

NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

UNDERGROUND INJECTION CONTROL
PROGRAM

CLASS II DEMONSTRATION

Submitted to:

U. S. ENVIRONMENTAL PROTECTION AGENCY

September 15, 1981

CLASS II DEMONSTRATION

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PROGRAM DESCRIPTION

a. Program structure, coverage and scope.

1. Background

The New Mexico Oil Conservation Commission was created in 1935.

The Act creating the Commission gave it three broad areas of responsibility:

1. The prevention of waste of oil and natural gas.
2. The protection of correlative rights.
3. The protection of fresh water.

To protect fresh water, current regulations prohibit injection into any aquifer containing ground water with a total dissolved solids concentration of 10,000 mg/l or less which is not an exempted aquifer.

Subsurface injection of fluids began in New Mexico almost thirty years ago with the injection of produced salt water back into oil producing zones. The Commission regulated these operations from their beginning.

In a 1977 state government reorganization, the duties of the Commission were transferred to the Oil Conservation Division (OCD) which was created as part of the new Energy and Minerals Department. The Commission, whose members are the Oil Conservation Division Director, the State Geologist, and the State Land Commissioner, continues to hear oil and gas cases on appeal, or in the first instance if they are judged to be of sufficient importance. The Oil Conservation Division now regulates all oil, gas, CO₂ and geothermal drilling, production, injection, storage, transportation, treating, refining, and associated waste disposal operations throughout the state.

2. OCD Organization

The OCD includes a central administrative office in Santa Fe and four District offices. Districts I and II encompass the producing counties in the southeast where most injection takes place. District III includes the producing

counties in the northwest. District IV, which includes most of the remaining counties, has its headquarters at the main office in Santa Fe. (See Exhibit I - District Map.) Sixty people are employed by the OCD in its four offices, (See Exhibit II - Table of Organization for a listing of employees' distribution between offices and for job titles.)

Complete well records for each District are maintained at the District offices and well records for the entire state are located in Santa Fe. The data processing section in Santa Fe compiles the drilling, production, injection, disposal, transportation, and processing data submitted by operators and refiners and publishes extensive summaries of oil and gas activities, including injection.

The Division budget for the state fiscal year which began July 1, 1981 is \$1,884,800 which includes a projected \$157,000 in federal UIC funds.

3. Class II Injection Wells

Injection in connection with oil and gas operations is taking place at present in the San Juan Basin in the northwest quadrant of the state (District III) and in the Permian Basin in the southeast quadrant (Districts I and II). There are no Class II injection wells in District IV at the present time.

At the beginning of 1981 there were 3,586 active Class II wells included in secondary recovery and pressure maintenance projects. Of these wells, 3,209 are located in the southeast and 377 in the northwest. Salt water and fresh water are the primary fluids injected. Some treated effluent from municipal sewage plants is also injected. Natural gas is injected to maintain pressure in some wells and large scale injection of CO₂ for tertiary recovery is anticipated in a few years.

Other Class II wells included, in January, 247 active salt water disposal wells in the southeast and 16 in the northwest. In addition, there are 19 LPG storage wells located in the southeast.

The waterflood and pressure maintenance injection well inventory for the UIC program has been completed through 1979. Listed in the inventory are 395 active and inactive or abandoned water flood and pressure maintenance projects which include 3680 injection wells and 4436 active producing wells. Injection volumes for 1979 totalled 226,034,524 barrels of water and 16,838,675 mcf. of gas. Injection volumes for salt water disposal wells in 1980 totalled 138,662,464 barrels.

4. Statutory Authority for the UIC Program

Primary authority for the regulation of Class II wells is vested in the Division by the Oil and Gas Act (Section 70-2-1 through 70-2-36, New Mexico Statutes Annotated, 1978 Compilation). Many of the provisions of the Act refer to the prevention of waste of oil and gas. In many cases, however, their enforcement also serves to protect underground sources of drinking water. As outlined in the Statement of Legal Authority, a number of provisions of Section 70-2-12 confer specific authority for regulating the construction and operation of injection wells and the protection of ground water. Section 70-2-11 (A) authorizes the Division to "make and enforce rules, regulations and orders, and to do whatever may be reasonably necessary to carry out the purpose of this act, whether or not indicated or specified in any section hereon." Under this provision, after public notice and hearing the Division has adopted Rules for the construction and operation of injection wells.

The Rules contained in Section I - SECONDARY RECOVERY, PRESSURE MAINTENANCE, SALT WATER DISPOSAL, AND UNDERGROUND STORAGE specify the requirements for obtaining permits to inject, casing and cementing requirements, operation and maintenance, testing and monitoring, plugging and abandonment, and reporting requirements.

Rule 701. A. PERMIT FOR INJECTION REQUIRED specifies that "The injection of gas, air, water, or any other medium into any reservoir for the purpose of maintaining reservoir pressure or for the purpose of secondary or other enhanced

recovery or for storage or the injection of water into any formation for the purpose of water disposal shall be permitted only by order of the Division after notice and hearing, unless otherwise provided herein."

Other Rules Sections entitled MISCELLANEOUS RULES, DRILLING, ABANDONMENT AND PLUGGING OF WELLS, REPORTS, RULES ON PROCEDURE, AND RULES ON ADMINISTRATION contain Rules which are applicable to both production and injection wells.

Specific rules are referred to in appropriate sections of this description.

5. UIC Program

Under Division Rule 701-A, permits for new secondary recovery and pressure maintenance projects are granted by Division Order only after public notice and hearing. Most salt water disposal wells are also approved after a hearing. Exceptions to the hearing requirement for water flood expansions, some salt water disposal wells, and storage wells are spelled out in 701-B through G. Administrative approval without a hearing can be granted if the proposed wells meet the requirements of these sections.

Before injection can be started in any well, a mechanical integrity test of the well must be conducted. Division Field Inspectors witness most such tests.

Operators of injection wells are required to keep accurate records and file monthly reports of the volume of fluids injected and injection pressures. Operators of LPG storage wells file annual reports.

Yearly bradenhead tests are currently conducted on almost all injection wells to assure their continuing mechanical integrity. Field Inspectors witness these tests in most cases. Wells found to be defective must be repaired by the operators or plugged under Division supervision.

When drinking water wells become contaminated by salt water or other contaminants, test wells are drilled and water samples analyzed to determine the contamination source. To date such studies have indicated that a defective injection well was the probable cause of contamination in only one instance.

When Rule violations or violations of the Orders permitting injection operations are encountered, Field Inspectors and District Supervisors contact the operator(s) directly or by letter and require that the necessary repairs or changes in procedures be made. The Division Director will contact the operator(s) in cases of serious or persistent violations. Legal action seeking fines may be taken by the Director against operators for repeated or serious violations.

Each District submits a monthly report of its UIC activities to the Santa Fe office. The reports list the number of wells inspected, the types of tests conducted, the number and types of problems encountered, and the enforcement actions taken. These reports are summarized in semi-annual reports to EPA.

Most Division staff members devote some, or in some cases, most of their time to UIC activities. In FY 80, twenty-seven of the thirty-one employees in Santa Fe devoted an average of 15.17 per cent of their time to UIC work. In the three District offices, twenty-six of the twenty-seven employees devoted an average of 23.65 per cent of their time to UIC work. The higher percentage in the Districts reflects the large amount of time spent by Field Inspectors inspecting and testing injection and related production wells.

Program Description

b. Permitting Process

1. Application and Hearing Requirements

Prior to beginning injection, all injection wells and injection projects must receive a permit to inject by an order of the Division. Such orders (permits) are issued by the Director after public notice and hearing or by administrative procedure as specified in Rule 701., as follows:

RULE 701. INJECTION OF FLUIDS INTO RESERVOIRS

A. Permit for Injection Required

The injection of gas, liquefied petroleum gas, air, water, or any other medium into any reservoir for the purpose of maintaining reservoir pressure or for the purpose of secondary or other enhanced recovery or for storage or the injection of water into any formation for the purpose of water disposal shall be permitted only by order of the Division after notice and hearing, unless otherwise provided herein.

B. Method of Making Application

1. Applications for authority for the injection of gas, liquefied petroleum gas, air, water or any other medium into any formation for any reason, including but not necessarily limited to the establishment of or the expansion of water flood projects, enhanced recovery projects, pressure maintenance projects, and salt water disposal, shall be by submittal of Division Form C-108 complete with all attachments.
2. The applicant shall furnish, by certified or registered mail, a copy of the application to the owner of the surface of the land on which each injection or disposal well is to be located and to each leasehold operator within one-half mile of the well.

3. Administrative Approval

If the application is for administrative approval rather than for a hearing, it must also be accompanied by a copy of a legal publication published by the applicant in a newspaper of general circulation in the county in which the proposed injection well is located. (The details required in such legal notice are listed on Side 2 of Form C-108.)

No application for administrative approval may be approved until 15 days following receipt by the Division of Form C-108 complete with all attachments including evidence of mailing as required under paragraph 2 above and proof of publication as required by paragraph 3 above.

If no objection is received within said 15-day period, and a hearing is not otherwise required, the application may be approved administratively.

C. Hearings

If a written objection to any application for administrative approval of an injection well is filed within 15 days after receipt of a complete application, or if a hearing is required by these rules or deemed advisable by the Division Director, the application shall be set for hearing and notice thereof given by the Division.

D. Salt Water Disposal Wells

1. The Division Director shall have authority to grant an exception to the requirements of Rule 701-A for water disposal wells only, without notice and hearing, when the waters to be disposed of are mineralized to such a degree as to be unfit for domestic, stock, irrigation, or other general use, and when said waters are to be disposed of into a formation older than Iriassic (Lea County only) which is nonproductive of oil or gas within a radius of two miles from the proposed injection well, and provided no objections are received pursuant to Rule 701-B(3).
2. Disposal will not be permitted into zones containing waters having total dissolved solids concentrations of 10,000 mg/l or less except after notice and hearing, provided however, that the Division may establish exempted aquifers for such zones wherein such injection may be approved administratively.
3. Notwithstanding the provisions of paragraph 2. above, the Division Director may authorize disposal into such zones if the waters to be disposed of are of higher quality than the native water in the disposal zone.

E. Pressure Maintenance Projects

1. Pressure maintenance projects are defined as those projects in which fluids are injected into the producing horizon in an effort to build up and/or maintain the reservoir pressure in an area which has not reached the advanced or "stripper" state of depletion.
2. All applications for establishment of pressure maintenance projects shall be set for hearing. The project area and the allowable formula for any pressure maintenance project shall be fixed by the Division on an individual basis after notice and hearing.
3. Pressure maintenance projects may be expanded and additional wells placed on injection only upon authority from the Division after notice and hearing or by administrative approval.

The Division Director shall have authority to grant an exception to the hearing requirements of Rule 701-A for the conversion to injection of additional wells within a project area provided that any such well is necessary to develop or maintain efficient pressure maintenance within such project and provided that no objections are received pursuant to Rule 701-B(3).

F. Water Flood Projects

1. Water flood projects are defined as those projects in which water is injected into a producing horizon in sufficient quantities and under sufficient pressure to stimulate the production of oil from other wells in the area, and shall be limited to those areas in which the wells have reached an advanced state of depletion and are regarded as what is commonly referred to as "stripper" wells.
2. All applications for establishment of water flood projects shall be set for hearing.

The project area of a water flood project shall comprise the proration units owned or operated by a given operator upon which injection wells are located plus all proration units owned or operated by the same operator which directly or diagonally offset the injection tracts and have producing wells completed on them in the same formation; provided however, that additional proration units not directly nor diagonally offsetting an injection tract may be included in the project area if, after notice and hearing, it has been established that such additional units have wells completed thereon which have experienced a substantial response to water injection.

3. The allowable assigned to wells in a water flood project area shall be equal to the ability of the wells to produce and shall not be subject to the depth bracket allowable for the pool nor to the market demand percentage factor.

Nothing herein contained shall be construed as prohibiting the assignment of special allowables to wells in buffer zones after notice and hearing. Special allowables may also be assigned in the limited instances where it is established at a hearing that it is imperative for the protection of correlative rights to do so.

4. Water flood projects may be expanded and additional wells placed on injection only upon authority from the Division after notice and hearing or by administrative approval.

The Division Director shall have authority to grant an exception to the hearing requirements of Rule 701-A for conversion to injection of additional wells provided that any such well is necessary to develop or maintain thorough and efficient waterflood injection for any authorized project and provided that no objections are received pursuant to Rule 701-B(3).

G. Storage Wells

The Division Director shall have authority to grant an exception to the hearing requirements of Rule 701-A for the underground storage of liquafied petroleum gas or liquid hydrocarbons in secure caverns within massive salt beds, and provided no objections are received pursuant to Rule 701-B(3).

In addition to the filing requirements of Rule 701-B, the applicant for approval of a storage well under this rule shall file the following:

1. With the Division Director:
 - (a) A plugging bond in accordance with the provisions of Rule 101;
2. With the appropriate district office of the Division in TRIPLICATE:
 - (a) Form C-101, Application for Permit to drill, Deepen, or Plug Back;
 - (b) Form C-102, Well Location and Acreage Dedication Plat; and
 - (c) Form C-105, Well Completion or Recompletion Report and Log.

As indicated in Rule 701.B. above, all applicants for permits to inject must submit Division Form C-108, complete with all attachments, signed by the applicant or his responsible employee, and indicate whether or not the application qualifies for administrative approval in the judgement of the applicant. Information on each well proposed for injection, as well as information on all other wells in the one-half mile area of review, and proof of notice and certification, must be submitted on Form C-108, which follows:

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APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☐ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ yes ☐ no
- II. Operator: _____
Address: _____
Contact party: _____ Phone: _____
- 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: _____ Title: _____
- Signature: _____ 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. _____

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.

Under the provisions of Rule 701.C. through 701.G., the Director may grant an exception to the hearing requirement of 701.A. if he considers it advisable to do so and no objection is received within fifteen days. Under these Rules, if an application is judged to be complete and no objections are received during the fifteen day waiting period, the Director may issue an administrative order approving or denying the applicant a permit to inject.

