elpaso

EL PASO ENERGY RATON, L.L.C.
P.O. Box 190 - RATON, N.M. 87740

August 31, 2004

RECEIVED

SEP 03 2004

Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505

New Mexico Oil Conservation Division
1220 South St. Frances
Santa Fe, NM 87505

Re: VPR A-182 WDW Application for Authority to Inject

Dear NMOCD:

Find attached Application for Authority to Inject VPR A-182 WDW with the following enclosures:

1. **Application Checklist**
2. **Application for Authority to Inject**
3. **Approved APD**
3. **Procedure**
4. **Vicinity Map**
5. **Geoprog**
6. **Source Water Analyses**
7. **Letter to Surface Owner**
8. **Receipt of Letter to Surface Owner**
9. **Legal Notice Publication**

Respectfully,

DR Lankford

Don Lankford
Production Manager
El Paso Energy Raton

DATE IN 9.3.04	SUSPENSE 9/18/04	ENGINEER Jones	LOGGED IN 9.7.04	TYPE SWD	APP NO. pSEM0425148~~307~~ 358

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

[A] ☒ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ☒ Application is One Which Requires Published Legal Notice

[D] ☒ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☒ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☒ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Donald R. Lankford	DR Lankford	Production Manager	8/31/04
Print or Type Name	Signature	Title	Date

donlankford@elpaso.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance X_____Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: **EL PASO ENERGY RATON, L.L.C.**

ADDRESS: **PO BOX 190 RATON, NEW MEXICO 87740**

CONTACT PARTY: **DONALD R. LANKFORD** PHONE: **(505) 445-6721**

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

IV. Is this an expansion of an existing project? _____Yes ____X____No
If yes, give the Division order number authorizing the project: _____

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

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

VII. Attach data on the proposed operation, including:

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

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

IX. Describe the proposed stimulation program, if any.

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

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

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

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

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

NAME: **DONALD R. LANKFORD** TITLE: **PRODUCTION MANAGER**

SIGNATURE: D R Lankford DATE: 08-31-04

E-MAIL ADDRESS: **donlankford@elpaso.com**

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

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

III. WELL DATA

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

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: **EL PASO ENERGY RATON, L.L.C.**

WELL NAME & NUMBER: **VPR A-182 WDW**

WELL LOCATION: **2166' FNL & 1074' FWL** | **E** | **28** | **32N** | **20E**

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

(SEE ATTACHMENT A)

30-007-20540

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: **17 ½"** Casing Size: **13 3/8"**

Cemented with: **200** sx. *or* **350** ft^3

Top of Cement: **Surface** Method Determined: _____

Intermediate Casing

Hole Size: **12 1'4"** Casing Size: **10 ¾"**

Cemented with: **500** sx. *or* **2600** ft^3

Top of Cement: **Surface** Method Determined: _____

Production Casing

Hole Size: **9 7/8"** Casing Size: **7 5/8"**

Cemented with: **1100** sx. *or* **6130** ft^3

Top of Cement: **Surface** Method Determined: _____

Total Depth: **7320'**

Injection Interval

6710' feet to **7170'**

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: **3 ½" / 2 7/8"** Lining Material: _____

Type of Packer: **5" x 2" Nickel Plated Loc Set w/ Carbide Slips**

Packer Setting Depth: _____

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? **X** Yes _____ No

   If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: **Entrada and Glorieta Sandstone**

3. Name of Field or Pool (if applicable): **Vermejo Park Ranch**

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. **No**

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: _____

   The Raton and Vermejo coal beds overlay the area of the proposed well. They will be sealed from the wellbore by 10 ¾" intermediate and 7 5/8" casing.

El Paso Energy Raton, L.L.C.
Vermejo Park Ranch "A", Well #182 Water Disposal
2166 FNL & 1074 FWL
Section 28, T-32N, R 20E
Colfax County, New Mexico

Additional Data

V. Map attached - "Attachment B", two mile & ½ mile radius area of review.

VI. Area of Review:

There are no Water Disposal Well within one half mile of the proposed disposal well that is currently injecting produced water into the Entrada and Glorieta.

VII. Operation Data:

1. Proposed average daily injection volume: 20,000 BWPD
   Proposed maximum daily injection volume: 20,000 BWPD

2. This well will be a closed system.

3. Proposed average daily injection pressure: 1,500 psi
   Proposed maximum daily injection pressure: 1,500 psi

4. Sources of injection/disposal water will be from the Vermejo and Raton Formation CBM wells that have been drilled or are scheduled to be drilled on the Vermejo Park Ranch.

5. Chemical analysis of water zones will be obtained by Baker Petrolite Laboratories and Roy Johnson, District 4, Oil Conservation Division, Santa Fe, NM.

VIII. Geological Data (Geologic Well Prognosis Report) – "Attachment C"

Information pertaining to the lithological details and thickness have been estimated based on the VPR A 42 well, located in Section 5, T31N, R19E.

IX. Stimulation Program

No stimulation program.

X. Logs and Test Data

The Oil Conservation Division, Att: Roy Johnson, Santa Fe, NM, is on the distribution list for all logs.

XI. Fresh Water

Roy Johnson, OGCD, will take fresh water samples during drilling.

XII. Statement

To the best of our current knowledge of the area, there is no evidence of open faults or other hydrologic connection between and disposal zone and underground sources of drinking water.

XIII. Proof of Notice attached as "Attachment D"

Surface Owner:

Vermejo Park, L.L.C.
PO Drawer E
Raton, NM 87740

Working/Offset & Royalty Owners:

El Paso Energy Corporation has 100% working interest.
There are no partners.

XIV. Certification: Form C-108 "Application for Authorization to Inject".

Copies of the Oil Conservation Division, Form C-108 have been sent to the above stated parties by Certified Mail on this 31st day of August, 2004.

DR Lankford

Donald R. Lankford, Production Manager
El Paso Energy Raton, L.L.C.
PO Box 190
Raton, NM 87740

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
May 27, 2004

Submit to appropriate District Office

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address	[2] OGRID Number
El Paso Energy Raton, L.L.C. **P.O. Box 190 Raton, New Mexico 87740**	**180514**
	[3] API Number: 30-007-20540

[5] Property Code	[4] Property Name	[6] Well No.
24648	**Vermejo Park Ranch**	**VPR A 182 WDW**

[9] Proposed Pool 1	[10] Proposed Pool 2
Entrada	**Glorieta**

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	**28**	**32N**	**20E**	**E**	**2166**	**North**	**1074**	**West**	**Colfax**

[8] Proposed Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Additional Well Information

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	**S**	**Air/Rotary**	**P**	**8095'**
[16] Multiple	[17] Proposed Depth	[18] Formation	[19] Contractor	[20] Spud Date
No	**7320'**	**Entrada/Glorieta**	**Key**	**October 1, 2004**

Depth to Groundwater	Distance from nearest fresh water well	Distance from nearest surface water

Pit: Liner: Synthetic ☐ ____mils thick Clay ☐ Pit Volume:_____bbls

Closed-Loop System ☐

Drilling Method:

Fresh Water ☐ Brine ☐ Diesel/Oil-based ☐ Gas/Air ☐

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
17 ½"	**13 3/8"**	**48#**	**350'**	**200 sks**	**Surface**
12 ¼"	**10 ¾"**	**40.5#**	**2600'**	**500 sks**	**Surface**
9 7/8"	**7 5/8"**	**26.4#**	**6130'**	**1100 sks**	**Surface**
6 ¾"	**5 ½"**	**15.5#**	**7320'**	**175 sks**	**5980'**

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

1. Drill 17 12" surface hole to 350". Set 13 3/8" casing and cement to surface with 200 sks SD 300 cement.
2. Drill 12 ¼" hole to just above Pierre Shale at approximately 2600'. Set 10 ¾" casing with 400 sks SD 300 cement. A cement bond log will be run if unable to circulate cement to surface.
3. Drill 9 7/8" hole to Dakota formation, at approximately 6130'. Set 7 5/8" casing. Cement with 1100 sks SD 300 cement. A cement bond log will be run if unable to circulate cement to surface.
4. Drill 6 ¾" hole through Entrada formation at approximately 7320'. Open hole logs to include induction, resistivity, caliper, density and gamma ray. Set 5 ½: Liner Cement with 175 sks SD 300 cement. Top of liner at 5980'
5. Perforate Entrada formation and attempt to catch native formation water sample.
6. Conduct injectivity test.
7. Restoration of surface location/site.

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify that the drilling pit will be constructed according to NMOCD guidelines ☐, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.**

Printed name: Donald R. Lankford DR Lankford

Title: Production Manager

E-mail Address: Donald.Lankford@elpaso.com

Date: 08/24/04 Phone:

OIL CONSERVATION DIVISION

Approved by: Ky Ellerman

Title: DISTRICT SUPERVISOR

Approval Date: 8/25/04 Expiration Date: 8/25/05

Provide reserve pit and mud program descriptions

Conditions of Approval Attached ☐

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 15, 2000
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	96970	STUBBLEFIELD CANYON - VERMEJO GAS

[4] Property Code	[5] Property Name	[6] Well Number
24648	VERMEJO PARK RANCH	VPR'A'-182 WDW

[7] OGRID No.	[8] Operator Name	[9] Elevation
180514	EL PASO ENERGY RATON, L.L.C.	8095' ±

[10] Surface Location

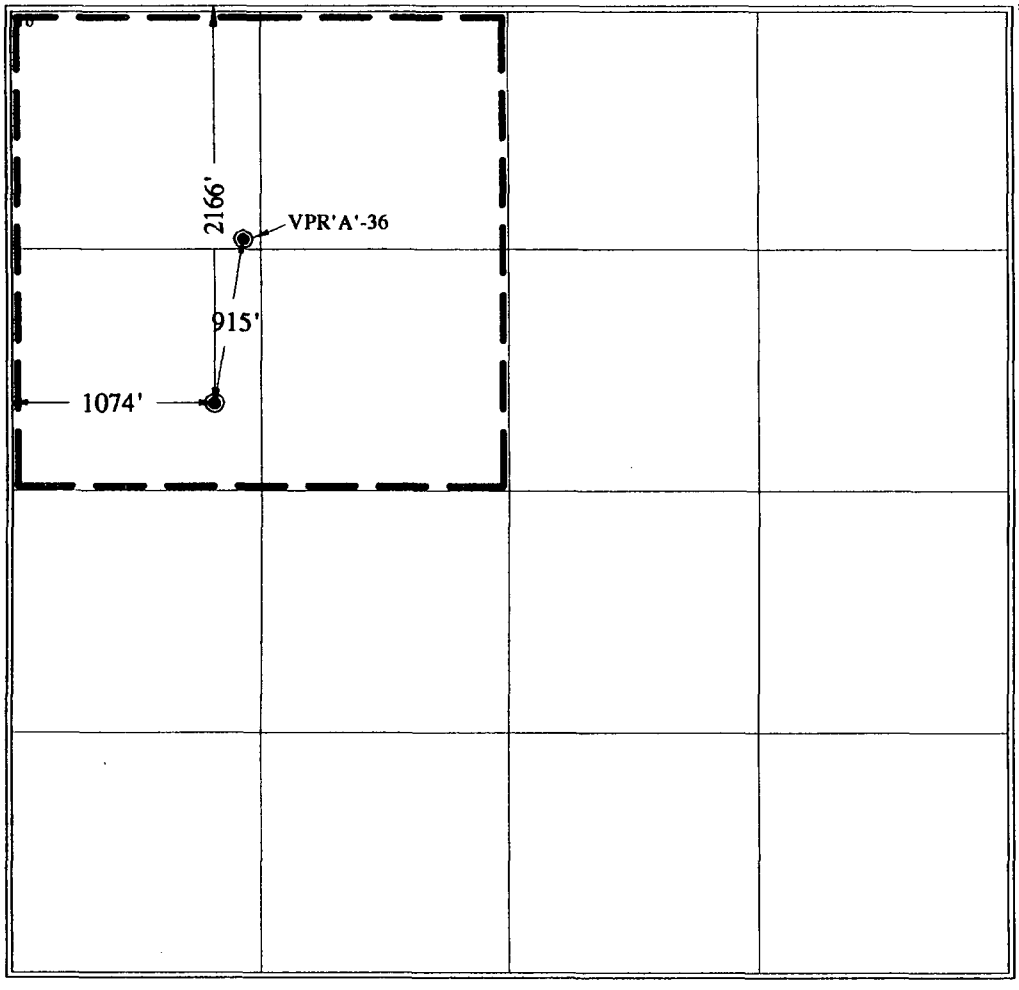
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	28	T 32 N	R 20 E	E	2166	NORTH	1074	WEST	COLFAX

