WR OIL & GAS COMPANY

June 27, 1986

RECEIVED

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OIL CONSERVATION DIVISION

Case 8943

Mr. Lloyd Davidson
P. O. Box 2182
Santa Fe, New Mexico 87501

Certified Mail No. P498 196 413
Return Receipt Requested

Dear Mr. Davidson:

As the involved offset leasehold operator, please be advised that WR Oil & Gas Company is making application to the New Mexico Oil Conservation Commission for approval to inject fluids on an oil and gas lease covering lands in T16N-R6W, N.M.P.M, McKinley County, New Mexico. Enclosed is a copy of our Form C-108, Application For Authorization to Inject. Please refer to this Filing for more detailed information about the wells and lands involved, our proposed stimulation program, etc.

Please contact me if you have any further questions.

Very truly yours,

WR OIL & GAS COMPANY

Walter P. Oliver
Walter P. Oliver
General Manager

vp

Enclosure

WR OIL & GAS COMPANY

June 27, 1986

Fernandez Company, Ltd.
c/o Mrs. Iona Lee
San Mateo, New Mexico 87050

Certified Mail No. P498 196 414
Return Receipt Requested

Gentlemen and Madam:

As the involved surface owner, please be advised that WR Oil & Gas Company is making application to the New Mexico Oil Conservation Commission for approval to inject fluids on an oil and gas lease covering lands in T16N-R6W, N.M.P.M, McKinley County, New Mexico. Enclosed is a copy of our Form C-108, Application For Authorization to Inject. Please refer to this Filing for more detailed information about the wells and lands involved, our proposed stimulation program, etc.

Please contact me if you have any further questions.

Very truly yours,

WR OIL & GAS COMPANY

Walter P. Oliver
General Manager

vp

Enclosure

WR OIL & GAS COMPANY

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APPLICATION FOR EXPANSION OF WATERFLOOD

****

MIGUEL CREEK FIELD

MCKINLEY COUNTY, NEW MEXICO

14800 Quorum Drive Suite 370 Dallas, Texas 75240 (214) 392-7565 TELEX 45-0698
A WILLIAMS RESOURCES COMPANY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [X] yes [ ] no

II. Operator: **WR Oil & Gas Company**

Address: **14800 Quorum Drive, Suite 370, Dallas, Texas 75240**

Contact party: **Walter P. Oliver** Phone: **(214) 392-7565**

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.
(Attached)

IV. Is this an expansion of an existing project? [X] yes [ ] no
If yes, give the Division order number authorizing the project **R-4875**.

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.
(Attached)

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.
(Attached)

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.).

(Attached)

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. **(Attached)**

IX. Describe the proposed stimulation program, if any. **(Attached)**

X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
(Filed)

* 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. **(Attached)**

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.
N/A

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
(Attached)

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: **Walter P. Oliver** Title **General Manager**

Signature: Walter P Oliver Date: **6-30-86**

* 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.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

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.

MIGUEL CREEK FIELD - McKINLEY CO., NEW MEXICO

WELL NUMBER & NAME	SECTION TWP-RNG	LOCATION	WELL TYPE	FLUID INJ'D	DATE DRLD	TOTAL DEPTH	HOLE SIZE	CASING DETAILS DEPTH	SIZE	WEIGHT	CMT	TOP	METHOD	PERFS	TUBING DETAILS DEPTH	SIZE	LINING	PACKER DETA DEPTH	NAME
#38 SFPRR	20-16-6	990 FS & EL	O	STEAM	6/81	784	7 7/8	783	4 1/2	9.50	90	330	CALC	764-73	740	2 3/8	NONE	NONE	
#37 SFPRR	21-16-6	1650 FSL & 330 FWL	O	STEAM	6/81	812	7 7/8	811	4 1/2	9.50	90	358	CALC	782-92	770	2 3/8	NONE	NONE	
#49 SFPRR	21-16-6	1650 FSL & 990 FWL	O	STEAM	6/81	812	7 7/8	812	4 1/2	9.50	125	183	CALC	744-92	760	2 3/8	NONE	NONE	
#54 SFPRR	21-16-6	2310 FS & WL	O	STEAM	7/81	955	7 7/8	955	5 1/2	14.00	155	SFC	CALC	892-02	910	2 3/8	NONE	NONE	
#56 SFPRR	21-16-6	1980 FSL & 660 FWL	O	STEAM	9/81	840	7 7/8	839	5 1/2	14.00	200	SFC	CALC	804-10	805	2 3/8	NONE	NONE	
#79 SFPRR ✓	21-16-6	1330 FSL & 10 FWL	I	WATER	5/82	84	12 1/4	84	8 5/8	24.00	75	SFC	VISUAL						
						786	7 7/8	786	4 1/2	11.00	85	368	CALC	768-72	726	2 3/8	NONE	726	GBSN
#80 SFPRR ✓	21-16-6	1330 FSL & 660 FWL	I	WATER	4/82	86	12 1/4	86	8 5/8	24.00	75	SFC	VISUAL						
						775	7 7/8	775	4 1/2	11.00	85	362	CALC	760-64	524	2 3/8	NONE	524	GBSN
#82 SFPRR ✓	21-16-6	1980 FSL & 1330 FWL	I	WATER	5/82	84	12 1/4	84	8 5/8	24.00	75	SFC	VISUAL						
						833	7 7/8	833	4 1/2	11.00	85	393	CALC	804-09	525	2 3/8	NONE	525	GBSN
#83 SFPRR ✓	21-16-6	1980 FSL & 10 FWL	I	WATER	4/82	85	12 1/4	85	8 5/8	24.00	75	SFC	VISUAL						
						839	7 7/8	839	4 1/2	11.00	85	396	CALC	823-28	768	2 3/8	NONE	768	GBSN
#31 SFPRR	28-16-6	330 FN & WL	O	STEAM	7/80	776	7 7/8	774	4 1/2	11.00	175	SFC	CALC	748-71	712	2 3/8	NONE	NONE	
#6Y SFPRR ✓	29-16-6	2013 FNL & 2003 FEL	I	WATER	8/78	748	6 3/4	733	4 1/2	9.5	CRC	SFC	VISUAL	733-48 (OH)	700	2 3/8	NONE	700	GBSN
#11 SFPRR	29-16-6	1660 FNL & 1650 FEL	O	STEAM	5/74	64	9 5/8	64	7	20.00	12	SFC	CALC						
						3062	6 1/4	731*	4 1/2	9.50	75	353	CALC	731-54 (OH)	744	2 3/8	NONE	NONE	
#36 SFPRR	29-16-6	330 FNL & 1650 FEL	O	STEAM	9/80	758	7 7/8	732	4 1/2	11.00	160	SFC	CALC	732-58 (OH)	702	2 3/8	NONE	NONE	

