CHECKLIST for ADMINISTRATIVE INJECTION APPLICATIONS

Operator: ARCO PERMIAN Well: MEDANO ST. COM #1

Contact: ELIZ. CASBEER Title: REGULATORY COMPL. Phone: 915·688·5570

DATE IN 11·5·97 RELEASE DATE 11·20·97 DATE OUT 12·18·97

Proposed Injection Application is for: ___ **WATERFLOOD** ___ Expansion ___ Initial

Original Order: R-_____ ___ Secondary Recovery ___ Pressure Maintenance

SENSITIVE AREAS X **SALT WATER DISPOSAL** ___ Commercial Well

___ WIPP | Capitan Reef

Data is complete for proposed well(s)? ___ Additional Data Req'd NO

5 MILES EAST OF WIPP

AREA of REVIEW WELLS

1 Total # of AOR

YES Tabulation Complete

YES Cement Tops Adequate

0 # of Plugged Wells

___ Schematics of P & A's

___ AOR Repair Required

INJECTION FORMATION

Injection Formation(s) DELAWARE Compatible Analysis YES

Source of Water or Injectate AREA DELAWARE PRODUCTION

PROOF of NOTICE

___ Copy of Legal Notice

___ Correct Operators

NO Objection Received

___ Information Printed Correctly

___ Copies of Certified Mail Receipts

___ Set to Hearing _____ Date

NOTES: _____

APPLICATION QUALIFIES FOR ADMINISTRATIVE APPROVAL? YES

COMMUNICATION WITH CONTACT PERSON:

1st Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

2nd Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

3rd Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

DATE 11/5/97	11/20/97	BS	NM	SWD 689

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS

Application Acronyms:

[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location]
[DD-Directional Drilling] [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]

RECEIVED
NOV - 5 1997

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

[A] Location - Spacing Unit - Directional Drilling
❑ NSL ❑ NSP ❑ DD ❑ 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

] **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] **INFORMATION / DATA SUBMITTED IS COMPLETE** - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

Elizabeth A Casbeer		Regulatory/Compliance Analyst	11/4/97
Print or Type Name	Signature	Title	Date

ARCO Permian
600 North Marienfeld
Midland TX 79701-4373
PO Box 1610
Midland TX 79702-1610
Telephone 915 688 5570

Elizabeth A. Casbeer
Regulatory/Compliance Analyst

NOV - 5

November 4, 1997

New Mexico Oil Conservation Division
ATTN: David Catanach
2040 S. Pacheco Street
Santa Fe, New Mexico 87505

RE: Application for Authorization to Inject
Medano State Com Well No. 1
Section 36, T22S, R31E
Eddy Co., NM

Mr. Catanach:

ARCO Permian respectfully requests approval for the enclosed Application for Authorization to Inject (Form C-108) for the Medano State Com Well No. 1, located in Section 36, T22S, R31E, Eddy County, New Mexico. Enclosed are the required attachments.

If you have any questions, please contact me at 915/688-5570. Please send the permit to:

ARCO Permian
ATTN: Elizabeth A. Casbeer, Room 959-54
P. O. Box 1610
Midland, TX 79702

Yours very truly,

Elizabeth A. Casbeer
Regulatory Compliance Analyst

xc: Larry Henson - EUN
Donald Knipe - 61323/MIO
Central Files - 41/MIO
R/C Files

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: ARCO Permian

Address: PO Box 1610, Midland, TX 79702

Contact party: Elizabeth A. Casbeer Phone: (915) 688-5570

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 _____.

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

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

VII. Attach data on the proposed operation, including:

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

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

IX. Describe the proposed stimulation program, if any.

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

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

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

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

XIV. Certification

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

Name: Elizabeth A. Casbeer Title Regulatory/Compliance Analyst

Signature: Elizabeth A. Casbeer Date: 11/4/97

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

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

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.

