STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

GARREY CARRUTHERS
GOVERNOR

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

Date: 10/28/87

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

Re: Proposed MC_____
Proposed DHC_____
Proposed NSL_____
Proposed SWD X
Proposed WFX_____
Proposed PMX_____

Gentlemen:

I have examined the application dated 10/26/87
for the Amoco Prod. Co. Billings Federal #1
Operator Lease & Well No.
E-25-27N-13W and my recommendations are as follows:
Unit, S-T-R

Approve

Yours truly,

Amoco Production Company
2325 East 30th
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

October 7, 1987

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

FILE: GOM-125-400.1

Conversion of Gallegos Federal No. 1
to a Water Disposal Well, San Juan County, New Mexico

Gentlemen:

Amoco Production Company requests approval to convert the Gallegos Federal No. 1 to a water disposal well. This well was originally drilled as a gas well, but never produced.

The original perforated intervals 5910' - 5986' and 4910' - 5160' will be isolated with a cast iron bridge plug set at 4850'. Five sacks of cement will be placed on top of bridge plug. The proposed injection interval, 2828' - 3908', is in the Blanco Mesaverde formation. The proposed zone is a sandstone which is permeable enough to accept fluids after stimulation. We will perform small matrix acid jobs on all perforated intervals. Expected injection rates will average 100 BWPD to a maximum of 500 BWPD. Proposed average injection pressures are 800 psi to a maximum of 2000 psi. The system will be closed.

The Ojo Alamo formation is an underground source of drinking water. The depth of the zone is 0' to 320'. One producing fresh water well was discovered .6 miles from the proposed injection well. The water is pumped for stock animals. Based on available geological evidence, no faults or breaks are evident within the area of review.

Water analysis comparisons between the injection fluid (GCU 244) and receiving formation water (State Gas Com I #1A) reveals no significant scaling tendencies when the waters are mixed.

The lease on the well expires May, 1989. Per telephone conversation with Arlin Heimer at the BLM in Farmington, a ROW is allowed to operate a disposal well with a "written policy Statement." Please inform us of any additional information required to continue using this well as a disposal well after the lease expires.

In compliance with the Form C-108, find attached an original and one copy with each of the following:

Attachment No.:

1. "Well Location and Dedication Plat" (NMOCD Form -102).

2. Location map showing all wells and leases within two miles of the proposed injection well.

3. List of names and addresses of outside operated wells and lease owners within the one half mile area of review.

4. A copy of the letter sent to all offset operators and surface land owners notifying them of our intent to convert to a disposal well.

5. Newspaper legal printed in Farmington Daily Times.

6. Water analysis for fresh water well.

7. Location map of fresh water well.

8. Water analysis for GCU 244, sample of injection fluid.

9. Water analysis for State Gas Com I #1A, sample of receiving formation.

10. Computer analysis of compatibility of GCU 244 and State Gas Com I #1A.

11. Injection Well Data Sheet for Gallegos Federal No. 1.

12. Tabulation of data for Hanson B-1. (Kimoco #1 & Odessa #1 do not penetrate injection zone)

13. Schematic of Plugging Detail of Hanson B-1.

14. Certified mail receipts sent to those listed in Attachment No. 4 with copy of application.

R. J. Brassard

VAC:ps

Amoco Production Company
2325 East 30th
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

October 7, 1987

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

FILE: GOM-125-400.1

Conversion of Gallegos Federal No. 1
to a Water Disposal Well, San Juan County, New Mexico

Gentlemen:

Amoco Production Company requests approval to convert the Gallegos Federal No. 1 to a water disposal well. This well was originally drilled as a gas well, but never produced.

The original perforated intervals 5910' - 5986' and 4910' - 5160' will be isolated with a cast iron bridge plug set at 4850'. Five sacks of cement will be placed on top of bridge plug. The proposed injection interval, 2828' - 3908', is in the Blanco Mesaverde formation. The proposed zone is a sandstone which is permeable enough to accept fluids after stimulation. We will perform small matrix acid jobs on all perforated intervals. Expected injection rates will average 100 BWPD to a maximum of 500 BWPD. Proposed average injection pressures are 800 psi to a maximum of 2000 psi. The system will be closed.

The Ojo Alamo formation is an underground source of drinking water. The depth of the zone is 0' to 320'. One producing fresh water well was discovered .6 miles from the proposed injection well. The water is pumped for stock animals. Based on available geological evidence, no faults or breaks are evident within the area of review.

Water analysis comparisons between the injection fluid (GCU 244) and receiving formation water (State Gas Com I #1A) reveals no significant scaling tendencies when the waters are mixed.

The lease on the well expires May, 1989. Per telephone conversation with Arlin Heimer at the BLM in Farmington, a ROW is allowed to operate a disposal well with a "written policy Statement." Please inform us of any additional information required to continue using this well as a disposal well after the lease expires.

In compliance with the Form C-108, find attached an original and one copy with each of the following:

Attachment No.:

1. "Well Location and Dedication Plat" (NMOCD Form -102).