MIGUEL CREEK FIELD - McKINLEY CO., NEW MEXICO

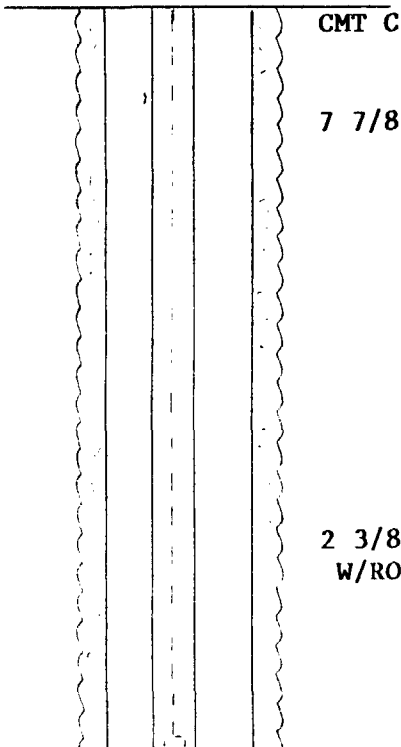
WELL NUMBER & NAME	SECTION TWP-RNG	LOCATION	WELL TYPE	FLUID INJ'D	DATE DRLD	TOTAL DEPTH	HOLE SIZE	CASING DETAILS DEPTH	SIZE	WEIGHT	CMT	TOP	METHOD	PERFS	TUBING DETAILS DEPTH	SIZE	LINING	PACKER DETAILS DEPTH	NAME	MODEL
#38 SFPRR	20-16-6	990 FS & EL	O	STEAM	6/81	784	7 7/8	783	4 1/2	9.50	90	330	CALC	764-73	740	2 3/8	NONE	NONE		
#37 SFPRR	21-16-6	1650 FSL & 330 FWL	O	STEAM	6/81	812	7 7/8	811	4 1/2	9.50	90	358	CALC	782-92	770	2 3/8	NONE	NONE		
#43 SFPRR	21-16-6	1650 FSL & 990 FWL	O	STEAM	6/81	812	7 7/8	812	4 1/2	9.50	125	183	CALC	744-92	760	2 3/8	NONE	NONE		
#54 SFPRR	21-16-6	2310 FS & WL	O	STEAM	7/81	955	7 7/8	955	5 1/2	14.00	155	SFC	CALC	892-02	910	2 3/8	NONE	NONE		
#56 SFPRR	21-16-6	1980 FSL & 660 FWL	O	STEAM	9/81	840	7 7/8	839	5 1/2	14.00	200	SFC	CALC	804-10	805	2 3/8	NONE	NONE		
#79 SFPRR	21-16-6	1330 FSL & 10 FWL	I	WATER	5/82	84	12 1/4	84	8 5/8	24.00	75	SFC	VISUAL							
						786	7 7/8	786	4 1/2	11.00	85	368	CALC	768-72	726	2 3/8	NONE	726	GBSN	UNIT 1
#80 SFPRR	21-16-6	1330 FSL & 660 FWL	I	WATER	4/82	86	12 1/4	86	8 5/8	24.00	75	SFC	VISUAL							
						775	7 7/8	775	4 1/2	11.00	85	362	CALC	760-64	524	2 3/8	NONE	524	GBSN	UNIT 1
#82 SFPRR	21-16-6	1980 FSL & 1330 FWL	I	WATER	5/82	84	12 1/4	84	8 5/8	24.00	75	SFC	VISUAL							
						833	7 7/8	833	4 1/2	11.00	85	393	CALC	804-09	525	2 3/8	NONE	525	GBSN	UNIT 1
#83 SFPRR	21-16-6	1980 FSL & 10 FWL	I	WATER	4/82	85	12 1/4	85	8 5/8	24.00	75	SFC	VISUAL							
						839	7 7/8	839	4 1/2	11.00	85	396	CALC	823-28	768	2 3/8	NONE	768	GBSN	UNIT 1
#31 SFPRR	28-16-6	330 FN & WL	O	STEAM	7/80	776	7 7/8	774	4 1/2	11.00	175	SFC	CALC	748-71	712	2 3/8	NONE	NONE		
#6Y SFPRR	29-16-6	2013 FNL & 2003 FEL	I	WATER	8/78	748	6 3/4	733	4 1/2	9.5	CRC	SFC	VISUAL	733-48 (OH)	700	2 3/8	NONE	700	GBSN	UNIT 1
#11 SFPRR	29-16-6	1660 FNL & 1650 FEL	O	STEAM	5/74	64	9 5/8	64	7	20.00	12	SFC	CALC							
						3062	6 1/4	731*	4 1/2	9.50	75	353	CALC	731-54 (OH)	744	2 3/8	NONE	NONE		
#36 SFPRR	29-16-6	330 FNL & 1650 FEL	O	STEAM	9/80	758	7 7/8	732	4 1/2	11.00	160	SFC	CALC	732-58 (OH)	702	2 3/8	NONE	NONE		

INJECTION WELL DATA SHEET SIDE 1

OPERATOR	LEASE			
WR Oil & Gas Company	Santa Fe Pacific Railroad			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
54	2310 FSL & WL	21	16	6

Steam Injection

Schematic



Tabular Data

Surface Casing

Size None " Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Intermediate Casing

Size None " Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 5 1/2 " Cemented with 155 sx.

TOC Surface feet determined by Calculation

Hole size 7 7/8

Total depth 955

Tubing size 2 3/8 lined with None (material) set in a

None (brand and model) packer at _____ feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Hospah

2. Name of Field or Pool (if applicable) Miguel Creek

3. Is this a new well drilled for injection? /_/ Yes /X/ No

   If no, for what purpose was the well originally drilled? Producer

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

   No other zones perforated

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

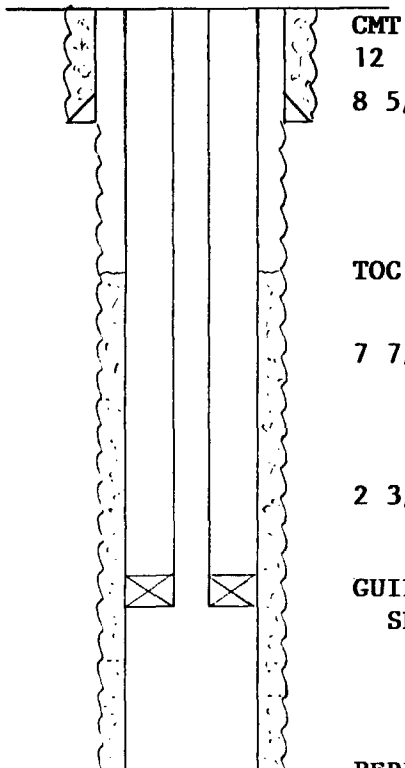
   None

INJECTION WELL DATA SHEET SIDE 1

OPERATOR	LEASE			
WR Oil & Gas Company	Santa Fe Pacific Railroad			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
80	1330 FSL & 660 FWL	21	16	6

Water Injection

Schematic



Tabular Data

Surface Casing

Size 8 5/8 " Cemented with 75 sx.

TOC Surface feet determined by Visual

Hole size 12 1/4

Intermediate Casing

Size None " Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 4 1/2 " Cemented with 85 sx.

TOC 362 feet determined by Calculation

Hole size 7 7/8

Total depth 775

Tubing size 2 3/8 lined with None (material) set in a

Guiberson Unit 1 (brand and model) packer at 524 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Hospah

2. Name of Field or Pool (if applicable) Miguel Creek

3. Is this a new well drilled for injection? /_/ Yes /X/ No

   If no, for what purpose was the well originally drilled? Producer

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)

