

## OIL CONSERVATION DIVISION

August 10, 1995

SDX Resources, Inc.  
P.O. Box 5061  
Midland, Texas 79704-5061

Attn: Mr. Chuck Morgan

Re: EOR Project Certification on the SDX Leonard Grayburg Jackson

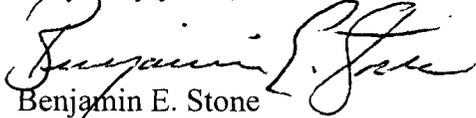
Dear Mr. Morgan,

The Oil Conservation Division has recently been reviewing and updating many of our files. During this process, the file containing information on the above referenced EOR project was reviewed and there was no associated *Certification Date*. The *Certification Date* is that date which identifies when injection operations have been initiated on the subject project so that the Division may certify this occurrence to the Taxation and Revenue Department. So that the subject project may be credited when that time comes, please inform this office at your earliest convenience, which of the following applies:

- 1) The subject project has not yet had injection operations initiated.
- 2) The subject project has initiated injection and will upon receipt of this letter, request that certification be made to Taxation and Revenue.
- 3) Injection has been initiated, a Certification Date has been issued for the subject project and a copy of such certification is being supplied in response to this request.

We apologize for any confusion regarding the situation and we appreciate your cooperation. Please direct replies or question to me at (505)827-8186.

Very truly yours,



Benjamin E. Stone  
UIC Administrator

/BES

**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. 10684  
Order No. R-9890**

**APPLICATION OF SDX RESOURCES, INC.  
FOR APPROVAL OF A WATERFLOOD  
PROJECT, EDDY COUNTY, NEW MEXICO.**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This cause came on for hearing at 8:15 a.m. on April 8, 1993, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 3rd day of May, 1993, 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, SDX Resources, Inc., seeks authority to institute a waterflood project on its Leonard Federal and Leonard "B" Federal Leases located in a portion of Section 33, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico, by the injection of water into the Grayburg and San Andres formations, Grayburg-Jackson-Seven Rivers-Queen-Grayburg-San Andres Pool, through the gross interval from approximately 2,650 feet to 3,048 feet in the following described wells both located in Section 33:

**WELL NAME & NUMBER**

**WELL LOCATION**

Leonard "B" Federal No. 1  
Leonard Federal No. 3

330' FNL & 1650' FEL (Unit B)  
1980' FNL & 1980' FWL (Unit F)

(3) Within the Leonard "B" Federal Well No. 1, the applicant proposes to inject into the perforated interval from 2,650 feet to 2,754 feet and the open hole interval from 2,754 feet to 3,048 feet.

(4) Within the Leonard Federal Well No. 3 the applicant proposes to inject into the perforated intervals as follows: 2,654-2,670; 2,708-2,713; 2,944-2,949; and, 2,951-2,956.

(5) The Leonard Federal Lease comprises the NW/4 and the N/2 SW/4 of Section 33. The Leonard "B" Federal Lease comprises the NE/4 of Section 33.

(6) According to applicant's testimony, the working interest and royalty interest within the Leonard Federal and Leonard "B" Federal Leases is common.

(7) The wells within the proposed project area are in an advanced state of depletion and should therefore be properly classified as "stripper wells".

(8) The proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(9) There is a plugged and abandoned well within the "area of review" of the Leonard "B" Federal Well No. 1, this being the Leonard State Well No. 4 located in Unit D of Section 34, Township 17 South, Range 29 East, NMPM, that the applicant has been unable to locate plugging records on.

(10) The Division has been able to locate plugging records on the aforesaid Leonard State Well No. 4 and these records indicate that the subject well is not plugged in a manner which will prevent the migration of fluid from the proposed injection zone.

(11) Prior to commencing injection operations into the Leonard "B" Federal Well No. 1, the applicant should be required to re-enter and replug the Leonard State Well No. 4 in accordance with an approved Division plugging program as directed by the supervisor of the Division's Artesia District Office.

(12) There is also a well within the "area of review" of both proposed injection wells, this being the Central Resources Inc. Federal "33" Com Well No. 2 located in Unit C of Section 33, which may not be cased and cemented in a manner which will prevent the migration of fluid from the proposed injection zone.

(13) Evidence presented by the applicant indicates that the Federal "33" Com Well No. 2 is currently cased and cemented as follows:

<u>CASING SIZE</u>	<u>DEPTH SET</u>	<u>SX CEMENT</u>	<u>TOC</u>
13 3/8"	348'	325	Circulated
8 5/8"	2800'	1200	Circulated
5 1/2"	9200'	400	6850 by CBL

(14) Within the Federal "33" Com Well No. 2, a portion of the proposed injection interval, being the "Premier" zone, is protected by the intermediate string of casing; however, a portion of the proposed injection zone, being the San Andres interval, is not protected by casing or cement.

