

APPLICATION FOR AUTHORIZATION TO INJECT

- ✓ I. PURPOSE: Secondary Recovery Pressure Maintenance Disposal Storage
Application qualifies for administrative approval? Yes No
- ✓ II. OPERATOR: Sonat Raton, L.L.C.
ADDRESS: P. O. Box 190; Raton, NM 87740-0190
CONTACT PARTY: Don Lankford PHONE: 505-445-4621
- ✓ III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.
Additional sheets may be attached if necessary.
- ✓ IV. Is this an expansion of an existing project? Yes No
If yes, give the Division order number authorizing the project: N/A
- ✓ 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: Ann E. Ritchie 915 6846381 TITLE: Regulatory Agent
SIGNATURE: [Signature] DATE: 4/3/2000

* 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: 1/22/99

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 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, P. O. Box 2088, Santa Fe, New Mexico 87501 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.

Sonat Raton, L.L.C.
 Vermejo Park Ranch "D", Well #25 Water Disposal
 1155.1' FSL & 1390.4' FWL
 Section 5, T-30N, R-18-E
 Colfax County, New Mexico

Attachment A

III. Well Data

Section A:

1. Lease Name: Vermejo Park Ranch "D", Well #25 (Water Disposal) (30-007-20152)
 Location: 1155.1' FSL & 1390.4' FWL, Sec. 5, T-30-N, R-18-E, Colfax Co. NM
2. Casing & Cementing (Wellbore Diagram attached)

Proposed:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
13 3/8"	350'	200 sx	17 1/2"	Surface
10 3/4"	2600'	500 sx	12 1/4"	Surface
7 5/8"	6440'	1100 sx	9 7/8"	Surface
5 1/2"	7400'	800 sx	6 3/4"	Surface

3. Tubing: 2 7/8" 6.5# J-55 @ +/- 6350'
4. Packer: Baker Model R-3 @ +/- 6350'

Section B:

1. Injection Formation: Dakota/Entrada Sand
 Field Name: Vermejo Park Ranch
2. Injection Interval: Dakota/Entrada Sandstone +/- 6400' - 7350' (perforated interval)
3. Original Purpose of Well: Drilled for the purpose of disposing of produced Formation water.
4. No other perforated intervals
5. Next Higher gas/oil zone: Vermejo Formation at approximately 2300'
 Next Lower gas/oil zone: None

IV. This is an expansion of an existing project.

V. Map attached - "Attachment B", two mile & 1/2 mile radius area of review.

Sonat Raton, L.L.C.
Vermejo Park Ranch "D", Well #25 Water Disposal
1155.1' FSL & 1390.4' FWL
Section 5, T-30N, R-18-E
Colfax County, New Mexico

VI. Area of Review

There are 5 wells within one half mile of the proposed disposal well, penetration is noted on forms attached.

VII. Operation Data:

1. Proposed average daily injection volume: 14,000 BWPD
Proposed maximum daily injection volume: 20,000 BWPD
2. This well will be a closed system.
3. Proposed average daily injection pressure: 875 psi
Proposed maximum daily injection pressure: 2000 psi due to step rate
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. Chlorides in the Entrada Formation are estimated to be between 1133 to 11,795 PPM as described in the "Attachment C" C-1, C-2 and C-3 Water Analysis Pantechs Laboratories taken from area wells – as available
Chemical analysis of water zones penetrated while drilling were obtained by Roy Johnson, District 4, Oil Conservation Division, Santa Fe, NM.

VII. Geological Data:

Information pertaining to the lithological details and thickness are limited to the Eustace #1, located in Section 36, T-32-N, R-19-E, Unit J, 2500' FSL & 2300' FEL. Logs on the Eustace #1 were previously submitted to the Oil Conservation Division. (Eustace #1 Form C-103 & C-105 attached)

VIII. Stimulation Program

Anticipated frac job will be 200,000# 20/40 sand w/cross linked gell @ 5# per gallon.