   No other zones perforated

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

   None

TWP-RNG	NUMBER	LOCATION	TYPE	DRLD	DEPTH	DEPTH	SIZE	WEIGHT	CMT	TYPE	INTERVAL	TREATMENT
20-16-6	20	1650 FN & EL	O	12/75	1195	1172	3.50	NR	CRC	OH	1172-95	NONE
	27	290 FSL & 330 FEL	O	10/80	754	751	4.50	11.0	160	PERF	716-47	NONE
	28	990 FSL & 330 FEL	O	9/80	765	740	4.50	11.0	160	OH	740-65	NONE
	29	1650 FSL & 330 FEL	O	9/80	797	786	4.50	11.0	160	OH	786-97	NONE
	30	525 FSL & 990 FEL	O	9/80	766	736	4.50	11.0	160	OH	736-66	NONE
	38	990 FS & EL	O	6/81	784	783	4.50	9.5	90	PERF	764-73	NONE
	41	660 FS & EL	O	6/81	760	732	4.50	9.5	90	OH	732-60	NONE
21-16-6	37	1650 FSL & 330 FWL	O	6/81	812	811	4.50	9.5	90	OH	782-92	NONE
	42	990 FSL & 330 FWL	O	7/81	817	814	5.50	14.0	90	OH	744-53	NONE
	43	330 FS & WL	O	6/81	760	730	5.50	14.0	125	OH	730-60	NONE
	47	2310 FSL & 330 FWL	O	7/81	865	865	5.50	14.0	125	PERF	820-52	NONE
	48	2310 FSL & 990 FWL	O	6/81	856	792	5.50	14.0	125	OH	792-56	NONE
	49	1650 FSL & 990 FWL	O	6/81	812	812	4.50	9.5	125	PERF	775-84	NONE
	50	990 FS & WL	O	7/81	793	793	5.50	14.0	125	PERF	744-92	NONE
	51	330 FSL & 990 FWL	O	6/81	801	760	5.50	14.0	125	OH	760-01	NONE
	52	2310 FSL & 1650 FWL	O	7/81	870	870	5.50	14.0	125	PERF	849-54	NONE
	53	1650 FS & WL	O	6/81	839	838	5.50	14.0	125	PERF	794-04	NONE
	54	2310 FS & WL	O	7/81	955	955	5.50	14.0	155	PERF	892-02	NONE
	55	1650 FSL & 2310 FWL	O	7/81	800	798	4.50	9.5	125	NONE	—	—
	56	1980 FSL & 660 FWL	O	9/81	840	839	5.50	14.0	200	PERF	804-10	1000 G. ACID
	57	1980 FS & WL	O	10/81	975	880	5.50	14.0	200	NONE	—	—
	59	990 FSL & 1650 FWL	I	4/81	805	804	4.50	11.0	85	PERF	780-83	NONE
	79	1330 FSL & 10 FWL	I	5/82	786	786	4.50	11,0	85	PERF	768-72	500 G. KCL
	80	1330 FSL & 660 FWL	I	4/82	775	755	4.50	11.0	85	PERF	760-64	500 G. KCL
	81	1650 FSL & 10 FWL	O	9/82	826	826	4.50	9.5	85	PERF	789-01	NONE
	82	1980 FSL & 1330 FWL	I	5/82	833	833	4.50	11.0	85	PERF	804-09	500 G. KCL
	83	1980 FSL & 10 FWL	I	4/82	839	839	4.50	11.0	85	PERF	823-28	500 G. KCL
28-16-6	31	330 FN & WL	O	7/80	776	774	4.50	11.0	175	PERF	748-71	NONE
	39	330 FNL & 660 FWL	O	5/81	784	783	4.50	9.5	90	PERF	761-75	NONE
	40	990 FN & WL	O	7/81	859	858	5.50	14.0	90	PERF	810-32	NONE
	45	990 FNL & 320 FWL	O	6/81	775	774	4.50	9.5	125	PERF	748-60	NONE
	46	1650 FNL & 330 FEL	O	7/81	782	780	5.50	14.0	125	PERF	743-49	NONE
	60	1650 FNL & 990 FWL	O	10/81	815	812	5.50	14.0	200	NONE	--	—
29-16-6	6Y	2013 FNL & 2003 FEL	I	8/78	748	733	4.50	9.5	CRC	OH	733-48	NONE
	7	2310 FNL & 1650 FEL	O	9/73	782	764	4.50	10.5	65	OH	764-82	NONE
	8	2310 FN & EL	O	9/73	754	736	4.50	10.5	65	OH	736-54	NONE
	11	1660 FNL & 1650 FEL	O	5/74	3062	731	4.50	9.5	75	OH	731-54	CRUDE FRAC
	15	2405 FNL & 2805 FEL	I	10/74	759	742	4.50	9.5	75	OH	742-59	NONE
	21	1750 FNL & 990 FEL	O	12/76	770	770	4.50	9.5	175	PERF	754-68	NONE
	23	1210 FNL & 640 FEL	O	4/80	742	726	4.50	11.0	176	OH	726-42	NONE
	24	330 FNL & 990 FEL	O	7/80	775	775	4.50	11.0	175	PERF	745-68	FOAM-FRAC
	25	330 FN & EL	O	8/80	775	775	4.50	11.0	175	OH	748-61	250 G. ACID
	26	660 FN & EL	O	8/80	775	775	4.50	11.0	160	PERF	744-60	250 G. ACID
	32	990 FNL & 1650 FEL	O	9/80	772	742	4.50	11.0	160	OH	742-72	NONE

OPERATOR	WELL NUMBER & NAME	SECTION TWP-RNG	LOCATION	ELEV (GL)	DATE DRLD	DATE PLUG'D	TOTAL DEPTH	HOLE SIZE	CASING DETAILS DEPTH	SIZE	WEIGHT	CMT	PERFS	PLUGS #	FROM	TO	SXS CMT
CAPITAL	#1 SFPRR	20-16-6	660 FS & EL	6410	6/56	2/83	101	12 1/4	101	10 3/4	32.75	125	-	1	740	1030	
							1030	8 3/4	1030	5 1/2	20.00	250	744-48	2	0	80	10
N. MINERALS	#23 SFPRR	20-16-6	2310 FNL & 1650 FEL	6790	8/77	8/77	1215	6 1/4	N/A					1	1100	1215	
														2	600	700	
														3	0	23	5
CAPITAL	#1 FERNANDEZ	21-16-6	1980 FSL & 2310 FEL	6391	8/81	9/83	992	7 7/8	990	5 1/2	14.00	175	NONE	1	760	860	20
														2	0	80	10
CARR	#1 SFPRR	28-16-6	2310 FNL & 490 FWL	6430	12/60	1/61	32	8 3/4	32	7		5	-	BP	738	744	
							840	4 3/4	N/A					1	0	738	112
N. MINERALS	#6 SFPRR	29-16-6	1980 FN & EL	6428	7/73	7/73	98	9	98	7	20.00	CRC	-	1	3016	3066	
							3066	6 1/4	N/A					2	1800	1900	
														3	273	812	100
														4	0	25	5
N. MINERALS	#16 SFPRR	29-16-6	2930 FNL & 2310 FEL	6450	2/75	5/76	790	6 1/4	775	4 3/4	16.00	90	775-90	NO RECORD OF PLUGS			
N. MINERALS	#17 SFPRR	29-16-6	2930 FNL & 1650 FEL	6493	1/75	2/75	856	5	N/A					1	775	856	10
														2	0	22	3
N. MINERALS	#18 SFPRR	29-16-6	2310 FNL & 990 FEL	6483	7/77	3/78	800	6 1/4	N/A					1	750	800	
														2	250	300	
														3	0	23	5
CAPITAL	#22 SFPRR	29-16-6	1650 FNL & 660 FEL	6428	1/80	9/83	804	4 3/8	804	2 7/8	6.4	100	NONE	1	20	804	100
														2	0	20	2
SHAW	#1A SFPRR	29-16-6	2140 FSL & 1025 FEL	6499	8/63	8/63	62	9	62	7	24.00	15	-	1	750	799	3
							800	6 1/4	N/A					2	200	300	20
														3	0	8	3
CAPITAL	#1 L DAVIDSON	29-16-6	960 FSL & 1230 FEL	6505	3/80	11/82	3105	6 3/4	3065	5 1/2	15.50	150	3065-05	1	2900	2975	10
														2	1550	1625	10
														3	925	1000	10
														4	0	60	15
GARDNER BROS	#1 SUTTON SF	29-16-6	660 FSL & 1980 FEL	6495	9/60	9/60	80	6 3/4	80	5 1/2		15	-	1	185	890	75
							890	4 3/4	N/A					2	0	42	5