If the application does not qualify under the Rules for administrative approval, or if an objection is received, the case is set for hearing under the provisions of Rules in Section N, as follows:

N - RULES ON PROCEDURE

RULE 1201. NECESSITY FOR HEARING

Except as provided in some general rule herein, before any rule, regulation or order, including revocation, changes, renewal or extension thereof, shall be made by the Division, a public hearing before the Commission or a legally appointed Division Examiner shall be held at such time and place as may be prescribed by the Division.

RULE 1202. EMERGENCY ORDERS

Notwithstanding any other provision of these rules, in case an emergency is found to exist by the Division, which, in its judgment, requires the making of a rule, regulation, or order without a hearing having first been had or concluded, such emergency rule, regulation, or order when made by the Division shall have the same validity as if a hearing with respect to the same had been held before the Division after due notice. Such emergency rule, regulation, or order shall remain in force no longer than 15 days from its effective date, and in any event, it shall expire when the rule, regulation, or order made after due notice and hearing with respect to the subject matter of such emergency rule, regulation, or order becomes effective.

RULE 1203. METHOD OF INITIATING A HEARING

The Division upon its own motion, the Attorney General on behalf of the State, and any operator or producer, or any other person having a property interest may institute proceedings for a hearing. If the hearing is sought by the Division it shall be on motion of the Division and if by any other person it shall be by application. The application shall be in triplicate and shall state (1) the name of the applicant, (2) the name or general description of the common source or sources of supply or the area affected by the order sought, (3) briefly the general nature of the order, rule, or regulation sought, and (4) any other matter required by a particular rule or rules, or order of the Division. The application shall be signed by the person seeking the hearing or by his attorney.

When conditions are such as to require verbal application to place a matter for hearing on a given docket, the Division will accept such verbal application in order to meet publishing deadlines. However, if written application, filed in accordance with the procedures outlined above, has not been received by the Division's Santa Fe office at least ten days before the date of the hearing, the case will be dismissed.

RULE 1204. METHOD OF GIVING LEGAL NOTICE FOR HEARING

Notice of each hearing before the Commission and notice of each hearing before a Division Examiner shall be given by personal service on the person affected or by publication once in a newspaper of general circulation published at Santa Fe, New Mexico, and once in a newspaper of general circulation published in the county or each of the counties, if there be more than one, in which any land, oil, or gas, or other property which may be affected is situated.

RULE 1205. CONTENTS OF NOTICE OF HEARING

Such notice shall be issued in the name of "The State of New Mexico" and shall be signed by the Director of the Division, and the seal of the Commission shall be impressed thereon.

The notice shall specify whether the case is set for hearing before the Commission or before a Division Examiner and shall state the number and style of the case and the time and place of hearing and shall briefly state the general nature of the order or orders, rule or rules, regulation or regulations to be promulgated or effected. The notice shall also state the name of the petitioner or applicant, if any, and unless the contemplated order, rule, or regulation is intended to apply to and affect the entire state, it shall specify or generally describe the common source or sources of supply which may be affected by such order, rule, or regulation.

RULE 1206. PERSONAL SERVICE OF NOTICE

Personal service of the notice of hearing may be made by any agent of the Division or by any person over the age of 18 years in the same manner as is provided by law for the service of summons in civil actions in the district courts of this state. Such service shall be complete at the time of such personal service or on the date of publication, as the case may be. Proof of service shall be by the affidavit of the person making personal service or of the publisher of the newspaper in which publication is had. Service of the notice shall be made at least 10 days before the hearing.

RULE 1207. PREPARATION OF NOTICES

After a motion or application is filed with the Division the notice or notices required shall be prepared by the Division and service and publication thereof shall be taken care of by the Division without cost to the applicant.

RULE 1208. FILING PLEADINGS: COPY DELIVERED TO ADVERSE PARTY OR PARTIES

When any party to a hearing files any pleading, plea, or motion of any character (other than application for hearing) which is not by law or by these rules required to be served upon the adverse party or parties, he shall at the same time either deliver or mail to the adverse party or parties who have entered their appearance therein, or their respective attorneys of record, a copy of such pleading, plea, or motion. For the purposes of these rules, an appearance of any interested party shall be made either by letter addressed to the Division or in person at any proceeding before the Commission or before an Examiner, with notice of such appearance to the parties from whom such pleadings, pleas, or motions are desired.

RULE 1209. CONTINUANCE OF HEARING WITHOUT NEW SERVICE

Any hearing before the Commission or an Examiner held after due notice may be continued by the person presiding at such hearing to a specified time and place without the necessity of notice of the same being again served or published. In the event of any continuance, a statement thereof shall be made in the record of the hearing which is continued.

RULE 1210. CONDUCT OF HEARINGS

Hearings before the Commission or Examiner shall be conducted without rigid formality. A transcript of testimony shall be taken and preserved as a part of the permanent record of the Division. Any person testifying in response to a subpoena issued by the Commission or any member thereof, or the authorized representative of the Division Director, and any person seeking to testify in support of an application or motion or in opposition thereto shall be required to do so under oath. However, relevant unsworn comments and observations by any interested party will be designated as such and included in the record. Comments and observations by representatives of operators' committees, the United States Geological Survey, the United States Bureau of Mines, the New Mexico Bureau of Mines, and other competent persons are welcomed. Any Examiner legally appointed by the Division Director may conduct such hearings as may be referred to such Examiner by the Director.

RULE 1211. POWER TO REQUIRE ATTENDANCE OF WITNESSES AND PRODUCTION OF EVIDENCE

The Commission or any member thereof, or the authorized representative of the Division Director has statutory power to subpoena witnesses and to require the production of books, papers, and records in any proceeding before the Commission or Division. A subpoena will be issued for attendance at a hearing upon the written request of any person interested in the subject matter of the hearing. In case of the failure of a person to comply with the subpoena issued, an attachment of the person may be issued by the district court of any district in the state, and such court has powers to punish for contempt. Any person found guilty of swearing falsely at any hearing may be punished for contempt.

RULE 1212. RULES OF EVIDENCE

Full opportunity shall be afforded all interested parties at a hearing to present evidence and to cross-examine witnesses. In general, the rules of evidence applicable in a trial before a court without a jury shall be applicable, provided that such rules may be relaxed, where, by so doing, the ends of justice will be better served. No order shall be made which is not supported by competent legal evidence.

RULE 1213. EXAMINERS' QUALIFICATIONS AND APPOINTMENT

The Division Director shall, by ex parte order, designate and appoint not more than four individuals to be examiners. Each Examiner so appointed shall be a member of the staff of the Division, but no Examiner need be a full time employee of the Division. The Director may, by ex parte order, designate and appoint a successor to any person whose status as an Examiner is terminated for any reason. Each individual designated and appointed as an Examiner must have at least six years practical experience as a geologist, petroleum engineer or licensed lawyer, or at least two years of such experience and a college degree in geology, engineering, or law; provided however, that nothing herein contained shall prevent any member of the Commission from being designated as, or serving as, an Examiner.

RULE 1214. REFERRAL OF CASES TO EXAMINERS

The Division Director may refer any matter or proceeding to any legally designated and appointed Examiner for hearing in accordance with these rules. The Examiner appointed to hear any specific case shall be designated by name.

RULE 1215. EXAMINER'S POWER AND AUTHORITY

The Division Director may, by ex parte order, limit the powers and duties of the Examiner in any particular case to such issues or to the performance of such acts as the Director deems expedient; however, subject only to such limitations as may be ordered by the Director, the Examiner to whom any matter or proceedings is referred under these rules shall have full authority to hold hearings on such matter or proceeding in accordance with and pursuant to these rules. The Examiner shall have the power to regulate all proceedings before him and to perform all acts and take all measures necessary or proper for the efficient and orderly conduct of such hearing, including the swearing of witnesses, receiving of testimony and exhibits offered in evidence subject to such objections as may be imposed, and shall cause a complete record of the proceedings to be made and transcribed and shall certify same to the Director as hereinafter provided.

RULE 1216. HEARINGS WHICH MUST BE HELD BEFORE COMMISSION

Notwithstanding any other provisions of these rules, the hearing on any matter shall be held before the Commission (1) if it is a hearing de novo, or (2) if the Division Director in his discretion desires the Commission to hear the matter.

RULE 1217. EXAMINER'S MANNER OF CONDUCTING HEARING

An Examiner conducting a hearing under these rules shall conduct himself as a disinterested umpire.

RULE 1218. REPORT AND RECOMMENDATIONS, EXAMINER'S HEARINGS

Upon the conclusion of any hearing before an Examiner, the Examiner shall promptly consider the proceedings in such hearing, and based upon the record of such hearing the Examiner shall prepare his written report and recommendations for the disposition of the matter of proceeding by the Division. Such report and recommendations shall either be accompanied by a proposed order or shall be in the form of a proposed order, and shall be submitted to the Division Director with the certified record of the hearing.

RULE 1219. DISPOSITION OF CASES HEARD BY EXAMINERS

After receipt of the report and recommendations of the Examiner, the Division Director shall enter the Division's order disposing of the matter or proceeding.

RULE 1220. DE NOVO HEARING BEFORE COMMISSION

When any order has been entered by the Division pursuant to any hearing held by an Examiner, any party adversely affected by such order shall have the right to have such matter or proceeding heard de novo before the Commission, provided that within 30 days from the date such order is rendered such party files with the Division a written application for such hearing before the Commission. If such application is filed, the matter or proceeding shall be set for hearing before the Commission at the first available hearing date following the expiration of fifteen days from the date such application is filed with the Division. Any person affected by the order or decision rendered by the Commission after hearing before the Commission may apply for rehearing pursuant to and in accordance with the provisions of Rule 1222 and said Rule 1222 together with the law applicable to rehearing and appeals in matters and proceedings before the Commission shall thereafter apply to such matter or proceeding.

RULE 1221. NOTICE OF COMMISSION AND DIVISION ORDERS

Within ten days after any order, including any order granting or refusing rehearing, or order following rehearing, has been rendered, a copy of such order shall be mailed by the Division to each person or his attorney of record who has entered his appearance of record in the matter of proceeding pursuant to which such order is rendered.

RULE 1222. REHEARINGS

Within 20 days after entry of any order or decision of the Commission any person affected thereby may file with the Division an application for rehearing in respect of any matter determined by such order or decision, setting forth the respect in which such order or decision is believed to be erroneous. The Commission shall grant or refuse any such application in whole or in part within 10 days after the same is filed and failure to act thereon within such period shall be deemed a refusal thereof and a final disposition of such application. In the event the rehearing is granted, the Commission may enter such new order or decision after rehearing as may be required under the circumstances.

RULE 1223. CHANGES IN FORMS AND REPORTS

Any change in the forms and reports or rules relating to such forms and reports shall be made only by order of the Commission or Division issued after due notice and hearing.

As stated in Rule 1206, above, notice of hearing, including notice when an administrative application is set for hearing, must be given by personal service or by publication in a newspaper at least ten days before the hearing. In point of fact, all notices for hearing are published in newspapers, and Division instructions to newspapers result in publication of hearing notices, at least twelve days prior to hearings. If this notice should prove insufficient for study of the case and preparation for the hearing, a request for a continuance to a date at least two weeks following the scheduled date will be honored by the Division when such request is made by any affected party.

As stated in Rule 701 and above, applications which qualify for administrative approval under the Rules and which are submitted with the proper proof of mailing and publication (*) can be approved by Administrative Order of the Division fifteen days following receipt of the application unless a written objection has been received. An example of such an Order approving a salt water disposal well is attached as Exhibit III.

As specified in Rule 701.C. above, if a written objection is received within the fifteen day waiting period, such application will not be approved administratively but will be set for hearing. Also, if the Division, in evaluating the application, decides that there are significant issues or concerns relative to the proposed injection which could better be resolved at a public hearing, the application will be set for hearing.

Under Rule 1203 above, hearings may be initiated by "The Division upon its own motion, the Attorney General on behalf of the State, and any operator or producer, or any other person having a property interest...". The Division in adopting this rule has provided the broadest appropriate right to initiate proceedings. The broad mandate of the New Mexico Attorney General, as set forth in Section 8-5-2, NMSA, 1978, states in part:

...the Attorney General shall:

*see Form C-108 XIII. PROOF OF NOTICE

...
J. Appear before local, state and federal courts and regulatory officers, agencies and bodies, to represent and to be heard on behalf of the state when, in his judgement, the public interest of the state requires such action or when requested to do so by the governor; ...

This general power coupled with the specific responsibilities of the Division and the individual self-interests of the producers, operators and other holders of property interests assures that all affected interests can be adequately protected.

As indicated above, Division Rules require that all applications, whether for administrative approval or approval after notice and hearing, must be advertised in newspapers for the information of all interested parties and the general public. An example of such an advertisement placed by the Division prior to a hearing is included as Exhibit IV.

Verbal applications are accepted if the applicant wishes the case to appear on a specific docket for which there is insufficient time to send a completed application to the Santa Fe office prior to the publishing deadline. However, if verbal application is made, Rule 1203 requires that written application be received at least 10 days prior to the hearing or the case will be dismissed. All notice requirements are the same for applications whether made verbally or in writing.

Approximately thirteen days prior to a hearing, a docket describing all cases to be considered is mailed to a list of interested persons. Anyone so desiring is placed on the docket mailing list. An example of a hearing docket is included as Exhibit V.

Following a Division Hearing, the Director issues an order approving or denying the application as specified in Rules 1218. and 1219. above. If the case has

been heard before the Oil Conservation Commission, the Commission will direct the preparation and issuance of an order of approval or denial.

Orders approving applications commonly contain injection pressure restrictions, reporting requirements, tubing and packer requirements for newly drilled injection wells, or other special requirements governing the construction and operation of the well or project. An example of such an order approving a pressure maintenance project is attached as Exhibit VI. Orders denying applications include the findings which resulted in the denial. One recent such Order denying a salt water disposal application is attached as Exhibit VII.

No exceptions are permitted under the Rules to the requirements of Rule 701.B for making application to inject. All complete applications are disposed of by issuance of an administrative order or an order of the Division after notice and hearing. Thus, no injection can take place until a permit to inject has been issued in the form of an administrative order or an order of the Division following a hearing.

In all cases the burden of proof that the proposed injection will not endanger USDW's is upon the operator and not upon the Division or the Director.

A flow chart of the permitting process is included as Exhibit VIII.