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

D R Lankford

Printed Name DONALD R. LANKFORD

Title SENIOR PETROLIUM ENGINEER

Date

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

August 23, 2004 (AMENDED)

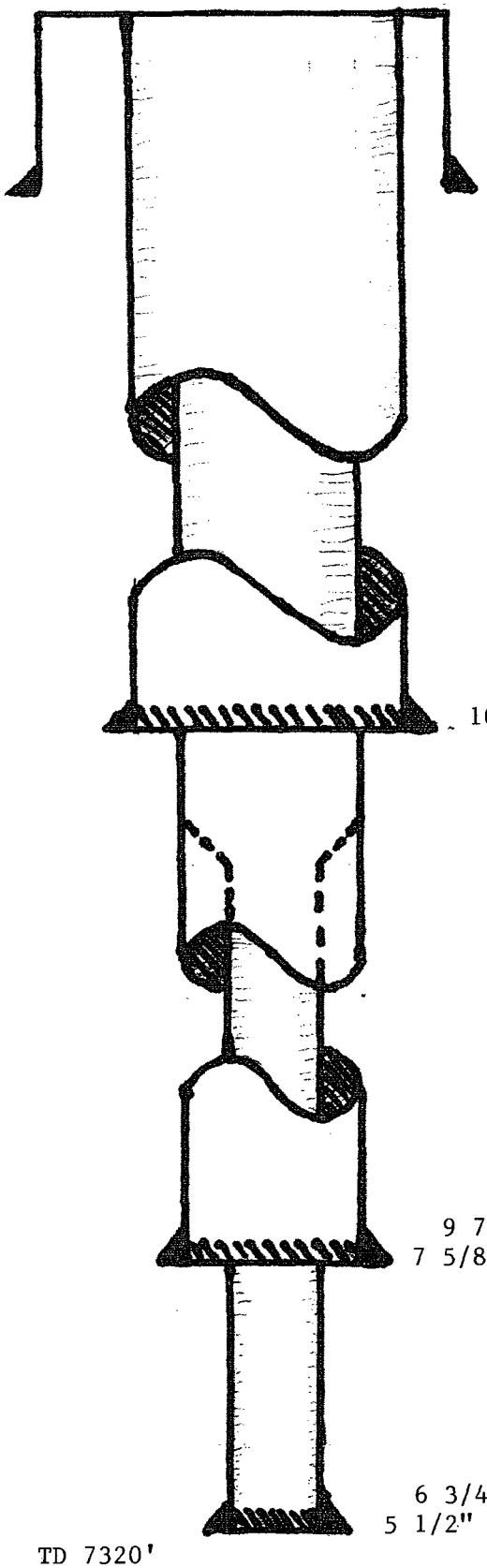
Date of Survey

Signature and Seal of Professional Surveyor:

Certificate Number NM LS NO. 5103

ATTACHMENT A

PROPOSE CASING SCHEDULE
VPR A 182 WDW



17 1/2 " hole
13 3/8" 48# csg @ 350'
200 sks SD 300 cement

12 1/4" hole
10 3/4" 40.5# casing @ 2600'
500 sks SD 300 cement

9 7/8" hole
7 5/8" csg @ 6130'
1100 sks TPB cement

6 3/4" hole
5 1/2" 15.5# csg @ 5980' - 7320'

TD 7320'

PROCEDURE

VPR A 182 WDW

MI RU RIG

NU ROTATING HEAD ON 20" CONDUCTOR

PU 12 ¼" HMR/FB. DRL TO 350' (+,-) AIR/FOAM

PU 17 ½" MT BIT. REAM HOLE TO 350' AIR/FOAM

SET 13 3/8" CSG

CMT W/ MIDCON II SURFACE BLEND – 100% EXCESS
USE POLYMER AS LEAD W/ FW SPACER

CUT OFF. WELD ON. NU BOPS & ROTATING HEAD

PU 12 ¼" HMR/FB. DRL TO 2600' – BTTM TRINADAD FORM. AIR/FOAM

RIG UP ELU. RUN OPEN HOLE LOGS TO LOOK @ VERMEJO COALS

SET 10 ¾" CSG.

CMT W/ TRINADAD PRODUCTION BLEND - 75% EXCESS

DROP SLIPS. CUT OFF. NU HEAD, BOPS & ROTATING HEAD

PU 9 7/8" HMR/FB. DRL TO 6130' (TOP OF DAKOTA) AIR/FOAM

RIG UP ELU. RUN OPEN HOLE LOGS TD TO BTTM SURFACE PIPE

SET 7 5/8" CSG W/ DV TOOL @ +,- 5000'

CMT 2 STAGES W/ TPB CMT. USE POLYMER AS LEAD AND FW SPACER

DROP SLIPS. CUT OFF. NU HEAD, BOPS & ROTATING HEAD

RUN CBL LOG OVER INTERMEDIATE CSG.

PU 6 ¾" BIT. PU 4 ¾" DC & 3 ½" DP. DRL SHOE, THEN TO 7,320'. TOP OF SANGRE DE CRISTO.

RU ELU. RUN OPEN HOLE LOGS.

SET 5 1/2" FJ LINER W/ 150' OL.

CMT W/ TPB CMT.

LD DP & DC, SECURE WELL. RD MO.

Basin Fluids

911 W. Broadway Bloomfield, NM 87413

Introducing

Basin Fluids Clean -Faze tm

"Clean -faze "a non-toxic environmental friendly drilling fluid designed with the local problem areas in mind. Basin Fluid takes pleasure , introducing our new drilling fluid "Clean -Faze" a non- dispersed lo-solids fluid which can be used with bentonite or without . The make up water can be produced water , showing a great savings on the cost of drill water and water hauling .

"Clean-faze " is the perfect fluid to utilize drilling a deviated bore-hole , the fluid contributes to drilling a gauge hole.(by caliper logs) which in turn will cut the Cement cost on the casing jobs by as much as 50 % . Basin Fluids "Clean -Faze" is a combination of stabilized bacterial resistant polymers and Polysaccharide . Design to form an ultra-thin resilient low permeable membrane which minimizes the potential for differential sticking and the invasion of damaging filtrate and drilled solids into your pay formations and tends to increase your production profits.

The "Clean-faze" system shows a great tolerance for encountered contaminate from the formation ,CO2 etc. "Clean-faze" is one of the more recent advancements in the technology of low- solids polymer drilling fluids .

The "Clean -Faze" drilling fluid system of cross-linked polymers retard the hydration and subsequent dispersion of drilled cuttings , allowing for lower mud densities and less products required to treat the system .

The "Clean-Faze" system is a true lo-solids drilling fluid which can be re-used and easily be disposed of with out adverse effects on our environment . When drilling a deviated well it is very important to keep the annulus of the bore hole clean . The "Clean-Faze " system that we recommend has progressive gel strengths , under static conditions and will allow us to use a higher drilling rate without the problems of plug flow , as seen in other lo-solids drilling systems .

Poly-Plus (PHPA) may be used in conjunction with The "Clean - Faze" system to strip drill-solids from the Drilling fluid .

The Cost of The "Clean-Faze " drilling fluid system is about the same as an conventional lo-solids mud .

Questions or Comments
Mike Atchison
basinfluids@cpinet.com
Office 505-632-2595
Cell 505-320-8407

Basin Fluids

911 W. Broadway, Bloomfield New Mexico 87413

Recommended Mud Program

August 24, 2004

Mr. Donnie Trimble
El Paso Production
309 Silver
Raton, NM 87740

Sangre de Cristo SWD

20" Conductor

17 ½"hole Interval : 13 3/8" Casing

Depth Feet.	Weight lb. / Gal.	Vis. Sec.	Filtrate ML.	YP	
0 to 350					**Air Mist**

12 ¼" hole Interval: 9 5/8" Casing

350' to 2600					**Air Mist** EMI-744(Bearcat) Cationic Polymer

8 ¾" Interval: 7" Casing

Depth Feet.	Weight lb. / Gal.	Vis. Sec.	Filtrate ML.	YP	
2600' to 6130'	8.4-8.6	32-34	4.6cc	6-12	**Clean Faze**

Abnormal drilling conditions

Loss of returns could be expected in the Point Lookout and Mesa Verda, and possibly the lowed Dakota. Pre treating with 20-25 % LCM has proven to be most successful in this area and should be maintained at 15-20% through TD (7" casing depth). Losses can also be expected in the Summerville and the Entrada.

Approximate Mud Cost $85.000

Questions or Comments
Mike Atchison
basinfluids@cptnet.con
Office 505-632-2595
Cell 505-320-8407

CLEAN FAZE

BASIN FLUIDS

Bloomfield, New Mexico

Product of Brazil

RISK: CAUTION! NUISANCE DUST. MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.	**RIESGO:** ¡CUIDADO! POLVO MOLESTO. PUEDE CAUSAR LA IRRITACIÓN DE LOS OJOS, LA PIEL Y LAS VÍAS RESPIRATORIAS.
PRECAUTIONS: Avoid creating and breathing dust. Avoid contact with eyes, skin and clothing. Supply ventilation adequate to keep exposure below occupational exposure limits (PEL or OES) for nuisance dust. Wear an approved particulate respirator (N95 or P2) when exposure may exceed the limit.	**PRECAUCIONES:** Evitar generar y respirar polvo. Evitar el contacto con los ojos, la piel y la ropa. Suministrar la ventilación adecuada para mantener la exposición por debajo de los límites de exposición profesional (PEL o OES) para polvos molestos. Usar un respirador aprobado para particulados (N95 o P2) cuando la exposición puede exceder el límite.
FIRST-AID MEASURES:	**PRIMEROS AUXILIOS:**
EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for as least 15 minutes. Get medical attention.	**OJOS:** Lavar inmediatamente los ojos con gran cantidad de agua, manteniendo los párpados abiertos. Seguir enjuagando durante por lo menos 15 minutos. Obtener atención médica.
INHALATION: Move to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.	**INHALACIÓN:** Desplazar inmediatamente la víctima al aire fresco. Administrar respiración artificial si la víctima deja de respirar. Obtener atención médica.
INGESTION: Drink water or milk to dilute. Do NOT induce vomiting unless directed to by a physician. Never give anything by mouth to an unconscious person. Get medical attention.	**INGESTIÓN:** Beber agua o leche para diluir. NO se debe inducir el vómito a menos que lo ordene un médico. No se debe administrar nada por la boca a una persona inconsciente. Obtener atención médica.
SKIN: Wash with soap and water. Remove contaminated clothing. Get medical attention if discomfort continues.	**PIEL:** Lavar con jabón y agua. Quitarse la ropa contaminada. Obtener atención médica si la molestia continúa.
For more information see the Material Safety Data Sheet.	Para más información consultar la Hoja de Datos de Seguridad sobre los Materiales (MSDS).