X. Logs and Test Data

Well has not been logged to date, the Oil Conservation Division, Att: Roy Johnson, Santa Fe, NM, is on the distribution list for all logs

XI. Fresh Water

Roy Johnson, OCD took fresh water samples, during drilling

Sonat Raton, L.L.C.
Vermejo Park Ranch "D", Well #25 Water Disposal
1155.1' FSL & 1390.4' FWL
Section 5, T-30N, R-18-E
Colfax County, New Mexico

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"

Sonat Raton, L.L.C. offsets Section 1 on all sides.

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

WDW: "VPRD-25" Casing and Cementing Plan
Casing and Cementing Design

Surface casing cement
200 sx. Midcon 2 @
13.5 ppg., 1.76 yld
(100% excess)

17 1/2" hole

13 3/8" 48# csg. @ 350'

Intermediate casing cement
400 sx. Silica Lite @
12 ppg., 2.07 yld followed
by 100 sx. Class "G" @
13.5 ppg., 1.76 yld.

12 1/4" hole

10 3/4" 40.5# csg. @ 2600'

Intermediate casing cement
1100 sx Midcon 2 12.0 ppg.,
2.49 yld (100% excess)

9 7/8" hole

7 5/8" 26.4# csg. @ 6440'

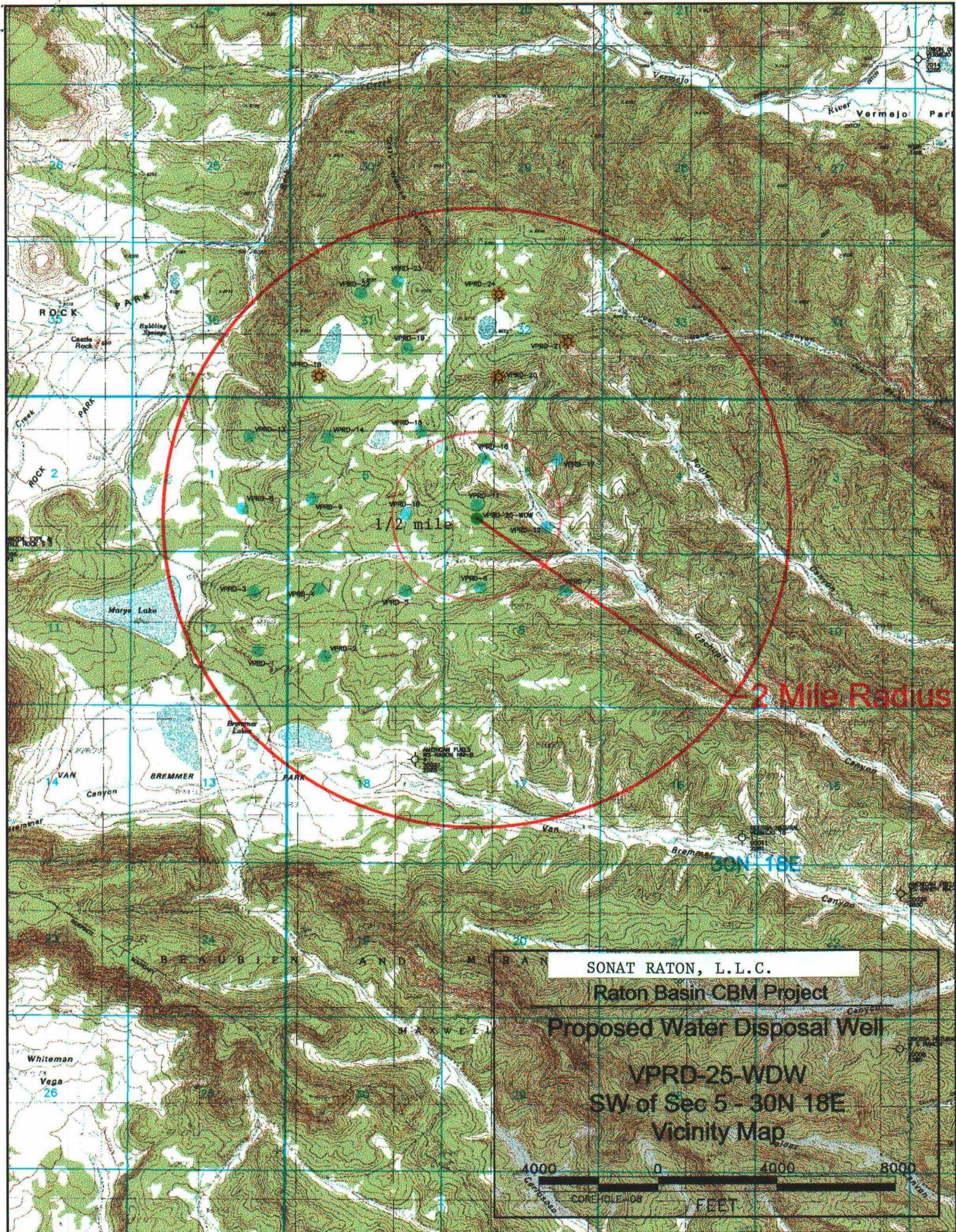
top Dakota @ ± 6440'