2. Construction Requirements

When an Order approving an injection well or project has been issued, the operator submits his plans for the drilling of any required new well or wells on Form C-101 - APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK to the appropriate District office for approval. Form C-102 - WELL LOCATION AND ACREAGE DEDICATION PLAT must also be filed. A description of all proposed operations must be given. Well construction details must meet the requirements of appropriate Rules in Section C - DRILLING and Section I - SECONDARY RECOVERY, ENHANCED RECOVERY, PRESSURE MAINTENANCE, SALT WATER DISPOSAL, AND UNDERGROUND STORAGE. In particular, Rule 106. requires the following:

RULE 106. SEALING OFF STRATA

- (a) During the drilling of any oil well, gas well, injection well, or any other service well, all oil, gas, and water strata above the producing and/or injection horizon shall be sealed or separated in order to prevent their contents from passing into other strata.
- (b) All fresh waters and waters of present or probable value for domestic, commercial, or stock purposes shall be confined to their respective strata and shall be adequately protected by methods approved by the Division. Special precautions by methods satisfactory to the Division shall be taken in drilling and abandoning wells to guard against any loss of artesian water from the strata in which it occurs, and the contamination of artesian water by objectionable water, oil, or gas.
- (c) All water shall be shut off and excluded from the various oil and gas bearing strata which are penetrated. Water shut-offs shall ordinarily be made by cementing casing.

In addition, Paragraph (a) of Rule 107. CASING AND TUBING REQUIREMENTS specifies in part that "Any well drilled for oil or natural gas or for injection shall be equipped with such surface and intermediate casing string and cement as may be necessary to effectively seal off and isolate all water, oil, and gas-bearing strata and other strata encountered in the well down to the casing point....".

In addition, Rule 702. CASING AND CEMENTING OF INJECTION WELLS requires that "Wells used for injection of gas, air, water, or any other medium, into any formation shall be cased with safe and adequate casing or tubing so as to prevent leakage and such casing or tubing shall be so set and cemented to prevent the movement of formation or injected fluid from the injection zone into any other zone or to the surface around the outside of any casing string."

A surety bond to cover the proper plugging and abandonment of the well must have been submitted to the Division and approved, as required by Rule 101, as follows:

RULE 101. PLUGGING BOND

(a) Any person, firm, corporation, or association who has drilled or acquired, is drilling, or proposes to drill or acquire any oil, gas, or service well on privately owned or state owned lands within this state shall furnish to the Division, and obtain approval thereof, a surety bond running to the State of New Mexico, in a form prescribed by the Division, and conditioned that the well be plugged and abandoned in compliance with the rules and regulations of the Division. Such bond may be a one-well plugging bond or a blanket plugging bond. All bonds shall be executed by a responsible surety company authorized to do business in the State of New Mexico.

(b) Blanket plugging bonds shall be in the amount of fifty thousand dollars (\$50,000) conditioned as above provided, covering all oil, gas, or service wells drilled, acquired or operated in this state by the principal on the bond.

One-well plugging bonds shall be in the amounts stated below in accordance with the depth and location of the well:

Chaves, Eddy, Lea, McKinley, Rio Arriba, Roosevelt, Sandoval, and San Juan Counties, New Mexico:

<u>Projected Depth of Proposed Well or Actual Depth of Existing Well</u>	<u>Amount of Bond</u>
Less than 5,000 feet	\$ 5,000
5,000 feet to 10,000 feet	\$ 7,500
More than 10,000 feet	\$12,000

All Other Counties in the State:

<u>Projected Depth of Proposed Well or Actual Depth of Existing Well</u>	<u>Amount of Bond</u>
Less than 5,000 feet	\$ 7,500
5,000 feet to 10,000 feet	\$10,000
More than 10,000 feet	\$12,500

Revised plans for an actively drilling well may be approved by the appropriate District Office of the Division for drilling as much as 500 feet deeper than the normal maximum depth allowed on the well's bond. Any well to be drilled more than 500 feet deeper than the normal depth bracket must be covered by a new bond in the amount prescribed for the deeper depth bracket.

The bond requirement for any intentionally deviated well shall be determined by the well's measured depth, and not its true vertical depth.

(c) Any bond required by this rule is a plugging bond, not a drilling bond, and shall endure until any well drilled or acquired under such bond has been plugged and abandoned and such plugging and abandonment has been approved by the Division, or has been covered by another bond approved by the Division.

(d) Transfer of a property does not of itself release a bond. In the event of transfer of ownership of a well, the appropriate form, C-103 or C-104, properly executed, shall be filed with the District Office of the Division in accordance with Rule 1103 or Rule 1104 by the new owner of the well. The District Office may approve the transfer providing that a new one-well bond covering the well, or a request that the well be covered by the new owners' blanket bond, has been approved by the Santa Fe office of the Division.

Upon approval of the bond and the Form C-103 or C-104, the transferor is released of plugging responsibility for the well, and upon request, the original bond will be released. No blanket bond will be released, however, until all wells covered by the bond have been plugged and abandoned or transferred in accordance with the provisions of this rule.

(e) All bonds shall be filed with the Santa Fe office of the Division, and approval of such bonds, as well as releases thereof, obtained from said office.

(f) All bonds required by these rules shall be conditioned for well plugging and location cleanup only, and not to secure payment for damages to livestock, range, water, crops, tangible improvements, nor any other purpose.

The District Supervisors review the applications and approve them if they meet the Rule requirements for ground water protection and other requirements. Orders approving injection projects now require the operators to notify the District Supervisor when injection well completion operations are taking place so that inspections can be made by District Field Inspectors if deemed necessary to assure compliance with the permit and appropriate rules and regulations.

If the approved injection wells are to be converted producing wells, the operator files a description of his conversion plans on Form C-103. SUNDRY NOTICES AND REPORTS ON WELLS. District Supervisors must approve these plans in the same manner as for new wells.

When work has been completed on both new and converted wells, operators must file a Form C-103 describing exactly what was done and when it was completed.

Rule 704. TESTING AND MONITORING requires in part that "Prior to commencement of injection, wells shall be tested to assure the initial integrity of the casing and the tubing and packer, if used, including pressure testing of the casing-tubing annulus". The operator must advise the Division of the date and time of the test so that it may be witnessed by a Field Inspector.

Rule 705. COMMENCEMENT, DISCONTINUANCE, AND ABANDONMENT OF INJECTION OPERATIONS requires in part that "Immediately upon the commencement of injection operations in any well, the operator shall notify the Division of the date such operation began."

3. Wells on Federal Land

Injection projects and individual injection wells are approved by the Division in the above manner regardless of whether or not the well or wells are to be located on federal land. However, when the Division has issued an order for wells on federal land, operators file intentions to drill or convert wells to injection with the U. S. Geological Survey instead of the Division District Offices. Applications are made on federal forms which are comparable to the

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state's C-101 and C-103; USGS Form 9-331C. APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK (submitted with Division Form C-102. WELL LOCATION AND ACREAGE DEDICATION PLAT); USGS Form 9-330. WELL COMPLETION OR RECOMPLETION REPORT AND LOG.

Rule 4. describes the Division's relationship to the USGS for purposes of regulating well drilling on federal land, as follows:

Rule 4. UNITED STATES GOVERNMENT LEASES

The Division recognizes that all persons drilling on United States Government land shall comply with the United States government regulations. Such persons shall also comply with all applicable state rules and regulations which are not in conflict therewith. Copies of "Application for Permit to Drill, Deepen or Plug Back," (USGS Form No. 9-331C), "Sundry Notices and Reports on Wells," (USGS Form No. 9-331), and "Well Completion or Recompletion Report and Log." (USGS Form No. 9-330), for wells on U. S. Government land shall be furnished by the Division.

Copies of the approved applications and subsequent reports are supplied to the Division by the USGS and these become part of that well file maintained for each injection and production well. The Division inspects well construction procedures for federal wells in the same manner that it does for all other wells.

The Division and the USGS work closely to maintain uniform practices for the regulation of all oil and gas and injection activities for wells throughout the state regardless of land type.

Although the USGS does not require operators to supply a specific well plugging bond, the Division has the authority and funds to plug wells on federal lands if operators cannot be located or cannot be made to do so. The Oil and Gas Reclamation Fund was established by the Oil and Gas Act to provide funds for plugging all wells which cannot be plugged otherwise by operators or by the utilization of bonds.

Section 70-2-38, New Mexico Statutes Annotated, 1978 Compilation, as amended in 1981 by Senate Bill 162, provides in part as follows:

- "A. The Oil and gas reclamation fund shall be administered by the Oil Conservation Division. Expenditures from the fund may be used by the director of the division for the purpose of employing the necessary personnel to survey abandoned wells and to prepare plans for the plugging of abandoned wells which have not been plugged or which have been improperly plugged. The director, as funds become available in the oil and gas reclamation fund, shall reclaim and

properly plug, all abandoned wells in accordance with the provisions of the Oil and Gas Act and the rules and regulations promulgated thereunder. The division may order wells plugged on federal lands on which there are no bonds running to the benefit of the state in the same manner and in accordance with the same procedures as with wells drilled on state and fee land, including utilizing funds from the oil and gas reclamation fund to pay the cost of such plugging.

The reclamation fund is now large enough to provide funds for all required well plugging under this provision of the law for the foreseeable future.

Historically, there is no evidence of any Class II Injection Well ever being operated directly by an agency of the federal government. The traditional pattern has been the granting of oil and gas exploration and production leases to private operators by the federal government. The leaseholders then carry out, or contract to have carried out, all necessary activities, including injection, under the regulatory supervision of both the USGS and the Division. There is no indication that this pattern will vary in the future.

4. Operating Requirements

Injection wells must be maintained and operated as prescribed in the applicable authorizing order and according to the requirements of Rule 703, as follows:

RULE 703. OPERATION AND MAINTENANCE

Injection wells shall be equipped, operated, monitored, and maintained to facilitate periodic testing and to assure continued mechanical integrity which will result in no significant leak in the tubular goods and packing materials used and no significant fluid movement through vertical channels adjacent to the well bore.

Injection projects, including injection wells and producing wells and all related surface facilities shall be operated and maintained at all times in such a manner as will confine the injected fluids to the interval or intervals approved and prevent surface damage or pollution resulting from leaks, breaks, or spills.

Failure of any injection well, producing well, or surface facility, which failure may endanger underground sources of drinking water, shall be reported under the "Immediate Notification" procedure of Rule 116.

Injection well or producing well failures requiring casing repair or cementing are to be reported to the Division prior to commencement of workover operations.

Injection wells or projects which have exhibited failure to confine injected fluids to the authorized injection zone or zones may be subject to restriction of injection volume and pressure, or shut-in, until the failure has been identified and corrected.

In addition to the notice requirements of Rule 703, immediate notification of any major injection well leaks is required under Rule 116 which reads in part:

IMMEDIATE NOTIFICATION. "Immediate Notification" shall be as soon as possible after discovery and shall be either in person or by telephone to the district office of the Division district in which the incident occurs, or if the incident occurs after normal business hours, to the District Supervisor, the Oil and Gas Inspector, or the Deputy Oil and Gas Inspector. A complete written report ("Subsequent Notification") of the incident shall also be submitted in duplicate to the appropriate district office of the Division within ten days after discovery of the incident.

When operators notify the Division of well failures which may endanger underground sources of drinking water, the Division will require tests of such wells to determine the cause of the failure and will order the operator to make the necessary repairs. Depending upon the cause of the problem the operator may be requested to shut-in the well or wells. If necessary, an emergency order requiring that specified wells be shut-in may be issued under the provisions of Rule 1202, included above. Should an operator decline to abide by Division requests or orders, a court injunction can be obtained denying permission for further injection, requiring that the well be shut-in or granting other relief. No such actions have been required to date as operators have complied with Division requests for corrective action.

When additional work is planned on a well, or there is to be any significant change in its status, Form C-103. SUNDRY NOTICES AND REPORTS ON WELLS must be filed in advance with the District Supervisor and Division approval obtained prior to commencing the work. A report of the work's completion must also be filed on Form C-103 as specified in Rule 1103, as follows:

RULE 1103. SUNDRY NOTICES AND REPORTS ON WELLS (Form C-103)

Form C-103 is a dual purpose form to be filed with the appropriate District Office of the Division to obtain Division approval prior to commencing certain operations and also to report various completed operations.

A. Form C-103 as a Notice of Intention

Form C-103 shall be filed in TRIPLICATE by the operator and approval obtained from the Division prior to:

- (1) Effecting a change of plans from those previously approved on Form C-101 or Form C-103.
- (2) Altering a drilling well's casing program or pulling casing or otherwise altering an existing well's casing installation.
- (3) Temporarily abandoning a well.
- (4) Plugging and abandoning a well.
- (5) Performing remedial work on a well which, when completed, will affect the original status of the well. (This shall include making new perforations in existing wells or squeezing old perforations in existing wells, but is not applicable to new wells in the process of being completed nor to old wells being deepened or plugged back to another zone when such re-completion has been authorized by an approved Form C-101, Application for Permit to Drill, Deepen, or Plug Back, nor to acidizing, fracturing, or cleaning out previously completed wells, nor to installing artificial lift equipment.)

In the case of well plugging operations, the Notice of Intention shall include a detailed statement of the proposed work, including plans for shooting and pulling casing, plans for mudding, including weight of mud, plans for cementing, including number of sacks of cement and depths of plugs, and the time and date of the proposed plugging operations. If not previously filed, a complete log of the well on Form C-105 (See Rule 1105) shall accompany the Notice of Intention to plug the well; the bond will not be released until this is complied with.

B. Form C-103 as a Subsequent Report

Form C-103 as a subsequent report of operations shall be filed in accordance with the section of this rule applicable to the particular operation being reported.

Form C-103 is to be used in reporting such completed operations as:

- (1) Commencement of drilling operations
- (2) Casing and cement test
- (3) Altering a well's casing installation
- (4) Temporary abandonment
- (5) Plug and Abandon
- (6) Plugging back or deepening
- (7) Remedial work
- (8) Installation of artificial lifting equipment
- (9) Change in ownership of a drilling well
- (10) Such other operations which affect the original status of the well but which are not specifically covered herein.

Information to be entered on Form C-103, Subsequent Report, for a particular operation is as follows:

(1) Report of Commencement of Drilling Operations

Within ten days following the commencement of drilling operations, the operator of the well shall file a report thereof on Form C-103 in TRIPLICATE. Such report shall indicate the hour and the date the well was spudded.