$63/BAG 4-5 lbs/BBL $1072
50 # BAG

FOR INDUSTRIAL USE ONLY

24-HOUR EMERGENCY PHONE: 505-632-2595

HMIS HEALTH **1** FLAMMABILITY **1** REACTIVITY **0** PERSONAL PROTECTION **E**

34 lbs

Donnie Trimble
Drilling Superintendent
El Paso Energy Raton L.L.C.
P.O. Box 109
Raton, New Mexico 87740

Proposed Drilling Pit Liner, Fencing/Netting Exception.

Pit Size and Location

Pit Size - 30'w x 80'l x 7'd Location – Immediately adjacent to drilling rig pad.

The pit will not be located in area of ground water sensitivity nor any wetlands.

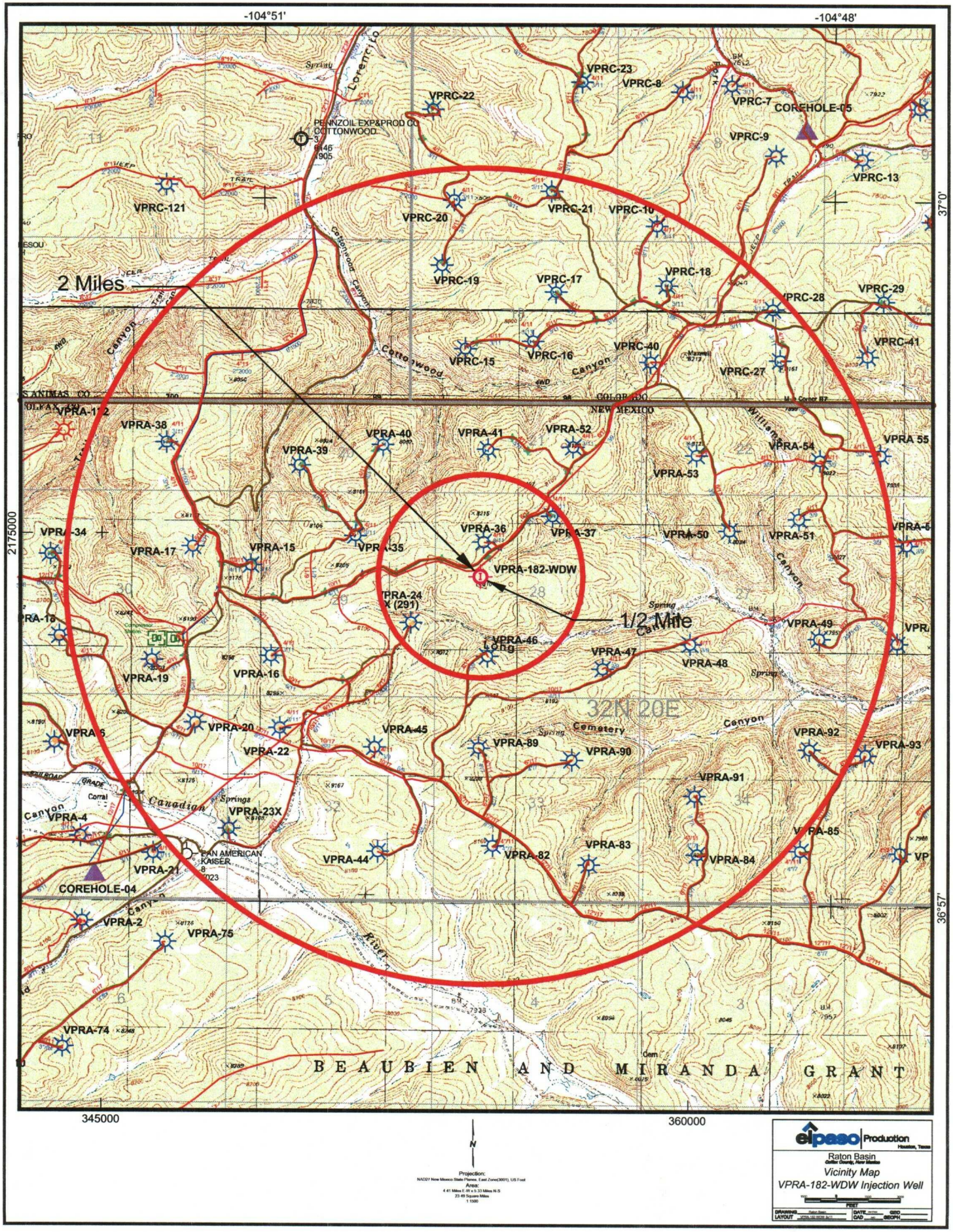
Liner

El Paso request exception to state wide rules to construct a temporary drilling pit Per C. (b) (i): Pit will be used to vent Air/Foam/Gas during the drilling operation. There will be no storage of drilling mud, oil or other hydrocarbons. Only run off water and fresh water used during the drilling operation will be allowed to collect in the drilling pit. Fluids will be removed as soon as operations have ceased. All fluids (see attachments) used during the Drilling Operation are non-toxic and are not environmental hazardous.

Fencing and Netting

The Drilling Pit will be free of oil or other hydrocarbons and shall be open only during the drilling/completion operation.

ATTACHMENT B



Projection:
NAD27 New Mexico State Planes, East Zone(3001), US Foot
Area:
4.41 Miles E-W x 5.33 Miles N-S
23.49 Square Miles
1:1500

elpaso Production
Houston, Texas

Raton Basin
Colfax County, New Mexico

Vicinity Map
VPRA-182-WDW Injection Well

FEET

DRAWING LAYOUT		DATE	GEO
		CAD	GEOPH

ATTACHMENT C

El Paso Energy Raton, LLC
PRELIMINARY GEOLOGIC WELL PROGNOSIS REPORT

DATE: 08/19/04
RIG:
SUPV: Donny Trimble
REPORT BY: Mike Korte

WELL NAME: VPR A182 WDW API number:

FIELD	RATON BASIN CBM PROJECT		SEC.	28	TW.	32N	RANGE	20E	
FEET FNL:	1,320	FEET FWL:	1,320	POD	A	AREA	Canadian River	COUNTY:	COLFAX	STATE: NM
ELEV. GL.:	8,120	Est Spud:	2004	EST TD	7,610	LOG:		PROJECT SPECIFIC:	Water Injection Well	
MUD LOGGERS:				CSG PT. GEOLOGIST:				OP. HOLE LOGGERS:		

Preliminary Location.....Elevation is estimated from Topograghic Map with pre Shields Lat 36.981029 N Long -104.823927 W near VPR A36 well

Intermediate 9 5/8"

DRILLERS DEPTH:	2,600	12 1/4"bit 3 1/2 days drilling		Surface Csg.:	13 3/8"	Set @:	350	ft.
LOGGERS DEPTH:				Intermediate Csg.:	9 5/8"	Set @:	2600	ft.
First significant gas:	700	subsea:	ft.	Cement Inter. Csg.:		Circ. Cmt.:	to surface	
RATON FM. TOP:	350	subsea:	7770 ft.					
VERMEJO FM. TOP:	2,000	subsea:	6120 ft.				Raton fm. CBM (ft.)	
TRINIDAD FM. TOP:	2,280	subsea:	5840 ft.				Vermejo fm. CBM (ft.)	

Intermediate 7" Pierre - Graneros Section

DRILLERS DEPTH:				Intermediate Csg.:	7"	Set @:		ft.
LOGGERS DEPTH:				Cement Inter. Csg.:		Circ. Cmt.:		
TRINIDAD FM. TOP:	2,280	subsea:	5840 ft.					
PIERRE FM. TOP:	2,380	subsea:	5740 ft.	SHALE dark gr./bl. firm mod calc, carb. minor sandy sh tr. bent and pyr...offset gas correlates 3,440' & 4,580'				
Lower Pierre member:	4,490	subsea:	3630 ft.	SHALE AS ABOVE with silty shale normally first gas flow				
NIOBRARA FM. TOP:	4,815	subsea:	3305 ft.					
Smokey Hill Member:	4,815	subsea:	3305 ft.	dark gray firm hard calcareous shale with minor gray arg ls and sdy sh, tr. bent and pyr				
Timpas Member:	5,425	subsea:	2695 ft.	SHALE dark gray calc. firm mica pyr becoming silty to vfg sd in lower parts, minor arg ls				
Fort Hayes Member:	5,670	subsea:	2450 ft.	LS tan microcrystalline to chalky limestone and gray calcareous shale				
BENTON FM TOP:	5,690	subsea:	2430 ft.					
Codell Member:	5,690	subsea:	2430 ft.	SH & SS dark gray carb shale, minor fine grained sandstone with thin beds of black limestone				
Carlile Sh. Member:	5,710	subsea:	2410 ft.	SHALE chalky to limy dark gray calc soft smooth shale with minor ls and calcareous sandy shale				
Greenhorn Ls. Member:	5,910	subsea:	2210 ft.	SHALE dark gray abnt pyr limy, minor hard crystalline dark gray ls, minor gray calc shale-arg. Ls				
Graneros Sh. Member:	5,935	subsea:	2185 ft.	SHALE dark gray to black noncalcareous sli silty, minor bentonite, limestone and silt-fg sandstone				
Dakota silt zone:	6,130	subsea:	1990 ft.	may encounter thin beds of siltstone, brown hard mica carb arg siltstone, minor fg ss				
DAKOTA FM TOP:	6,130	subsea:	1990 ft.					
Tops based on nearby deep wells								

Intermediate (Liner)

DRILLERS DEPTH:				Production Liner:		Set @:		ft.
LOGGERS DEPTH:				Cement Liner in place:				
DAKOTA FM TOP:	6,130	subsea:	1990 ft.					
Dakota SS A member:	6,130	subsea:	1990 ft.	As Dakota Silt or SS med to coarse grained sli calc, silica cement w/minor carb shale, trace of coal				
Dakota SS B member:	6,180	subsea:	1940 ft.	SS as above A member, mostly crs grained, minor chert conglomeratic ss and carb shale				
Purgatoire SS member:	6,225	subsea:	1895 ft.	SS poorly sorted med-crse conglomeratic quartz grained friable, sli calc.				
MORRISON FM TOP:	6,295	subsea:	1825 ft.	Jurassic Age: SH & SS Variegated shales, red green, gray maroon, minor tan hard ls, wh f-m gr ss				
Wanakah member:	6,670	subsea:	1450 ft.	SS f gr wh to orange mod cmt sli calc glauconitic fspr, minor gypsum, fxn oolitic ls				
ENTRADA FM TOP:	6,710	subsea:	1410 ft.	SS wh -lt gn f-m gr calc. well rd and sorted frsted grains minor uncons SS				
DOCKUM FM TOP:	6,815	subsea:	1305 ft.	Triassic Age: SHALE Variegated (red) mica calc, minor thin beds of f gr limy gray SS				
Glorieta ss member:	7,090	subsea:	1030 ft.	Permian Age: SS orange to pink to white med grained silica cement				
Yeso member:	7,170	subsea:	950 ft.	SS orange and dolomitic cemented silty, may become coarse arkosic ss				
Est. TD 150' below Glorieta	7,320	subsea:	800 ft.	SHALE AND ARKOSIC SS (WASH) dominantly red shale, siltstone and red arkosic crs sediments				
Glorietta SS. In Sangre de Cristo								

MUD LOG/GEOLOGIC DRILLING NOTES

NOTES: Tops based on surrounding Dakota Wells and controlling Trinidad Depth wells of CBM field...Dakota SS appears 3,850 ft below the top of Trinidad SS as mapped.
Dakota, Entrada and Glorieta sandstones are the primary and proven injection well horizons

The most important geologic key to success for both deep WDWs is that, after running casing to Trinidad and air drilling ahead, the well is drilled deep enough to penetrate the upper 5' or so of the T/Dakota before second string run. Just scratch T/Dakota however because water flows can be be expected. Do not expose the Pierre/Niobrara/Greenhorn to any formation or drilling fluid. This cannot be over-stressed and is a major reason why historically these WDWs have been so costly. Recommend that have Korte out on location along w/ Tom Doupe as mudlogger.

