

4R - 003

REPORTS

DATE:

Oct. 31, 1990



RECEIVED
DIVISION
OCT 31 1990
FBI 9 05

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

October 31, 1990

NMOCD
POB 2088
Santa Fe, NM 87504-2088

Roger Anderson,

During a recent routine laboratory check we discovered isolated incidents of a miscalculation involving electrical conductivity. One of your samples, listed below, was reported with incorrect electrical conductivities. I sincerely apologise for this inconvenience. Please contact me at 1-800-786-0576 if I can be of any assistance.

Client: NMOCD

Date received: 09/06/90
Date collected: 09/04/90

Electrical conductivity, umhos/cm.

Lab #:	Sample site:	Sample ID:	Previous result:	Recalculated result:
F4922	MW-13	9009041620	21300	27300

Sincerely,

A handwritten signature in cursive script that reads 'C. Neal Schaeffer'.
C. Neal Schaeffer
Senior chemist



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD
ID: 9009041620
SITE: MW-13
LAB NO: F4922

DATE REPORTED: 09/20/90
DATE RECEIVED: 09/06/90
DATE COLLECTED: 09/04/90

Lab pH (s.u.).....	7.79
Lab conductivity, umhos/cm.....	27300
Lab resistivity, ohm-m.....	0
Total dissolved solids (180), mg/l..	20010
Total dissolved solids (calc), mg/l.	17130
Total alkalinity as CaCO ₃ , mg/l.....	584
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	6850
Sodium absorption ratio.....	19

	mg/l	meq/l
Bicarbonate as HCO ₃	714	12
Carbonate as CO ₃	0	0
Chloride.....	7940	224
Sulfate.....	3020	63
Calcium.....	1080	54
Magnesium.....	1010	83
Potassium.....	22	1
Sodium.....	3700	161
Major cations.....		298
Major anions.....		299
Cation/anion difference.....		0 %



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD
ID: 9009041620
SITE: MW-13
LAB NO: F4922

DATE REPORTED: 09/20/90
DATE RECEIVED: 09/06/90
DATE COLLECTED: 09/04/90

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.0002

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.27	<0.01
Barium (Ba).....	0.08	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.01	<0.01
Iron (Fe).....	ND	<0.05
Manganese (Mn).....	0.17	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	1.1	<0.05
Silicon (Si).....	4.3	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.31	<0.01

ND - Analyte "not detected" at the stated detection limit.

C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

October 31, 1990

Vermejo Mineral Corp.
Rt 1, Box 68
Cimarron, NM 87714

Larry Williamson,

During a recent routine laboratory check we discovered isolated incidents of a miscalculation involving electrical conductivity. Five of your samples, listed below, were reported with incorrect electrical conductivities. I sincerely apologise for this inconvenience. Please contact me at 1-800-786-0576 if I can be of any assistance.

Client: NMOCD-Penzoil

Date received: 09/14/90
Date collected: 09/10/90

Electrical conductivity, umhos/cm.

Lab #:	Sample site:	Sample ID:	Previous result:	Recalculated result:
F4989	Well S	9009101630	720	771
F4990	Well 3118-321 I	9009101430	2710	2900
F4991	Well 3017-271 G	9009101600	1170	1250
F4992	Well 3118-311 M	9009101400	1930	2070
F4993	Well 3017-031 F	9009101500	717	768

Since we sent the original results to Roger Anderson of the NMOCD, I took the liberty of forwarding a copy of this as well.

Sincerely,

A handwritten signature in dark ink, appearing to read 'C. Neal Schaeffer', is written over a horizontal line.

C. Neal Schaeffer
Senior chemist



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOC-D-Penzoil
ID: 9009101630
SITE: Well S
LAB NO: F4989

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.70
Lab conductivity, umhos/cm.....	771
Lab resistivity, ohm-m.....	13
Total dissolved solids (180), mg/l..	544
Total dissolved solids (calc), mg/l.	557
Total alkalinity as CaCO ₃ , mg/l.....	462
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	50.2
Sodium absorption ratio.....	13.4

	mg/l	meq/l
Bicarbonate as HCO ₃	522	8.55
Carbonate as CO ₃	20.4	0.68
Chloride.....	42	1.18
Sulfate.....	0.82	0.02
Calcium.....	16.1	0.8
Magnesium.....	2.46	0.2
Potassium.....	0.64	0.02
Sodium.....	218	9.5
Major cations.....		10.5
Major anions.....		10.4
Cation/anion difference.....		0.41 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.44
Lab conductivity, umhos/cm.....	2900
Lab resistivity, ohm-m.....	3.45
Total dissolved solids (180), mg/l..	2070
Total dissolved solids (calc), mg/l.	2050
Total alkalinity as CaCO ₃ , mg/l.....	1030
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	68.3
Sodium absorption ratio.....	43.6

	mg/l	meq/l
Bicarbonate as HCO ₃	1200	19.7
Carbonate as CO ₃	30.9	1.03
Chloride.....	569	16
Sulfate.....	0.82	0.02
Calcium.....	24.1	1.2
Magnesium.....	1.98	0.16
Potassium.....	1.5	0.04
Sodium.....	829	36.1
Major cations.....		37.5
Major anions.....		36.8
Cation/anion difference.....		0.96 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

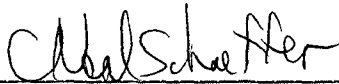
CLIENT: NMOCD-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	1.07	<0.01
Barium (Ba).....	1.41	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	ND	<0.05
Manganese (Mn).....	0.25	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	5.8	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101600
SITE: Well 3017-271 G
LAB NO: F4991

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.36
Lab conductivity, umhos/cm.....	1250
Lab resistivity, ohm-m.....	7.99
Total dissolved solids (180), mg/l..	924
Total dissolved solids (calc), mg/l.	912
Total alkalinity as CaCO ₃ , mg/l.....	641
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	50.2
Sodium absorption ratio.....	22.7

	mg/l	meq/l
Bicarbonate as HCO ₃	763	12.5
Carbonate as CO ₃	10.2	0.34
Chloride.....	139	3.91
Sulfate.....	1.65	0.03
Calcium.....	12	0.6
Magnesium.....	4.9	0.4
Potassium.....	1.44	0.04
Sodium.....	369	16.1
Major cations.....		17.1
Major anions.....		16.8
Cation/anion difference.....		0.96 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

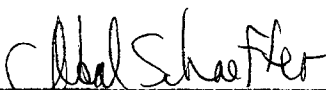
CLIENT: NMOCD-Penzoil
ID: 9009101600
SITE: Well 3017-271 G
LAB NO: F4991

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.63	<0.01
Barium (Ba).....	0.35	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.15	<0.05
Manganese (Mn).....	0.06	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	6.8	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.08	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101400
SITE: Well 3118-311 M
LAB NO: F4992

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.56
Lab conductivity, umhos/cm.....	2070
Lab resistivity, ohm-m.....	4.83
Total dissolved solids (180), mg/l..	1490
Total dissolved solids (calc), mg/l.	1460
Total alkalinity as CaCO3, mg/l.....	795
Total acidity as CaCO3, mg/l.....	0
Total hardness as CaCO3, mg/l.....	60.2
Sodium absorption ratio.....	33

	mg/l	meq/l
Bicarbonate as HCO3.....	824	13.5
Carbonate as CO3.....	71.7	2.39
Chloride.....	369	10.4
Sulfate.....	0.82	0.02
Calcium.....	16.1	0.8
Magnesium.....	4.9	0.4
Potassium.....	2.6	0.07
Sodium.....	589	25.6
Major cations.....		26.9
Major anions.....		26.3
Cation/anion difference.....		1.04 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

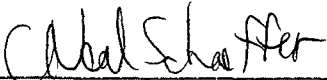
CLIENT: NMOCD-Penzoil
ID: 9009101400
SITE: Well 3118-311 M
LAB NO: F4992

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	1.12	<0.01
Barium (Ba).....	0.56	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.38	<0.05
Manganese (Mn).....	0.05	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	9.0	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.



C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.12
Lab conductivity, umhos/cm.....	768
Lab resistivity, ohm-m.....	13
Total dissolved solids (180), mg/l..	548
Total dissolved solids (calc), mg/l.	573
Total alkalinity as CaCO ₃ , mg/l.....	453
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	60.2
Sodium absorption ratio.....	12.2

	mg/l	meq/l
Bicarbonate as HCO ₃	553	9.06
Carbonate as CO ₃	0	0
Chloride.....	44.1	1.24
Sulfate.....	16.5	0.34
Calcium.....	16.1	0.8
Magnesium.....	4.9	0.4
Potassium.....	1.06	0.03
Sodium.....	218	9.49
Major cations.....		10.7
Major anions.....		10.6
Cation/anion difference.....		0.35 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

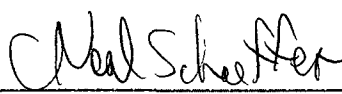
CLIENT: NMOCD-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.64	<0.01
Barium (Ba).....	0.26	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.49	<0.05
Manganese (Mn).....	0.10	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	7.7	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director

WATER CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION

700 CAMINO DE SALUD, ALBUQUERQUE, NM 87106

Water Chemistry Section - Telephone: (505) 841-2555

SLD No. 1

Date Received: _____

Request ID No. 004344-B

2 User Code #: 710131210

3 Request ID No.:

4 Priority Code #: 3

(If 11 or 12, call EID-SLD Coordinator)

5 Facility Name: Pennzoil Vermejo Park

6 County: Colfax

7 City: Raton

8 State: N.M.

9 Sample Location: _____

10 Collected By: William OLISON

On: 9/09/10

At: 11:50 hrs.

11 Codes: Submitter WSS # Organization

12 Latitude (DDMMSS) Longitude (DDMMSS) 2 Digit ID (if needed)

13 Report To: David G. Boyer

14 Phone #: (505) 827-5812

Address: New Mexico Oil Conservation Division P. O. 2088

City, State Zip: Santa Fe, New Mexico 87504-2088

15 Sampling Information: Sample Purpose: ☒ Grab ☐ Composite ☐ Compliance ☐ Flow Proportioned ☒ Check ☐ Equal Aliquot ☐ Monitoring ☒ Sample Split w/ Permittee ☐ Special ☐ Chain of Custody

16 Field Data: pH: _____ Conductivity: 750 umhos @ 28°C Temperature: _____ Chlorine Residual: _____ mg/l Flow: _____

17 Sample Source: ☐ Stream ☐ Lake ☐ Drain ☐ Pool ☐ WWTP ☐ Well; Depth: _____ ☐ Spring ☐ Distribution ☐ Point-of-Entry ☒ Other: Coal gas well head

18 Field Notes/ Sample #: Well # 3617 - 031 F

19 Sample Type: ☒ Water, ☐ Soil, ☐ Food, ☐ Wastewater, ☐ Other. This form accompanies a single sample consisting of: _____ - 1 liter cubitainers (1 quart) _____ - 4 liter cubitainers (1 gallon)

20 Preservation: ☐ WNF Water Not Preserved; Filtered ☒ WNN Water Not Preserved; Not Filtered ☐ WPF Water Preserved with Sulfuric Acid (H2SO4); Filtered ☐ WPN Water Preserved with Sulfuric Acid; Not Filtered ☐ WNL Water Not Preserved in Field; Please Add H2SO4 at Lab ☐ ICE Water Iced ☐ Other

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analyses required. Group Analyses: ☐ (854) SDWA Group II (Nitrate as N) ☐ (861) SDWA Group III (Fluoride) ☐ (860) SDWA Complete Secondary ☐ (859) SWQB SS Anion - Cation Group + ☐ (868) SWQB NPS Anion, Cation, Physical + TSS ☒ (869) SWQB Nutrient Analysis Group + ☒ (867) Major Anions & Cations

Cations: ☐ Calcium (as Ca) ☐ Magnesium (as Mg) ☐ Potassium (as K) ☐ Sodium (as Na) ☐ Total Hardness (as CaCO3) Anions: ☐ Alkalinity (as CaCO3) ☐ Bicarbonate (as HCO3) ☐ Carbonate (as CO3) ☐ Chloride (as Cl) ☐ Fluoride (as F) ☐ Sulfate (as SO4)

Physical Parameters: ☐ Color ☐ Conductance (Micromhos @ 25°C) ☐ Odor ☐ pH ☐ Surfactants ☐ Total Dissolved Solids ☐ Turbidity Other: _____

Surface and Waste Water: ☐ Biological Oxygen Demand ☐ Total Suspended Solids ☐ Chemical Oxygen Demand ☐ Total Organic Carbon ☐ Cyanide Nutrients: ☐ Nitrate + Nitrite (as N) ☐ Ammonia (as N) ☐ Total Kjeldahl (as N) ☐ Nitrite (as N) ☐ Orthophosphate (as P) ☐ Total Phosphorus (as P)

☒ Ion Charge Balance
Remarks: coal fines in water

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud, NE

Albuquerque, NM 87106 [505]-841-2500

WATER CHEMISTRY SECTION [505]-841-2555

November 6, 1990

Request

ID No. 004344

ANALYTICAL REPORT
SLD Accession No. WC-90-3337Distribution☐ User 70320☒ Submitter 995☒ SLD Files

To: M. Talley/ L. Berge -SLD
Auto. Assign from WSS Table
by Update Program (cron)
when wss > 99 & dtout<800000
WSS's Field Off, NM 87106

From: Water Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

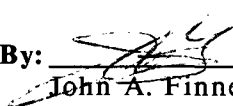
Re: A water, Nonpres/No sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

<u>COLLECTION</u>		<u>LOCATION</u>
On: 10-Sep-90	By: Ols . . .	Well 3017-031F
At: 15:00 hrs.	In/Near: Raton	

ANALYTICAL RESULTS

<u>Analysis</u>	<u>Value</u>	<u>D. Lmt.</u>	<u>Units</u>
calcium	8.00		mG/L
magnesium	2.40		mG/L
potassium	2.00		mG/L
sodium	219.00		mG/L
hardness	30.00		mG/L
bicarbonate	514.00		mG/L
carbonate	0.00		mG/L
chloride	36.00		mG/L
sulfate	< 5.00		mG/L
Ion Balance	108.00		mG/L 20
total diss resid	555.00		mG/L

Reviewed By: 

John A. Finney 11/06/90

Supervisor, Water Chemistry Section

00 11 00 51 NOV 06.

