DATE IN 08/02/13	SUSPENSE	ENGINEER PG	LOGGED IN 08/05/13	TYPE IPI	APP NO. pPRG1321740397

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [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]

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

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ 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

[D] Other: Specify SWD-516 / [IPI to 998 #] IPI-

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[2] **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
Copy Mailed 7/30/13

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

~~Note: Statement must be completed by an individual with managerial and/or supervisory capacity.~~

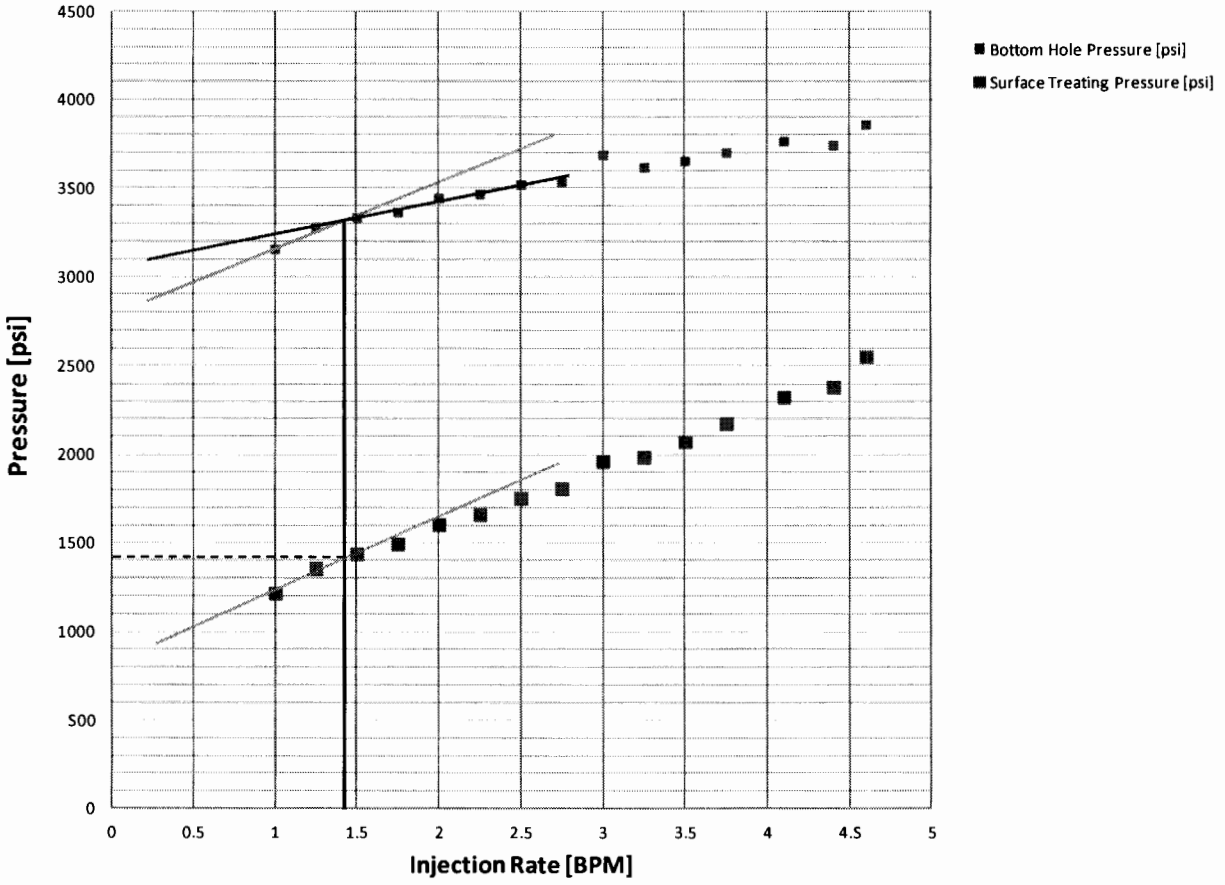
David Stewart		Sr Regulatory Advisor	7/30/13
Print or Type Name	Signature	Title	Date

david_stewart@oxy.com
e-mail Address 432-685-5717

OXY USA Inc. - 16696
Cal-Mon #5
30-015-25640

SWD-516

Cal-mon #5 (SWD-516)



The data points for the surface treating pressure appear not to show a clear indication for the FPP. Therefore, we can identify an FPP using the Bottom Hole Pressure at 3300 psi. A BHP of 3300 psi corresponds to an FPP of 1400 psi (surface treating pressure). Based on an FPP of 1400 psi we would like to request an increase in the injection pressure to 1350 psi.