Mudlogger important on have on location below Trinidad to better characterize potential 'deep play' shows as well as help pick DK casing point.

EL PASO ENERGY RATON, L.L.C.
P.O. BOX 190 - RATON, N.M. 87740

August 23, 2004

Vermejo Park Ranch
PO Drawer E
Raton, NM 87740

Attention: Mr. Marv Jensen

Subject: Notice of Drilling Water Injection Well VPR 'A' 182 WDW

Dear Marv:

This correspondence is to serve notice that El Paso Energy Raton, L.L.C., plans to drill and complete a produced water injection well in the SW 1/4 of the NW 1/4 of Section 28, T32N, R20E in Colfax County. The well will be called the "VPR A 182 WDW".

Produced water from coalbed methane wells will be injected into the Entrada and Glorieta formations at approximate depth 6710' – 7170'.

Respectfully,

DRL

Donald R. Lankford
Production Manager

"Notice of Application for Fluid Injection Well Permit"

El Paso Raton, L.L.C., Nine Greenway Plaza, Houston, Texas is seeking administrative approval from the New Mexico Oil Conservation Division to complete their Vermejo Park Ranch A-182 WDW, located in Section 28, T-32N, R-20E, Colfax County, Vermejo Park Ranch, New Mexico as water disposal well. The proposed interval is the Entrada and Glorieta formations from an estimated depth of 6710'-7,170'. El Paso Raton, L.L.C. intends to inject a maximum of 20,000 bbls of produced formation water per day per well at a maximum injection pressure of 1500 psi. Interested parties must file objections or request for hearing with the Oil Conservation Division, 1220 South St. Francis Drive, Santa Fe, NM 87505, within 15 days of this notice.

Donald R. Lankford, Production Manager

El Paso Raton, L.L.C.

PO Box 190

Raton, NM 87740

(505) 445-6721

(505) 445-6788 Fax

Legal No. 492004. Published in The Raton Range: August 27, 2004.

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Vermejo Park Ranch
ATTN: Mary Jensen
PO Drawer E
Raton NM 87740

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jim Fields ☐ Agent ☐ Addressee

B. Received by (Printed Name) Jim Fields C. Date of Delivery 8/26/04

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7003 1010 0004 1556 4890

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-1540

BAKER HUGHES
Baker Petrolite

Rocky Mountain Region
1675 Broadway, Suite 1500
Denver, CO 80202
(303) 573-2772
Lab Team Leader - Sheila Hernandez
(915) 495-7240

Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	312546
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	35560
Entity (or well #):	BATTERY	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	INJ. WATER - WATER TANK A - COMPOSITE H2O		

Summary	
Sampling Date:	6/16/03
Analysis Date:	6/24/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	4018.5
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 312546 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**1077.0**	**30.38**	**Sodium:**	**1290.7**	**56.14**
Bicarbonate:	**1625.0**	**26.63**	**Magnesium:**	**2.5**	**0.21**
Carbonate:	**0.0**	**0.**	**Calcium:**	**11.0**	**0.55**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**1.5**	**0.03**
Phosphate:			**Barium:**	**1.5**	**0.02**
Borate:			**Iron:**	**0.3**	**0.01**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.13	Lead:		
pH used in Calculation:		**8.13**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.60	6.63	-4.15	0.00	-4.22	0.00	-3.25	0.00	-0.16	0.00	0.16
100	0	0.64	6.98	-4.17	0.00	-4.17	0.00	-3.23	0.00	-0.30	0.00	0.25
120	0	0.69	7.33	-4.17	0.00	-4.10	0.00	-3.20	0.00	-0.41	0.00	0.37
140	0	0.75	7.68	-4.17	0.00	-4.00	0.00	-3.16	0.00	-0.50	0.00	0.55

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

BAKER HUGHES
Baker Petrolite

Rocky Mountain Region
1675 Broadway, Suite 1500
Denver, CO 80202
(303) 573-2772
Lab Team Leader - Sheila Hernandez
(915) 495-7240

Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	312541
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	35456
Entity (or well #):	POD INJ. WATER	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	CHARGE PUMP	COMPOSITE H_2O	

Summary	
Sampling Date:	6/12/03
Analysis Date:	6/20/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	4488.7
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000001
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 312541 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**1408.0**	**39.71**	**Sodium:**	**1417.7**	**61.67**
Bicarbonate:	**1572.0**	**25.76**	**Magnesium:**	**10.0**	**0.82**
Carbonate:	**0.0**	**0.**	**Calcium:**	**48.0**	**2.4**
Sulfate:	**6.0**	**0.12**	**Strontium:**	**5.0**	**0.11**
Phosphate:			**Barium:**	**5.0**	**0.07**
Borate:			**Iron:**	**9.0**	**0.33**
Silicate:			Potassium:	8.0	0.2
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		7.9	Lead:		
pH used in Calculation:		**7.9**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.99	31.75	-3.38	0.00	-3.45	0.00	-2.60	0.00	0.50	1.74	0.26
100	0	1.06	33.50	-3.40	0.00	-3.40	0.00	-2.58	0.00	0.35	1.40	0.38
120	0	1.13	35.24	-3.40	0.00	-3.32	0.00	-2.55	0.00	0.24	1.05	0.53
140	0	1.21	36.64	-3.40	0.00	-3.23	0.00	-2.51	0.00	0.15	0.70	0.74

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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1675 Broadway, Suite 1500
Denver, CO 80202
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Lab Team Leader - Sheila Hernandez
(915) 495-7240

Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306191
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37564
Entity (or well #):	15	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	1658.2
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	0.999999
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306191 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**113.0**	**3.19**
Bicarbonate:	**1061.4**	**17.4**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		**8.2**
pH at time of analysis:		
pH used in Calculation:		**8.2**

Cations	mg/l	meq/l
Sodium:	**437.1**	**19.01**
Magnesium:	**0.7**	**0.06**
Calcium:	**6.0**	**0.3**
Strontium:	**0.4**	**0.01**
Barium:	**0.6**	**0.01**
Iron:	**32.0**	**1.16**
Potassium:	4.0	0.1
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.37	2.80	-4.31	0.00	-4.38	0.00	-3.73	0.00	-0.46	0.00	0.1
100	0	0.44	3.15	-4.32	0.00	-4.32	0.00	-3.71	0.00	-0.60	0.00	0.14
120	0	0.50	3.50	-4.32	0.00	-4.24	0.00	-3.67	0.00	-0.71	0.00	0.21
140	0	0.58	3.85	-4.31	0.00	-4.14	0.00	-3.63	0.00	-0.79	0.00	0.3

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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1675 Broadway, Suite 1500
Denver, CO 80202
(303) 573-2772
Lab Team Leader - Sheila Hernandez
(915) 495-7240

Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306189
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37565
Entity (or well #):	16	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 306189 @ 75 °F					
Sampling Date:	8/29/03	**Anions**	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Analysis Date:	9/12/03	**Chloride:**	**119.0**	**3.36**	**Sodium:**	**379.7**	**16.52**
Analyst:	ANNA McELANEY	**Bicarbonate:**	**829.6**	**13.6**	**Magnesium:**	**0.6**	**0.05**
TDS (mg/l or g/m3):	1344.4	**Carbonate:**	**0.0**	**0.**	**Calcium:**	**5.0**	**0.25**
Density (g/cm3, tonne/m3):	1.001	**Sulfate:**	**3.0**	**0.06**	**Strontium:**	**0.5**	**0.01**
Anion/Cation Ratio:	0.9999999	Phosphate:			**Barium:**	**0.5**	**0.01**
		Borate:			**Iron:**	**1.5**	**0.05**
		Silicate:			Potassium:	5.0	0.13
Carbon Dioxide:					Aluminum:		
Oxygen:		Hydrogen Sulfide:			Chromium:		
Comments:		**pH at time of sampling:**		7.74	Copper:		
		pH at time of analysis:			Lead:		
		pH used in Calculation:		**7.74**	Manganese:		
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.20	0.00	-4.30	0.00	-4.38	0.00	-3.57	0.00	-0.48	0.00	0.22
100	0	-0.08	0.00	-4.31	0.00	-4.31	0.00	-3.54	0.00	-0.61	0.00	0.29
120	0	0.04	0.35	-4.30	0.00	-4.23	0.00	-3.50	0.00	-0.72	0.00	0.38
140	0	0.17	1.40	-4.29	0.00	-4.13	0.00	-3.45	0.00	-0.80	0.00	0.48

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306192
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37566
Entity (or well #):	17	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2243.5
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306192 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**206.0**	**5.81**
Bicarbonate:	**1378.6**	**22.59**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8
pH at time of analysis:		
pH used in Calculation:		**8**

Cations	mg/l	meq/l
Sodium:	**639.2**	**27.8**
Magnesium:	**0.8**	**0.07**
Calcium:	**8.0**	**0.4**
Strontium:	**0.9**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**1.0**	**0.04**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.38	3.50	-4.23	0.00	-4.31	0.00	-3.43	0.00	-0.29	0.00	0.19
100	0	0.47	4.20	-4.25	0.00	-4.25	0.00	-3.41	0.00	-0.43	0.00	0.27
120	0	0.55	4.90	-4.25	0.00	-4.18	0.00	-3.37	0.00	-0.54	0.00	0.38
140	0	0.64	5.25	-4.25	0.00	-4.08	0.00	-3.33	0.00	-0.63	0.00	0.52

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	317529
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	40419
Entity (or well #):	19	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	12/18/03
Analysis Date:	1/6/04
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	3254.3
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	0.9999995
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 317529 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**646.0**	**18.22**
Bicarbonate:	**1586.0**	**25.99**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.22
pH at time of analysis:		
pH used in Calculation:		**8.22**

Cations	mg/l	meq/l
Sodium:	**995.3**	**43.29**
Magnesium:	**2.0**	**0.16**
Calcium:	**10.0**	**0.5**
Strontium:	**1.5**	**0.03**
Barium:	**1.0**	**0.01**
Iron:	**2.5**	**0.09**
Potassium:	7.0	0.18
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.66	6.29	-4.26	0.00	-4.33	0.00	-3.32	0.00	-0.40	0.00	0.13
100	0	0.71	6.64	-4.28	0.00	-4.28	0.00	-3.30	0.00	-0.54	0.00	0.2
120	0	0.75	6.99	-4.28	0.00	-4.21	0.00	-3.27	0.00	-0.65	0.00	0.31
140	0	0.81	6.99	-4.28	0.00	-4.11	0.00	-3.22	0.00	-0.74	0.00	0.45

