BEFORE EXAMINER STOGNER
OIL CONSERVATION COMMISSION
Amoco EXHIBIT NO. 4
CASE NO. 7869 6/8/83

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: Amoco Production Company

Address: P. O. Box 3092 Houston Texas 77253

Contact party: Larry W. Sheppard Phone: (713)556-3941

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: Larry W. Sheppard Title Staff Petroleum Engineer

Signature: Larry W Sheppard Date: 5-11-83

* 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.

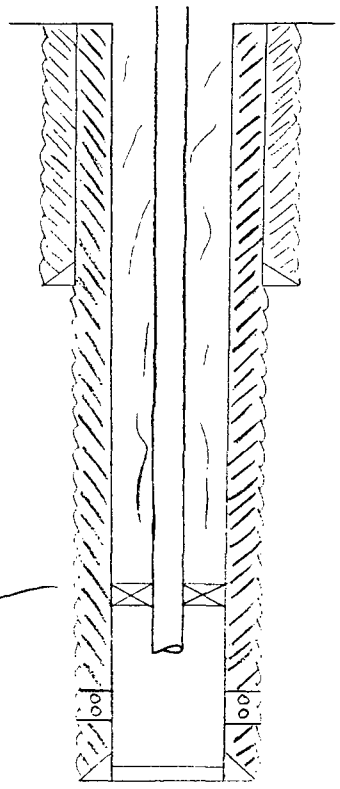
INJECTION WELL DATA SHEET

OPERATOR: Amoco Production Company LEASE: Bravo Dome SE Gas Collection System SWD

WELL NO: 1934 261D FOOTAGE LOCATION: 500' FNL x 565' FWL

SECTION: Sec. 26 TOWNSHIP: T-19-N RANGE: R-34-E

Schematic



1550

Tabular Data

*Surface Casing

Size: 9-5/8" Cemented with _____ sx.

TOC: surface feet determined by circ

Hole size: 12-1/4"

Intermediate Casing

Size: _____" Cemented with _____ sx.

TOC: _____ feet determined by _____

Hole size: _____

Long String

Size: 7 " Cemented with _____ sx.

TOC: surface feet determined by circ

Hole size: 8½"

Total depth: 1720'

Injection interval

1620 feet to 1680 feet

(perforated or open-hole, indicate which)

Perforated

*All values are projections based on best estimates using offset well information.

Tubing size 2-3/8" lined with plastic coat (material) set in a

Guiberson Uni-packer VI (brand and model) packer at 1550 feet.

OTHER DATA

1. Name of the injection formation: Glorieta
2. Name of Field or Pool (if applicable): N/A
3. Is this a new well drilled for injection: /X/ Yes / / No
4. Has the well ever been perforated in any other zone(s)? No
5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area: Tubb 2180' (+2565' subsea)
   Carbon dioxide production from Tubb at approximately 2140' (+2632 subsea)

LS/cag
ER/1194/R

VII. Proposed Operations

1. Anticipated volumes of water to be disposed:

   Average = 500 BWPD
   Maximum = 900 BWPD

2. Operation will be a closed system.

3. Proposed surface injection pressure limit:

   Average = 100 psi
   Maximum = 330 psi

4. Source of injection fluid is the Tubb formation, see attached analysis.

5. See attached analysis of water from proposed disposal horizon. Water is compatible with water to be injected.

VIII. Geology of Disposal Horizon

1. Lithology: Fine to coarse grain sandstone. Grains are composed of clean, semi-rounded quartz which are well cemented by calcareous material.

2. Geologic Name: Glorieta

3. Horizon Thickness: 155'
   Net Pay: 60'

4. Depth: 1,605' (+3,167') to top of Glorieta
   1,650' (+3,122') to mid-point of perfs

   These are projections of anticipated depths based on analysis of offset wells.

5. Fresh Water Sand: The deepest fresh water sand in this area is the Morrison-Exeter sandstone which is of Jurassic age and occasionally referred to as the Entrada; which is probably equivalent. Areal studies indicate the base of the Exeter to be approximately 550' while log on offset BDCDGU 1934 231K show it to be approximately 530'.

IX. Proposed Stimulation Program:

If stimulation is required, well will be treated with a small volume, approximately 1,000 gallons, of 7½% HCl acid.

X. Logs will be submitted after well is drilled.

XI. There are four (4) fresh water wells within a one (1) mile radius of proposed SWD well. Water analyses are presently being obtained on these wells and will be submitted into evidence at hearing.

1. Two (2) wells belong to Amoco and both are located in NE/4 NW/4, Section 26, T-19-N, R-34-E, Depth = 200'.

2. Two (2) wells are located on the Boltz property as follows:

NE/4, Section 25, T-19-N, R-34-E, Depth = 125'
SE/4, Section 26, T-19-N, R-34-E, Depth = 150'

XII. All available geologic and engineering data have been examined and there is no evidence of open faults or any other hydrologic connection between the proposed disposal horizon and any underground source of drinking water.

XIII. Copy of this application has been forwarded to the surface owner by certified mail.

LS/nlp
1210/D

Summary of Water Analyses

Well Name Formation	BDCDGU 1932 041D Glorieta	BDCDGU 2034 081F Tubb
Na	2,864	8,537
Ca	5,120	6,120
Mg	1,848	1,420
Cl	17,500	26,600
SO_4	2,000	1,430
CO_3	N/A	0
HCO_3	0	830
TDS	29,332	44,937
Total Iron	N/A	N/A
PH	4.0	6.3
Specific Gravity	1.020	1.037
Resistivity	0.23 ohm-meters @ 67° F	0.149 ohm-meters @ 77° F