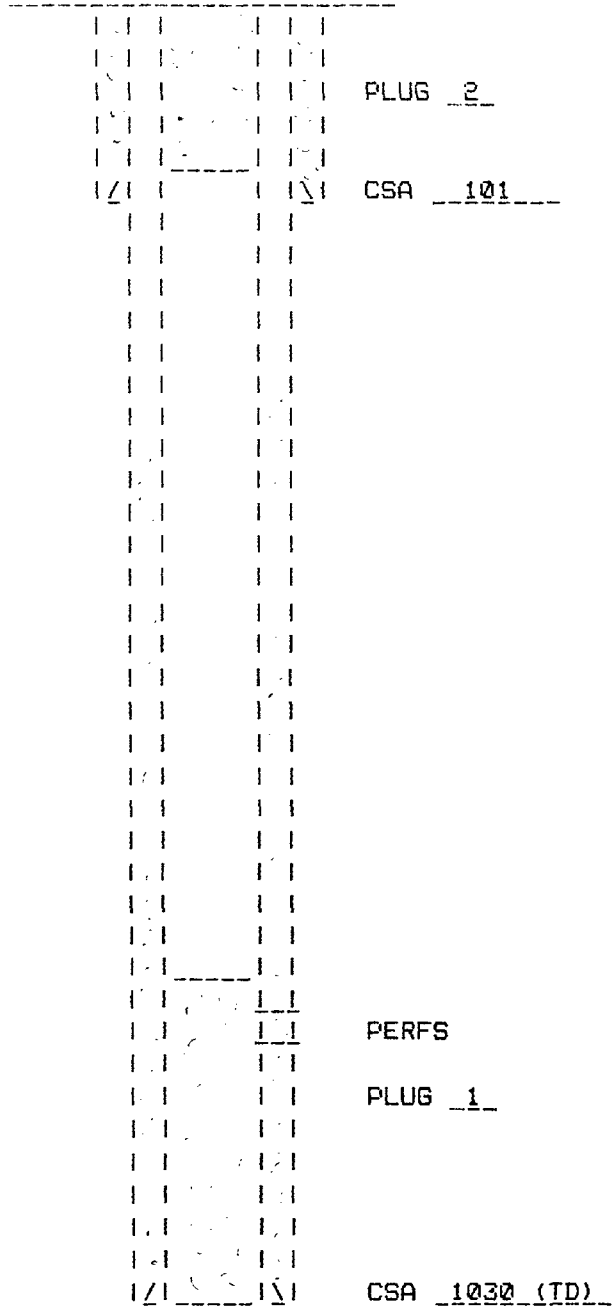
* FOOTAGES ESTIMATED USING A

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: CAPITAL (DRL'D BY SINCLAIR)

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 1



LOCATION
SECTION: 20
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 660 FS & EL
ELEVATION (GL.): 6410

SPUD DATE: 6/56
DATE PLUGGED 2/83

SURFACE CASING
DEPTH: 101 HOLE SIZE: 12 1/4
CSG SIZE: 10 3/4 WEIGHT: 32.75
CMT W/ 125 SXS, TOC: SFC
TOP DETERMINED BY: VISUAL

TOTAL DEPTH DRILLED: 1030

LONG STRING
DEPTH: 1030 HOLE SIZE: 8 3/4
CSG SIZE: 5 1/2 WEIGHT: 20.00
CMT W/ 250 SXS, TOC:
TOP DETERMINED BY:

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: PERF
FROM: 744 TO: 748
FORMATION: GALLUP

PLUG 1
FROM: 740 TO: 1030
OF SACKS USED:

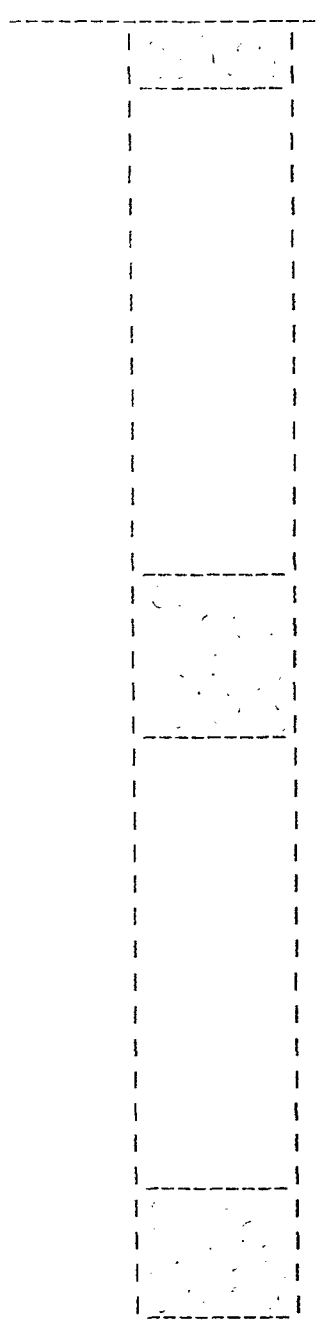
PLUG 2
FROM: SURF TO: 80
OF SACKS USED: 10

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: NORTHERN MINERALS

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 23



LOCATION
SECTION: 20
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 2310 FNL & 1650 FEL
ELEVATION (GL.): 6790

SPUD DATE: 8/77
DATE PLUGGED 8/77

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

TOTAL DEPTH DRILLED: 1215

LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 6 1/4
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 1100 TO: 1215
OF SACKS USED: _____

PLUG 2
FROM: 600 TO: 700
OF SACKS USED: _____

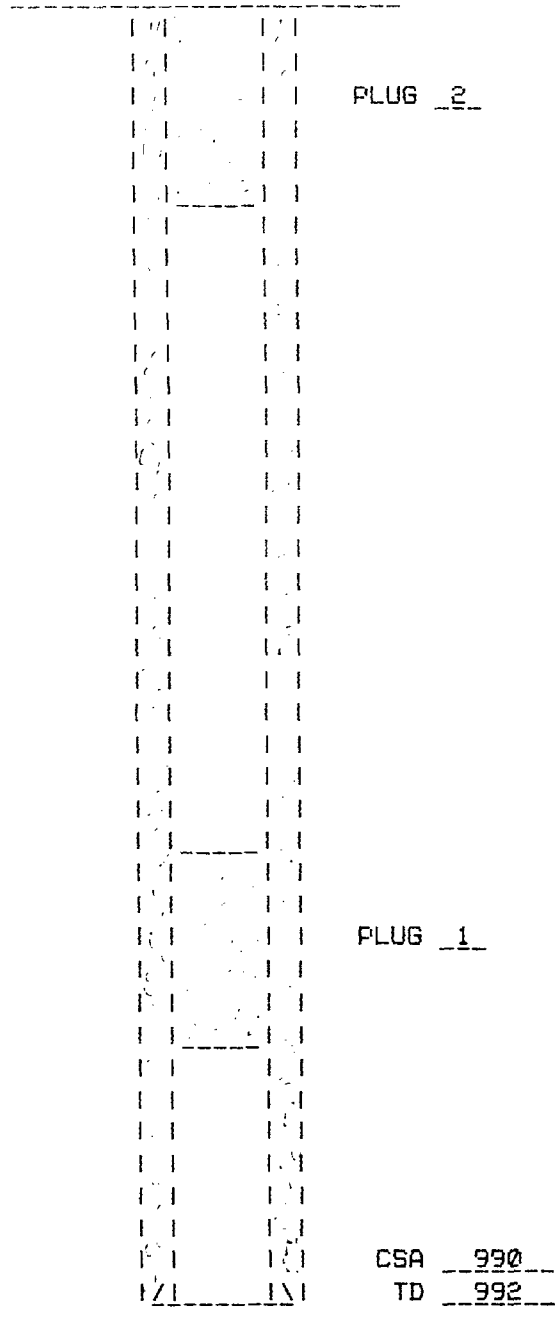
PLUG 3
FROM: SURF TO: 23
OF SACKS USED: 5

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: CAPITAL

LEASE: FERNANDEZ
WELL NUMBER: 1



LOCATION
SECTION: 21
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 1980 FSL & 2310 FEL
ELEVATION (GL.): 6391