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196056
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28429
Entity (or well #):	20	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 196056 @ 75 °F					
Sampling Date:	8/28/02	**Anions**	mg/l	meq/l	**Cations**	mg/l	meq/l
Analysis Date:	9/5/02	**Chloride:**	**166.0**	**4.68**	**Sodium:**	**596.8**	**25.96**
Analyst:	SHEILA HERNANDEZ	**Bicarbonate:**	**1317.6**	**21.59**	**Magnesium:**	**1.0**	**0.08**
TDS (mg/l or g/m3):	2093.3	**Carbonate:**	**0.0**	**0.**	**Calcium:**	**3.0**	**0.15**
Density (g/cm3, tonne/m3):	1.002	**Sulfate:**	**3.0**	**0.06**	**Strontium:**	**0.6**	**0.01**
Anion/Cation Ratio:	1	Phosphate:			**Barium:**	**0.7**	**0.01**
		Borate:			**Iron:**	**0.6**	**0.02**
		Silicate:			Potassium:	4.0	0.1
					Aluminum:		
Carbon Dioxide:		Hydrogen Sulfide:			Chromium:		
Oxygen:					Copper:		
Comments:		pH at time of sampling:		8.61	Lead:		
		pH at time of analysis:			Manganese:		
		pH used in Calculation:		**8.61**	Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.47	1.75	-4.71	0.00	-4.78	0.00	-3.64	0.00	-0.46	0.00	0.05
100	0	0.50	1.75	-4.72	0.00	-4.72	0.00	-3.61	0.00	-0.60	0.00	0.07
120	0	0.53	1.75	-4.72	0.00	-4.64	0.00	-3.57	0.00	-0.70	0.00	0.12
140	0	0.56	1.75	-4.71	0.00	-4.54	0.00	-3.52	0.00	-0.78	0.00	0.18

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218419
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29657
Entity (or well #):	22	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2183.7
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000007
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218419 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**327.0**	**9.22**
Bicarbonate:	**1189.0**	**19.49**
Carbonate:	**0.0**	**0.**
Sulfate:	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**7.96**
pH used in Calculation:		**7.96**

Cations	mg/l	meq/l
Sodium:	**646.7**	**28.13**
Magnesium:	**1.0**	**0.08**
Calcium:	**6.0**	**0.3**
Strontium:	**0.6**	**0.01**
Barium:	**0.4**	**0.01**
Iron:	**3.0**	**0.11**
Potassium:	6.0	0.15
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	**Calcite CaCO3**		**Gypsum CaSO4*2H20**		**Anhydrite CaSO4**		**Celestite SrSO4**		**Barite BaSO4**		**CO2 Press**
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.16	1.40	-4.23	0.00	-4.30	0.00	-3.48	0.00	-0.56	0.00	0.18
100	0	0.25	2.10	-4.24	0.00	-4.24	0.00	-3.46	0.00	-0.70	0.00	0.26
120	0	0.34	2.80	-4.24	0.00	-4.17	0.00	-3.42	0.00	-0.81	0.00	0.35
140	0	0.43	3.15	-4.24	0.00	-4.07	0.00	-3.38	0.00	-0.90	0.00	0.48

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306184
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37568
Entity (or well #):	23	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	8/29/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	1921.4
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	0.9999994
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306184 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**315.0**	**8.89**
Bicarbonate:	**1012.6**	**16.6**
Carbonate:	**0.0**	**0.**
Sulfate:	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.03
pH at time of analysis:		
pH used in Calculation:		**8.03**

Cations	mg/l	meq/l
Sodium:	**561.3**	**24.41**
Magnesium:	**1.5**	**0.12**
Calcium:	**10.0**	**0.5**
Strontium:	**1.0**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**10.0**	**0.36**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.40	4.20	-3.98	0.00	-4.05	0.00	-3.24	0.00	-0.15	0.00	0.13
100	0	0.48	5.25	-3.99	0.00	-4.00	0.00	-3.21	0.00	-0.28	0.00	0.19
120	0	0.57	5.60	-3.99	0.00	-3.92	0.00	-3.18	0.00	-0.39	0.00	0.27
140	0	0.66	6.30	-3.98	0.00	-3.82	0.00	-3.13	0.00	-0.48	0.00	0.37

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218597
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	38002
Entity (or well #):	35	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/12/2003
Analysis Date:	9/23/2003
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	1965.2
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000007
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218597 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**170.0**	**4.8**
Bicarbonate:	**1220.0**	**19.99**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		**8.23**
pH at time of analysis:		
pH used in Calculation:		**8.23**

Cations	mg/l	meq/l
Sodium:	**562.3**	**24.46**
Magnesium:	**1.0**	**0.08**
Calcium:	**3.5**	**0.17**
Strontium:	**0.4**	**0.01**
Barium:	**0.2**	**0.**
Iron:	**0.3**	**0.01**
Potassium:	4.5	0.12
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.20	1.05	-4.57	0.00	-4.64	0.00	-3.76	0.00	-0.97	0.00	0.1
100	0	0.26	1.40	-4.58	0.00	-4.59	0.00	-3.74	0.00	-1.10	0.00	0.15
120	0	0.33	1.40	-4.59	0.00	-4.51	0.00	-3.70	0.00	-1.21	0.00	0.22
140	0	0.40	1.75	-4.58	0.00	-4.41	0.00	-3.65	0.00	-1.29	0.00	0.32

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306193
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37570
Entity (or well #):	36	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2811.7
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999995
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306193 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**683.0**	**19.26**	**Sodium:**	**871.7**	**37.92**
Bicarbonate:	**1220.0**	**19.99**	**Magnesium:**	**3.0**	**0.25**
Carbonate:	**0.0**	**0.**	**Calcium:**	**15.0**	**0.75**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**2.0**	**0.05**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**7.0**	**0.25**
Silicate:			Potassium:	4.0	0.1
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.64	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.64**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.22	4.19	-3.90	0.00	-3.97	0.00	-3.03	0.00	0.07	0.00	0.38
100	0	0.33	5.94	-3.91	0.00	-3.91	0.00	-3.00	0.00	-0.07	0.00	0.51
120	0	0.45	7.34	-3.91	0.00	-3.84	0.00	-2.97	0.00	-0.19	0.00	0.67
140	0	0.56	8.74	-3.91	0.00	-3.74	0.00	-2.93	0.00	-0.27	0.00	0.85

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306194
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37571
Entity (or well #):	37	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2794.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000000
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306194 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**591.0**	**16.67**	**Sodium:**	**850.3**	**36.98**
Bicarbonate:	**1317.6**	**21.59**	**Magnesium:**	**2.0**	**0.16**
Carbonate:	**0.0**	**0.**	**Calcium:**	**18.0**	**0.9**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**2.0**	**0.05**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**2.0**	**0.07**
Silicate:			Potassium:	6.0	0.15
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.31	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.31**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.02	0.35	-3.81	0.00	-3.88	0.00	-3.02	0.00	0.07	0.00	0.87
100	0	0.14	3.50	-3.82	0.00	-3.83	0.00	-3.00	0.00	-0.07	0.00	1.14
120	0	0.27	6.29	-3.82	0.00	-3.75	0.00	-2.96	0.00	-0.18	0.00	1.45
140	0	0.40	8.74	-3.82	0.00	-3.65	0.00	-2.92	0.00	-0.27	0.00	1.78

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306195
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37572
Entity (or well #):	38	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	1939.1
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	0.9999999
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306195 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**347.0**	**9.79**	**Sodium:**	**581.2**	**25.28**
Bicarbonate:	**988.2**	**16.2**	**Magnesium:**	**0.7**	**0.06**
Carbonate:	**0.0**	**0.**	**Calcium:**	**10.0**	**0.5**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**1.5**	**0.03**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**0.5**	**0.02**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		8.35	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.35**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.68	6.30	-4.13	0.00	-4.20	0.00	-3.20	0.00	0.02	0.00	0.06
100	0	0.73	6.65	-4.14	0.00	-4.14	0.00	-3.17	0.00	-0.11	0.00	0.1
120	0	0.78	7.00	-4.13	0.00	-4.06	0.00	-3.13	0.00	-0.22	0.00	0.15
140	0	0.84	7.00	-4.12	0.00	-3.96	0.00	-3.09	0.00	-0.31	0.00	0.22

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218425
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29661
Entity (or well #):	39 X	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	1896.2
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000005
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218425 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**121.0**	**3.41**
Bicarbonate:	**1216.0**	**19.93**
Carbonate:	**7.0**	**0.23**
Sulfate:	**6.0**	**0.12**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**8.34**
pH used in Calculation:		**8.34**

Cations	mg/l	meq/l
Sodium:	**538.6**	**23.43**
Magnesium:	**0.6**	**0.05**
Calcium:	**2.0**	**0.1**
Strontium:	**0.3**	**0.01**
Barium:	**0.5**	**0.01**
Iron:	**0.2**	**0.01**
Potassium:	4.0	0.1
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.06	0.35	-4.52	0.00	-4.59	0.00	-3.58	0.00	-0.26	0.00	0.08
100	0	0.11	0.35	-4.53	0.00	-4.53	0.00	-3.56	0.00	-0.40	0.00	0.12
120	0	0.17	0.70	-4.53	0.00	-4.45	0.00	-3.52	0.00	-0.51	0.00	0.18
140	0	0.23	0.70	-4.52	0.00	-4.35	0.00	-3.47	0.00	-0.59	0.00	0.27

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218421
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29663
Entity (or well #):	41	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2375.9
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000006
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218421 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**512.0**	**14.44**	**Sodium:**	**736.2**	**32.02**
Bicarbonate:	**1109.0**	**18.18**	**Magnesium:**	**2.0**	**0.16**
Carbonate:	**0.0**	**0.**	**Calcium:**	**6.0**	**0.3**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**1.0**	**0.02**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**0.7**	**0.03**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		**8.16**	Lead:		
pH used in Calculation:		**8.16**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.30	2.45	-4.39	0.00	-4.46	0.00	-3.41	0.00	-0.32	0.00	0.11
100	0	0.36	2.80	-4.40	0.00	-4.40	0.00	-3.39	0.00	-0.46	0.00	0.16
120	0	0.43	3.15	-4.40	0.00	-4.32	0.00	-3.35	0.00	-0.57	0.00	0.23
140	0	0.50	3.50	-4.39	0.00	-4.22	0.00	-3.31	0.00	-0.65	0.00	0.33

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218420
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29656
Entity (or well #):	44	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	5315
Density (g/cm3, tonne/m3):	1.005
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218420 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**2550.0**	**71.93**
Bicarbonate:	**786.0**	**12.88**
Carbonate:	**0.0**	**0.**
Sulfate:	**26.0**	**0.54**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**7.74**
pH used in Calculation:		**7.74**

Cations	mg/l	meq/l
Sodium:	**1868.0**	**81.25**
Magnesium:	**14.0**	**1.15**
Calcium:	**49.0**	**2.45**
Strontium:	**7.0**	**0.16**
Barium:	**5.0**	**0.07**
Iron:	**1.0**	**0.04**
Potassium:	9.0	0.23
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.51	14.99	-2.79	0.00	-2.86	0.00	-1.87	0.00	1.07	2.79	0.18
100	0	0.61	18.48	-2.80	0.00	-2.80	0.00	-1.86	0.00	0.93	2.44	0.25
120	0	0.70	22.31	-2.80	0.00	-2.72	0.00	-1.83	0.00	0.81	2.44	0.35
140	0	0.79	25.80	-2.79	0.00	-2.62	0.00	-1.79	0.00	0.72	2.44	0.47

