

# NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

## OIL CONSERVATION DIVISION

CF 10107  
R-9327

January 2, 1996

Conoco, Inc.  
10 Desta Drive, Suite 100W  
Midland, Texas 79705-4500

Attn: Mr. Jerry Hoover

**RE: Injection Pressure Increase, Salt Water Disposal,  
SEMU Well No.95, Lea County, New Mexico**

Dear Mr. Hoover:

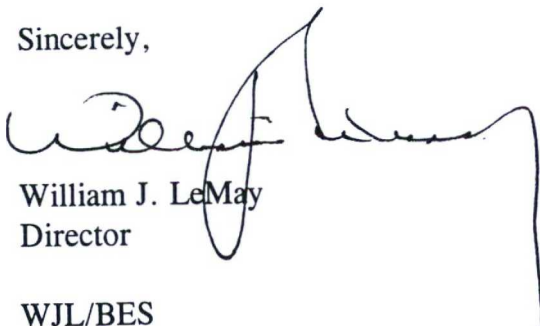
Reference is made to your request dated November 27, 1995 to increase the surface injection pressure on the above referenced well. This request is based on a step rate test conducted on November 9, 1995. The results of the test have been reviewed by my staff and we feel an increase in injection pressure on this well is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following well:

Well and Location	Maximum Injection Surface Pressure
SEMU Well No.95, Unit Letter J	3923 PSIG
Located in Section 23, Township 20 South, Range 37 East, Lea County, New Mexico.	

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,



William J. LeMay  
Director

WJL/BES

cc: Oil Conservation Division - Hobbs  
File: Case No.10107; PSI-X 3rd QTR 96

OFFICE OF THE SECRETARY - P. O. BOX 6429 - SANTA FE, NM 87505-6429 - (505) 827-5950  
ADMINISTRATIVE SERVICES DIVISION - P. O. BOX 6429 - SANTA FE, NM 87505-6429 - (505) 827-5925  
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PSI-X N/R

Midland Division  
Exploration Production

OIL CONSERVATION DIVISION  
RECEIVED  
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Conoco Inc.  
10 Desta Drive, Suite 100W  
Midland, TX 79705-4500  
(915) 686-5400

November 27, 1995

Mr. William J. LeMay  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87501

**Re: Application for Authorization of Higher Surface  
Injection Pressure for Conoco's S.E.M.U. SWD  
Well No. 95, Unit J, Sec. 23, T-20S, R-37E, Lea  
County, New Mexico**

Dear Mr. LeMay:

Division Order No. R-9327 approved injection into this SWD well at a surface injection pressure no greater than 830 psi based on a .2 psi/ft gradient and a 4160 foot top perforation. This order, approved October 19, 1990, is included as ATTACHMENT A for your convenience.

A recent step-rate test was performed on this well which shows that a considerably higher surface injection pressure could be safely utilized without fracturing the San Andres formation which is the disposal interval in this well. The test data, on five minute intervals, is enclosed as ATTACHMENT B. Six points at approximate one hour time intervals were plotted for analysis of this test as shown on ATTACHMENT C. An enlargement of this plot, ATTACHMENT D, indicates that even at a rate of 6500 BWPD the fracture point was not reached in this well during this step-rate test.

The last data point was recorded at 3923 psi surface pressure and 6500 BWPD. The current top perforation in this well is at 4676 feet which is a .84 gradient. Two recent hydraulic fracture treatments of the San Andres formation in this same area have shown fracturing to occur at a gradient in a range from .9 to 1.0. Therefore, it is not surprising that this step-rate test did not achieve a fracture profile.

Therefore, it is requested that a new maximum surface injection pressure for this well be approved for the last data point recorded in this test, at 3923 psi of surface injection pressure.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Jerry W. Hoover".