Form C-108
Application For Authorization To Inject
ARCO Permian, Operator
Medano State Com No. 1
Section 36, T22S, R31E, Eddy County, New Mexico

I. The purpose of the well is as a disposal well for area Delaware produced water.

II. Operator: ARCO Permian
P. O. Box 1610
Midland, Texas 79702-1610
Contact: Donald L. Knipe, P.E. (915) 688-5316

III. Well Data: See Attachment A, B, and C.

IV. This is not an expansion of an existing project.

V. Map of wells and leases within 2 miles and 1/2 mile radius: See Attachment D.

VI. Data on wells within 1/2 mile area of review: See Attachment E and E1.

VII. 1. Proposed average daily injection volume: 4,000 BWPD
Proposed maximum daily injection volume: 10,000 BWPD
Attachment F

2. This will be a closed system.

3. Proposed average daily injection pressure: 875 psi
Proposed maximum daily injection pressure: 1200 psi
Attachment F

4. Sources of injection water will be produced water from area Delaware wells that have been drilled and that are scheduled to be drilled on the Barclay State, Barclay Federal, and Medano State leases (see list of source wells, Attachment G). A water analysis from nearby Delaware production (see Attachment H1, H2, & H3) is attached that is taken from the water tanks adjacent to the Barclay Federal No. 2 and Medano State No. 2.

5. Chlorides in all of the source well is expected to be similar to the water analysis in Attachment H1, H2, & H3.

VIII. The proposed injection zone is the Delaware interval 4500'-6000'. The Delaware is a sandstone (containing siltstones and shale) of Permian age approximately 3850' thick found at a depth of 4500' to 8350'. Possible fresh drinking water zones overlie the proposed injection formation at depths to approximately 800'. No drinking water sources are found underlying the proposed injection zone.

IX. The proposed injection interval may be acidized with 7-1/2% HCL acid and sand fractured as needed.

X. All well logs and test data available have been previously submitted to the NMOCD, Once the well is recompleted, a copy of any additional logs run will be forwarded to the NMOCD.

XI. No fresh water wells are found within a mile of the proposed injection well.

XII. The applicant has examined geological and engineering data and find there is no evidence of open faults or other hydrologic connection between the proposed disposal zone and any underground source of drinking water. Attachment I.

XIII. Proof of Notice

A. A copy of the application has been sent by certified mail to the surface owner and offset operators of leases within 1/2 mile (see list attached - Attachment J).

B. A copy of the legal advertisement is attached (Attachment K). Proof of publication in an Eddy County newspaper will be forwarded once available.

XIV. Certification: See signature on form C-108.

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment A

III. Well Data

Section A:

1. Lease Name: Medano State Com No. 1

   Location: 1980' FSL & 1980' FWL, Sec. 36, T22S, R32E, Eddy County, NM

2. Casing and Cement

EXISTING

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
13-3/8"	745'	600	17-1/2"	circ. to surface
10-3/4"	4513'	2250	12-1/4"	circ. to surface
7-5/8"	12620'	2425	9-1/2"	3800' by TS[1]
4-1/2"	12281'-15118'	500	6-1/2"	Unknown

[1]TS = Temperature Survey

PROPOSED

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
13-3/8"	745'	600	17-1/2"	circ. to surface
10-3/4"	4513'	2250	12-1/4"	circ. to surface
7-5/8"	12620'	2425	9-1/2"	circ. to surface
4-1/2"	12281'-15118'	500	6-1/2"	P&A'd

NOTE: It is proposed to plug and abandoned existing Lower Delaware perforations from 6732' to 8264' with a Cast Iron Bridge Plug (CIBP) set at ±6700' with a 35' cement cap on top of the CIBP. Perforations will be shot at the cement top behind the 7-5/8" casing and cement circulated to surface.

3. Tubing: 3-1/2", 9.3# internally plastic coated set at 4400'.

4. Packer: Baker Lok-Set or Guiberson UNI-VI nickel plated or plastic coated set at 4300'

Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment A-Continued

III. Well Data - Continued

Section B

1. Injection Formation: Delaware Sand

   Field or Pool Name: Livingston Ridge (Delaware)