2. Location map showing all wells and leases within two miles of the proposed injection well.

3. List of names and addresses of outside operated wells and lease owners within the one half mile area of review.

4. A copy of the letter sent to all offset operators and surface land owners notifying them of our intent to convert to a disposal well.

5. Newspaper legal printed in Farmington Daily Times.

6. Water analysis for fresh water well.

7. Location map of fresh water well.

8. Water analysis for GCU 244, sample of injection fluid.

9. Water analysis for State Gas Com I #1A, sample of receiving formation.

10. Computer analysis of compatibility of GCU 244 and State Gas Com I #1A.

11. Injection Well Data Sheet for Gallegos Federal No. 1.

12. Tabulation of data for Hanson B-1. (Kimoco #1 & Odessa #1 do not penetrate injection zone)

13. Schematic of Plugging Detail of Hanson B-1.

14. Certified mail receipts sent to those listed in Attachment No. 4 with copy of application.

R. J. Brassard

VAC:ps

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.

ENERGY AND MINERALS DEPARTMENT

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

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: 2325 E. 30th Street, Farmington, NM 87401

Contact party: Ed Alizadeh Phone: 325-8841

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: R. J. Broussard Title District Manager

Signature: R. J. Broussard Date: _____

* 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 district office

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-107
Revised 10-1-

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
AMOCO PRODUCTION COMPANY	AMOCO-FEDERAL-GALLEGOS	1

Unit Letter	Section	Township	Range	County
E	25	27N	13W	San Juan

Actual Footage Location of Well:
1850 feet from the North line and 790 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5961	Wildcat	Wildcat	unspaced Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

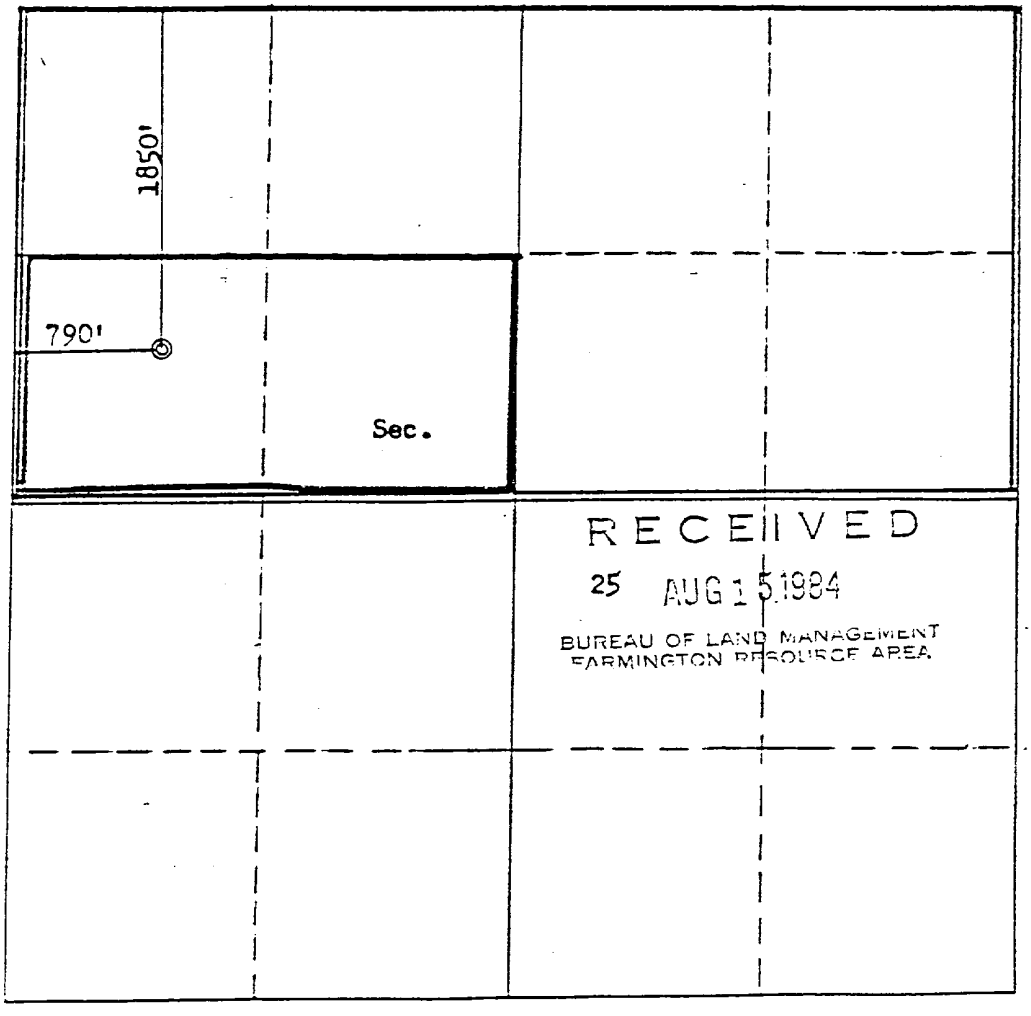
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



RECEIVED
25 AUG 15 1984
BUREAU OF LAND MANAGEMENT
FARMINGTON RESOURCE AREA

Scale: 1"=1000'

CERTIFICATION

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

Original Signed By
B. D. Shaw

Name: B.D. Shaw

Position: Administrative Supervisor

Company: Amoco Production Company

Date: 8-8-84

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 knowledge and belief.

