

WITNESSED BY KENNETH LINGO, U.I.C. INSPECTOR THE CADMUS GROUP, INC.  
 been obtained at the maximum test injection pressure  
 utilized, the test results may indicate that the formation  
 had been accepting fluids without having been fractured.

This SRIT outline is consistent with acceptable oilfield practices. It should identify an allowable injection pressure which will provide adequate protection of the underground sources of drinking water at an injection well having demonstrated mechanical integrity. The allowable injection pressure will be determined after an EPA review of the SRIT results. (Tabular & Graphic).

Table I - SUGGESTED STEP-RATE INJECTIVITY TEST DATA

Inj. Rate <u>BPM</u>	Elapsed Time <u>min.</u>	Inj. Pres. <u>psig</u>	Inj. Rate <u>BPM</u>	Elapsed Time <u>min.</u>	Inj. Pres. <u>psig</u>	
1. <del>1/2</del>	0	<u>350</u>	2. <del>3/4</del>	0	<u>475</u>	9. 0 <u>12</u>
	5	<u>400</u>		5	<u>500</u>	5 <u>12</u>
5 GPM	10	<u>410</u>	10 GPM	10	<u>525</u>	10 <u>12</u>
	15	<u>410</u>		15	<u>540</u>	15 <u>12</u>
	20	<u>425</u>		20	<u>550</u>	20 <u>12</u>
	25	<u>440</u>		25	<u>575</u>	25 <u>12</u>
	30	<u>440</u>		30	<u>580</u>	30 <u>12</u>
3. <del>1/2</del>	0	<u>600</u>	4. <del>1/2</del>	0	<u>710</u>	
	5	<u>625</u>		5	<u>725</u>	
	10	<u>640</u>		10	<u>750</u>	
15 GPM	15	<u>650</u>	20 GPM	15	<u>760</u>	
	20	<u>650</u>		20	<u>775</u>	
	25	<u>675</u>		25	<u>790</u>	
	30	<u>675</u>		30	<u>800</u>	
5. <del>2/2</del>	0	<u>810</u>	6. <del>3/2</del>	0	<u>925</u>	
	5	<u>850</u>		5	<u>950</u>	
	10	<u>870</u>		10	<u>950</u>	
25 GPM	15	<u>875</u>	30 GPM	15	<u>960</u>	
	20	<u>875</u>		20	<u>975</u>	
	25	<u>890</u>		25	<u>1000</u>	
	30	<u>900</u>		30	<u>1000</u>	
7. <del>5/2</del>	0	<u>1050</u>	8. <del>8/2</del>	0	<u>1060</u>	
	5	<u>1060</u>		5	<u>1080</u>	
	10	<u>1060</u>		10	<u>1100</u>	
35 GPM	15	<u>1060</u>	40 GPM	15	<u>1100</u>	
	20	<u>1060</u>		20	<u>1100</u>	
	25	<u>1060</u>		25	<u>1120</u>	
	30	<u>1060</u>		30	<u>1125</u>	

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 OCT 30 1991  
 OIL CON. DIV.  
 DIST. 3

ISIP = 1150 psig, 5min = 875, 10 min = 790, 15 min = 725 PSI.

FCD: April 30, 1990: C\DATA\WP42\GUS\SRITGUID.GS

WELL WAS SHUT-IN F/48 HRS.

WAS INJECTING @ 249 BPM = 840 PSI  
 BEFORE SHUT-IN.

2

TOTAL DEPTH = 1762'  
 PERF'S @ 1642' - 55'  
 4 1/2" CASING @ 1749'  
 2 3/8" TUBING @ 1550'

MERIDIAN OIL CO.  
ENGINEERING CALCULATION

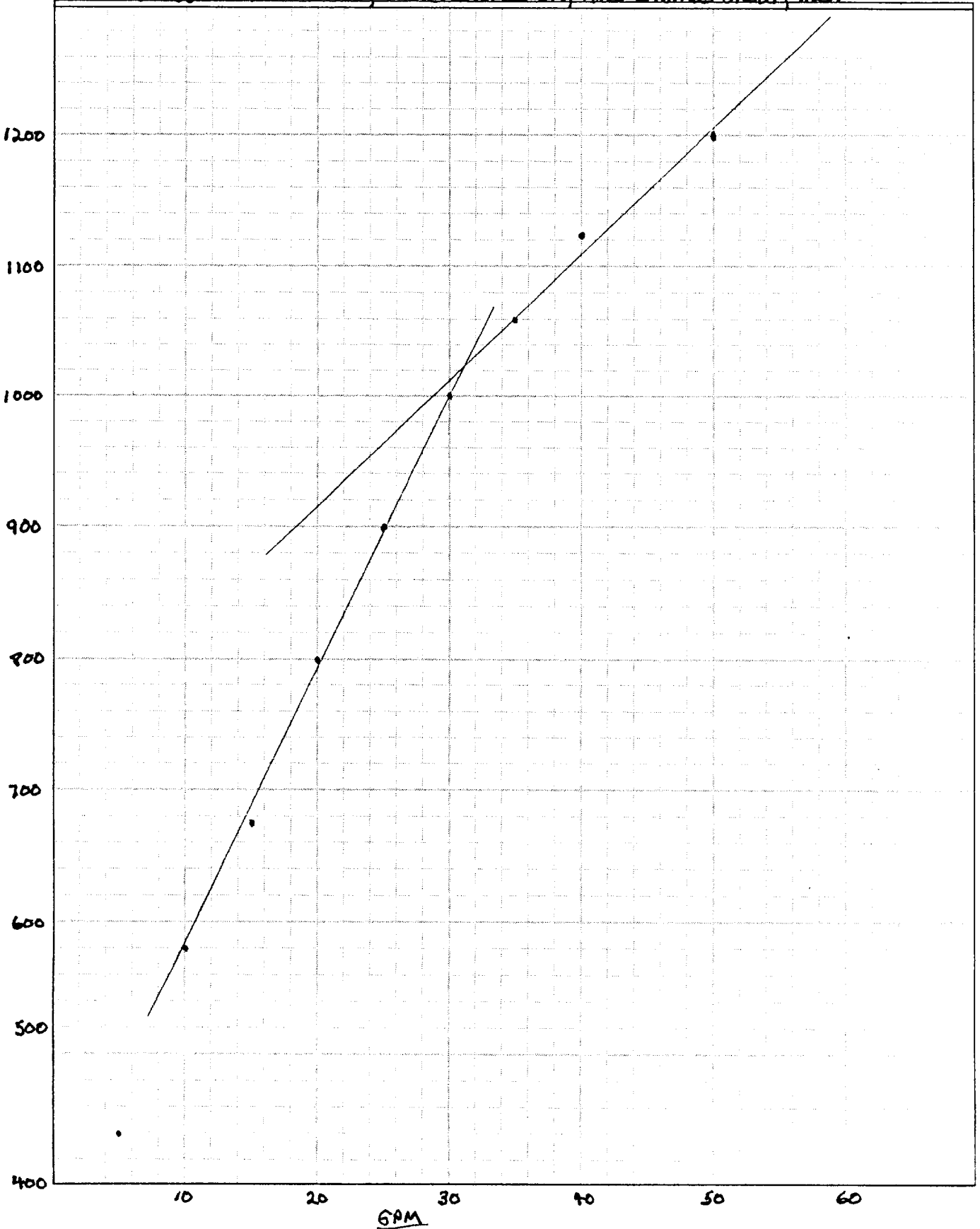
Sheet: \_\_\_\_\_ of \_\_\_\_\_  
Date: \_\_\_\_\_  
By: \_\_\_\_\_  
File: \_\_\_\_\_

GRAND RESOURCES, NAJATO TRIBAL C-5, SEC. 14, T32N, R  
SAN JUAN CO., N.M.

10-21-91

COMPILED BY KENNETH LINGO, U.I.C. INSPECTOR, THE CADMUS GROUP, INC.

PSI





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200  
DALLAS, TEXAS 75202

August 8, 1989

Certified Mail #P 117 780 775 - Return Receipt Requested

Mr. Marvin J. Robinowitz, President  
Grand Resources, Incorporated  
2250 East 73rd Street, Suite 400  
Tulsa, Oklahoma 74136

Re: Underground Injection Control Permit  
Permit No. 06SNMN2P9002 - San Juan County, New Mexico

**RECEIVED**  
NOV 4 1991  
OIL CON. DIV.  
DIST. 3

Dear Mr. Robinowitz:

Enclosed is a copy of the final permit referenced above and our response to comments received on the draft permit.

Please read the entire permit so that you can become familiar with the effective date and the conditions of the permit. In response to comments received, permit condition I.B.2. has been modified. Please pay special attention to permit condition number I.B.1. which requires that you receive an "Authorization to Inject" from this office prior to operating this well, except to conduct the required step-rate test. "Authorization to Inject" will not be granted until the operator has satisfactorily demonstrated compliance with special permit conditions I.A.1., I.A.2., I.A.3., I.B.1., and I.B.2. In accordance with Underground Injection Control regulations 40 CFR §124.15(b), the effective date of this permit is 30 days after the date of this letter. The Regional Administrator will review each issued permit at least once every five (5) years to determine whether it should be modified or terminated.

If you have any questions, please call Ms. Betty West in Dallas at (214) 655-7165.

Sincerely yours,

Myron O. Knudson, P.E.  
Director  
Water Management Division (6W)

Enclosures

cc: with enclosures:  
Navajo Nation (Tribe)  
BIA, Gallup, New Mexico  
BLM, Farmington, New Mexico  
New Mexico Oil Conservation Division, Santa Fe, New Mexico

ENVIRONMENTAL PROTECTION AGENCY  
UNDERGROUND INJECTION CONTROL (UIC) PERMIT

Permit No. 06SNMN2P9002  
Well No. C-5

AUTHORIZATION TO CONVERT A WELL TO  
AN INJECTION WELL UNDER THE UIC PROGRAM  
NAVAJO NATION

In compliance with the provisions of the Safe Drinking Water Act, (hereafter referred to as "the Act" or "SDWA") as amended (42 U.S.C. §300f et seq.),

Grand Resources, Incorporated  
2250 East 73rd Street, Suite 400  
Tulsa, Oklahoma 74136

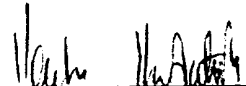
is authorized to convert a well to a Class II enhanced oil recovery injection well in San Juan County, New Mexico at:

2310 feet from the South line and 330 feet from the West line, SW Quarter, Section 14, Township 32N, Range 18W into the injection interval at a depth of 1641 feet to 1666 feet below land surface in the Gallup Sand in accordance with the construction and operation requirements, injection pressure limits, reporting and monitoring requirements, and other conditions set forth in Parts I and II of this permit and the New Mexico Indian Lands Class II Underground Injection Control Program and Regulations.

Authorization to inject fluids into the well described in this permit except to conduct the required step-rate test, shall be separately granted. Such authorization may be verbally granted by the Chief, UIC Permits and Enforcement Section when the operator has satisfactorily demonstrated compliance with special permit conditions I.A.1., I.A.2., I.A.3., I.B.1., and I.B.2. Any verbal authorization to inject will be followed by a written "Authorization to Inject" from the Director, Water Management Division (WMDD).

