SINCLAIR-SANTA FE PACIFIC # 6
SE NE 35-28N-1W COCONINO CO.

P-W

COUNTY Coconino AREA _____ LEASE NO. Santa Fe Pacific Fee

WELL NAME Sinclair Oil Company #1 Santa Fe Pacific 1980' FNL

LOCATION SW NE SEC 35 TWP 28N RANGE 1W FOOTAGE ~~660' FSL~~ 1980' FEL

ELEV 6005' GR _____ KB SPUD DATE 11-15-51? STATUS COMP. DATE ~~5-3-52~~ TOTAL DEPTH 3544'

CONTRACTOR Sinclair Oil & Gas Co.

CASING SIZE	DEPTH	CEMENT	LINER SIZE & DEPTH
13 3/8	316'	300 sx	na
9 5/8	2205	450 sx	

DRILLED BY ROTARY x

DRILLED BY CABLE TOOL _____

PRODUCTIVE RESERVOIR _____

INITIAL PRODUCTION P&A

FORMATION TOPS	DEPTHS	SOURCE L.L.	SOURCE E.L.	REMARKS
Coconino	608'	xxxxx	xxxx	
Supai	920'			
Penn.	1548			
Miss	2195'			
Redwal	2330			
Devonian	2806			
Cambrian	2844			
Tapeats	3490			

ELECTRIC LOGS	PERFORATED INTERVALS	PROD. INTERVALS
Electric Reduced log filed in Geol. Surv.		

SAMPLE LOG Am Strat
SAMPLE DESCRP. x
SAMPLE NO. 126 & 1517
CORE ANALYSIS _____
DSTs _____

REMARKS ~~9 5/8" csg. shot off = 1934' rec. leaving 271' of 9 5/8"~~ csg in hole.

APP. TO PLUG x
PLUGGING REP. x
COMP. REPORT x

WATER WELL ACCEPTED BY Cataract Livestock Co.

BOND CO. U. S. Guarantee Co. BOND NO. 7515 594

BOND AMT. $ 10,000 CANCELLED 8-14-53 DATE ORGANIZATION REPORT _____

FILING RECEIPT none LOC. PLAT _____ WELL BOOK x PLAT BOOK x

API NO. 02-005-05019 DATE ISSUED 10-26-51 DEDICATION SW/4 SE/4

PERMIT NUMBER 6

(over)

6

ARIZONA
COCONINO CO.
WILDCAT

PETROLEUM INFORMATION
DENVER CASPER
ROCKY MOUNTAIN
OIL INFORMATION

T 8N-1W
Section 35
C SW NE

OPR: Sinclair Oil & Gas Co. WELL #: 1 Santa Fe.

ELEV: 6005 GR

*TOPS: ~~Elec. Log~~ Sample

Coconino	608
Supai	920
Callville Lime (Penn)	2008
Red Wall (Miss)	2330
Temple Buttes (Dev.)	2806
Mauv Limestone (Cambrian)	2844
Bright Angel Shale	3085
Tapeats	3490

DSTS. & CORES:
DST 2878-2932, 1 hr, rec 155' drilling mud.

SPUD: 11-15-51 COMPL:
TD: 3544 PB:
CSG: 13-3/8" @ 316.

PERF:

PROD. ZONE:

INIT. PROD: Plugged & Abandoned.

7-24-52

*For Electric Logs on Rocky Mountain Wells—Ask Us!

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well [X] Work-Over [ ] Deepen [ ] Plug Back [ ] Same Reservoir [ ] Different Reservoir [ ] Oil [ ] Gas [ ] Dry [X]

DESCRIPTION OF WELL AND LEASE

Operator: Atlantic Richfield Company, successor to Sinclair Oil & Gas Company	Address: 501 Lincoln Tower Bldg., Denver, Colo. 80203
Federal, State or Indian Lease Number or name of lessor if fee lease: Santa Fe Pacific	Well Number: 1
Field & Reservoir: Wildcat	
Location: SW NE Sec. 35	County: Coconino
Sec. TWP-Range or Block & Survey: Section 35-28N-1W	

Date spudded	Date total depth reached	Date completed, ready to produce	Elevation (DF, RKB, RT or Gr.) feet	Elevation of casing hd. flange feet
11/15/51	4/25/52	Dry	DF - 6016'	6005'

Total depth	P.B.T.D.	Single, dual or triple completion?	If this is a dual or triple completion, furnish separate report for each completion.
3543' (WLTD) (3544')	1200'	Dry hole	

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)
None	0 - 3543'	- -

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed
no	no	no	- -

Type of electrical or other logs run (check logs filed with the commission): EL, EL w/10"normal & 24' lateral, Lmstn survey, Micro, Gamma Ray, & Section Gauge — Date filed: ?

CASING RECORD

Casing (report all strings set in well—conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled
Surface	17-3/4	13-3/8"	?	316'	300 sx	0
Intermediate	12-1/4"	9-5/8"	?	2206'	450 sx	?

TUBING RECORD none

Size in.	Depth set ft.	Packer set at ft.

LINER RECORD none

Size in.	Top ft.	Bottom ft.	Sacks cement	Screen (ft.)

PERFORATION RECORD none

Number per ft.	Size & type	Depth Interval

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

Am't. & kind of material used	Depth Interval

INITIAL PRODUCTION - Dry

Date of first production	Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)
-	

Date of test	Hrs. tested	Choke size	Oil prod. during test bbls.	Gas prod. during test MCF	Water prod. during test bbls.	Oil gravity ° API (Corr)
-	-					

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hrs.	Oil bbls.	Gas MCF	Water bbls.	Gas—oil ratio
-						

Disposition of gas (state whether vented, used for fuel or sold):

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Drilling Clerk of the Atlantic Richfield Company (company), and that I am authorized by said company to make this report: and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

January 22, 1972
Date

M E Brown
Signature M. E. Brown

RECEIVED
JAN 24 1972
O & G CONS. COMM.

Permit No. 4

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
File One Copy
Form No. 4

(Complete Reverse Side)

DETAIL OF FORMATIONS PENETRATED - See Attached

Formation	Top	Bottom	Description*
DRILL STEM TESTS:			
#1 - 2827.60' - 2881', 3/4" BHC, 1" SC, Open w/sli blow, decreased, dead in 10 min. Tool open 75 minutes. Rec'd 10' drlg mud. IH & FH 1300#, all other pr - 0#.			
#2 - 2878-2932', 3/4" BHC, 1" SC, Open w/sli blow immed, decreased, dead in 62 min. Tool open 1 hr 26 min., Rec'd 155' vy sli GCM. IH & FH 1350#, all other pr - 0#.			
#3 - 2911-2956', 3/4" BHC, 1" SC, Open w/medium blow, decreased to vy sli blow @ end of test. Tool open 65 min.. Rec'd 65' drlg mud, 100' water. IH & FH - 1380#, all other pr - 0#.			
CORES (Also see attached)			
#1 - 2662-65', Rec'd 18", Pink to rose, vugular and silicious magnesium limestone with chert inclusions.			
#2 - 2665-68', Rec'd 10", Gray to pink vugular magnesium limestone w/included chert.			
#3 & #4 (#3 f/2820-50'; #4 f/2850-2881')			
	2820-39'		- Gray, massive dolomite with streaks of red shale. Specks of fluorescense on samples 2830-32 & 2833-34'.
	2839-42'		- Gray to pink fractured dolomite
	2842-47'		- Gray dolomite, very vugular w/streaks of red & green shale.
	2847-49'		- Gray to brown sandy fractured dolomite. Light canary colored fluor..
	2849-81'		- Gray to purplish-gray vugular dolomite. Fluor. 2867-68'.
#5	2881-2891'		- Gray, purplish-gray in upper 2', fine to sub-drystalline, slightly vugular to vugular dolomite. Small amount of green shale in streaks in upper portion.
#6	2891-2911		
		2891	- Dense, gray vy sli sdy dolomite;vugular, large vugs (1")filled w/red shale inclusions. Vert fracs. Massive, Blotchy fluor under light.
		2892	- Dense, gray dolomite. Vert fracs filled w/red calcite.
		2893	- Sli vugular,sli sdy in strks, dense,gray dolomite w/some incl red shale.
		2895	- Dense,gray, vy sli sdy dolomite w/pink calcite veining.
		2897	- Dense, gray, vugular dolomite.
		2898	- Gray, sli sdy dolomite, pink calcite veining. vy tight.
		2901.5	- Gray, dense dolomite w/maroon & green waxy shale. Pink calcite veining.
		2904	- (Top) Vy tight, gray, vy sli sdy dolomite w/aragonite veining.
		2904	(bottom) - Sli sdy gray, dense dolomite, vert. fractures.
		2905	- Dense,gray dolomite. Pink calcite & limonite veining along fractures.
		2906	- Dense, gray sandy, massive, tight, dolomite
		2908	- Gray, very dense, tight dolomite.
		2910	- Same
		2910.6	- Gray, hard sandstone. Mineral fluor.
		2911	- Fine grain, hard, gray, quartzitic sandstone(silica cement) Compact.
#7	2911-32'	2911-13	- Dark gray, dense, fine grain,quartzitic SS w/vert fractures.
		2913-30	- Fine grain, highly cross-bedded, friable, purplish-gray & maroon, some pale green, sucrosic SS. Grains rounded to sub-angular, clear quartz. Becomes sli glauconitic @ 2914 & increases downward
		2930-32	- Maroon, highly micaceous, sandy shale or shaly sandstone.
#8	2934-56		Maroon, micaceous, glauconitic, sandy (vy fn grain) shale & streaks of maroon to pale green,glauconitic, vy fn clear quartz grains Sandstone. SS & sh are interbedded. Core dense, hard and tight.

* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Oil & Gas Conservation Commission not later than thirty days after project completion.

Form No. 4

SANTA FE PACIFIC, Well #1
SW NE Section 35-28N-1W
Coconino County, Arizona

Formation Tops:

Formation	Age	Top	Thickness
Kiabab Limestone	Permian	Surface	608'
Coconino Sandstone	Permian	608	312'
Supai Formation	Permian	920	1088'
Supai-Marine	Pennsylvanian	2008	322'
Redwall Limestone	Mississippian	2330	476'
Temple Buttes Limestone	Devonian	2806	38'
Mauv Limestone	Middle Cambrian	2844	241'
Bright Angel Shale	Middle Cambrian	3085	405'
Tapeats Sandstone	Middle Cambrian	3490	54'

Driller's TD - 3543'
Wire Line - 3544'

Well turned over to Cataract Land and Cattle Company for possible water well.

STATE LAND DEPARTMENT

STATE OF ARIZONA

Form O&G 56

Form Prescribed Under Oil and Gas Conservation Act of 1951

ABANDONMENT AND PLUGGING RECORD

(Within thirty days after the plugging of any well has been accomplished, the owner or operator thereof shall file this form with the Commissioner, setting forth in detail the method used in plugging the well.)

PLUGGING METHODS AND PROCEDURE-- The methods and procedure for plugging a well shall be as follows: (a) The bottom of the hole shall be filled to, or a bridge shall be placed at, the top of each producing formation open to the well bore, and in either event a cement plug not less than fifty (50) feet in length shall be placed immediately above each producing formation open to the well bore when ever possible.

(b) A cement plug not less than fifty (50) feet in length shall be placed at approximately fifty (50) feet below all fresh-water-bearing strata.

(c) A plug shall be placed at or near the surface of the ground in each hole.

(d) The interval between plugs shall be filled with heavy-mud-laden fluid.

(e) An uncased hole shall be plugged with heavy mud up to the base of the surface string, at which point a plug of not less than fifty (50) feet of cement shall be placed.

Operator Sinclair Oil & Gas Company Field Wildcat

Pool Wildcat

County Coconino, Arizona

Address all correspondence concerning this form to: Sinclair Oil & Gas Company

Street: P. O. Box 521 City Tulsa 2 State Oklahoma

Lease Name Santa Fe Pacific Well No. 1 Sec. 35 Twp 28-N Rge. 1-W

Date well was plugged May 6, 1952

Was the well plugged according to regulations of the Commissioner? Yes

Set out method used in plugging well and record of casing pulled:

Well was drilled with Rotary tools from surface to 3544'-TD. Set 13-3/8"OD casing at 313' and cemented w/300-sacks. 9-5/8"OD casing set at 2205' from surface and cemented w/450-sacks 313' of 13-3/8"OD casing left in hole. 1934' of 9-5/8"OD casing was pulled leaving 271' in hole. Hole was filled with 98 viscosity mud from bottom to 1276' from surface. Cement plug was placed from 1276' to 1236'. Plug tested OK. At request of land owner hole was left open from 1236' to bottom of 13-3/8"OD casing @ 313'(Surface Measurements) for future use as water well. Cap was placed on top of 13-3/8"OD casing. See letter (dated May 3, 1952) from Mr. W. W. Lane, State Land Commissioner of Arizona, to R. A. Bonnell as authority for procedure in plugging this well.