SPUD DATE: 8/81
DATE PLUGGED 9/83

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

TOTAL DEPTH DRILLED: 992

LONG STRING
DEPTH: 990 HOLE SIZE: 7 7/8
CSG SIZE: 5 1/2 WEIGHT: 14
CMT W/ 175 SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 760 TO: 860
OF SACKS USED: 20

PLUG 2
FROM: 0 TO: 20
OF SACKS USED: 10

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: CARR, LAUTH & BROWN

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 1

LOCATION
SECTION: 28
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 2310 FNL & 490 FWL
ELEVATION (GL.): 6430

SPUD DATE: 12/60
DATE PLUGGED 1/61

SURFACE CASING
DEPTH: 32 HOLE SIZE: 8 3/4
CSG SIZE: 7 WEIGHT: _____
CMT W/ 5 SXS, TOC: SFC
TOP DETERMINED BY: CALC

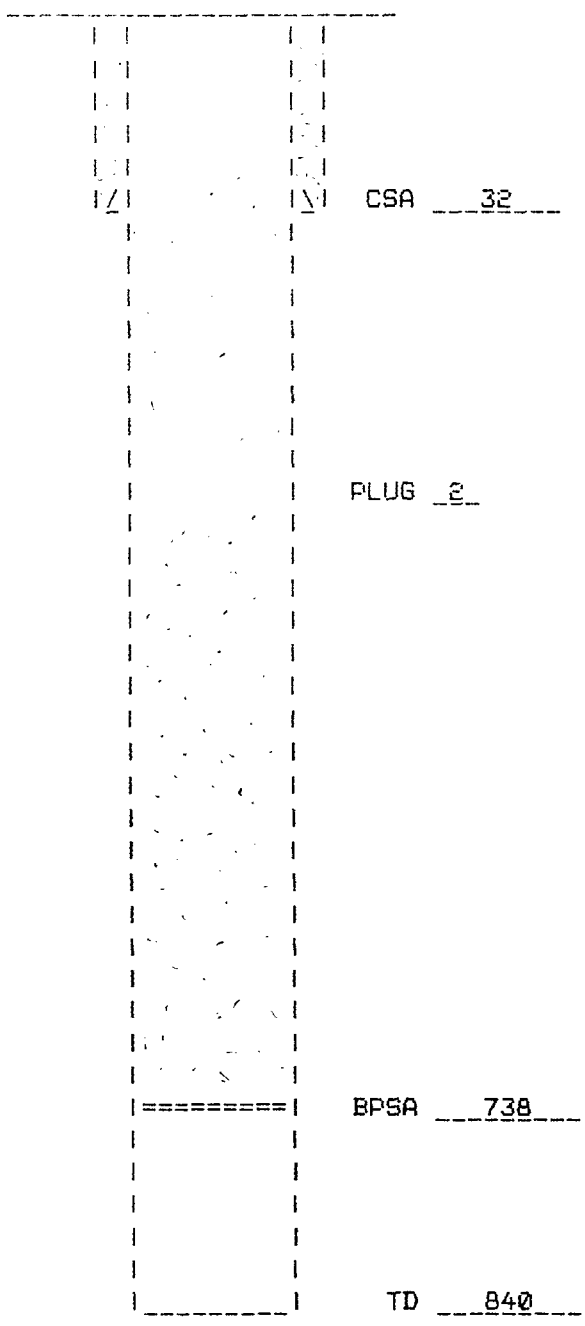
TOTAL DEPTH DRILLED: 840

LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 4 3/4
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 738 TO: 744
OF SACKS USED: (BP)

PLUG 2
FROM: SURF TO: 738
OF SACKS USED: 112

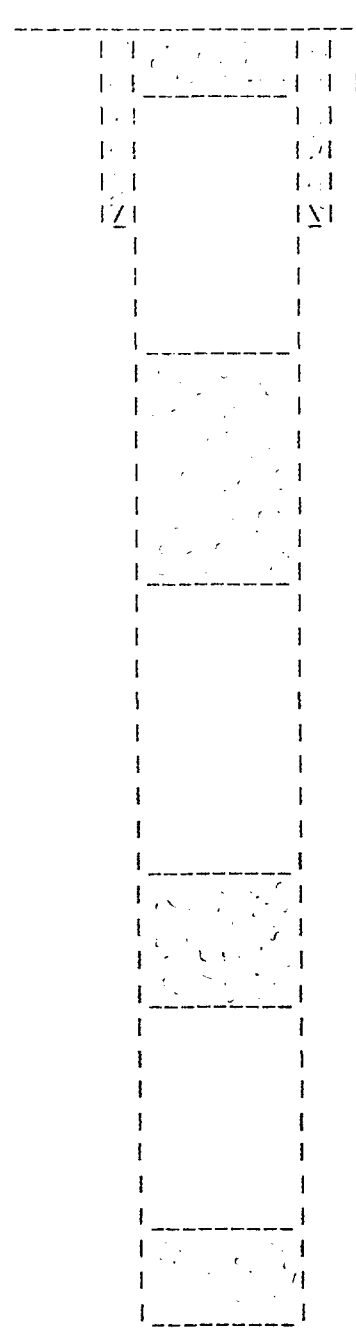


APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: NORTHERN MINERALS

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 6



LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 1980 FN & EL
ELEVATION (GL.): 6428

SPUD DATE: 7/73
DATE PLUGGED 7/73

SURFACE CASING
DEPTH: 98 HOLE SIZE: 9
CSG SIZE: 7 WEIGHT: 20
CMT W/ CRC SXS, TOC: SFC
TOP DETERMINED BY: VISUAL

TOTAL DEPTH DRILLED: 3066

LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 6 1/4
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 3016 TO: 3066
OF SACKS USED: _____

PLUG 2
FROM: 1800 TO: 1900
OF SACKS USED: _____

PLUG 3
FROM: 273 TO: 812
OF SACKS USED: 100

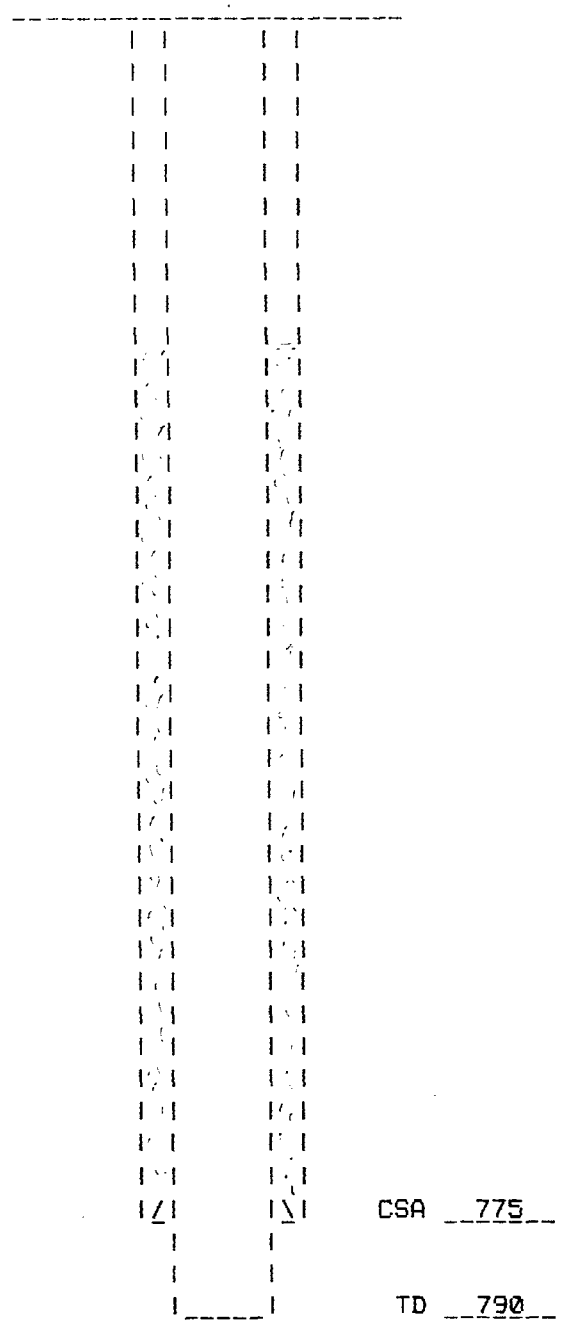
PLUG 4
FROM: SURF TO: 25
OF SACKS USED: 25