NOISIAID 00 11 00 51 NOV 06.

AIR & HEAVY METALS ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION

700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106

Air & Heavy Metals Section - Telephone: (505) 841-2553

SLD No. 1

Date Received:

2 User Code #: 7 1 0 1 3 1 2 1 0	3 Request ID No.: Request ID No. 004345-B	4 Priority Code #: 3
5 Facility Name: Pennzoil Vernejo Park	6 County: Colfax	7 City: Raton
8 State: NM		
9 Sample Location: 		
10 Collected By: William COLLISION On: 90/09/10 At: 1151010 hrs. First Last Date: (YY/MM/DD) Time: 24 hr. clock 3:00 pm - 1:00 am		
11 Codes: Submitter WSS # Organization		12 Latitude (DDMMSS): 2 Digit ID (if needed):
13 Report To: David G. Boyer 14 Phone #: (505) 827-5812		15 Sampling Information: Sample Purpose: ☒ Compliance ☐ Check ☐ Monitoring ☐ Special ☐ Grab ☐ Composite ☐ Flow Proportioned ☐ Equal Aliquot ☐ Sample Split w/Permittee ☐ Chain of Custody
Address: New Mexico Oil Conservation Division P. O. Box 2088 City, State Zip: Santa Fe, New Mexico 87504-2088		
16 Field Data: pH: , Conductivity: 750 umhos @ 28 °C, Temperature: °C, Chlorine Residual: mg/l, Flow: 		
17 Sample Source: ☐ -Stream ☐ -Well; Depth: ☐ -Lake ☐ -Spring ☐ -Drain ☐ -Distribution ☐ -Pool ☐ -Point-of-Entry ☐ -WWTP ☒ -Other: coal gas well head		18 Field Notes/ Sample #: Well # 3017-031F
19 Sample Type: ☒ -Water, ☐ -Soil, ☐ -Food, ☐ -Wastewater, ☐ -Other This form accompanies a <u>single sample</u> consisting of: ☒ - 1 liter cubitainers (1 quart) ☐ - 4 liter cubitainers (1 gallon)		20 Preservation: ☐ - WNF Water Not Preserved; Filtered ☐ - WNN Water Not Preserved; Not Filtered ☐ - WPF Water Preserved with Nitric Acid (HNO3); Filtered ☐ - WPN Water Preserved with Nitric Acid; Not Filtered ☒ - WNL Water Not Preserved in Field; Please Add HNO3 at Lab ☐ - ICE Water Iced ☐ - Other
21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analyses required. ☒ - (704) ICAP Scan ☐ - (720) SDWA Group I Only ☐ - (721) SDWA Group I + other parameter(s) marked below ☐ - Aluminum ☐ - Arsenic ☐ - Barium ☐ - Cadmium ☐ - Chromium ☐ - Cobalt ☐ - Copper ☐ - Iron ☐ - Lead ☐ - Manganese ☐ - Mercury ☐ - Molybdenum ☐ - Nickel ☐ - Selenium ☐ - Silver ☐ - Uranium ☐ - Vanadium ☐ - Zinc		
Remarks: coal fines in water		

SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700
Albuquerque, NM 87196-4700700 Camino de Salud, NE
[505]-841-2500

AIR & HEAVY METALS SECTION [505]-841-2553

December 19, 1990

Request
ID No. 004345**ANALYTICAL REPORT**
SLD Accession No. IC-90-0232Distribution☐ User 70320
☒ Submitter 260
☒ SLD Files

To: David Boyer
NM Oil Conserv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Air & Heavy Metals Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

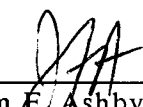
Re: A sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

COLLECTION		LOCATION
On: 10-Sep-90	By: Ols . . .	Well 3017-031F
At: 15:00 hrs.	In/Near: Raton	

ANALYTICAL RESULTS in mg/L

Analysis	Value	Analysis	Value	Analysis	Value
Aluminum	1.10	Cobalt	< 0.05	Nickel	< 0.10
Barium	0.30	Copper	< 0.10	Silicon	0.60
Beryllium	< 0.10	Iron	19.00	Silver	< 0.10
Boron	0.50	Lead	0.30	Strontium	0.40
Cadmium	< 0.10	Magnesium	0.40	Tin	< 0.10
Calcium	6.90	Manganese	0.23	Vanadium	< 0.10
Chromium	< 0.10	Molybdenum	< 0.10	Zinc	0.20

Laboratory Remarks: Digested. Acidified at SLD.Reviewed By: Jim F. Ashby 12/19/90
Lab. Scientist, Air & Heavy Metals Section

RECEIVED

DEC 31 1990
OIL CONSERVATION DIV.
SANTA FE

ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION

700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106

Organic Chemistry Section - Telephone: (505) 841-2570

SLD No. 1

Date Received: _____

Request ID No. 004343-C

2 User Code #: <u>7103210</u>	3 Request ID No.: _____	4 Priority Code #: _____ (N-1 or 2, call EIO-SLD Coordinator)																									
5 Facility Name: <u>Pennfold Verdejo Park</u>	6 County: <u>Colfax</u>	7 City: <u>Raton</u>																									
8 State: <u>NM</u>																											
9 Sample Location: _____																											
10 Collected By: <u>William</u> <u>10/15/10</u> On: <u>90109110</u> At: <u>11:50</u> hrs. First Last Date: (YY/MM/DD) Time: 24 hr. clock 3:00 pm = 1500 hrs.																											
11 Codes: _____ Submitter WSS # Organization		12 Latitude (DDMMSS) _____ Longitude (DDMMSS) _____ 2 Digit ID (if needed)																									
13 Report To: <u>David G. Boyer</u> Name Address <u>New Mexico Oil Conservation Division</u> <u>P. O. Box 2088</u> Ctry, State Zip <u>Santa Fe, New Mexico 87504-2088</u>		14 Phone #: <u>(505) 827-5812</u> 15 Sampling Information: <table border="0" style="width: 100%;"><tr><td>☐ Compliance</td><td>☒ Grab</td></tr><tr><td>☒ Check</td><td>☐ Composite (Composite Time Period)</td></tr><tr><td>☐ Monitoring</td><td>☐ Flow Proportioned</td></tr><tr><td>☐ Special</td><td>☐ Equal Aliquot</td></tr><tr><td></td><td>☒ Sample Split w/Permittee</td></tr><tr><td></td><td>☐ Chain of Custody</td></tr></table>	☐ Compliance	☒ Grab	☒ Check	☐ Composite (Composite Time Period)	☐ Monitoring	☐ Flow Proportioned	☐ Special	☐ Equal Aliquot		☒ Sample Split w/Permittee		☐ Chain of Custody													
☐ Compliance	☒ Grab																										
☒ Check	☐ Composite (Composite Time Period)																										
☐ Monitoring	☐ Flow Proportioned																										
☐ Special	☐ Equal Aliquot																										
	☒ Sample Split w/Permittee																										
	☐ Chain of Custody																										
16 Field Data: pH: _____, Conductivity: <u>750</u> umhos @ <u>28</u> °C, Temperature: _____, Chlorine Residual: _____ mg/l, Flow: _____																											
17 Sample Source: <table border="0" style="width: 100%;"><tr><td>☐ Stream</td><td>☐ Well; Depth: _____</td></tr><tr><td>☐ Lake</td><td>☐ Spring</td></tr><tr><td>☐ Drain</td><td>☐ Distribution</td></tr><tr><td>☐ Pool</td><td>☐ Point-of-Entry</td></tr><tr><td>☐ WWTP</td><td>☒ Other: <u>coal gas well head</u></td></tr></table>	☐ Stream	☐ Well; Depth: _____	☐ Lake	☐ Spring	☐ Drain	☐ Distribution	☐ Pool	☐ Point-of-Entry	☐ WWTP	☒ Other: <u>coal gas well head</u>	18 Field Notes/ Sample #: <u>Well # 3017 - 031 F</u>																
☐ Stream	☐ Well; Depth: _____																										
☐ Lake	☐ Spring																										
☐ Drain	☐ Distribution																										
☐ Pool	☐ Point-of-Entry																										
☐ WWTP	☒ Other: <u>coal gas well head</u>																										
19 Sample Type: ☒ Water, ☐ Soil, ☐ Food, ☐ Wastewater, ☐ Other _____ This form accompanies a <u>single sample</u> consisting of: <u>2</u> - septum vial(s) (volume = <u>40 ml</u>) _____ - glass jugs (volume = _____) _____ (volume = _____)	20 Preservation: <table border="0" style="width: 100%;"><tr><td>☐ NP</td><td>No Preservation; Sample stored at room temperature</td></tr><tr><td>☒ P-ice</td><td>Sample stored in an ice bath (Not Frozen)</td></tr><tr><td>☐ P-TS</td><td>Sample Preserved with Sodium Thiosulfate to remove chlorine residual</td></tr><tr><td>☐ P-HCl</td><td>Sample Preserved with Hydrochloric Acid (2 drops/40 ml)</td></tr><tr><td>☒ Other</td><td><u>8020 vial preserved with HCl</u></td></tr></table>		☐ NP	No Preservation; Sample stored at room temperature	☒ P-ice	Sample stored in an ice bath (Not Frozen)	☐ P-TS	Sample Preserved with Sodium Thiosulfate to remove chlorine residual	☐ P-HCl	Sample Preserved with Hydrochloric Acid (2 drops/40 ml)	☒ Other	<u>8020 vial preserved with HCl</u>															
☐ NP	No Preservation; Sample stored at room temperature																										
☒ P-ice	Sample stored in an ice bath (Not Frozen)																										
☐ P-TS	Sample Preserved with Sodium Thiosulfate to remove chlorine residual																										
☐ P-HCl	Sample Preserved with Hydrochloric Acid (2 drops/40 ml)																										
☒ Other	<u>8020 vial preserved with HCl</u>																										
21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required. Whenever possible, list specific compounds suspected or required.																											
<table border="0" style="width: 100%;"><tr><td style="width: 50%; vertical-align: top;">Volatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (753) Aliphatic Headspace (1-5 Carbons)</td></tr><tr><td>☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)</td></tr><tr><td>☐ (765) Mass Spectrometer Purgeables (EPA 624)</td></tr><tr><td>☐ (766) SDWA Total Trihalomethanes (EPA 501.1)</td></tr><tr><td>☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)</td></tr><tr><td>☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)</td></tr></table> Other Specific Compounds or Classes: <table border="0" style="width: 100%;"><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr></table></td><td style="width: 50%; vertical-align: top;">Semivolatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (763) Acid Extractables</td></tr><tr><td>☐ (751) Aliphatic Hydrocarbons</td></tr><tr><td>☐ (755) Base/Neutral Extractables (EPA 625)</td></tr><tr><td>☐ (756) Base/Neutral/Acid Extractables (EPA 8270)</td></tr><tr><td>☐ (758) Herbicides, Chlorophenoxy Acid</td></tr><tr><td>☐ (759) Herbicides, Triazines</td></tr><tr><td>☐ (760) Organochlorine Pesticides</td></tr><tr><td>☐ (761) Organophosphate Pesticides</td></tr><tr><td>☐ (767) Polychlorinated Biphenyls (PCB's)</td></tr><tr><td>☐ (764) Polynuclear Aromatic Hydrocarbons</td></tr><tr><td>☐ (762) SDWA Pesticides & Herbicides</td></tr></table></td></tr></table>			Volatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (753) Aliphatic Headspace (1-5 Carbons)</td></tr><tr><td>☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)</td></tr><tr><td>☐ (765) Mass Spectrometer Purgeables (EPA 624)</td></tr><tr><td>☐ (766) SDWA Total Trihalomethanes (EPA 501.1)</td></tr><tr><td>☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)</td></tr><tr><td>☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)</td></tr></table> Other Specific Compounds or Classes: <table border="0" style="width: 100%;"><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr></table>	☐ (753) Aliphatic Headspace (1-5 Carbons)	☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)	☐ (765) Mass Spectrometer Purgeables (EPA 624)	☐ (766) SDWA Total Trihalomethanes (EPA 501.1)	☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)	☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)	☐ - {	_____	☐ - {	_____	☐ - {	_____	Semivolatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (763) Acid Extractables</td></tr><tr><td>☐ (751) Aliphatic Hydrocarbons</td></tr><tr><td>☐ (755) Base/Neutral Extractables (EPA 625)</td></tr><tr><td>☐ (756) Base/Neutral/Acid Extractables (EPA 8270)</td></tr><tr><td>☐ (758) Herbicides, Chlorophenoxy Acid</td></tr><tr><td>☐ (759) Herbicides, Triazines</td></tr><tr><td>☐ (760) Organochlorine Pesticides</td></tr><tr><td>☐ (761) Organophosphate Pesticides</td></tr><tr><td>☐ (767) Polychlorinated Biphenyls (PCB's)</td></tr><tr><td>☐ (764) Polynuclear Aromatic Hydrocarbons</td></tr><tr><td>☐ (762) SDWA Pesticides & Herbicides</td></tr></table>	☐ (763) Acid Extractables	☐ (751) Aliphatic Hydrocarbons	☐ (755) Base/Neutral Extractables (EPA 625)	☐ (756) Base/Neutral/Acid Extractables (EPA 8270)	☐ (758) Herbicides, Chlorophenoxy Acid	☐ (759) Herbicides, Triazines	☐ (760) Organochlorine Pesticides	☐ (761) Organophosphate Pesticides	☐ (767) Polychlorinated Biphenyls (PCB's)	☐ (764) Polynuclear Aromatic Hydrocarbons	☐ (762) SDWA Pesticides & Herbicides
Volatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (753) Aliphatic Headspace (1-5 Carbons)</td></tr><tr><td>☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)</td></tr><tr><td>☐ (765) Mass Spectrometer Purgeables (EPA 624)</td></tr><tr><td>☐ (766) SDWA Total Trihalomethanes (EPA 501.1)</td></tr><tr><td>☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)</td></tr><tr><td>☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)</td></tr></table> Other Specific Compounds or Classes: <table border="0" style="width: 100%;"><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr><tr><td>☐ - {</td><td>_____</td></tr></table>	☐ (753) Aliphatic Headspace (1-5 Carbons)	☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)	☐ (765) Mass Spectrometer Purgeables (EPA 624)	☐ (766) SDWA Total Trihalomethanes (EPA 501.1)	☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)	☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)	☐ - {	_____	☐ - {	_____	☐ - {	_____	Semivolatile Screens: <table border="0" style="width: 100%;"><tr><td>☐ (763) Acid Extractables</td></tr><tr><td>☐ (751) Aliphatic Hydrocarbons</td></tr><tr><td>☐ (755) Base/Neutral Extractables (EPA 625)</td></tr><tr><td>☐ (756) Base/Neutral/Acid Extractables (EPA 8270)</td></tr><tr><td>☐ (758) Herbicides, Chlorophenoxy Acid</td></tr><tr><td>☐ (759) Herbicides, Triazines</td></tr><tr><td>☐ (760) Organochlorine Pesticides</td></tr><tr><td>☐ (761) Organophosphate Pesticides</td></tr><tr><td>☐ (767) Polychlorinated Biphenyls (PCB's)</td></tr><tr><td>☐ (764) Polynuclear Aromatic Hydrocarbons</td></tr><tr><td>☐ (762) SDWA Pesticides & Herbicides</td></tr></table>	☐ (763) Acid Extractables	☐ (751) Aliphatic Hydrocarbons	☐ (755) Base/Neutral Extractables (EPA 625)	☐ (756) Base/Neutral/Acid Extractables (EPA 8270)	☐ (758) Herbicides, Chlorophenoxy Acid	☐ (759) Herbicides, Triazines	☐ (760) Organochlorine Pesticides	☐ (761) Organophosphate Pesticides	☐ (767) Polychlorinated Biphenyls (PCB's)	☐ (764) Polynuclear Aromatic Hydrocarbons	☐ (762) SDWA Pesticides & Herbicides			
☐ (753) Aliphatic Headspace (1-5 Carbons)																											
☒ (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)																											
☐ (765) Mass Spectrometer Purgeables (EPA 624)																											
☐ (766) SDWA Total Trihalomethanes (EPA 501.1)																											
☐ (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)																											
☐ (775) SDWA VOC's II [EDB & DBCP] (EPA 504)																											
☐ - {	_____																										
☐ - {	_____																										
☐ - {	_____																										
☐ (763) Acid Extractables																											
☐ (751) Aliphatic Hydrocarbons																											
☐ (755) Base/Neutral Extractables (EPA 625)																											
☐ (756) Base/Neutral/Acid Extractables (EPA 8270)																											
☐ (758) Herbicides, Chlorophenoxy Acid																											
☐ (759) Herbicides, Triazines																											
☐ (760) Organochlorine Pesticides																											
☐ (761) Organophosphate Pesticides																											
☐ (767) Polychlorinated Biphenyls (PCB's)																											
☐ (764) Polynuclear Aromatic Hydrocarbons																											
☐ (762) SDWA Pesticides & Herbicides																											
Remarks: <u>coal fines in water</u>																											