Jerry W. Hoover  
Sr. Conservation Coordinator

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

CASE NO. 10107  
ORDER NO. R-9327

APPLICATION OF CONOCO INC.  
FOR SALT WATER DISPOSAL,  
LEA COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on October 3, 1990, at Santa Fe, New Mexico, before Examiner Jim Morrow.

NOW, on this 19th day of October, 1990, the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

- (1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.
- (2) The applicant, Conoco Inc., is the owner and operator of the SEMU Well No. 95, located 2130 feet from the South line and 1980 feet from the East line (Unit J) of Section 23, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico.
- (3) The applicant proposes to utilize said well to dispose of produced salt water into the San Andres formation, with injection into the perforated interval from approximately 4160 feet to 5020 feet.
- (4) The injection should be accomplished through 2 3/8-inch plastic-lined tubing installed in a packer set at approximately 4130 feet; the casing-tubing annulus should be filled with an inert fluid; and a pressure gauge or approved leak detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.
- (5) Prior to commencing injection operations, the casing in the subject well should be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

ATTACHMENT A

(6) The injection well or system should be equipped with a pressure limiting switch or other acceptable device which will limit the wellhead pressure on the injection well to no more than 830 psi.

(7) The Director of the Division should be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the San Andres formation.

(8) The operator should notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity pressure test in order that the same may be witnessed.

(9) The operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(10) Approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Conoco Inc, is hereby authorized to utilize its SEMU Well No. 95, located 2130 feet from the South line and 1980 feet from the East line (Unit J) of Section 23, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico, to dispose of produced salt water into the San Andres formation, injection to be accomplished through 2 3/8-inch tubing installed in a packer set at approximately 4130 feet, with injection into the perforated interval from approximately 4160 feet to 5020 feet.

PROVIDED HOWEVER THAT, the tubing shall be internally plastic-lined; the casing-tubing annulus shall be filled with an inert fluid; and a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak detection device in order to determine leakage in the casing, tubing or packer.

PROVIDED FURTHER THAT, prior to commencing injection operations, the casing in the subject well shall be pressure-tested to assure the integrity of such casing in a manner that is satisfactory to the supervisor of the Division's district office at Hobbs, New Mexico.

(2) The injection well or system shall be equipped with a pressure limiting switch or other acceptable device which will limit the wellhead pressure on the injection well to no more than 830 psi.

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Case No. 10107

Order No. R-9327

(3) The Director of the Division may authorize an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the San Andres formation.

(4) The operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity pressure test in order that the same may be witnessed.

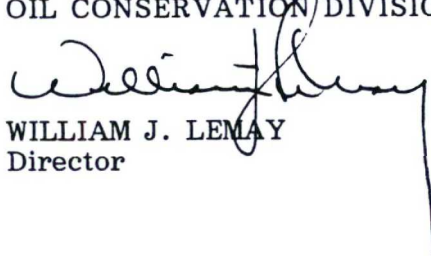
(5) The operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing or packer in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(6) The applicant shall conduct disposal operations and submit monthly reports in accordance with Rules 702, 703, 704, 705, 706, 708 and 1120 of the Division Rules and Regulations.