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306187
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37574
Entity (or well #):	45	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	**8/29/03**
Analysis Date:	**9/12/03**
Analyst:	**ANNA McELANEY**
TDS (mg/l or g/m3):	1215.5
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	**0.9999999**
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306187 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**92.0**	**2.59**	**Sodium:**	**343.5**	**14.94**
Bicarbonate:	**768.6**	**12.6**	**Magnesium:**	**0.4**	**0.03**
Carbonate:	**0.0**	**0.**	**Calcium:**	**3.0**	**0.15**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.2**	**0.**
Phosphate:			**Barium:**	**0.3**	**0.**
Borate:			**Iron:**	**0.5**	**0.02**
Silicate:			Potassium:	4.0	0.1
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		8.47	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.47**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.23	1.05	-4.54	0.00	-4.61	0.00	-3.97	0.00	-0.70	0.00	0.04
100	0	0.28	1.05	-4.55	0.00	-4.55	0.00	-3.94	0.00	-0.83	0.00	0.06
120	0	0.34	1.40	-4.54	0.00	-4.47	0.00	-3.90	0.00	-0.94	0.00	0.09
140	0	0.41	1.40	-4.53	0.00	-4.36	0.00	-3.85	0.00	-1.02	0.00	0.13

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306500
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37575
Entity (or well #):	46	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	8/29/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	3122.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000004
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306500 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**984.0**	**27.76**	**Sodium:**	**1010.1**	**43.94**
Bicarbonate:	**1085.8**	**17.79**	**Magnesium:**	**4.0**	**0.33**
Carbonate:	**0.0**	**0.**	**Calcium:**	**19.0**	**0.95**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**3.0**	**0.07**
Phosphate:			**Barium:**	**3.0**	**0.04**
Borate:			**Iron:**	**5.0**	**0.18**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		8.04	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.04**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.63	10.13	-3.84	0.00	-3.91	0.00	-2.89	0.00	0.20	0.35	0.13
100	0	0.70	11.18	-3.85	0.00	-3.86	0.00	-2.87	0.00	0.06	0.00	0.2
120	0	0.77	12.23	-3.85	0.00	-3.78	0.00	-2.84	0.00	-0.05	0.00	0.29
140	0	0.85	12.93	-3.85	0.00	-3.68	0.00	-2.79	0.00	-0.14	0.00	0.41

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218417
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29660
Entity (or well #):	47	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3806.4
Density (g/cm3, tonne/m3):	1.004
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218417 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**1326.0**	**37.4**
Bicarbonate:	**1173.0**	**19.22**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**8.12**
pH used in Calculation:		**8.12**

Cations	mg/l	meq/l
Sodium:	**1276.1**	**55.51**
Magnesium:	**4.0**	**0.33**
Calcium:	**11.0**	**0.55**
Strontium:	**3.0**	**0.07**
Barium:	**3.0**	**0.04**
Iron:	**0.3**	**0.01**
Potassium:	7.0	0.18
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.46	5.24	-4.26	0.00	-4.33	0.00	-3.07	0.00	0.03	0.00	0.12
100	0	0.51	5.94	-4.27	0.00	-4.28	0.00	-3.05	0.00	-0.11	0.00	0.18
120	0	0.57	6.29	-4.27	0.00	-4.20	0.00	-3.01	0.00	-0.23	0.00	0.27
140	0	0.63	6.98	-4.27	0.00	-4.10	0.00	-2.97	0.00	-0.32	0.00	0.4

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306197
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37576
Entity (or well #):	48	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/5/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	3906.4
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999998
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306197 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**1469.0**	**41.44**
Bicarbonate:	**1073.6**	**17.6**
Carbonate:	**0.0**	**0.**
Sulfate:	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.21
pH at time of analysis:		
pH used in Calculation:		**8.21**

Cations	mg/l	meq/l
Sodium:	**1281.8**	**55.76**
Magnesium:	**6.0**	**0.49**
Calcium:	**33.0**	**1.65**
Strontium:	**4.0**	**0.09**
Barium:	**4.0**	**0.06**
Iron:	**26.0**	**0.94**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.97	20.60	-3.69	0.00	-3.76	0.00	-2.84	0.00	0.25	0.70	0.09
100	0	1.01	22.00	-3.70	0.00	-3.70	0.00	-2.82	0.00	0.11	0.35	0.14
120	0	1.05	23.04	-3.70	0.00	-3.62	0.00	-2.79	0.00	0.00	0.00	0.22
140	0	1.10	24.09	-3.69	0.00	-3.52	0.00	-2.75	0.00	-0.09	0.00	0.33

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306493
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37577
Entity (or well #):	49	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 306493 @ 75 °F					
Sampling Date:	9/3/03	**Anions**	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Analysis Date:	9/12/03	**Chloride:**	**1095.0**	**30.89**	**Sodium:**	**1097.3**	**47.73**
Analyst:	ANNA McELANEY	**Bicarbonate:**	**1122.4**	**18.39**	**Magnesium:**	**4.0**	**0.33**
TDS (mg/l or g/m3):	3354.8	**Carbonate:**	**0.0**	**0.**	**Calcium:**	**20.0**	**1.**
Density (g/cm3, tonne/m3):	1.002	**Sulfate:**	**3.0**	**0.06**	**Strontium:**	**3.5**	**0.08**
Anion/Cation Ratio:	1.0000002	Phosphate:			**Barium:**	**4.0**	**0.06**
		Borate:			**Iron:**	**0.6**	**0.02**
		Silicate:			Potassium:	5.0	0.13
Carbon Dioxide:					Aluminum:		
Oxygen:		Hydrogen Sulfide:			Chromium:		
Comments:		**pH at time of sampling:**		8.25	Copper:		
		pH at time of analysis:			Lead:		
		pH used in Calculation:		**8.25**	Manganese:		
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.84	12.93	-3.98	0.00	-4.05	0.00	-2.97	0.00	0.18	0.35	0.09
100	0	0.88	13.62	-3.99	0.00	-3.99	0.00	-2.95	0.00	0.04	0.00	0.14
120	0	0.93	13.97	-3.99	0.00	-3.91	0.00	-2.92	0.00	-0.07	0.00	0.21
140	0	0.98	14.67	-3.98	0.00	-3.81	0.00	-2.87	0.00	-0.16	0.00	0.31

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218413
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29664
Entity (or well #):	50	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/02
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	4392
Density (g/cm3, tonne/m3):	1.004
Anion/Cation Ratio:	0.9999998
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218413 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**1536.0**	**43.32**	**Sodium:**	**1464.0**	**63.68**
Bicarbonate:	**1347.0**	**22.08**	**Magnesium:**	**6.0**	**0.49**
Carbonate:	**0.0**	**0.**	**Calcium:**	**18.0**	**0.9**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**4.0**	**0.09**
Phosphate:			**Barium:**	**3.0**	**0.04**
Borate:			**Iron:**	**2.0**	**0.07**
Silicate:			Potassium:	8.0	0.2
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		**8.03**	Lead:		
pH used in Calculation:		**8.03**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.62	10.12	-3.97	0.00	-4.04	0.00	-2.86	0.00	0.11	0.35	0.17
100	0	0.68	10.82	-3.98	0.00	-3.98	0.00	-2.84	0.00	-0.03	0.00	0.25
120	0	0.74	11.87	-3.98	0.00	-3.91	0.00	-2.81	0.00	-0.14	0.00	0.37
140	0	0.80	12.56	-3.98	0.00	-3.81	0.00	-2.77	0.00	-0.24	0.00	0.53

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306188
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37578
Entity (or well #):	51	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	**9/3/03**
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2829.4
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306188 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**569.0**	**16.05**
Bicarbonate:	**1366.4**	**22.39**
Carbonate:	**0.0**	**0.**
Sulfate:	**6.0**	**0.12**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		**7.79**
pH at time of analysis:		
pH used in Calculation:		**7.79**

Cations	mg/l	meq/l
Sodium:	**867.8**	**37.75**
Magnesium:	**2.0**	**0.16**
Calcium:	**9.0**	**0.45**
Strontium:	**0.7**	**0.02**
Barium:	**3.0**	**0.04**
Iron:	**0.5**	**0.02**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.19	2.45	-3.94	0.00	-4.01	0.00	-3.30	0.00	0.42	1.05	0.3
100	0	0.29	3.50	-3.96	0.00	-3.96	0.00	-3.28	0.00	0.28	0.70	0.41
120	0	0.39	4.19	-3.96	0.00	-3.88	0.00	-3.25	0.00	0.17	0.35	0.56
140	0	0.49	4.89	-3.96	0.00	-3.79	0.00	-3.20	0.00	0.08	0.35	0.73

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306499
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37579
Entity (or well #):	52	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	**9/3/03**
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2080.5
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000006
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306499 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**238.0**	**6.71**	**Sodium:**	**578.6**	**25.17**
Bicarbonate:	**1220.0**	**19.99**	**Magnesium:**	**2.5**	**0.21**
Carbonate:	**0.0**	**0.**	**Calcium:**	**12.0**	**0.6**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**0.9**	**0.02**
Phosphate:			**Barium:**	**1.5**	**0.02**
Borate:			**Iron:**	**18.0**	**0.65**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		**8.02**	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.02**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.54	6.30	-3.93	0.00	-4.00	0.00	-3.30	0.00	0.01	0.00	0.16
100	0	0.62	7.00	-3.94	0.00	-3.94	0.00	-3.28	0.00	-0.12	0.00	0.23
120	0	0.70	7.70	-3.94	0.00	-3.87	0.00	-3.24	0.00	-0.24	0.00	0.33
140	0	0.78	8.39	-3.94	0.00	-3.77	0.00	-3.20	0.00	-0.32	0.00	0.45

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	306495
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	37580
Entity (or well #):	53	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/3/03
Analysis Date:	9/12/03
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	3245.8
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 306495 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**927.0**	**26.15**
Bicarbonate:	**1244.4**	**20.39**
Carbonate:	**0.0**	**0.**
Sulfate:	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		7.87
pH at time of analysis:		
pH used in Calculation:		**7.87**

Cations	mg/l	meq/l
Sodium:	**1017.4**	**44.25**
Magnesium:	**6.0**	**0.49**
Calcium:	**27.0**	**1.35**
Strontium:	**4.0**	**0.09**
Barium:	**4.0**	**0.06**
Iron:	**7.0**	**0.25**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.68	15.02	-3.70	0.00	-3.77	0.00	-2.78	0.00	0.32	0.70	0.23
100	0	0.76	16.77	-3.71	0.00	-3.72	0.00	-2.75	0.00	0.18	0.35	0.32
120	0	0.85	18.17	-3.71	0.00	-3.64	0.00	-2.72	0.00	0.06	0.35	0.44
140	0	0.94	19.22	-3.71	0.00	-3.54	0.00	-2.68	0.00	-0.03	0.00	0.6

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218418
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	29659
Entity (or well #):	54	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/25/03
Analysis Date:	11/25/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2346.2
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	0.9999994
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218418 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**215.0**	**6.06**	**Sodium:**	**675.6**	**29.39**
Bicarbonate:	**1441.0**	**23.62**	**Magnesium:**	**0.8**	**0.07**
Carbonate:	**0.0**	**0.**	**Calcium:**	**3.0**	**0.15**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**0.6**	**0.01**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**0.2**	**0.01**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			*Chromium:*		
pH at time of sampling:			Copper:		
pH at time of analysis:		**8.27**	Lead:		
pH used in Calculation:		**8.27**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.21	1.05	-4.57	0.00	-4.64	0.00	-3.51	0.00	-0.19	0.00	0.11
100	0	0.26	1.05	-4.58	0.00	-4.59	0.00	-3.48	0.00	-0.32	0.00	0.17
120	0	0.31	1.40	-4.58	0.00	-4.51	0.00	-3.45	0.00	-0.43	0.00	0.25
140	0	0.37	1.40	-4.58	0.00	-4.41	0.00	-3.40	0.00	-0.52	0.00	0.36