This permit shall become effective on August 8, 1989 for conversion and for injection on the date specified in the "Authorization to Inject." Upon authorization to inject, this permit shall remain in effect until the well is plugged and abandoned or the permit is terminated.

Signed this 8th day of August 1989.

  
Myron O. Khudson, P.E.  
Director, Water Management Division  
Environmental Protection Agency  
Region 6

Part I. SPECIAL PERMIT CONDITIONS

A. Construction Requirements

1. Surface casing shall be set at 30 feet below land surface and cemented back to the surface. The long string casing shall be set at 1749 feet below land surface and cemented with 35 sacks of cement.
2. The well shall be equipped with standard female fittings with cut-off valves connected to the tubing and the tubing/casing annulus so that the injection pressure and annulus pressure may be measured by an EPA representative by attaching a gauge having a standard male fitting.
3. Tubing and packer must be installed. The packer must be run on the tubing and set inside the casing between 1566 and 1636 feet of depth below the land surface.

B. Operating Requirements

1. Authorization to inject will not be granted until the permittee shows to the satisfaction of the WMDD pursuant to 40 CFR 146.8 that the well has mechanical integrity. The well's mechanical integrity must be demonstrated prior to the start of injection and at least every five years thereafter. The permittee must notify the EPA Region 6 UIC office at least 14 days prior to mechanical integrity testing so that an EPA representative can witness the test.
2. The maximum injection pressure at the wellhead shall be determined by the results of a step-rate test. The permittee shall conduct a step-rate test on this well and submit the data to the EPA Region 6 UIC office. Based on the results of the test, EPA will establish the maximum allowable injection pressure and notify the operator by letter. That letter shall become a part of this permit.
3. The permittee is authorized to inject salt water for enhanced oil recovery.
4. Injection volume shall be limited to 15,000 barrels per month.

C. Plugging and Abandonment Requirements

1. After a cessation of operations of two years, the operator shall plug and abandon the well in accordance with the following procedures:
  - (a) Set a cast iron bridge plug (CIBP) at 1550 feet below the land surface and spot a minimum of 10 feet of cement in the CIBP;
  - (b) Shoot off 4-1/2 inch casing at free point;
  - (c) Circulate cement from 100 feet below the land surface to the surface with interval between the cement plugs filled with drilling mud with a density of at least 9 pounds per gallon.
2. Permittee shall notify the RA at least 45 days before plugging and abandonment. Any modifications to the above referenced procedures shall be included in this notice.
3. Within 60 days after plugging, a plugging report must be submitted. The report must include:
  - (a) A statement that plugging was complete in accordance with special permit condition I.C.1.; or
  - (b) If actual plugging differed from requirements of special permit condition I.C.1., specify the different procedures used.

Part II. CONDITIONS APPLICABLE TO ALL PERMITS

A. Confidentiality

Any information except the permittee's name and address and information concerning the existence, absence or level of contaminants in drinking water may be claimed as confidential. Any claim of confidentiality must be asserted at the time of submission. If no claim is made, EPA may make the information available to the public without further notice.

B. Duty to Comply

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification.

Compliance with the terms of this grant does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law for any imminent or substantial endangerment to human health or the environment or for any breach of any other applicable legal duty.

2. The permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in a temporary emergency permit under 40 CFR 144.34.

C. Duty to Halt or Reduce Activity

It shall not be a defense for a permittee, in an enforcement action, that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Migrate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

E. Proper Operation and Maintenance

1. All injection wells must have and maintain mechanical integrity consistent with 40 CFR 146.8(b)(1) and 147.3010. Mechanical integrity must be demonstrated initially and also any time the tubing is removed from the well, the packer is reset, or a loss of mechanical integrity becomes evident during operation.

Further, the Regional Administrator (RA) may by written notice require the permittee to demonstrate mechanical integrity at any time. The permittee shall notify the EPA Region 6 UIC office of his intent to prove mechanical integrity at least 14 days prior to such demonstration. The permittee shall report the results of the mechanical integrity demonstration within 30 days after completion (unless the demonstration is witnessed by an EPA inspector, in which case the inspector will prepare the report).

2. If the permittee or the RA finds that the well fails to demonstrate mechanical integrity during a test, or a loss of mechanical integrity as defined by 40 CFR 146.8 and 147.3010 becomes evident during operation, the operation shall be halted immediately and shall not be resumed until the RA gives approval to recommence injection.
3. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate engineering capability available, adequate funding, operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

F. Permit Actions

1. This permit may be modified, revoked and reissued, or terminated for the following causes (see 40 CFR 144.39 and 144.40):
  - a) There are substantial changes to the facility or activity which occurred after permit issuance that justify revised or additional permit conditions.
  - b) The RA has received information (e.g., from monitoring reports, inspections) which warrants a modified permit.
  - c) The regulations or standards on which the permit was based have changed.
  - d) The RA has received notice of a proposed permit transfer.
  - e) An interested person requests in writing that a permit be modified and the RA determines that cause for modification exists.



- f) Cause exists for termination under 40 CFR 144.40, but the RA determines that permit modification is appropriate.

The modification described in 40 CFR 144.39 must be followed to accomplish the modifications described in item "a" through "f" of this section.

- 2. Minor modifications do not require that the procedure listed in 40 CFR 144.39 be followed. Minor modifications consist of:
  - a) Correcting typographical errors;
  - b) Requiring more frequent monitoring or reporting;
  - c) Changing ownership or operational control (see 40 CFR 144.38, Permit Transfers); or
  - d) Changing quantities or types of injected fluids, provided:
    - (i) The facility can operate within conditions of the permit;
    - (ii) The facility classification would not change.

The filing of a request by the permittee for a permit modification, or a notification of planned change or anticipated noncompliance, does not stay any permit condition.

G. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

H. Duty to Provide Information

The permittee shall furnish to the RA within a reasonable time any information which the RA requests to determine whether cause exists for modifying, revoking and reissuing or terminating this permit. The permittee shall also furnish to the RA, upon request, copies of records required to be kept by this permit.

I. Inspection and Entry

The permittee shall allow EPA representatives upon the presentation of credentials and other documentation to:

- 1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records required by this permit are kept;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any location.

J. Monitoring and Records

1. Samples and measurements taken for the purpose of monitoring shall be representative of the injection activity. The operator shall monitor the injection pressure (psi) and rate (bbl/day) once a month. Reporting of monitoring results shall be in accordance with procedures and at intervals prescribed in condition II.L.4 of this permit.
2. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample measurement, report or application. This period may be extended by request of the RA at any time.

The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of any plugging and abandonment procedures specified under 40 CFR 144.28(c) and 144.28(j)(2). The RA may require the owner or operator to deliver the records to the RA at the conclusion of the retention period.

3. Records of monitoring information shall include:
  - a) The date, exact place, and time of sampling or measurements;
  - b) The individuals who performed the sampling or measurements;
  - c) The date(s) analyses were performed;
  - d) The individual(s) who performed the analyses;
  - e) The analytical techniques or methods used including quality assurance techniques employed to insure the generation of reliable data; and

f) The results of such analyses.

4. The owner/operator shall retain all monitoring records for three (3) years, unless an enforcement action is pending, and then until three (3) years after the enforcement action has been resolved.

K. Signatory Requirements

All applications, reports, or information submitted to the RA shall be signed and certified (see 40 CFR 144.32) by the injection facility owner/operator or his duly authorized representative.

L. Reporting Requirements

1. The owner/operator shall notify the EPA Region 6 UIC office within 30 days of the date on which injection commenced.
2. Planned changes - The permittee shall give advance notice to the RA of any planned changes which may result in noncompliance.
3. Transfers - This permit is not transferable to any person except after notice to the RA.

a) Permits may be transferred to another permittee:

- (1) If the current permittee notifies the RA by certified mail at least 10 days before the proposed transfer date; and
- (2) If the notice includes a written agreement between the existing and new permittees containing:
  - (i) A specific date for transfer of permit responsibility, coverage and liability; and
  - (ii) Assurance that the new permittee has a surety bond on file with BIA; and
- (3) If the RA does not respond with a notice to the existing permittee that the permit will be modified.

b) If the conditions in paragraph (a) of this section are met, the transfer is effective on the date specified in paragraph (a)(2)(i).

4. Monitoring reports - Monitoring results shall be reported annually on the EPA Annual Disposal/Injection Well Monitoring Report form or an identical format. The report shall specify the types of methods used to generate the monitoring data.
5. Compliance schedules - Reports of compliance or noncompliance with, or any progress report on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 30 days following each interim date and final date of compliance.
6. Twenty-four hour reporting - The permittee shall report to EPA Region 6 UIC office any noncompliance which may endanger an underground source of drinking water. The report shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
7. The following shall be reported within 30 days of occurrence:
  - a) Any monitoring reports or other information required under paragraph 6 that is not available within five (5) days.
  - b) Any malfunction of the injection system including any mechanical failure or downhole problem involving well integrity, well workovers, or any noncompliance (40 CFR 144.27).
8. Other noncompliance - The permittee shall report all instances of noncompliance not reported under paragraphs 6 and 7 of this section at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph L.6 of this section.
9. The permittee shall notify the EPA Region 6 UIC office within 30 days of the date injection has terminated.
10. Other information. When the permittee becomes aware that he failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the RA, the permittee shall promptly submit such facts or information.

M. Additional Conditions

1. The operator of a well shall not allow the movement of fluid containing any contaminant into underground sources of drinking water if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect human health.
2. The owner/operator shall notify the EPA Region 6 UIC office within 30 days of the date injection has terminated. The well must be plugged within two years after termination of injection. The RA may extend the time to plug, but only if no fluid movement into a USDW will occur, and the operator has presented a viable plan for utilizing the well within a reasonable time.
3. The permittee shall notify the EPA Region 6 UIC office by certified mail at least forty-five (45) days prior to the commencement of plugging operations. The notice must include that information prescribed at 40 CFR 146.10.
4. Plugging and Abandonment - The well shall be plugged in a manner which will not allow movement of fluids either into or between underground sources of drinking water. Placement of cement plugs shall be accomplished by one of the methods described in 40 CFR 146.10 or some other method approved by the RA.

The well to be abandoned shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the RA, prior to the placement of the cement plug(s).

N. Financial Responsibility

The permittee must demonstrate and maintain financial responsibility and resources to close, plug, and abandon the underground injection well.

O. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

P. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provisions to other circumstances, and the remainder of this permit, shall not be affected thereby.

Q. Explanation of Terms

Terms used in this permit are defined as follows:

"RA" - Regional Administrator, Region 6 EPA

"UIC" - Underground Injection Control

"SDWA"/"the Act" - The Safe Drinking Water Act

"EPA Region 6"- U.S. Environmental Protection Agency (6W-SE)  
1445 Ross Avenue  
Dallas, Texas 75202-2733  
Telephone - (214) 655-7165

"Well Stimulation" - means several processes used to clean the wellbore, enlarge channels, and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation, and includes (1) surging, (2) jetting, (3) blasting, (4) acidizing, (5) hydraulic fracturing.