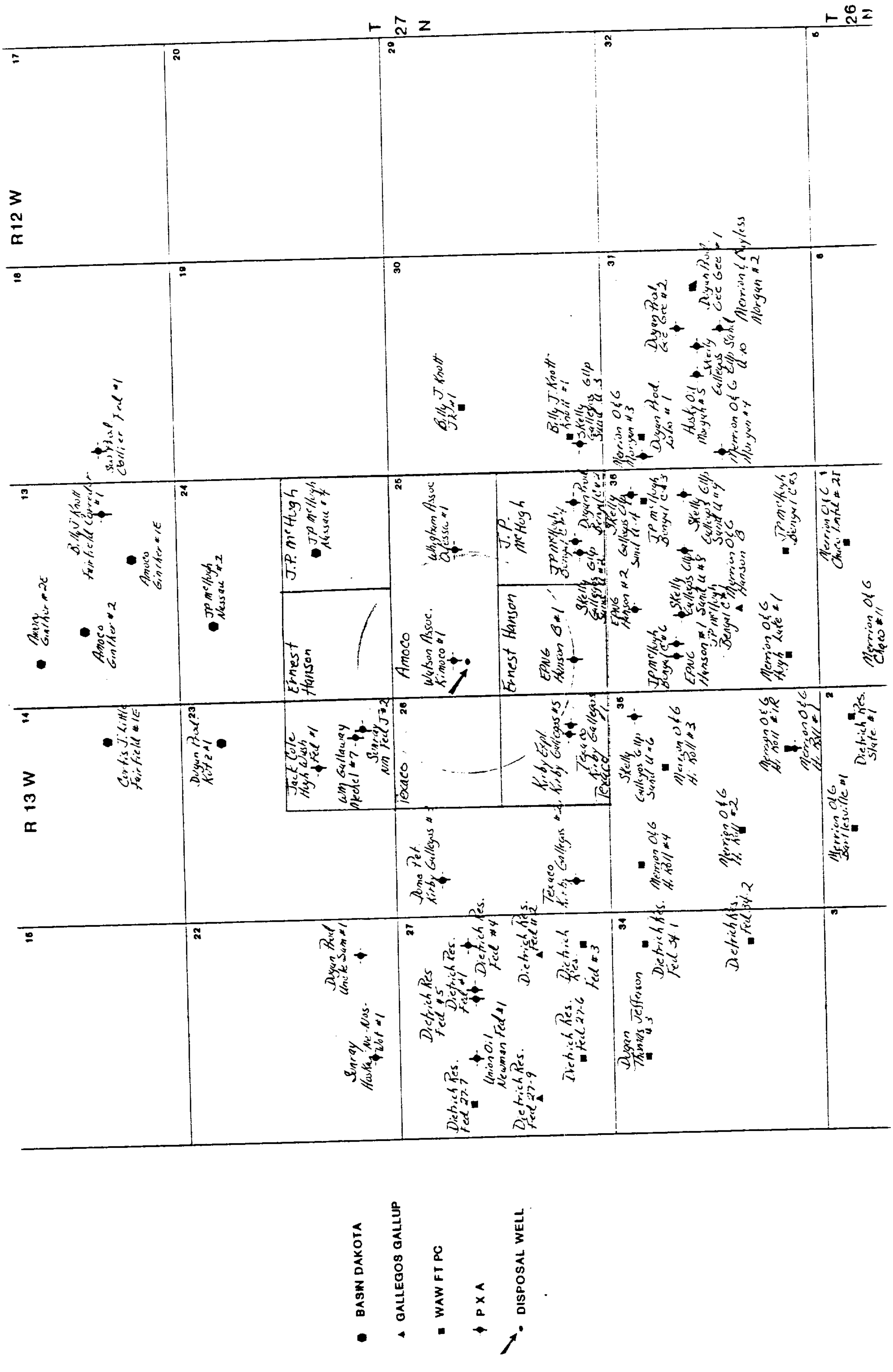
Date Surveyed: June 29, 1984

Registered Professional Engineer and Land Surveyor

Fred B. Kerr Jr.

Certificate No. 3950

Attachment 2



Navajo Tribe
P.O. Box 146
Window Rock, AZ 86515

Texaco
P.O. Box EE
Cortez, CO 81321

Ernest Hanson
P.O. Box 1515
Roswell, NM 88201

Jerome P. McHugh
650 S. Cherry #1225
Denver, CO 80222

Amoco Production Company
2325 East 30th
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

October 6, 1987

(See attached Addressee List)

File: GOM-124-400.1

Proposed Conversion of Gallegos Federal No. 1
to a Water Disposal Well, San Juan County, New Mexico

Dear Sir:

This to to advise you that Amoco Production Company (Farmington District Office) is requesting administrative approval from the Division Director of the New Mexico Oil Conservation Division to convert to a disposal well, the:

Gallegos Federal No. 1
1850' FNL x 790' FWL
Section 25, T27N, R13W
San Juan County, New Mexico

This well is completed in the Basin Dakota and Gallup formations. To isolate the formations from injection, a permanent cast iron bridge plug will be set at 4850' with 5 sacks cement placed on top of plug. The Blanco Mesaverde formation, 2828' - 3908', will be perforated. Intended injection rates will average 100 BWPD to a maximum of 500 BWPD at injection pressures of 800 to 2000 pounds per square inch.