Program Description

Rule 1103 (cont'd.)

(2) Report of Results of Test of Casing and Cement Job; Report of Casing Alteration

A report of casing and cement test shall be filed by the operator of the well within ten days following the setting of each string of casing or liner. Said report shall be filed in TRIPLICATE on Form C-103 and shall present a detailed description of the test method employed and the results obtained by such test, and any other pertinent information required by Rule 107. The report shall also indicate the top of the cement and the means by which such top was determined. It shall also indicate any changes from the casing program previously authorized for the well.

(3) Report of Temporary Abandonment

A report of temporary abandonment of a well shall be filed by the operator of the well within ten days following completion of the work. The report shall be filed in TRIPLICATE and shall present a detailed account of the work done on the well, including location and type of plugs used, if any and status of surface and downhole equipment, and any other pertinent information relative to the overall status of the well.

(4) Report on Plugging of Well

A report of plugging operations shall be filed by the operator of the well within 30 days following completion of plugging operations on any well. Said report shall be filed in TRIPLICATE on Form C-103 and shall include the date the plugging operations were begun and the date the work was completed, a detailed account of the manner in which the work was performed including the depths and lengths of the various plugs set, the nature and quantities of materials employed in the plugging operations including the weight of the mud used, the size and depth of all casing left in the hole, and any other pertinent information. (See Rules 201-204 regarding plugging operations.)

No plugging report will be approved by the Division until the pits have been filled and the location levelled and cleared of junk. It shall be the responsibility of the operator to contact the appropriate District Office of the Division when the location has been so restored in order to arrange for an inspection of the plugged well and the location by a Division representative.

(5) Report of Remedial Work

A report of remedial work performed on a well shall be filed by the operator of the well within 30 days following completion of such work. Said report shall be filed in QUADRUPLICATE on Form C-103 and shall present a detailed account of the work done and the manner in which such work was performed; the daily production of oil, gas, and water both prior to and after the remedial operation; the size and depth of shots; the quantity of sand, crude, chemical or other materials employed in the operation, and any other pertinent information. Among the remedial work to be reported on Form C-103 are the following:

- (a) Report on shooting, fluid fracturing or chemical treatment of a previously completed well
- (b) Report on squeeze job
- (c) Report on setting of liner or packer
- (d) Report of installation of pumping equipment or gas lift facilities
- (e) Report of any other remedial operations which are not specifically covered herein.

(6) Report on Deepening or Plugging Back

A report of deepening or plugging back shall be filed by the operator of the well within 30 days following completion of such operations on any well. Said report shall be filed in QUADRUPLICATE on Form C-103 and shall present a detailed account of the work done and the manner in which such work was performed. If the well is recompleted in the same pool, it shall also report the daily production of oil, gas, and water both prior to and after recompletion. If the well is recompleted in another pool, Form C-104 must also be filed in accordance with Rule 1104.

(7) Report of Change in Ownership of a Drilling Well

A report of change of ownership shall be filed by the new owner of any drilling well within ten days following actual transfer of ownership. Said report shall be filed in TRIPLICATE on Form C-103 and shall include the name and address of both the new owner and the previous owner, the effective date of the change of ownership, and any other pertinent information. No change in the ownership of a drilling well will be approved by the Division unless the new owner has an approved bond in accordance with Rule 101. (Form C-104 shall be used to report transfer of ownership of a completed well; see Rule 1104.)

(8) Other Reports on Wells

Reports on any other operations which affect the original status of the well but which are not specifically covered herein shall be submitted to the Division on Form C-103, in TRIPLICATE, by the operator of the well within ten days following the completion of such operation.

5. Transfer of Permits

Advance notification and approval by the Division of a transfer of ownership of any injection well is required by Rule 708, as follows:

Rule 708. TRANSFER OF AUTHORITY TO INJECT

Authority to inject granted under any order of the Division is not transferable except upon approval of the Division. Approval of transfer of authority to inject may be obtained by filing Form C-104 in accordance with Rule 1104 (5).

The Division may require a demonstration of mechanical integrity prior to authorizing transfer of authority to inject.

Rule 1104. (5) requires the filing of Form C-104 as follows:

- (5) Form C-104 with Sections I, II, III, and VI, completely filled out in QUINTUPLICATE by the operator of the well in the event there is a change of ownership of any producing well, injection well, or disposal well, or a change of transporter (oil, condensate, casinghead gas, or dry gas), a change in pool designation, lease name, or well number, or any other pertinent change in condition of any such well. When filing Form C-104 for change in ownership, the new operator shall file the form in the above manner, and shall give the name and address of the previous as well as the present operator. The Form C-104 will not be approved by the Division unless the new operator has an approved bond in compliance with Rule 101 .

A mechanical integrity test is required prior to the transfer of any well which the Division has any reason to believe may not be in a satisfactory operating condition.

6. Modification of Permits.

To modify a permit an operator must submit a Form C-108 as in the case of the original application and must fulfil the Proof of Notice requirements in order to obtain administrative approval for increasing the area of the project, for adding injection wells or for other modifications. If the Division, in evaluating the application, decides that there are issues and concerns which could be better resolved at a public hearing, administrative approval will be denied and the case will be set for hearing if the operator so wishes.

7. Termination of Permits

If significant violations of Orders or Division Rules are discovered, or if changed conditions warrant, the Division, on its own initiative, may set a hearing after public notice to consider whether to rescind an operator's approval for injection.

As discussed in Section 4. above, emergency orders under Rule 1202 may also be issued rescinding injection authority or making other permit modifications. These orders are effective for fifteen days and a public hearing must be scheduled within that period. No such orders have been required to date relative to any injection facility nor have any other hearings been required for purposes of revoking injection permits.

As discussed in d. 5. Cancellation of Authority to Inject, (p.31), Rule 705 automatically terminates the authority to inject after a continuous six-month period of non-injection unless an extension is granted administratively by the Director.

8. Emergency Permits

Under Rule 1202, emergency permits could be issued to permit use of a well for injection purposes for up to fifteen days. While the Division's administrative requirements would be delayed under such a process, the technical requirements would still be observed. In all cases, emergency orders require public notice and hearing within fifteen days and the entry of a new order for any extension (temporary or permanent) of the authority to inject. An example of circumstances which might result in the issuance of such an order are: The failure of an authorized injection well with the threat of a serious loss of production, combined with the availability of a good alternative well for injection. To date no emergency orders authorizing injection have been issued.

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9. Inspection and Entry. Recordkeeping and Reports.

The Division's authority to make physical inspections of injection facilities and to require the keeping of records and making of reports for purposes of assuring that permit conditions are met, and Rules are being followed, is contained in Section 70-2-12 New Mexico Statutes Annotated, 1978 Compilation. Paragraph A of this section says in part, "Included in the power given to the division is the authority to collect data; to make investigations and inspections; to examine properties, leases, papers, books and records;....to provide for the keeping of records and making of reports and for the checking of the accuracy thereof;....". Rules have been adopted after public notice and hearing which specify reporting, record keeping and inspection requirements. These Rules are included and discussed in appropriate sections of this Description.

10. Variances from Programmatic Requirements.

Operators may apply to the Division for temporary or permanent exemption from requirements for such things as corrective action and injection pressure limitations. In one such case an operator was allowed to postpone cementing off the injection zone in a well offsetting a disposal well so long as he regularly monitored the formation to be sure that no migration of fluids was taking place. Such exemptions can be granted administratively unless the Division considers a public hearing on the request to be necessary.

To receive such an exemption the operator must present evidence that the requested variance will not result in ground water contamination through the migration of injection or formation fluids. Such evidence or tests may include but not be limited to:

- (1) Running of cement bond log (s) across suspect intervals;
- (2) Reexamination of well records and identification of erroneous original data; and
- (3) perforating and squeezing attempts that reveal higher cement tops than originally inferred.

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Further, the operator may request waiver of the corrective action requirements on individual wells for reasons such as risk to the well to be corrected (permanent production loss), inability to physically reenter an old well, location of the well at the extreme margins of the area of review, or hydrologic conditions in the area. Such requests are considered on a case by case basis and exceptions are normally accompanied by requirements for more frequent monitoring in the area, including water quality or hydrologic conditions (noise logging opposite the injection interval or completion and use of monitor wells). Such exceptions are usually given only as a last resort after all reasonable efforts have been made to take corrective action. Further, field inspectors may authorize minor deviations in the field under provisions of Rule 1303. Again protection of water and other resources is given paramount consideration when such deviations are given. (Example: relocation of a plug in a well based on field findings or conditions).

c. Operation of Rules

As stated in b. (p.15), "no injection can take place until a permit to inject has been issued in the form of an administrative order or an order of the Division following a hearing". All injection wells, whether in a new project or an expansion of an old one, must be individually listed and applied for on Form C-108 and must be included in an order (permit) approving the application to inject prior to beginning injection. Thus, no approval by rule is possible under Division Rules.

d. Technical Requirements

1. General

The technical requirements for drilling or converting and for maintaining and operating injection wells are contained in both Division Rules and in the provisions of the Division Orders which authorize specific injection projects and wells.

The general requirement that all injection wells must be maintained and operated to assure continued mechanical integrity and in such a manner as to confine injected fluids to the approved intervals is contained in Rule 703, as follows:

RULE 703. OPERATION AND MAINTENANCE

Injection wells shall be equipped, operated, monitored, and maintained to facilitate periodic testing and to assure continued mechanical integrity which will result in no significant leak in the tubular goods and packing materials used and no significant fluid movement through vertical channels adjacent to the well bore.

Injection projects, including injection wells and producing wells and all related surface facilities shall be operated and maintained at all times in such a manner as will confine the injected fluids to the interval or intervals approved and prevent surface damage or pollution resulting from leaks, breaks, or spills.

Failure of any injection well, producing well, or surface facility, which failure may endanger underground sources of drinking water, shall be reported under the "Immediate Notification" procedure of Rule 116.

Injection well or producing well failures requiring casing repair or cementing are to be reported to the Division prior to commencement of workover operations.

Injection wells or projects which have exhibited failure to confine injected fluids to the authorized injection zone or zones may be subject to restriction of injection volume and pressure, or shut-in, until the failure has been identified and corrected.

Program Description

Sealing off of strata while drilling is mandated in Rule 106 (See b. 2. Construction Requirements). Casing and Cementing requirements for injection wells are contained in Rules 107 and 702 (see b.2. Construction Requirements). Form C-108 APPLICATION FOR AUTHORIZATION TO INJECT requires applicants for disposal wells to "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 sources of drinking water". (see b.1. Permitting Process for complete Form C-108).

The information provided on Form C-108 is examined at the public hearing and no well or project will be approved after hearing unless the Division Examiner and Division Director are satisfied that the proposed methods of construction and operation meet the above requirements.

2. Area of Review

Form C-108 requires the following attachments relative to the area of review:

- 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.

The information is examined to determine which wells, if any, in the area of review may be cemented or plugged in such a manner as to permit the possible escape of fluid from the injection zone. When such wells are identified, the Order authorizing the project after notice and hearing specifies that corrective action must be taken on these wells prior to commencing injection. Corrective action may include that proposed by the applicant or that required by the Division.

In lieu of remedial work, operators may conduct tests or present other evidence to the District Supervisor prior to beginning injection to prove that remedial work on specific wells is not required to confine injected fluids in the approved zone.

3. Mechanical Integrity

To assure the initial mechanical integrity of any injection well as defined in Rule 703, an initial test is required under Rule 704, as follows:

"Prior to commencement of injection, wells shall be tested to assure the initial integrity of the casing and the tubing and packer, if used, including pressure testing of the casing-tubing annulus."

Field inspectors witness most such tests and operators report the results on Form C-103. SUNDRY NOTICES AND REPORTS ON WELLS.

Whenever additional tests are deemed necessary to assure that the injected fluids will be confined to the approved zones, the Division requires operators to conduct tracer surveys, noise logs, temperature surveys or other tests on injection wells and other wells in the area of review.

As specified in Rule 703, whenever injection wells exhibit failure to confine injected fluids to the authorized injection zones they may be ordered shut-in until the reason for the failure has been identified and corrected.

Periodic pressure tests of all injection wells are required as discussed in Section e. Monitoring, Inspection, Reporting.

The extensive well test program conducted by the Division since 1975 assures the mechanical integrity of existing wells. This program is discussed extensively in our annual reports to EPA and demonstrates that essentially every injection well in the State will have been tested at least once and witnessed by a Division inspector by the end of this year. Such process includes a review of casing and cementing records.

4. Injection Pressure

Maximum injection pressures are specified in Division Orders authorizing

Program Description

injection. Pressures are limited to a maximum which will not initiate new fractures or propagate existing ones in the confining zone, and will not cause the movement of the fluids into an underground source of drinking water. The Division has established as a general rule a maximum safe surface pressure of 0.2 psi per foot of depth to the top of the injection zone. Operators may seek administrative approval of higher injection pressures by submitting step rate test results, or data from instantaneous shut-in after fracture, which show that the confining strata has a fracture gradient which will support a higher pressure.

Older projects may or may not be subject to pressure limits. The Division's periodic test program has identified projects which should have either pressure or volume restrictions and the same are in place. (See Exhibit IX for a discussion of the effectiveness of the existing state program relating to such projects.)

5. Cancellation of Injection Authority

Rule 705. B. 1. specifies that "Whenever there is a continuous six-month period of non-injection into any injection project, storage project, salt water disposal well, or special purpose injection well, such project or well shall be considered abandoned, and the authority for injection shall automatically terminate ipso facto." Rule 705. B. 2. permits the Division Director, for good cause, to grant an administrative extension or extensions of the authority to inject as an exception to 705. B. 1. Normally such extensions are made prior to the expiration of the six-month period of non-injection. In cases where the lapse has been short, the Director, after reviewing the circumstances, may authorize an extension without a hearing after the six-month period has expired. In other cases where the integrity of the wells may be in question, a new application and hearing would be required and a new order authorizing injection could be issued.

6. Plugging and Abandonment

Rule 101 (included in b.2. Construction Requirements) requires that operators submit to the Division a plugging bond running to the State of New Mexico

prior to the drilling or aquisition of any wells on state or private land. The bond is not released until the well or wells have been properly plugged and the well area has been cleaned up.