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: NORTHERN MINERALS

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 16



LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 2930 FNL & 2310 FEL
ELEVATION (GL.): 6450

SPUD DATE: 2/75
DATE PLUGGED 5/76

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

TOTAL DEPTH DRILLED: 790

LONG STRING
DEPTH: 775 HOLE SIZE: 6 1/4
CSG SIZE: 4 3/4 WEIGHT: 16
CMT W/ 90 SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: OH
FROM: 775 TO: 790
FORMATION: GALLUP

PLUG 1 ** NO RECORD OF PLUG DEPTHS **
FROM: _____ TO: _____
OF SACKS USED: _____

PLUG 2
FROM: _____ TO: _____
OF SACKS USED: _____

PLUG 3
FROM: _____ TO: _____
OF SACKS USED: _____

PLUG 4
FROM: _____ TO: _____
OF SACKS USED: _____

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: NORTHERN MINERALS

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 17

LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 2310 FNL & 1650 FEL
ELEVATION (GL.): 6493

SPUD DATE: 1/75
DATE PLUGGED 2/75

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

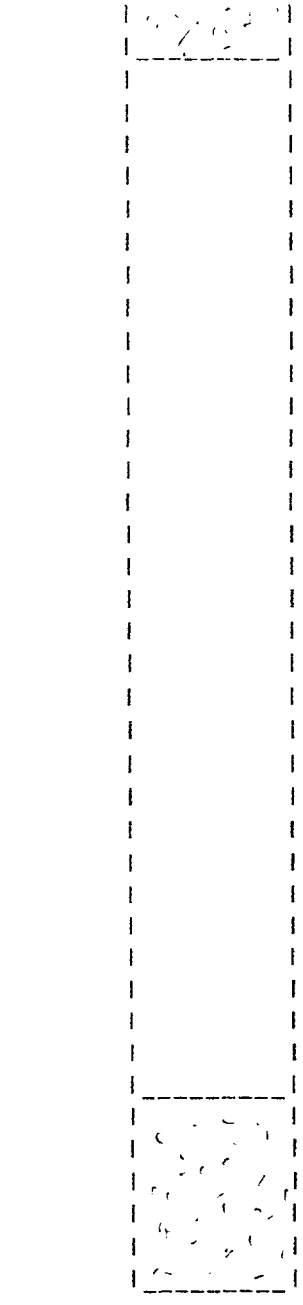
TOTAL DEPTH DRILLED: 856

LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 5
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 775 TO: 856
OF SACKS USED: 10

PLUG 2
FROM: SURF TO: 22
OF SACKS USED: 3



APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: CAPITAL

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 22

LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 1650 FNL & 660 FEL
ELEVATION (GL.): 6428

SPUD DATE: 1/80
DATE PLUGGED 9/83

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

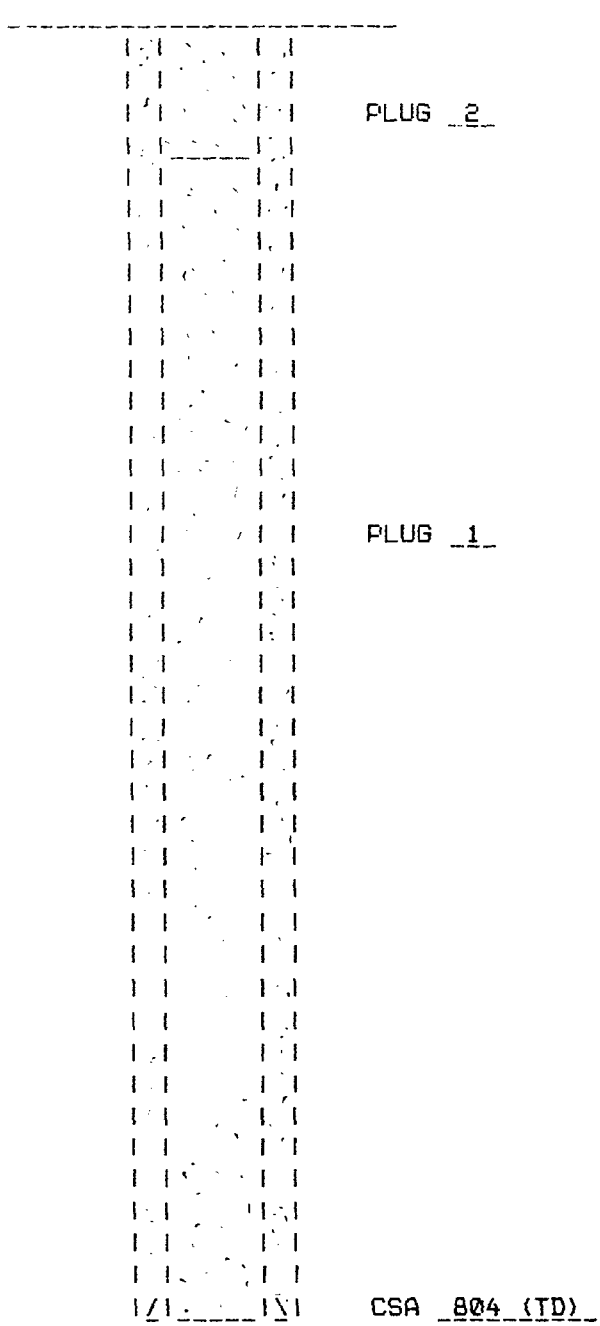
TOTAL DEPTH DRILLED: 804

LONG STRING
DEPTH: 804 HOLE SIZE: 4 3/8
CSG SIZE: 2 7/8 WEIGHT: 6.4
CMT W/ 100 SXS, TOC: SURF
TOP DETERMINED BY: VISUAL

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 20 TO: 804
OF SACKS USED: 100

PLUG 2
FROM: SURF TO: 20
OF SACKS USED: 2



APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: OBIE SHAW

LEASE: SANTA FE PACIFIC RAILROAD
WELL NUMBER: 1A

LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 2140 FSL & 1025 FEL
ELEVATION (GL.): 6499