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196092
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28726
Entity (or well #):	83	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/10/02
Analysis Date:	9/18/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2671.6
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 196092 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**415.0**	**11.71**
Bicarbonate:	**1440.0**	**23.6**
Carbonate:	**0.0**	**0.**
Sulfate	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		7.99
pH at time of analysis:		
pH used in Calculation:		**7.99**

Cations	mg/l	meq/l
Sodium:	**793.6**	**34.52**
Magnesium:	**2.0**	**0.16**
Calcium:	**9.0**	**0.45**
Strontium:	**2.0**	**0.05**
Barium:	**1.0**	**0.01**
Iron:	**2.0**	**0.07**
Potassium:	4.0	0.1
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.41	4.19	-4.24	0.00	-4.31	0.00	-3.13	0.00	-0.34	0.00	0.2
100	0	0.49	4.89	-4.25	0.00	-4.25	0.00	-3.11	0.00	-0.48	0.00	0.29
120	0	0.57	5.24	-4.25	0.00	-4.18	0.00	-3.08	0.00	-0.59	0.00	0.41
140	0	0.65	5.94	-4.25	0.00	-4.08	0.00	-3.04	0.00	-0.68	0.00	0.56

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Lab Team Leader - Sheila Hernandez
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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196095
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28729
Entity (or well #):	84	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 196095 @ 75 °F					
Sampling Date:	9/10/02	**Anions**	mg/l	meq/l	**Cations**	mg/l	meq/l
Analysis Date:	9/18/02	**Chloride:**	**112.0**	**3.16**	**Sodium:**	**553.7**	**24.08**
Analyst:	JAMES AHRLETT	**Bicarbonate:**	**1293.0**	**21.19**	**Magnesium:**	**0.5**	**0.04**
TDS (mg/l or g/m3):	1970.9	**Carbonate:**	**0.0**	**0.**	**Calcium:**	**2.0**	**0.1**
Density (g/cm3, tonne/m3):	1.001	**Sulfate**	**3.0**	**0.06**	**Strontium:**	**0.3**	**0.01**
Anion/Cation Ratio:	1	Phosphate:			**Barium:**	**0.4**	**0.01**
		Borate:			**Iron:**	**2.0**	**0.07**
		Silicate:			Potassium:	4.0	0.1
Carbon Dioxide:					Aluminum:		
Oxygen:		Hydrogen Sulfide:			Chromium:		
Comments:		pH at time of sampling:		8.65	Copper:		
		pH at time of analysis:			Lead:		
		pH used in Calculation:		**8.65**	Manganese:		
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.33	1.05	-4.87	0.00	-4.94	0.00	-3.93	0.00	-0.69	0.00	0.04
100	0	0.35	1.05	-4.89	0.00	-4.89	0.00	-3.90	0.00	-0.83	0.00	0.07
120	0	0.39	1.05	-4.88	0.00	-4.81	0.00	-3.86	0.00	-0.93	0.00	0.11
140	0	0.42	1.05	-4.87	0.00	-4.70	0.00	-3.81	0.00	-1.01	0.00	0.17

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196091
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28733
Entity (or well #):	89	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/10/02
Analysis Date:	9/18/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3890
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 196091 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**1337.0**	**37.71**	**Sodium:**	**1287.0**	**55.98**
Bicarbonate:	**1220.0**	**19.99**	**Magnesium:**	**6.0**	**0.49**
Carbonate:	**0.0**	**0.**	**Calcium:**	**15.0**	**0.75**
Sulfate	**4.0**	**0.08**	**Strontium:**	**4.0**	**0.09**
Phosphate:			**Barium:**	**3.0**	**0.04**
Borate:			**Iron:**	**7.0**	**0.25**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.59	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.59**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.11	2.44	-4.00	0.00	-4.07	0.00	-2.82	0.00	0.15	0.35	0.41
100	0	0.22	4.19	-4.01	0.00	-4.01	0.00	-2.80	0.00	0.01	0.00	0.55
120	0	0.34	5.94	-4.01	0.00	-3.93	0.00	-2.77	0.00	-0.11	0.00	0.72
140	0	0.45	7.68	-4.01	0.00	-3.84	0.00	-2.73	0.00	-0.20	0.00	0.93

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196094
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28735
Entity (or well #):	90	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/10/02
Analysis Date:	9/18/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2378.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 196094 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**409.0**	**11.54**
Bicarbonate:	**1232.0**	**20.19**
Carbonate:	**0.0**	**0.**
Sulfate	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		7.67
pH at time of analysis:		
pH used in Calculation:		**7.67**

Cations	mg/l	meq/l
Sodium:	**712.9**	**31.01**
Magnesium:	**1.0**	**0.08**
Calcium:	**7.0**	**0.35**
Strontium:	**1.0**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**5.0**	**0.18**
Potassium:	6.0	0.15
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.04	0.00	-4.18	0.00	-4.25	0.00	-3.27	0.00	-0.18	0.00	0.36
100	0	0.07	0.70	-4.19	0.00	-4.19	0.00	-3.25	0.00	-0.32	0.00	0.49
120	0	0.18	1.75	-4.19	0.00	-4.11	0.00	-3.22	0.00	-0.43	0.00	0.64
140	0	0.30	2.80	-4.18	0.00	-4.02	0.00	-3.17	0.00	-0.52	0.00	0.81

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	195852
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28737
Entity (or well #):	91	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/10/02
Analysis Date:	9/18/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2188.5
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.000000
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 195852 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**211.0**	**5.95**	**Sodium:**	**627.3**	**27.28**
Bicarbonate:	**1330.0**	**21.8**	**Magnesium:**	**0.7**	**0.06**
Carbonate:	**0.0**	**0.**	**Calcium:**	**4.0**	**0.2**
Sulfate	**5.0**	**0.1**	**Strontium:**	**0.7**	**0.02**
Phosphate:			**Barium:**	**0.8**	**0.01**
Borate:			**Iron:**	**5.0**	**0.18**
Silicate:			Potassium:	4.0	0.1
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.75	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.75**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.16	0.00	-4.30	0.00	-4.37	0.00	-3.31	0.00	-0.16	0.00	0.33
100	0	-0.06	0.00	-4.31	0.00	-4.31	0.00	-3.28	0.00	-0.29	0.00	0.45
120	0	0.05	0.35	-4.31	0.00	-4.24	0.00	-3.25	0.00	-0.40	0.00	0.59
140	0	0.17	1.05	-4.31	0.00	-4.14	0.00	-3.21	0.00	-0.49	0.00	0.76

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196096
Lease/Platform:	VERMEJO PARK RANCH 'A'	Analysis ID #:	28739
Entity (or well #):	92	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/10/02
Analysis Date:	9/18/02
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2597.9
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.000000
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 196096 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**594.0**	**16.75**	**Sodium:**	**792.9**	**34.49**
Bicarbonate:	**1171.0**	**19.19**	**Magnesium:**	**3.0**	**0.25**
Carbonate:	**0.0**	**0.**	**Calcium:**	**12.0**	**0.6**
Sulfate	**3.0**	**0.06**	**Strontium:**	**2.0**	**0.05**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**12.0**	**0.43**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.23	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.23**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.28	0.00	-4.09	0.00	-4.16	0.00	-3.13	0.00	-0.34	0.00	0.93
100	0	-0.15	0.00	-4.10	0.00	-4.11	0.00	-3.10	0.00	-0.48	0.00	1.22
120	0	-0.02	0.00	-4.10	0.00	-4.03	0.00	-3.07	0.00	-0.59	0.00	1.54
140	0	0.12	2.45	-4.10	0.00	-3.93	0.00	-3.03	0.00	-0.68	0.00	1.88

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	301823
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	38040
Entity (or well #):	10	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	**9/8/2003**
Analysis Date:	**9/24/2003**
Analyst:	**ANNA McELANEY**
TDS (mg/l or g/m3):	3649.4
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	**0.9999997**
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 301823 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**886.0**	**24.99**
Bicarbonate:	**1586.0**	**25.99**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		7.96
pH at time of analysis:		
pH used in Calculation:		**7.96**

Cations	mg/l	meq/l
Sodium:	**1153.3**	**50.17**
Magnesium:	**2.5**	**0.21**
Calcium:	**9.0**	**0.45**
Strontium:	**2.0**	**0.05**
Barium:	**1.5**	**0.02**
Iron:	**0.1**	**0.**
Potassium:	6.0	0.15
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.37	3.84	-4.33	0.00	-4.40	0.00	-3.22	0.00	-0.25	0.00	0.23
100	0	0.44	4.54	-4.34	0.00	-4.34	0.00	-3.20	0.00	-0.39	0.00	0.34
120	0	0.51	5.24	-4.35	0.00	-4.27	0.00	-3.17	0.00	-0.50	0.00	0.48
140	0	0.59	5.59	-4.35	0.00	-4.18	0.00	-3.13	0.00	-0.59	0.00	0.67

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	301828
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	38042
Entity (or well #):	15	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	9/12/2003
Analysis Date:	9/24/2003
Analyst:	ANNA McELANEY
TDS (mg/l or g/m3):	2777.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 301828 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**539.0**	**15.2**	**Sodium:**	**851.5**	**37.04**
Bicarbonate:	**1366.4**	**22.39**	**Magnesium:**	**1.5**	**0.12**
Carbonate:	**0.0**	**0.**	**Calcium:**	**5.5**	**0.27**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**1.5**	**0.03**
Phosphate:			**Barium:**	**1.5**	**0.02**
Borate:			**Iron:**	**1.0**	**0.04**
Silicate:			Potassium:	6.0	0.15
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		8.09	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.09**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.26	2.10	-4.34	0.00	-4.41	0.00	-3.15	0.00	-0.05	0.00	0.15
100	0	0.32	2.45	-4.35	0.00	-4.36	0.00	-3.13	0.00	-0.19	0.00	0.23
120	0	0.39	2.80	-4.36	0.00	-4.28	0.00	-3.09	0.00	-0.30	0.00	0.33
140	0	0.46	3.15	-4.35	0.00	-4.18	0.00	-3.05	0.00	-0.39	0.00	0.46

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	317579
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	41452
Entity (or well #):	16	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	1/24/04
Analysis Date:	2/12/04
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2839.3
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999997
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 317579 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**493.0**	**13.91**	**Sodium:**	**865.0**	**37.62**
Bicarbonate:	**1464.0**	**23.99**	**Magnesium:**	**1.0**	**0.08**
Carbonate:	**0.0**	**0.**	**Calcium:**	**4.0**	**0.2**
Sulfate:	**7.0**	**0.15**	**Strontium:**	**0.9**	**0.02**
Phosphate:			**Barium:**	**0.4**	**0.01**
Borate:			**Iron:**	**1.0**	**0.04**
Silicate:			Potassium:	3.0	0.08
			Aluminum:		
Hydrogen Sulfide:			*Chromium:*		
			Copper:		
pH at time of sampling:		8.08	Lead:		
pH at time of analysis:			Manganese:		
pH used in Calculation:		**8.08**	Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.14	0.70	-4.24	0.00	-4.31	0.00	-3.13	0.00	-0.39	0.00	0.17
100	0	0.20	1.05	-4.25	0.00	-4.26	0.00	-3.11	0.00	-0.52	0.00	0.25
120	0	0.27	1.40	-4.26	0.00	-4.18	0.00	-3.07	0.00	-0.64	0.00	0.36
140	0	0.34	1.75	-4.26	0.00	-4.09	0.00	-3.03	0.00	-0.72	0.00	0.5