2 Injection Interval: Delaware interval 4500'-5700' perforated

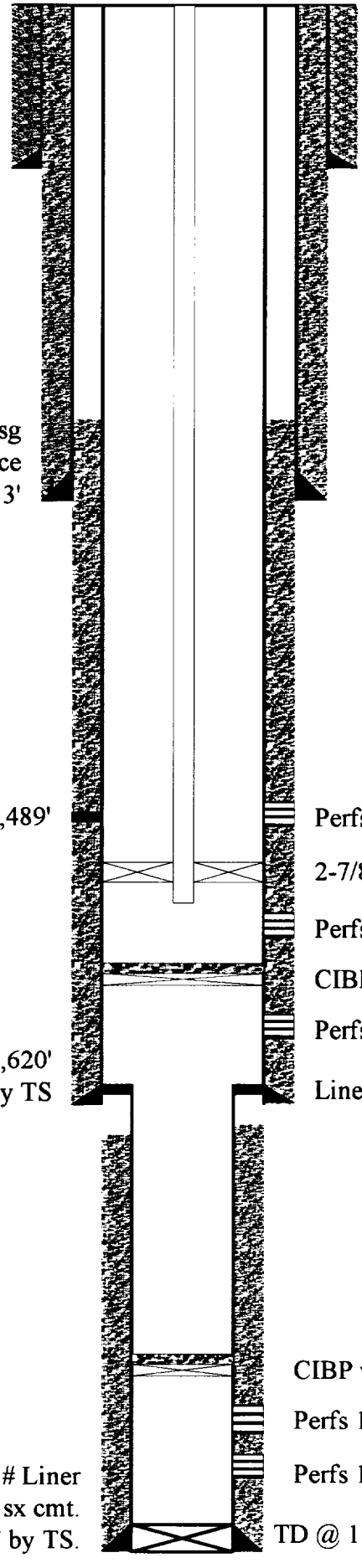
3. Original purpose of well: Drilled to test Morrow Formation

4. Other perforated intervals, bridge plugs, cement plugs:
   Perforations 14572' - 14716' CIBP at 14420' w/30' cmt.
   Perforations 10140' - 10202' CIBP at 10100' w/35' cmt

5. Next higher oil & gas zone: None
   Next lower oil & gas zone: Bone Springs

See current and proposed wellbore schematic (Attachments B and C)

CURRENT WELLBORE SCHEMATIC



Medano State No. 1

1980' FSL & 1980' FWL (K)
Sec. 36, T-22S, R-31-E
Eddy County, NM
API: 30-015-26171
Spudded 10\24\89
Completed 07\03\90

KB: 3488' GL: 3466'

13-3/8" 48# Surface Casing
cmt'd w/ 600 sx cmt to surface
Shoe @ 745'

10-3/4" 45.5# csg
cmt'd w/ 2250 sx cmt to surface
Shoe @ 4513'

Howco DV tool @ 7,489'

Perfs 6,732'-6,930' (21 holes)

2-7/8" tbg and TAC @ 7895'

Perfs 8,107'-8,284' (24 holes) Lower Brushy

CIBP @ 10,100' w/35' cmt on top

Perfs 10,140'-202' (125 holes)

7-5/8" 29.7 & 33.7# csg. Set @ 12,620'
w/2425 sx cmt. Top of cmt @ 3800' by TS

Liner top @ 12,281'

Attachment B

CIBP w/30'cmt @ 14,420'

Perfs 14,572'-579' (42 holes)

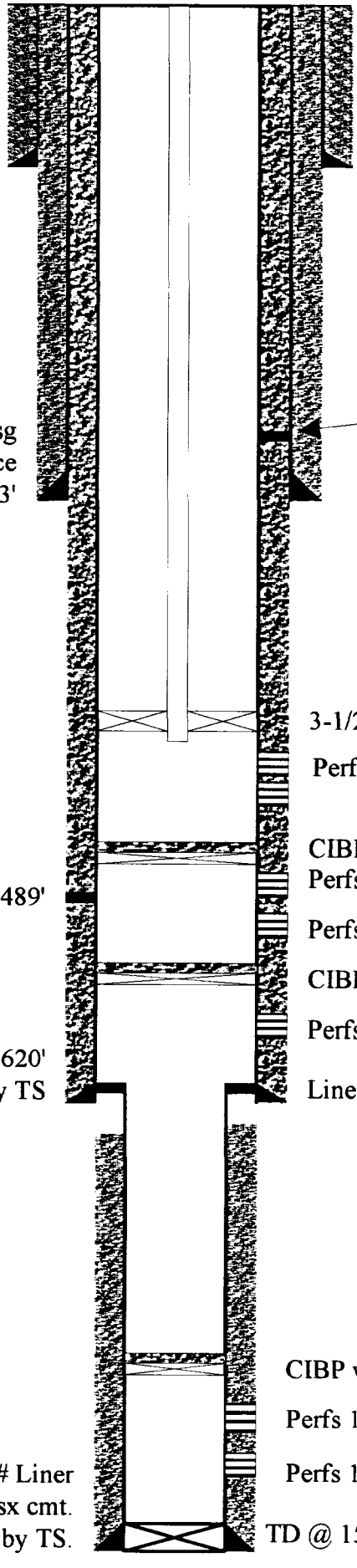
Perfs 14,701'-14,716' (80 holes)

4-1/2" 13.5# Liner
Set @ 15,118' w/500 sx cmt.
TOC @ 13,330' by TS.