Other references to program - specific terms, acronyms and abbreviations shall mean those terms as defined by the UIC program regulations, 40 CFR 124, 144, 145, 146, 147 and the Safe Drinking Water Act.

Underground Injection Control Program  
Draft Permit  
Response to Comments

This is our response to comments received on the subject draft Underground Injection Control (UIC) permit in accordance with UIC program regulations [40 CFR 124.17(b)].

Permit No.: 06SNMN2P9002  
Permittee Name: Grand Resources, Incorporated  
Well Location: SW Quarter, Sec. 14, Twp. 32N, Rnge. 18W  
Draft Permit Public Comment Period: June 28, 1989, through July 26, 1989  
Prepared by: Richard C. Peckham

Issue

Comments were received that the 1000 psi maximum injection pressure was excessive and suggested that a 0.2 psi per foot gradient be used to determine the allowable pressure until a step-rate test has been run which might justify a higher injection pressure.

Response

EPA considered the comments and agree that injection pressures higher than that calculated by a 0.2 psi per foot gradient should be justified by a step-rate test. Therefore, special permit condition I.B.2. has been changed to require a step-rate test prior to EPA establishing a maximum injection rate.

Appeal of Final Permit Decision

The final permit may be appealed by any person who filed comments on the draft permit. Persons who did not comment on the draft permit may appeal only those changes made to the final permit subsequent to draft permit issuance. Appeals must be submitted in writing to the Regional Administrator within 30 days of the date the Water Management Division Director signs the permit. Such requests must include that information required in 40 CFR §124.19(a).

Navajo 5-C  
L-14-32N-18W

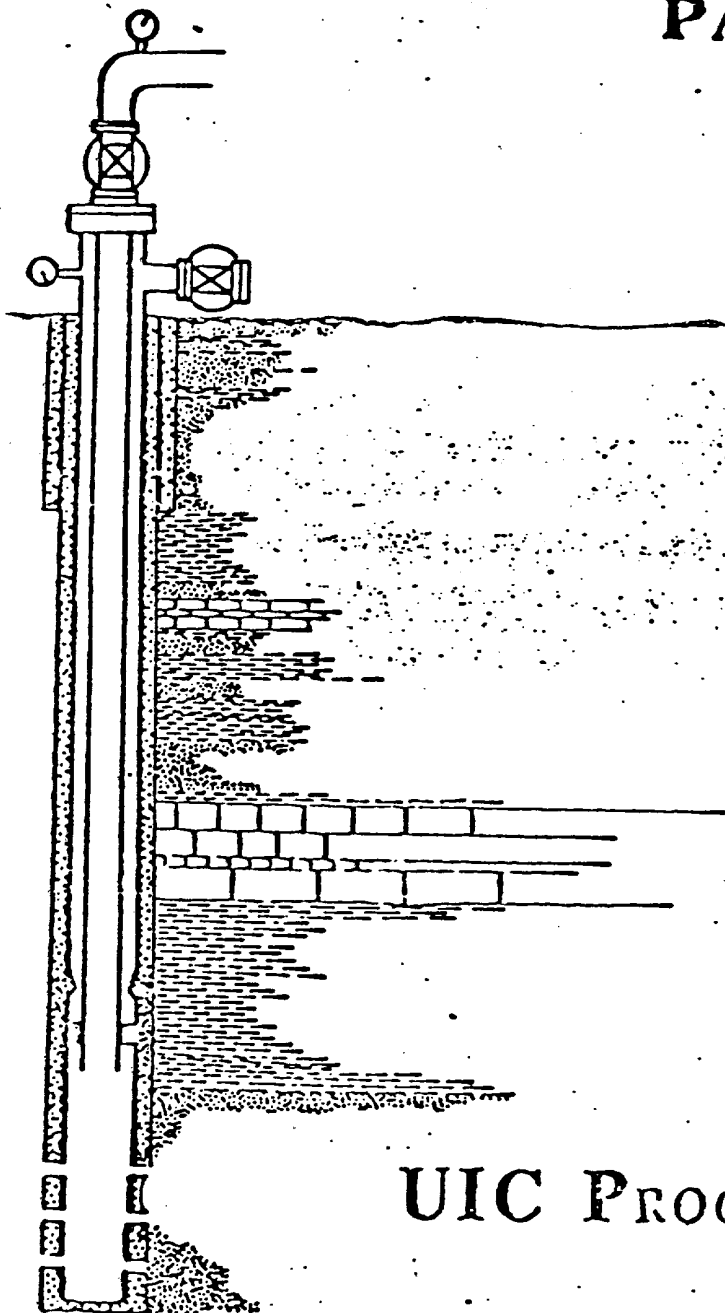
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# PERMIT APPLICATION PACKAGE

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NOV 4 1991

OIL CON. DIV.)  
DIST. 3



**UIC PROGRAM**





## Introduction

Most injection wells which are currently operating on other Indian lands in Oklahoma are authorized by rule and need not apply for an individual permit. Wells in the following categories, however, must apply for and receive an EPA permit to construct or operate an oil and gas related injection well on other Oklahoma Indian lands:

1. Any well constructed or completed after November 25, 1988.
2. Any production well converted to an injection well after November 25, 1988.
3. Existing SWD wells must apply for a permit as scheduled by the RA, but no later than November 25, 1992.
4. Wells which the operator wishes to operate outside rule requirements (for example; at a higher pressure than authorized by rule).
5. Wells which were authorized by rule, but have been identified as:
  - a. being in violation of the rule, or
  - b. no longer within the category of rule authorized well, or
  - c. needing additional restrictions to protect underground sources of drinking water (USDW's).\*

Please include or reference all the information requested in this package, so that we may quickly process your application and not delay your operations [A copy of this package will be immediately forwarded to the affected Tribal Government].

The application consists of either the Budget Bureau Form #1004-0135 (for conversions) or #1004-0136 (for new drilled) and additional required data listed on the "Permit Application Checklist". We have included blank tabulations, well schematic, data sheets and certifications which you may find convenient for providing some of the required data. At any time, if you have questions about the information requested, please call the Environmental Protection Agency in Dallas at (214) 655-7165. We will be happy to explain what is needed.

\*Operators of wells in this category will receive a letter from the Environmental Protection Agency Dallas Office directing them to apply for a permit.

Well # C-5  
 Permit # \_\_\_\_\_  
 Date Received : \_\_\_\_\_  
 \*EPA Authorization # \_\_\_\_\_

# Permit Application Checklist

	<u>Attached</u>	<u>Not Attached</u>	
1.	<u>  x  </u>	<u>          </u>	1. Budget Bureau Form # 1004 - 0135 (Sundry Notices) or #1004 - 0136 (Application to Drill) (2 copies to EPA).
2.	<u>  x  </u>	<u>          </u>	2. Map using township-range-sections to show the location of wells within 1/2 mile (2640 ft.) of the proposed well.
3.	<u>  x  </u>	<u>          </u>	3. Tabulation of data on wells within 1/2 mile (2640 ft) that penetrate the injection interval including:
		<u>          </u>	company and well name
		<u>          </u>	depth
		<u>          </u>	location
		<u>          </u>	date drilled
		<u>          </u>	type of well and status
		<u>          </u>	record of plugging and/or completion
		<u>          </u>	corrective action plan for inadequately completed or plugged wells.
4.	<u>  x  </u>	<u>          </u>	4. Injection well schematic drawings of surface and subsurface details showing:
		<u>          </u>	(i) total depth plug-back depth,
		<u>          </u>	(ii) depth to top and bottom of injection interval,
		<u>          </u>	(iii) depth to top and bottom of casing and cemented interval, plus amount of cement,
		<u>          </u>	(iv) size of casing and tubing and depth of packer, and
		<u>          </u>	(v) hole diameter,
		<u>          </u>	(vi) all perforated intervals, and/or open hole interval

\* Applicable to wells authorized by rule

- |     | <u>Attached</u>         | <u>Not Attached</u> |  |
|-----|-------------------------|---------------------|--|
| 5.  | <u>  x  </u>            | <u>          </u>   | 5. Operating data including: <ul style="list-style-type: none"><li>(i) maximum and average injection rate,</li><li>(ii) maximum and average injection pressure,</li><li>(iii) fracture pressure gradient of injection zone,</li><li>(iv) whether operations is cyclic or continuous, and</li><li>(v) source and analysis of injected fluids including TDS, chlorides, and additives.</li></ul> |
| 6.  | <u>  x  </u>            | <u>          </u>   | 6. Geologic data on the injection and confining zones, including faults, geological name, thickness, porosity, permeability, depth, current reservoir pressure or fluid level, water quality, and lithologic description.  |
| 7.  | <u>(no fresh water)</u> | <u>  x  </u>        | 7. Depth to base of fresh water (10,000 mg/l)  |
| 8.  | <u>  x  </u>            | <u>          </u>   | 8. Verification of public notice, consisting of a list showing names, addressess, and date that notice of permit application was given or sent to each: <ul style="list-style-type: none"><li>(i) surface land owner,</li><li>(ii) tenant,</li><li>(iii) operator of a producing lease within one-half mile of the well location, and</li><li>(iv) affected Tribal Government.</li></ul>       |
| 9.  | <u>  x  </u>            | <u>          </u>   | 9. All available logging and testing data on the well (for existing wells only).   |
| 10. | <u>  x  </u>            | <u>          </u>   | 10. Proof of adequate financial responsibility.  |
| 11. | <u>  x  </u>            | <u>          </u>   | 11. Certification form signed by well owner/operator or authorized representative (authorization must be in writing and copy attached).  |
| 12. | <u>(Yes)</u>            | <u>(No)</u>         | 12. Has the applicant declared any part of his submission confidential? [147.2907]   |
| 13. | <u>(Yes)</u>            | <u>(No)</u>         | 13. Is the injection well currently authorized by rule? If yes, EPA Inventory No. is <u>          </u> .   |

- |     | <u>Attached</u> | <u>Not Attached</u> |   |
|-----|-----------------|---------------------|---|
| 14. | <u>(Yes)</u>    | <u>(No)</u>         | 14. Was applicant required by EPA to apply for a permit?                      |
| 15. | <u>(Yes)</u>    | <u>(No)</u>         | 15. The permit applicant is the <u>owner/operator</u><br>(circle one or both) |
| 16. | <u>(Yes)</u>    | <u>(No)</u>         | 16. Has the applicant requested emergency authorization to inject.            |
| 17. | <u>X</u>        | <u>          </u>   | 17. Plugging and Abandonment Plan, and estimated cost of plan.                |

\_\_\_\_\_  
Administrative Reviewer  
Signature/Date

\_\_\_\_\_  
Technical Reviewer  
Signature/Date

17. PLUGGING AND ABANDONMENT PLAN

When the well is plugged, a cast iron bridge plug will be set at 1550 feet. An acceptable cement slurry will be spotted above the CIBP, heavy drilling mud will be spotted above cement plug. 4 $\frac{1}{4}$ " casing will be shot off at free point and cement will be circulated from 100 feet to the surface. Location will be restored to as natural a state as possible. Estimated cost - \$5,000.00.