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	317935
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	43426
Entity (or well #):	17	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	5/13/04
Analysis Date:	5/26/04
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3253.6
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999998
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 317935 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**694.0**	**19.58**	**Sodium:**	**1002.4**	**43.6**
Bicarbonate:	**1525.0**	**24.99**	**Magnesium:**	**3.0**	**0.25**
Carbonate:	**0.0**	**0.**	**Calcium:**	**11.0**	**0.55**
Sulfate:	**6.0**	**0.12**	**Strontium:**	**2.0**	**0.05**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**0.2**	**0.01**
Silicate:			Potassium:	9.0	0.23
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.78	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.78**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.29	4.19	-3.90	0.00	-3.97	0.00	-2.88	0.00	-0.09	0.00	0.34
100	0	0.39	5.24	-3.91	0.00	-3.92	0.00	-2.86	0.00	-0.23	0.00	0.47
120	0	0.48	5.94	-3.92	0.00	-3.84	0.00	-2.83	0.00	-0.34	0.00	0.63
140	0	0.58	6.64	-3.92	0.00	-3.75	0.00	-2.79	0.00	-0.43	0.00	0.84

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	317592
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	41442
Entity (or well #):	18	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	1/24/04
Analysis Date:	2/12/04
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2664.4
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	0.9999994
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 317592 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**296.0**	**8.35**	**Sodium:**	**772.7**	**33.61**
Bicarbonate:	**1573.8**	**25.79**	**Magnesium:**	**0.9**	**0.07**
Carbonate:	**0.0**	**0.**	**Calcium:**	**6.0**	**0.3**
Sulfate:	**5.0**	**0.1**	**Strontium:**	**1.0**	**0.02**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**3.0**	**0.11**
Silicate:			Potassium:	4.0	0.1
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		7.65	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**7.65**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.04	0.00	-4.17	0.00	-4.24	0.00	-3.20	0.00	0.19	0.35	0.48
100	0	0.06	0.70	-4.19	0.00	-4.19	0.00	-3.18	0.00	0.06	0.00	0.65
120	0	0.18	1.75	-4.19	0.00	-4.12	0.00	-3.14	0.00	-0.06	0.00	0.84
140	0	0.29	2.45	-4.19	0.00	-4.02	0.00	-3.10	0.00	-0.14	0.00	1.07

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	Sample #:	27256
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	26404
Entity (or well #):	19	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	6/6/02
Analysis Date:	6/12/02
Analyst:	SHEILA HERNANDEZ
TDS (mg/l or g/m3):	2320.4
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999995
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 27256 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**250.0**	**7.05**
Bicarbonate:	**1378.6**	**22.59**
Carbonate:	**0.0**	**0.**
Sulfate:	**6.0**	**0.12**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.59
pH at time of analysis:		
pH used in Calculation:		**8.59**

Cations	mg/l	meq/l
Sodium:	**674.2**	**29.33**
Magnesium:	**1.0**	**0.08**
Calcium:	**4.0**	**0.2**
Strontium:	**1.0**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**0.6**	**0.02**
Potassium:	4.0	0.1
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
55	0	0.55	2.45	-4.27	0.00	-4.40	0.00	-3.15	0.00	0.18	0.35	0.03
75	0	0.57	2.45	4.30	0.00	4.39	0.00	3.14	0.00	0.01	0.00	0.04
95	0	0.60	2.45	4.32	0.00	4.34	0.00	3.12	0.00	-0.14	0.00	0.07
105	0	0.61	2.45	-4.32	0.00	-4.30	0.00	-3.10	0.00	-0.20	0.00	0.09

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	Sample #:	27257
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	26405
Entity (or well #):	20	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 27257 @ 75 °F					
Sampling Date:	6/6/02	**Anions**	mg/l	meq/l	**Cations**	mg/l	meq/l
Analysis Date:	6/12/02	**Chloride:**	**241.0**	**6.8**	**Sodium:**	**695.7**	**30.26**
Analyst:	SHEILA HERNANDEZ	**Bicarbonate:**	**1464.0**	**23.99**	**Magnesium:**	**1.0**	**0.08**
		Carbonate:	**0.0**	**0.**	**Calcium:**	**6.0**	**0.3**
TDS (mg/l or g/m3):	2418.7	**Sulfate:**	**3.0**	**0.06**	**Strontium:**	**1.0**	**0.02**
Density (g/cm3, tonne/m3):	1.002	Phosphate:			**Barium:**	**1.0**	**0.01**
Anion/Cation Ratio:	0.9999994	Borate:			**Iron:**	**2.0**	**0.07**
		Silicate:			Potassium:	4.0	0.1
Carbon Dioxide:		Hydrogen Sulfide:			Aluminum:		
Oxygen:		pH at time of sampling:		8.09	Chromium:		
Comments:		pH at time of analysis:			Copper:		
		pH used in Calculation:		**8.09**	Lead:		
					Manganese:		
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
55	0	0.27	2.10	-4.35	0.00	-4.48	0.00	-3.42	0.00	-0.10	0.00	0.1
75	0	0.33	2.45	4.38	0.00	4.47	0.00	3.41	0.00	-0.27	0.00	0.15
95	0	0.40	2.80	4.40	0.00	4.42	0.00	3.39	0.00	-0.42	0.00	0.22
105	0	0.44	3.15	-4.40	0.00	-4.39	0.00	-3.38	0.00	-0.48	0.00	0.27

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Water Analysis Report by Baker Petrolite

Company:	EL PASO PRODUCTION	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	317701
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	41430
Entity (or well #):	21	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	1/24/04
Analysis Date:	2/12/04
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2937.5
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000001
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 317701 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**502.0**	**14.16**
Bicarbonate:	**1525.0**	**24.99**
Carbonate:	**0.0**	**0.**
Sulfate:	**6.0**	**0.12**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.02
pH at time of analysis:		
pH used in Calculation:		**8.02**

Cations	mg/l	meq/l
Sodium:	**890.4**	**38.73**
Magnesium:	**2.0**	**0.16**
Calcium:	**3.0**	**0.15**
Strontium:	**1.0**	**0.02**
Barium:	**0.4**	**0.01**
Iron:	**0.7**	**0.03**
Potassium:	7.0	0.18
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4{*}2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.03	0.00	-4.44	0.00	-4.51	0.00	-3.16	0.00	-0.46	0.00	0.2
100	0	0.04	0.35	-4.45	0.00	-4.46	0.00	-3.14	0.00	-0.60	0.00	0.29
120	0	0.11	0.70	-4.46	0.00	-4.38	0.00	-3.10	0.00	-0.71	0.00	0.41
140	0	0.19	1.05	-4.46	0.00	-4.29	0.00	-3.06	0.00	-0.80	0.00	0.57

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218396
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	29207
Entity (or well #):	27	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/4/02
Analysis Date:	10/28/02
Analyst:	SHEILA HERNANDEZ
TDS (mg/l or g/m3):	6095.3
Density (g/cm3, tonne/m3):	1.005
Anion/Cation Ratio:	0.9999997
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218396 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**2462.0**	**69.44**
Bicarbonate:	**1472.0**	**24.12**
Carbonate:	**0.0**	**0.**
Sulfate:	**8.0**	**0.17**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**8.17**
pH used in Calculation:		**8.17**

Cations	mg/l	meq/l
Sodium:	**2091.4**	**90.97**
Magnesium:	**10.0**	**0.82**
Calcium:	**28.0**	**1.4**
Strontium:	**7.0**	**0.16**
Barium:	**5.0**	**0.07**
Iron:	**0.9**	**0.03**
Potassium:	11.0	0.28
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4*2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.91	18.81	-3.59	0.00	-3.65	0.00	-2.42	0.00	0.53	1.74	0.13
100	0	0.93	19.51	-3.60	0.00	-3.60	0.00	-2.40	0.00	0.39	1.39	0.21
120	0	0.96	20.21	-3.61	0.00	-3.53	0.00	-2.37	0.00	0.27	1.05	0.33
140	0	1.00	20.90	-3.60	0.00	-3.43	0.00	-2.33	0.00	0.18	0.70	0.5

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	Sample #:	27259
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	26407
Entity (or well #):	28	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	6/6/02
Analysis Date:	6/12/02
Analyst:	SHEILA HERNANDEZ
TDS (mg/l or g/m3):	2851.6
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	0.9999996
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 27259 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**423.0**	**11.93**
Bicarbonate:	**1561.6**	**25.59**
Carbonate:	**0.0**	**0.**
Sulfate:	**3.0**	**0.06**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		8.2
pH at time of analysis:		
pH used in Calculation:		**8.2**

Cations	mg/l	meq/l
Sodium:	**851.5**	**37.04**
Magnesium:	**1.5**	**0.12**
Calcium:	**6.0**	**0.3**
Strontium:	**1.0**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**1.0**	**0.04**
Potassium:	2.0	0.05
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	**Calcite CaCO3**		**Gypsum CaSO4*2H20**		**Anhydrite CaSO4**		**Celestite SrSO4**		**Barite BaSO4**		**CO2 Press**
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
55	0	0.38	2.80	-4.40	0.00	-4.54	0.00	-3.47	0.00	-0.15	0.00	0.08
75	0	0.43	3.15	4.44	0.00	4.52	0.00	3.46	0.00	-0.32	0.00	0.12
95	0	0.48	3.50	4.45	0.00	4.48	0.00	3.44	0.00	-0.47	0.00	0.19
105	0	0.51	3.50	-4.46	0.00	-4.44	0.00	-3.43	0.00	-0.53	0.00	0.23

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	218407
Lease/Platform:	VERMEJO PARK RANCH 'C'	Analysis ID #:	29210
Entity (or well #):	40	Analysis Cost:	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	10/4/02
Analysis Date:	10/28/02
Analyst:	SHEILA HERNANDEZ
TDS (mg/l or g/m3):	2448.7
Density (g/cm3, tonne/m3):	1.003
Anion/Cation Ratio:	1.0000001
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 218407 @ 75 °F

Anions	mg/l	meq/l
Chloride:	**181.0**	**5.11**
Bicarbonate:	**1556.0**	**25.5**
Carbonate:	**0.0**	**0.**
Sulfate:	**4.0**	**0.08**
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		
pH at time of sampling:		
pH at time of analysis:		**8.22**
pH used in Calculation:		**8.22**

Cations	mg/l	meq/l
Sodium:	**691.9**	**30.09**
Magnesium:	**0.9**	**0.07**
Calcium:	**5.0**	**0.25**
Strontium:	**0.9**	**0.02**
Barium:	**1.0**	**0.01**
Iron:	**3.0**	**0.11**
Potassium:	5.0	0.13
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.41	2.45	-4.35	0.00	-4.42	0.00	-3.34	0.00	-0.20	0.00	0.13
100	0	0.46	2.80	-4.37	0.00	-4.37	0.00	-3.32	0.00	-0.33	0.00	0.2
120	0	0.52	2.80	-4.38	0.00	-4.30	0.00	-3.28	0.00	-0.44	0.00	0.29
140	0	0.58	3.15	-4.37	0.00	-4.20	0.00	-3.24	0.00	-0.53	0.00	0.42

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.