Find attached a copy of the application that is being submitted. Please note that you have 15 days from the date this application is received to file any objections or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, NM 87501.

Sincerely,

R. J. Broussard

VAC:ps

Attachment

ATTACHMENT 5

AFFIDAVIT OF PUBLICATION

No. 20663

STATE OF NEW MEXICO,
County of San Juan:

Betty Shipp being duly sworn, says: That he is the National Ad Manager of THE FARMINGTON DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached legal notice

was published in a regular and entire issue of the said FARMINGTON DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for ~~three~~ consecutive (~~days~~) (weeks) on the same day as follows:

First Publication ~~Sunday, Sept. 20, 1987~~
Second Publication Sunday, Sept. 27, 1987
Third Publication Sunday, Oct. 4, 1987
Fourth Publication

and that payment therefor in the amount of $ 32.13 has been made.

Betty Shipp

Subscribed and sworn to before me this 5th day of Oct., 19 87.

J. Shorter

NOTARY PUBLIC, SAN JUAN COUNTY, NEW MEXICO

My Commission expires: June 23, 1990

Copy of Publication

NOTICE

Notice is hereby given that Amoco Production Company, 2325 E. 30th St., Farmington, New Mexico 87401, 505-325-8841, Attn: Ed Alizadeh, intends to convert the Gallegos Federal No. 1 to a water disposal well. Application will be filed with the New Mexico Oil Conservation Division.

The Gallegos Federal No. 1 is located in the SW/4 NE/4 of Section 25, Township 27 North, Range 13 West, N.M.P.M. The well is drilled to a total depth of 6072 feet and the injection zone will be into the Blanco Mesaverde formation. Five hundred barrels per day at 2000 pounds per square inch are the maximum calculated injection rates.

Any person, firm, association, or corporation, of the state of New Mexico or the United States of America, deeming that the granting of the above application will impair or be detrimental to their water rights may protest in writing the proposal set forth in said application. The protest shall set forth in writing all protestant's reasons why the application should not be approved and must be filed with the Oil and Gas Conservation Division, PO Box 2088, Santa Fe, New Mexico 87501 within 15 days of the date of last publication of this notice.

Legal No. 20663 published in the Farmington Daily Times, Farmington, New Mexicoon Sundays, September 20, 27 and October 4, 1987.

TECH Inc.
333 East Main
Farmington
New Mexico

TECH

API WATER ANALYSIS REPORT FORM

Company Amoco Production Co.		Sample No.		Date Sampled 9/29/87
Field	Legal Description		County or Parish San Juan	State NM
Lease or Unit	Well Water	Depth	Formation	Water, B/D
Type of Water (Produced, Supply, etc.)	Sampling Point			Sampled By

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	7860	342
Calcium, Ca	573	28.6
Magnesium, Mg	73	6.0
Barium, Ba		
Potassium, K	5	.2

ANIONS	mg/l	me/l
Chloride, Cl	78	2
Sulfate, SO_4	17600	361
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	408	7

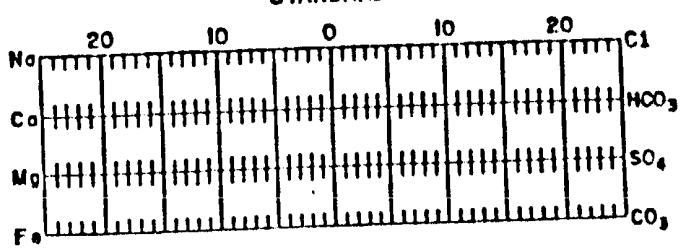
Total Dissolved Solids (calc.)	26,600
Iron, Fe (total)	0
Sulfide, as H_2S	0

OTHER PROPERTIES

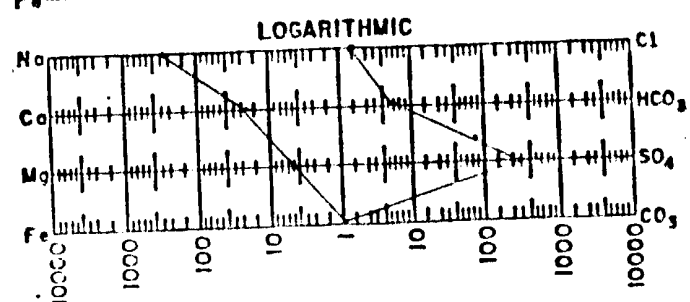
pH	8.17
Specific Gravity, 60/60 F.	1.0175
Resistivity (ohm-meters) 72° F.	0.61
Conductivity	16000 micromhos