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud, NE

Albuquerque, NM 87106 [505]-841-2500

ORGANIC CHEMISTRY SECTION [505]-841-2570

October 10, 1990

Request

ID No. 004343

ANALYTICAL REPORT
SLD Accession No. OR-90-2003Distribution☐ User 70320☒ Submitter 260☒ SLD Files

To: David Boyer
NM Oil Conserv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Organic Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, Purgeable sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

COLLECTION	LOCATION
On: 9-Sep-90 By: Ols . . . At: 15:00 hrs. In/Near: Raton	Pennzoil Vermejo Pk., 3017-031F

ANALYTICAL RESULTS: Aromatic & Halogenated Purgeable Screen {754}

Parameter	Value	Note	MDL	Units
Halogenated Purgeables (33)	0.00	N	1.00	ppb
Aromatic Purgeables (6)	0.00	N	1.00	ppb

See Laboratory Remarks for Additional Information

Notations & Comments:

MDL = Minimal Detectable Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;
T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.Evidentiary Seals: Not Sealed ☒; Intact: No ☐, Yes ☐ & Broken By: _____ Date: _____Laboratory Remarks:

QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

COMPOUND DETECTED
No Compounds Detected

CONCENTRATION (PPB)

SURROGATE RECOVERIES:

SURROGATE
Fluorobenzene

CONCENTRATION
25.0 ppb

% RECOVERY
111.9

(Continued on page 2.)

ANALYTICAL REPORT
SLD Accession No. OR-90-2003
Continuation, Page 2 of 2

2-Bromo-1-chloropropane 15.0 ppb 106.4

SPIKE RECOVERY: The % recoveries for compounds in the batch
spike were from 80% to 120% with the exception of the compounds
listed below:

COMPOUND	CONCENTRATION	% RECOVERY
Vinyl chloride	25.0 ppb	69.2
1,1-Dichloroethene	25.0 ppb	56.8
Chloroform	25.0 ppb	70.8
1,1-Trichloroethane	25.0 ppb	124.4
Carbontetrachloride	25.0 ppb	124.0

Analyst: Gary C. Eden 9/13/90
Gary C. Eden Analysis
Analyst, Organic Chemistry Date

Reviewed By: Richard F. Meyerhein 10/10/90
Richard F. Meyerhein 09/21/90
Supervisor, Organic Chemistry Section

ANALYSIS REQUEST FORM

Contract Lab IML Contract No. _____

Sample No. 9009101500

Collection Date	Collection Time	Collected by —Person/Agency
9/10/90	1500	Olson, Johnson, Williamson

SITE INFORMATION

Sample location	Vermejo Park
Collection Site Description	
Well # 3017-031F	Township, Range, Section, Tract:
	+ + -

SEND
FINAL
REPORT
TO

Vermejo Minerals Corp c/o Pennzoil Expl + Production Co.
Rt. 1 Box 68
Cimarron, N.M. 87714
Attn: Larry Williamson
(505) 376-2817

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted: 4

- ☒ NF: Whole sample (Non-filtered)
☐ F: Filtered in field with 0.45 μ membrane filter
☐ PF: Pre-filtered w/45 μ membrane filter

- ☒ NA: No acid added
☐ A: HCL
☐ A: 2ml H₂SO₄/L added
☐ A: 5ml conc. HNO₃ added
☐ A: 4ml fuming HNO₃ added

FIELD COMMENTS:

coal fines in water

SAMPLING CONDITIONS ☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level
	Discharge
pH(00400)	Sample type
Water Temp. (00010)	Conductivity (Uncorrected)
28°C	750 μ mho
	Conductivity at 25°C
	μ mho

* copy of analyses to NM OCB

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	7130
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	7470
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	6010
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☒ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	606	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7196	☐	OTHER	



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.12
Lab conductivity, umhos/cm.....	717
Lab resistivity, ohm-m.....	13.9
Total dissolved solids (180), mg/l..	548
Total dissolved solids (calc), mg/l.	573
Total alkalinity as CaCO ₃ , mg/l.....	453
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	60.2
Sodium absorption ratio.....	12.2

	mg/l	meq/l
Bicarbonate as HCO ₃	553	9.06
Carbonate as CO ₃	0	0
Chloride.....	44.1	1.24
Sulfate.....	16.5	0.34
Calcium.....	16.1	0.8
Magnesium.....	4.9	0.4
Potassium.....	1.06	0.03
Sodium.....	218	9.49
Major cations.....		10.7
Major anions.....		10.6
Cation/anion difference.....		0.35 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



OIL CONSERVATION DIVISION
RECEIVED

'90 AUG 23 AM 9 58

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD
ID: 9008091000
SITE: CR-3017-031F
LAB NO: F4739

DATE REPORTED: 08/21/90
DATE RECEIVED: 08/14/90
DATE COLLECTED: 08/09/90

Lab pH (s.u.).....	8.11
Lab conductivity, umhos/cm.....	1079
Lab resistivity, ohm-m.....	9.2678
Total dissolved solids (180), mg/l..	690
Total dissolved solids (calc), mg/l.	652
Total alkalinity as CaCO ₃ , mg/l.....	467.95
Total acidity as CaCO ₃ , mg/l.....	0.00
Total hardness as CaCO ₃ , mg/l.....	44.18
Sodium absorption ratio.....	16.68

	mg/l	meq/l
Bicarbonate as HCO ₃	570.9	9.36
Carbonate as CO ₃	0.0	0.00
Chloride.....	94.4	2.66
Sulfate.....	2.5	0.05
Calcium.....	11.2	0.56
Magnesium.....	3.9	0.32
Potassium.....	4.4	0.11
Sodium.....	254.8	11.08
Major cations.....		12.08
Major anions.....		12.07
Cation/anion difference.....		0.01 %


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.64	<0.01
Barium (Ba).....	0.26	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.49	<0.05
Manganese (Mn).....	0.10	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	7.7	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOCD-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable halocarbons in water.

Parameter	Concentration
Chloromethane, ug/l.....	ND (10)
Bromomethane, ug/l.....	ND (10)
Dichlorodifluoromethane, ug/l.....	ND (10)
Vinyl chloride, ug/l.....	ND (10)
Chloroethane, ug/l.....	ND (1.0)
Dichloromethane (methylene chloride)	ND (1.0)
Trichlorofluoromethane, ug/l.....	ND (1.0)
1,1-dichloroethene, ug/l.....	ND (1.0)
1,1-dichloroethane, ug/l.....	ND (1.0)
trans-1,2-dichloroethene, ug/l.....	ND (1.0)
cis-1,2-dichloroethene, ug/l.....	ND (1.0)
Chloroform, ug/l.....	ND (1.0)
1,2-dichloroethane, ug/l.....	ND (1.0)
1,1,1-trichloroethane, ug/l.....	ND (1.0)
Carbon tetrachloride, ug/l.....	ND (1.0)
Bromodichloromethane, ug/l.....	ND (1.0)
Bromochloromethane, ug/l.....	ND (1.0)
1,2-Dichloropropane, ug/l.....	ND (1.0)
1,3-Dichloropropane, ug/l.....	ND (1.0)
1,2-Dibromoethane, ug/l.....	ND (1.0)
1,2-Dibromo-3-chloropropane, ug/l...	ND (1.0)
Trichloroethene, ug/l.....	ND (1.0)
Dibromochloromethane, ug/l.....	ND (1.0)
1,1,2-Trichloroethane, ug/l.....	ND (1.0)
1,1-dichloropropene, ug/l.....	ND (1.0)
2-chloroethyl vinyl ether, ug/l.....	ND (10)
Bromoform, ug/l.....	ND (1.0)
1,1,1,2-tetrachloroethane, ug/l.....	ND (1.0)
1,1,2,2-tetrachloroethane, ug/l.....	ND (1.0)
Tetrachloroethene, ug/l.....	ND (1.0)
Chlorobenzene, ug/l.....	ND (1.0)
1,3-dichlorobenzene, ug/l.....	ND (1.0)
1,2-dichlorobenzene, ug/l.....	ND (1.0)
1,4-dichlorobenzene, ug/l.....	ND (1.0)
bis(2-chloroisopropyl)ether, ug/l....	ND (1.0)
Bromobenzene, ug/l.....	ND (1.0)
2-Chlorotoluene, ug/l.....	ND (1.0)
Dibromomethane, ug/l.....	ND (1.0)
1,2,3-Trichloropropane, ug/l.....	ND (1.0)

Method:

601 Purgeable Halocarbons, 40 CFR Part 136, USEPA (1984).

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOC-D-Penzoil
ID: 9009101500
SITE: Well 3017-031 F
LAB NO: F4993

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable aromatics in water.