(AFFIDAVIT)

STATE OF ~~ARIZONA~~ Texas

COUNTY OF Midland

SINCLAIR OIL & GAS COMPANY

By J T Reeves J.T.Reeves

(Operator) Division Supt.

Before me, the undersigned authority, on this day personally appeared J. T. Reeves, known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is authorized to make this report and has knowledge of the facts stated herein and that said report is true and correct.

Subscribed and sworn to before me this the 12 day of July 1952

My commission expires: 6-1-53

D. R. Dickson

Notary Public in and for Midland Co., Texas

Orig. &cc: State Land Department
Phoenix, Arizona
cc: WHC, EGC, JTR

STATE LAND DEPARTMENT

STATE OF ARIZONA Form O&G 56

Form Prescribed Under Oil and Gas Conservation Act of 1951

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(Within thirty days after the plugging of any well has been accomplished, the owner or operator thereof shall file this form with the Commissioner, setting forth in detail the method used in plugging the well.)

PLUGGING METHODS AND PROCEDURE-- The methods and procedure for plugging a well shall be as follows: (a) The bottom of the hole shall be filled to, or a bridge shall be placed at, the top of each producing formation open to the well bore, and in either event a cement plug not less than fifty (50) feet in length shall be placed immediately above each producing formation open to the well bore when ever possible.

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(c) A plug shall be placed at or near the surface of the ground in each hole.

(d) The interval between plugs shall be filled with heavy-mud-laden fluid.

(e) An uncased hole shall be plugged with heavy mud up to the base of the surface string, at which point a plug of not less than fifty (50) feet of cement shall be placed.

Operator Sinclair Oil & Gas Company Field Wildcat

Pool Wildcat

County Coconino

Address all correspondence concerning this form to: J. T. Reeves

Street: Box 1470 City Midland State Texas

Lease Name Santa Fe Pacific Well No. 1 Sec. 35 Twp. 28N Rge. 1W

Date well was plugged May 3, 1952, 19 52

Was the well plugged according to regulations of the Commissioner? Yes

Set out method used in plugging well and record of casing pulled: With authorization from State Land Department of Arizona, the hole was filled with 98 viscosity mud containing as much loss circulation material as mud would carry; then a cement plug was placed from 1236' to 1276', surface measurements. Surface pipe then capped. Plug withstood wover 20,000 pounds weight. Procedure above followed so as Cataract Livestock Company could attempt to make water well from 560' to 1140' if formation found to contain water. 9-5/8" casing shot off at 1934'. Recovered 51 joints 1934'.

(AFFIDAVIT)

STATE OF ARIZONA.

COUNTY OF Coconino

Robert A. Bonnell Jr
(Operator)

Before me, the undersigned authority, on this day personally appeared ROBERT A. BONNELL, JR., known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is authorized to make this report and has knowledge of the facts stated herein and that said report is true and correct.

Subscribed and sworn to before me this the 6th day of May 19 52

My commission expires: April 22, 1955

Hazel Kalb
Notary Public in and for Coconino

STATE LAND DEPARTMENT
STATE OF ARIZONA

O&G 55

Form Prescribed Under Oil and Gas Conservation Act 1951

APPLICATION TO ABANDON, PLUG, DEEPEN and SIDETRACK OR PERFORATE
(After Well Has Once Been Completed)

INSTRUCTIONS: -- File in duplicate with Commissioner. One copy will be returned with approval or denial.

FIELD: Wildcat
OPERATOR: Sinclair Oil & Gas Co. ADDRESS Box 1470, Midland, Texas
LEASE: Santa Fe Pacific WELL NO. 1 COUNTY Coconino
SURVEY: T 28 N R 1 W SECTION 35 DRILLING PERMIT NO. 6
LOCATION: 660 Ft. from South & East lines of the SW NE Section 35

TYPE OF WELL: Dry Hole TOTAL DEPTH 3544'
(Oil, Gas or Dry Hole)

ALLOWABLE (If Assigned)
LAST PRODUCTION TEST: OIL (Bbls.) WATER (Bbls)
GAS (M.C.F.) DATE OF TEST

PRODUCING HORIZON PRODUCING FROM: TO

1. COMPLETE CASING RECORD: 13-3/8" casing set @ 316 ft from surface cemented from top to bottom
9-5/8" casing set @ 2205' from surface top cement @ 1975' behind casing

2. FULL DETAILS OF PROPOSED PLAN OF WORK: Shoot off 9-5/8" casing at approximately 1960' and remove from well. Place cement plug at approximately 1200'. Weld cap on surface casing and then turn well over to Cataract Livestock Company of Flagstaff who will then attempt to develop open hole into a water well.

If the well is to be deepened to another zone other than that covered by permit, this form shall be accompanied by a certified lease plat as is prescribed on Form No. O & G 51.

If well is to be abandoned, does proposed work conform with requirements of SW Rule 26? No. If not, outline procedure proposed above.

DATE COMMENCING OPERATIONS: April 30, 1952
NAME OF PARTY DOING WORK: Sinclair Oil & Gas Co. ADDRESS: Box 1470 Midland, Texas
CORRESPONDENCE SHOULD BE SENT TO:

NAME: J. T. Reeves

TITLE: Division Superintendent

ACTION OF COMMISSIONER

APPROVED:
W. W. Lane, State Land Commissioner (Subject to mudding of hole from 3544' to the bottom of the proposed cement plug.)
DENIED:

BY:

APR 1952
STATE LAND DEPT.

6

Permit #6

SINCLAIR #1 SANTA FE PACIFIC

Lithologic Description of Samples

Interval	Description
0-10 feet	Limestone, buff and light pink, sandy, with green shale partings and many large grains of clear quartz.
10-20	Limestone, light gray, buff, and light pink, sandy, with green shale partings, large grains of clear quartz.
20-30	Limestone, light gray, buff, and light purple, sub-crystalline, vugular, with chert.
30-40	Limestone, light gray and some buff, slightly sandy, sub-crystalline, vugular, with chert.
40-50	Limestone, light gray, and buff, sub-crystalline to finely crystalline, vugular, with a few crystals of calcite.
50-60	Limestone, light gray and light pink, sandy, with a few frosted, medium-sized, sub-rounded sand grains; cherty.
60-70	Limestone, light gray to gray, some buff, sandy, vugular, with chert.
70-80	Limestone, light gray and light buff, sandy, vugular with much chert.
80-90	Limestone, light gray, sandy, fossiliferous with much chert.
90-100	Limestone, gray, pink, buff, sandy, with abundant chert.
100-10	Limestone, gray, sandy, with abundant chert.
110-20	Limestone, light gray, buff, sandy, with abundant chert and nodules of asphalt.
120-30	Limestone, light gray, sandy, with abundant chert.
130-40	Limestone, light gray, sandy, with a few clear, medium-sized grains of sub-rounded quartz.
140-50	Limestone, light gray, sandy, vugular in part, with abundant chert.
150-60	Limestone, light gray, and light buff, sandy, vugular, with chert.

160-70	Limestone, light gray, and light buff, sandy, extremely cherty.
170-80	Same.
180-90	Limestone, light gray, and light buff, sandy, vugular in part; extremely cherty.
190-200	Limestone, light gray, and light buff, sandy; abundant chert.
200-10	Sandstone, light buff, fine-grained, calcareous; much chert.
210-20	Sandstone, buff, fine-grained, calcareous; small amount of chert.
220-30	Sandstone, buff, fine-grained, slightly calcareous; small amount of chert; trace of copper mineral.
230-40	Sandstone, buff, fine-grained, calcareous, with chert, and a trace of copper mineral and copper stain.
240-50	Limestone, buff, sandy with some chert and a trace of copper mineral.
250-60	Limestone, light gray, sandy, with some chert and a trace of copper mineral.
260-70	Sandstone, buff, fine-grained, calcareous, with much chert.
270-80	Same.
280-90	Sandstone, buff, fine-grained, calcareous, with much chert and a trace of copper mineral.
290-300	Sandstone, buff, fine-grained, calcareous with abundant chert.
300-10	Sandstone, light gray and light buff, calcareous, with some chert.
310-20	Same.
320-30	Limestone, gray, sub-crystalline, and shale, gray, very sandy with very fine sand grains, very calcareous.
330-40	Limestone, dark gray, dolomitic, dense, and shale, gray, very sandy with very fine sand grains, very calcareous.
340-50	Limestone, buff, sandy, crystalline.
350-60	Same.

360-70	Sandstone, buff, red, fine to medium grained, with a few large grains, calcareous.
370-80	Same.
380-90	Sandstone, buff and red, fine-grained, calcareous, and limestone, buff, sandy.
390-400	Limestone, gray, sandy.
400-10	Sandstone, buff to red, fine-grained, calcareous.
410-20	Sandstone, buff to red, fine-grained, calcareous, with some chert.
420-30	Sandstone, buff to red, fine-grained, with some medium-sized grains, calcareous, with some chert.
430-40	Same.
440-50	Same.
450-60	Sandstone, buff to red, fine-grained, calcareous.
460-70	Sandstone, buff to red, fine-grained, calcareous, with some chert.
470-80	Sandstone, buff to red, fine-grained, calcareous, with much chert.
480-90	Sandstone, buff to red, fine-grained, calcareous.
490-500	Limestone, light to dark gray, sub-crystalline.
500-10	Limestone, gray, sub-crystalline, vugular, with chert.
510-20	Limestone, gray and pinkish-gray, sub-crystalline, vugular.
520-30	Limestone, gray and pinkish-gray, sub-crystalline, vugular, with chert.
530-40	Limestone, gray and pinkish-gray, sub-crystalline, vugular.
540-50	Limestone, dark gray, dolomitic, sub-crystalline, with vugular porosity.
550-60	Same.
560-70	Limestone, dark gray, dolomitic, sub-crystalline, with vugular porosity, and with chert.

570-80	Limestone, dark gray, dolomitic, sub-crystalline, with vugular porosity.
580-90	Limestone, gray to pinkish-gray, sandy, with some chert.
590-600	Same.
600-10	Sandstone, red-brown, fine-grained, calcareous.
610-20	Same.
620-30	Sandstone, cream to buff, fine-grained, soft, friable.
630-40	Same.
640-50	Same. Lost circulation at 648 feet.
650-60	Same.
660-70	Sandstone, cream to buff, fine-grained, poorly cemented.
670-80	Same.
680-90	Same.
690-700	Sandstone, buff, fine to medium-grained, with sub-angular to sub-rounded clear quartz grains.
700-10	Same.
710-20	Same.
720-30	Same. Lost circulation at 727 feet.
730-40	Sandstone, red-brown, fine-grained, with sub-angular to angular grains, calcareous.
740-50	Same.
750-60	Same.
760-70	Sandstone, light red-brown to buff, fine-grained, with sub-angular to angular grains, calcareous.
770-80	Sandstone, light red-brown to buff, fine-grained.
780-90	Sandstone, light red-brown, fine-grained.
790-800	Sandstone, light red-brown to buff, fine-grained.
800-10	Same.

810-20	Sandstone, buff, fine-grained.
820-30	Same.
830-40	Sandstone, buff, fine-grained with a few medium-sized grains.
840-50	Sandstone, buff to red-brown, fine, sub-angular grains, calcareous, fairly well cemented.
850-60	Sandstone, red-brown, fine-grained with sub-angular to sub-rounded clear quartz grains, calcareous.
860-70	Sandstone, red-brown, fine-grained, with sub-angular to sub-rounded clear quartz grains, calcareous, with trace of gypsum with included sand grains.
870-80	Sandstone, red-brown, fine-grained, with sub-angular to sub-rounded clear quartz grains, calcareous.
880-90	Sandstone, red-brown, fine-grained, with sub-angular to sub-rounded clear quartz grains, calcareous, with trace of gypsum with included sand grains.
890-900	Sandstone, red-brown, fine-grained, with sub-angular to sub-rounded clear quartz grains, calcareous.
900-10	Sandstone, buff to red-brown, fine-grained, with sub-angular to sub-rounded clear quartz grains.
910-20	Same.
920-30	Sandstone, red-brown, fine-grained, sub-angular to sub-rounded, slightly calcareous.
930-40	Same.
940-50	Same.
950-60	Same.
960-70	Same.
970-80	Same.
980-90	Same.
990-1000	Same.
1000-10	Same.
1010-20	Same.