WATER PATTERNS — me/l

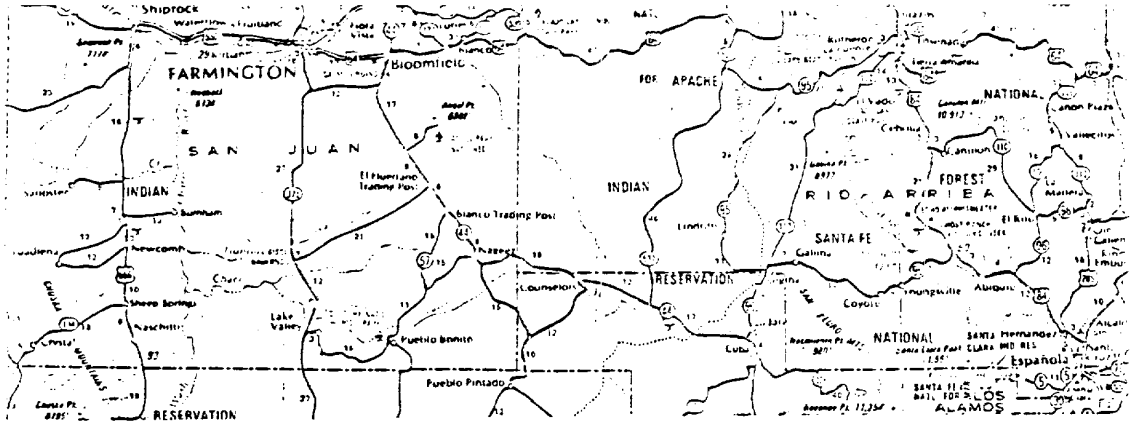
STANDARD

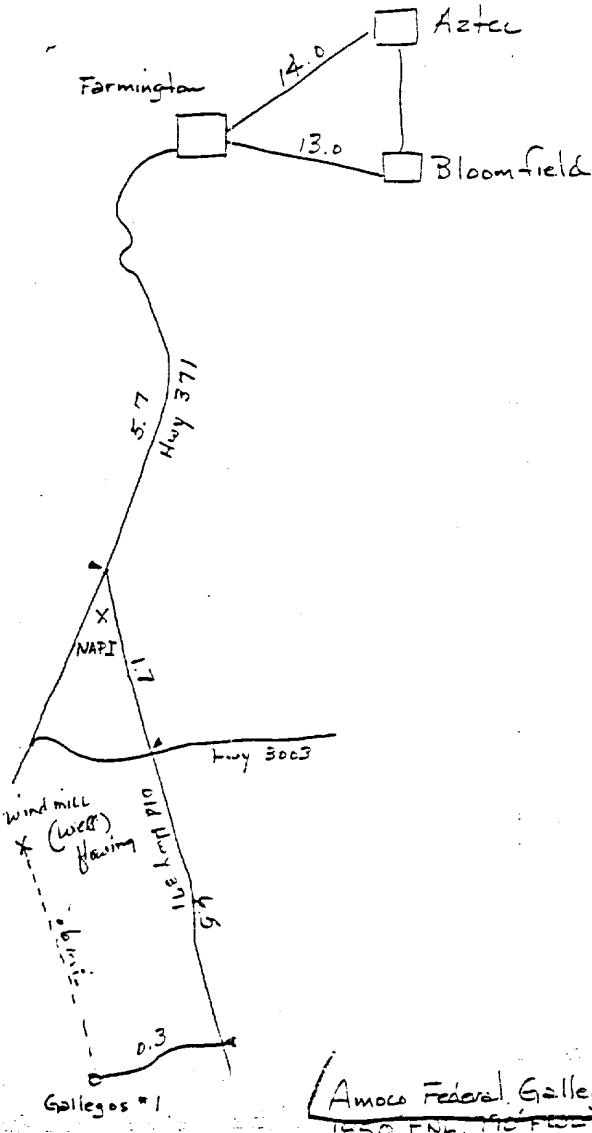


LOGARITHMIC



REMARKS & RECOMMENDATIONS:





Amoco Federal Gallegos #1
1650 FNL, 790 FWL
Sec. 25, T27N-R13W
San Juan Co., N.M.
Rail Point: 137 mi. Gallup, NM
Mud Point: 14 mi Farmington, NM
Cement Point: 14 mi. Farmington, NM

ANALYSIS NO. 40-102-85

FIELD RECEIPT NO. 1824695

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company		Sample No.	Date Sampled
AMOCO PRODUCTION COMPANY		1	
Field	**Legal Description**	**County or Parish**	**State**
Basin Dakota	Sec.35, T28N, R12W	San Juan	NM
Lease or Unit	**Well**	**Depth**	**Formation**	**Water, B/D**
GCU	244	6324	Dakota	
Type of Water (Produced, Supply, etc.)	**Sampling Point**	**Sampled By**
Produced		Bell

DISSOLVED SOLIDS

CATIONS	mg/l	me/l	ppm
Sodium, Na (calc.)	11341	493	11272
Calcium, Ca	587	29.3	583
Magnesium, Mg	145	11.9	144
Barium, Ba	-	-	--
Potassium, K^+	72	1.85	72