Rules 201 - 204, Section D - ABANDONMENT AND PLUGGING OF WELLS, contain the requirements for plugging and abandonment and temporary abandonment, as follows:

D - ABANDONMENT AND PLUGGING OF WELLS

RULE 201. NOTICE

Notice of intention to plug must be filed with the Division by the owner or his agent prior to the commencement of plugging operations on Form C-103, Sundry Notices and Reports on Wells, which notice shall state the name and location of the well and the name of the operator. In the case of a newly completed dry hole, the operator may commence plugging by securing the approval of the Division as to the method of plugging and the time plugging operations are to begin. He shall, however, file the regular notification form.

RULE 202. PLUGGING AND ABANDONMENT

A. PLUGGING

Before any well is abandoned, it shall be plugged in a manner which will permanently confine all oil, gas, and water in the separate strata originally containing them. This operation shall be accomplished by the use of mud-laden fluid, cement and plugs, used singly or in combination as may be approved by the Division. The exact location of abandoned wells shall be shown by a steel marker at least four inches in diameter set in concrete, and extending at least four feet above mean ground level. The name and number of the well and its location (unit letter, section, township, and range) shall be welded, stamped, or otherwise permanently engraved into the metal of the marker. Seismic, core or other exploratory holes drilled to or below sands containing fresh water shall be plugged and abandoned in accordance with the applicable provisions recited above. Permanent markers are not required on seismic holes.

Within thirty days following the completion of plugging operations on any well, a record of the work done shall be filed with the Division in TRIPLICATE, on Form C-103. Such report shall be filed by the owner of the well and shall include the date the plugging operations were begun along with the date the work was completed; a detailed account of the manner in which the work was performed; the depths and lengths of the various plugs set; the nature and quantities of materials employed in plugging operations; the amount, size and depth of all casing left in the hole and the weight of mud employed in plugging the well and any other pertinent information. No plugging report submitted on Form C-103 shall be approved by the Division unless such report specifically states that pits have been filled and the location levelled and cleared of junk. The filing of Form C-105, Well Completion or Recompletion Report and Log is also necessary to obtain Division approval of a plugging report.

It shall be the responsibility of the owner of the plugged well to contact the appropriate District Office of the Division to arrange for an inspection of the plugged well and the location by a Division representative.

B. TEMPORARY ABANDONMENT

No well in this state shall be temporarily abandoned for a period in excess of six months unless a permit for such temporary abandonment has been approved by the Division. Such permit shall be for a period not to exceed one year and shall be requested from the appropriate District Office of the Division by filing Form C-103 in triplicate. No such permit shall be approved unless evidence is furnished that the condition of the well is such as to prevent damage to the producing zone, migration of hydrocarbons or water, the contamination of fresh water or other natural resources, or the leakage of any substance at the surface.

The District Supervisor of the appropriate District Office of the Division shall have authority to grant one extension to the permit for temporary abandonment. Such extension shall not exceed one year and shall be requested in the same manner as the original permit for temporary abandonment. No extension shall be approved unless good cause therefor is shown, and evidence is furnished that the continued condition of the well is as described above.

Upon expiration of the permit for temporary abandonment and any extension thereto, the well shall be put to beneficial use or shall be permanently plugged and abandoned, unless it can be shown to the Division after notice and hearing that good cause exists why the well should not be plugged and abandoned, and a further extension to the temporary abandonment permit should be issued. Prior to issuing such "further extension," the Division may at its option require the operator of the well to post with the Division a one-well plugging bond for the well, in an amount determined by the Division to be satisfactory to meet the particular requirements of the well.

The Division Director shall have the authority to waive the above requirement for notice and hearing and grant further extension to a permit for temporary abandonment in the case of:

- (1) a remote and unconnected commercial gas well or a presently non-commercial gas well which may reasonably be expected to be commercial within the foreseeable future; or
- (2) a well in an oil pool in which secondary recovery operations have, by actual performance, been shown to be commercially feasible, and which well may, with reasonable certainty, be expected to be included in a bona fide secondary recovery project within the foreseeable future.

Prior to issuing such further extension, the Division Director may at his option require the operator of the well to post with the Division a one-well plugging bond for the well, in an amount determined by the Director to be satisfactory to meet the particular requirements of the well.

No "further extension," whether issued by the Division or by the Division Director, shall be of more than two years duration, but may be renewed if circumstances warrant.

C. DRILLING WELLS

When drilling operations on a well have been suspended for 60 days, the well shall be plugged and abandoned unless a permit for temporary abandonment has been obtained for the well in accordance with Section B above.

RULE 203. WELLS TO BE USED FOR FRESH WATER

When the well to be plugged may safely be used as a fresh water well and such utilization is desired by the landowner, the well need not be filled above sealing plug set below the fresh water formation, provided that written agreement for such use shall be secured from the landowner and filed with the Division.

RULE 204. LIABILITY

The owner of any well drilled for oil or gas or for injection, or any seismic, core or other exploratory hole, whether cased or uncased, shall be responsible for the plugging thereof.

In preparing and submitting a plugging program under 201, operators generally follow Division Guidelines for Plugging Programs. (See Exhibit X). District Supervisors utilize the Guidelines to judge the adequacy of the proposed program in determining whether to approve it.

Specific requirements for injection well abandonment are contained in Rule 705., as follows:

RULE 705. COMMENCEMENT, DISCONTINUANCE, AND ABANDONMENT OF INJECTION OPERATIONS

The following provisions shall apply to all injection projects, storage projects, salt water disposal wells and special purpose injection wells:

A. Notice of Commencement and Discontinuance

1. Immediately upon the commencement of injection operations in any well, the operator shall notify the Division of the date such operations began.

2. Within 30 days after permanent cessation of gas or liquefied petroleum gas storage operations or within 30 days after discontinuance of injection operations into any other well, the operator shall notify the Division of the date of such discontinuance and the reasons therefor. No injection well may be temporarily abandoned for a period exceeding six months unless the injection interval has been isolated by use of cement or a bridge plug. The Director of the Division may delay the cement or bridge plug requirements above upon a demonstration that there is a continuing need for such a well, that the well exhibits mechanical integrity, and that continued temporary abandonment will not endanger underground sources of drinking water.
3. Before any injection well is plugged, the operator shall obtain approval for the well's plugging program from the appropriate District Office of the Division in the same manner as when plugging oil and gas wells or dry holes.

B. Abandonment of Injection Operations

1. Whenever there is a continuous six-month period of non-injection into any injection project, storage project, salt water disposal well, or special purpose injection well, such project or well shall be considered abandoned, and the authority for injection shall automatically terminate ipso facto.
2. For good cause shown, the Division Director may grant an administrative extension or extensions of injection authority as an exception to Paragraph 1. above.

If wells have been temporarily abandoned or have defects which cannot be corrected and the Division judges that they may become a threat to underground sources of drinking water, the Division requests the operator to plug such wells. If the operator does not carry out the plugging within a reasonable time, or if the operator is not known, as in the case of very old abandoned wells, the Division will set a forced plugging case for public hearing. Following the issuance of a plugging order resulting from such hearing, the Division will contract to have the well plugged. In the case of bonded wells, the insurance company issuing the bond will pay the plugging costs. In the case of any wells for which there is no bond, plugging costs are paid from the Division's Oil and Gas Reclamation Fund.

Program Description

Sections 70-2-37 and 70-2-38, New Mexico Statutes Annotated, 1978

Compilation, provide for the operation of the Oil and Gas Reclamation Fund,
as follows:

70-2-37 OIL AND GAS RECLAMATION FUND CREATED--DISPOSITION OF FUND.--There is hereby created the "oil and gas reclamation fund". All funds in the oil and gas reclamation fund and the earnings therefrom are appropriated to the energy and minerals department for use by the oil conservation division in carrying out the provisions of the Oil and Gas Act.

70-2-38 OIL AND GAS RECLAMATION FUND ADMINISTERED--PLUGGING WELLS ON FEDERAL LAND--RIGHT OF IDENTIFICATION--ANNUAL REPORT--CONTRACTORS SELLING EQUIPMENT FOR SALVAGE.--

A. The oil and gas reclamation fund shall be administered by the oil conservation division. The director of the division shall cause to be prepared plans for the plugging of abandoned wells which have not been plugged or which have been improperly plugged. The director, as funds become available in the oil and gas reclamation fund, shall reclaim, and properly plug, all abandoned wells in accordance with the provisions of the Oil and Gas Act, and the rules and regulations promulgated thereunder. The division may order wells plugged on federal lands on which there are no bonds running to the benefit of the state in the same manner and in accordance with the same procedures as with wells drilled on state and fee land, including utilizing funds from the oil and gas reclamation fund to pay the cost of such plugging. When the costs of plugging a well drilled on federal mineral leases are paid from the oil and gas reclamation fund, the division is authorized to bring a suit against the operator or the owner of the minerals under the tract, or both, in the district court of the county in which the well is located for indemnification for all costs incurred by the division in plugging said well. Any funds collected pursuant to a judgment in a suit for indemnification brought under the Oil and Gas Act shall be deposited in the oil and gas reclamation fund.

B. The director shall make an annual report to the secretary of energy and minerals, the governor and the legislature on the use of the oil and gas reclamation fund.

C. All contracts for well plugging shall be entered into in accordance with the provisions of the Public Purchases Act. Any contractor employed by the division to plug a well is authorized to sell for salvage the equipment and material which is removed from the well in plugging it.

Operators of wells on federal land submit plugging programs for approval to the USGS. Copies of the approved program are supplied to the Division by the USGS. In preparing plugging programs for federal wells, operators again generally follow the Division Guidelines. At times the Division has prescribed plugging programs deemed necessary to protect ground water regardless of the land type.

For further discussion of well plugging on federal land, see b.3. Wells on Federal Land.

e. Monitoring, Inspection, Reporting.

1. Well inspection and testing.

All newly drilled or converted injection wells must be pressure tested for mechanical integrity prior to commencing injection and at least once every five years thereafter. Rule 704 states these requirements, as follows:

RULE 704. TESTING AND MONITORING

A. Testing

Prior to commencement of injection, wells shall be tested to assure the initial integrity of the casing and the tubing and packer, if used, including pressure testing of the casing-tubing annulus.

At least once every five years thereafter, injection wells shall be tested to assure their continued mechanical integrity. Tests demonstrating continued mechanical integrity shall include the following:

- (a) measurement of annular pressures in wells injecting at positive pressures under a packer or a balanced-fluid seal;
- (b) pressure testing of the casing-tubing annulus for wells injecting under vacuum conditions; and,
- (c) such other tests which are demonstrably effective and which may be approved for use by the Division.

Notwithstanding the test procedures outlined above, the Division may require more comprehensive testing of the injection wells when deemed advisable, including the use of tracer surveys, noise logs, temperature logs, or other test procedures or devices.

In addition, the Division may order special tests to be conducted prior to the expiration of five years if conditions are believed to so warrant. Any such special test which demonstrates continued mechanical integrity of a well shall be considered the equivalent of an initial test for test scheduling purposes, and the regular 5-year testing schedule shall be applicable thereafter.

The injection well operator shall advise the Division of the date and time any initial, 5-year, or special tests are to be commenced in order that such tests may be witnessed.

B. Monitoring

Injection wells shall be so equipped that the injection pressure and annular pressure may be determined at the wellhead and the injected volume may be determined at least monthly.

Injection wells used for storage shall be so equipped that both injected and produced volumes may be determined at any time.

At least twenty-five percent of these pressure tests are witnessed by District Field Inspectors. Inspectors operate under the authority of the Oil and Gas Act which empowers the Division to "make and enforce rules, regulations, and orders, and to do whatever may be reasonably necessary to carry out the purpose of this act, whether or not indicated or specified in any section hereof". Rule 1303. DUTIES AND AUTHORITY OF FIELD PERSONNEL states that oil and gas inspectors and other Division personnel "have the authority and duty to enforce the rules and regulations of the Division".

In the eight counties of District I, II, and III where Class II wells presently exist, ten full-time field inspectors schedule and witness annual pressure tests for mechanical integrity on almost all injection wells and many related production wells. As reported on computerized Field Trip summaries during 1980 fifteen Division staff members spent 7656 hours in 1133 days inspecting 11,935 injection and related producing wells, 298 other injection facilities, and took 71 enforcement actions in the field.

In the few cases where tests are not witnessed, operators are required to file results of the tests with the District offices. In addition to pressure tests, inspectors conduct site inspections to assure that Division Rules are being properly followed.

Program Description

When tests indicate that wells are defective, operators are instructed to take corrective action. Operators must submit for advance approval a description of the proposed repairs on Form C-103. SUNDRY NOTICES AND REPORTS ON WELLS. In urgent cases when work should begin immediately, telephone approval can be obtained from the Division prior to submission of Form C-103. A report of the work when it is completed must also be submitted on Form C-103. (See Rule 1103 in b.3 Operating Requirements). District inspectors then schedule and witness followup pressure tests to be certain that the corrective action has been successful.

2. Reports of Breaks, Spills, Leaks, etc.

Rule 116 requires operators to report mechanical failures or downhole problems which might endanger fresh water in the following manner:

RULE 116. NOTIFICATION OF FIRE, BREAKS, LEAKS, SPILLS, AND BLOWOUTS

The Division shall be notified of any fire, break, leak, spill, or blowout occurring at any injection or disposal facility or at any oil or gas drilling, producing, transporting, or processing facility in the State of New Mexico by the person operating or controlling such facility.

"Facility," for the purpose of this rule, shall include any oil or gas well, any injection or disposal well, and any drilling or workover well; any pipe line through which crude oil, condensate, casinghead or natural gas, or injection or disposal fluid (gaseous or liquid) is gathered, piped, or transported (including field flow-lines and lead-lines but not including natural gas distribution systems); any receiving tank, holding tank, or storage tank, or receiving and storing receptacle into which crude oil, condensate, injection or disposal fluid, or casinghead or natural gas is produced, received, or stored; any injection or disposal pumping or compression station including related equipment; any processing or refining plant in which crude oil, condensate, or casinghead or natural gas is processed or refined; and any tank or drilling pit or slush pit associated with oil or gas well or injection or disposal well drilling operations or any tank, storage pit, or pond associated with oil or gas production or processing operations or with injection or disposal operations and containing hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, or other deleterious chemicals or harmful contaminants.