Data used to create the plot (Results from the Step Rate Test):

Rate [bbls/min]	Tubing Head Pressure [psi]
1.00	1218
1.25	1356
1.50	1438
1.75	1495
2.00	1604
2.25	1660
2.50	1753
2.75	1808
3.00	1962
3.25	1986
3.50	2075
3.75	2178
4.10	2327
4.40	2383
4.60	2554

To: New Mexico Oil Conservation Division
Attn: Phillip R. Goetze, P.G.

OXY USA Inc. (16696) formally requests an increase in maximum injection pressure to 2000 psi for the following approved SWD well. The justification will be presented herein.

Well Name: Cal-Mon #5
API#: 30-015-25640
1980 FNL 1980 FEL Ut G Sec 35 T23S R31E
Administrative Order SWD-516 5/18/93 ~~IPI 12/17/93 -998#~~

The SWD well is completed in the Bell Canyon & Upper Cherry Canyon (4509–5148') with 2.875" Duoline tubing (2.25" ID) set at a depth of 4387'. Please see Figure 1 below:

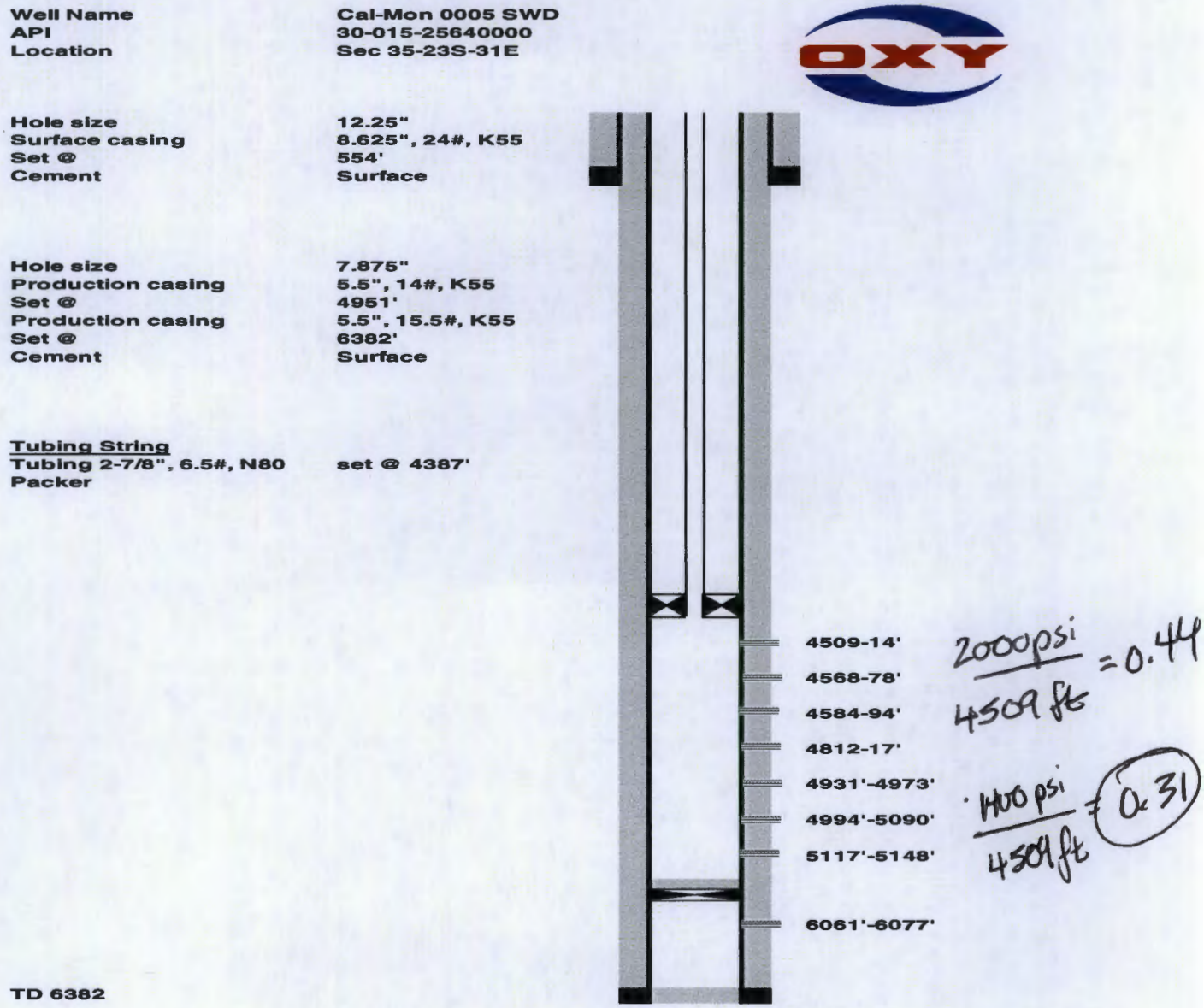


Figure 1: Cal-Mon #5 Well Schematic.