ANIONS			
Chloride, Cl	18742	528	18628
Sulfate, SO_4	25	0.525	25
Carbonate, CO_3	0	0	0
Bicarbonate, HCO_3	449	7.35	446

Total Dissolved Solids (calc.) 31,360

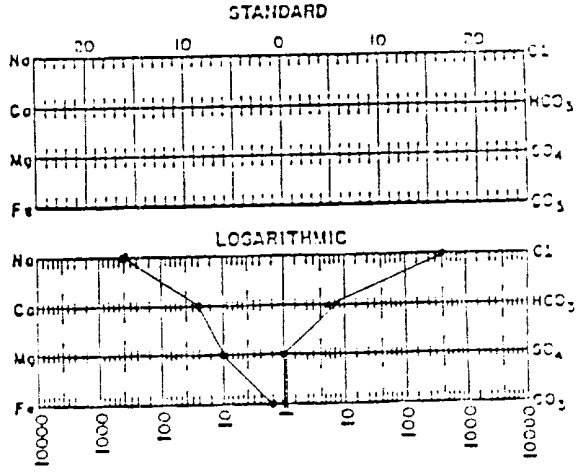
Iron, Fe (total) Fe^{++} 0; Fe^{+++} 0

Sulfide, as H_2S

OTHER PROPERTIES

pH	7.2
Specific Gravity, 60/60 F.	1.0061
Resistivity (ohm-meters) 78° F.	0.21
Total hardness	2050

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

ANALYST: Russ Pyeatt

THE WESTERN COMPANY OF
NORTH AMERICA, FARMINGTON, NM
(505) 327-6222

Please refer any questions to: Clay Terry, District Engineer or
Tom Burris, Field Engineer
Russ Pyeatt, Field Engineer

CL1-51 (REV. 1966)

CHEM LAB

WATER ANALYSIS EXCHANGE REPORT

27-13

MEMBER Amoco Production Co.
OPERATOR Amoco Production Co.
WELL NO. State Gas Com "I" #1A
FIELD Blanco-Mesaverde
COUNTY San Juan
STATE New Mexico

LAB NO. 27925-6 REPORT NO.
LOCATION Sec. 2-29N-9W
FORMATION Mesaverde
INTERVAL
SAMPLE FROM Production (6-15-78)
DATE July 17, 1978

REMARKS & CONCLUSIONS:

Cations	mg/l	meq/l
Sodium	4837	210.41
Potassium	123	3.15
Lithium		
Calcium	66	3.29
Magnesium	19	1.56
Iron	-	
Total Cations		218.41

Anions	mg/l	meq/l
Sulfate	0	0.00
Chloride	7000	197.40
Carbonate	-	
Bicarbonate	1281	21.01
Hydroxide		
Hydrogen sulfide	-	
Total Anions		218.41

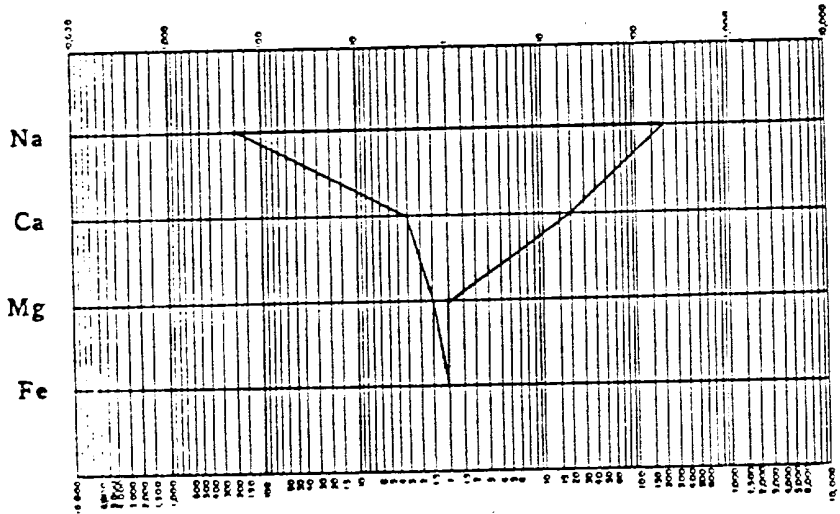
Total dissolved solids, mg/l	12676
NaCl equivalent, mg/l	12407
Observed pH	7.5

Specific resistance @ 68° F.:
Observed 0.57 ohm-meters
Calculated 0.53 ohm-meters

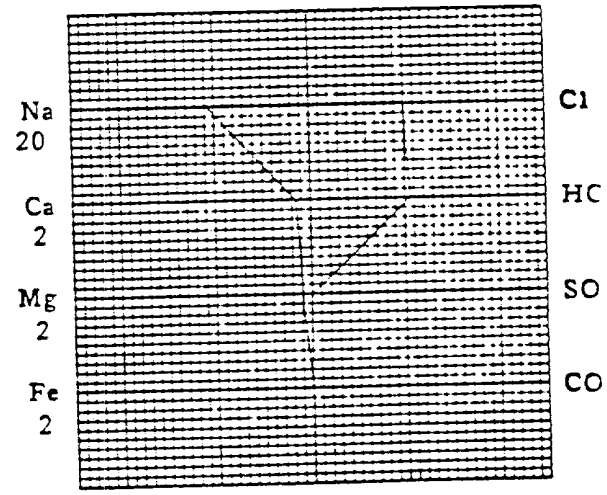
WATER ANALYSIS PATTERNS

MEQ per unit

LOGARITHMIC



STANDARD



(Na value in above graphs includes Na, K, and Li)
NOTE: Mg/l = Milligrams per liter. Meq/l = Milligram equivalents per liter