Parameter	Concentration	Units
-----	-----	-----
Benzene	ND (2)	ug/l
Toluene	15 (2)	ug/l
Ethylbenzene	4.0 (2)	ug/l
m/p-Xylene	20 (2)	ug/l
o-Xylene	14 (2)	ug/l
1,4-Dichlorobenzene	ND (4)	ug/l
1,3-Dichlorobenzene	ND (3)	ug/l
1,2-Dichlorobenzene	ND (4)	ug/l
Chlorobenzene	ND (2)	ug/l

Method:

8020 Aromatic Volatile Organics, SW-846, USEPA (1982).
602 Purgeable Aromatics, 40 CFR, Part 136.

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist

WATER CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION

700 CAMINO DE SALUD, ALBUQUERQUE, NM 87106

Water Chemistry Section - Telephone: (505) 841-2555

SLD No. 1

Date Received: _____

Request ID No. 004341-B

2 User Code #: 710 13 12 10	3 Request ID No.:	4 Priority Code #: 3 (If "1" or "2", call EID-SLD Coordinator)
------------------------------------	--------------------------	--

5 Facility Name: Pennzell Veranojo Park	6 County: Colfax	7 City: Raton	8 State: N.M.
--	-------------------------	----------------------	----------------------

9 Sample Location:

10 Collected By: William Ellison	On: 9/10/10	At: 11410 hrs.	Time: 24 hr. clock 3:00 pm = 1500 hrs.
---	-------------	----------------	---

11 Codes: Submitter WSS # Organization	12 Latitude (DDMMSS) Longitude (DDMMSS) 2 Digit ID (if needed)
---	---

13 Report To: David G. Boyer	14 Phone #: (505) 827-5812
-------------------------------------	-----------------------------------

Address: New Mexico Oil Conservation Division	15 Sampling Information:
---	---------------------------------

P. O. 2088	Sample Purpose: ☒ Grab ☐ Composite ☐ Flow Proportioned ☐ Equal Aliquot ☒ Check ☐ Monitoring ☒ Sample Split w/Permittee ☐ Special ☐ Chain of Custody
------------	---

City, State Zip: Santa Fe, New Mexico 87504-2088	
--	--

16 Field Data: pH: _____, Conductivity: _____ umhos @ _____ °C, Temperature: _____ °C, Chlorine Residual: _____ mg/l, Flow: _____
--

17 Sample Source: ☐ Stream ☐ Lake ☐ Drain ☐ Pool ☐ WWTP ☐ Well; Depth: _____ ☐ Spring ☐ Distribution ☐ Point-of-Entry ☒ Other: coal gas well head	18 Field Notes/ Sample #: Well # 3118 - 311M
---	--

19 Sample Type: ☒ Water, ☐ Soil, ☐ Food, ☐ Wastewater, ☐ Other This form accompanies a <u>single sample</u> consisting of: 1 - 1 liter cubitainers (1 quart) 4 - 4 liter cubitainers (1 gallon)	20 Preservation: ☐ WNF Water Not Preserved; Filtered ☒ WNN Water Not Preserved; Not Filtered ☐ WPF Water Preserved with Sulfuric Acid (H2SO4); Filtered ☐ WPN Water Preserved with Sulfuric Acid; Not Filtered ☐ WNL Water Not Preserved in Field; Please Add H2SO4 at Lab ☒ ICE Water Iced ☐ Other
---	---

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analyses required.**Group Analyses:**

- ☐ (854) SDWA Group II (Nitrate as N)
☐ (861) SDWA Group III (Fluoride)
☐ (860) SDWA Complete Secondary

- ☐ (859) SWQB SS Anion - Cation Group +
☐ (868) SWQB NPS Anion, Cation, Physical + TSS
☐ (869) SWQB Nutrient Analysis Group +
☒ (867) Major Anions & Cations

Cations:

- ☐ Calcium (as Ca)
☐ Magnesium (as Mg)
☐ Potassium (as K)
☐ Sodium (as Na)
☐ Total Hardness (as CaCO3)

Anions:

- ☐ Alkalinity (as CaCO3)
☐ Bicarbonate (as HCO3)
☐ Carbonate (as CO3)
☐ Chloride (as Cl)
☐ Fluoride (as F)
☐ Sulfate (as SO4)

☒ Ion Charge Balance**Physical Parameters:**

- ☐ Color
☐ Conductance (Micromhos @ 25 °C)
☐ Odor
☐ pH
☐ Surfactants
☐ Total Dissolved Solids
☐ Turbidity

Other:

- ☐
☐
☐
☐

Surface and Waste Water:

- ☐ Biological Oxygen Demand
☐ Total Suspended Solids
☐ Chemical Oxygen Demand
☐ Total Organic Carbon
☐ Cyanide

Nutrients:

- ☐ Nitrate + Nitrite (as N)
☐ Ammonia (as N)
☐ Total Kjeldahl (as N)
☐ Nitrite (as N)
☐ Orthophosphate (as P)
☐ Total Phosphorus (as P)

Remarks:

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud, NE
Albuquerque, NM 87106 [505]-841-2500
WATER CHEMISTRY SECTION [505]-841-2555

November 6, 1990

Request
ID No. 004341

ANALYTICAL REPORT
SLD Accession No. WC-90-3338

Distribution

☐ User 70320
☒ Submitter 995
☒ SLD Files

To: D. G. Boyer
Auto. Assign from WSS Table
by Update Program (cron)
when wss > 99 & dtout < 800000
WSS's Field Off, NM 87106

From: Water Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, Nonpres/No sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

<u>COLLECTION</u>	<u>LOCATION</u>
On: 10-Sep-90 By: Ols ...	Well 3118-311M
At: 14:00 hrs. In/Near: Raton	

ANALYTICAL RESULTS

<u>Analysis</u>	<u>Value</u>	<u>D. Lmt.</u>	<u>Units</u>
calcium	4.00		mg/L
magnesium	3.70		mg/L
potassium	4.00		mg/L
sodium	599.00		mg/L
hardness	25.00		mg/L
bicarbonate	979.00		mg/L
carbonate	0.00		mg/L
chloride	382.00		mg/L
sulfate	< 5.00		mg/L
Ion Balance	99.00		mg/L
total diss resid	1530.00		mg/L

Reviewed By: 

John A. Finney 11/06/90
Supervisor, Water Chemistry Section

00 11 00 91 JUN 06.

001 11
NOISIAIC 11 11 11 11 11 11

1

(If "1" or "2",
call EIO-SLO
Coordinator)

8	State
X	M

This Form Will NOT Be Returned With Your Results. Please RETAIN A COPY!

SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700
Albuquerque, NM 87196-4700700 Camino de Salud, NE
[505]-841-2500

AIR & HEAVY METALS SECTION [505]-841-2553

December 19, 1990

Request
ID No. 004342**ANALYTICAL REPORT**
SLD Accession No. IC-90-0233Distribution☐ User 70320
☒ Submitter 260
☒ SLD Files

To: David Boyer
NM Oil Conserv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Air & Heavy Metals Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

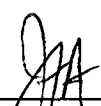
Re: A sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

COLLECTION		LOCATION
On: 10-Sep-90	By: Ols . . .	Well 3118-311M
At: 14:00 hrs.	In/Near: Raton	

ANALYTICAL RESULTS in mg/L

Analysis	Value	Analysis	Value	Analysis	Value
Aluminum	0.30	Cobalt	< 0.05	Nickel	< 0.10
Barium	0.70	Copper	< 0.10	Silicon	0.50
Beryllium	< 0.10	Iron	10.00	Silver	< 0.10
Boron	1.10	Lead	< 0.10	Strontium	1.10
Cadmium	< 0.10	Magnesium	1.60	Tin	< 0.10
Calcium	12.00	Manganese	0.15	Vanadium	< 0.10
Chromium	< 0.10	Molybdenum	< 0.10	Zinc	< 0.10

Laboratory Remarks: Digested. Acidified at SLD.Reviewed By: Jim F. Ashby 12/19/90
Lab. Scientist, Air & Heavy Metals Section

RECEIVED

DEC 31 1990

OIL CONSERVATION DIV.
SANTA FE

ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION

700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106

Organic Chemistry Section - Telephone: (505) 841-2570

SLD No. 1

Date Received: _____

Request ID No. 11111111
004340-C

2 User Code #: 7103210

3 Request ID No.: _____

4 Priority Code #: 3

(If "1" or "2", call EIO-SLD Coordinator)

5 Facility Name: Pennant Vermajo Park

6 County: Colfax

7 City: Raton

8 State: NM

9 Sample Location: _____

10 Collected By: William 10/1/10 On: 90/09/10 At: 1141010 hrs.
First Last Date: (YY/MM/DD) Time: 24 hr. clock
3:00 pm = 1500 hrs.

11 Codes: _____
Submitter WSS # Organization

12 Latitude (DDMMSS) _____
Longitude (DDMMSS) _____
2 Digit ID (if needed)

13 Report To: David G. Boyer 14 Phone #: (505) 827-5812

Address: New Mexico Oil Conservation Division
P. O. Box 2088
City, State Zip: Santa Fe, New Mexico 87504-2088

15 Sampling Information:
Sample Purpose: ☒ Grab ☐ Composite (Composite Time Period)
☐ Compliance ☐ Flow Proportioned
☒ Check ☐ Equal Aliquot
☒ Monitoring ☒ Sample Split w/Permittee
☐ Special ☐ Chain of Custody

16 Field Data: pH: _____, Conductivity: _____ umhos @ _____ °C, Temperature: _____ °C, Chlorine Residual: _____ mg/l, Flow: _____

17 Sample Source:
☐ -Stream ☐ -Well; Depth: _____
☐ -Lake ☐ -Spring
☐ -Drain ☐ -Distribution
☐ -Pool ☐ -Point-of-Entry
☐ -WWTP ☒ -Other: Cool gas well here

18 Field Notes/
Sample #: Well # 3118-311 M

19 Sample Type: ☒ -Water, ☐ -Soil, ☐ -Food,
☐ -Wastewater, ☐ -Other
This form accompanies a single sample consisting of:
2 - septum vial(s) (volume = 40 ml)
_____ - glass jugs (volume = _____)
_____ (volume = _____)

20 Preservation:
☐ - NP No Preservation: Sample stored at room temperature
☒ - P-ice Sample stored in an ice bath (Not Frozen)
☐ - P-TS Sample Preserved with Sodium Thiosulfate to remove chlorine residual
☐ - P-HCl Sample Preserved with Hydrochloric Acid (2 drops/40 ml)
☒ - Other One vial preserved with HCl

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required. Whenever possible, list specific compounds suspected or required.

Volatile Screens:

- ☐ - (753) Aliphatic Headspace (1-5 Carbons)
- ☒ - (754) Aromatic & Halogenated Purgeables (EPA 601 & 602)
- ☒ - (765) Mass Spectrometer Purgeables (EPA 624)
- ☐ - (766) SDWA Total Trihalomethanes (EPA 501.1)
- ☐ - (774) SDWA VOC's I [8 Regulated +] (EPA 502.2)
- ☐ - (775) SDWA VOC's II [EDB & DBCP] (EPA 504)

Other Specific Compounds or Classes:

☐ - () _____
☐ - () _____
☐ - () _____

Semivolatile Screens:

- ☐ - (763) Acid Extractables
- ☐ - (751) Aliphatic Hydrocarbons
- ☐ - (755) Base/Neutral Extractables (EPA 625)
- ☐ - (756) Base/Neutral/Acid Extractables (EPA 8270)
- ☐ - (758) Herbicides, Chlorophenoxy Acid
- ☐ - (759) Herbicides, Triazines
- ☐ - (760) Organochlorine Pesticides
- ☐ - (761) Organophosphate Pesticides
- ☐ - (767) Polychlorinated Biphenyls (PCB's)
- ☐ - (764) Polynuclear Aromatic Hydrocarbons
- ☐ - (762) SDWA Pesticides & Herbicides

Remarks: _____

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud, NE

Albuquerque, NM 87106 [505]-841-2500

ORGANIC CHEMISTRY SECTION [505]-841-2570

October 10, 1990

Request

ID No. 004340

ANALYTICAL REPORT
SLD Accession No. OR-90-2002Distribution☐ User 70320☒ Submitter 260☒ SLD Files

To: David Boyer
NM Oil Consv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Organic Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, Purgeable sample submitted to this laboratory on September 13, 1990

DEMOGRAPHIC DATA

COLLECTION		LOCATION
On: 9-Sep-90	By: Ols . . .	Pennzoil Vermejo Pk., 3118-311M
At: 14:00 hrs.	In/Near: Raton	

ANALYTICAL RESULTS: Aromatic & Halogenated Purgeable Screen {754}

Parameter	Value	Note	MDL	Units
Halogenated Purgeables (33)	0.00	N	1.00	ppb
Benzene	28.40		1.00	ppb
Toluene	69.20		1.00	ppb
Ethylbenzene	6.80		1.00	ppb
p- & m-Xylene	54.30		1.00	ppb
1,2-Dimethylbenzene	21.80		1.00	ppb

See Laboratory Remarks for Additional Information

Notations & Comments:

MDL = Minimal Detectable Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;

T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.