On 06/18/2013 a planned step rate test was performed on the Cal-Mon #5 to identify the formation parting pressure, thus determining a maximum allowable injection pressure. The well was back flowed for 4hrs, then shut-in for an additional 12 hrs to ensure the accurate testing results. The step-rate test was then conducted at the below rates utilizing 2% KCL water and a mobile pump truck. Pump rates were maintained for 15 minutes or until we achieved a stablized injection pressure.

Rate [bbls/day]	Rate [bbls/min]	Cumulative Volume Pumped [bbls]	Tubing Head Pressure [psi]
0	0.00	0	815
1440	1.00	15	1218
1800	1.25	33	1356
2160	1.50	51	1438
2520	1.75	73	1495
2880	2.00	104	1604
3240	2.25	140	1660
3600	2.50	162	1753
3960	2.75	180	1808
4320	3.00	206	1962
4680	3.25	238	1986
5040	3.50	267	2075
5400	3.75	304	2178
5904	4.10	354	2327
6336	4.40	416	2383
6624	4.60	424	2554

Table 1: Cal-mon #5 SWD Step Rate test data.

A clear indication of the formation parting pressure was not observed during the step-rate test. A conservative approach was taken in regards to injection rates in order to eliminate the possiblility of fracture propagation into a non-disposal zone. It is important to note that a historical step rate test (dated 1993) also did not observe a formation parting pressure. Although they did not observe a formation parting pressure the NMOCD was still able to permit a maximum permitted injection pressure increase based on the maximum surface treating pressure obtained during the test.

Additionaly, an analysis was conducted to observe the pressure loss due to friction in two small diameter sized tubings. The results from the pressure drop due to friction in a 2-3/8" & 2-7/8" tubing is significant enough to prevent the bottom hole pressure from ever reaching the formation parting pressure. The friction loss results are show in figure 2 & figure 3 below.

The calculated flowing bottom hole pressure during the test was found to have never exceeded 3859 psi with a surface treating pressure of 2554 psi. Figures 2 & 3 illustrate the results of a high pressure drop in the small ID tubing as a result of friction. The requested 2000 psi surface injection pressure represents an equivalent bottom hole pressure well below the maximum pressure obtained during the test.