top Entrada @ ± 7400'

Long string cement 700 sx.
Midcon 2 (12.0 ppg., 2.17 yld
followed by 100 sx Class "G"
(14.6 ppg., 1.46 yld

6 3/4" hole

5 1/2" 15.5# csg. @ 7400'



SONAT RATON, L.L.C.
Raton Basin CBM Project
Proposed Water Disposal Well
VPRD-25-WDW
SW of Sec 5 - 30N 18E
Vicinity Map

4000 0 4000 8000
COREFILE-08 FEET

District I
1625 N French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Form C-101
Revised March 17, 1999

Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Submit to appropriate District Office
State Lease - 6 Copies
Fee Lease - 5 Copies

AMENDED REPORT

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

¹ Operator Name and Address Sonat Raton, L.L. C. P.O. Box 190 Raton, NM 87740		² OGRID Number 180514
		³ API Number 30-007- 20144
⁴ Property Code 24648 25179	⁵ Property Name Vermejo Park Ranch (VPR)	⁶ Well No. VPR D-11

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
L	05	30N	18E	I.	1616'	SOUTH	1070'	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
⁹ Proposed Pool 1 Vermejo					¹⁰ Proposed Pool 2 Raton				

¹¹ Work Type Code N	¹² Well Type Code G	¹³ Cable/Rotary ROTARY/AIR	¹⁴ Lease Type Code P	¹⁵ Ground Level Elevation 8566' (GL)
¹⁶ Multiple Yes No	¹⁷ Proposed Depth 2500'	¹⁸ Formation Trinidad	¹⁹ Contractor Not Available	²⁰ Spud Date January 30, 2000

²¹ Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
11"	8 5/8"	23#	350'	100 sx.	SURFACE
7 7/8"	5 1/2"	15.50#	2500'	300 sx.	SURFACE

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 11" hole to +/- 350' with air.
2. Set 8 5/8" surface casing and cement to surface with 100sks of cement.
3. Drill 7 7/8" hole to 2500' with air. Run open hole logs.
4. Set 5 1/2" production casing to TD and cement to surface. Cement volumes calculated from openhole logs.
5. Perforate and stimulate Vermejo and/or Raton Coals. Clean out well bore and run production equipment.

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: *DR Lankford*

Printed name: Donald R. Lankford

Title: Senior Petroleum Engineer

Date: 01/20/2000

Phone: (505) 445-4620

OIL CONSERVATION DIVISION

Approved by: *R. E. Ephraim*

Title: **DISTRICT SUPERVISOR**

Approval Date: 1/21/00

Expiration Date: 1/21/01

Conditions of Approval:

Attached

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

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Energy Minerals and Natural Resources

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¹ Operator Name and Address Sonat Raton, L.L.C. P.O. Box 190 Raton, NM 87740		² OQRID Number 180514
		³ API Number 30-007- 20147
⁴ Property Code 25179	⁵ Property Name Vermejo Park Ranch (VPR)	⁶ Well No. VPR D-16

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	05	30N	18E	E	2079'	NORTH	Pool from the 1302	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

⁹ Proposed Pool 1

Vermejo

¹⁰ Proposed Pool 2

Raton

¹¹ Work Type Code N	¹² Well Type Code G	¹³ Cable/Rotary ROTARY/AIR	¹⁴ Lease Type Code P	¹⁵ Ground Level Elevation 8451' (GL)
¹⁶ Multiple X N	¹⁷ Proposed Depth 2500'	¹⁸ Formation Trinidad	¹⁹ Contractor Not Available	²⁰ Spud Date January 30, 2000

²¹ Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
11"	8 5/8"	23#	350'	100 sx.	SURFACE
7 7/8"	5 1/2"	15.50#	2500'	300 sx.	SURFACE

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.

