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STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL  
RESOURCES DEPARTMENT

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

MAR 17 2004

PDIC0407839182  
FORM C-108  
Revised June 10, 2003

**APPLICATION FOR AUTHORIZATION TO INJECT**  
OIL CONSERVATION  
DIVISION

- I. PURPOSE: ☒ Secondary Recovery ☐ Pressure Maintenance ☐ Disposal ☐ Storage  
Application qualifies for administrative approval? ☒ Yes ☐ No
- II. OPERATOR: SAGE ENERGY COMPANY  
ADDRESS: PO DRAWER 3068, Midland, TX. 79702  
CONTACT PARTY: GEORGE M. HARRIS, JR. PHONE: 432-683-5271
- 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: R-9359 30-025-29192
- 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: GEORGE M. HARRIS, JR.

TITLE: DISTRICT ENGINEER

SIGNATURE: George M. Harris, Jr.

DATE: 2/26/04

E-MAIL ADDRESS: gharris@sagemid.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: ORIGINAL C-108 for PROJECT, DATED 8/10/90

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

February 26, 2004

**ADDENDUM TO FORM C-108**

**SAGE ENERGY COMPANY**

**APPLICATION FOR AUTHORIZATION TO INJECT**

- VII.** 1.) Average daily injection rate is 200 bwpd, maximum daily injection rate is 450 bwpd. The total volume of fluid to be injected 1,460,000 barrels.
- 2.) This injection system is closed.
- 3.) The proposed average injection pressure is 4050#, maximum proposed injection pressure is 4500#.
- 4.) The injection fluid will be fresh water from the Ogallala. This water is compatible with the Abo formation as witnessed by the past performance of this flood. Fresh water analysis is attached.
- IX.** This well will not be stimulated.


**REEF**  
 CHEMICAL

Company: Sage Energy  
 Source: Fresh Water Well  
 Number: 583

Location: NVANU  
 Attention:  
 Date Sampled: February 25, 2004  
 Salesman: Robert Kepple

ANALYSIS	mg/L	EQ. WT.	MEQ/L
1. pH	7.64		
2. Specific Gravity 60/60 f.	1.002		
3. Hydrogen Sulfide	Negative		
4. Carbon Dioxide	Not Determined		
5. Dissolved Oxygen	Not Determined		
6. Hydroxyl (OH-)	0	/ 17.0 =	0.00
7. Carbonate (CO3=)	0	/ 30.0 =	0.00
8. Bicarbonate (HCO3-)	220	/ 61.1 =	3.60
9. Chloride (Cl-)	1,100	/ 35.5 =	30.99
10. Sulfate (SO4=)	18	/ 48.8 =	0.37
11. Calcium (CA++)	0	/ 20.1 =	0.00
12. Magnesium (Mg++)	0	/ 12.2 =	0.00
13. Sodium (Na+)	804	/ 23.0 =	34.98
14. Barium (Ba++)	0.00		
15. Total Iron (Fe)	0.00		
16. Manganese	0.00		
17. Strontium	0		
18. Potassium	62.00		
19. Total Dissolved Solids	2,204		

21. Resistivity @ 75 F. (calculated) 4.00 /cm.

22. CAC03 Saturation Index  
 @80 F. 0.0000  
 @100 F. 0.0000  
 @120 F. 0.0000  
 @140 F. 0.0000  
 @160 F. 0.0000

23. CASO4 Supersaturation Ratio  
 @70F 0.0000  
 @90F 0.0000  
 @110F 0.0000  
 @130F 0.0000  
 @150F 0.0000  
 Ratio Greater than 1 indicates Scale