1020-30	Sandstone, buff to light red-brown, fine-grained with sub-angular to sub-rounded grains, slightly calcareous.
1030-40	Same.
1040-50	Sandstone, buff to light red-brown, fine-grained with sub-angular to sub-rounded grains, slightly calcareous.
1050-60	Sandstone, buff to light red-brown, fine to medium-grained, angular clear quartz grains with some rounded frosted grains, calcareous cement. Trace of white gypsum.
1060-70	Sandstone, buff to light red-brown, fine to medium-grained, angular clear quartz grains with some rounded frosted grains, calcareous cement; with yellow tan, very sandy limestone. Trace of white gypsum.
1070-80	Sandstone, buff to light red-brown, fine to medium-grained, angular clear quartz grains with some rounded frosted grains, calcareous cement. Trace of white gypsum.
1080-90	Sandstone, buff to light red-brown, fine to medium-grained, angular clear quartz grains with some rounded frosted grains, calcareous cement; with trace of gray sandy dolomite and trace of white gypsum.
1090-1100	Sandstone, buff to light red-brown, fine to medium-grained, angular clear quartz grains with some rounded frosted grains, calcareous cement. Trace of white gypsum. Abundant extraneous material from above due to circulation troubles. Lost circulation 1095½ feet.
1100-10	Sandstone, red-brown, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement, with trace of white gypsum, chert.
1110-20	Sandstone, red-brown, fine to medium-grained, sub-rounded, clear quartz grains, calcareous cement. Trace of chert.
1120-30	Sandstone, light red-brown and red-brown, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement with white gypsum with included sand grains.
1130-40	Sandstone, light red-brown, some buff, fine-grained, sub-rounded clear quartz grains. Trace of gypsum with included sand grains.
1140-42	Same.
1142-50	Shale, chocolate, sandy, with very fine sand grains.

1150-60	Shale, chocolate, very sandy, slightly calcareous, with trace of light purple sandy shale and a trace of chert.
1160-70	Shale, chocolate, very sandy, slightly calcareous with trace light purple shaly sandstone and a trace of chert.
1170-80	Shale, chocolate, very sandy, slightly calcareous, with trace of sandstone, light green, fine-grained, sub-rounded clear quartz grains, calcareous cement, and with trace cherty limestone, gypsum.
1180-90	Shale, chocolate, very sandy, slightly calcareous, with very small amount of sandstone, light green and light purple, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement. Trace gypsum.
1190-1200	Sandstone, chocolate, very shaly, very fine-grained, calcareous cement. Trace gypsum.
1200-10	Sandstone (or siltstone), chocolate, very fine-grained, slightly calcareous; and shale, chocolate, very sandy, with very fine sand grains, slightly calcareous. Trace light purple sandstone, fine-grained. Trace gypsum. A few clear calcite crystals.
1210-20	Shale, chocolate, very sandy, with very fine quartz grains, slightly calcareous. A few coarse crystals of calcite.
1220-30	Shale, chocolate, very sandy with very fine quartz grains, slightly calcareous and sandstone, very fine-grained, slightly calcareous. Trace gypsum and calcite crystals.
1230-40	Sandstone (or siltstone), chocolate, very fine-grained, slightly calcareous, with some calcite veining.
1240-50	Shale, chocolate, very sandy, with very fine sand grains, slightly calcareous. Some gray to buff streaks.
1250-60	Shale, chocolate, very sandy with very fine sand grains, slightly calcareous and sandstone, light brown, fine-grained, sub-rounded clear quartz grains, calcareous cement. Trace gypsum with included sand grains.
1260-70	Same.
1270-80	Shale, chocolate, some light purple, very sandy, with very fine sand grains, slightly calcareous, and sandstone, light brown, fine-grained, sub-rounded clear quartz grains, calcareous cement. Trace gypsum with included sand grains; trace chert.
1280-90	Same.

1290-1300	Sandstone, light-brown with light-gray and buff, fine-grained, sub-angular to sub-rounded clear quartz grains, calcareous cement. Some shale, chocolate, very sandy, with very fine sand grains, slightly calcareous. Trace gypsum with included sand grains; trace dolomite, gray, very sandy.
1300-10	Same.
1310-20	Sandstone, light red-brown, some light-gray, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement. Trace gray chert, gypsum with included sand grains.
1320-30	Sandstone, light red-brown, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement. Trace gray sandy limestone, and trace calcite crystals.
1330-40	Sandstone, light red-brown, fine-grained, a few medium-sized grains, sub-rounded clear quartz grains, slightly calcareous, fairly well cemented. Trace typsum with included sand grains; trace gray, sub-crystalline, dolomitic limestone; trace chert. Lost circulation 1338 feet.
1340-50	Shale, red-brown, very sandy with very fine sand grains, slightly calcareous, and sandstone, red-brown and light red-brown, some light purple, fine to medium-grained, sub-rounded clear quartz grains, calcareous cement. Trace gypsum with included sand grains. Much lost circulation material.
1350-60	Sandstone, red-brown, some light purple, fine to medium-grained, sub-rounded clear quartz grains, slightly calcareous. Small amount shale, red-brown, very sandy with very fine sand grains, slightly calcareous. Trace gray chert; trace gray, finely-crystalline limestone.
1360-70	Sandstone, light red-brown to red-brown, grading into light purple, fine to medium-grained with sub-rounded clear quartz grains, slightly calcareous. Some shale, dark red-brown, very sandy with very fine sand grains. Trace gypsum with included sand grains; trace chert.
1370-80	Sandstone, white, light red-brown, red-brown, light-purple, fine-grained, clear quartz grains, slightly calcareous. Trace gypsum.
1380-90	Sandstone, tan, light red-brown, and red-brown, some gray and gray-purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, fairly well cemented.
1390-1400	Sandstone, tan, some reddish-purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, firmly cemented.

1400-10	Sandstone, tan, some white, light gray, light green, light purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, good cement. Trace red-brown shaly sandstone.
1410-20	Sandstone, tan and red-brown, some white and light purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, good cement. Trace gypsum with included sand grains.
1420-30	Same.
1430-40	Sandstone, tan and red-brown, some white and light purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, good cement. Some dark red-brown shaly sandstone, slightly calcareous. Trace gypsum with included sand grains.
1440-50	Sandstone, tan and red-brown, some white and light purple, fine-grained, sub-rounded clear quartz grains, slightly calcareous, good cement and some dark red-brown, very sandy, with very fine sand grains, shale. Trace gypsum with included sand grains. Specks of soft black mineral, no fluorescence.
1450-60	Sandstone, light reddish-purple, fine-grained, sub-rounded, clear quartz grains, very slightly calcareous, sugary, firmly cemented. Trace gypsum with included sand grains.
1460-70	Same.
1470-80	Sandstone, reddish-purple, fine-grained, sub-angular to sub-rounded; specks of soft black mineral, no fluorescence. Trace gypsum with included sand grains.
1480-90	Sandstone, reddish-purple and tan, some light gray, fine-grained, sub-rounded clear quartz grains, some medium-sized calcite crystals in bands. Trace gypsum with included sand grains.
1490-1500	Sandstone, reddish-purple and tan, some light gray, fine-grained, sub-rounded clear quartz grains, slightly calcareous. Trace gypsum with included sand grains.
1500-10	Sandstone, tan, red-brown, reddish-purple, some white, fine-grained, slightly calcareous. Lost circulation 1509 feet.
1510-20	Sandstone, tan, red-brown, fine-grained, very calcareous.
1520-30	Same.
1530-40	Sandstone, red-brown, very fine-grained, very shaly, calcareous; and shale, red-brown, very sandy, calcareous, soft.
1540-50	Sandstone, red-brown, fine-grained, calcareous; and shale, red-brown, very sandy, calcareous; and limestone, greenish-gray to white, sub-crystalline.

1550-60	Same.
* 1560-70	Same. Light green fluorescence in carbon tetrachloride.
* 1570-80	Same. Light green fluorescence in carbon tetrachloride.
1580-90	No sample. Rotary Engineering logged 70% red shale, 30% gray to white to greenish limestone.
1590-1600	Sandstone, grey, light to dark red-brown, some greenish, fine-grained, calcareous, with some red-brown sandy shale. Trace gypsum with included sand grains.
1600-10	Sandstone, light to dark red-brown, greenish, fine-grained, calcareous, with some dark-red sandy shale and minor amounts of gray sub-crystalline limestone.
1610-20	Sandstone, light to dark red-brown, greenish, fine-grained, calcareous with some dark-red sandy shale and minor amounts of gray, very sandy, sub-crystalline limestone.
* 1620-30	Sandstone, light to dark red-brown, greenish, fine-grained, calcareous, with some dark-red sandy shale and minor amounts of gray, very sandy sub-crystalline limestone. Very light fluorescence in carbon tetrachloride.
1630-40	Shale, red-brown, very sandy with very fine sand grains, slightly calcareous; and limestone, gray, greenish, sandy, and some sandstone as above.
1640-50	Shale, red-brown, very sandy with very fine sand grains, calcareous; and some sandstone, light red-brown, fine-grained, calcareous; and limestone, gray, sandy.
1650-60	Sandstone, red-brown, small amount of purple, fine-grained, calcareous, shaly.
1660-70	Sandstone, red-brown, fine-grained, calcareous, with some shale, red-brown, sandy, with very fine sand grains and limestone, gray, sandy.
* 1670-80	Sandstone, red-brown, fine-grained, calcareous, with some shale, red-brown, sandy, with very fine sand grains and limestone, gray, sandy. Trace gypsum with included sand grains. Slight yellow fluorescence in sample. Slight yellow fluorescence in carbon tetrachloride.
1680-90	Sandstone, light to dark red-brown, fine-grained, calcareous, some is shaly, and small amount of shale, red-brown, very sandy with very fine sand grains, calcareous. Trace gypsum with included sand grains. Abundant muscovite and biotite mica in sandstone.

1690-1700	Same. Some very sandy gray limestone.
1700-10	Same. Much gray-green, sandy limestone. Rotary Engineering samples show mica to be present from 1684 to 1706 feet.
1710-20	Sandstone, reddish-purple, fine-grained with sub-angular to sub-rounded clear quartz grains, calcareous, sugary. Rotary Engineering samples show this sand to start at 1718 feet.
1720-30	Sandstone, reddish-purple, fine-grained with sub-angular to sub-rounded clear quartz grains, slightly calcareous, sugary; some shale, green, sandy calcareous. Trace gypsum with included sand grains.
1730-40	Sandstone, red-brown, some reddish-purple and white, fine-grained with shaly streaks. White sandstone is very calcareous. Some limestone, gray, soft, interbedded. Trace gypsum with included sand grains.
* 1740-50	Sandstone, white to red-purple, speckled red, fine-grained, slightly calcareous. Trace limestone, gray, sandy, and trace gypsum with included sand grains. A few slightly fluorescent fragments give very light yellow fluorescence in carbon tetrachloride. Bulk sample gives light greenish-yellow fluorescence in carbon tetrachloride. Lost circulation 1741 feet.
1750-60	Sandstone, white to red-purple, speckled red, fine-grained, slightly calcareous. Trace limestone, gray, sandy, and trace gypsum with included sand grains.
1760-74	Same.
1774-80	Limestone, gray, grading to pink at base, crystalline to sub-crystalline 1774-1778 feet. Sandstone, dark red-brown, fine-grained, slightly calcareous. Trace gypsum. Red shale 1778-80.
1780-90	Sandstone, red, silty, very fine-grained, some shale, red, sandy, calcareous, and limestone, gray and gray-green, sandy. Trace gypsum with included sand grains; trace chert.
1790-1800	Sandstone, red, some white, fine-grained, shaly, some fairly hard, slightly calcareous; shale, red, soft, grading to sandy with fine sand grains; limestone, gray to pinkish, sandy to sub-crystalline. All interbedded. Trace gypsum with included sand grains.
1800-10	Sandstone, red, some white, fine-grained, slightly calcareous; some shale, red, sandy, some soft; and limestone, gray and pink, sandy and sub-crystalline. All interbedded. Trace of gypsum with included sand grains.

1810-20	Sandstone, red, fine-grained, slightly calcareous, with small amount mica coming in at 1814 feet. Small amount limestone, gray and pink, sandy. Trace gypsum with included sand grains.
1820-30	Sandstone, red, some light red, fine-grained, calcareous; some limestone, gray, sandy. 1828-30 is shale, red, sandy. Trace gypsum.
1830-40	Alternating beds of sandstone, red, fine-grained, calcareous; shale, red, sandy, with fine sand grains, small amount mica; and limestone, gray to pink, sandy. Trace gypsum.
* 1840-50	Sandstone, light red-brown to red-brown, fine-grained, some shaly, calcareous, hard, good cement, some shale, red-brown, sandy. Streak of limestone, tan, gray to pink, sub-crystalline. Trace gypsum with included sand grains. Bulk sample gives slight yellow fluorescence in carbon tetrachloride, which may be due to rig grease.
1850-60	Sandstone, light red-brown and red-brown, fine-grained, hard, sucrosic in beginning of the interval. Some shale, red, sandy. 1858-60 is limestone, gray to pink, sandy to sub-crystalline.
* 1860-70	Limestone, light gray to pink, sandy to 1864 feet. 1864-70 feet is sandstone, buff to light red-brown, fine-grained, calcareous, loosely cemented. Dry sample gives slight yellowish-green fluorescence, is probably due to rig grease. No cut is noted in carbon tetrachloride for bulk sample.
1870-80	Same as lower interval above. No fluorescence. Lost circulation 1879 feet.
1880-90	Sandstone, buff, tan, fine-grained, calcareous cement. Trace limestone, light gray, dense to sandy.
1890-1900	Sandstone, light-buff, tan, grading downward to red-brown, fine-grained, calcareous cement, becoming less calcareous downward. Trace gray dolomite 1894-1896.
1900-10	Same as above becoming darker red-brown with purplish calcareous sandstone.
* 1910-20	Sandstone, white, very fine-grained, hard, calcareous cement. 1910-12. Bulk sample gives yellow-green fluorescence in carbon tetrachloride. 1912-14. Same. 1916-18. Same.
* 1920-28	Sandstone, white, grading downward to pink to pale maroon, fine-grained, calcareous. 1920-25 bulk sample gives slight yellow-green fluorescence in carbon tetrachloride.