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4. Set 5 1/2" production casing to TD and cement to surface. Cement volumes calculated from openhole logs.
5. Perforate and stimulate Vermejo and/or Raton Coals. Clean outwellbore and run production equipment.

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: *DR Lankford*

Printed name: Donald R. Lankford

Title: Senior Petroleum Engineer

Date: 01/20/2000

Phone: (505) 445-4620

OIL CONSERVATION DIVISION

Approved by: *R. Johnson*

Title: DISTRICT SUPERVISOR

Approval Date: 1/21/00

Expiration Date: 1/21/01

Conditions of Approval:

Attached

District I
1675 N. French Dr., Hobbs, NM 88240

District II
811 South First, Artesia, NM 88210

District III
1000 Rio Brazos Road, Aztec, NM 87410

District IV
2040 South Pacheco, Santa Fe, NM 87505

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

¹ Operator Name and Address Sonat Raton, L.L. C. P.O. Box 190 Raton, NM 87740		² OGRID Number 180514
		³ API Number 30-007- 20145
⁴ Property Code 2468 25179	⁵ Property Name Vermejo Park Ranch (VPR)	⁶ Well No. VPR D-12

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
O	05	30N	18E	O	885'	SOUTH	1852'	EAST	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

⁹ Proposed Pool 1 Vermejo	¹⁰ Proposed Pool 2 Raton
---	--

¹¹ Work Type Code N	¹² Well Type Code G	¹³ Cable/Rotary ROTARY/AIR	¹⁴ Lease Type Code P	¹⁵ Ground Level Elevation 8334' (GL)
¹⁶ Multiple DR NO	¹⁷ Proposed Depth 2500'	¹⁸ Formation Trinidad	¹⁹ Contractor Not Available	²⁰ Spud Date January 30, 2000

²¹ Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
11"	8 5/8"	23#	350'	100 SK.	SURFACE
7 7/8"	5 1/2"	15.50#	2500'	300 SK.	SURFACE

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.

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4. Set 5 1/2" production casing to TD and cement to surface. Cement volumes calculated from openhole logs.
5. Perforate and stimulate Vermejo and/or Raton Coals. Clean outwellbore and run production equipment.

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: *DR Lankford*

Printed name: Donald R. Lankford

Title: Senior Petroleum Engineer

Date: 01/20/2000

Phone: (505) 445-4620

OIL CONSERVATION DIVISION

Approved by:

Title: **DISTRICT SUPERVISOR**

Approval Date: *1/21/00*

Expiration Date: *1/21/01*

Conditions of Approval:

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¹ Operator Name and Address Sunat Raton, L.L.C. P.O. Box 190 Raton, NM 87740		² OGRID Number 180514
		³ API Number 30-007-20178
¹ Property Code 20178 25179	⁵ Property Name Vermejo Park Ranch (VPR)	⁴ Well No. VPR D-10

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
P	6	30N	18 E	P	1237'	SOUTH	1212'	EAST	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
									Colfax

⁹ Proposed Pool 1 Vermejo	¹⁰ Proposed Pool 2 Raton
---	--

¹¹ Work Type Code N	¹² Well Type Code G	¹³ Cable/Rotary ROTARY/AIR	¹⁴ Lease Type Code P	¹⁵ Ground Level Elevation 8451' (GL)
¹⁶ Multiple Yes	¹⁷ Proposed Depth 2500'	¹⁸ Formation Trinidad	¹⁹ Contractor PENSE or EXCEL	²⁰ Spud Date March 1, 2000

²¹ Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
11"	8 5/8"	23#	350'	100 sx.	SURFACE
7 7/8"	5 1/2"	15.50#	2500'	300 sx.	SURFACE