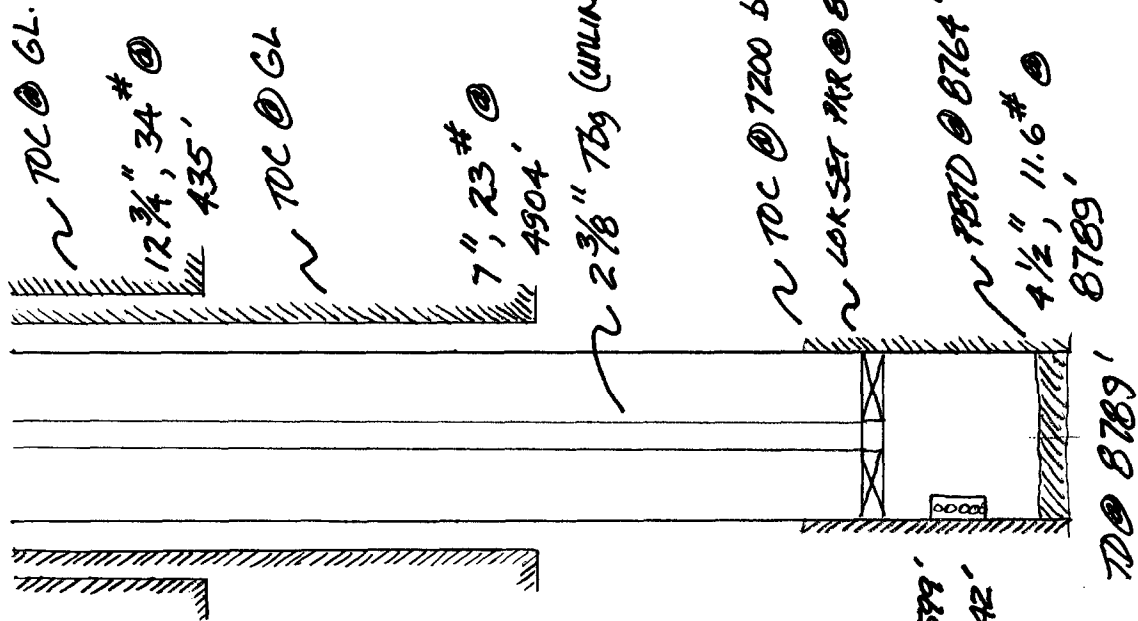
PROBABLE MINERAL COMPOSITION				
COMPOUND	EQ. WT.	X	MEQ/L	= mg/L
Ca(HCO3)2	81.04		0.00	0
CaSO4	68.07		0.00	0
CaCl2	55.50		0.00	0
Mg(HCO3)2	73.17		0.00	0
MgSO4	60.19		0.00	0
MgCL2	47.62		0.00	0
NaHCO3	84.00		3.60	302
NaSO4	71.03		0.37	28
NaCl	58.46		30.99	1,812

Chemist

## INJECTION WELL DATA SHEET

OPERATOR: SAGE ENERGY COMPANYWELL NAME & NUMBER: NVANU 9#3WELL LOCATION: 460 FSL, 1680 FELUNIT LETTER: "O"SECTION: 2TOWNSHIP: 17-SRANGE: 34-E

FOOTAGE LOCATION

SECTION: 2 TOWNSHIP: 17-S RANGE: 34-EWELLBORE SCHEMATICWELL CONSTRUCTION DATASurface CasingInjection Interval

PERFORATIONS 8599 feet to 8642'

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 2-3/8" Lining Material: N/A

Type of Packer: LOK SET (4 1/2") (BAKER)

Packer Setting Depth: 8492'