Notification of such fire, break, leak, spill, or blowout shall be in accordance with the provisions set forth below:

1. Well Blowouts. Notification of well blowouts and/or fires shall be "immediate notification" described below. ("Well blowout" is defined as being loss of control over and subsequent eruption of any drilling or workover well, or the rupture of the casing, casinghead, or wellhead of any oil or gas well or injection or disposal well, whether active or inactive, accompanied by the sudden emission of fluids, gaseous or liquid, from the well.)

2. "Major" Breaks, Spills, or Leaks. Notification of breaks, spills, or leaks of 25 or more barrels of crude oil or condensate, or 100 barrels or more of salt water, none of which reaches a watercourse or enters a stream or lake; breaks, spills, or leaks in which one or more barrels of crude oil or condensate or 25 barrels or more of salt water does reach a watercourse or enters a stream or lake; and breaks, spills, or leaks of hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, gases, or other deleterious chemicals or harmful contaminants of any magnitude which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" described below.

3. "Minor" Breaks, Spills, or Leaks. Notification of breaks, spills, or leaks of 5 barrels or more but less than 25 barrels of crude oil or condensate, or 25 barrels or more but less than 100 barrels of salt water, none of which reaches a watercourse or enters a stream or lake, shall be "subsequent notification" described below.

Program Description

Rule 116 (Cont'd.)

4. Gas Leaks and Gas Line Breaks. Notification of gas leaks from any source or of gas pipe line breaks in which natural or casinghead gas of any quantity has escaped or is escaping which may with reasonable probability endanger human health or result in substantial damage to property shall be "immediate notification" described below. Notification of gas pipe line breaks or leaks in which the loss is estimated to be 1000 or more MCF of natural or casinghead gas but in which there is no danger to human health nor of substantial damage to property shall be "subsequent notification" described below.

5. Tank Fires. Notification of fires in tanks or other receptacles caused by lightning or any other cause, if the loss is, or it appears that the loss will be, 25 or more barrels of crude oil or condensate, or fires which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" as described below. If the loss is, or it appears that the loss will be at least 5 barrels but less than 25 barrels, notification shall be "subsequent notification" described below.

6. Drilling Pits, Slush Pits, and Storage Pits and Ponds. Notification of breaks and spills from any drilling pit, slush pit, or storage pit or pond in which any hydrocarbon or hydrocarbon waste or residue, strong caustic or strong acid, or other deleterious chemical or harmful contaminant endangers human health or does substantial surface damage, or reaches a watercourse or enters a stream or lake in such quantity as may with reasonable probability endanger human health or result in substantial damage to such watercourse, stream, or lake, or the contents thereof, shall be "immediate notification" as described below. Notification of breaks or spills of such magnitude as to not endanger human health, cause substantial surface damage, or result in substantial damage to any watercourse, stream, or lake, or the contents thereof, shall be "subsequent notification" described below, provided however, no notification shall be required where there is no threat of any damage resulting from the break or spill.

IMMEDIATE NOTIFICATION. "Immediate Notification" shall be as soon as possible after discovery and shall be either in person or by telephone to the district office of the Division district in which the incident occurs, or if the incident occurs after normal business hours, to the District Supervisor, the Oil and Gas Inspector, or the Deputy Oil and Gas Inspector. A complete written report ("Subsequent Notification") of the incident shall also be submitted in duplicate to the appropriate district office of the Division within ten days after discovery of the incident.

SUBSEQUENT NOTIFICATION. "Subsequent Notification" shall be a complete written report of the incident and shall be submitted in duplicate to the district office of the Division district in which the incident occurred within ten days after discovery of the incident.

CONTENT OF NOTIFICATION. All reports of fires, breaks, leaks, spills, or blowouts, whether verbal or written, shall identify the location of the incident by quarter-quarter, section, township, and range, and by distance and direction from the nearest town or prominent landmark so that the exact site of the incident can be readily located on the ground. The report shall specify the nature and quantity of the loss and also the general conditions prevailing in the area, including precipitation, temperature, and soil conditions. The report shall also detail the measures that have been taken and are being taken to remedy the situation reported.

WATERCOURSE, for the purpose of this rule, is defined as any lake-bed or gully, draw, stream bed, wash, arroyo, or natural or man-made channel through which water flows or has flowed.

In cases of reported injection well failure appropriate corrective action to protect ground water will be required of the operator, or, if necessary, the well or wells will be ordered shut-in or plugged.

Rule 705 (included in d. 6. Plugging and Abandonment) requires notification to the Division of commencement, discontinuance and abandonment of injection operations.

Monthly or annual reports of injection volumes and pressures are required for all injection wells under Rule 706, as follows:

RULE 706. RECORDS AND REPORTS

The operator of an injection well or project for secondary or other enhanced recovery, pressure maintenance, natural gas storage, salt water disposal, or injection of any other fluids shall keep accurate records and shall report monthly to the Division gas or fluid volumes injected, stored, and/or produced as required on the appropriate form listed below:

1. Secondary or Other Enhanced Recovery on Form C-115;
2. Pressure Maintenance on Form C-115 and as otherwise prescribed by the Division;
3. Salt Water Disposal on Form C-120-A;
4. Natural Gas Storage on Form C-131-A; and
5. Injection of other fluids on a form prescribed by the Division.

The operator of a liquefied petroleum gas storage project shall report annually on Form C-131-B, Annual LPG Storage Report.

Additional reporting requirements are contained in Rules 1115 and 1131 as follows:

RULE 1115. OPERATOR'S MONTHLY REPORT (Form C-115)

Operator's Monthly Report, Form C-115 or Form C-115-EDP, shall be filed on each producing lease and each secondary or other enhanced recovery project or pressure maintenance project injection well within the State of New Mexico for each calendar month, setting forth complete information and data indicated on said forms in the order, format, and style prescribed by the Division Director. Oil production from wells which are producing into common storage shall be estimated as accurately as possible on the basis of periodic tests.

The reports on this form shall be filed by the producer as follows:

Original to the Oil Conservation Division at Santa Fe; one copy to the District Office of the Division in which district the lease is located; and one copy to each transporter involved. Each report for each month shall be postmarked not later than the 24th day of next succeeding month. Failure of an operator to file this report in accordance with the provisions of this rule may result in cancellation of Form C-104 for the affected well or wells and/or cancellation of authority to inject.

**RULE 1131. MONTHLY GAS STORAGE REPORT (Form C-131-A)
ANNUAL LPG STORAGE REPORT (Form C-131-B)**

Each operator of an underground natural gas storage project shall report its operation monthly on Form C-131-A. Form C-131-A shall be filed in duplicate (one copy to the appropriate district office) and shall be postmarked not later than the 24th day of the next succeeding month.

Each operator of an underground liquefied petroleum gas storage project approved by the Division shall report its operation annually on Form C-131-B.

Rule 1100. C. requires operators to make and keep records for a minimum of five years, as follows:

Rule 1100. General

C. Books and Records

All producers, injectors, transporters, storers, refiners, gasoline or extraction plant operators, treating plant operators, and initial purchasers of natural gas within the State of New Mexico shall make and keep appropriate books and records for a period of not less than five years, covering their operations in New Mexico, from which they may be able to make and substantiate the reports required by these rules.

Program Description

f. Enforcement

Differing kinds of enforcement actions are taken at different levels of the Division.

1. Direct action by Field Inspectors. When easily corrected problems such as small surface leaks or excessive injection pressures are encountered by Field Inspectors, the problems are brought directly to the attention of the operator by the Field Inspector for corrective action. As stated in the previous section, 74 such enforcement actions were taken by Field Inspectors in connection with injection Facilities in 1980.

2. District Office Action. When an inspection reveals that a well is leaking or when other serious problems are detected or reported, the District Supervisor or Field Inspector will notify the operator by telephone and/or letter of the repairs which must be made. The operator must file a Form C-103 stating the work which will be performed on the well and a second Form C-103 when the work is completed (See Exhibit xi). In many cases, Field Inspectors will witness the corrective action taken. If the work is not completed within a reasonable time, followup letters are sent to ensure that the remedial action is taken. District Supervisors can order wells shut-in by cancelling the allowable or cancelling the authority to inject if the threat to ground water is severe or if operators fail to take the required remedial action.

3. Division Director Action. District Supervisors refer major cases to the main office in Santa Fe. The Division Director may write or telephone operators ordering corrective action, or he may call a hearing, after public notice, at which the operator must show cause why he should not be required to take action to comply with Division Rules or Orders. To accomplish this, the

operator might present evidence demonstrating that the data causing the call for the hearing was erroneous, that the operator was actually in compliance, or that corrective action had already been taken. Depending on the findings made at the hearing, the Director would issue an Order of the Division specifying the remedial actions, if any, required of the operator. To date operators have cooperated in making well repairs and taking other corrective action and no hearings leading to orders requiring specific corrective action have been required.

The Division Director, in consultation with the General Counsel, and considering the recommendations of the District Supervisor, determines whether or not violations warrant court action to seek fines.

When old wells are judged to be a potential threat to ground water, and the operator does not plug them upon request, or the operator no longer is in business in the state, a case is brought to hearing to determine whether there is any reason why such wells should not be ordered plugged. After the hearing, money for plugging is obtained from bonding companies or from the Division's Reclamation Fund and the Division contracts with a driller to have such wells plugged. Additionally, the Division may take court action to obtain payment from the operator for plugging costs.

4. Court Action. The Division can seek injunctive relief in District Court if operators do not comply with Division Orders and Rules to stop violations, including violations which endanger drinking water.

In cases in which violations appear to result from wilful neglect the Division may seek the assessment of fines of up to \$1,000 a day in civil penalties or up to \$5,000 in criminal penalties for each day a violation takes place. *

As noted above, the vast majority of enforcement actions are carried out by Field Inspectors and the District Supervisors. During 1980 approximately

* See House Bill 232(attached to Division Rules and Statutes) which amends the penalty provisions contained in Section 70-2-20 NMSA, 1978.

4,000 tests of secondary recovery and salt water disposal injection wells were conducted in the southeast producing area. The average rate of problems for all wells tested was approximately 7.3 per cent. However, in areas where annual testing has taken place for a number of years, the failure rate was as low as 2 per cent.

An effective enforcement tool is cancelling the allowable for production wells. This is the equivalent of pipeline severance. In most cases the threat of doing this is sufficient to bring about prompt compliance. If injection wells present problems in a waterflood project and the production allowable for the project wells is cancelled the effect is to shut down injection until corrective action is taken. No such actions have been required in connection with injection wells.

When operators fail to file required monthly reports of production and injection volumes on Form C-115, letters are sent to them cancelling their allowable until they have reported. Approximately thirty to forty such cancellation notices are sent monthly. Plans whereby letters will be sent to operators of disposal wells and injection projects which show no injection for a period of over six months informing them that their authority to inject shall be cancelled ipso facto under Rule 703 are expected to be completed this year.

In waterflood projects in which water flows or other problems have become pronounced, all wells have been tested annually or semiannually and the defective wells have been ordered repaired. Such testing continues until the percentage of wells with defects declines to a minimum level. In such cases the District Supervisors have required the necessary corrective action on defective wells. In virtually all cases, operators have made the necessary repairs without undue delay. Inspectors have witnessed most of the corrective action.

Certain operators are responsible for more frequent violations than others. The violations are mainly in the areas of lease cleanup and minor surface leaks and spills. Field Inspectors make more frequent inspections of such operations, followup more quickly on the requests made for corrective action, and threaten to cancel, or do cancel, allowables more frequently in such cases.

If dangerous or flagrant violations occur, either the District Supervisor or the Division Director can immediately cancel the authority to inject. If the operator should fail to obey such an order, a formal, emergency Division Order cancelling injection authority, could be issued under Rule 1202. Under this rule, a hearing on the Order would be scheduled within fifteen days, but the Order would be effective in the interim. In cases of failure to comply with such an Order, the next step would be court action seeking injunctive relief and fines. No cases of such serious nature have arisen to date in connection with injection operations.

The Division may call a simple show cause hearing at any time for violation of rules or orders where an operator has refused to comply but no emergency condition exists.

Fines have been sought recently against operators for surface leaks and spills but not for injection operation. In 1976, an operator was fined \$18,000 for permitting serious leaks in a salt water disposal well to go undetected for a substantial period of time.

One water contamination study made by the Division (Doom, Mathis, and Owens; Lea County; 1977-78) indicated that a Class II injection well was the probable source of chloride contamination of a water well. Other such studies have generally shown that abandoned brine pits (prohibited by Division Order in most areas since 1969) were the probable contamination source.

Program Description

g. Division Staff and Resources

The Chief of the Technical Support Bureau in the Santa Fe office is directly in charge of UIC activities (See Exhibit II - Table of Organization). Working under him is the UIC Planner who carries out record keeping, reporting, grant application writing, liaison and budgeting duties for the UIC Program.

Applications for new water flood and pressure maintenance projects and for salt water disposal wells and other new injection projects are reviewed by the Water Resource Specialist in Santa Fe who schedules them for Division Hearings or writes Administrative Orders for the Director's approval in cases in which the Rules do not require a hearing (i.e., some salt water disposal wells and additional injection wells in previously approved water flood projects).

The Records Management and Support Section maintains complete records of all injection wells as well as producing wells.

In addition to producing many monthly, semi-annual and annual reports of drilling activity and production, the twelve-person data processing staff utilizes the IBM 4331 computer to produce two monthly reports of injection volumes, pressures and well use for 1) water flood and pressure maintenance projects and 2) salt water disposal wells. Two data processing staff members are also working to complete the injection well inventory for EPA.

All Santa Fe staff members with the exception of the four people in the Oil and Gas Proration Unit work on UIC matters. During the first six months of FY 81, twenty-seven Santa Fe staff members spent an average of almost 17 per cent of their time on UIC work.

District Offices

The thirty-one staff members in Districts I, II, and III devote an average of over twenty per cent of their time to UIC activity. However, in Districts I and II where most injection wells are located, the eight Field

Inspectors spent forty per cent of their time scheduling inspections, inspecting and testing injection and related production wells, investigating complaints of rule violations, witnessing well repairs, and carrying out other UIC activities. In all three Districts inspectors witness mechanical integrity tests on almost all injection wells annually.