Evidentiary Seals: Not Sealed ☒; Intact: No ☐, Yes ☐ & Broken By: _____ Date: _____Laboratory Remarks:

Twenty-seven late eluting compounds in the C3 substituted benzene region at 1 to 5 ppb detected by the photoionization detector, but not identified.

QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected

(Continued on page 2.)

ANALYTICAL REPORT
SLD Accession No. OR-90-2002
Continuation, Page 2 of 2

in this blank above the reported detection limit.

COMPOUND DETECTED	CONCENTRATION (PPB)
No Compounds Detected	

SURROGATE RECOVERIES:

SURROGATE	CONCENTRATION	% RECOVERY
Fluorobenzene	25.0 ppb	86.8
2-Bromo-1-chloropropane	15.0 ppb	95.2

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

COMPOUND	CONCENTRATION	% RECOVERY
Vinyl chloride	25.0 ppb	69.2
1,1-Dichloroethene	25.0 ppb	56.8
Chloroform	25.0 ppb	70.8
1,1-Trichloroethane	25.0 ppb	124.4
Carbontetrachloride	25.0 ppb	124.0

Analyst: Gary C. Eden 9/13/90
Gary C. Eden Analysis
Analyst, Organic Chemistry Date

Reviewed By: Richard F. Meyerhein 10/10/90
Richard F. Meyerhein 09/21/90
Supervisor, Organic Chemistry Section

ANALYSIS REQUEST FORM

Contract Lab

JML

Contract No.

Sample No. 9009101400

Collection Date	Collection Time	Collected by —Person/Agency
9/10/90	1400	Clsen, Johnson, Williamson
SITE INFORMATION		
Sample location Vermejo Park		
Collection Site Description		
Well # 3118 - 311 M		Township, Range, Section, Tract:

SEND
FINAL
REPORT
TO

Vermejo Minerals Corp c/o Pennzoil Expl. & Prod. Co.
 Rt. 1 Box 68
 Cimarron, N.M. 87714
 Attn: Larry Williamson
 (505) 376-2817

SAMPLING CONDITIONS		SAMPLE FIELD TREATMENT — Check proper boxes	
☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level	No. of samples submitted: 4	
	Discharge	☒ NF: Whole sample (Non-filtered) ☐ F: Filtered in field with 0.45 μ membrane filter ☐ PF: Pre-filtered w/45 μ membrane filter	
pH(00400)	Sample type grab	☒ NA: No acid added ☐ A: 5ml conc. HNO ₃ added ☐ A: HCL ☐ A: 4ml fuming HNO ₃ added ☐ A: 2ml H ₂ SO ₄ /L added	
Water Temp. (00010)	Conductivity (Uncorrected) μ mho	FIELD COMMENTS:	
	Conductivity at 25° C μ mho		
* copy of analyses to OGD			

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	7130
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	7470
☐ 004	VOH	801	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	6010
☐ 006	SUITE	601-602	☐ 018	VOC	8280	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	810	☐ 022	AS	7080	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	808	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101400
SITE: Well 3118-311 M
LAB NO: F4992

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.56
Lab conductivity, umhos/cm.....	1930
Lab resistivity, ohm-m.....	5.17
Total dissolved solids (180), mg/l..	1490
Total dissolved solids (calc), mg/l.	1460
Total alkalinity as CaCO ₃ , mg/l.....	795
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	60.2
Sodium absorption ratio.....	33

	mg/l	meq/l
Bicarbonate as HCO ₃	824	13.5
Carbonate as CO ₃	71.7	2.39
Chloride.....	369	10.4
Sulfate.....	0.82	0.02
Calcium.....	16.1	0.8
Magnesium.....	4.9	0.4
Potassium.....	2.6	0.07
Sodium.....	589	25.6
Major cations.....		26.9
Major anions.....		26.3
Cation/anion difference.....		1.04 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



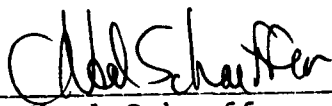
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101400
SITE: Well 3118-311 M
LAB NO: F4992

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	1.12	<0.01
Barium (Ba).....	0.56	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.38	<0.05
Manganese (Mn).....	0.05	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	9.0	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



OIL CONSERVATION DIVISION
RECEIVED

'90 AUG 23 AM 9 58

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

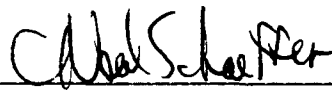
CLIENT: NMOCD
ID: 9008091020
SITE: CR-3118-311M
LAB NO: F4741

DATE REPORTED: 08/21/90
DATE RECEIVED: 08/14/90
DATE COLLECTED: 08/09/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.05
Aluminum (Al).....	0.3	<0.1
Arsenic (As).....	ND	<0.005
Boron (B).....	1.26	<0.01
Barium (Ba).....	0.8	<0.05
Beryllium (Be).....	ND	<0.005
Calcium (Ca).....	17	<10
Cadmium (Cd).....	ND	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	0.02	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	7.11	<0.05
Manganese (Mn).....	0.20	<0.02
Potassium (K).....	ND	<1.0
Molybdenum (Mo).....	ND	<0.01
Magnesium (Mg).....	2	<10
Sodium (Na).....	543	<10
Nickel (Ni).....	ND	<0.01
Lead (Pb).....	ND	<0.2
Antimony (Sb).....	ND	<0.05
Selenium (Se).....	ND	<0.005
Silicon (Si).....	10.5	<0.05
Titanium (Ti).....	ND	<0.05
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.02	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOC-D-Penzoil

ID: 9009101400

SITE: Well 3118-311 M

LAB NO: F4992

DATE REPORTED: 09/27/90

DATE ANALYZED: 09/18/90

DATE RECEIVED: 09/14/90

DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable halocarbons in water.

Parameter	Concentration
Chloromethane, ug/l.....	ND (10)
Bromomethane, ug/l.....	ND (10)
Dichlorodifluoromethane, ug/l.....	ND (10)
Vinyl chloride, ug/l.....	ND (10)
Chloroethane, ug/l.....	ND (1.0)
Dichloromethane (methylene chloride)	ND (1.0)
Trichlorofluoromethane, ug/l.....	ND (1.0)
1,1-dichloroethene, ug/l.....	ND (1.0)
1,1-dichloroethane, ug/l.....	ND (1.0)
trans-1,2-dichloroethene, ug/l.....	ND (1.0)
cis-1,2-dichloroethene, ug/l.....	ND (1.0)
Chloroform, ug/l.....	ND (1.0)
1,2-dichloroethane, ug/l.....	ND (1.0)
1,1,1-trichloroethane, ug/l.....	ND (1.0)
Carbon tetrachloride, ug/l.....	ND (1.0)
Bromodichloromethane, ug/l.....	ND (1.0)
Bromochloromethane, ug/l.....	ND (1.0)
1,2-Dichloropropane, ug/l.....	ND (1.0)
1,3-Dichloropropane, ug/l.....	ND (1.0)
1,2-Dibromoethane, ug/l.....	ND (1.0)
1,2-Dibromo-3-chloropropane, ug/l...	ND (1.0)
Trichloroethene, ug/l.....	ND (1.0)
Dibromochloromethane, ug/l.....	ND (1.0)
1,1,2-Trichloroethane, ug/l.....	ND (1.0)
1,1-dichloropropene, ug/l.....	ND (1.0)
2-chloroethyl vinyl ether, ug/l.....	ND (10)
Bromoform, ug/l.....	ND (1.0)
1,1,1,2-tetrachloroethane, ug/l.....	ND (1.0)
1,1,2,2-tetrachloroethane, ug/l.....	ND (1.0)
Tetrachloroethene, ug/l.....	ND (1.0)
Chlorobenzene, ug/l.....	ND (1.0)
1,3-dichlorobenzene, ug/l.....	ND (1.0)
1,2-dichlorobenzene, ug/l.....	ND (1.0)
1,4-dichlorobenzene, ug/l.....	ND (1.0)
bis(2-chloroisopropyl)ether, ug/l....	ND (1.0)
Bromobenzene, ug/l.....	ND (1.0)
2-Chlorotoluene, ug/l.....	ND (1.0)
Dibromomethane, ug/l.....	ND (1.0)
1,2,3-Trichloropropane, ug/l.....	ND (1.0)

Method:

601 Purgeable Halocarbons, 40 CFR Part 136, USEPA (1984).

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOCD-Penzoil
ID: 9009101400
SITE: Well 3118-311 M
LAB NO: F4992

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable aromatics in water.

Parameter	Concentration	Units
-----	-----	-----
Benzene	32 (2)	ug/l
Toluene	78 (2)	ug/l
Ethylbenzene	8.7 (2)	ug/l
m/p-Xylene	62 (2)	ug/l
o-Xylene	29 (2)	ug/l
1,4-Dichlorobenzene	ND (4)	ug/l
1,3-Dichlorobenzene	ND (3)	ug/l
1,2-Dichlorobenzene	ND (4)	ug/l
Chlorobenzene	ND (2)	ug/l

Method:

8020 Aromatic Volatile Organics, SW-846, USEPA (1982).
602 Purgeable Aromatics, 40 CFR, Part 136.

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist

ANALYSIS REQUEST FORM

Contract Lab

IML

Contract No.

Sample No. 9009101630

Collection Date	Collection Time	Collected by — Person/Agency	
9/10/90	1630	Olsen, Johnson, Williamson	OCD
SITE INFORMATION			
Sample location Vermejo Park			
Collection Site Description			
Well # 5			Township, Range, Section, Tract:

SEND
FINAL
REPORT
TO

Vermejo Minerals Corp. c/o Pennzait Expl. & Prod. Co.
 Rt. 1 Box 68
 Cimarron, N.M. 87714
 Attn: Larry Williamson
 (505) 376-2817

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted: 4

- ☒ NF: Whole sample (Non-filtered)
☐ F: Filtered in field with 0.45 μ m membrane filter
☐ PF: Pre-filtered w/45 μ m membrane filter

- ☒ NA: No acid added
☐ A: HCL
☐ A: 2ml H₂SO₄ added
☐ A: 5ml conc. HNO₃ added
☐ A: 4ml fuming HNO₃ added

FIELD COMMENTS:

SAMPLING CONDITIONS ☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level
	Discharge
pH(00400)	Sample type grab
Water Temp. (00010)	Conductivity (Uncorrected) 750 μ mho
23.5	Conductivity at 25° C μ mho

* copy of analyses to NM OCD

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	804	☐ 026	Cd	7130
☐ 002	VOA	802	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	824	☐ 028	Hg(L)	7470
☐ 004	VOH	801	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	825	☒ 032	ICAP	6010
☐ 006	SUITE	801-802	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	810	☐ 022	AS	7080	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	808	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101630
SITE: Well S
LAB NO: F4989

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.70
Lab conductivity, umhos/cm.....	720
Lab resistivity, ohm-m.....	13.9
Total dissolved solids (180), mg/l..	544
Total dissolved solids (calc), mg/l.	557
Total alkalinity as CaCO ₃ , mg/l.....	462
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	50.2
Sodium absorption ratio.....	13.4

	mg/l	meq/l
Bicarbonate as HCO ₃	522	8.55
Carbonate as CO ₃	20.4	0.68
Chloride.....	42	1.18
Sulfate.....	0.82	0.02
Calcium.....	16.1	0.8
Magnesium.....	2.46	0.2
Potassium.....	0.64	0.02
Sodium.....	218	9.5
Major cations.....		10.5
Major anions.....		10.4
Cation/anion difference.....		0.41 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

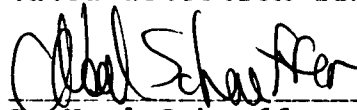
CLIENT: NMOCD-Penzoil
ID: 9009101630
SITE: Well S
LAB NO: F4989

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.27	<0.01
Barium (Ba).....	0.08	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.51	<0.05
Manganese (Mn).....	0.02	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	6.4	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOCD-Penzoil

ID: 9009101630

SITE: Well S

LAB NO: F4989

Analysis Requested: Purgeable halocarbons in water.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90

DATE ANALYZED: 09/18/90

DATE RECEIVED: 09/14/90

DATE COLLECTED: 09/10/90

Parameter	Concentration
Chloromethane, ug/l.....	ND (10)
Bromomethane, ug/l.....	ND (10)
Dichlorodifluoromethane, ug/l.....	ND (10)
Vinyl chloride, ug/l.....	ND (10)
Chloroethane, ug/l.....	ND (1.0)
Dichloromethane (methylene chloride)	ND (1.0)
Trichlorofluoromethane, ug/l.....	ND (1.0)
1,1-dichloroethene, ug/l.....	ND (1.0)
1,1-dichloroethane, ug/l.....	ND (1.0)
trans-1,2-dichloroethene, ug/l.....	ND (1.0)
cis-1,2-dichloroethene, ug/l.....	ND (1.0)
Chloroform, ug/l.....	ND (1.0)
1,2-dichloroethane, ug/l.....	ND (1.0)
1,1,1-trichloroethane, ug/l.....	ND (1.0)
Carbon tetrachloride, ug/l.....	ND (1.0)
Bromodichloromethane, ug/l.....	ND (1.0)
Bromochloromethane, ug/l.....	ND (1.0)
1,2-Dichloropropane, ug/l.....	ND (1.0)
1,3-Dichloropropane, ug/l.....	ND (1.0)
1,2-Dibromoethane, ug/l.....	ND (1.0)
1,2-Dibromo-3-chloropropane, ug/l...	ND (1.0)
Trichloroethene, ug/l.....	ND (1.0)
Dibromochloromethane, ug/l.....	ND (1.0)
1,1,2-Trichloroethane, ug/l.....	ND (1.0)
1,1-dichloropropene, ug/l.....	ND (1.0)
2-chloroethyl vinyl ether, ug/l.....	ND (10)
Bromoform, ug/l.....	ND (1.0)
1,1,1,2-tetrachloroethane, ug/l.....	ND (1.0)
1,1,2,2-tetrachloroethane, ug/l.....	ND (1.0)
Tetrachloroethene, ug/l.....	ND (1.0)
Chlorobenzene, ug/l.....	ND (1.0)
1,3-dichlorobenzene, ug/l.....	ND (1.0)
1,2-dichlorobenzene, ug/l.....	ND (1.0)
1,4-dichlorobenzene, ug/l.....	ND (1.0)
bis(2-chloroisopropyl)ether, ug/l....	ND (1.0)
Bromobenzene, ug/l.....	ND (1.0)
2-Chlorotoluene, ug/l.....	ND (1.0)
Dibromomethane, ug/l.....	ND (1.0)
1,2,3-Trichloropropane, ug/l.....	ND (1.0)

Method:

601 Purgeable Halocarbons, 40 CFR Part 136, USEPA (1984).

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOC-D-Penzoil
ID: 9009101630
SITE: Well S
LAB NO: F4989

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable aromatics in water.