1928-44	Sandstone, pale maroon, fine-grained, angular quartz grains, calcareous, with gray-green, fine-grained sandstone interval 1934-40.
1944-58	Sandstone, white, fine-grained, slightly calcareous. Trace chert.
1958-68	Sandstone, red-brown, fine-grained, shaly. Trace red and gray limestone.
1968-72	Sandstone, light red-brown to pale maroon, fine-grained, slightly calcareous. Trace of gray limestone.
1972-76	No samples due to lost circulation. (Samples 1975-77 obtained while reaming consist of sandstone, white, pink, buff, to red, very fine-grained, almost silty, calcareous, slightly porous with a trace of red sandy shale.)
1976-86	Sandstone, white, fine-grained, very friable. Lost circulation 1977 feet.
1986-2008	Sandstone, white, fine-grained, very friable, slightly calcareous. Trace limestone 1992-1994.
2008-16	Limestone, light-gray to buff, finely crystalline, sandy, hard. Trace brown vugular limestone 2010-2012.
2016-26	Sandstone, light pink and white mottled, fine-grained, calcareous, hard. Trace of brown vugular limestone 2024-2026.
2026-30	Sandstone, red-brown, fine-grained, shaly, calcareous grading downward to limestone, red-brown to maroon, shaly.
2030-42	Limestone, light to dark gray, sub-crystalline, with orange to buff chert.
2042-60	Sandstone, pink, very fine-grained, calcareous, with chert.
2060-70	Sandstone, white spotted with pink to maroon, fine-grained, calcareous.
2070-80	Sandstone, maroon and white spotted, fine-grained, calcareous.
2080-84	Limestone, gray-brown, sub-crystalline.
2084-88	Sandstone, light red-brown, fine-grained, slightly calcareous.
* 2094-2116	Sandstone, light red-brown, fine-grained, calcareous; black accessory mineral (Mn ?) 2088-2090; gray, sub-crystalline limestone streaks 2090-2102; trace of chert 2102-2104 and 2108-2110; red shale streaks 2110-2116. Bulk sample gives yellow fluorescence in carbon tetrachloride 2094-96.

2116-22	Shale, red-brown, sandy.
2122-28	Limestone, gray-brown, sub-crystalline, with secondary veining (fracture?).
2128-30	Sandstone, tan, pink, cream, fine to coarse-grained, friable.
2130-50	No returns due to lost circulation. (Samples 2130-50 obtained while reaming consist of sandstone, lavender, very fine-grained, very calcareous with buff to red-brown cherty limestone stringers. Limestone increases at 2134, and decreases in amount at 2142.) Lost circulation 2131 feet. (Interval 2131-53 dry-drilled.)
2150-53	No returns due to lost circulation. (Samples 2150-53 obtained while reaming consist of sandstone, lavender to red, calcareous, very fine-grained to shaly.)
2153-56	Shale, red-brown, slightly sandy, with anhydrite.
2156-64	Sandstone, buff to red-brown, fine-grained, calcareous; trace of chert.
2164-76	Sandstone, white to light buff, with red staining, fine-grained, very calcareous; trace chert and limestone.
2176-80	No returns, due to lost circulation. Lost circulation 2180 feet. (Interval 2180-2206 dry-drilled.)
2180-99	No returns. Sample taken from bit : light gray to gray-brown, sub-crystalline limestone 2195-99.
2199-2206	No returns. Interval was dry-drilled; nothing adhered to the bit.
2206-20	Sandstone, red and red-white mottled, calcareous, very fine-grained to shaly. Some pebble conglomerate of yellow jasper and very fine-grained grains in a slightly calcareous matrix 2208-2210. Trace of red and red and white to gray, very sandy limestone 2210-2218.
* 2220-26	Limestone, pink, crystalline, sandy. Trace typsum and chert, some clear quartz and some red-brown sandy shale in lower 2 feet. Fluorescence in carbon tetrachloride 2222-2226. Hole took some mud 2222 feet; corrected with lost circulation material.
2226-30	Sandstone, lavender, red and white grading downward to red predominating, very fine-grained, very calcareous.
2230-40	Sandstone, red and lavender, calcareous, very fine-grained, shaly with gray-buff to brown, sub-crystalline to finely-crystalline limestone coming in at 2234 and increasing downward.

2240-46	Sandstone, maroon-red, calcareous, very fine-grained to shaly, with some gray-buff to brown sub-crystalline limestone. A few very narrow silica stringers through sandstone 2242-44. Milky to gray chert coming in 2244-46.
2246-52	Chert, milky to pink, and limestone, dark gray-brown, sub-crystalline, with some sandstone, maroon-red, very fine-grained, shaly. Sandstone increases downward.
2252-62	Sandstone, red, some white, very calcareous, very fine-grained to shaly. Trace of gray to brown sub-crystalline cherty limestone coming in at 2254 and increasing downward.
2262-68	Limestone, gray-brown to pink, sub-crystalline, very cherty, becoming more red and sandy at bottom.
2268-70	Sandstone, red, very calcareous, very fine-grained to shaly, with some gray to brown, sub-crystalline cherty limestone.
2270-74	Limestone, pink and gray, sub-crystalline, cherty with red, calcareous sandy shale in lower portion.
2274-80	Limestone, gray to brown, sub-crystalline, cherty with red, calcareous, very fine-grained sandstone and gray and pink, sub-crystalline cherty limestone interbedded in lower four feet.
2280-96	Limestone, gray to pink, sub-crystalline, alternating with sandstone, very fine-grained to shaly, slightly calcareous, slightly glauconitic 2282-84, with orange translucent chert 2280-82.
2296-2308	Sandstone, red, very calcareous, very fine-grained to shaly, with streak of cherty limestone, white, sub-crystalline to sucrosic, with a few calcite crystals 2304-06.
2308-20	Shale, red, gummy with stringers of limestone, gray to white, sucrosic to sub-crystalline.
2320-30	Shale, red, gummy.
2330-50	Chert, white to gray, slightly calcareous, with some shale, red, and sandstone, red, very fine-grained, calcareous. Trace limestone, gray, buff, sub-crystalline at 2342-50; few free calcite crystals.
2350-58	Limestone, white to gray-buff, sub-crystalline to medium-crystalline, somewhat siliceous. From 2354-58 a few clear medium quartz crystals.

* 2358-74	Limestone, white to gray, chalky and soft to coarsely-crystalline, with a few clear quartz crystals 2360-62. Trace sandstone, white, very fine-grained, calcareous 2362-74. Bulk sample gives fluorescence in carbon tetrachloride 2370-74.
2374-90	Limestone, white, soft and chalky to medium-crystalline, with occasional very thin red shale partings. A few quartz crystals in clusters 2376-78. Possible fossil (coral) 2378-84. Some vugular porosity 2380-84.
2390-94	Limestone, rose to white, coarsely-crystalline to sub-crystalline, with yellow sandy shale and a few quartz crystals.
* 2394-2434	Limestone, white, buff and pearl gray, sub-crystalline to coarsely-crystalline, with red shale partings and traces of yellow sandy shale. Trace of chert 2412-16 and 2426-30. Bulk sample gives yellow fluorescence in carbon tetrachloride 2416-18.
2434-44	Limestone, white, buff, and pearl gray, sub-crystalline to coarsely crystalline, with trace of chert 2440-44.
2444-50	Limestone, white to light gray-buff, sub-crystalline to medium-crystalline with a few shale stringers.
2450-58	Limestone, white to light gray and rose, very pure, finely crystalline to coarsely crystalline. Some limestone oolitic.
2458-64	Limestone, white to light-gray and rose, very pure, finely crystalline to coarsely crystalline, with some yellow shale and yellow shaly sandstone. Limestone is largely oolitic.
2464-70	Limestone, white to light gray and buff, oolitic, with some yellow and red shale.
2470-92	Limestone, gray to white, oolitic, with trace of sandstone, red and white, very fine-grained, shaly 2486-88 and 2490-92. Trace chert 2488-90.
2492-96	Limestone, white, oolitic.
2496-2504	Limestone, white, oolitic, with limestone, light gray, medium-crystalline to sub-crystalline. Trace red sandy shale.
2504-18	Limestone, white to light gray, sub-crystalline to coarsely-crystalline. Some oolitic, and some red shale. Trace white, very fine-grained sandstone 2506-10.
2518-26	Limestone, white to light gray, some rose, sub-crystalline to medium-crystalline, with stringers of red and green mottled shale, and trace of chert.

2526-44	Limestone, white to light gray, some rose, sub-crystalline to medium-crystalline, some oolitic. No rose-colored limestone below 2532.
2544-52	Limestone, white to light gray, sub-crystalline to coarsely crystalline.
2552-78	Limestone, white, sub-crystalline to coarsely-crystalline, pure, with some gray limestone 2568-78. Fossil fragment 2568-70.
2578-84	Limestone, white, medium-crystalline to coarsely-crystalline, few oolites 2578-2580. Trace light pink, sub-crystalline dolomite 2582-84.
2584-2602	Limestone, white, medium-crystalline to coarsely-crystalline, with some red shale, with traces of white chert 2588-90 and 2592-98.
2602-36	Dolomitic limestone, pink, sub-crystalline to coarsely-crystalline, slightly vugular to vugular; traces of white limestone as above from 2602-10. Also traces of pink sandstone and red shale 2604-12. Trace chert 2610-12. Few crinoid stem prints 2634-36.
2636-48	Dolomitic limestone, pink to rose, sub-crystalline to coarsely-crystalline, vugular, with white chert and trace of white limestone; trace of red shale 2638-42.
2648-51	No returns. Lost circulation 2651 feet.
2651-62	Dolomitic limestone, rose to white, finely-crystalline to medium-crystalline, with white to gray chert. Samples very poor due to lost circulation difficulties. Lost all mud while drilling this interval.
2662-65	Core #1, recovery 18 inches, conventional core bit. 1 inch of dolomite, pink, vugular, finely-crystalline. 17 inches of dolomite, rose, slightly vugular, very finely-crystalline. Pink and white chert inclusions. Vugs lined with dolomite crystals.
2665-68	Core #2, recovery 10 inches, conventional core bit. 3 inches of dolomite, gray-pink, finely-crystalline, slightly vugular, with white chert nodules. 7 inches of dolomite, gray-pink, finely-crystalline, vugular.
2668-80	Dolomite, pink to white, finely-crystalline to medium-crystalline, vugular, with white to pink chert. Hole took some mud 2668-2711.

2680-2710 Dolomitic limestone, pink to buff, medium-crystalline to finely-crystalline, vugular, with traces of red-brown and gray banded chert 2682-84. Traces white chert 2688-90, and brown chert 2692-2702. Traces of gray, sub-crystalline limestone.

2710-50 Limestone, pink, very vugular, questionably dolomitic, medium-crystalline, few colorless dolomite crystals 2712-14. Few calcite stringers and some white chert 2714-16. Specks of solidified asphalt appearing material in pores, no cut, 2718-20. Crinoid stem 2744-46. Bryozoan or coral 2746-48.

2750-94 Limestone, pink to gray and white, very vugular, questionably dolomitic, crinoid imprints 2754-58. Few calcite crystals and quartz (?) crystals 2782-86.

2794-2806 Dolomite, pink to buff and gray-brown, medium-crystalline, grading downward to finely-crystalline, a few stringers of calcite 2802-04. Trace of red shale and white, soft, chalky limestone 2804-06.

2806-20 Dolomitic limestone, dark gray to buff, some brown, finely-crystalline to medium-crystalline, with traces of red shale, and with stringers of green waxy calcareous shale with few rounded frosted quartz grains included. Some sandstone, very fine-grained, calcarecus 2808-10 and 2814-16. Stringers of pale green dolomite 2810-12. Trace of white to buff chert 2812-14. Trace purple-brown micaceous shale with dark-brown inclusions 2816-20. Granular clusters of calcite crystals 2818-20. 2810-20 becomes sandier toward base.

2820-50 Core #3. 3 1/2 inch Christensen diamond core head. 100% recovery. Bedding planes are horizontal in core.

2820-21 Dolomite, dark to light gray, massive, finely-crystalline, with stringers of red sandy shale (with quartz particles). Vertical fractures filled with red shale.

2821-22 Dolomite, light to dark gray to maroon, massive, finely-crystalline, with stringers of red sandy shale and some green shale.

2822-23 Shale, red, waxy, with inclusions of rounded frosted quartz grains.

2823-24 Dolomite, gray, dense, finely-crystalline, with a few red waxy shale stringers. Shale has included quartz grains.