(15) At the time of the hearing, the applicant requested that it be allowed to inject only into the "Premier" interval until such time as remedial cement operations can be performed on the Federal "33" Com Well No. 2.

(16) This request is reasonable and should be granted.

(17) Prior to commencing injection operations, the applicant should consult with the supervisor of the Division's Artesia District Office in order to determine:

- a) the vertical location of the "Premier" and San Andres intervals within the proposed injection wells; and,
- b) a satisfactory method by which the injection wells may be completed in order to limit the injection interval to the "Premier" zone only.

(18) The applicant 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 from injection, production, or plugged and abandoned wells.

(19) The injection of water into the proposed injection wells should be accomplished through 2 3/8-inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(20) Prior to commencing injection operations into the proposed injection wells, the casing in each 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.

(21) The injection wells or pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 530 psi.

(22) The Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(23) The operator should give advance notification to the supervisor of the Artesia District Office of the Division of the date and time of the conductance of re-entry and replugging operations on the Leonard State Well No. 4, the installation of injection equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(24) The proposed waterflood project should be approved and the project should be governed by the provisions of Rule Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(25) At the time of the hearing, the applicant requested that the subject waterflood project be approved by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(26) The evidence presented indicates that the subject waterflood project meets all the criteria for approval.

(27) The approved "project area" should initially comprise the N/2 and N/2 SW/4 of Section 33.

(28) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(29) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to The Department of Taxation and Revenue those lands and wells which are eligible for the credit.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of SDX Resources, Inc. for authority to institute a waterflood project on its Leonard Federal and Leonard "B" Federal Leases, comprising the N/2 and N/2 SW/4 of Section 33, Township 17 South, Range 29 East, NMPM, Grayburg-Jackson-Seven Rivers-Queen-Grayburg-San Andres Pool, Eddy County, New Mexico, by the injection of water into the Grayburg and San Andres formations through the gross interval from approximately 2,650 feet to 3,048 feet in the following described wells, both located in Section 33, is hereby approved:

<u>WELL NAME &amp; NUMBER</u>	<u>WELL LOCATION</u>
Leonard "B" Federal No. 1	330' FNL & 1650' FEL (Unit B)
Leonard Federal No. 3	1980' FNL & 1980' FWL (Unit F)

(2) Prior to commencing injection operations into the Leonard "B" Federal Well No. 1, the applicant shall re-enter and replug the Leonard State Well No. 4, located in Unit D of Section 34, Township 17 South, Range 29 East, NMPM, in accordance with an approved Division plugging program as directed by the supervisor of the Division's Artesia District Office.

(3) Injection into the above-described wells shall be limited to the "Premier" interval until such time as remedial cement operations are conducted on the Central Resources Inc. Federal "33" Com Well No. 2 located in Unit C of Section 33 in order to effectively isolate the San Andres formation.

(4) Prior to commencing injection operations, the applicant shall consult with the supervisor of the Division's Artesia District Office in order to determine:

- a) the vertical location of the "Premier" and San Andres intervals within the proposed injection wells; and,
- b) a satisfactory method by which the injection wells may be completed in order to limit the injection interval to the "Premier" zone only.

(5) The applicant 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 from injection, production, or plugged and abandoned wells.

(6) Injection shall be accomplished through 2 3/8-inch plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus in each well shall be filled with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(7) The injection wells or pressurization system shall be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 530 psi.

(8) The Division Director shall have the authority to administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(9) Prior to commencing injection operations, the casing in each injection well shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(10) The operator shall give advance notification to the supervisor of the Artesia District Office of the Division of the date and time of the conductance of reentry and replugging operations on the Leonard State Well No. 4, the installation of injection equipment and of the mechanical integrity pressure tests of the injection wells in order that the same may be witnessed.

(11) The applicant shall immediately notify the supervisor of the Artesia District Office of the Division of the failure of the tubing, casing or packer in any of the injection wells, the leakage of water or oil from or around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.

(12) The subject waterflood project is hereby designated the SDX Leonard Grayburg-Jackson Waterflood Project, and the applicant shall conduct injection operations in accordance with Division Rule Nos. 701 through 708 and shall submit monthly progress reports in accordance with Division Rule Nos. 706 and 1115.

(13) The subject waterflood project is hereby approved as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

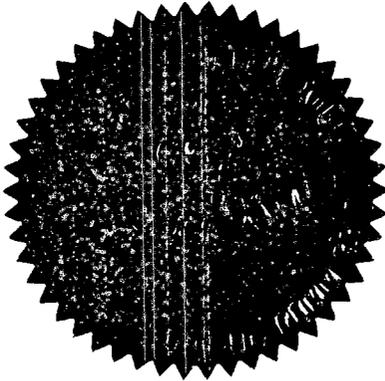
(14) The approved "project area" shall initially comprise the N/2 and N/2 SW/4 of Section 33.