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²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>DR Lankford</i>	OIL CONSERVATION DIVISION	
	Approved by: <i>[Signature]</i>	
Printed name: Donald R. Lankford	Title: DISTRICT SUPERVISOR	
Title: Senior Petroleum Engineer	Approval Date: <i>2/10/00</i>	Expiration Date: <i>2/10/01</i>
Date: 02/02/2000	Phone: (505) 445-4620	Conditions of Approval:

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		³ API Number 30-007-20193
⁴ Property Code 25179	⁵ Property Name Vermejo Park Ranch (VPR)	⁶ Well No. VPR D-06

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	R	30N	18 E	E	1346'	NORTH	1204'	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
									Colfax

⁹ Proposed Pool 1 Vermejo	¹⁰ Proposed Pool 2 Raton
---	--

¹¹ Work Type Code N	¹² Well Type Code G	¹³ Cable/Rotary ROTARY/AIR	¹⁴ Lease Type Code P	¹⁵ Ground Level Elevation 8426' (GL)
¹⁶ Multiple Yes	¹⁷ Proposed Depth 2500'	¹⁸ Formation Triadad	¹⁹ Contractor PENSE or EXCEL	²⁰ Spud Date March 1, 2000

²¹ Proposed Casing and Cement Program					
Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
11"	8 5/8"	23#	350'	100 SK.	SURFACE
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	Approved by: <i>[Signature]</i>	Title: DISTRICT SUPERVISOR
	Approval Date: 3/2/00	Expiration Date: 3/2/01
Date: 02/02/2000	Phone: (505) 445-4620	Conditions of Approval:

PANTLEIS LABORATORIES

P. O. BOX 2439 TEL. 806 669-6821 PAMPA, TEXAS 79066-2439
 P. O. BOX 3246 TEL. 806 797-4325 LUBBOCK, TEXAS 79452-3246

WATER ANALYSIS

SAMPLING DATA

Lab #.....0689
 Customer.....VERNEJO MINERALS CORP.
 Sample ID.....# Well # 0
 Produced Water
 Date sampled.....3-1-90
 Sampling point.....--
 Sample temp (deg. F).....75
 Sampled by.....Vernejo
 Analysis date.....3-7-90

REMARKS:

Cimarron, New Mexico Area
 Color:
 Gray; cloudy; suspended Solids

DISTRIBUTION

3-Vernejo Minerals Corporation
 Rte 1 Box 68
 Cimarron, New Mexico 87714
 Mr Larry Williamson

ANALYTICAL DATA

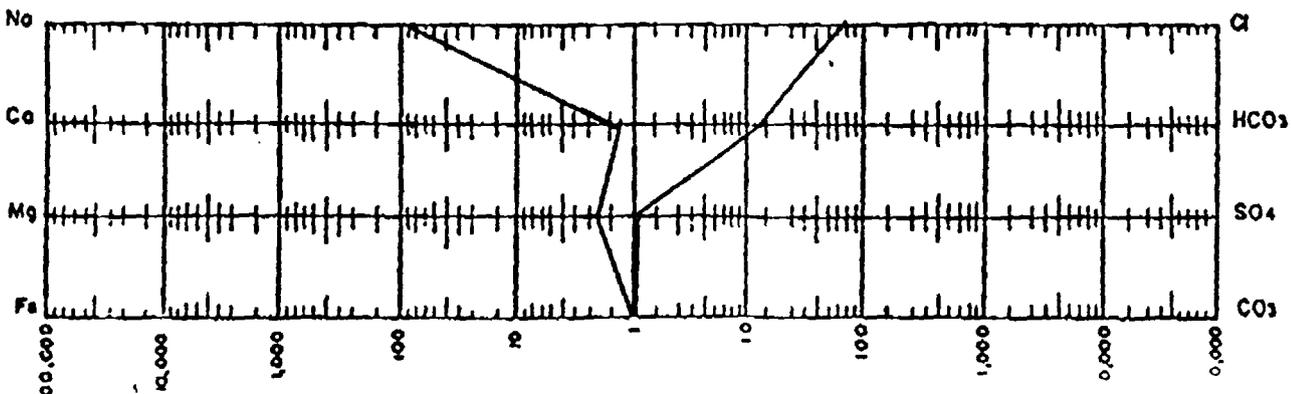
pH.....8.09
 Specific gravity @ 75 deg. F.....1.0031
 Resistivity (ohm-cm).....1.19
 Filterable solids (mg/l).....166.8
 Carbon dioxide (CO₂) mg/l.....NA
 Sulfide (as H₂S) mg/l.....NA
 Total hardness (as CaCO₃) mg/l.....NA