request data revaluation

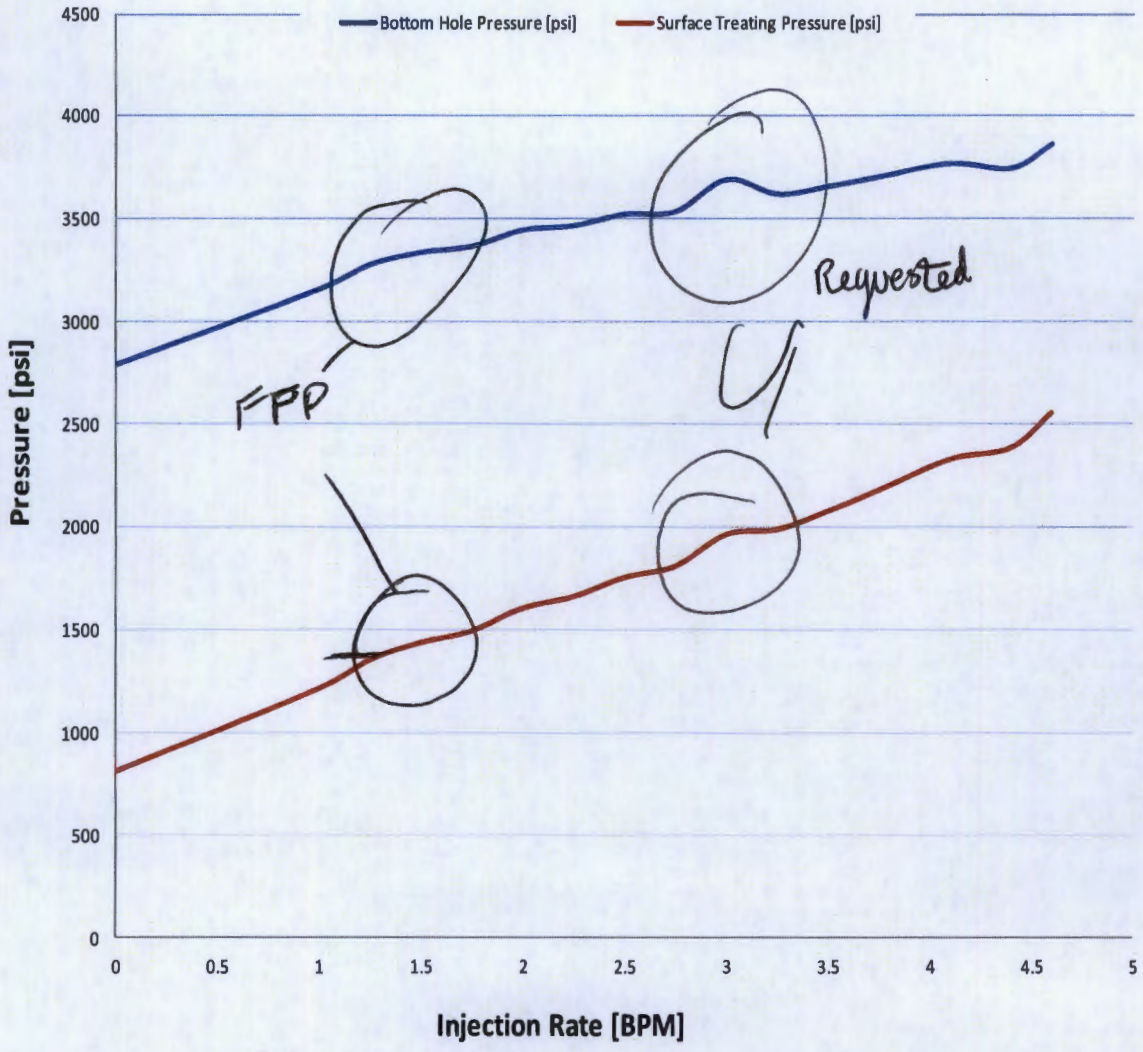


Figure 2: Surface Treating Pressure & Calculated Bottom Hole Pressure versus injection rate.

