	None

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TCLP BNA	TCLP Metals	TCLP VOA	Remarks
1 NDWPE Discharge	073092	0900	B923346	Water	4				
2 South Evap Pond		0930	B923347		4				
3 North Evap Pond		1006	B923348		4				
1 NDWP-E		1140	B923349	Sludge	3				
2 South Evap Pond		0930	B923350		3				
3 North Evap Pond		1000	B923351		3				
Trip Blank			B923352						

NFE

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Wanda Ohs	073092	1655	UPS		
UPS	7/31/92	1030	Billie J. Perry	7/31/92	1030
Relinquished by: (Signature)	Date	Time	Received by Laboratory: (Signature)	Date	Time

Inter-Mountain Laboratories, Inc.

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iml Inter- Mountain Laboratories, Inc.

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CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES / PARAMETERS
Bloomfield Refining Co. via IML - Farmington	Bozeman → Sheridan	
Sampler: (Signature) Client	**Chain of Custody Tape No.** Ref. Blank C.O.C. # 10378	

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TCLP M+	Remarks
5658	8/4/92	08:30	B923346	Water	1	✓	
			B923347	Water	2	✓	
			B923348	Water	2	✓	
		09:15	B923349	Sludge	2	✓	
			B923350	Sludge	2	✓	
			B923351	Sludge	2	✓	

DRL

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
D.R. Lingenfelter	8/5/92	16:00	UPS	8/5/92	16:00

Inter-Mountain Laboratories, Inc.

10379

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CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES / PARAMETERS
Bloomfield Ref. via Farmington IML	Bozeman → Sheridan	
Sampler: (Signature) Client	**Chain of Custody Tape No.** COC # 10379	

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TCLP Mt				Remarks
Blank 70	8/4/92	08:30	Blank 70	Extract #1	2	✓				

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
D. R. Lingenfelter	8/5/92	16:00	UPS	8/5/92	16:00
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

Inter-Mountain Laboratories, Inc.

10378

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CHAIN OF CUSTODY RECORD

Client/Project Name: BLOOMFIELD REFINING COMPANY

Project Location: BLOOMFIELD /NM

Sampler: (Signature) [signature]

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TCLP BNA	TCLP METALS	TCLP VOA'S	TCLP VOA'S	Remarks
1 NOWP-E DISCHARGE	7-30-92	9:00a		WATER	4	1	1	0	2	
2 SOUTH EVAP POND	7-30-92	9:30a		WATER	4	1	1	0	2	
3 NORTH EVAP POND	7-30-92	10:00a		WATER	4	1	1	0	2	
1 NOWP-E	7-30-92	11:40a		SLUDGE	3	1	1	1		
2 SOUTH EVAP POND	7-30-92	9:30a		SLUDGE	3	1	1	1		
3 NORTH EVAP POND	7-30-92	10:00a		SLUDGE	3	1	1	1		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	7/30/92	3:55p	[signature]	7-30-92	1600
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

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