TD @ 15,120' PBTD @ 10,065'

DLK 10--22-97

PROPOSED SWD WELLBORE SCHEMATIC



Medano State No. 1

1980' FSL & 1980' FWL (K)
Sec. 36, T-22S, R-31-E
Eddy County, NM
API: 30-015-26171
Spudded 10\24\89
Completed 07\03\90

KB: 3488' GL: 3466'

13-3/8" 48# Surface Casing
cmt'd w/ 600 sx cmt to surface
Shoe @ 745'

10-3/4" 45.5# csg
cmt'd w/ 2250 sx cmt to surface
Shoe @ 4513'

Perf 4 shots above cmt top behind
7-5/8" csg and circulate cmt to surface.

3-1/2" IPC tbg and Pkr @ 4400'

Perforations from 4,500'-5,700'

CIBP @ 6,700' w/35' cmt on top
Perfs 6,732'-6,930' (21 holes)

Howco DV tool @ 7,489'

Perfs 8,107'-8,284' (24 holes) Lower Brushy

CIBP @ 10,100' w/35' cmt on top

Perfs 10,140'-202' (125 holes)

7-5/8" 29.7 & 33.7# csg. Set @ 12,620'
w/2425 sx cmt. Top of cmt @ 3800' by TS

Liner top @ 12,281'

Attachment C

CIBP w/30'cmt @ 14,420'

Perfs 14,572'-579' (42 holes)

4-1/2" 13.5# Liner
Set @ 15,118' w/500 sx cmt.
TOC @ 13,330' by TS.

Perfs 14,701'-14,716' (80 holes)

TD @ 15,120' PBTD @ 10,065'

DLK 10-22-97

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment E

VI. Data on wells within the 1/2 mile area of review:

The following well is the only well within 1/2 mile of the Medano State Com No. 1

Medano State No. 2

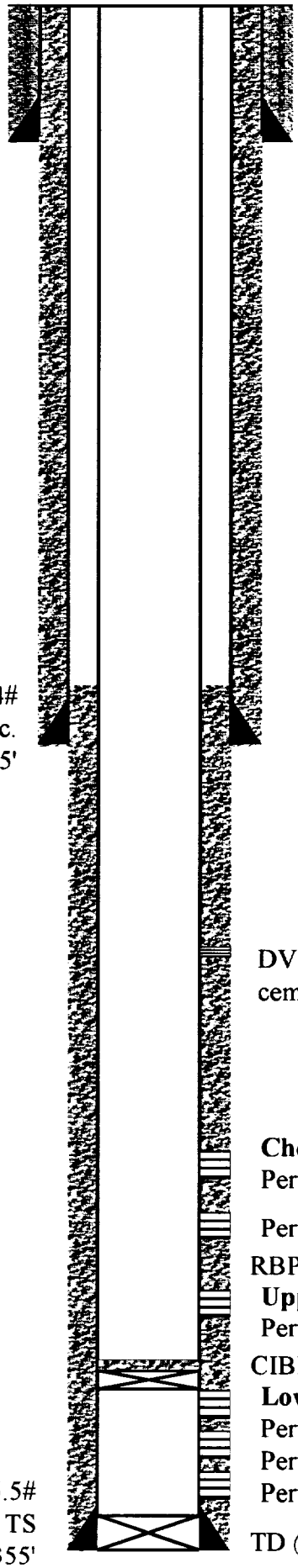
1. Well type: Producing Delaware Oil well
2. Spud Date: May 27, 1997
3. Completion Date: June 13, 1997
4. Total Depth: 8354'
5. Casing:
   - Surface Casing 13-3/8" Surface to 890'
     Cemented w/775 sxs, circulated to surface
   - Intermediate Casing 8-5/8" Surface to 4455'
     Cemented w/1600 sxs, circulated to surface
   - Production Casing 5-1/2" Surface to 8354
     Cemented w/850 sxs, circulated thru DV tool at 5517'
     Top of cement at 3900' by Temperature Survey
6. Perforations:
   - Lower Brushy Canyon 8124'-8288' P&A'd
     CIBP @ 8100' w/35' cmt cap on top of CIBP
   - Upper Brushy Canyon 7142'-7263' Producing
   - Cherry Canyon 6553'-6824' Producing