Parameter	Concentration	Units
-----	-----	-----
Benzene	1.1 (0.2)	ug/l
Toluene	2.8 (0.2)	ug/l
Ethylbenzene	1.0 (0.2)	ug/l
m/p-Xylene	3.1 (0.2)	ug/l
o-Xylene	1.8 (0.2)	ug/l
1,4-Dichlorobenzene	ND (0.4)	ug/l
1,3-Dichlorobenzene	ND (0.3)	ug/l
1,2-Dichlorobenzene	ND (0.4)	ug/l
Chlorobenzene	ND (0.2)	ug/l

Method:

8020 Aromatic Volatile Organics, SW-846, USEPA (1982).
602 Purgeable Aromatics, 40 CFR, Part 136.

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist

ANALYSIS REQUEST FORM

Contract Lab

JML

Contract No.

Sample No. 9009101430

Collection Date	Collection Time	Collected by — Person/Agency
9/10/90	1430	G/son, Johnson, Williamson
SITE INFORMATION		
Sample location Vermejo Park		
Collection Site Description		
Well # 3118-321 F		Township, Range, Section, Tract:
		+ + +

SEND
FINAL
REPORT
TO

Vermejo Minerals Corp. c/o Pennzeal Expl. & Production Co.
 Rt. 1 Box 68
 Cimarron, N.M. 87714
 Attn: Larry Williamson
 (505) 376-2817

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted: 4

- ☒ NF: Whole sample (Non-filtered)
☐ F: Filtered in field with 0.45 μ membrane filter
☐ PF: Pre-filtered w/45 μ membrane filter

- ☒ NA: No acid added
☐ A: HCL
☐ A: 2ml H₂SO₄/L added
☐ A: 5ml conc. HNO₃ added
☐ A: 4ml fuming HNO₃ added

FIELD COMMENTS:

SAMPLING CONDITIONS ☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level
	Discharge
pH(00400)	Sample type grab
Water Temp. (00010)	Conductivity (Uncorrected) 2450 μ mho
27°C	Conductivity at 25°C μ mho

* copy of analyses to NM OCK

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	7130
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	7470
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	6010
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	608	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7196	☐	OTHER	



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.44
Lab conductivity, umhos/cm.....	2710
Lab resistivity, ohm-m.....	3.69
Total dissolved solids (180), mg/l..	2070
Total dissolved solids (calc), mg/l.	2050
Total alkalinity as CaCO ₃ , mg/l.....	1030
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	68.3
Sodium absorption ratio.....	43.6

	mg/l	meq/l
Bicarbonate as HCO ₃	1200	19.7
Carbonate as CO ₃	30.9	1.03
Chloride.....	569	16
Sulfate.....	0.82	0.02
Calcium.....	24.1	1.2
Magnesium.....	1.98	0.16
Potassium.....	1.5	0.04
Sodium.....	829	36.1
Major cations.....		37.5
Major anions.....		36.8
Cation/anion difference.....		0.96 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

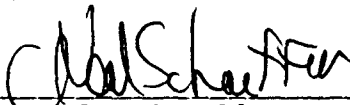
CLIENT: NMOC-D-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	1.07	<0.01
Barium (Ba).....	1.41	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	ND	<0.05
Manganese (Mn).....	0.25	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	5.8	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable halocarbons in water.

Parameter	Concentration
Chloromethane, ug/l.....	ND (10)
Bromomethane, ug/l.....	ND (10)
Dichlorodifluoromethane, ug/l.....	ND (10)
Vinyl chloride, ug/l.....	ND (10)
Chloroethane, ug/l.....	ND (1.0)
Dichloromethane (methylene chloride)	ND (1.0)
Trichlorofluoromethane, ug/l.....	ND (1.0)
1,1-dichloroethene, ug/l.....	ND (1.0)
1,1-dichloroethane, ug/l.....	ND (1.0)
trans-1,2-dichloroethene, ug/l.....	ND (1.0)
cis-1,2-dichloroethene, ug/l.....	ND (1.0)
Chloroform, ug/l.....	ND (1.0)
1,2-dichloroethane, ug/l.....	ND (1.0)
1,1,1-trichloroethane, ug/l.....	ND (1.0)
Carbon tetrachloride, ug/l.....	ND (1.0)
Bromodichloromethane, ug/l.....	ND (1.0)
Bromochloromethane, ug/l.....	ND (1.0)
1,2-Dichloropropane, ug/l.....	ND (1.0)
1,3-Dichloropropane, ug/l.....	ND (1.0)
1,2-Dibromoethane, ug/l.....	ND (1.0)
1,2-Dibromo-3-chloropropane, ug/l...	ND (1.0)
Trichloroethene, ug/l.....	ND (1.0)
Dibromochloromethane, ug/l.....	ND (1.0)
1,1,2-Trichloroethane, ug/l.....	ND (1.0)
1,1-dichloropropene, ug/l.....	ND (1.0)
2-chloroethyl vinyl ether, ug/l.....	ND (10)
Bromoform, ug/l.....	ND (1.0)
1,1,1,2-tetrachloroethane, ug/l.....	ND (1.0)
1,1,2,2-tetrachloroethane, ug/l.....	ND (1.0)
Tetrachloroethene, ug/l.....	ND (1.0)
Chlorobenzene, ug/l.....	ND (1.0)
1,3-dichlorobenzene, ug/l.....	ND (1.0)
1,2-dichlorobenzene, ug/l.....	ND (1.0)
1,4-dichlorobenzene, ug/l.....	ND (1.0)
bis(2-chloroisopropyl)ether, ug/l.....	ND (1.0)
Bromobenzene, ug/l.....	ND (1.0)
2-Chlorotoluene, ug/l.....	ND (1.0)
Dibromomethane, ug/l.....	ND (1.0)
1,2,3-Trichloropropane, ug/l.....	ND (1.0)

Method:

601 Purgeable Halocarbons, 40 CFR Part 136, USEPA (1984).

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist



Inter-Mountain
Laboratories, Inc.

CLIENT: NMOCD-Penzoil
ID: 9009101430
SITE: Well 3118-321 I
LAB NO: F4990

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable aromatics in water.

Parameter -----	Concentration -----	Units -----
Benzene	49 (2)	ug/l
Toluene	100 (2)	ug/l
Ethylbenzene	13 (2)	ug/l
m/p-Xylene	74 (2)	ug/l
o-Xylene	37 (2)	ug/l
1,4-Dichlorobenzene	ND (4)	ug/l
1,3-Dichlorobenzene	ND (3)	ug/l
1,2-Dichlorobenzene	ND (4)	ug/l
Chlorobenzene	ND (2)	ug/l

Method:

8020 Aromatic Volatile Organics, SW-846, USEPA (1982).
602 Purgeable Aromatics, 40 CFR, Part 136.

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist

ANALYSIS REQUEST FORM

Contract Lab

JML

Contract No.

Sample No. 900910/600

Collection Date	Collection Time	Collected by —Person/Agency
9/10/90	1600	Oban, Johnson, Williamson
SITE INFORMATION		
Sample location Vermejo Park		
Collection Site Description		
Well # 3017-271 G		Township, Range, Section, Tract:

SEND
FINAL
REPORT
TO

Vermejo Minerals Corp. c/o Pennzill Expl. & Production Co.
Rt 1 Box 68
Cimarron, N.M. 87714
Attn: Larry Williamson
(505) 376-2817

SAMPLING CONDITIONS		SAMPLE FIELD TREATMENT — Check proper boxes	
☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level	No. of samples submitted: 4	
	Discharge 0	☒ NF: Whole sample (Non-filtered) ☐ F: Filtered in field with 0.45 μ m membrane filter ☐ PF: Pre-filtered w/45 μ m membrane filter	
pH(00400)	Sample type grab	☒ NA: No acid added ☐ A: 5ml conc. HNO ₃ added ☐ A: HCL ☐ A: 4ml fuming HNO ₃ added ☐ A: 2ml H ₂ SO ₄ /L added	
Water Temp. (00010) 25°C	Conductivity (Uncorrected) 1200 μ mho	FIELD COMMENTS:	
	Conductivity at 25°C μ mho		

* copy of analyses to NM OCD

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	804	☐ 026	Cd	7130
☐ 002	VOA	802	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	824	☐ 028	Hg(L)	7470
☐ 004	VOH	801	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	825	☒ 032	ICAP	6010
☐ 006	SUITE	801-802	☐ 018	VOC	8280	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	810	☐ 022	AS	7080	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	808	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD-Penzoil
ID: 9009101600
SITE: Well 3017-271 G
LAB NO: F4991

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Lab pH (s.u.).....	8.36
Lab conductivity, umhos/cm.....	1170
Lab resistivity, ohm-m.....	8.55
Total dissolved solids (180), mg/l..	924
Total dissolved solids (calc), mg/l.	912
Total alkalinity as CaCO ₃ , mg/l.....	641
Total acidity as CaCO ₃ , mg/l.....	0
Total hardness as CaCO ₃ , mg/l.....	50.2
Sodium absorption ratio.....	22.7

	mg/l	meq/l
Bicarbonate as HCO ₃	763	12.5
Carbonate as CO ₃	10.2	0.34
Chloride.....	139	3.91
Sulfate.....	1.65	0.03
Calcium.....	12	0.6
Magnesium.....	4.9	0.4
Potassium.....	1.44	0.04
Sodium.....	369	16.1
Major cations.....		17.1
Major anions.....		16.8
Cation/anion difference.....		0.96 %

Trace metals by AA (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.002
Lead (Pb).....	ND	<0.005
Selenium (Se).....	ND	<0.005



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

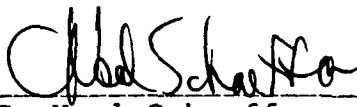
CLIENT: NMOCD-Penzoil
ID: 9009101600
SITE: Well 3017-271 G
LAB NO: F4991

DATE REPORTED: 10/09/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Trace metals by ICAP (dissolved concentration), mg/l

	Analytical Result:	Detection Limit:
Silver (Ag).....	ND	<0.01
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.63	<0.01
Barium (Ba).....	0.35	<0.05
Cobalt (Co).....	ND	<0.01
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.15	<0.05
Manganese (Mn).....	0.06	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Antimony (Sb).....	ND	<0.05
Silicon (Si).....	6.8	<0.05
Thallium (Tl).....	ND	<0.2
Vanadium (V).....	ND	<0.1
Zinc (Zn).....	0.08	<0.01

ND - Analyte "not detected" at the stated detection limit.


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOC-D-Penzoil

ID: 9009101600

SITE: Well 3017-271 G

LAB NO: F4991

DATE REPORTED: 09/27/90

DATE ANALYZED: 09/18/90

DATE RECEIVED: 09/14/90

DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable halocarbons in water.