Form 160-5  
November 1983)  
Formerly 9-331)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPlicate  
(Other instructions on  
reverse side)

Form approved  
Budget Bureau No. 1004-0135  
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER Water Injection Well Conversion		3. LEASE DESIGNATION AND SERIAL NO. Navajo Tribal 14-20-603-58
2. NAME OF OPERATOR Grand Resources, Inc.		6. OF INTEREST, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL
3. ADDRESS OF OPERATOR 2250-E. 73rd., Ste 400, Tulsa, OK 74136		7. UNIT AGREEMENT NAME Mesa Gallup
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface 2310 F S Line, 330 F W Line Section 14-32N-18W		8. NAME OF LEASE NAME Navajo Tribe
14. PERMIT NO.		9. WELL NO. 5C
15. ELEVATIONS (Show whether DT, ST, OR, etc.) DE 5727		10. FIELD AND POOL, OR WILLACAT Mesa Gallup
		11. SEC., T., R., W., OR BLK. AND SUBST OF AREA Sec. 14-32N-18W
		12. COUNTY OR PARISH 13. STATE San Juan NM

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>	WATER SHUT-OFF	<input type="checkbox"/>
FRACURE TREAT	<input type="checkbox"/>	FRACURE TREATMENT	<input type="checkbox"/>
BHOOT OR ACIDIZE	<input type="checkbox"/>	BHOOTING OF ACIDIZING	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	(Other)	<input type="checkbox"/>
(Other) convert to water injection	<input checked="" type="checkbox"/>		
PILL OR ALTER CASING	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	ABANDONING CASING	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	ABANDONMENT*	<input type="checkbox"/>
CHANGE PLATTS	<input type="checkbox"/>		

(Note: Report results of multiple completion on Well Completion or Recompletion Report and L-g form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

1. Lay down production tubing and rods.
2. Run plastic lined 2 3/8" tubing to 1600' with Baker Model R packer. Set packer at 1600', load annular space with treated packer fluid, pressure test annulus for hole integrity.
3. Acidize perfs 1641-57 and 1659-66 with 500 gal., 15% MCA. Commence injection, approximately July 15, 1989.

18. I hereby certify that the foregoing is true and correct

SIGNED

TITLE President

DATE

May 11, 1989

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

TABULATION OF WELLS WITHIN 1/2 MILE OF PROPOSED INJECTION WELL  
WHICH PENETRATE THE INJECTION ZONE.

Well Name \_\_\_\_\_ Company Name \_\_\_\_\_ Date Drilled \_\_\_\_\_ Depth \_\_\_\_\_  
 Location \_\_\_\_\_ ' F L & \_\_\_\_\_ ' F L; \_\_\_\_\_ /4, Sec. \_\_\_\_\_ -T \_\_\_\_\_ -R \_\_\_\_\_ Status \_\_\_\_\_

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:

Formations Open to Wellbores: \_\_\_\_\_

Well Name \_\_\_\_\_ Company Name \_\_\_\_\_ Date Drilled \_\_\_\_\_ Depth \_\_\_\_\_  
 Location \_\_\_\_\_ ' F L & \_\_\_\_\_ ' F L; \_\_\_\_\_ /4, Sec. \_\_\_\_\_ -T \_\_\_\_\_ -R \_\_\_\_\_ Status \_\_\_\_\_

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:

Formations Open to Wellbores: \_\_\_\_\_

Well Name \_\_\_\_\_ Company Name \_\_\_\_\_ Date Drilled \_\_\_\_\_ Depth \_\_\_\_\_  
 Location \_\_\_\_\_ ' F L & \_\_\_\_\_ ' F L; \_\_\_\_\_ /4, Sec. \_\_\_\_\_ -T \_\_\_\_\_ -R \_\_\_\_\_ Status \_\_\_\_\_

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:

Formations Open to Wellbores: \_\_\_\_\_

Well Name \_\_\_\_\_ Company Name \_\_\_\_\_ Date Drilled \_\_\_\_\_ Depth \_\_\_\_\_  
 Location \_\_\_\_\_ ' F L & \_\_\_\_\_ ' F L; \_\_\_\_\_ /4, Sec. \_\_\_\_\_ -T \_\_\_\_\_ -R \_\_\_\_\_ Status \_\_\_\_\_

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:

Formations Open to Wellbores: \_\_\_\_\_

WELL IN AREA OF REVIEW

OPERATOR	WELL NAME	SPUD DATE	LOCATION	SECTION	TOTAL DEPTH	COMPLETION INTERVAL	I.P. (BOPD)	FORMA- TION	CASING SIZE & DEPTH	CEMENT SXS	STATUS
ZOLLER & DANNENBERG	BLUEHILL #1	7-26-65	2319FW-1980FE	25,32N-18W	1573	-	-	"	7"ø30	circ.	P&A
	GRAND NAV "A" #4	11-8-61	B600FN-1980FE	25,32N-18W	1120	1051-66	8	GALLUP	4½"ø1045	100	P
	GRAND NAV "A" #5	12-4-61	C610FN-1980FW	25,32N-18W	1062	1037-45	5	"	3½"ø1057	100	P
	RL BAYLESS NAV #6	7-2-64	3300FS-3300FW	25,32N-18W	1093	-	-	"	5½"ø52	circ.	P&A
NAVAJO											
GRAND	#3	8-10-61	N660FS-1980FW	24,32N-18W	1163	1110-26	49	"	4½"ø1158	45	P
GRAND	#4	10-3-61	J1650FS-1710FE	14,32N-18W	1365	1315-23	6	"	4½"ø1357	35	P
EXPL/DRILL/CO	#5	11-29-61	J2135FS-1935FE	23,32N-18W	1254	-	-	"	7"ø30	circ.	P&A
EXPL/DRILL/CO	#6	12-30-61	365FS-760FW	13,32N-18W	1472	-	-	"	7"ø66	circ.	P&A
GRAND	#7	1-13-62	E2310FN-330FW	24,32N-18W	1482	1423-38	88	"	4½"ø1481	40	P
GRAND	#8	2-10-62	A950FN-330FE	23,32N-18W	1445	1383-94	88	"	4½"ø1437	40	P
GRAND	#11	1-24-62	B330FN-1650FE	23,32N-18W	1438	1381-92	87	"	4½"ø1438	40	P
GRAND	#12	2-18-62	F2290FN-1780FW	24,32N-18W	1573	1521-28	8	"	4½"ø1572	40	P
NAVAJO TRIBAL C											
GRAND	#1	2-26-62	L660FN-2310FS	24,32N-18W	1295	1225-36	92	"	4½"ø1288	80	P
GRAND	#2	3-10-62	H1650FN-330FE	23,32N-18W	1478	1407-17	89	"	4½"ø1476	80	P
GRAND	#3	3-17-62	O330FS-2310FE	14,32N-18W	1380	1312-20	36	"	4½"ø1373	80	P
GRAND	#4	10-3-61	J1650FS-1710FE	14,32N-18W	1365	1315-23	6	"	4½"ø1357	35	P
GRAND	#5	3-23-68	L2310FS-330FW	14,32N-18W	1762	1642-65	84	"	4½"ø1749	35	P
GRAND	#6	3-12-69	N1720FW-650FS	14,32N-18W	1310	1252-69	77	"	4½"ø1310	35	P
EXPL/DRILL/CO	#7	4-7-69	H990FS-990FW	14,32N-18W	1327	-	-	"	7"ø30	circ.	P&A



WELL IN AREA OF REVIEW

OPERATOR	WELL NAME	SPUD DATE	LOCATION	SECTION	TOTAL DEPTH	COMPLETION INTERVAL	I.P. (BOPD)	FORMA- TION	CASING SIZE & DEPTH	CEMENT SXS	STATUS
AZTEC OIL & GAS	NAV #3	11-14-59	4745FW-790FS.	25,32N-18W	1660			GALLUP	8 5/8@60	35	P&A
DUGAN	HORSESHOE #2E	6-17-64	330FW-3210FS	30,32N-17W	1175	1101-10	10	GALLUP	4 1/2" @ 1172	35	P
ARI-MEX	NAV B #2	10-15-70	4950FW-2310FS	15,32N-18W	1718	1612-14	10	"	4 1/2" @ 1717	125	P
ARI-MEX	NAV #6	5-16-68	4950FW-3030FS	15,32N-18W	1360	1282-1304		"	4 1/2" @ 1345	35	P
ARI-MEX	NAV C #1	5-2-64	4595FW-3580FS	15,32N-18W	1276	1223-38	32	"	4 1/2" @ 1276	50	P
ARI-MEX	NAV #3A	5-30-64	4530FW-4335FS.	15,32N-18W	1312	1250-60	19	"	4 1/2" @ 1312	35	P
AAA FSHING TL	NAV #4	1-24-68	3850FW-2510FS	15,32N-18W	1414	-		"	7" @ 50	circ.	P&A
AAA FSHING TL	NAV B #1	12-18-70	1650FW-1650FE	15,32N-18W	1285	-		"	7" @ 60	25	P&A
ARI-MEX	NAV B #3	3-19-70	1115FW-1480FE	15,32N-18W	1275	1197-1205	6	"	4 1/2" @ 1272	125	P
AAA FSHING TL	NAV #7	2-24-69	2310FW-4950FS	15,32N-18W	1295	-	-	"	7" @ 30	circ.	P&A
ARI-MEX	NAV #5	10-4-67	3300FW-440FS	10,32N-17W	1873	1664-78	6	"	4 1/2" @ 1764	135	P
HARLAN DRUG	NAV #2	5-4-64	350FW-540FS	10,32N-17W	1183	-	-	"	7" @ 30	circ.	P&A

\* ALL WELLS ARE 6 1/2" hole size except:

RL BAYLESS NAVAJO #6, 3300 FS - 3300 FW, Section 25-32N-18W and  
 AXTEC OIL & GAS NAVAJO #3, 4745 FW - 790 FS, Section 25-32N-18W and  
 these two wells have 7 7/8" hole size

\* THE TOP OF THE CEMENT IS NOT INDICATED BY EITHER TEMPERATURE SURVEY OR  
 BOND LOG ON THE PRODUCING WELLS. ALL CEMENT TOPS MUST BE CALCULATED.

# WELL SCHEMATIC

Operator Grand Resources, Inc.  
Completion Date: 3-29-68

Well Name: Navajo Well # C-5  
2310 Ft. F 5 L & 330 Ft. F W L  
SW 1/4 Section 14 Twp. 32N Rg. 18W

Surface Elevation 5727

Formation(s) Top/Bottom  
from PBTD to surface:

Carlisle Shale	1720	/	1666
Gallup Sand	1666	/	1641
Gallup Silt	1641	/	1551
Mancos Shale	1551	/	266
Point Lookout Sand	266	/	Surf.
---	--	/	--
---	--	/	--

Tubing Size: 2 3/8 In.  
Weight: 4.6 lb./Ft.  
Length: 1600 Ft.