DISSOLVED SOLIDS

Cations	meq/l	mg/l	ppm
Sodium (Na)	85.4	1963	1967
Calcium (Ca)	1.5	30	30
Magnesium (Mg)	2.5	30	30
Iron (Fe), total	.7	20	20
Potassium (K)	NA	NA	NA
Barium (Ba)	NA	NA	NA
Anions			
Chloride (Cl)	71.2	2524	2516
Sulfate (SO ₄)	0	0	0
Carbonate (CO ₃)	0	0	0
Bicarbonate (HCO ₃)	18.9	1153	1149
Hydroxide (OH)	0	0	0
Total dissolved solids (calculated)	180.2	5720	5702

Analysis By: Steve Hopkins

Water Patterns (meq/l)
 Logarithmic



PANTLICH'S LABORATORIES

P. O. BOX 2439 TEL. 806 669-6821 PAMPA, TEXAS 79066-2439
 P. O. BOX 3246 TEL. 806 797-4325 LUBBOCK, TEXAS 79452-3246

WATER ANALYSIS

SAMPLING DATA

Lab #.....0687
 Customer.....VERNEJO MINERALS CORP.
 Sample ID.....Well # 1
 Produced Water
 Date sampled.....3-1-90
 Sampling point.....
 Sample temp (deg. F).....75
 Sampled by.....Vernejo
 Analysis date.....3-7-90

REMARKS:

• Clearon, New Mexico Area
 Color:
 Yellow; cloudy; suspended solids

DISTRIBUTION

J-Vernejo Minerals Corporation
 Rte 1 Box 68
 Clearon, New Mexico 87714
 Mr Larry Williamson

ANALYTICAL DATA

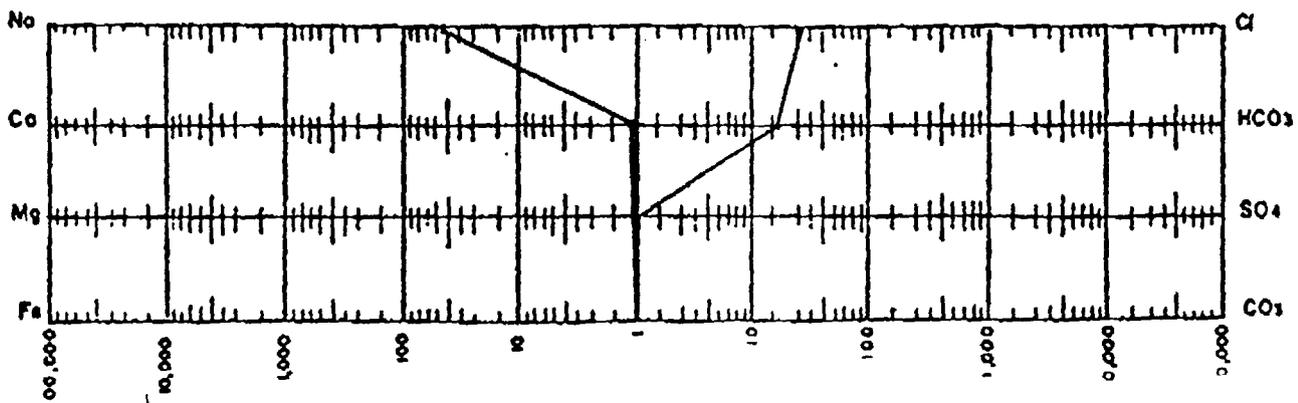
pH.....8.14
 Specific gravity @ 75 deg. F.....1.0005
 Resistivity (ohm-cm).....1.98
 Filterable solids (mg/l).....10.8
 Carbon dioxide (CO₂) (mg/l).....NA
 Sulfide (as H₂S) (mg/l).....NA
 Total hardness (as CaCO₃) (mg/l).....NA