SCALE PREDICTIONS, MIXTURE NO. 1: 10.0 PERCENT DAKOTA
90.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 1 IN MG/L:

(NA)=	5487.	(CL)=	8174.
(CA)=	78.	(SO4)=	2.
(MG)=	32.	(HCO3)=	1198.
(BA)=	0.	(CO3)=	0.
(SR)=	0.	PH=	7.5

MOLAL IONIC STRENGTH= 0.252
SPECIFIC GRAVITY= 1.010

SCALING TENDENCIES(MG/L):

			SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	CASO4	BASO4	SRSO4	CACO3
70.	300.0	0.000	-581.	-7.	-376.	167.
70.	600.0	0.000	-595.	-7.	-384.	166.
70.	900.0	0.000	-610.	-7.	-391.	164.
70.	1200.0	0.000	-624.	-7.	-399.	163.
70.	1500.0	0.000	-639.	-7.	-407.	161.
70.	2000.0	0.000	-665.	-7.	-420.	158.
100.	300.0	0.000	-451.	-10.	-420.	171.
100.	600.0	0.000	-462.	-10.	-428.	170.
100.	900.0	0.000	-472.	-10.	-436.	169.
100.	1200.0	0.000	-483.	-10.	-444.	168.
100.	1500.0	0.000	-494.	-11.	-452.	167.
100.	2000.0	0.000	-512.	-11.	-466.	164.
130.	300.0	0.000	-358.	-13.	-399.	176.
130.	600.0	0.000	-366.	-13.	-406.	175.
130.	900.0	0.000	-374.	-14.	-414.	174.
130.	1200.0	0.000	-383.	-14.	-421.	173.
130.	1500.0	0.000	-391.	-14.	-428.	172.
130.	2000.0	0.000	-405.	-14.	-440.	170.

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 3: 30.0 PERCENT DAKOTA
70.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 3 IN MG/L:

(NA)=	6788.	(CL)=	10523.
(CA)=	191.	(SO4)=	7.
(MG)=	57.	(HCO3)=	1031.
(BA)=	0.	(CO3)=	0.
(SR)=	0.	PH=	7.4

MOLAL IONIC STRENGTH= 0.321
SPECIFIC GRAVITY= 1.013

SCALING TENDENCIES(MG/L):

			SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	CASO4	BASO4	SRSO4	CACO3
70.	300.0	0.000	-693.	-4.	-411.	448.
70.	600.0	0.000	-712.	-5.	-419.	446.
70.	900.0	0.000	-731.	-5.	-427.	445.
70.	1200.0	0.000	-750.	-5.	-436.	443.
70.	1500.0	0.000	-770.	-5.	-444.	441.
70.	2000.0	0.000	-803.	-5.	-458.	438.
100.	300.0	0.000	-537.	-7.	-458.	452.
100.	600.0	0.000	-551.	-8.	-467.	451.
100.	900.0	0.000	-565.	-8.	-475.	450.
100.	1200.0	0.000	-579.	-8.	-484.	449.
100.	1500.0	0.000	-594.	-8.	-493.	447.
100.	2000.0	0.000	-618.	-9.	-508.	445.
130.	300.0	0.000	-426.	-11.	-436.	457.
130.	600.0	0.000	-437.	-11.	-443.	456.
130.	900.0	0.000	-448.	-11.	-451.	455.
130.	1200.0	0.000	-459.	-11.	-459.	454.
130.	1500.0	0.000	-470.	-12.	-467.	453.
130.	2000.0	0.000	-489.	-12.	-480.	451.

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 2: 20.0 PERCENT DAKOTA
80.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 2 IN MG/L:

(NA)=	6138.	(CL)=	9348.
(CA)=	135.	(SO4)=	5.
(MG)=	44.	(HCO3)=	1115.
(BA)=	0.	(CO3)=	0.
(SR)=	0.	PH=	7.4

MOLAL IONIC STRENGTH= 0.286
SPECIFIC GRAVITY= 1.012

SCALING TENDENCIES(MG/L):

			SCALE INDEX(MG/L)			
TEMP(F)	P(PSI)	CO2(PSI)	CASO4	BASO4	SRSO4	CACO3
70.	300.0	0.000	-652.	-5.	-394.	308.
70.	600.0	0.000	-669.	-5.	-402.	306.
70.	900.0	0.000	-686.	-6.	-410.	305.
70.	1200.0	0.000	-703.	-6.	-418.	303.
70.	1500.0	0.000	-721.	-6.	-426.	302.
70.	2000.0	0.000	-751.	-6.	-439.	299.
100.	300.0	0.000	-506.	-8.	-440.	312.
100.	600.0	0.000	-518.	-9.	-448.	311.
100.	900.0	0.000	-531.	-9.	-456.	310.
100.	1200.0	0.000	-544.	-9.	-465.	308.
100.	1500.0	0.000	-556.	-9.	-473.	307.
100.	2000.0	0.000	-578.	-10.	-488.	305.
130.	300.0	0.000	-401.	-12.	-418.	316.
130.	600.0	0.000	-411.	-12.	-425.	315.
130.	900.0	0.000	-421.	-12.	-433.	314.
130.	1200.0	0.000	-431.	-12.	-440.	313.
130.	1500.0	0.000	-441.	-13.	-448.	312.
130.	2000.0	0.000	-458.	-13.	-461.	311.