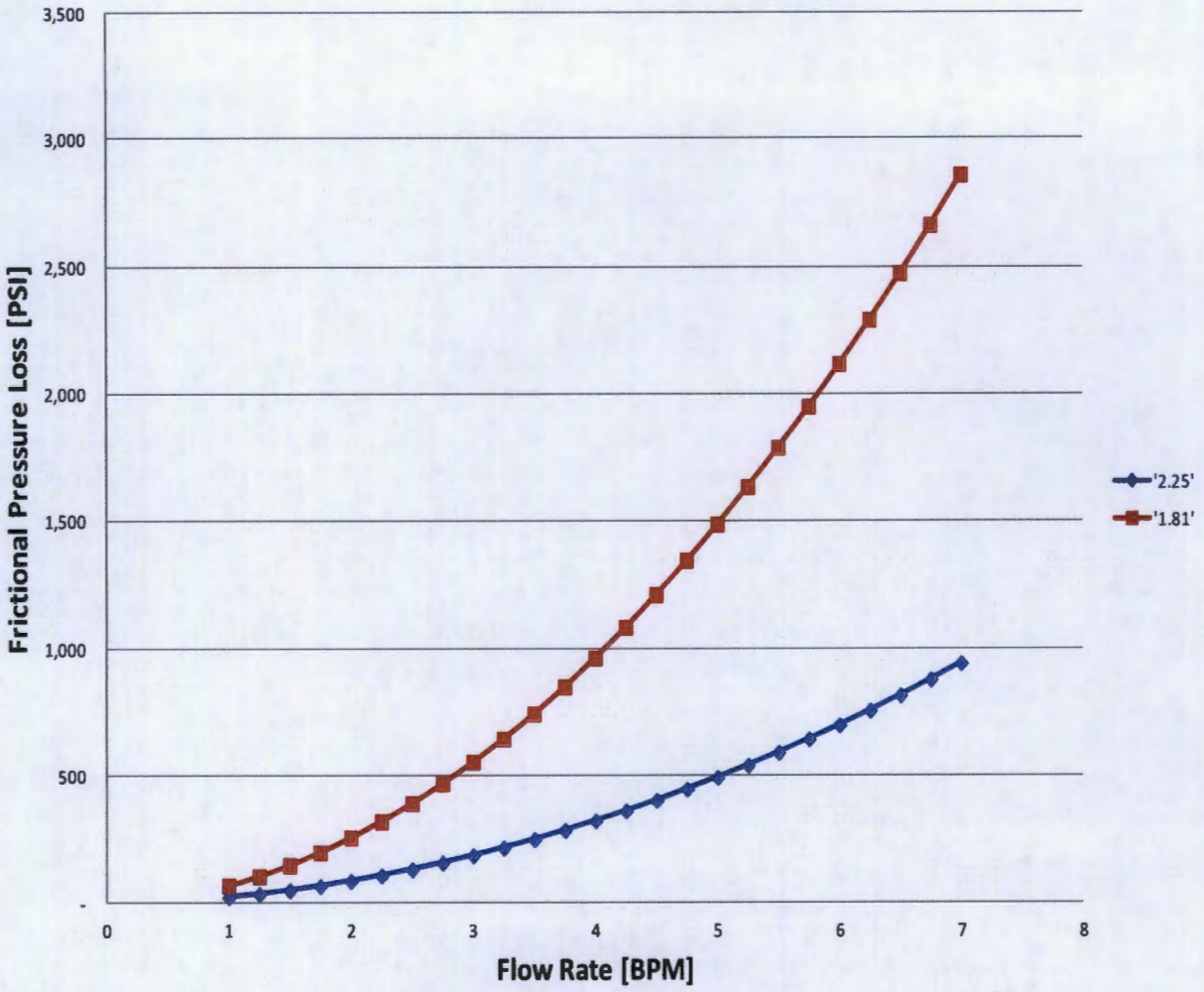


Figure 3: Frictional Pressure Loss comparison in a tubing ID of 2.25" versus 1.81".

Please advise if any additional data is required in order to make a ruling of the proposed increase in permitted injection pressure.

Best regards

Joseph M. Evans
Production Engineer
SE New Mexico Reservoir Management Team
OXY Permian Primary Development.
Office - 713-350-4640
Cell – 713-855-0624
joseph_evans@oxy.com

cc: NMOCD-Artesia, BLM Carlsbad

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

ADMINISTRATIVE ORDER SWD-516

APPLICATION OF POGO PRODUCING COMPANY FOR SALT WATER DISPOSAL, EDDY COUNTY, NEW MEXICO.

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 701(B), Pogo Producing Company made application to the New Mexico Oil Conservation Division on May 3, 1993, for permission to complete for salt water disposal its Cal-Mon Well No. 5 located 1980 feet from the North line and 1980 feet from the East line (Unit G) of Section 35, Township 23 South, Range 31 East, NMPM, Eddy County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

(1) The application has been duly filed under the provisions of Rule 701(B) of the Division Rules and Regulations;

(2) Satisfactory information has been provided that all offset operators and surface owners have been duly notified;

(3) The applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 will be met; and

(4) No objections have been received within the waiting period prescribed by said rule.

IT IS THEREFORE ORDERED THAT:

The applicant herein, Pogo Producing Company is hereby authorized to complete its Cal-Mon Well No. 5 located 1980 feet from the North line and 1980 feet from the East line (Unit G) of Section 35, Township 23 South, Range 31 East, NMPM, Eddy County, New Mexico, in such manner as to permit the injection of salt water for disposal purposes into the Bell Canyon and Upper Cherry Canyon formations at approximately 4484 feet to 5780 through 2 7/8-inch plastic-lined tubing set in a packer located at approximately 4400 feet.

IT IS FURTHER ORDERED THAT:

The operator shall 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.

Prior to commencing injection operations into the well, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing, or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 897 psi.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Bell Canyon and Upper Cherry Canyon formations. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing, or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for the entry of such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The operator shall submit monthly reports of the disposal operations in accordance with Rule Nos. 706 and 1120 of the Division Rules and Regulations.

The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

Approved at Santa Fe, New Mexico, on this 18th day of May, 1993.

WILLIAM J. LEMAY, Director

WJL/BES/amg

xc: Oil Conservation Division - Artesia
US Bureau of Land Management - Carlsbad

SWD-516

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

December 17, 1993

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

Pogo Producing Company
P.O. Box 10340
Midland, TX 79702-7340

Attention: Mr. Barrett L. Smith

RE:Injection Pressure Increase, Cal-Mon Well No. 5 SWD; Eddy County, New Mexico

Dear Mr. Smith:

Reference is made to your request dated October 21, 1993 to increase the surface injection pressure on the above referenced well. This request is based on a step rate test conducted on this well on October 12, 1993. 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
Cal-Mon Well No. 5 SWD 1980' FNL - 1980' FEL Unit G, Section 35, Township 23 South, Range 31 East	998 PSIG
This well located in Eddy 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/amg

cc: Oil Conservation Division - Artesia
File: SWD-516
PSI-X 4th Quarter