(7) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

  
WILLIAM J. LEMAY  
Director

S E A L

dr/

**S.E.M.U. SWD #95****Step Rate****Injection Test****11/9/95**

Elapsed Time (min)	Surface Trtg. Press. (psi)	Rate (bpm)	Rate (gals/min)	Rate (bbbls/day)	Stage Volume (bbbls)	Total Volume (bbbls)
5	98	0.88	36.96	1267	4.7	4.7
10.25	116	1.08	45.36	1555	9.8	9.8
15.26	126	1.18	49.56	1699	15.1	15.1
20.54	138	0.87	36.54	1253	20.4	20.4
25.82	148	0.91	38.22	1310	25.1	25.1
31.09	152	0.92	38.64	1325	30.0	30.0
36.38	154	0.97	40.74	1397	35.0	35.0
41.38	159	0.99	41.58	1426	39.9	39.9
46.66	160	0.99	41.58	1426	45.1	45.1
51.93	163	1.01	42.42	1454	50.5	50.5
56.93	160	1.01	42.42	1454	55.6	55.6
61.04	165	1.03	43.26	1483	59.8	59.8
66.33	586	1.76	73.92	2534	4.9	68.9
71.61	700	1.86	78.12	2678	14.5	78.4
76.9	577	1.74	73.08	2506	23.8	87.8
81.9	581	1.74	73.08	2506	32.5	96.5
86.91	581	1.73	72.66	2491	41.2	105.2
91.92	574	1.73	72.66	2491	49.9	113.9
96.93	576	1.73	72.66	2491	58.6	122.6
102.21	585	1.74	73.08	2506	67.8	131.8
107.48	603	1.75	73.5	2520	77.0	141.0
112.48	584	1.73	72.66	2491	85.8	149.8
116.01	609	1.75	73.5	2520	91.9	155.9
121.29	1272	2.36	99.12	3398	3.2	166.1
126.55	1315	2.4	100.8	3456	15.8	178.7
131.8	1337	2.43	102.06	3499	28.6	191.5
137.06	1340	2.45	102.9	3528	41.5	204.3
142.32	1348	2.45	102.9	3528	54.4	217.3
147.57	1318	2.44	102.48	3514	67.2	230.1
152.82	1338	2.45	102.9	3528	80.1	243.0
158.08	1351	2.46	103.32	3542	93.1	256.0
163.34	1358	2.47	103.74	3557	106.1	269.0
168.61	1273	2.4	100.8	3456	119.0	281.9
173.88	1260	2.39	100.38	3442	131.7	294.6
179.15	1276	2.41	101.22	3470	144.4	307.3
179.44	1275	2.4	100.8	3456	145.1	308.0
184.7	2124	3.07	128.94	4421	15.5	323.9
189.95	2014	3.05	128.1	4392	31.6	340.1
195.2	2032	3.08	129.36	4435	47.7	356.2
200.45	2055	3.09	129.78	4450	63.9	372.4
205.7	2094	3.12	131.04	4493	80.3	388.8
210.96	2126	3.14	131.88	4522	96.8	405.3
216.23	2114	3.15	132.3	4536	113.4	421.9
221.5	2117	3.14	131.88	4522	130.0	438.5
226.77	2093	3.12	131.04	4493	146.6	455.1