WELLBORE SCHEMATIC

MEDANO STATE NO. 2

660' FSL & 1980' FWL (N)
Sec. 36, T-22-S, R-31-E,
Eddy County, NM
API: 30-015-29525
Spudded: 05/27/97
Completed: 06/13/97

KB: 3476' **GL: 3460'**



Surface Casing 13-3/8" 48#
Cmt'd w/ 775 sx, Circ.
Shoe @ 890'

Surface Casing 8 5/8" 24#
Cmt'd w/ 1600 sx, Circ.
Shoe @ 4,455'

DV Tool @ 5517'
cement to 3900'

Cherry Canyon:
Perfs @ 6,553'-67' (2 spf - 29 holes)

Perfs @ 6,804'-24' (2 spf - 41 holes)

RBP @ 6,950'

Upper Brushy Canyon:
Perfs @ 7,142'-7,263' (22 shots - select fire)

CIBP @ 8,100' w/35'cmt.

Lower Brushy Canyon:
Perfs @ 8,124'-44' (1 sp2f)
Perfs @ 8,206'-36' (1 sp2f)
Perfs @ 8,282'-88' (1 sp2f)

TD @ 8,354' PBTD @ 8,310'

Production Casing 5-1/2" 17# & 15.5#
Cement w/850 sx, TOC @ 3900' by TS
Shoe @ 8,355'

Attachment E-1

DLK 10-22-97

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment F

Proposed Operation:

1. Plans are to inject 4000 barrels of produced water per day.

2. The injection system will be a closed system.

3. The proposed injection pressure is 1200 psig.

4. The injection fluid will be Delaware produced water.

5. See attached water analysis.

BAKER PETROLITE
A Baker Hughes company

Water Analysis Report from Petrolite Corporation

ARCO PERMAIN

BARCLAY STATE
WELL #1
BATTERY STOCK TANK

EUNICE, NEW MEXICO

Summary		Analysis: 35841					
Anion/Cation Ratio	***1.00***	***Anions***	**mg/L**	**meq/L**	***Cations***	**mg/L**	**meq/L**
		Chloride	**34,800**	**982**	**Sodium**	**18,113**	**788**
TDS (mg/L or g/m³)	58,744	**Bicarbonate**	**266**	**4.36**	**Magnesium**	**281**	**23.1**
Density (g/cm³ or tonne/m³)	1.030	**Carbonate**	**0.00**	**0.00**	**Calcium**	**2,166**	**108**
		Sulfate	**286**	**5.95**	**Strontium**	**258**	**5.89**
Chemical Treatment		**Phosphate**	N/A	N/A	**Barium**	**1.90**	**0.03**
Sample Condition		**Borate**	N/A	N/A	**Iron**	**106**	**3.80**
		Silicate	N/A	N/A	**Potassium**	2,466	63.1
Sampling Date	9/2/97				**Aluminum**	N/A	N/A
Sampled by		**Hydrogen Sulfide**			**Chromium**	N/A	N/A
Submitted by	BOB WILSON				**Copper**	N/A	N/A
		pH at time of sampling			**Lead**	N/A	N/A
Analysis Date	9/8/97	**pH at time of analysis**		6.80	**Manganese**	N/A	N/A
Sample analysis number	35841	**pH used in Calculations**		**6.80**	**Nickel**	N/A	N/A

Predictions of Saturation Index and Amount of Scale in lb/1000bbl

Pressure (psi)		Temp.	Calcite CaCO3		Gypsum CaSO4.2H2O		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4	
CO2	Total	°F	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0.36	0.00	80	0.29	10.5	-0.98		-1.02		-0.10		0.88	0.95
0.47	0.00	100	0.39	14.6	-1.01		-0.99		-0.10		0.70	0.88
0.59	0.00	120	0.49	19.0	-1.04		-0.94		-0.10		0.55	0.79
0.72	0.00	140	0.60	23.7	-1.05		-0.86		-0.09		0.43	0.69

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: CO2 Pressure is absolute pressure. Total Pressure is gauge pressure.