Packer Type: HAL MOD R  
Set at: 1600 Ft.

Formation(s) perforated above packer:

None ' to '  
' to '

Formation(s) perforated below packer:

Gallup Sand 1641 ' to 1656 '  
Gallup Sand 1660 ' to 1666 '  
-- -- ' to -- '

Open hole below production casing  
from None ' to -- -- '

Formation(s) present in open hole:

None

## SURFACE CASING DATA

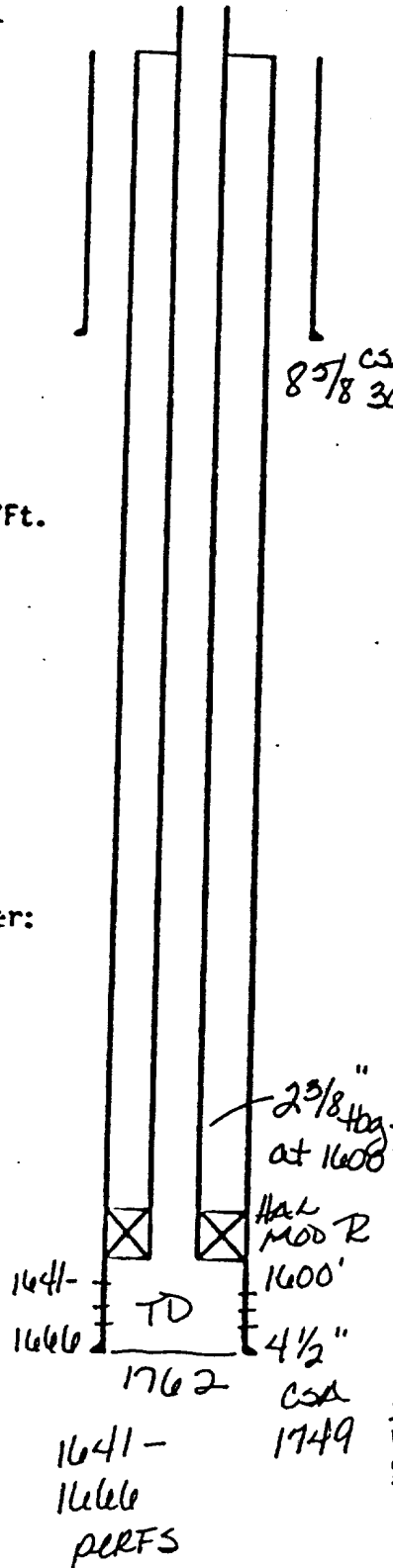
Hole Size: 8 3/4 In.  
Casing Size: 7 In.  
Weight: 23 lb/F  
Length: 30 Ft.  
Cement Type: Class Regular  
Amount: 7 Sx.  
Additives: None  
Casing set at: 30 Ft.  
Top of Cement: circ. Ft.  
Method of Determination: circ.

## PRODUCTION CASING DATA

Hole Size: 6 1/2 In.  
Casing Size: 4 1/2 In.  
Weight: 9 1/2 lb/Ft  
Length: 1749 Ft.  
Cement Type: Class Regular  
Amount: 35 Sx.  
Additives: None  
Casing Set at: 1749 Ft.  
Top of Cement: 1545 Ft.  
Method of Determination: Calc.

PBTD: 1720  
TD: 1762

NOTE: All depths are to be from ground level. If KB depths are used make notations on diagram & give height of KB above ground level.



Permit # \_\_\_\_\_

### Well Completion and Operation Data

Type Injection Well: (EOR/SWD/HC Storage) (New/Conversion)

Injection: (Continuous/Cyclic)

Approximate # days operating/year 365  
Rate (B/D): Average 300 Maximum 500  
Wellhead pressure (psi): Average 250 Maximum 1000  
Fluid: TDS -- -- Sp. Gr. -- -- Analyses included: (yes/no)  
Source (formation name) Morrison  
Will anything be added to the water to be injected? (yes/no)  
What will those additives be? -- -- -- -- --

### Geologic Data (all references to depths are below land surface)

Injection Interval: Top 1642 ; Bottom 1665 ; Effective Thickness 18 ft.  
Formation name Gallup Lithology Sandstone  
Porosity (%) 17 Current Reservoir Pressure 120# Date 5-11-89  
Current Fluid Level in Well 200 ft. Date 5-11-89  
Permeability (md) 180  
Drill Stem Test Included: (YES) (NO)

Confining Zones: Thickness between injection zone and USDW No USDW  
Lithology Shales  
Cumulative shale 1640 : thickest shale zone all (interval)  
Faults: Are there any faults in the area of the well which penetrate the injection interval? (Yes/No)

### Well Data: (all references to depths are below land surface)

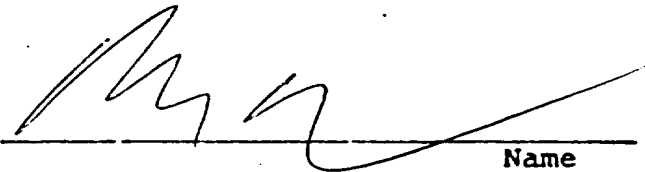
Surface Elevation: 5727 (KB/GL) Total (Depth/Plugged Back Depth) 1762/1720  
Date Drilled or to be drilled 3-29-68  
Type logs available on (this well/offset well): (By reference/included)  
Gamma Ray Neutron

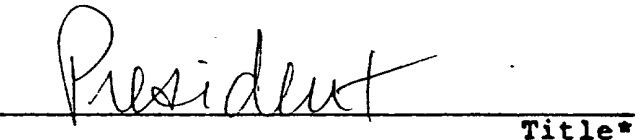
Construction:	Size (in)	Depth Interval	Sacks of Cement	Hole Size	Cement Interval	How Determined
Surface Csg.	7	30'	7	8 3/4	all	circ
Intermediate Csg.	--	--	--	--	--	--
Long String Csg.	4 1/2	1749'	35	6 1/2	1749-1545	calc
Liner	--	--	--	--	--	--
Tubing	2 3/8	1600'	Packer type and depth HAL MOD R at 1600'			

Other Perforated Intervals None

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

  
Name

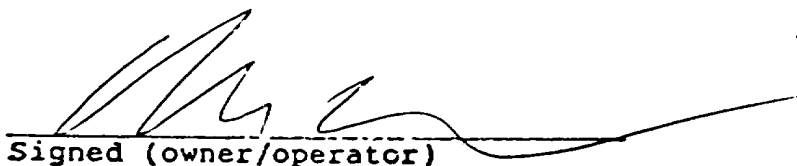
  
Title\*

\*If certification is signed by a party other than the injection well owner/operator a written statement of authorization signed by the owner/operator must accompany the application.

STATEMENT OF AUTHORIZATION

I GRAND Resources, Inc., hereby authorize Marvin Robinswiz  
injection well owner/operator

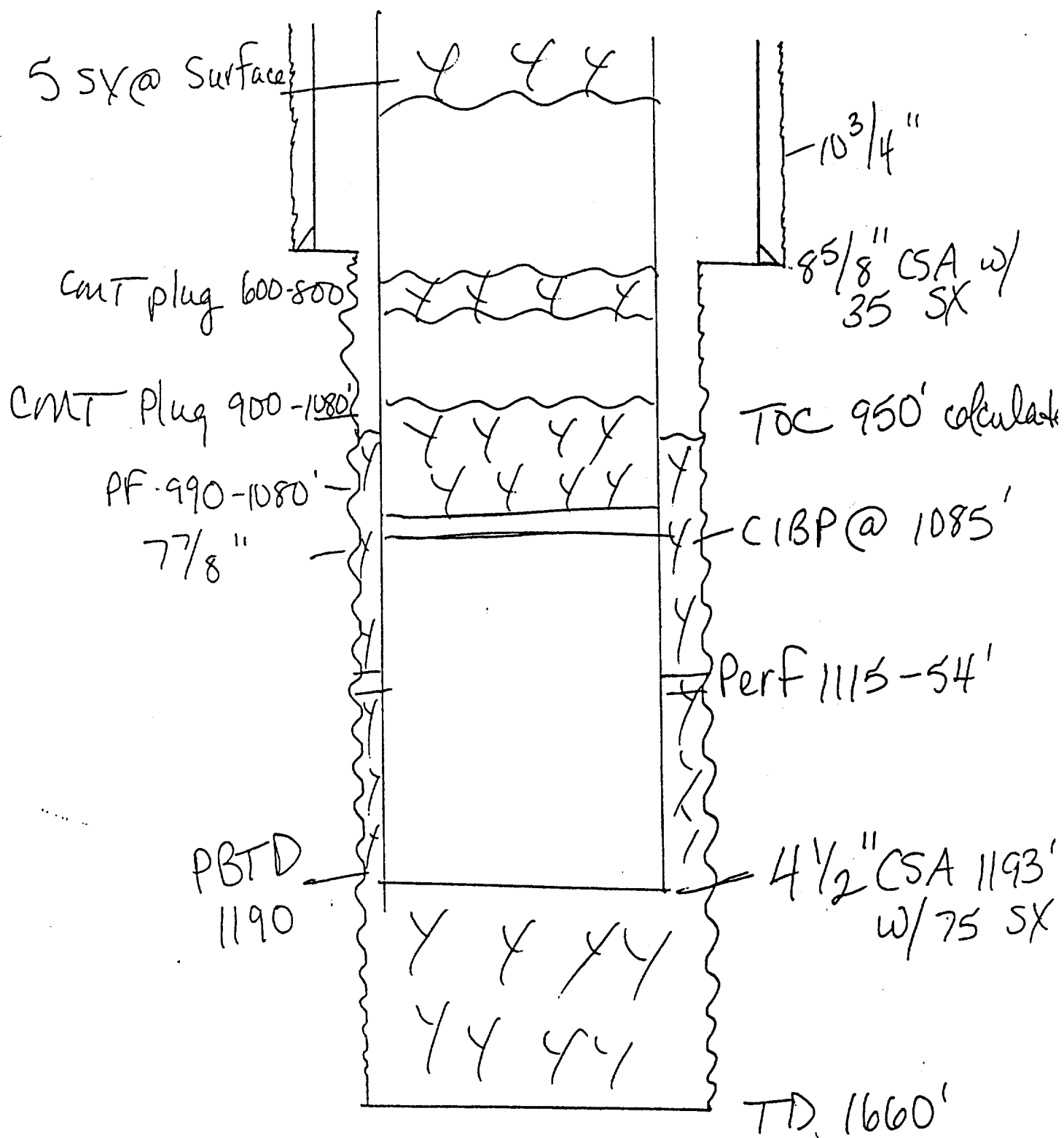
to act in my behalf in executing the necessary forms including permit applications, compliance reports, etc., as required under the Environmental Protection Agency Underground Injection Control program.