# **S.E.M.U. SWD #95**

## **Step Rate**

### **Injection Test**

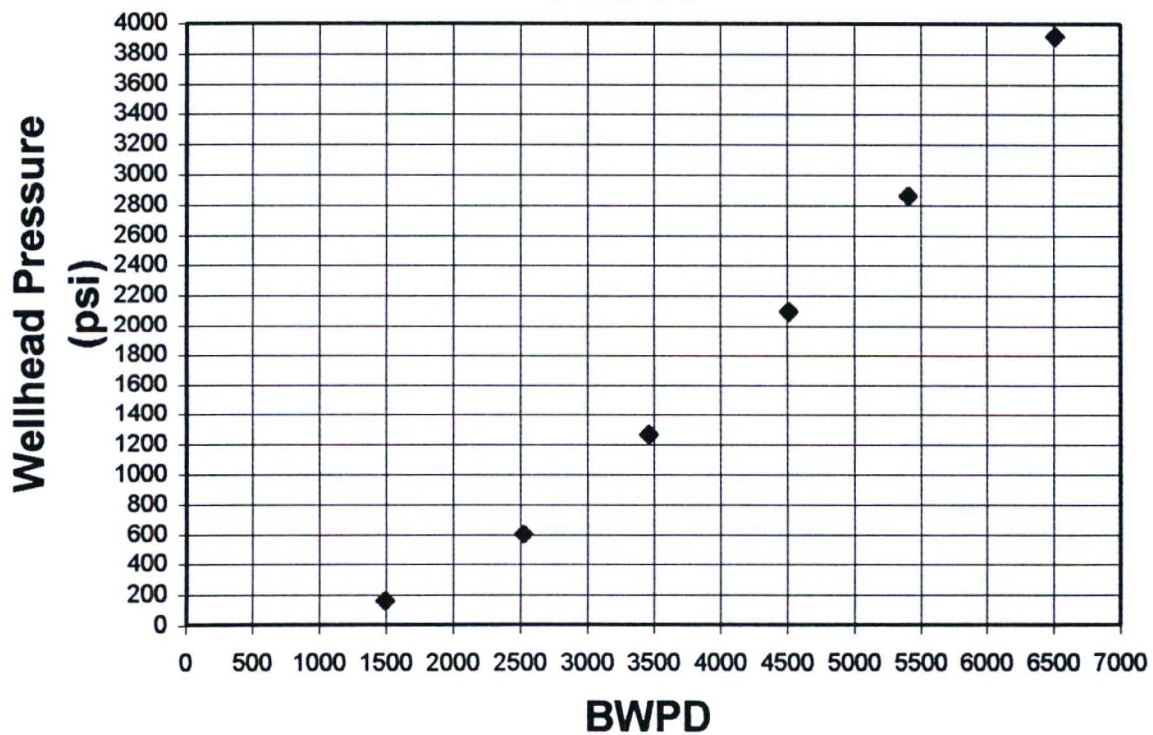
**11/9/95**

Elapsed Time (min)	Surface Trtg. Press. (psi)	Rate (bpm)	Rate (gals/min)	Rate (bbbls/day)	Stage Volume (bbbls)	Total Volume (bbbls)
232.04	2089	3.12	131.04	4493	163.1	471.6
237.31	2085	3.13	131.46	4507	179.7	488.1
239.65	2099	3.13	131.46	4507	187.0	495.4
244.92	2916	3.76	157.92	5414	19.5	515.1
250.18	2940	3.76	157.92	5414	38.9	534.5
255.46	2926	3.76	157.92	5414	58.9	554.4
260.74	2927	3.76	157.92	5414	78.8	574.4
266.02	2971	3.8	159.6	5472	98.9	594.4
271.31	2975	3.8	159.6	5472	119.1	614.6
276.6	2988	3.81	160.02	5486	139.3	634.9
281.89	3020	3.86	162.12	5558	159.6	655.2
286.89	2903	3.77	158.34	5429	178.9	674.4
291.89	2887	3.76	157.92	5414	197.7	693.3
296.89	2883	3.76	157.92	5414	216.6	712.2
299.84	2866	3.75	157.5	5400	227.7	723.2
305.12	3917	4.46	187.32	6422	22.8	746.6
310.4	3911	4.46	187.32	6422	46.4	770.2
315.69	3978	4.51	189.42	6494	70.2	794.0
320.97	3983	4.52	189.84	6509	94.2	818.0
325.97	3994	4.55	191.1	6552	117.0	840.7
330.97	3948	4.52	189.84	6509	139.7	863.4
335.97	3915	4.5	189	6480	162.4	886.1
340.97	3930	4.5	189	6480	185.0	908.7
345.98	3981	4.55	191.1	6552	207.7	931.5
350.99	3978	4.55	191.1	6552	230.6	954.3
356	3953	4.55	191.1	6552	253.4	977.1
359.54	3923	4.52	189.84	6509	269.4	993.2

**S.E.M.U. SWD #95  
STEP RATE  
INJECTION TEST  
11/9/95**

Elapsed Time (min)	Rate (bbls/day)	Trtg. Press. (psi)
61.04	1483	165.5
116.01	2520	608.9
179.44	3456	1274.8
239.65	4507	2098.6
299.84	5400	2866.2
359.54	6508	3923.1

**S.E.M.U. SWD #95  
Step Rate Injection Test  
11/9/95**



**S.E.M.U. SWD #95**  
**Step Rate Injection Test**  
**11/9/95**