Attachment H2

ARCO Permian - Medano State Com No. 1

BAKER PETROLITE
A Baker Hughes company

Water Analysis Report from Petrolite Corporation

ARCO PERMAIN

MEDANO STATE
WELL #1
HEATER TREATER

EUNICE, NEW MEXICO

Summary		Analysis: 54978					
Anion/Cation Ratio	1.00	Anions	mg/L	meq/L	Cations	mg/L	meq/L
		Chloride	179,000	5,049	Sodium	80,451	3,499
TDS (mg/L or g/m³)	290,158	Bicarbonate	26.0	0.43	Magnesium	3,779	311
Density (g/cm³ or tonne/m³)	1.180	Carbonate	0.00	0.00	Calcium	23,290	1,162
		Sulfate	284	5.91	Strontium	1,029	23.5
Chemical Treatment		Phosphate	N/A	N/A	Barium	2.10	0.03
Sample Condition		Borate	N/A	N/A	Iron	50.0	1.79
		Silicate	N/A	N/A	Potassium	2,247	57.5
Sampling Date	9/2/97				Aluminum	N/A	N/A
Sampled by		Hydrogen Sulfide			Chromium	N/A	N/A
Submitted by	BOB WILSON				Copper	N/A	N/A
		pH at time of sampling			Lead	N/A	N/A
Analysis Date	9/8/97	pH at time of analysis		5.83	Manganese	N/A	N/A
Sample analysis number	54978	pH used in Calculations		5.83	Nickel	N/A	N/A

Predictions of Saturation Index and Amount of Scale in lb/1000bbl

Pressure (psi)		Temp.	Calcite CaCO3		Gypsum CaSO4.2H2O		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4	
CO2	Total	°F	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0.19	0.00	80	-0.57		-0.31		-0.25		-0.18		0.23	0.43
0.22	0.00	100	-0.49		-0.40		-0.27		-0.20		0.03	0.07
0.25	0.00	120	-0.42		-0.47		-0.26		-0.21		-0.14	
0.27	0.00	140	-0.34		-0.53		-0.23		-0.20		-0.29	

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: CO2 Pressure is absolute pressure. Total Pressure is gauge pressure.

Attachment H3

ARCO Permian - Medano State Com No. 1

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment I

Geology and Lithology:

Injection zones are sandstone zones within the Delaware formation at an average depth of ± 4500'-5700' Specifically they are:

Cherry Canyon

Fresh Water Zones:

Base of near surface aquifer is 800'. No fresh water zones exist below the proposed injection interval.

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment J

XIII. Item A.

Proof of Notice

List of Surface Owners within 2 Miles:

J. C. Mills
P. O. Box 190
Abernathy, Texas 79311

List of Lease Operators Within 1/2 Mile:

ARCO Permian
P. O. Box 1610
Midland, Texas 79702

(Section 35, T22S, R31E, Eddy County, New Mexico
Bureau of Land Management
Roswell District Office
2909 W. 2nd Street
Roswell, New Mexico 88201

STATE OF TEXAS

COUNTY OF MIDLAND

BEFORE ME, the undersigned authority on this day personally appeared Elizabeth A. Casbeer, an Regulatory Compliance Analyst with **ARCO Permian**, who being by me duly sworn, deposes and states that the persons listed on the foregoing attached list have been sent a copy on November 4, 1997, of the New Mexico Oil Conservation Division form C-108 entitled, "Application For Authorization To Inject" for the Medano State Com Well No. 1, located in Section 36, T22S, R31E, Eddy County New Mexico.

ARCO Permian

Elizabeth A. Casbeer

SUBSCRIBED AND SWORN TO before me on November 4, 1997, to certify which witness my hand and seal of office.

LAURIE WHITE
Notary Public, State of Texas
My Commission

NOTARY PUBLIC, STATE OF TEXAS

ARCO Permian
Medano State Com No. 1
1980' FSL & 1980' FWL
Section 36, 22S, 31E
Eddy County, New Mexico

Attachment K

XIII. Item B.

LEGAL NOTICE

ARCO PERMIAN, P. O. Box 1610, Midland, Texas 79702, has filed form C-108 (Application For Authorization To Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Medano State Com No. 1 is located 1980' FSL, 1980' FWL, Section 36, Township 22 South, Range 31 East, Eddy County, New Mexico. Disposal water will be sourced from area wells producing from the Delaware formation. The disposal water will be injected into the Delaware formation at a depth of 4500'-5700', a maximum surface pressure of 1200 psi, and a maximum rate of 10,000 BWPD.

All interested parties opposing the action must file objections or requests for hearing with the Oil Conservation Division, 2040 S. Pacheco Street, Santa Fe, New Mexico 87505, within 15 days. Additional information can be obtained by contacting Elizabeth A. Casbeer, Regulatory Compliance Analyst, at P. O. Box 1610, Midland, Texas 79702, or (915) 688-5570.