2824-25 Dolomite, gray, sub-lithographic, very dense.

2825-26	Dolomite, gray, sub-lithographic, very dense, with a few inclusions of red waxy and green waxy shale.
2826-27	Dolomite, grey, sub-lithographic, very dense, with a few inclusions of red waxy and green waxy shale. Some vertical fractures.
2827-28	Upper 7/10 of this interval is the same as 2826-27. Lower 3/10 of this interval is red waxy shale.
2828-29	Dolomite, dark gray, sub-crystalline, very dense, with a few red shale streaks. Some calcite veining.
2829-30	Dolomite, gray, sub-crystalline, dense, with red and some green shale streaks.
* 2830-31	Dolomite, gray, sub-crystalline, dense, with red shale streaks. Speckled natural fluorescence.
2831-32	Upper 1/2 is dolomite, gray sub-crystalline, dense, with fractures filled with red waxy shale. Lower 1/2 is limestone, light to dark gray to purple, brecciated, highly fractured, with red waxy shale filling the fractures.
2832-33	Dolomite, light gray and buff, sub-crystalline and sub-lithographic, with red shale stringers.
2833-34	Dolomite, grayish-purple, sub-crystalline, dense, with red shale stringers.
2834-35	Dolomite, grayish-purple, sub-crystalline, dense.
2835-36	Dolomite, grayish-purple, sub-crystalline, dense, with red shale stringers and green shale inclusions.
2836-37	Dolomite, light gray to light purplish-gray, sub-lithographic, dense, with a few red shale stringers.
2837-38	Dolomite, gray, dense, with fine to coarse-grained, rounded quartz sand streaks.
2838-39	Two inches of green shale at top. Dolomitic limestone, dark gray, dense, with horizontal and vertical fractures filled with pink calcite.
2839-41	Dolomitic limestone, pinkish and mottled gray, sub-crystalline, highly fractured.
2841-42	Same. Some quartz grains.
2842-43	Dolomite, gray, dense, with vertical fractures filled with red sand.

2843-44 Dolomite, light to dark gray, sub-crystalline, dense, vugular, with vertical and diagonal fractures filled with red shale. Vugs are up to 1 inch long.

2844-47 Same. Some vugs are lined to entirely filled with calcite.

* 2847-48 Dolomite, gray, sandy, sub-crystalline, dense, with vertical and diagonal fractures filled with red shale. Sand grains are rounded, frosted. One fragmentary fossil found in this interval. Canary fluorescence in carbon tetrachloride; natural canary fluorescence.

2848-49 Dolomitic limestone, brownish-gray, sandy, has speckled appearance.

2849-50 Shale, green, waxy.

2850-81 Core #4. 3 1/2 inch Christensen diamond core head. 100% recovery. Bedding planes are horizontal in core.

2850-51 Dolomitic limestone, purplish-gray, sub-lithographic, dense, with sand streaks (sand grains are medium to fine-grained, rounded and frosted), and red and green shale streaks. Red shale fills vertical fractures. Very small amount of pyrite in limestone.

2851-52 Dolomite, gray, sub-lithographic, dense, with red and green shale streaks, and with rounded, frosted, medium to fine-grained quartz grains in streaks.

2852-53 Dolomitic limestone, purplish-gray, sub-crystalline, dense, very vugular. Black specks of hematite. Frosted sand grains in streaks. One 1 inch streak of red and green shale. Vugs appear to be filled with water. Vertical fractures.

2853-54 Dolomite, gray, sub-crystalline, dense.

2854-55 Dolomite, gray, sub-crystalline, dense, very vugular, with green shale inclusions. Vugs are lined with calcite crystals, and appear to be filled with water.

2855-56 Dolomite, purplish-gray, sub-crystalline, dense, very vugular. Vugs appear to be filled with water.

2856-57 Same.

2857-58 Dolomite, dark gray, sub-crystalline, dense, very vugular. Black specks of hematite. Vugs contain brackish water. Vertical and diagonal fractures.

2858-62 Dolomite, dark gray, sub-crystalline, dense, very vugular. Black specks of hematite. Vugs contain brackish water.

2862-64 Dolomite, dark gray, sub-crystalline, dense, slightly vugular, with diagonal fractures.

2864-65 Dolomite, dark gray, sub-crystalline, dense, slightly vugular.

2865-66 Dolomite, medium gray, sub-crystalline, to sub-lithographic, dense, with vertical and diagonal fractures.

2866-67 Dolomite, fray, sub-crystalline, dense, with vertical and diagonal fractures.

* 2867-69 Dolomite, dark gray, sub-crystalline, dense, vugular, with vertical and diagonal fractures. Fluorescence 2867-68.

2869-70 Dolomite, dark gray, sub-crystalline, dense, extremely vugular, with streaks of red and green shale.

2870-72 Dolomite, light gray, sub-lithographic, dense, with diagonal fractures filled with red shale.

2872-73 Dolomite, light gray, sub-lithographic, dense, with diagonal fractures.

2873-74 Dolomite, light gray, sub-lithographic, dense, with some green included shale, diagonal fractures.

2874-77 Dolomite, medium gray, sub-crystalline, dense, somewhat vugular, very highly fractured, with calcite filling the fractures.

2877-78 Same. Very vugular, highly fractured, with calcite veining.

2878-80 Dolomite, medium gray, sub-crystalline, dense, extremely vugular, grading downward to vugular. Lower 1 ft. is highly fractured.

2880-81 Dolomite, medium gray, sub-crystalline, dense, vugular, highly fractured, with black specks which may be asphaltic residue.

2881-91 Core #5. 3 1/2 inch Christensen diamond core head. 100% recovery. Bedding planes are horizontal in core.

2881-82 Dolomite, dark purplish-gray, sub-crystalline, dense, somewhat vugular with crystals of calcite in the vugs, and with red and green shale streaks. Shatters irregularly.

6

2882-83 Dolomite, purplish-gray, sub-crystalline grading downward into sub-lithographic, dense, very slightly vugular, with red and green waxy shale stringers toward the base, diagonal fractures.

2883-84 Dolomite, gray, sub-lithographic, dense, with green shale inclusions, diagonal fractures.

2884-85 Dolomite, gray, sub-crystalline, dense, slightly vugular, calcite veining, a few scattered clear quartz grains, green shale inclusions, diagonal fractures.

2885-86 Dolomite, gray and pinkish, finely-crystalline to sub-crystalline, dense, vugular, with green shale streaks and inclusions, diagonal fractures.

2886-87 Dolomite, greenish-gray, finely-crystalline, dense, vugular (up to 1 inch) with calcite crystals in vugs and pink calcite veining.

2887-88 Dolomite, gray, finely-crystalline, dense, vugular, some calcite in vugs, diagonal fractures.

2888-89 Dolomite, gray, finely-crystalline, dense, slightly vugular, pink calcite in veins and vugs, diagonal and vertical fractures.

2889-90 Dolomite, gray, finely crystalline to sub-crystalline, dense, slightly vugular, some pink calcite veining, diagonal and vertical fractures.

2890-91 Dolomite, gray, finely-crystalline to sub-crystalline, dense, slightly vugular, some pink calcite in veins and vugs, diagonal and vertical fractures.

2891-2911 Core #6. 3 1/2 inch Christensen diamond core head. 100% recovery.

* 2891 Dolomite, gray, very slightly sandy, dense, vugular, large vugs (1 in.) filled with red shale inclusions, vertical fractures, massive. Blotchy fluorescence under light; fluorescent cut in carbon tetrachloride.

2892 Dolomite, gray, dense, vertical fractures filled with red calcite.

2893 Dolomite, gray, dense, slightly vugular, slightly sandy in streaks, with some included red shale.

2895	Dolomite, gray, dense, very slightly sandy, with pink calcite veining.
* 2897	Dolomite, gray, dense, vugular, fluorescence under light. Rotary Engineering gives zero porosity by analysis.
* 2898	Dolomite, gray, slightly sandy, pink calcite veining, very tight, very strong fluorescence (light canary). Slight fluorescence with carbon tetrachloride.
* 2901½	Dolomite, gray, dense, with maroon and green waxy shale, pink calcite veining, strong natural fluorescence.
2904 (top)	Dolomite, gray, very slightly sandy, very tight, with aragonite veining.
2904 (bottom)	Dolomite, gray, slightly sandy, dense, vertical fractures.
2905	Dolomite, gray, dense, pink calcite and limonite veining along fractures.
2906	Dolomite, gray, sandy, dense, massive, tight.
2908	Dolomite, gray, very dense, tight.
2910	Dolomite, gray, very dense, tight.
2910.6	Sandstone, gray, hard, mineral fluorescence.
2911	Sandstone, gray, quartzitic, fine-grained, hard, silica cement, compact.
2911-2932	Core #7. 3 1/2 inch Christensen diamond core head. 100% recovery.
2911-13	Sandstone, dark gray, fine-grained, dense, quartzitic, with vertical fractures, bedding planes horizontal.
2913-30	Sandstone, purplish-gray and maroon, some pale green, highly cross-bedded, fine-grained, friable, sucrosic. Sandstone grains are rounded to sub-angular, clear quartz. Becomes slightly glauconitic at 2914 and increases downward.
2930-32	Shaly sandstone or sandy shale, maroon, highly micaceous; sand grains are very fine-grained.

2932-34 Drilled. Very poor sample due to reeming out hole before drilling this interval. Samples indicate sandstone, red-brown to green, shaly, fine-grained, clear, rounded to sub-angular grains, micaceous, very glauconitic, and some brick-red, sandy, slightly micaceous shale. The green sandstone appears speckled.

2934-2956 Core #8. 3 1/2 inch Christensen diamond core head. 100% recovery.

2934-56 Shale, maroon, sandy with very fine sand grains, micaceous, glauconitic, and streaks of maroon to pale green, glauconitic, very fine-grained clear quartz sandstone. The sandstone and shale are interbedded, and each varies in thickness from 1/4 inch to 2 inches. The whole core is very dense, hard, and tight, but breaks readily horizontally, probably due to the presence of mica.

2956-64 Shale, red-brown to maroon to greenish-gray, micaceous, glauconitic, sandy with very fine, clear, sub-angular to sub-rounded grains, and sandstone, fine-grained, shaly interbedded. Stringer of light-gray, slightly sandy, finely-crystalline, dolomitic limestone in lower 2 feet.

2964-3010 Shale, maroon to greenish-gray, glauconitic, micaceous, sandy, and sandstone, shaly, fine-grained, sub-angular grains interbedded. Stringers of green, slightly sandy shale 2984-88. Traces of chert were noted 2964-66 and 2992-98. Maroon sandstone and shale decrease in lower 6 feet.

3010-60 Dolomitic limestone, gray, finely-crystalline, slightly sandy, with included grains of glauconite. The limestone is dense to finely-crystalline 3046-48. Limestone becomes more sandy beginning at 3054.

3060-82 Sandstone, greenish-gray, slightly calcareous, glauconitic, and sandstone, buff to pink, slightly calcareous, micaceous, glauconitic, interbedded, with stringers of greenish and red micaceous shale. Sand grains in sandstones are medium to fine-grained. Trace pyrite 3068-70; trace gray dolomite 3070-72.

3082-96 Dolomitic limestone, light to dark gray to white, dense, finely-crystalline. Some white to light yellow chert; abundant chert 3094-96.

3096-3112 Sandstone, greenish-gray, slightly calcareous, medium to fine-grained, glauconitic, interbedded with sandstone, buff to pink, slightly calcareous, medium to fine-grained micaceous, glauconitic. Stringers of red and green micaceous shale. Trace gray, dense, sub-crystalline limestone 3108-10. Trace chert.

3112-14 Sandstone, greenish-gray, glauconitic, micaceous, fine to medium-grained, slightly calcareous, with stringers of red, very slightly micaceous shale.