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 4: 40.0 PERCENT DAKOTA
60.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 4 IN MG/L:

(NA)=	7439.	(CL)=	11697.
(CA)=	248.	(SO4)=	10.
(MG)=	69.	(HCO3)=	948.
(BA)=	0.	(CO3)=	0.
(SR)=	0.	PH=	7.4

MOLAL IONIC STRENGTH= 0.355
SPECIFIC GRAVITY= 1.014

SCALING TENDENCIES(MG/L):

			SCALE INDEX(MG/L)		
TEMP(F)	P(PSI)	CO2(PSI)	CASO4	BASO4	SRSO4	CACO3
70.	300.0	0.000	-724.	-4.	-428.	588.
70.	600.0	0.000	-744.	-4.	-436.	587.
70.	900.0	0.000	-765.	-4.	-445.	585.
70.	1200.0	0.000	-786.	-4.	-453.	584.
70.	1500.0	0.000	-807.	-4.	-462.	582.
70.	2000.0	0.000	-843.	-5.	-477.	579.
100.	300.0	0.000	-561.	-7.	-476.	593.
100.	600.0	0.000	-575.	-7.	-485.	592.
100.	900.0	0.000	-591.	-7.	-494.	590.
100.	1200.0	0.000	-606.	-7.	-503.	589.
100.	1500.0	0.000	-622.	-7.	-512.	588.
100.	2000.0	0.000	-649.	-8.	-527.	585.
130.	300.0	0.000	-447.	-10.	-453.	597.
130.	600.0	0.000	-459.	-10.	-461.	596.
130.	900.0	0.000	-468.	-10.	-469.	595.
130.	1200.0	0.000	-480.	-11.	-477.	594.
130.	1500.0	0.000	-492.	-11.	-485.	593.
130.	2000.0	0.000	-513.	-11.	-499.	591.

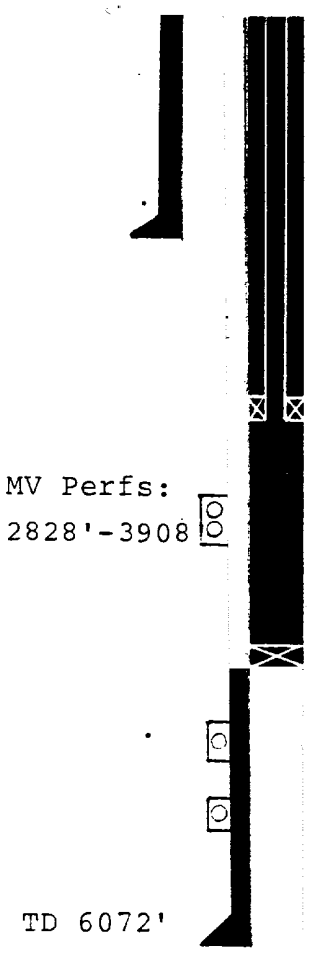
SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

Attachment 11

INJECTION WELL DATA SHEET

OPERATOR		LEASE		
Amoco Production Company		Gallegos Federal		
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
No. 1	1850' FNL x 790' FWL	Section 25	T27N	R13W

Schematic



Tabular Data

Surface Casing

Size 9 5/8" Cemented with 366 cf cmt

TOC Surface feet determined by return during ~~cement job~~

Hole size 12 1/4"

Intermediate Casing

Size _____" Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 7" Cemented with 1277 cf cmt

TOC Surface feet determined by return during ~~cement job~~

Hole size 8 3/4"

Total depth 6072'

Injection interval

2828 feet to 3908 feet
(perforated or open-hole, indicate which)

238' of performations:

2828 - 2848
2906 - 2916
3010 - 3020
3066 - 3076
3196 - 3208
3258 - 3274
3292 - 3308
3314 - 3328
3390 - 3408
3542 - 3588
3624 - 3636
3854 - 3908

Tubing size 2 7/8" or 3½" lined with none (material) set in a

Baker Model D (brand and model) packer at 2730 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Mesaverde

2. Name of Field or Pool (if applicable) Blanco Mesaverde

3. Is this a new well drilled for injection? [ ] Yes [X] No

   If no, for what purpose was the well originally drilled? Natural Gas Well

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

   4910' - 5160' 5910' - 5986'

   CIBP @ 4850' x 5 sx cmt

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

   Pictured Cliff top @ 1280'

   Gallup top @ 4892'