Parameter	Concentration
Chloromethane, ug/l.....	ND (10)
Bromomethane, ug/l.....	ND (10)
Dichlorodifluoromethane, ug/l.....	ND (10)
Vinyl chloride, ug/l.....	ND (10)
Chloroethane, ug/l.....	ND (1.0)
Dichloromethane (methylene chloride)	ND (1.0)
Trichlorofluoromethane, ug/l.....	ND (1.0)
1,1-dichloroethene, ug/l.....	ND (1.0)
1,1-dichloroethane, ug/l.....	ND (1.0)
trans-1,2-dichloroethene, ug/l.....	ND (1.0)
cis-1,2-dichloroethene, ug/l.....	ND (1.0)
Chloroform, ug/l.....	ND (1.0)
1,2-dichloroethane, ug/l.....	ND (1.0)
1,1,1-trichloroethane, ug/l.....	ND (1.0)
Carbon tetrachloride, ug/l.....	ND (1.0)
Bromodichloromethane, ug/l.....	ND (1.0)
Bromochloromethane, ug/l.....	ND (1.0)
1,2-Dichloropropane, ug/l.....	ND (1.0)
1,3-Dichloropropane, ug/l.....	ND (1.0)
1,2-Dibromoethane, ug/l.....	ND (1.0)
1,2-Dibromo-3-chloropropane, ug/l...	ND (1.0)
Trichloroethene, ug/l.....	ND (1.0)
Dibromochloromethane, ug/l.....	ND (1.0)
1,1,2-Trichloroethane, ug/l.....	ND (1.0)
1,1-dichloropropene, ug/l.....	ND (1.0)
2-chloroethyl vinyl ether, ug/l.....	ND (10)
Bromoform, ug/l.....	ND (1.0)
1,1,1,2-tetrachloroethane, ug/l.....	ND (1.0)
1,1,2,2-tetrachloroethane, ug/l.....	ND (1.0)
Tetrachloroethene, ug/l.....	ND (1.0)
Chlorobenzene, ug/l.....	ND (1.0)
1,3-dichlorobenzene, ug/l.....	ND (1.0)
1,2-dichlorobenzene, ug/l.....	ND (1.0)
1,4-dichlorobenzene, ug/l.....	ND (1.0)
bis(2-chloroisopropyl)ether, ug/l....	ND (1.0)
Bromobenzene, ug/l.....	ND (1.0)
2-Chlorotoluene, ug/l.....	ND (1.0)
Dibromomethane, ug/l.....	ND (1.0)
1,2,3-Trichloropropane, ug/l.....	ND (1.0)

Method:

601 Purgeable Halocarbons, 40 CFR Part 136, USEPA (1984).

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist



InterMountain
Laboratories, Inc.

CLIENT: NMOCD-Penzoil
ID: 9009101600
SITE: Well 3017-271 G
LAB NO: F4991

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

DATE REPORTED: 09/27/90
DATE ANALYZED: 09/18/90
DATE RECEIVED: 09/14/90
DATE COLLECTED: 09/10/90

Analysis Requested: Purgeable aromatics in water.

Parameter	Concentration	Units
-----	-----	-----
Benzene	1.6 (0.2)	ug/l
Toluene	9.4 (0.2)	ug/l
Ethylbenzene	4.1 (0.2)	ug/l
m/p-Xylene	22 (0.2)	ug/l
o-Xylene	12 (0.2)	ug/l
1,4-Dichlorobenzene	ND (0.4)	ug/l
1,3-Dichlorobenzene	ND (0.3)	ug/l
1,2-Dichlorobenzene	ND (0.4)	ug/l
Chlorobenzene	ND (0.2)	ug/l

Method:

8020 Aromatic Volatile Organics, SW-846, USEPA (1982).
602 Purgeable Aromatics, 40 CFR, Part 136.

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer
Senior Chemist

Samples submitted for Pennzoil

~~GIL CONSERVATION DIVISION~~

[illegible]

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files



CIL 00 1 DIVISION
RE 750

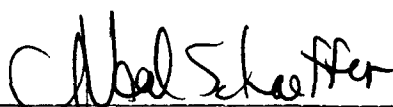
'90 AUG 23 50 9 58
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: NMOCD
ID: 9008090940
SITE: CR-3117-141G Penz.
LAB NO: F4738

DATE REPORTED: 08/21/90
DATE RECEIVED: 08/14/90
DATE COLLECTED: 08/09/90

Lab pH (s.u.).....	8.25
Lab conductivity, umhos/cm.....	944
Lab resistivity, ohm-m.....	10.5932
Total dissolved solids (180), mg/l..	604
Total dissolved solids (calc), mg/l.	574
Total alkalinity as CaCO ₃ , mg/l.....	467.95
Total acidity as CaCO ₃ , mg/l.....	0.00
Total hardness as CaCO ₃ , mg/l.....	12.05
Sodium absorption ratio.....	30.03

	mg/l	meq/l
Bicarbonate as HCO ₃	570.9	9.36
Carbonate as CO ₃	0.0	0.00
Chloride.....	44.1	1.24
Sulfate.....	2.9	0.06
Calcium.....	3.2	0.16
Magnesium.....	1.0	0.08
Potassium.....	2.8	0.07
Sodium.....	239.6	10.42
Major cations.....		10.73
Major anions.....		10.66
Cation/anion difference.....		0.33 %


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermejo Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well A

DATE RECEIVED: 10/18/89

LAB NO: F3371

DATE COLLECTED: 10/10/89

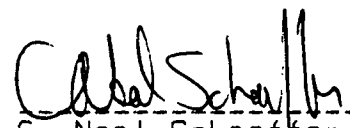
Lab pH.....	7.46
Lab Conductivity, umhos/cm.....	8766
Lab resistivity, ohm-m.....	1.1408
Total Dissolved Solids (180), mg/l..	6866
Total Dissolved Solids (calc), mg/l.	6481
Total Alkalinity as CaCO ₃ , mg/l.....	453.42
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	362.09
Sodium Absorption Ratio.....	56.40
Bromide, mg/l.....	42.65

	mg/l	meq/l
Bicarbonate as HCO ₃	553.17	9.07
Carbonate as CO ₃	0.00	0.00
Chloride.....	3588.08	101.22
Sulfate.....	<0.10	<0.01
Calcium.....	138.12	6.89
Magnesium.....	4.25	0.35
Potassium.....	10.92	0.28
Sodium.....	2467.50	107.33
Major Cations.....		114.85
Major Anions.....		110.28
Cation/Anion Difference.....		2.03 % *

* This cation/anion percent difference is probably due to to high concentration of Bromide, which is not included in the balance equation.

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	62.81	<0.05
Manganese (Mn).....	0.84	<0.02


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermejo Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well E
LAB NO: F3372

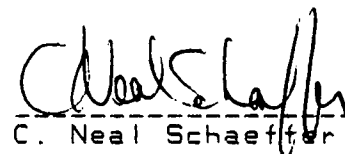
DATE RECEIVED: 10/18/89
DATE COLLECTED: 10/10/89

Lab pH.....	8.03
Lab Conductivity, umhos/cm.....	5827
Lab resistivity, ohm-m.....	1.7161
Total Dissolved Solids (180), mg/l..	4832
Total Dissolved Solids (calc), mg/l.	4401
Total Alkalinity as CaCO ₃ , mg/l.....	1281.06
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	138.94
Sodium Absorption Ratio.....	64.43
Bromide, mg/l.....	15.71

	mg/l	meq/l
Bicarbonate as HCO ₃	1562.89	25.62
Carbonate as CO ₃	0.00	0.00
Chloride.....	1823.77	51.45
Sulfate.....	<0.10	<0.01
Calcium.....	40.43	2.02
Magnesium.....	9.26	0.76
Potassium.....	13.20	0.34
Sodium.....	1746.00	75.95
Major Cations.....		79.06
Major Anions.....		77.07
Cation/Anion Difference.....		1.28 %

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	33.54	<0.05
Manganese (Mn).....	0.43	<0.02


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermejo Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well E Lab Split

DATE RECEIVED: 10/18/89

LAB NO: F3376

DATE COLLECTED: 10/10/89

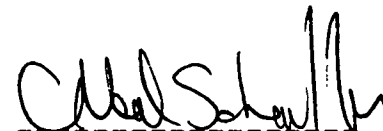
Lab pH.....	8.07
Lab Conductivity, umhos/cm.....	5894
Lab resistivity, ohm-m.....	1.6966
Total Dissolved Solids (180), mg/l..	4804
Total Dissolved Solids (calc), mg/l..	4510
Total Alkalinity as CaCO ₃ , mg/l.....	1275.12
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	138.94
Sodium Absorption Ratio.....	67.09
Bromide, mg/l.....	17.28

	mg/l	meq/l
Bicarbonate as HCO ₃	1555.65	25.50
Carbonate as CO ₃	0.00	0.00
Chloride.....	1863.42	52.56
Sulfate.....	<0.10	<0.01
Calcium.....	48.85	2.44
Magnesium.....	4.15	0.34
Potassium.....	11.00	0.28
Sodium.....	1818.00	79.08
Major Cations.....		82.14
Major Anions.....		78.07
Cation/Anion Difference.....		2.54 % *

* This cation /anion percent difference is probably due to high concentration of Bromide, which is not included in the balance equation.

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	34.11	<0.05
Manganese (Mn).....	0.44	<0.02


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermejo Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well I

DATE RECEIVED: 10/18/89

LAB NO: F3373

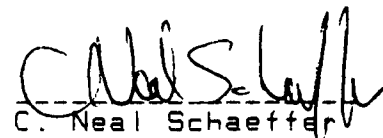
DATE COLLECTED: 10/10/89

Lab pH.....	8.13
Lab Conductivity, umhos/cm.....	4379
Lab resistivity, ohm-m.....	2.2836
Total Dissolved Solids (180), mg/l..	3572
Total Dissolved Solids (calc), mg/l..	3233
Total Alkalinity as CaCO ₃ , mg/l.....	1145.55
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	80.00
Sodium Absorption Ratio.....	63.58
Bromide, mg/l.....	8.39

	mg/l	meq/l
Bicarbonate as HCO ₃	1397.57	22.91
Carbonate as CO ₃	0.00	0.00
Chloride.....	1199.33	33.83
Sulfate.....	<0.10	<0.01
Calcium.....	25.27	1.26
Magnesium.....	4.12	0.34
Potassium.....	9.12	0.23
Sodium.....	1307.40	56.87
Major Cations.....		58.70
Major Anions.....		56.74
Cation/Anion Difference.....		1.70 %

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	26.23	<0.05
Manganese (Mn).....	0.27	<0.02


C. Neal Schaeffer
Lab Director



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermeja Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well H

DATE RECEIVED: 10/18/89

LAB NO: F3374

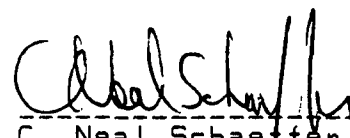
DATE COLLECTED: 10/10/89

Lab pH.....	8.12
Lab Conductivity, umhos/cm.....	6974
Lab resistivity, ohm-m.....	1.4339
Total Dissolved Solids (180), mg/l..	5620
Total Dissolved Solids (calc), mg/l..	5248
Total Alkalinity as CaCO ₃ , mg/l.....	1223.64
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	143.15
Sodium Absorption Ratio.....	74.89
Bromide, mg/l.....	29.32

	mg/l	meq/l
Bicarbonate as HCO ₃	1492.84	24.47
Carbonate as CO ₃	0.00	0.00
Chloride.....	2388.75	67.38
Sulfate.....	<0.10	<0.01
Calcium.....	48.01	2.40
Magnesium.....	5.69	0.47
Potassium.....	11.60	0.30
Sodium.....	2060.00	89.60
Major Cations.....		92.76
Major Anions.....		91.86
Cation/Anion Difference.....		0.49 %

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	42.88	<0.05
Manganese (Mn).....	0.48	<0.02


C. Neal Schaeffer
Lab Director



Inter-Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Vermeja Minerals Corp.

DATE REPORTED: 10/26/89

SITE: Well R

DATE RECEIVED: 10/18/89

LAB NO: F3375

DATE COLLECTED: 10/10/89

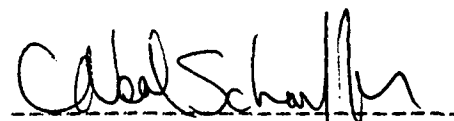
Lab pH.....	8.41
Lab Conductivity, umhos/cm.....	1268
Lab resistivity, ohm-m.....	7.8864
Total Dissolved Solids (180), mg/l..	1250
Total Dissolved Solids (calc), mg/l..	863
Total Alkalinity as CaCO ₃ , mg/l.....	748.44
Total Acidity as CaCO ₃ , mg/l.....	0.00
Total Hardness as CaCO ₃ , mg/l.....	42.10
Sodium Absorption Ratio.....	22.62
Bromide, mg/l.....	<0.1

	mg/l	meq/l
Bicarbonate as HCO ₃	898.60	14.73
Carbonate as CO ₃	7.13	0.24
Chloride.....	59.47	1.68
Sulfate.....	<0.10	<0.01
Calcium.....	10.95	0.55
Magnesium.....	3.60	0.30
Potassium.....	2.25	0.06
Sodium.....	337.50	14.68
Major Cations.....		15.58
Major Anions.....		16.65
Cation/Anion Difference.....		3.31 % *

* This large anion/cation % difference is probably due to unidentified anions such as nitrates, nitrites, sulfides, or halides. All major ions were reanalyzed without significant changes.