6

3114-18	Sandstone, greenish-gray, slightly calcareous, medium to fine-grained, glauconitic, interbedded with sandstone, buff to pink slightly calcareous, medium to fine-grained, micaceous, glauconitic, stringers of red and green micaceous shale.
3118-60	Sandstone, greenish-gray, some red, micaceous, glauconitic, slightly calcareous, medium to fine-grained. Some green, micaceous sandy shale. Stringers of red micaceous shale 3130-38. Shale increases slightly 3140-42, some shale has included glauconite. Reddish sandstone decreases downward from about 3144.
3160-72	Limestone, gray, dense, finely-crystalline to sub-crystalline, much chert.
3172-86	Sandstone, gray-green, some maroon, glauconitic, micaceous, fine to medium-grained, with some reddish, and green, micaceous shale. Stringers of gray, sub-crystalline limestone 3172-80. Small amount mottled white to maroon, medium to fine-grained, highly glauconitic, micaceous, angular to sub-rounded, slightly calcareous, sandstone 3180-82. Trace gypsum 3180-82. Some large calcite crystals 3182-86. Some limestone has included glauconite 3184-86. Some light gray limestone, some buff sandstone 3182-84.
3186-94	Sandstone, greenish-gray and maroon, glauconitic, micaceous, slightly calcareous, fine to medium-grained; shale, green, micaceous, glauconitic; some limestone, gray, slightly sandy; trace chert. A few calcite crystals 3188-90. Trace gypsum, some buff sandstone, trace red shale, trace gray, dense, sub-crystalline limestone 3190-92. Some buff sandstone, and gray to pink, massive dolomitic limestone 3192-94.
3194-3228	Sandstone, green, gray, buff, maroon, micaceous, glauconitic, slightly calcareous; red and green slightly sandy shale; green, micaceous, glauconitic shale; cherty; some limestone and dolomitic limestone, gray to pink, massive. Some gray, dense, finely-crystalline to sub-crystalline limestone with some included glauconite; trace of chert; some grains of sands cemented with calcite 3196-98. Increase of red sandy shale; some light gray, dense limestone with included glauconite 3198-3200. Some clear, medium-grained, angular to sub-rounded quartz cemented with calcite; increase of red sandy shale; light gray to gray, dense, finely-crystalline to sub-crystalline limestone; green shale with included sand grains 3200-02. Some light gray to buff, fine to coarse-grained, clear-grained, sub-angular, glauconitic, slightly calcareous sandstone 3202-04. Traces of gypsum and magnetite; some chert exhibits vugs lined with quartz crystals; small amount medium to coarse-grained, with clear quartz, glauconitic, rounded to sub-angular sandstone 3206-08. Trace of gypsum and magnetite 3208-10. Trace gypsum

3194-3228 (Continued)	and calcite crystals 3210-12. Trace magnetite and calcite crystals 3212-14. Trace calcite crystals 3214-16, 3218-20, 3222-24. Trace gypsum with included sand grains 3224-26. Red shale increases, and some maroon shale 3226-28.
3228-66	Sandstone, buff to gray to green to maroon, micaceous, glauconitic, slightly calcareous, medium to fine-grained, sub-angular to sub-rounded, some quartz grains well cemented with calcite; shale, red mottled with white, and red and green, micaceous to slightly micaceous, few included rounded sand grains; some maroon sandy shale; some dolomite, gray to pink, dense to sub-crystalline; some chert; some large calcite crystals; trace of pyrite in sandstone (3228-30). Some light gray, sub-crystalline, dolomitic limestone 3230-32. Trace limonite 3232-34. Trace pale green dolomitic limestone 3234-36. Very little red shale, trace chert 3240-42. With brown, fine to medium-grained, clear quartz grains, conglomeratic sandstone with shale matrix 3242-44. Very little dolomite 3244-46. Increase of red shale; some light gray to pink, vugular (tiny vugs) sub-crystalline limestone 3250-52. Trace of gypsum with included sand grains, black speck of limonite, some limonite specks on light gray, pure limestone 3250-52. Much red shale 3252-62. Traces of gypsum with included sand grains 3254-56, 3258-60. Limonite specks on sandstone 3260-62. Red shale makes up total interval 3362-64. Trace of chert 3264-66.
3266-94	Sandstone, gray to green, some buff to maroon, micaceous, glauconitic, medium to fine-grained, very slightly to slightly calcareous, trace of pyrite in buff sandstone; dolomite, gray to pink, dense, sub-crystalline; trace of gypsum; some shale, green, micaceous, glauconitic, sandy; some red sandy, shale occasionally mottled with white. Some light gray to white, dense, sub-crystalline limestone 3268-72. Sandstone becomes friable and continues downward at 3272. Some brown, sub-crystalline dolomite and increase of red, sandy shale 3272-74. Trace of chert 3274-76. Some large calcite crystals 3276-78. Increase of green sandy shale 3278-80. Some pink sub-crystalline limestone with tiny vugs 3280-82. Increase of red shale, trace of chert, large calcite crystals 3284-86. Increase of dolomite and red shale 3286-88. Some chert, large calcite crystals 3288-90. Much red sandy shale 3290-92. Some large crystals of calcite, sample red sandy shale 3292-94.
3294-98	No returns due to lost circulation. Lost circulation at 3298 feet. Some mud lost 3234-98 feet.
3298-3302	Sandstone, gray to green, some buff to maroon, fine to medium-grained, sub-angular to sub-rounded, glauconitic, micaceous, slightly calcareous; dolomite, dolomitic limestone, light gray to gray to pink to white, dense, finely-crystalline to sub-

3298-3302 (Continued)	crystalline; trace red to maroon, some mottled white, sandy shale; some dolomite, slightly vugular. Some limonite specks on sandstone; trace calcite crystals. Very little shale 3300-02.
3302-16	Sandstone, greenish-gray to greenish-buff to gray, glauconitic, micaceous, medium to fine-grained, slightly calcareous, sub-angular to sub-rounded. Some green micaceous shale interbedded 3304-06. Few large flakes of mica in sandstone 3306-08. Some green micaceous shale 3308-10. Small amount green micaceous, sandy shale 3312-14.
3316-24	Sandstone, greenish-gray and gray, glauconitic, calcareous, clear quartz grains, medium to fine-grained, sub-angular to sub-rounded; green, micaceous shale and sandy shale.
3324-30	Sandstone, gray to buff, medium-grained, speckled with glauconite, sub-angular to sub-rounded, clear quartz grains, mostly sub-angular, slightly calcareous; with some coarse-grained sandstone, and green, micaceous, sandy shale and shale stringers 3328-30.
3330-42	Sandstone, gray to buff, fine to coarse-grained, speckled with glauconite to glauconitic, sub-angular to sub-rounded, with clear grains of quartz; coarse-grained sandstone appears quartzitic; mostly sub-angular, medium to fine-grained sandstone, mostly calcareous, and micaceous, with green, micaceous sandy shale and shale. Fossil fragments in sandstone. Some sandstone highly glauconitic, some green sandy shale has glauconitic sand streaks 3334-36. Some limonite staining on sandstone 3338-40. Trace of pyrite, and some pink, dense, sub-crystalline, slightly vugular dolomite 3340-42.
3342-48	Dolomite, pink, some gray to light gray, slightly vugular, finely-crystalline to sub-crystalline, dense. Trace chert 3346-48.
3348-50	Sandstone, maroon to gray, glauconitic, fine to very coarse clear quartz grains, sub-angular to sub-rounded, with little bells of red shale, slightly calcareous, fossiliferous, quartzose.
3350-60	Dolomite, pink, some gray, finely-crystalline to sub-crystalline, dense, slightly vugular, slightly cherty. Some light gray, dense, limestone 3354-56. Some large calcite crystals 3356-58. Some sandstone as described 3348-50.
3360-3400	Sandstone, buff to greenish, fine to medium-grained, micaceous, glauconitic, quartzose, with gray micaceous sandy shale and shale, and shaly sandstone. Interval 3392-96 is sandstone, purple, glauconitic, micaceous, fine to medium-grained, sub-angular to sub-rounded, with minute remains of fossils.

3400-18	Sandstone, brown, medium to fine-grained, micaceous, sub-angular to sub-rounded, quartz grains, quartzose, glauconitic with green, micaceous shale partings. Grades downward to red to purple, medium-grained, sub-angular to sub-rounded, slightly glauconitic to glauconitic sandstone cemented with hematitic cement beginning at 3406. Some white sandstone which gives blotchy effect with the brown sandstone 3402-04.
3418-24	Sandstone, buff to greenish, fine to medium-grained, micaceous, glauconitic, quartzose; with green, micaceous, sandy shale and shale, and some shaly sandstone. Trace of gypsum and white sandstone 3422-24.
3424-26	Dolomite, gray to pink, slight vugular, sub-crystalline to dense; a few large grains of dolomite; trace of chert.
3426-46	Sandstone, buff to greenish, fine to medium-grained, micaceous and glauconitic, sub-angular to sub-rounded, quartzose; with partings of green micaceous sandy shale, shale, and shaly sandstone. Fossils 3428-30. Stringer of gray to pink, slightly vugular, sub-crystalline, dense dolomite and a trace of chert 3436-38. Sandstone is buff to greenish to reddish 3440-42.
3446-62	Sandstone, buff to light gray, medium-grained, with few scattered coarse grains, sub-angular to sub-rounded, quartzitic, some glauconitic. With some green, micaceous shale partings 3458-60. Sandstone is entirely free of glauconite 3460-62.
3462-80	Sandstone, white, medium to coarse-grained, sub-angular to sub-rounded, clear quartz grains, quartzitic, with some limonite stain. Trace of pyrite. With stringers of green, hard, very thinly laminated shale 3472-76. With stringers of dark purplish-brown, micaceous, glauconitic, fine-grained shaly sandstone with thinly laminated appearance 3476-78.
3480-82	Sandstone, dark reddish-brown to chocolate, fine with some medium to coarse clear quartz grains, hard, glauconitic to non-glauconitic, micaceous to non-micaceous.
3482-86	Sandstone, pinkish-buff to reddish-brown, fine to coarse-grained, angular to sub-rounded, micaceous to non-micaceous, glauconitic to non-glauconitic, conglomeratic, with weathered feldspar crystals.
3486-98	Sandstone, greenish-gray to green, glauconitic, micaceous, fine-grained quartzose to shaly, with green micaceous, thinly laminated shale with some red sandy shale. Stringers of pink, gray, sub-crystalline dolomite and a trace of chert 3490-92. White shale gives mottled appearance with red shale, trace of chert 3496-98.

3498-3504	Sandstone, white to purplish, fine to coarse-grained, sub-angular to sub-rounded, conglomeratic, quartzose, with some specks of limonite staining.
3504-10	Sandstone, reddish-purple, fine-grained, glauconitic, micaceous. With stringer of dark-green to pale green, fine to medium-grained, sub-angular to sub-rounded, glauconitic, with some heavy concentration of malachite, and green micaceous shale and sandy shale.
3510-3520	Sandstone, pale reddish-purple to white, fine to medium-grained, sub-angular to sub-rounded, with a few quartz grains, quartzose. With green, platy, micaceous shale and sandy shale. Sandstone is mostly white 3518-20.
3520-22	Sandstone, lavender to white, fine to coarse-grained, sub-angular to sub-rounded, small stains of limonite, quartzose, and some pale greenish-gray, micaceous, glauconitic, fine-grained, quartzose sandstone.
3522-26	Sandstone, white, medium to coarse-grained, sub-angular to sub-rounded, quartzose, with some pale green fine-grained with some medium-grained, sub-angular to sub-rounded, micaceous, glauconitic sandstone with shale streaks. Some green micaceous sandy shale and shale.
3526-28	Sandstone, pale green, fine-grained, glauconitic, micaceous, quartzose, with thin beds green, micaceous platy shale, and sandy shale.
3528-36	Sandstone, white, some gray to lavender, fine to very coarse-grained, with a few small rounded yellowish pebbles of quartz, quartzitic, sub-angular to sub-rounded, some dark reddish-purple, micaceous, sandy shale in upper two feet. Small amount of mica in lavender sandstone in last two feet.
N.B.	Total depth is 3543 feet; samples in the interval 3536 to 3544 did not return to surface.

Sinclair Oil & Gas Company
#1 Santa Fe-Pacific
SW NE 35-28N-1W
Coconino County, Arizona

Depth	Description
0-200	Gray to buff sandy limestone, considerable chert.
200-240	Buff, fine-greined sandstone, upper half calcareous.
240-260	Gray sandy limestone.
260-300	Buff calcareous sandstone with abundant chert.
300-370	Gray to buff, sub-crystalline to gramular limestone, slightly sandy at base.
370-385	Buff to red, fine-grained sandstone.
385-400	Buff sandy limestone.
400-490	Buff to red fine-grained sandstone, sl. calcareous with some chert.
490-540	Gray to pinkish sub-crystalline limestone with chert, vuggy.
540-585	Dark gray dolomitic limestone, vuggy.
585-608	Gray to pinkish sandy limestone.
608-1040	Red-brown, cream, buff fine-grained sandstone, tr. gypsum in lower portion.
1040-1350	Interbedded lt. brown to chocolate sandstone and chocolate shale, tr. gypsum.
1350-1450	White, tan, red-brown fine-grained sandstone, tr. gypsum.
1450-1500	Reddish-purple fine-grained sandstone, tr. gypsum.
1500-1680	Brown to red-brown find-grained sandstone, with some shale and thin limestone beds.
1680-1864	Red, red-brown, red-purple fine-grained sandstone, with interbedded shale and limestone streaks.
1864-1975	Red-brown, buff, white fine-grained sandstone, calcareous, with interbedded gray to maroon limestone streaks.
1975-2008	White fine-grained sandstone.
2008-2308	White, red, pink fine-grained sandstone, with streaks sub-crystalline limestone.
2308-2330	Red shale with stringers of chert and limestone.