SPUD DATE: 8/63
DATE PLUGGED 8/63

SURFACE CASING
DEPTH: 62 HOLE SIZE: 9
CSG SIZE: 7 WEIGHT: 24
CMT W/ 15 SXS, TOC: SFC
TOP DETERMINED BY: CALC

TOTAL DEPTH DRILLED: 800

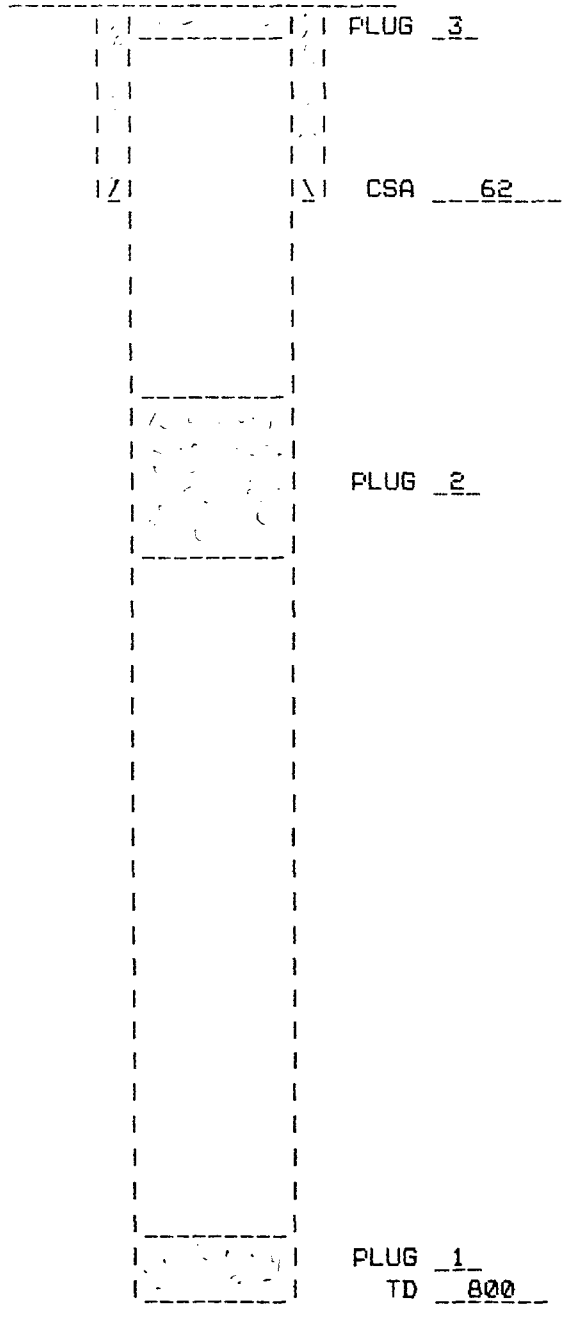
LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 6 1/4
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 750 TO: 799
OF SACKS USED: 3

PLUG 2
FROM: 200 TO: 300
OF SACKS USED: 20

PLUG 3
FROM: SURF TO: 8
OF SACKS USED: 3

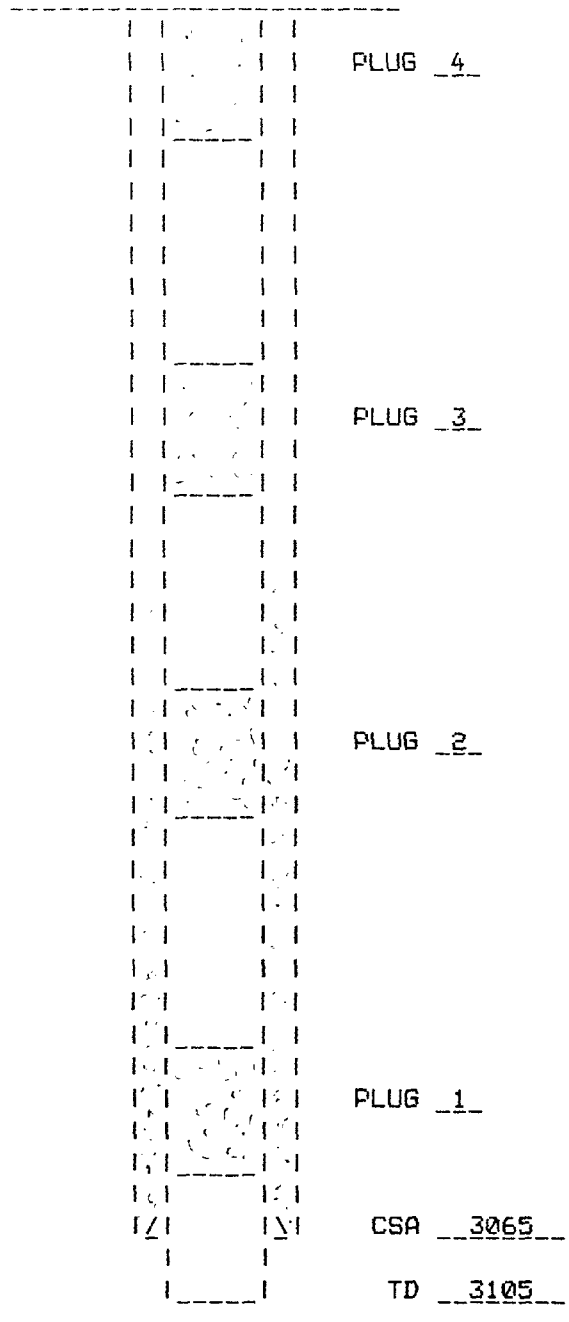


APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: CAPITAL

LEASE: LLYOD DAVIDSON
WELL NUMBER: 1



LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 960 FSL & 1230 FEL
ELEVATION (GL.): 6505

SPUD DATE: 3/80
DATE PLUGGED 11/82

SURFACE CASING - N/A
DEPTH: _____ HOLE SIZE: _____
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

TOTAL DEPTH DRILLED: 3105

LONG STRING
DEPTH: 3065 HOLE SIZE: 6 3/4
CSG SIZE: 5 1/2 WEIGHT: 15.5
CMT W/ 150 SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: OH
FROM: 3065 TO: 3105
FORMATION: ENTRADA

PLUG 1
FROM: 2900 TO: 2975
OF SACKS USED: 10

PLUG 2
FROM: 1550 TO: 1625
OF SACKS USED: 10

PLUG 3
FROM: 925 TO: 1000
OF SACKS USED: 10

PLUG 4
FROM: SURF TO: 60
OF SACKS USED: 15

APPLICATION FOR AUTHORIZATION TO INJECT
PARAGRAPH VI
PLUGGED WELL SCHEMATIC

MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

OPERATOR: GARDNER BROS DRLG CO

LEASE: SUTTON SANTA FE
WELL NUMBER: 1-17

LOCATION
SECTION: 29
TWNSHP: 16 N RNG: 6 W
FOOTAGE: 660 FSL & 1980 FEL
ELEVATION (GL.): 6495

SPUD DATE: 9/60
DATE PLUGGED 9/60

SURFACE CASING
DEPTH: 80 HOLE SIZE: 6 3/4
CSG SIZE: 5 1/2 WEIGHT: 15.5
CMT W/ 15 SXS, TOC: SFC
TOP DETERMINED BY: CALC

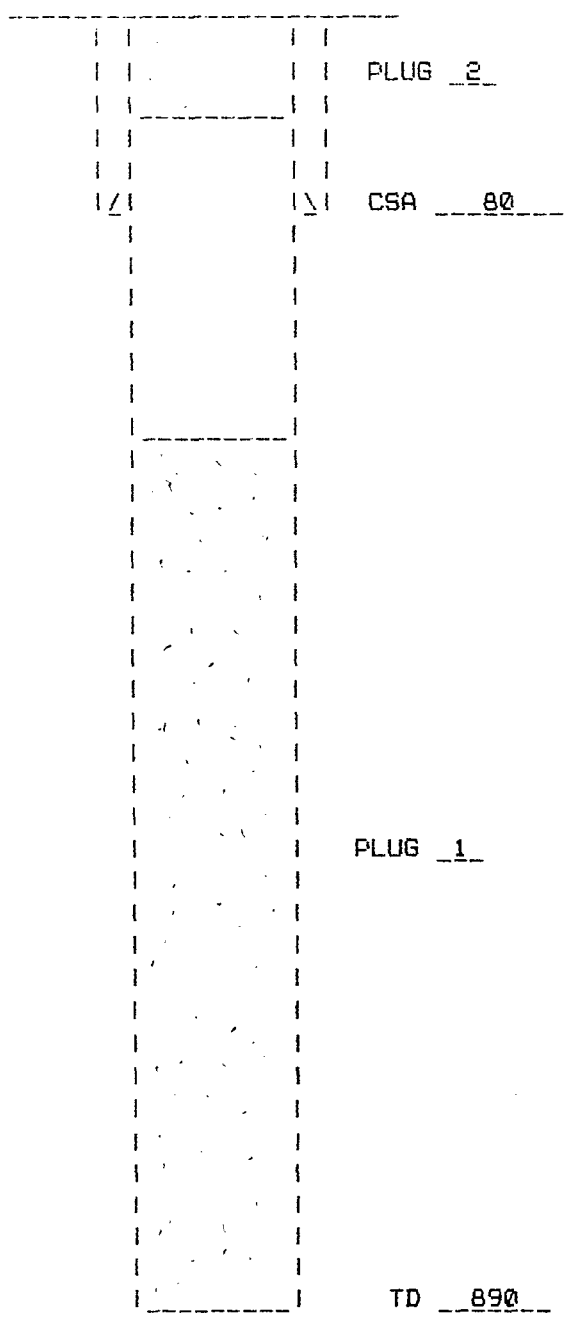
TOTAL DEPTH DRILLED: 890

LONG STRING - N/A
DEPTH: _____ HOLE SIZE: 4 3/4
CSG SIZE: _____ WEIGHT: _____
CMT W/ _____ SXS, TOC: _____
TOP DETERMINED BY: _____