Office personnel process drilling and workover applications and maintain complete District well files. Field inspectors observe the majority of the critical operations carried out in drilling and repairing wells to be certain that well construction is adequate to confine fluids to the approved zones. Technical personnel review injection applications to be sure that the proposed injection will not result in fluid migration into drinking water aquifers. When reports of water contamination are received the District Technical staff as well as the Water Resource Specialist from Santa Fe conduct studies to determine the source of contamination. Technical assistance in planning injection projects is given to operators by staff geologists, Field Inspectors, and District Supervisors.

Staff resources are sufficient to permit careful monitoring of injection activities throughout the state. Systematic procedures for testing essentially all injection wells and requiring the repair of defective wells assure the integrity of injection systems and the prevention of fresh water contamination in almost all cases.

Program Description

h. Other State Agencies

The Oil Conservation Division has sole authority for the regulation of Class II wells.

i. Class II Well Inventory

The Contractor employed by the Division to prepare the inventory, completed the inventory for 1978 and began to update the inventory for 1979. Letters were sent to individual operators asking them to verify the information contained in the 1978 records. Based on their replies, discrepancies have been resolved. Operator contact names and addresses have been added. On June 30 the Contractor completed his work and the regular data processing staff continued the updating process. By January 1, 1982, the inventory is expected to be updated, completed and corrected through 1980 and will be submitted to EPA at that time.

j. Aquifer Protection, Aquifer Exemption.

1- Introduction

The purpose of EPA's UIC program is to protect underground sources of drinking water (USDWs) from the potentially harmful effects of the injection of fluids (Class II wells) for produced fluid disposal, enhanced recovery, and hydrocarbon storage.

EPA regulations define a USDW as "an 'aquifer' or its portion

- (a) (1) Which supplies drinking water for human consumption; or
- (2) In which the ground water contains fewer than 10,000 mg/l total dissolved solids, and
- (b) Which is not an exempted aquifer."

The regulations define an aquifer as "a geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring."

The regulations define an exempted aquifer as "an 'aquifer' or its portion that meets the criteria in the definition of underground source of drinking water but which has been exempted according to the procedures in § 122.35 (b)."

Under Section 1425 of the Act the State is not bound by, among others, Section 122.35 (b) of the regulations. Further, two Division studies attached as Appendix A-1 and A-2 demonstrate that the procedures of said section are not practical or economic.

However, under guidelines adopted by EPA for State Demonstrations, States are expected to be bound by the criteria of Section 146.04 of the regulations in exempting aquifers.

This section reads as follows relative to Class II wells:

§ 146.04 criteria for exempted aquifers

An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water: in § 146.03 may be determined under 40 CFR 122.35 to be an "exempted aquifer" if it meets the following criteria:

- (a) It does not currently serve as a source of drinking water, and
- (b) It cannot now and will not in the future serve as a source of drinking water because;
 - (1) It is mineral, hydrocarbon or geothermal energy producing;
 - (2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;
 - (3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption.

While it may be reasonable to describe and exempt aquifers in some areas such as that described in the Lea County report, Appendix A-2, such action is not uniformly needed nor is it practical. We believe it is possible to conduct a program for regulation of Class II injection wells which will, (1) protect underground sources of drinking water, and (2) not unnecessarily impede approval and use of such wells without formal aquifer designation or exemption. Nevertheless it remains the Division's intention to protect USDWs.

Prior to detailing the nature of the Division program which will accomplish the goals set out above, there should be some additional discussion as to the general impracticality and lack of necessity for aquifer exemption relative to Class II wells.

2 - Practicality

In addition to the gross economic impracticality conclusions inferred from the Eddy County report, Appendix A-1, the nature of

hydrocarbon reservoirs in a formation is such as to defy drawing a line on a map which once and for all may define the horizontal limits thereof. This commonly results from additional drilling which reveals edge wells, isolated pods of protection, or unsuspected pool extensions. Further completely new reservoirs in the same formation may be discovered in proximity to or somewhat removed from currently known reservoirs. These conditions are exemplified by figures A-1 and A-2 following and can be confirmed by comparing development maps from the 1940s and 50s to a recent map.

In essentially all cases one would expect that injection into such extended or new reservoirs would be necessary in order to recover the maximum volume of hydrocarbons contained therein. To require that the State Program be revised each time a new edge well was drilled or a new reservoir found would be wasteful, ridiculous, and of no value.

3 - Necessity

There seems little necessity for elaborate aquifer exemptions related to ER Projects for the following reasons:

- (1) The pressure sinks surrounding the producing wells in an ER project cause injected fluids to move inward toward producing wells rather than outward toward any other part of the formation. Such contained movement eliminates the direct potential for contamination of USWDS which may be located elsewhere in the same formation.
- (2) The Division knows of no instance in the State where drinking water is being produced and consumed by the public from an aquifer which is also an oil and/or gas reservoir at the same horizontal and vertical section. Some USDWs exist within the same vertical section but horizontally removed from the hydrocarbon zone. The San Andres formation in Eddy County provides excellent examples of both of these situations. These conditions are discussed and extensively referenced in Appendix A-1.

The review and approval process to be used for produced fluid disposal wells will assure aquifer protection on a case by case basis. This process is discussed later in this Section.

4 - Approval Process - Enhanced Recovery

The actual approval process is discussed elsewhere in this demonstration. The result of this process, however, will be to permit completion of enhanced recovery injection (ER) wells in that vertical and horizontal portion of a geologic formation which contains hydrocarbons which may be susceptible to production from ER operations. Injection will be permitted in such zone and in the same interval normally not further than one-half mile from the outer boundary of the project. The outer boundary of any ER project may be considered to be a line which is determined by projecting horizontal and vertical lines through the outermost project wells (those wells which have produced or are demonstrated to have productive potential from the project). See Figure A-3.

5 - Approval Process - Produced Fluid Disposal

Produced fluid disposal wells (SWD) will not be authorized to inject into a formation or part thereof containing water having TDS levels of 10,000 mg/l or less except under the following conditions:

- (a) The formation or zone has been declared an exempt aquifer as a part of the State demonstration or any subsequent amendment thereto; or
- (b) The applicant demonstrates at a public hearing that said formation or part thereof meets the exemption criteria of Section 146.04 (a) and (b), (1), (2), or (3).

The Lea County study attached to this demonstration as Appendix A-2 illustrates the type of evidence the Division would seek in such cases.

All applications for approval of SWD wells not within an oil or gas zone or within one mile thereof will contain data on water quality in the proposed disposal interval. Any SWD well proposed for disposal into a formation or zone containing water of 10,000 mg/l TDS or less which is not an exempted aquifer will be set for public hearing before a Division examiner.

The Division will place the Dallas EPA office on its mailing list for hearing dockets as well as for copies of injection well permits.

Program Description

6-- Approval Process - Liquid Hydrocarbon Storage

Liquid hydrocarbon storage wells will be approved in the same manner as produced fluid disposal wells.

7 - Aquifer Exemption - Lea County

The Lea County study contained in Appendix A-2 contains extensive data on Permian age aquifers, their water quality, the potential for their use, alternative water sources, cost analyses, and the value of such aquifers for disposal purposes.

Based upon this study the Division proposes that the Tansil, Yates, Seven Rivers, Queen, Grayburg, and San Andres formations of Lea County be classified as exempt aquifers.

Please refer to Figures 8 and 9 of the Lea County Report, Appendix A-2 and Resource Map No. 6 from "Stratigraphy and Ground-Water Hydrology of the Capitan Aquifer, Southeastern New Mexico and Western Texas". by William L. Hiss (PHD Thesis, University of Colorado 1975) for the vertical and horizontal sections to be exempted. (See following). Because of the gradational nature of the back reef facies a more precise description is not proposed.