Coo 608

Depth	Description
2330-2350	White chert, tr. red shale and sandstone.
2350-2602	White, buff, gray sub-crystalline to medium crystalline limestone.
2602-2760	Lt. gray and pink dolomite, some chert.
2760-2820	Gray and pink, medium to coarse dolomitic limestone, tr. shale near base.
2820-2910	Gray to purple-gray massive to dense dolomite, some shale streaks.
2910-3010	Purple-gray, maroon, green fine-grained sucrosic sandstone, some shale streaks, glauconite.
3010-3060	Gray, finely-crystalline dolomitic limestone, sandy.
3060-3080	Greenish-gray, sl. calcareous glauconitic sandstone.
3080-3096	Gray dolomitic limestone, some chert.
3096-3160	Greenish-gray sl. calcareous glauconitic sandstone; some shale stringers.
3160-3302	Gray-green glauconitic sandstone, with some red and green shale and thin beds of gray sub-crystalline limestone.
3302-3342	Greenish-gray to buff glauconitic sandstone, sl. calcareous.
3342-3360	Pink, sub-crystalline dolomite, sandy.
3360-3424	Buff to greenish, glauconitic sandstone with green shale.
3424-3432	Gray to pink sub-crystalline to dense dolomite.
3432-3544	White, buff, lavender, brown fine to coarse grained, glauconitic sandstone; some shale and dolomite streaks; some chert.

TD 3544

Sinclair Oil & Gas Company
#1 Santa Fe-Pacific
SWNE 35-28N-1W
Coconino County, Arizona
CAT. #197

Depth	Description
0-200	Gray to buff sandy limestone, considerable chert
200-240	Buff, fine-grained sandstone, upper half calcareous
240-260	Gray sandy limestone
260-300	Buff calcareous sandstone with abundant chert
300-370	Gray to buff, sub-crystalline to granular limestone, slightly sandy at base
370-385	Buff to red, fine grained sandstone
385-400	Buff sandy limestone
400-490	Buff to red fine grained sandstone, sl. calcareous with some chert
490-540	Gray to pinkish sub-crystalline limestone with chert, vuggy
540-585	Dark gray dolomitic limestone, vuggy
585-608	Gray to pinkish sandy limestone
608-1040	Red-brown, cream, buff, fine grained sandstone, tr. gypsum in lower portion
1040-1350	Interbedded lt. brown to chocolate sandstone & chocolate shale, tr. gypsum
1350-1450	White, tan, red-brown fine-grained sandstone, tr. gypsum
1450-1500	Reddish-purple fine grained sandstone, tr. gypsum
1500-1680	Brown to red-brown fine grained sandstone, with some shale & thin limestone beds
1680-1864	Red, red-brown, red-purple fine grained sandstone, with interbedded shale and limestone streaks
1864-1975	Red-brown, buff, white fine grained sandstone, calcareous, with interbedded gray to maroon limestone streaks
1975-2008	White fine grained sandstone
2008-2308	White, red, pink fine grained sandstone, with streaks sub-crystalline limestone
2308-2330	Red shale with stringers of chert and limestone
2330-2350	White chert, tr. red shale and sandstone
2350-2602	White, buff, gray sub-crystalline to medium crystalline limestone
2602-2760	Lt gray and pink dolomite, some chert
2760-2820	Gray and pink, medium to coarse dolomitic limestone tr shale near base
2820-2910	Gray to purple-gray massive to dense dolomite, some shale streaks
2910-3010	Purple-gray, maroon, green fine-grained sucrosic sandstone, some shale streaks, glauconite
3010-3060	Gray, finely crystalline dolomitic limestone, sandy
3060-3080	Greenish-gray, sl. calcareous glauconitic sandstone
3080-3096	Gray dolomitic limestone, some chert

Sinclair Oil & Gas Company
#1 Santa Fe-Pacific
SWNE 35-28N-1W
Coconino County
CAT #197

3096-3160	Greenish-gray sl. calcareous glauconitic sandstone; some shale stringers
3160-3302	Gray-green glauconitic sandstone, with some red and green shale and thin beds of gray sub-crystalline limestone
3302-3342	Greenish-gray to buff glauconitic sandstone, sl. calcareous
3342-3360	Pink, sub-crystalline dolomite, sandy
3360-3424	Buff to greenish, glauconitic sandstone with green shale
3424-3432	Gray to pink sub-crystalline to dense dolomite
3432-3544	White, buff, lavender, brown fine to coarse grained glauconitic sandstone; some shale and dolomite streaks; some chert

TD 3544

STATE LAND DEPARTMENT
STATE OF ARIZONA

Form OG 51

Form Prescribed Under Oil and Gas Conservation Act of 1951

NOTICE OF INTENTION TO DRILL NEW WELL

This notice and surety bond must be filed and permit must be granted before drilling begins

Williams Ariz. Oct. 16 1951

State Land Commissioner

In compliance with Statewide Rule 3, notice is hereby given that it is our intention to commence the work of drilling well No. 1 Sec. 35, T. 28 North, R. 1 West, Gila & Salt River B. & M., Wildcat Field, Coconino County.

Legal description of lease Santa Fe Pacific (See attached plat)
(Attach map or plat to scale)

Location of Well: 660 Feet from South and East lines of the SW NE Section 35
(Give exact footage from section corners or other legal subdivisions or streets)
i.e. 1980' FNL & 1980' FEL

Proposed drilling depth 4500 feet. Acres in drilling unit 40. Has surety bond been filed? Yes. Is location a regular or exception to spacing rule? Regular.

Elevation of ground above sea level 6005.5 feet.

All depth measurements taken from top of Ground (Derrick floor, Rotary Table or Kelly Bushing) which is _____ feet above the ground.

PROPOSED CASING PROGRAM

Size of Casing Inches A.P.I.	Weight	Grade and Type	Top	Bottom	Cementing Depths
13 3/8" OD	54-58	H-40	0	300	300'
7" OD	26	J-55	0	4500	4500'

Intended Zone or Zones of completion:

Name	Perforated Interval
Wildcat well. Will test all formations to Pre-Cambrian.	

AFFIDAVIT:

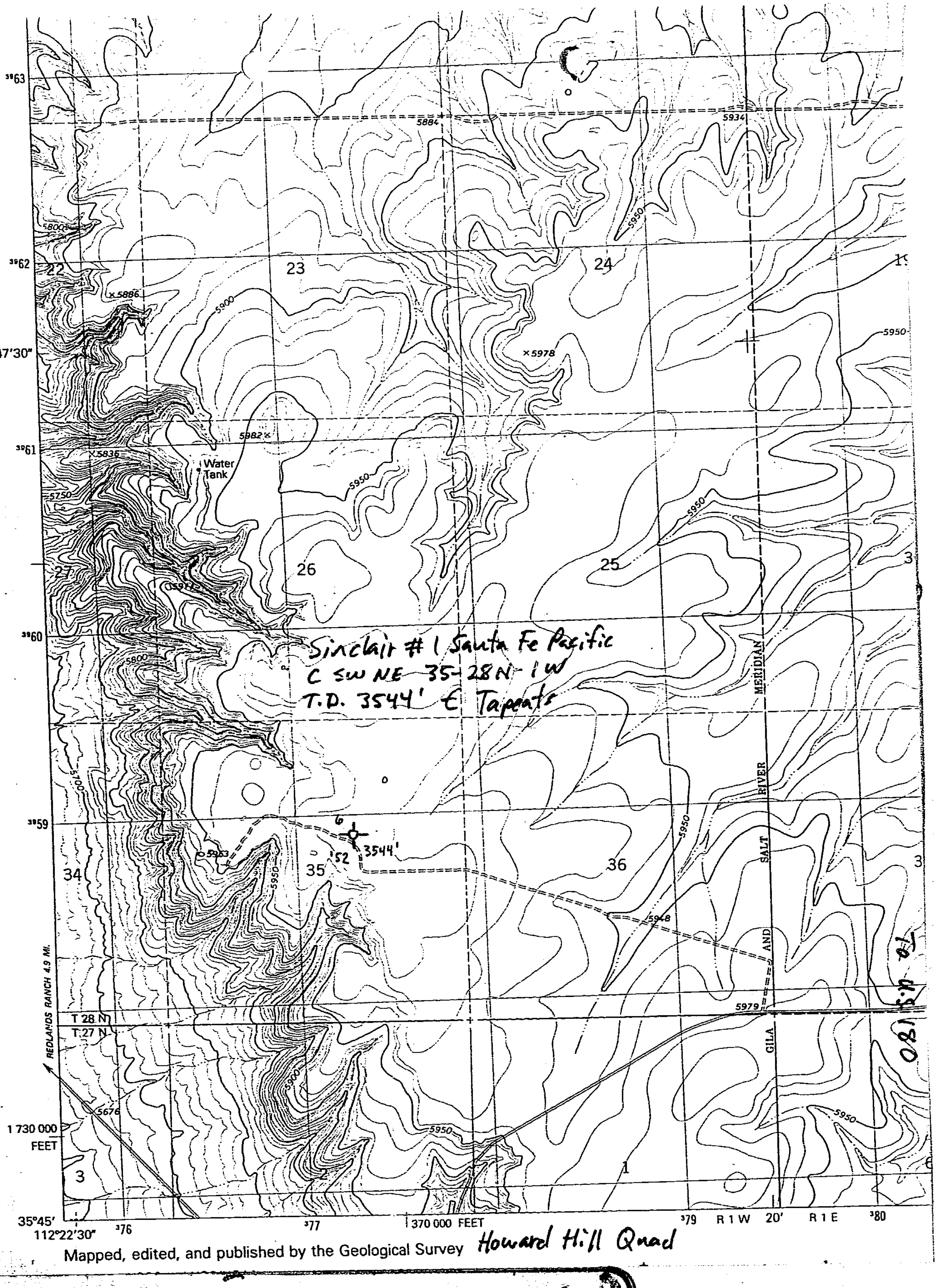
I hereby certify under the penalty of perjury, that the information contained and statements herein made are to the best of my knowledge and belief, true, correct and complete.

Sinclair Oil and Gas Company
(Applicant)
By J. B. McEnerney

Application approved this 26 day of October 1951

Permit NO. 6

James R Burger
Deputy State Land Commissioner



Mapped, edited, and published by the Geological Survey Howard Hill Quad

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Fife Symington
Governor

Larry D. Fellows
Director and State Geologist

December 1, 1995

Ms. Elizabeth Coffman
Dwight's EnergyData, Inc.
4350 Will Rogers Parkway, Suite 101
Oklahoma City, OK 73108

Dear Elizabeth:

The information you requested from our files 9-3, 13-1, 6, 14, 156, 372, 883, and 884 is enclosed. The Ridgeway wells (883 and 884) are still in confidential status. I can say, however, that the 3-1 (884) was drilled about 4 miles south of the Ridgeway/Canstar #1 Plateau Cattle ((880) which was also reported as a CO_2 discovery. Ridgeway has not yet proposed a name for this apparent CO_2 field.

As I have noted before, information in some of the earlier well files is sometimes quite meager.

Let me know if I may be of further assistance.

Sincerely,

Steven L. Rauzi
Oil & Gas Program Administrator

Enclosures

PB

Date: 11/6/95 **RESEARCH REQUEST** ID#: R-991453

TO: Steve Rauzi STATE AZ

FROM: Elizabeth Coffman in Oklahoma City OK
Scout City, State

Please search the wellfile at State Office. USGS/BLM Office (circle one) and send the information checked for the following well.

Operator Sinclair Oil + Gas

Wellname Santa Fe #1

State AZ County Coconino

TWP 28 N RANGE 1 W SECTION 35

→ QTR [illegible]

→ FOOTAGE [illegible]

RESEARCHER'S USE			
STATE OFFICE		USGS/BLM	
Info Attach	Info NA	Info Attach	Info NA

____ See reverse for my request.
____ Drill Stem Tests
____ Log Tops
____ Core Description
____ Geological Report or Well Resume
____ Completion Report
__✓__ Plat
__✓__ Application to Drill
____ Sundries - location change
____ Sundries - Perfs & trtment
____ API # 02-005-05019
____ Permit # [illegible]
____ GR Elevation
____ KB Elevation
____ Entire Wellfile
____ Other ~~to~~ who was
____ original operator
____

RESEARCHER'S COMMENTS:

Sinclair

GEORGE C. CREAGER

Tel: 405 842 4727

P. O. BOX 20624
OKLAHOMA CITY, OKLAHOMA 73156-0624

April 14, 1992

Arizona State Geological Survey
Oil and Gas Division
ATT: Mr. Steve Raudi
845 N. Park Ave.
Tucson, Az.85711

Dear Steve:

I appreciated talking with you while in Tucson regarding oil and gas prospects in Arizona. I like your attitude.

I mentioned the area near the Sinclair test in Coconino County.

Enclosed is a small map showing location of the leases acquired by Sinclair before that well was drilled. Sinclair leased thecore of the block.

C. D. Johnson was the Sinclair geologist who worked that test and he was a close friend of Dorsey Hager. As I told you, C. D. told Mr. Hager that he had recommended a second test just south of the first test but Sinclair had an obligation to drill a well in the reservation which was dry . With their merger coming up, as I understand, they decided to pull out of Arizona.

Unfortunately I have never seen the geology for that block but it is my thought that if some one could find Sinclairs geology that the area might again become interesting. One test certainly did not condemn the whole area.