DISSOLVED SOLIDS

Cations	meq/l	mg/l	ppm
Sodium (Na)	33.7	1233	1234
Calcium (Ca)	.9	18	18
Magnesium (Mg)	.7	9	9
Iron (Fe), total	0	0	0
Potassium (K)	NA	NA	NA
Barium (Ba)	NA	NA	NA
Anions			
Chloride (Cl)	32	1134	1133
Sulfate (SO ₄)	0	0	0
Carbonate (CO ₃)	0	0	0
Bicarbonate (HCO ₃)	23.3	1421	1420
Hydroxide (OH)	0	0	0
Total dissolved solids (calculated)	110.6	3817	3814

Analysis By: Steve Hopkins

Water Patterns (meq/l)
 Logarithmic



PANTCHS LABORATORIES

P. O. BOX 2439 TEL. 806 669-6821 PAMPA, TEXAS 79066-2439
 P. O. BOX 3246 TEL. 806 797-4325 LUBBOCK, TEXAS 79452-3246

Attachment C-3
WATER ANALYSIS

SAMPLING DATA

Lab #.....0586
 Customer.....VERMEJO MINERALS CORP.
 Sample ID.....# Well # P
 Produced Water
 Date sampled.....1-30-90
 Sampling point.....
 Sample temp (deg. F).....75
 Sampled by.....Vermejo
 Analysis date.....2-5-90

ANALYTICAL DATA

pH.....6.37
 Specific gravity @ 75 deg. F.....1.0141
 Resistivity (ohm-cm)......31
 Filterable solids (mg/l).....566
 Carbon dioxide (CO2) mg/l.....NA
 Sulfide (as H2S) mg/l.....NA
 Total hardness (as CaCO3) mg/l.....NA

REMARKS:

• Cimarron, New Mexico Area

Color:
 Orange W/Suspended Solids

DISSOLVED SOLIDS

Cations	mg/l	mg/l	ppm
Sodium (Na)	302.7	6948	6851
Calcium (Ca)	32.6	653	644
Magnesium (Mg)	7.6	92	91
Iron (Fe), total	1.1	31	31
Potassium (K)	NA	NA	NA
Barium (Ba)	NA	NA	NA

Anions

Chloride (Cl)	337.4	11761	11795
Sulfate (SO4)	.1	5	5
Carbonate (CO3)	0	0	0
Bicarbonate (HCO3)	6	366	361
Hydroxide (OH)	0	0	0
Total dissolved solids (calculated)	687	20056	19778

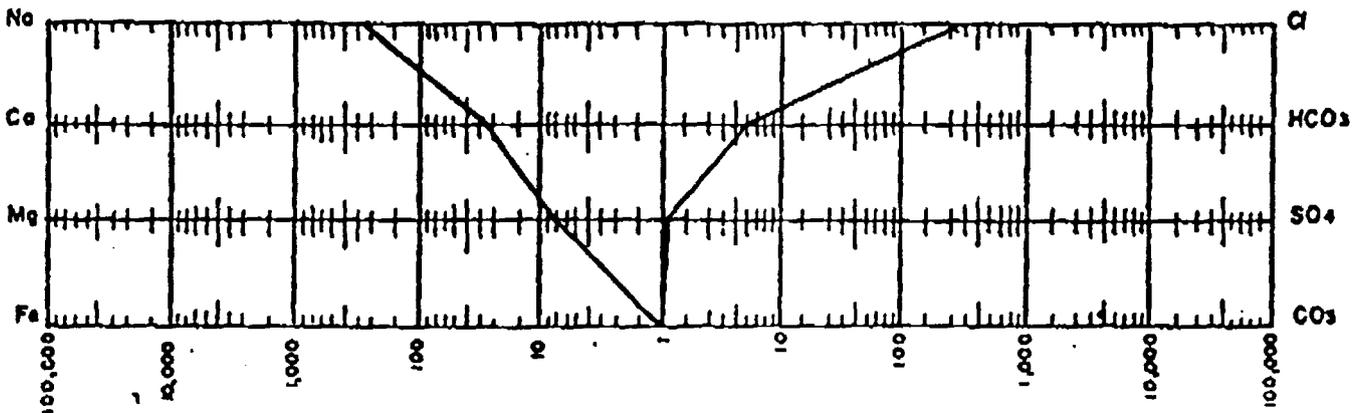
DISTRIBUTION

J-Vermejo Minerals Corporation
 Rte 1 Box 68
 Cimarron, New Mexico 87714

 Mr Larry Williamson

Analysis By Steve Hopkins

Water Patterns (mg/l)
 Logarithmic



Attachment "D"