COMPLETION INTERVAL
PERFORATED/OPEN HOLE: NONE
FROM: _____ TO: _____
FORMATION: _____

PLUG 1
FROM: 185 TO: 890
OF SACKS USED: 75

PLUG 2
FROM: SURF TO: 42
OF SACKS USED: 5



APPLICATION FOR AUTHORIZATION TO INJECT
MIGUEL CREEK FIELD
McKINLEY CO., NEW MEXICO

PARAGRAPH VII
PROPOSED OPERATIONS

PROPOSED INJECTION INCLUDES THE INJECTING OF STEAM (HUFF & PUFF) INTO THE PRODUCING WELLS FOR STIMULATING PRODUCTION AND THE INJECTING WATER INTO THE INJECTORS FOR BUILDING AND MAINTAINING PRESSURE. PAST WATER INJECTION IN THIS FIELD APPEARS TO HAVE EXCEEDED PARTING PRESSURE; THEREFORE, ONCE INJECTION HAS BEEN STABILIZED AT THE PRESSURES LISTED BELOW, STEP RATE TESTS WILL BE RUN TO DETERMINE THE PARTING PRESSURE AND THE OPTIMUM INJECTION RATE.

1. AVERAGE & MAXIMUM DAILY RATE & VOLUMES PER WELL:
   A. WATER INJECTION WELLS
      AVGERAGE RATE 600 BWPM - MAXIMUM RATE 750 BWPM
   B. PRODUCING WELLS
      AVGERAGE RATE 25 BWPD - MAXIMUM RATE 30 BWPD
      (WATER TO BE CONVERTED TO STEAM AND INITIALLY INJECTED FOR A PERIOD OF FOUR DAYS PER WELL)

2. THE SYSTEM IS CLOSED

3. AVERAGE & MAXIMUM INJECTION PRESSURE:
   A. WATER INJECTION WELLS
      AVGERAGE PRESSURE 150 PSI - MAXIMUM PRESSURE 250 PSI
   B. PRODUCING WELLS
      AVGERAGE PRESSURE 350 PSI - MAXIMUM PRESSURE 500 PSI
      (INJECTION TEMPERATURE APPROXIMATELY 330 DEG F)

4. WATER/STEAM SOURCE - MASSIVE GALLUP WATER SAND (ANALYSIS ATTACHED)

5. N/A

PARAGRAPH VIII
GEOLOGICAL HISTORY

NAME: UPPER GALLUP SANDSTONE (HOSPAH SAND)

LITHOLOGY: GRAY, FINE GRAINED SANDSTONE, SLIGHTLY ARGILLACEOUS

THICKNESS: 3 TO 30 FEET

AVERAGE POROSITY: 24%

AVERAGE DEPTH: 775' (5650' ABOVE SEA LEVEL)

FRESH WATER ZONE: MASSIVE GALLUP WATER SAND
855' (5570' ABOVE SEA LEVEL)

PARAGRAPH IX
STIMULATION PROGRAM

PENDING RESULTS OF INJECTION RATES AND PRESSURES, BOTH INJECTORS AND PRODUCERS MAY NEED TO BE STIMULATED WITH APPROXIMATELY 500 GALS HCL ACID.

369 Marshall Avenue / Saint Louis, Missouri 63119
(314) WO 1-3500/TWX 910-760 1660/Telex 44 2417

WATER ANALYSIS REPORT

COMPANY Capitol Oil & Gas ADDRESS Milan, NM DATE: 6-7-[illegible]

SOURCE well #37, S.F.P.R.R. Lease DATE SAMPLED _____ ANALYSIS NO. _____

Analysis	Mg/l	*Meq/l	
1. pH	6.0		
2. H_2S (Qualitative)	1.5		
3. Specific Gravity	1.005		
4. Dissolved Solids	5715		
5. Suspended Solids			
6. Phenolphthalein Alkalinity ($CaCO_3$)			
7. Methyl Orange Alkalinity ($CaCO_3$)	490		
8. Bicarbonate (HCO_3)	598	÷61 [illegible]	HCO_3
9. Chlorides (Cl)	2978	÷35.5 84	Cl
10. Sulfates (SO_4)	0	÷48 0	SO_4
11. Calcium (Ca)	236	÷20 12	Ca
12. Magnesium (Mg)	0	÷12.2 [illegible]	Mg
13. Total Hardness ($CaCO_3$)	350		
14. Total Iron (Fe)	16.0		
15. Barium (Qualitative)			
16. Strontium			

Location: Section 21, Township 16N, Range 6W
1650' FSL & 330' FWL

*Milli equivalents per liter

PROBABLE MINERAL COMPOSITION

12	Ca ←	→ HCO_3
0	Mg →	→ SO_4
82	Na →	← Cl

10	HCO_3	
0	SO_4	
84	Cl	

Saturation Values Distilled Water 20°C

$CaCO_3$	13 Mg/l
$CaSO_4 \cdot 2H_2O$	2,090 Mg/l
$MgCO_3$	103 Mg/l

Compound	Equiv. Wt.	X Meq/l	= Mg/l
$Ca(HCO_3)_2$	81.04	10	810
$CaSO_4$	68.07		
$CaCl_2$	55.50	2	111
$Mg(HCO_3)_2$	73.17		
$MgSO_4$	60.19		
$MgCl_2$	47.62		
$NaHCO_3$	84.00		
Na_2SO_4	71.03		
NaCl	58.46	82	4794

REMARKS CO_2 - 500ppm

Scaling tendency is plus .4. There will be possible scaling problem with this well.

Respectfully submitted
TRETOLITE COMPANY
Lloyd McLean

UPPER GALLUP SANDSTONE (HOSPAH SAND)

AnaCor, Inc.
7300 Jefferson Street, N.E.
Albuquerque, NM 87109
(505) 345-8964

Joint Venture of AnaChem, Inc. and Assaigai Analytical Laboratory

To: Enhanced Energy Systems
511 Comanche NE
Albuquerque, NM 87107

Date: January 26, 1983
JV-107

Attention: Willy Widemeyer

Sample Identification		Analytical Results
Water Sample	Na	518.4 ppm
	Ca	9.59 ppm
	Mg	4.20 ppm
	Fe	0.53 ppm
	Mn	<0.1 ppm
	CO_3	Ø mg/l
	HCO_3	100.0 mg/l
	Cl	95.0 mg/l
	SO_4	425.0 mg/l
	pH	8.22 ppm
	Si	4.95 ppm
	Conductivity	2650 micromhos/cm
	Hardness	100 mg($CaCO_3$)/l

An invoice for services is enclosed. Thank you for contacting AnaCor.

Sincerely,

Jennifer V. Smith, Ph.D.
Laboratory Director

JVS:rp

Enclosure

MASSIVE GALLUP WATER SAND