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

Additional Data

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

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

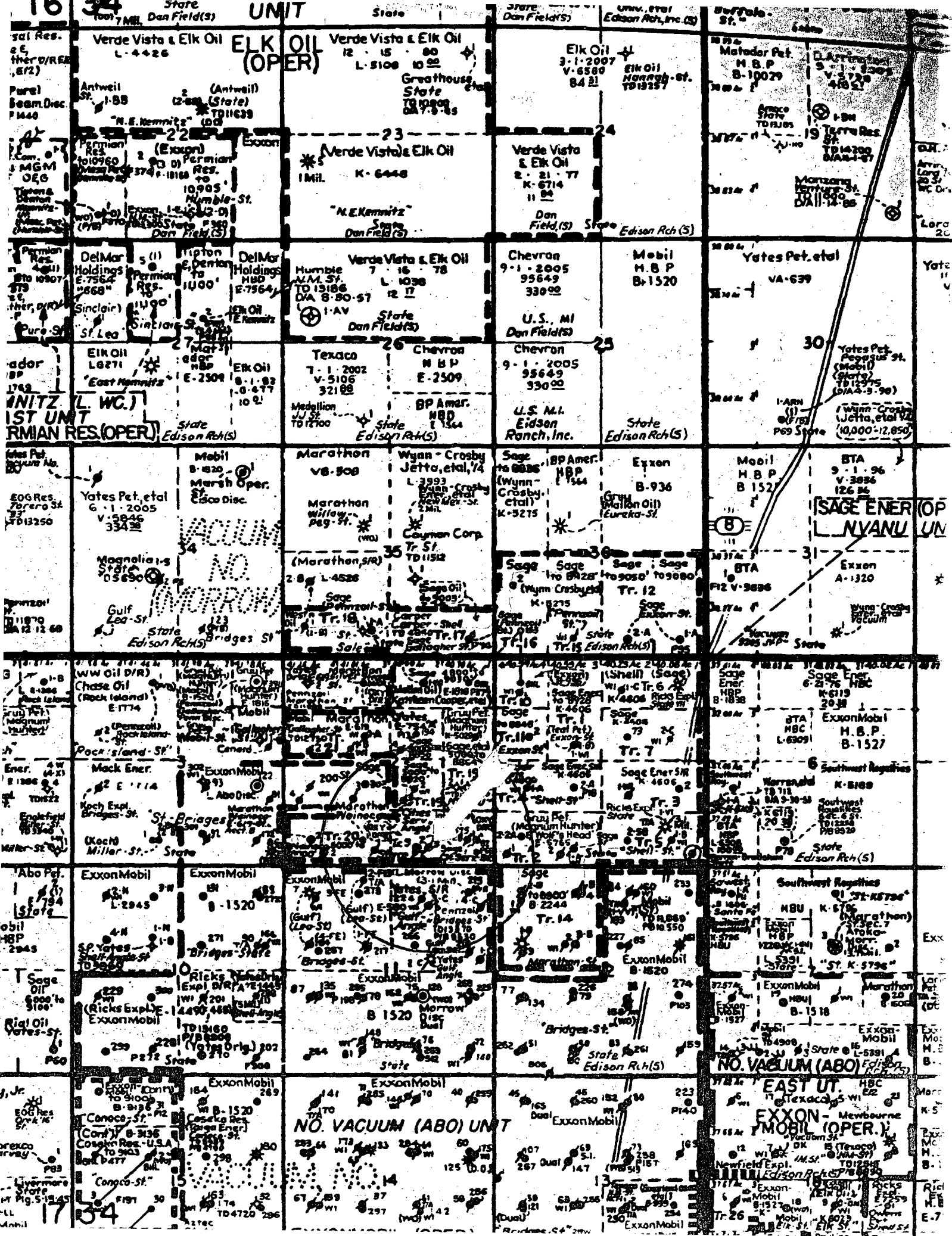
2. Name of the Injection Formation: Abo

3. Name of Field or Pool (if applicable): Vacuum, Abo North

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:

SAN Andres @ 1400', Wolfcamp @ 10,800'



# Affidavit of Publication

STATE OF NEW MEXICO )

) ss.

COUNTY OF LEA )

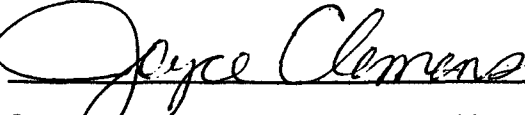
Joyce Clemens being first duly sworn on oath deposes and says that she is Advertising Director of **THE LOVINGTON DAILY LEADER**, a daily newspaper of general paid circulation published in the English language at Lovington, Lea County, New Mexico; that said newspaper has been so published in such county continuously and uninterruptedly for a period in excess of Twenty-six (26) consecutive weeks next prior to the first publication of the notice hereto attached as hereinafter shown; and that said newspaper is in all things duly qualified to publish legal notices within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico.

That the notice which is hereto attached, entitled

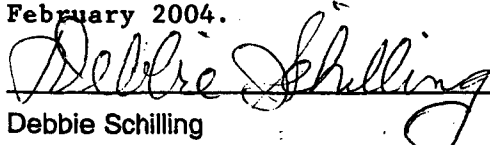
## Legal Notice

was published in a regular and entire issue of **THE LOVINGTON DAILY LEADER** and not in any supplement thereof, for one (1) day, beginning with the issue of February 26, 2004 and ending with the issue of February 26, 2004.

And that the cost of publishing said notice is the sum of \$ 11.21 which sum has been (Paid) as Court Costs.



Subscribed and sworn to before me this 26th day of February 2004.