XIII. Proof of Notice

Surface Owner:

Vermejo Park, L.L.C.
P. O. Drawer E
Raton, NM 87740

Working/Offset & Royalty Owners:

Sonat Raton, L.L.C.
Sonat Exploration
P. O. Box 1513
Houston, Texas 77251-1513
Attn: Stephen P. Guerin, P.E.

Vermejo Minerals Corp.
C/o Devon Energy Corp.
P. O. Box 4616
Houston, Texas 77210-4616
Attn: Ken Gray

Copies of the Oil Conservation Division, Form C-108 have been sent to the above stated parties by certified mail on the the 3rd day of April, 2000.



Ann E. Ritchie Regulatory Agent
Sonat Raton, L.L.C.
P. O. Box 190
Raton, New Mexico 87740

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF COLFAX)

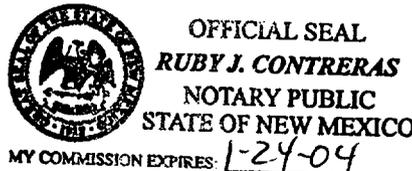
The undersigned, being first duly sworn according to law, on his/her oath deposes and says that he/she is the business manager of the newspaper named "The Raton Range" and that he/she has personal knowledge of the facts stated herein; that the said "The Raton Range" is a twice-weekly newspaper of general paid circulation printed and published in the County of Colfax and State of New Mexico and entered under the Second class postal privilege in said County, and having been uninterruptedly and continuously printed and published in said County during the period of more than six months to the date of publishing of the first issue of the publication next prior or notice concerning which this affidavit is made and a copy of which is hereto attached; that said newspaper is duly qualified for that purpose under the laws of the state of New Mexico; that the publication, a printed copy of which is hereunto attached and made a part of this affidavit, was published in said newspaper once each week for 2 successive weeks, said paid publication having been made on the following dates, to-wit:

- First publication: The 24 day of March, 2000
- Second publication: The 28 day of March, 2000
- Third publication: The ___ day of _____, 2000
- Fourth publication: The ___ day of _____, 2000
- Fifth publication: The ___ day of _____, 2000
- Sixth publication: The ___ day of _____, 2000

Margaret Massine
Business Manager

Subscribed and sworn to before me this 28th
day of March, 2000.

Ruby Contreras
Notary Public



PUBLISHER'S BILL

55 lines, 8pt. type, 2 Times, 48.56
3.39
51.95

Notice of Application
for Fluid Injection
Well Permit

Sonat Raton, L.L.C., P.O. Box 190, Raton, New Mexico 87740 is seeking administrative approval from the New Mexico Oil Conservation Division to complete their Vermejo Park Ranch "A," Well No. 42, located in Section 1, T-31-N, R-19-E, Vermejo Park Ranch "D," Well No. 25, located in Section 5, T-30-N, R-18E, Vermejo Park Ranch "B," Well No. 27, Section 36, T-30-N, R-18-E, Colfax County, New Mexico as water disposal wells. The proposed interval is the Dakota/Entrada Sand from an estimated depth of 6400'-7350'. Sonat 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 1240 psi.

Interested parties must file objections or request for hearing with the Oil Conservation Division, 2040 S. Pacheco, Santa Fe, N.M. 87505 within 15 days of this notice.

Ann E. Ritchie, Regulatory Agent

Sonat Raton, L.L.C.
C/o P.O. Box 953
Midland, Texas 79702
1-800-432-2967, (915) 682-1458 fax

e-mail: aritic19676@aol.com

Legal No. 295100.

Published in The
Raton Range March
24 and 28, 2000.