Trace metals by AA (Total Concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	15.66	<0.05
Manganese (Mn).....	0.29	<0.02


C. Neal Schaeffer
Senior Chemist



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

Client: Vermejo Minerals Corp.
Site: Leandro *CREEK*
IML #: F1558

Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

Total dissolved solids (180).....	390	mg/l
Total dissolved solids (103).....	420	mg/l
Total dissolved solids (calculated).....	410	mg/l
Total alkalinity (as CaCO3).....	378	mg/l
Total hardness (as CaCO3).....	10	mg/l
Lab pH.....	8.53	
Lab conductivity.....	700	umhos/cm @ 25C
Lab resistivity.....	14.2857	ohm-m
Sodium adsorption ratio.....	24.00	

	mg/l	meq/l
Acidity (as CaCO3).....	<1.0	<0.01
Bicarbonate (as HCO3).....	443.27	7.27
Carbonate (as CO3).....	8.88	0.30
Chloride.....	6.48	0.18
Sulfate.....	0.41	0.01
Calcium.....	3.28	0.16
Magnesium.....	0.00	0.04
Potassium.....	0.85	0.02
Sodium.....	174.10	7.57
Major cations.....		7.79
Major anions.....		7.75
Anion/cation % difference.....		0.25 %

Bromide..... 0.565 mg/l



C. Neal Schaeffer
Senior Chemist

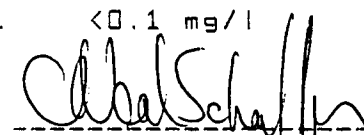
Client: Vermejo Minerals Corp.
Site: Mary's Lake
IML #: F1554

Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

Total dissolved solids (180).....	426 mg/l
Total dissolved solids (103).....	488 mg/l
Total dissolved solids (calculated).....	449 mg/l
Total alkalinity (as CaCO ₃).....	397 mg/l
Total hardness (as CaCO ₃).....	109 mg/l
Lab pH.....	8.02
Lab conductivity.....	774 umhos/cm @ 25C
Lab resistivity.....	12.9199 ohm-m
Sodium adsorption ratio.....	6.15

	mg/l	meq/l
Acidity (as CaCO ₃).....	<1.0	<0.01
Bicarbonate (as HCO ₃).....	484.18	7.94
Carbonate (as CO ₃).....	0.00	0.00
Chloride.....	19.44	0.55
Sulfate.....	8.64	0.18
Calcium.....	19.68	0.98
Magnesium.....	14.69	1.21
Potassium.....	2.78	0.07
Sodium.....	148.00	6.44
Major cations.....		8.70
Major anions.....		8.67
Anion/cation % difference.....		0.19 %

Bromide..... <0.1 mg/l


C. Neal Schaeffer
Senior Chemist

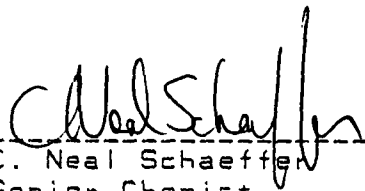
Client: Vermejo Minerals Corp.
Site: Bubbling Springs *
IML #: F1553

Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

Total dissolved solids (180).....	184 mg/l
Total dissolved solids (103).....	250 mg/l
Total dissolved solids (calculated).....	262 mg/l
Total alkalinity (as CaCO3).....	201 mg/l
Total hardness (as CaCO3).....	191 mg/l
Lab pH.....	7.80
Lab conductivity.....	463 umhos/cm @ 25C
Lab resistivity.....	21.5983 ohm-m
Sodium adsorption ratio.....	0.87

	mg/l	meq/l
Acidity (as CaCO3).....	<1.0	<0.01
Bicarbonate (as HCO3).....	244.66	4.01
Carbonate (as CO3).....	0.00	0.00
Chloride.....	12.96	0.37
Sulfate.....	34.98	0.73
Calcium.....	50.83	2.54
Magnesium.....	15.64	1.29
Potassium.....	0.76	0.02
Sodium.....	27.70	1.20
Major cations.....		5.05
Major anions.....		5.11
Anion/cation % difference.....		0.58 %
Bromide.....	0.265 mg/l	

* Water used for cement & Frac Jobs


C. Neal Schaeffer
Senior Chemist



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

Sec. 1, T31N, R17E
1450 FBL, 660 FEL

TD 620' - Vermejo Formation

Client: Vermejo Minerals Corp.
Site: 3-1
IML #: F1557

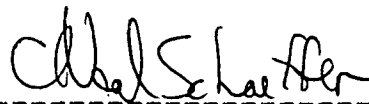
Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

0111

Total dissolved solids (180).....	364	mg/l
Total dissolved solids (103).....	404	mg/l
Total dissolved solids (calculated).....	396	mg/l
Total alkalinity (as CaCO ₃).....	366	mg/l
Total hardness (as CaCO ₃).....	8	mg/l
Lab pH.....	8.63	
Lab conductivity.....	678	umhos/cm @ 25C
Lab resistivity.....	14.7493	ohm-m
Sodium adsorption ratio.....	26.28	

	mg/l	meq/l
Acidity (as CaCO ₃).....	<1.0	<0.01
Bicarbonate (as HCO ₃).....	419.80	6.88
Carbonate (as CO ₃).....	13.32	0.44
Chloride.....	3.24	0.09
Sulfate.....	0.62	0.01
Calcium.....	3.28	0.16
Magnesium.....	0.00	.00
Potassium.....	1.01	0.03
Sodium.....	170.50	7.42
Major cations.....		7.60
Major anions.....		7.43
Anion/cation % difference.....		1.14 %

Bromide..... 0.875 mg/l



C. Neal Schaeffer
Senior Chemist

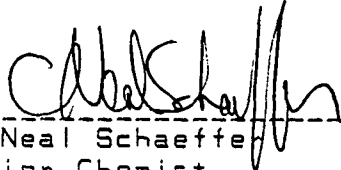
Client: Vermejo Minerals Corp.
Site: Vermejo River
IML #: F1556

Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

Total dissolved solids (180).....	104	mg/l
Total dissolved solids (103).....	146	mg/l
Total dissolved solids (calculated).....	129	mg/l
Total alkalinity (as CaCO3).....	93	mg/l
Total hardness (as CaCO3).....	104	mg/l
Lab pH.....	7.96	
Lab conductivity.....	241	umhos/cm @ 25C
Lab resistivity.....	41.4938	ohm-m
Sodium adsorption ratio.....	0.38	

	mg/l	meq/l
Acidity (as CaCO3).....	<1.0	<0.01
Bicarbonate (as HCO3).....	112.85	1.85
Carbonate (as CO3).....	0.00	0.00
Chloride.....	3.24	0.09
Sulfate.....	23.25	0.48
Calcium.....	32.79	1.64
Magnesium.....	5.28	0.43
Potassium.....	1.02	0.03
Sodium.....	8.90	0.39
Major cations.....		2.48
Major anions.....		2.43
Anion/cation % difference.....		1.18 %

Bromide..... 0.055 mg/l



C. Neal Schaeffe
Senior Chemist



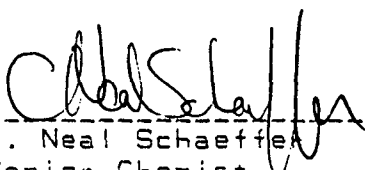
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

Client: Vermejo Minerals Corp.
Site: Van Bremmer Can.
IML #: F1555

Date of report: 06/22/89
Date sampled: 06/06/89
Date received: 06/09/89

Total dissolved solids (180).....	352 mg/l
Total dissolved solids (103).....	412 mg/l
Total dissolved solids (calculated).....	412 mg/l
Total alkalinity (as CaCO3).....	313 mg/l
Total hardness (as CaCO3).....	163 mg/l
Lab pH.....	8.34
Lab conductivity.....	711 umhos/cm @ 25C
Lab resistivity.....	14.0647 ohm-m
Sodium adsorption ratio.....	3.63

	mg/l	meq/l
Acidity (as CaCO3).....	<1.0	<0.01
Bicarbonate (as HCO3).....	377.82	6.19
Carbonate (as CO3).....	2.22	0.07
Chloride.....	12.96	0.37
Sulfate.....	53.08	1.11
Calcium.....	27.87	1.39
Magnesium.....	22.79	1.87
Potassium.....	2.99	0.08
Sodium.....	106.70	4.64
Major cations.....		7.98
Major anions.....		7.74
Anion/cation % difference.....		1.55 %
Bromide.....	0.064 mg/l	


C. Neal Schaeffer
Senior Chemist



R. D. Osterhout
Division Construction Engineer
U.S. Offshore Division

Pennzoil Place
P.O. Box 2967
Houston, TX 77252-2967
713/546-4774

a division of **PENNZOIL COMPANY**

SATHE ANALYTICAL LABORATORY, INC.

301 W. 2ND STREET

P.O. BOX 1527
WILLISTON, ND. 58801

701-572-3632

WATER ANALYSIS REPORT

OPERATOR: PENNZOIL COMPANY

DATE: 10/28/87

WELL NO. Leandro Creek #1

LAB NO.: W-87-1961

FIELD:

FORMATION: not listed

COUNTY:

INTERVAL: not listed

STATE:

DST #:

LOC:

SAMPLE Sample Date - 10/16/87

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	224.0	9.7	CHLORIDE	120.1	3.4
CALCIUM	28.0	1.4	CARBONATE	3.0	0.1
MAGNESIUM	2.1	0.2	BICARBONATE	549.2	9.0
IRON	0.3	0.0	SULFATE	27.3	0.6
POTASSIUM	3.5	0.1	NITRATE	0.0	0.0
BARIUM	0.2	0.0			
CHROMIUM	0.0	0.0			

SPECIFIC GRAVITY @ 77°F

0.998 PH

7.74

RESISTIVITY @ 77°F, ohm-meters

6.901 NACL (Calc.)

198.1

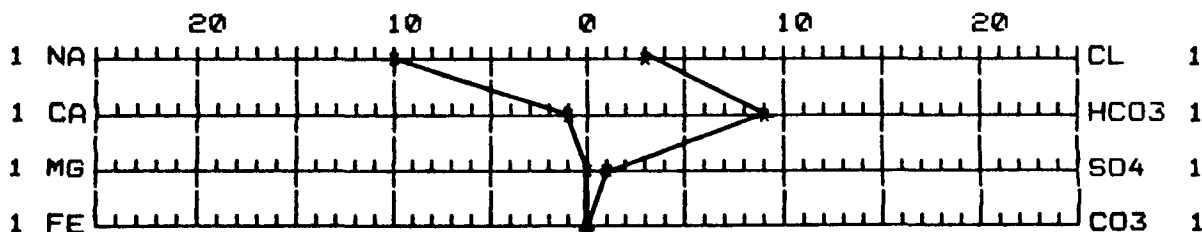
TOTAL DISSOLVED SOLIDS (Calc.) MG/L

957.8

HYDROGEN SULFIDE

NEG

WATER ANALYSIS PATTERN - MEQ/L



REMARKS - Sample received from Mark Shumway.

DISTRIBUTION OF RESULTS

BATHE ANALYTICAL LABORATORY, INC.

301 W. 2ND STREET

P.O. BOX 1527
WILLISTON, ND. 58801

701-572-3632

WATER ANALYSIS REPORT

OPERATOR: PENNZOIL COMPANY

DATE: 10/28/87

WELL NO. *Vermejo Park*
~~Van-Bremmer~~ 3-1

LAB NO.: W-87-1960

FIELD:

FORMATION: not listed

COUNTY:

INTERVAL: not listed

STATE:

DST #:

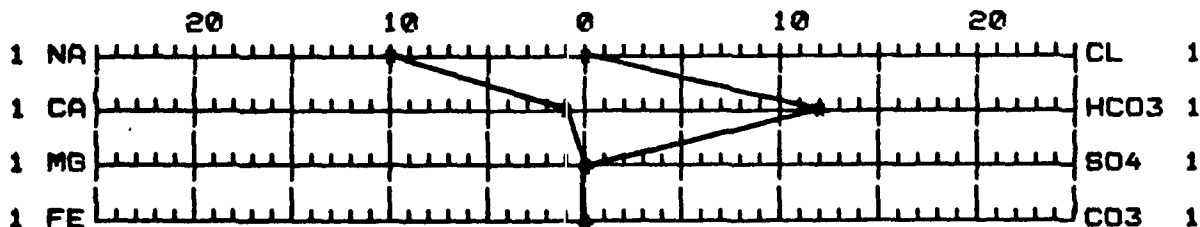
LOC:

SAMPLE Sample Date ~ 10/16/87

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	234.0	10.2	CHLORIDE	10.9	0.3
CALCIUM	23.6	1.2	CARBONATE	4.5	0.1
MAGNESIUM	1.2	0.1	BICARBONATE	732.2	12.0
IRON	0.0	0.0	SULFATE	13.3	0.3
POTASSIUM	3.5	0.1	NITRATE	0.0	0.0
BARIUM	0.0	0.0			
CHROMIUM	0.0	0.0			

SPECIFIC GRAVITY @ 77°F	0.992	PH	8.31
RESISTIVITY @ 77°F, ohm-meters	8.745	NACL (Calc.)	18.0
TOTAL DISSOLVED SOLIDS (Calc.) MG/L	1024.2	HYDROGEN SULFIDE	NEG

WATER ANALYSIS PATTERN - MEQ/L



REMARKS - Sample received from Mark Shumway 10/26/87.

DISTRIBUTION OF RESULTS
2cc-Sidney, MT-Attn: Mark Shumway