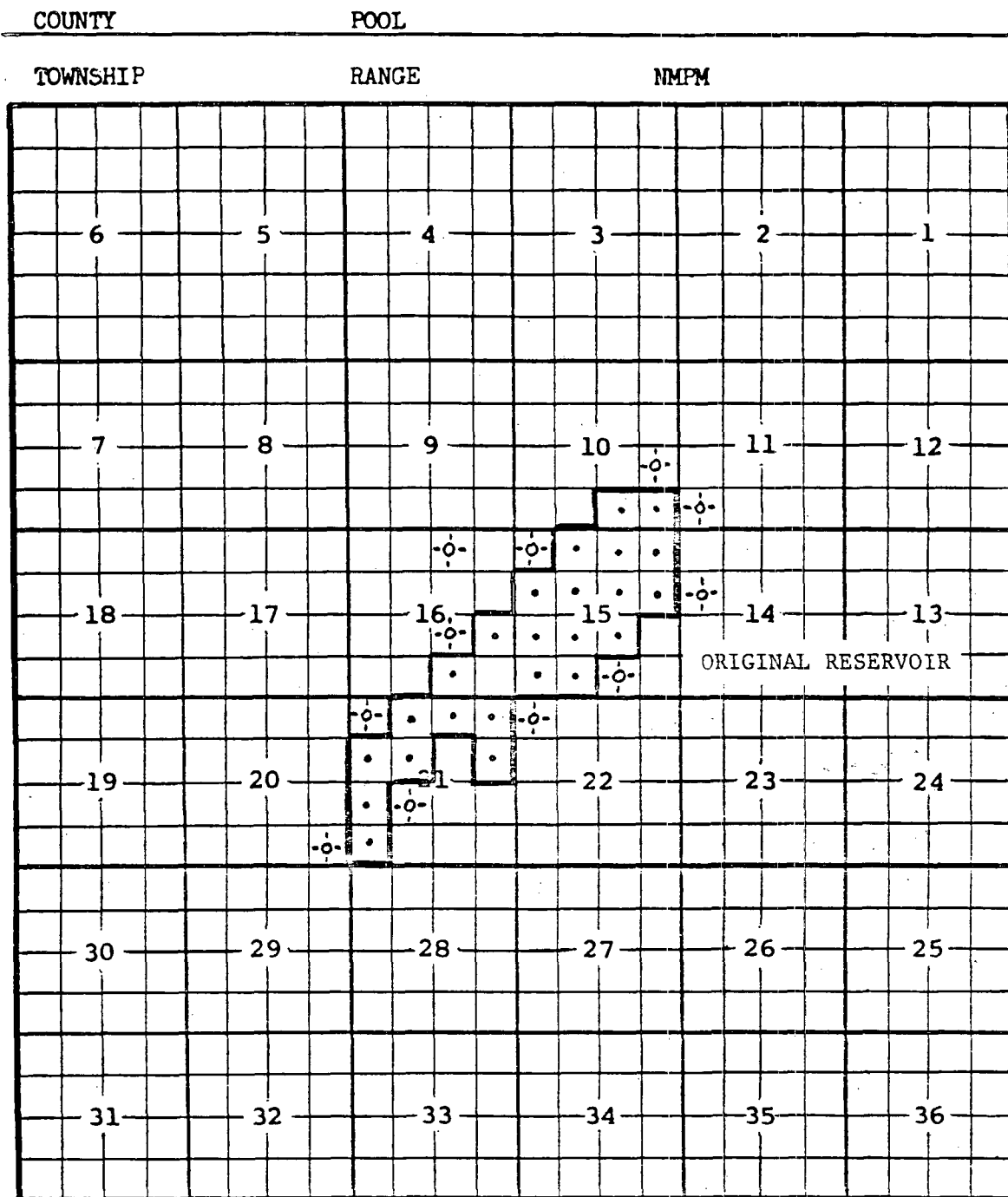


FIGURE A-1

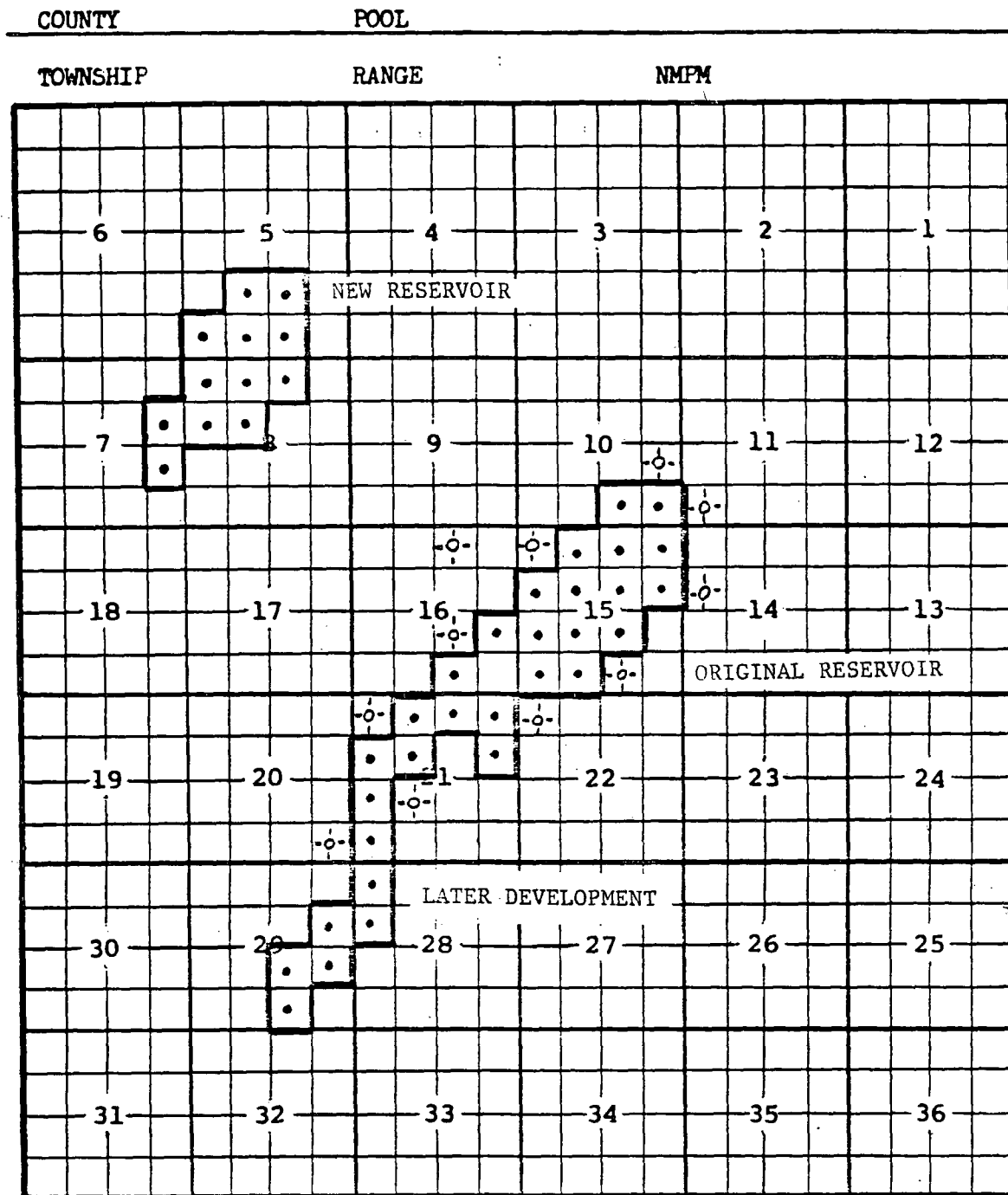


FIGURE A-2

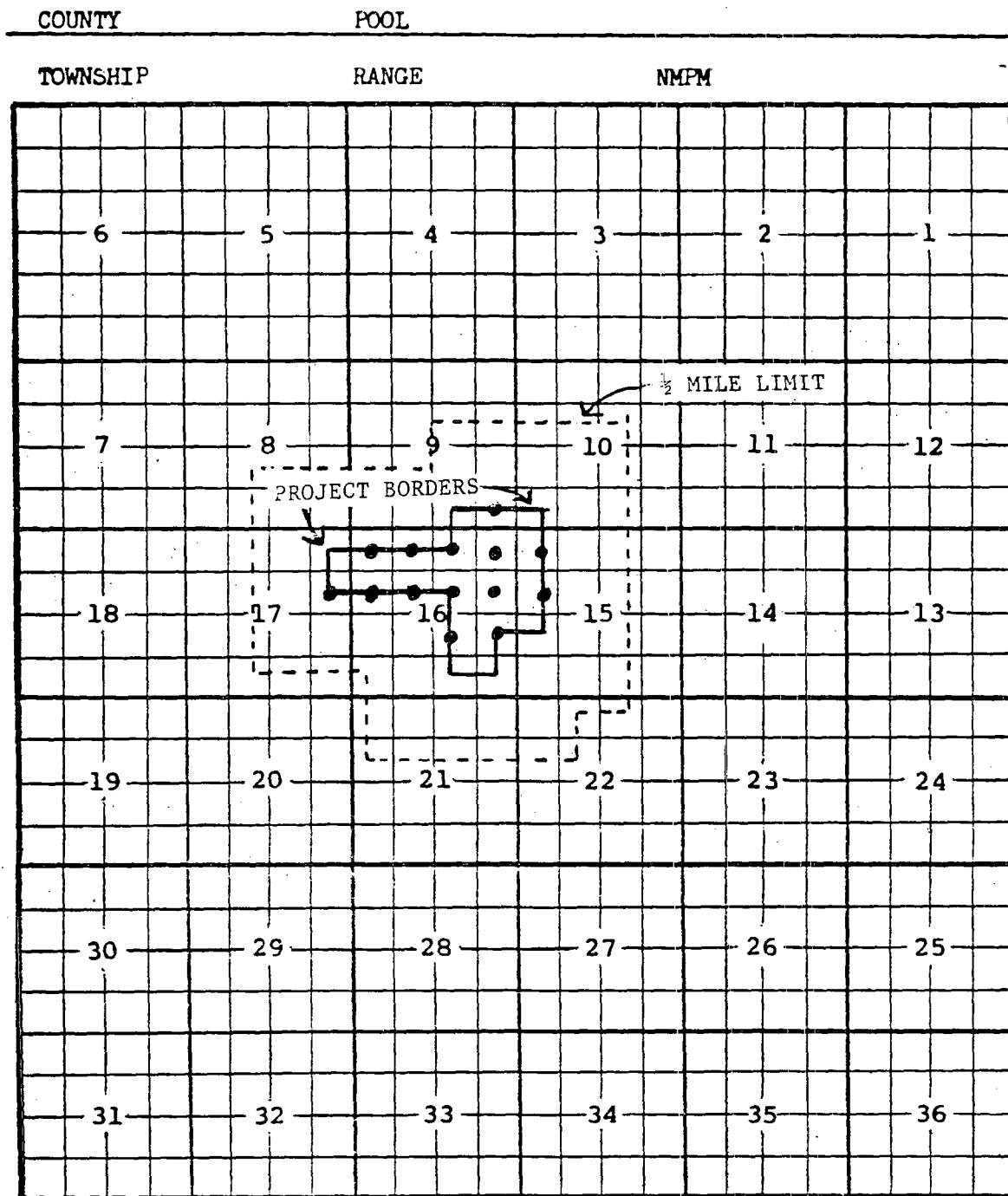


FIGURE A-3

Program Description

New Mexico
From PROFESSIONAL ENGINEER
Vol. 23, No. 11, 1971

WATER-LEVEL CHANGES IN THE PERMIAN CAPITAN AQUIFER

Eddy and Southern Lea Counties, New Mexico

Publication authorized by Director,
U. S. Geological Survey

About the Author --

Prepared in cooperation with the New Mexico
State Engineer

W. L. (Bill) Hiss, the author of our cover article, is a Hydrologist with the U. S. Geological Survey, Water Resource Division in Albuquerque. He has been a teacher, petroleum geologist, writer, roughneck and tooldresser in his career. He tells me that his photo is of fairly recent vintage, geologically speaking, but usually he doesn't look so calm as he and I have been rushing each other to check on copy or an illustration for the article.

Bill received his B.S. degree from Kansas State University and M. S. degree from the University of Oklahoma. Both degrees were in geology.

He has completed all the requirements for a PhD degree in geology at the University of Colorado with the exception of the dissertation. Part of the study of the ground water geology of the Capitan reef in southeastern New Mexico and western Texas will be used as his dissertation.

The U.S. Geological Survey, his employer for the past six years, and the New Mexico State Engineer are conducting this project cooperatively. Bill has been the project chief for this study since it was started six years ago.

He can't lay claim to being a member of the New Mexico Society of Professional Engineers. However, he is a member of the American Association of Petroleum Geologists, Geological Society of America, Sigma Xi and the New Mexico Geological Society. He is currently the Treasurer of the N. M. Geological Society, and will be Secretary next year. He is also Vice-president of the Albuquerque Santa Fe Federal Automatic Data Processing Council and one of the Directors and the Secretary of IMS Corporation, a manufacturing company located in Albuquerque.

By

W. L. Hiss, Hydrologist

U. S. Geological Survey, Albuquerque, N. Mex.

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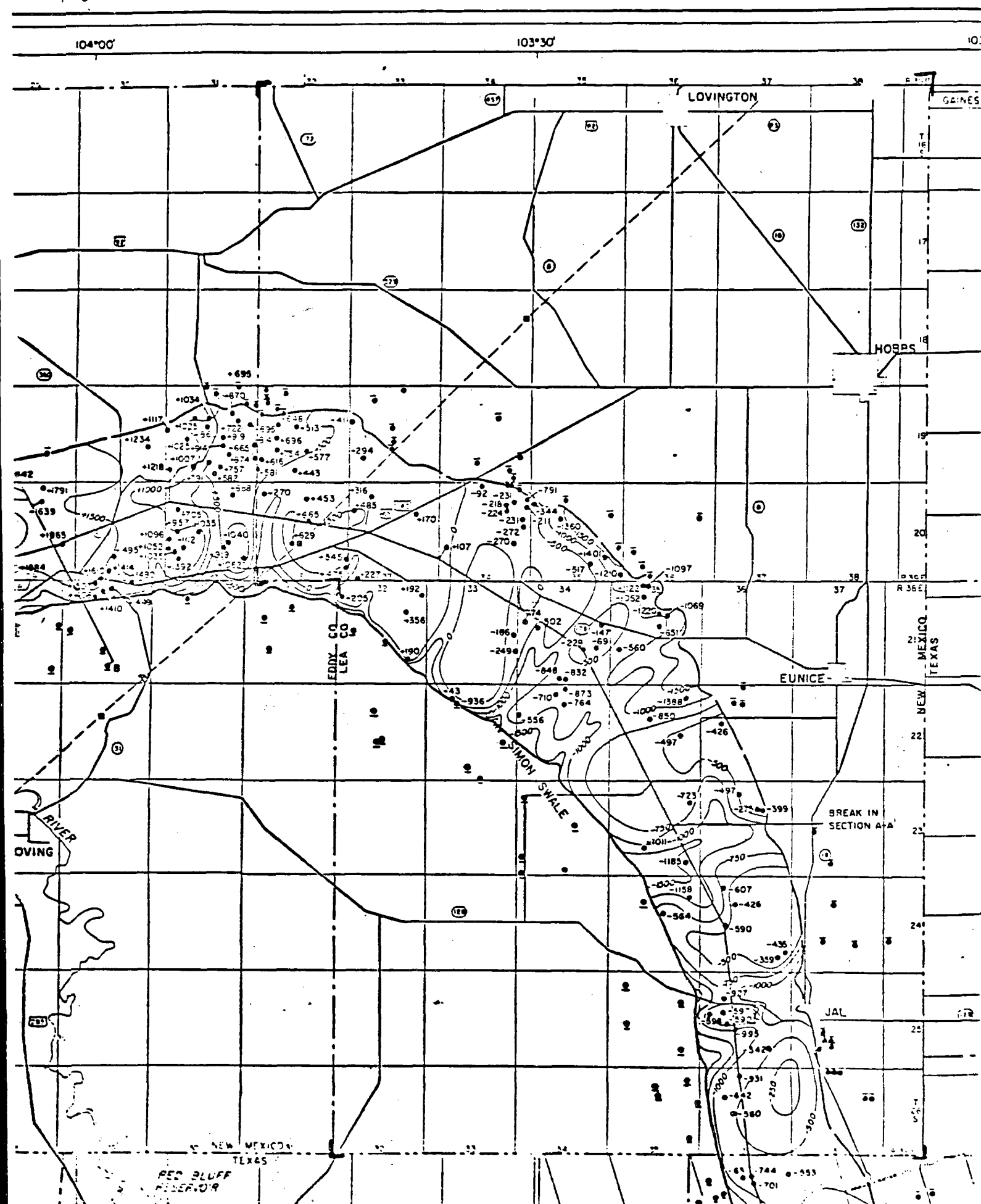
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from PROFESSIONAL ENGINEER (cont'd.)

INTRODUCTION

The U. S. Geological Survey, in cooperation with the State Engineer of New Mexico, is using 12 wells in Eddy and southern Lea Counties, New Mexico, to observe changes in hydraulic head in the Capitan aquifer. The observation wells are located in the area underlain by the Capitan Limestone (Permian) in an arc extending from southwest of Carlsbad, N. Mex. around the north and east margins of the Delaware basin to southwest of Jal, N. Mex. (Hiss, 1971; figs. 1 and 2 and table 1)

Large quantities of saline ground water are being withdrawn from the Capitan aquifer in Lea County, New Mexico and Winkler and Ward Counties, Texas (Guyton and Associates, 1958; Brackbill and Gaines, 1961). This water, together with some additional saline water produced with oil, is transported to other areas where it is injected into several formations to repressurize partially depleted oil fields. The location of principal water fields producing from the Capitan aquifer is shown in Figure 1.



Program Description

k. Review of existing Class II wells.

Since 1976 the Division has been conducting an intensified program of testing all Class II wells related to secondary recovery and salt water disposal. This program is described above in Section e. In water flood projects where problems developed, the Division has tested most production and injection wells annually or semiannually and has caused wells to be repaired. Operators submit repair plans to the Division for approval, and in most cases Field Inspectors witness the repair procedures. This work has resulted in reducing the percentage of problem wells to approximately two per cent.

The review proposed in this section of the Guidance, then, has been essentially completed and no major well review program is necessary.

In 1981, and annually for the next few years, the Division will arrange with operators for mechanical integrity tests of virtually all injection wells in water flood and pressure maintenance projects and salt water disposal wells. Field inspectors will witness most such tests and necessary repairs will be required. Authority to inject will be cancelled for those wells which operators do not repair successfully. When such inspections reveal evidence of low failure rates, the test periods may be lengthened but will not exceed five years.

In addition, the status and condition of the score of LPG storage wells will be rechecked within two years.

The above program assures that the mechanical integrity of existing Class II wells will be verified frequently enough to provide sufficient protection to underground sources of drinking water.

l. Public Participation

A public information program to inform New Mexicans about underground injection control and to solicit public input for the UIC program will be carried

out. At the same time, under the provisions of Rules Section N-Rules on Procedure, public notice is given of all Division and Commission hearings called to consider applications for new or expanded injection projects. The public is permitted to offer testimony at all such hearings.

Significant comments made by any individual at hearings are addressed by the Hearing Examiner during the hearing and become part of the hearing transcript, or they are addressed in the findings which accompany the subsequent order. In both instances, the responses to comments become part of the case record and are available for public perusal in the Santa Fe office of the Division.

In the case of applications for expanded projects which can be approved administratively without a hearing under Rule 701, the notice provisions require applicants to furnish a copy of the application to the surface owner and to each offset operator within a half mile of the well location and also to publish notice of the application in a newspaper of general circulation in the county in which the proposed well is located. If objections are received within 15 days, the application will not be approved and the case will be scheduled for hearing after public notice if the operator so desires.

m. Public Complaints

Having existed for over 30 years the three District Offices of the Division in the oil and gas producing regions of the State, and the central office in Santa Fe, are well known to interested members of the public as the locations for obtaining information and registering complaints related to oil and gas activities. The Division Director, Technical Support Chief, Chief Engineer, General Counsel, District Supervisors, Field Inspectors and other Division staff members are readily available to respond to public inquiries and complaints. A complaint form (see Exhibit XII) is utilized to record public complaints and the action taken on complaints received at the District Offices are sent to Santa Fe for review and possible further action to alleviate the

cause of the specific complaint or to prevent the recurrence of similar situations.

As part of the UIC information program, efforts are being made to re-emphasize to the public where and to whom to come with questions and complaints related to oil and gas activities.