  
Signed (owner/operator)

Date: 5-15-89

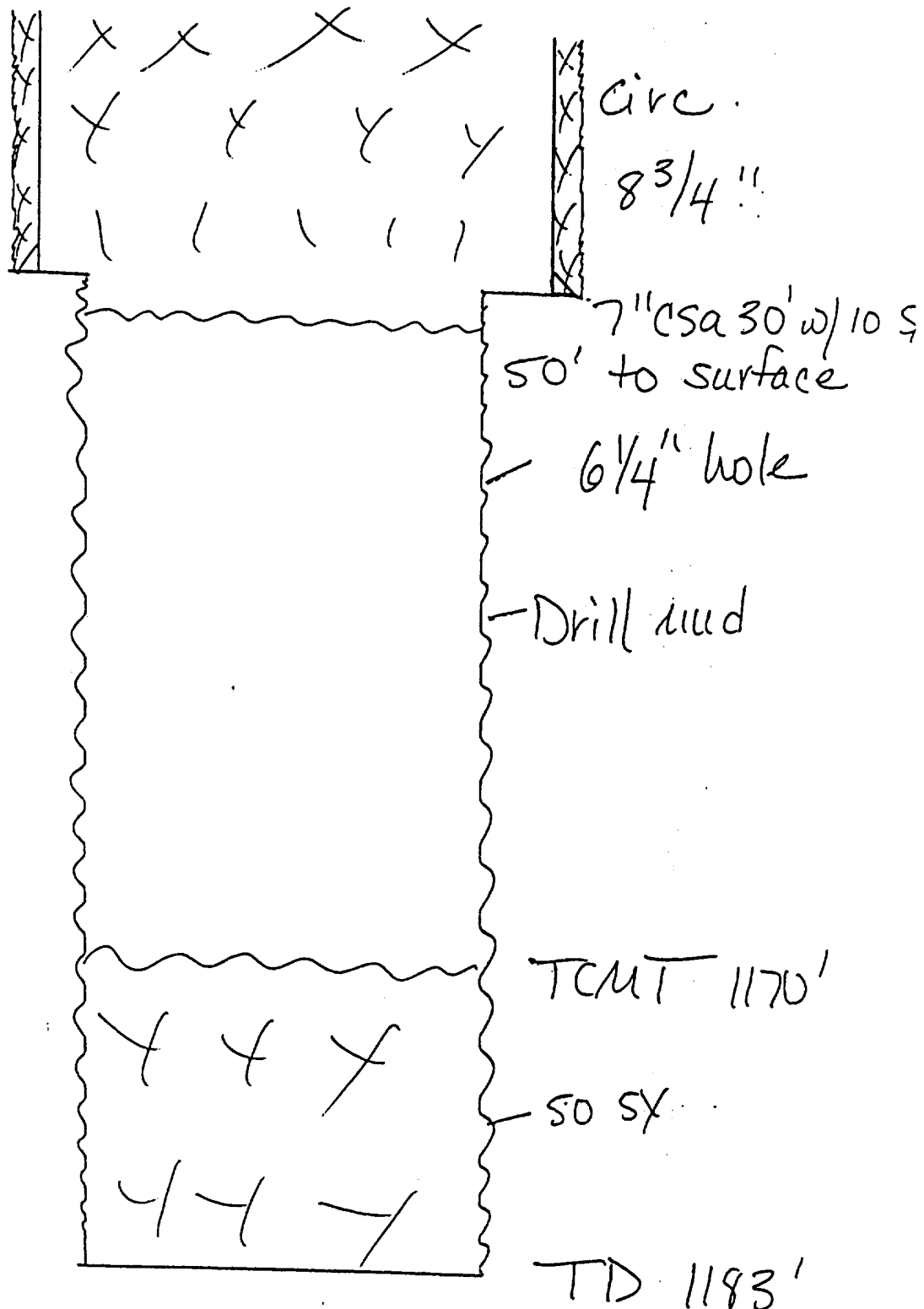
## WELL DATA SHEET

AZTEC OIL & GAS CO.		NAVAJO		11-14-59	
OPERATOR		LEASE		SPUD DATE	
#3		790FS-535FE		32N 18W	
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE	



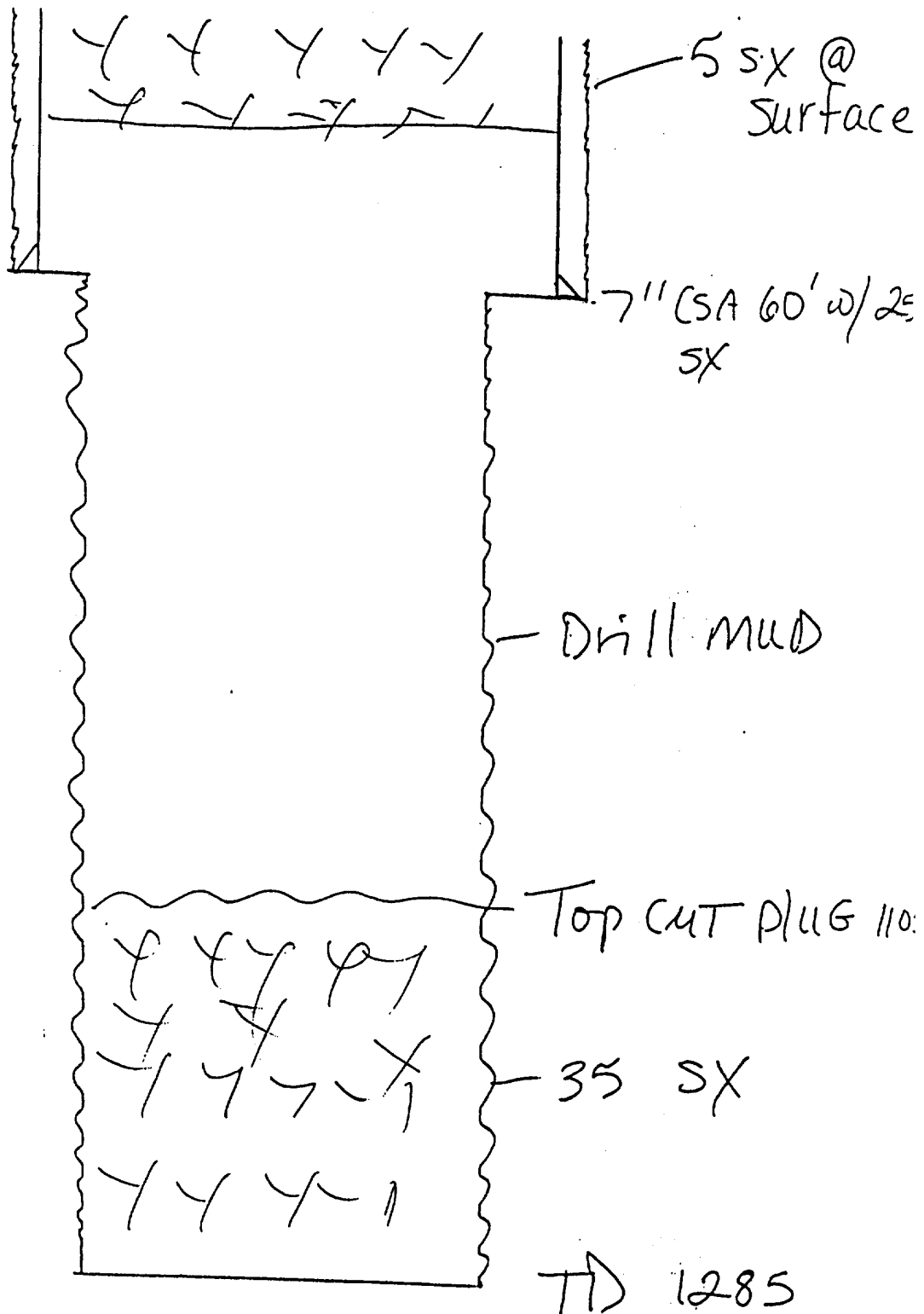
# WELL DATA SHEET

OPERATOR	LEASE	SPUD DATE
HARLAN DRILLING CO.	NAVAJO	5-4-64
#2	350FW-540FS	10
WELL NO.	FOOTAGE LOCATION	SECTION
		TOWNSHIP
		RANGE



WELL DATA SHEET

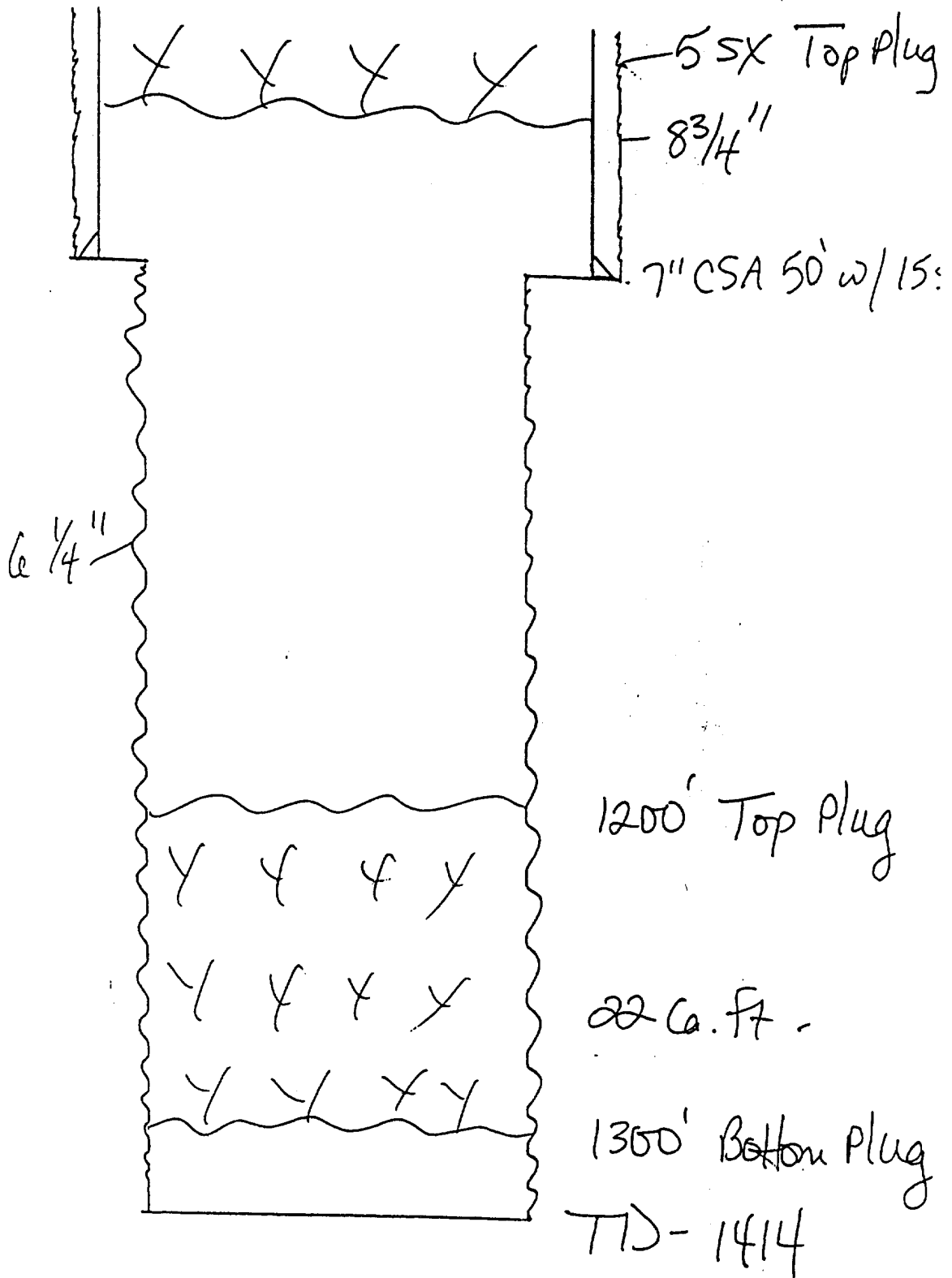
AAA	FISHING TOOL	NAVAJO	12-3-70	
OPERATOR		LEASE	SPUD DATE	
B-1	1650FN-1650FE	15	32N	18W
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE





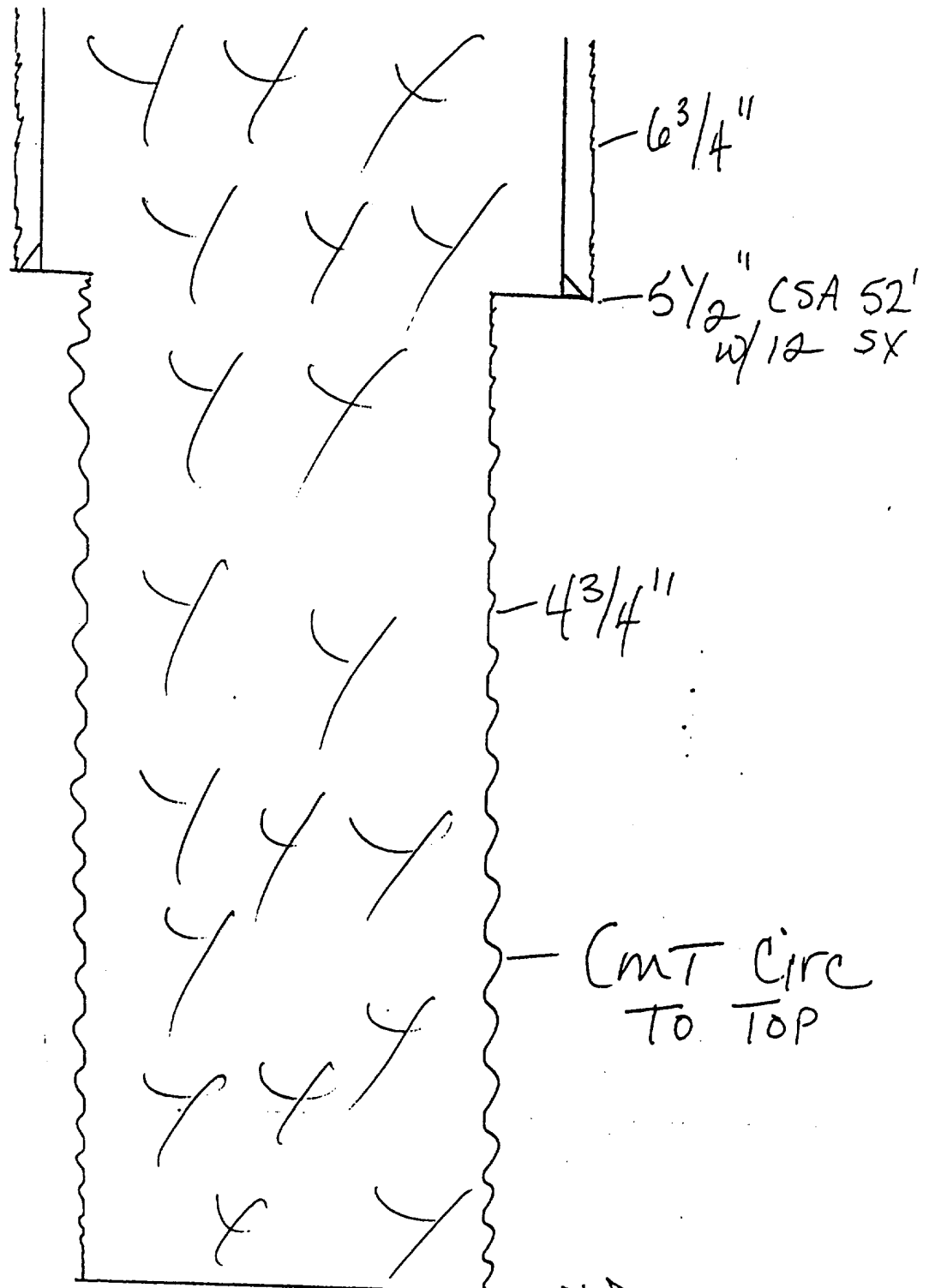
WELL DATA SHEET

AAA FISHING TOOL	NAVAJO	1-24-68
OPERATOR	LEASE	SPUD DATE
#4	3850FW-2510FS	15      32N      18W
WELL NO.	FOOTAGE LOCATION	SECTION      TOWNSHIP      RANGE



# WELL DATA SHEET

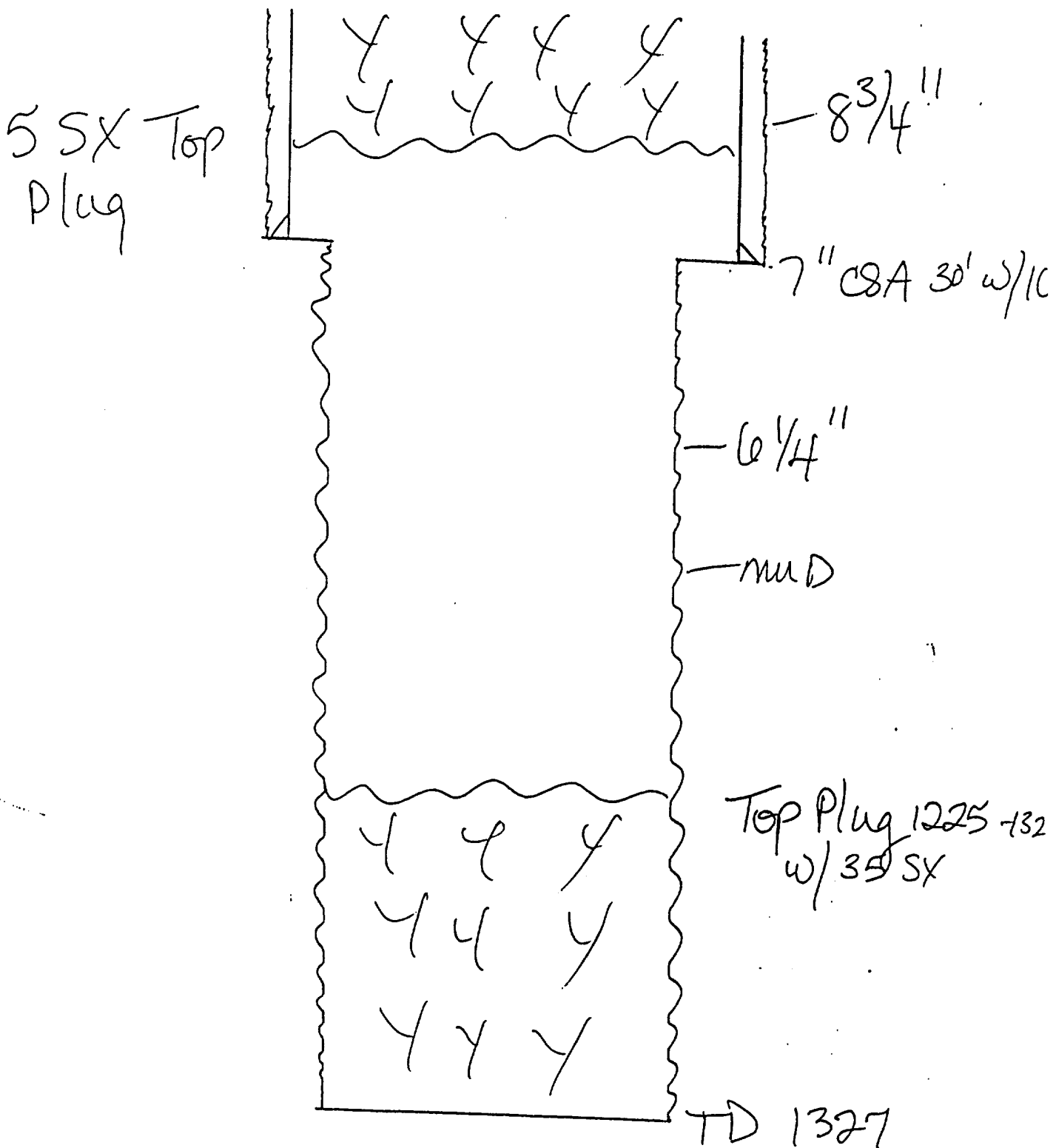
OPERATOR	R. L. BAYLESS	LEASE	NAVAJO	SPUD DATE	7-1-64
WELL NO.	#6	FOOTAGE LOCATION	1980FN-1980FE	SECTION	25
				TOWNSHIP	32N
				RANGE	18W