Debbie Schilling

Notary Public, Lea County, New Mexico

My Commission Expires June 22, 2006

**LEGAL NOTICE**  
Sage Energy Company, P.O. Drawer 3068, Midland, Texas 79702 (contact: George Harris, 432-683-5271) has applied to convert the NVANU Well 9#3 to water injection service in the North Vacuum (Abo) North Unit water flood. This well is located 460' FSL, 1680' FEL of Sec 2, R-34-E, T-17-S, in Lea County, New Mexico. The operator intends to inject fresh water into the Abo formation at a depth of 8600'. Maximum rate is 450 bwpd at a maximum pressure of 4500#. Interested parties must file objections or request for hearing with the Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico, 87505, within 15 days of today's date.  
Published in the Lovington Daily Leader February 26, 2004.

7003 1680 0006 6219 3600

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Postage	\$ 0.60	UNIT ID: 0702
Certified Fee	2.30	Postmark Here
Return Receipt Fee (Endorsement Required)	1.75	Clerk: KMMWQ3
Restricted Delivery Fee (Endorsement Required)		02/26/04
Total Postage & Fees	\$ 4.65	

Sent To: Exxon Mobil - Greg Stoute  
Street, Apt. No., or PO Box No. 800 Bell St #1440D  
City, State, ZIP+4 HOUSTON TX 77002

PS Form 3800, June 2002 See Reverse for Instructions

7003 1680 0006 6219 3617

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**OFFICIAL USE**

SANTA FE, NM 87504

Postage	\$ 0.60	UNIT ID: 0702
Certified Fee	2.30	Postmark Here
Return Receipt Fee (Endorsement Required)	1.75	Clerk: KMMWQ3
Restricted Delivery Fee (Endorsement Required)		02/26/04
Total Postage & Fees	\$ 4.65	

Sent To: STATE OF NM - LAND OFFICE  
Street, Apt. No., or PO Box No. Box 1148  
City, State, ZIP+4 SANTA FE, NM 87504

PS Form 3800, June 2002 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"><li>Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.</li><li>Print your name and address on the reverse so that we can return the card to you.</li><li>Attach this card to the back of the mailpiece, or on the front if space permits.</li></ul>		<p>A. Signature <u>[Signature]</u> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p> <p>B. Received by (Printed Name) <u>[Name]</u> C. Date of Delivery <u>3-1-04</u></p> <p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, enter delivery address below:</p>	
1. Article Addressed to: <u>Exxon Mobil Prod. Co.</u> <u>Lower 48 Joint Int. Oper</u> <u>800 Bell St, RM 1440D</u> <u>HOUSTON TX 77002</u> <u>% Mr. GREG STOUTE</u>		3. Service Type <input type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.	
2. Article Number (Transfer from service label)		4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes	
7003 1680 0006 6219 3600			

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

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"><li>Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.</li><li>Print your name and address on the reverse so that we can return the card to you.</li><li>Attach this card to the back of the mailpiece, or on the front if space permits.</li></ul>		<p>A. Signature <u>[Signature]</u> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p> <p>B. Received by (Printed Name) <u>[Name]</u> C. Date of Delivery <u>MAR 2 2004</u></p> <p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, enter delivery address below:</p>	
1. Article Addressed to: <u>STATE OF NEW MEXICO -</u> <u>STATE LAND OFFICE</u> <u>P.O. Box 1148</u> <u>SANTA FE, NM 87504</u>		3. Service Type <input type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.	
2. Article Number (Transfer from service label)		4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes	
7003 1680 0006 6219 3617			

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





# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**BILL RICHARDSON**  
Governor

April 5, 2004

**Joanna Prukop**  
Cabinet Secretary  
Acting Director  
Oil Conservation Division

Sage Energy Company  
P.O. Drawer 3068  
Midland, Texas 79702

Attention: Mr. George M. Harris, Jr.

Re: Form C-108  
NVANU "9" Well No. 3  
Unit O, Section 2, T-17 South, R-34 East, NMMP,  
Lea County, New Mexico

Dear Mr. Harris:

I have reviewed your application dated February 26, 2004 to convert the NVANU "9" Well No. 3 to an injection well within the North Vacuum Abo North Unit Waterflood Project. I am seeking additional information with regards to Part VI of Form C-108. This project was originally approved on November 13, 1990. Please verify that within this well's area of review, nothing has changed since this data was presented in 1990. Anything that has changed during this time period, including the drilling of new wells, plugging of wells, etc. must be reported within this new application.

If you should have any questions, please contact me at (505) 476-3466. I will continue to process your application once I have received the requested material.

Sincerely,

David Catanach  
Engineer/Examiner