(15) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(16) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(17) 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

## APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose:  Secondary Recovery  Pressure Maintenance  Disposal  Storage  
Application qualifies for administrative approval?  yes  no
- II. Operator: SDX RESOURCES, INC.  
Address: 300 WEST TEXAS, SUITE 525, P. O. BOX 5061 MIDLAND, TX 79704  
Contact party: CHUCK MORGAN Phone: (505) 748-9814
- 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: Chuck Morgan Title Engr  
Signature: Chuck Morgan Date: 1/13/93
- \* 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. \_\_\_\_\_

**APPLICATION FOR AUTHORIZATION TO INJECT****SDX Resources, Inc.**

- 1.) Leonard Fed. #3  
Unit F, Sec. 33, T-17-S, R-29-E,  
Eddy County, New Mexico
  - 2.) Leonard B Fed. #1  
Unit B, Sec. 33, T-17-S, R-29-E,  
Eddy County, New Mexico
- I. SDX plans to covert these 2 wells to injection wells in the Grayburg and San Andres Formations.
  - II. Operator: SDX Resources, Inc.  
300 W. Texas, Suite 525  
P. O. Box 5061  
Midland, TX 79704-5061  
  
Chuck Morgan (915) 685-1761
  - III. Well Data: See Attachment A
  - IV. This is not an expansion of existing project.
  - V. See Attached maps. Attachment B-1 and B-2.
  - VI. Tabular list of wells within both areas of review. (See Attachments C-1 and C-2) (P&A Schematics Attachment D)
  - VII. (1) Proposed average daily injection volume: 200 BWPD  
Maximum daily injection volume: 1,000 BWPD  
  
(2) This will be a closed system.  
  
(3) Proposed average injection pressure: unknown  
Proposed maximum injection pressure: 530 psi  
  
(4) Injected water would be produced water from the Grayburg Jackson. At a later date, supplemental make up water consisting of fresh water from the

Double Eagle fresh water supply system could possibly be added to the system. Injection Fluid Analysis (Attachment E).

- (5) Formation Water Analysis (Attachment E).
- VIII.(1) The proposed injection interval is the portion of the Grayburg and San Andres Formations consisting of porous sand and dolomite.
- (2) Fresh water zones overlie the proposed injection zone at approximately 150'.
- IX. The proposed injection interval in both wells may be acidized with 15% HCL.
- X. Well logs and test data are on file at the OCD.
- XI. A windmill exist very near the 1/2 mile area of review. (Location an Analysis see Attachment F.)
- XII. Geologic and engineering data have been examined and no evidence of open faults or any other hydrological connection between the injection zones and any underground fresh water aquifers has been found.
- XIII.(A) Certified letters sent to surface owners and offset operators attached. (See Attachment G)
- (B) Copy of legal advertisement attached. (See Attachment H) (Copy of affidavit of publication attached.)

ATTACHMENT A

Page 1

III. Well Data: Leonard Fed. #3

- A. (1) Unit F, Section 33, T-17-S, R-29-E, Eddy County, New Mexico being 1980' FNL and 1980' FWL.
- (2) Casing: 8 5/8", 24# at 357' cemented with 75 sx.  
TOC at Surface (Calc.)  
5 1/2", 15.5# at 2989' cemented with 125 sx.  
TOC at 2227' (Calc.)  
TD: 3052'  
PBSD: 2989'
- (3-4) Proposed well condition: Same as above with 2 3/8" plastic coated tbg at 2550' with plastic coated R-4 packer at 2550'.
- B. (1) Injection Formation: Grayburg and San Andres
- (2) Injection interval will be thru existing perforations 2654'-2956'.
- (3) Well was drilled and completed as a producer in the Grayburg and San Andres.
- (4) Perforations: 2654-70, 2708-13, 2944-49, 2951-56.
- (5) Next shallow oil or gas zone: Queen  
Next deeper oil or gas zone: Yeso

ATTACHMENT A

Page 2

III. Well Data: Leonard B Fed. #1

- A. (1) Unit B, Section 33, T-17-S, R-29-E, Eddy County, New Mexico being 330' FNL and 1650' FEL.
- (2) Casing: 8 1/4", 24# at 310' cemented with 50 sx.  
TOC at 90' (Calc.)  
5 1/2", 15# at 2754' cemented with 100 sx.  
TOC at 2145' (Calc.)  
O.H. 2754'-3048'
- (3-4) Proposed well condition: Casing same as above. Select perforations may be added in casing between 2650'-2754'. Injection will be into additional perms 2650'-2754' and O.H. 2754'-3048' thru 2 3/8 plastic coated tubing with a R-4 plastic packer set at 2550'.
- B. (1) Injection Formation: Grayburg and San Andres
- (2) Injection interval: perms 2650'-2754' and O.H. 2754'-3048'.
- (3) Well was drilled and completed as a producer in the Grayburg and San Andres.
- (4) Perforations: Proposed 2650'-2754' O.H. 2754'-3048'
- (5) Next shallow oil or gas zone: Queen  
Next deeper oil or gas zone: Yeso