TD 1093

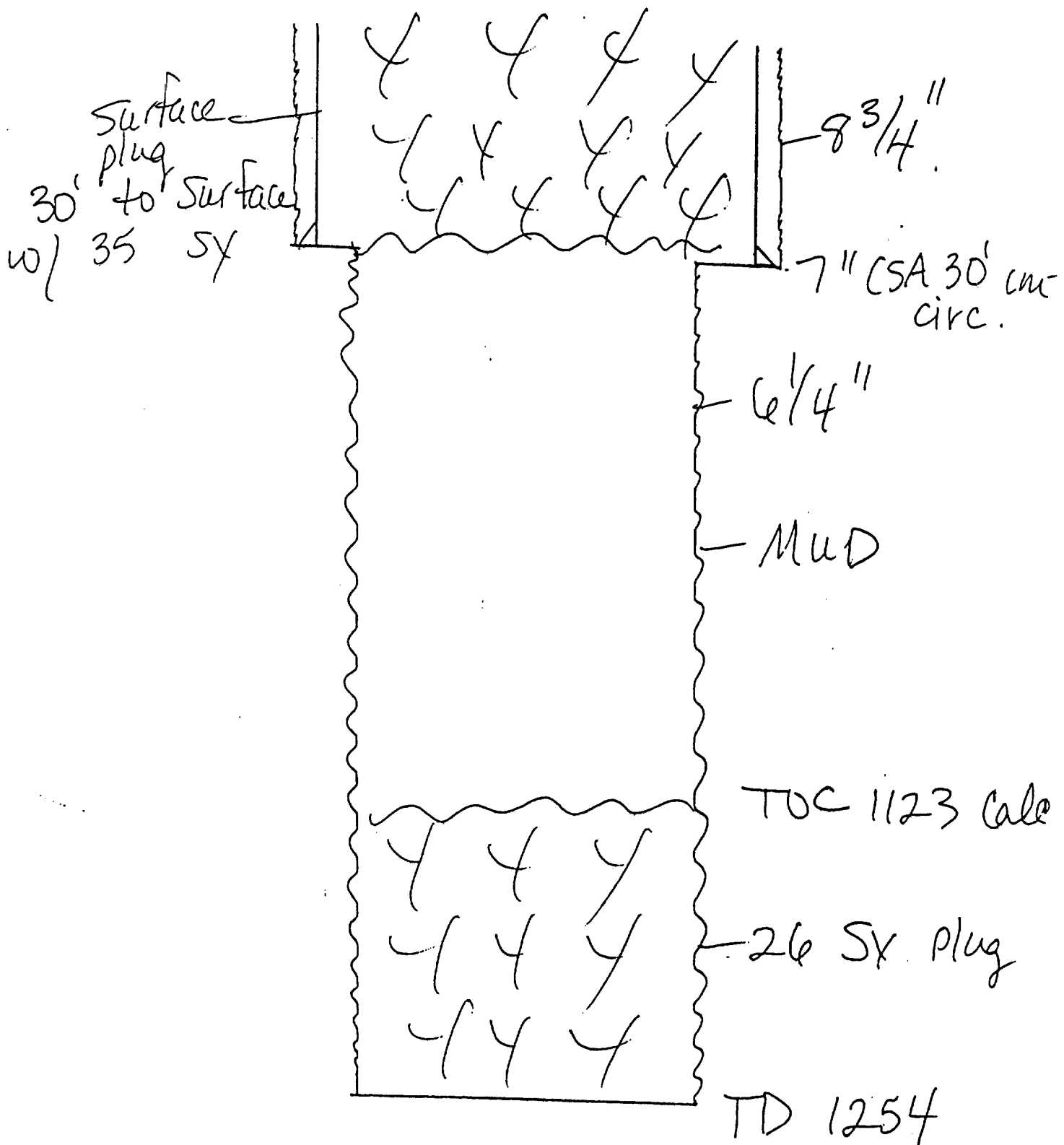
# WELL DATA SHEET

EXPLORATION DRILLING CO.	NAVAJO	4-7-69
OPERATOR	LEASE	SPUD DATE
#7	990FS-990Fw	14
WELL NO.	FOOTAGE LOCATION	SECTION
		TOWNSHIP
		RANGE



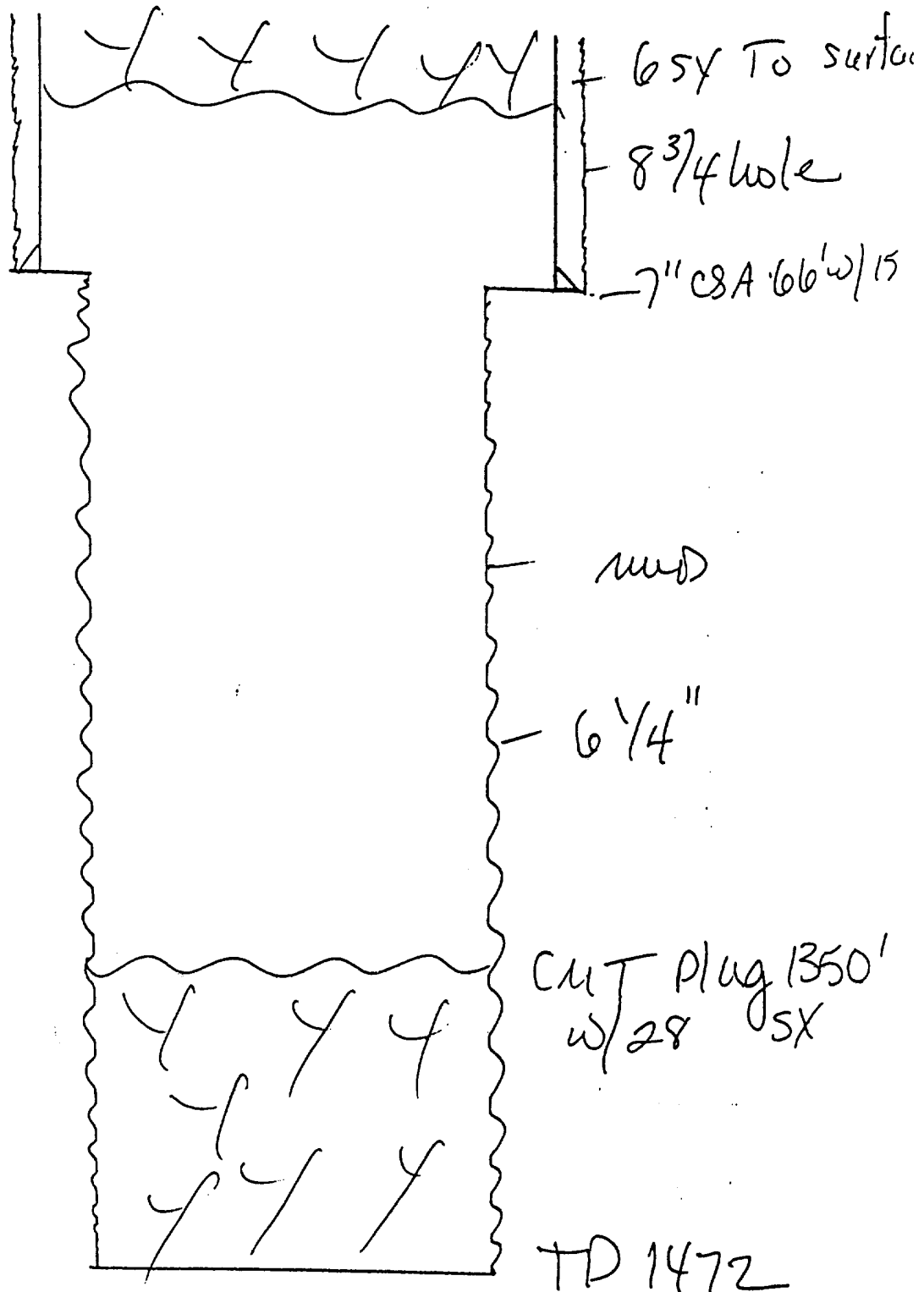
# WELL DATA SHEET

EXPLORATION DRILLING CO.	NAVAJO	11-29-61
OPERATOR	LEASE	SPUD DATE
#5	2135FS-1935FE	23
		32N 18W
WELL NO.	FOOTAGE LOCATION	SECTION
		TOWNSHIP
		RANGE



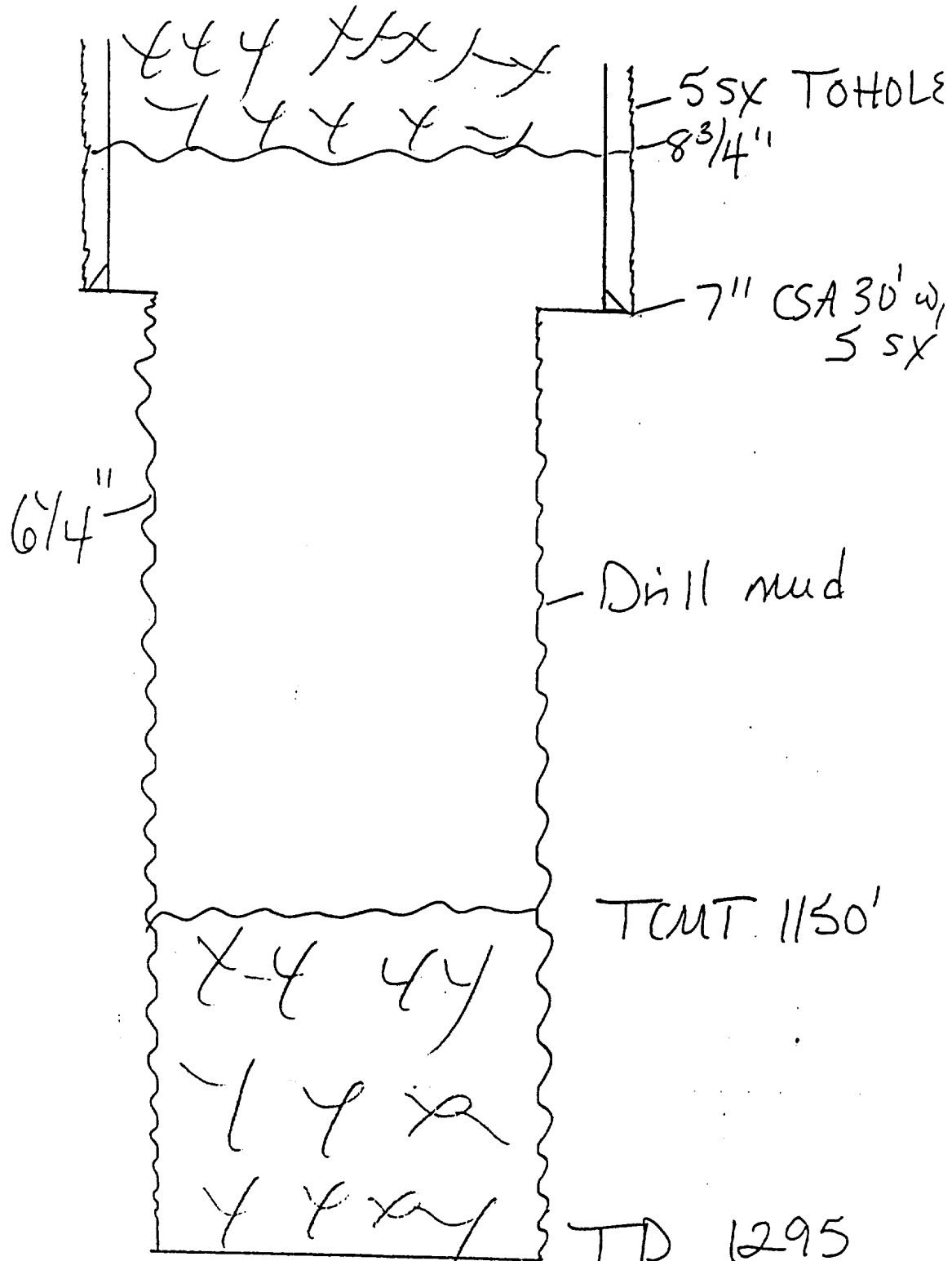
# WELL DATA SHEET

EXPLORATION DRILLING CO.	NAVAJO	12-30-61
OPERATOR	LEASE	SPUD DATE
#6	365FS-760FW	13 32N 18W
WELL NO.	FOOTAGE LOCATION	SECTION TOWNSHIP RANGE



# WELL DATA SHEET

AAA FISHING TOOL		NAVAJO	2-24-69	
OPERATOR		LEASE	SPUD DATE	
#7	2310FW-4950FS	15	32N	18W
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE



# WELL DATA SHEET

ZOLLER & DANNEBERG	BLUEHILL	7-26-65
OPERATOR	LEASE	SPUD DATE
#1	2319FN-1980FE	25
		32N
		18W
WELL NO.	FOOTAGE LOCATION	SECTION
		TOWNSHIP
		RANGE