Our little group is quite proud of the fact that the Pinta helium discovery was made on our farmout. Have been told that the helium production is the only royalty ever paid to the state.

Like they say on Candid camera---somewhere, sometime, commercial oil and gas will be found outside the reservations in Arizona.

Best wishes to you.

Sincerely,

George C. Creager

GRAND CANYON NATIONAL PARK

KAIBAB NATIONAL FOREST

COCONINO COUNTY

YAVAPAI COUNTY

COLORADO RIVER

PHANTOM RANCH

GRAND CANYON

COCONINO

TUSAYAN

HOWARD HILL

Sinclair Oil & Gas Co Sante Fe #1

Sinclair J. Osborne 4800 ac

VALLE

CURVERO

HOWARD LAKE

SPRING VALLEY

DAVENPORT LAKE

WILLIAMS

ASHFORK

EL PASO NATURAL GAS CO.

T.31N.
T.30N.
T.29N.
T.28N.
T.27N.
T.26N.
T.25N.
T.24N.
T.23N.
T.22N.
T.21N.
T.20N.
T.19N.

R.5W. R.4W. R.3W. R.2W. R.1W. R.1E. R.2E. R.3E. R.4E.

(1) AREA LEASED - MOST ACREAGE BY SINCLAIR OIL & GAS CO.
(2) LEASED BY:- WALTER S. HOME, P.B. MALLORY & C.M. DONALDSON.
(3) LEASED BY: G.A. DUELL & J.M. SHIELDS.

Information on this Map was compiled from various sources considered reliable but is not guaranteed and is subject to revisions and additions.

NOTE:- LEASE OWNERSHIP MAPS AVAILABLE.

GEO. C. CREAGER
LUHRS BLDG.
PHOENIX, ARIZONA

Amoco Production Company
Security Life Building
Denver, Colorado 80202

September 13, 1972

Mr. E. A. Koester
Oil and Gas Conservation Commission
4515 N. 7th Avenue
Phoenix, Arizona 85013

Dear Ed:

Attached is our scout ticket on the Eisele well. This data was assembled in the "old days" of detailed scout checks so it should be pretty good. As you can see, there is no report of flowing gas and the TD is 4231 by the ticket. However, sample TD is 4260. The Schlumberger log gives a depth of 4190.

Our tops (from various workers):

T/Naco Penn 2285' (E Log)
T/Miss 3400' (E Log & Sample Log)
T/Dev Martin 3730' (E Log)
or
T/Carbonate 3470' (Sample Log)

One of our geologists ran the samples in 1957 and felt Granite Wash was drilled from 3770' to about 4200' and that granite was penetrated to sample TD 4260. Geo Log gives 3730' as top pre-Cambrian granite. I am enclosing an extra Geo Log copy that you can have if you need it.

We believe there is a relatively normal section in the Sinclair Cow Springs well, based on regional correlations. The Collins well does indeed have a very thin Pennsylvanian section (78'?), while wells to the south (Sinclair #1 Santa Fe 28N-1W and Lockhart #1 Babbitt, 27N-9E) appear to be lacking in Penn sediments. This area of thinning extends north into southern Utah. Frankly, Ed, I have not done enough work on a regional scale to say whether this is an isolated uplift as Turner implies or whether it is just a regional thinning out of the Paleozoic geosyncline to the west. This is part of an area I have been trying to get some studies started in, but have not been able to procure the personnel.

Apparently Humble is having velocity problems--witness their #2 well. I was surprised to hear they are moving southeast. Getting into the Sonoran embayment it looks like to me.

Hope the info will be of some help.

Sincerely,

Glenn

H. G. Richards

HGR/cdm

Enclosures: Scout Ticket
Geo Log

October 21, 1971

Atlantic Richfield
501 Lincoln Tower Building
Denver, Colorado 80203

Re: Sinclair Oil Company Santa Fe Pacific #1
SE/SE Sec 35-T28N-R1W
Coconino County
Our File Permit #6

Gentlemen:

It has come to our attention that we do not have a Completion Report on the above referenced well.

If at all possible, we would appreciate your Company supplying us with the above referenced report.

Very truly yours,

W. E. Allen, Director
Enforcement Section

WEA/rlb

Encs.

June 19, 1958

This is to acknowledge receipt, and responsibility for the return of one Schlumberger Electric Log for the Sinclair Oil Company - Pacific Santa Fe #1 Well, Section 35, Township 28 North, Range 1 West, being taken from the office of the State Land Commissioner - Oil and Gas Conservation.

Ron Stulik

Ron Stulik,
U.S.G.S.
Ellis Bldg.,
Phoenix, Arizona

June 20, 1958

Received from Mr. Ron Stulik, U. S. G. S., Ellis Bldg., Phoenix the log for the Sinclair Oil Company, Pacific Santa Fe #1 Well, Section 35, Township 28 North, Range 1 West.

Muriel R. Bates

By: Muriel R. Bates

6

OFFICE OF

State Land Department

STATE OF ARIZONA

Phoenix, Arizona

January 27, 1956

ROGER ERNST
STATE LAND COMMISSIONER

COPY

Mr. Ken Reim
United Geophysical Corporation
Box M.
Pasadena 15, California

Dear Mr. Reim:

I have made negotiations with the Phoenix Blue Print Company to send you a copy of the electrical log of the Sinclair Santa Fe-Pacific well which you requested sometime ago. They will bill you direct which was the way we agreed to handle it. I hope this takes care of your needs.

Very truly yours,

Phillip W. Johnson,
Geologist

PWJ:mlb

6

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : Muriel

~~FROM~~ : Log of Sinclair Well

DATE: 7/25/55

SUBJECT:

I am sending you herewith the original and 4 ~~duplicate~~ copies of the log on the Sinclair - Santa Fe Pacific well also the Schlumberger log. I am also enclosing the correspondence from O'Dougherty which I think you can now answer - Thanks Phil

(over)

P.S. This is all the info we received on this well. That's why I was unhappy with Sinclair. They did better by us on their next test.

P.

September 22, 1953

Federal Insurance Company
90 John Street
New York 38, New York

Attention: Mr. Stephen Plum

Dear Mr. Plum:

Enclosed please find a copy of our letter of August 14th, 1953 to the Valley National Company of Phoenix in which the blanket bond in the amount of $10,000.00 issued to cover the drilling of oil and gas wells in the State of Arizona, has been terminated and that all requirements have been fully complied with.

Very truly yours,

James R. Burger,
Deputy State Land Commissioner,
State Land Department

JRB:mb
Encl.

6

Telephone: WOrth 4-1200

FEDERAL INSURANCE COMPANY
Into Which Has Been Merged (July, 1953)
UNITED STATES GUARANTEE COMPANY

CHUBB & SON, *Managers* 90 John Street, New York 38, N. Y.

September 16, 1953

State of Arizona
State Land Department
Phoenix, Arizona

Gentlemen:

Under date of October 17, 1951 the United States Guarantee Company executed under its No. 7515594, on behalf of the Sinclair Oil & Gas Company, a $10,000.00 Bond for Drilling Oil or Gas Wells, in favor of the State of Arizona.

This Company has now been informed that the drilling operations have been completed and that continuance of the bond is no longer required. Will you kindly therefore authorize termination of bond described in the first paragraph as to future transactions occurring subsequent to such date as you may so specify, preferably a date subsequent to October 17, 1953, the premium anniversary date of bond referred to above.

Yours very truly,

Stephen Plum

Stephen Plum
Assistant Secretary

SP/drl

6
10 Dec 53 X

August 14, 1953

The Valley National Company
Insurance Division
P. O. Box 31
Phoenix, Arizona

Attention: Mr. John G. Howard

Re: Sinclair Oil & Gas Company

Dear Mr. Howard:

The blanket bond in the amount of $10,000.00 was issued on October 17, 1951 to cover the wells for drilling of oil and gas in the State of Arizona by the Sinclair Oil and Gas Company as principal, and the United States Guarantee Company as surety, which bond was conditioned upon the drilling, casing and plugging of all oil and gas wells drilled to prevent the escape of oil or gas from one stratum to another, to prevent intrusion of water into an oil or gas stratum from a separate stratum, to prevent the pollution of fresh water supplies by oil, gas or salt water and to prevent waste.

In addition said bond was conditioned upon the submission of all reports required by the Oil and Gas Conservation Act of 1951 of the State of Arizona, and the Rules and Regulations of the State Land Department, such as logs, drilling records, and other reports as are required by said Rules and Regulations of the Oil and Gas Conservation Law of Arizona.

The records of the Department indicate that with respect to the wells drilled by the Sinclair Oil and Gas Company in Arizona, and from the well, Sinclair Oil-Navajo Tribal #1, located in Section 28, Township 37N., Range 14E., and the well known as Sinclair Oil-Santa Fe Pacific #1, located in Section 35, Township 28N., Range 1W., that all requirements as contained in said Oil and Gas Conservation Law of Arizona and the Rules and Regulations of the State Land Department, have been met and fully complied with by the said Sinclair Oil and Gas Company and therefore, the bond heretofore described may be terminated.

Very truly yours,

James R. Burger,
Deputy State Land Commissioner
State Land Department

JRBmb
cc - Sinclair Oil & Gas Company

6
to permit

STATE OF ARIZONA

STATE LAND DEPARTMENT

BOND FOR DRILLING OIL OR GAS WELL

State of Arizona)
)
County of Maricopa)

KNOW ALL MEN BY THESE PRESENTS:

That we, SINCLAIR OIL & GAS COMPANY, a Maine Corporation,
hereinafter called Principal, and UNITED STATES GUARANTEE COMPANY,
hereinafter called the Surety, are held and firmly bound unto the State of Arizona in the sum of Ten Thousand Dollars ($10,000) for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas the Principal has obtained a permit from the State Land Commissioner to drill a well in search of oil or gas, and whereas said Principal is required by provisions of the Oil and Gas Conservation Act of 1951 to deposit with the said Commissioner a good and sufficient bond:

Now, therefore, the condition of the foregoing obligation is such that if the Principal shall drill, case and plug all wells drilled by said Principal in such manner as to prevent the escape of oil or gas from one stratum to another and to prevent the intrusion of water into an oil or gas stratum from a separate stratum, and to prevent the pollution of fresh water supplies by oil, gas or salt water and in such manner as to prevent waste, and shall make reports to the Commissioner showing the location of all oil and gas wells drilled by said Principal, and shall file all logs and drilling records kept by said Principal within six (6) months from the time of the completion or abandonment of any well drilled for oil or gas and shall plug each dry or abandoned well in the manner provided by the rules and regulations adopted by said Commissioner, then this obligation to be null and void, otherwise to be and remain in full force and effect.

Witness our hands and seals this 17th day of October, 1951.

CANCELLED
DATE ATTEST: 8-4-52 C. Bath
Secretary

SINCLAIR OIL & GAS COMPANY
By J. Hammett
Principal
Vice President

UNITED STATES GUARANTEE COMPANY
By L. M. Kramer
Surety
Attorney-in-Fact

WITNESSES:
G. Domogalla
Tulsa, Oklahoma

Countersigned for the State of Arizona
THE VALLEY NATIONAL COMPANY - INSURANCE
By John A. Hawes
Resident Agent, Phoenix, Arizona.

Approved this 6th day of November, 1951.

H. H. Hughes
State Land Commissioner

CANCELLED
August 14, 1953

DEPUTY

Certified Copy of

POWER OF ATTORNEY

Know All Men by These Presents, that the UNITED STATES GUARANTEE COMPANY of New York, New York, a corporation of the State of New York, has constituted and appointed, and does hereby constitute and appoint

Hunter L. Martin, C. E. McFarland, L. M. Kramp and James P. Hancock

of Tulsa, Oklahoma -

each its true and lawful Attorney-in-Fact to execute - - - - - - - - - - - - - - - - - - - under such designation in its name and to affix its corporate seal to and deliver for and on its behalf as surety thereon or otherwise, bonds of either of the following classes, to-wit:

1. Bonds on behalf of contractors in connection with bids, proposals or contracts to or with the United States of America, any State or political subdivision thereof or any person, firm or corporation;
2. Surety Bonds to the United States of America or any agency thereof, including those required or permitted under the laws or regulations relating to Customs or Internal Revenue; License and Permit bonds or other indemnity bonds under the laws, ordinances or regulations of any State, City, Town, Village, Board or other body or oganization, public or private; bonds to Transportation Companies, Lost Instrument bonds, Lease bonds, Workmen's Compensation bonds, Miscellaneous Surety bonds and bonds on behalf of Notaries Public, Sheriffs, Deputy Sheriffs and similar public officials.
3. Bonds and Undertakings required or permitted by law to be given or filed in any suit, matter or poceeding in any Court of the United States, or in any State or other Court, or given to or filed with any Sheriff or Magistrate within any State, for the doing or not doing of anything specified in such Bond or Undertaking, in which the penalty of the bond or liability incurred under such undertakng does not exceed with respect

   to Fiduciary Bonds the sum of Three-hundred Thousand - - - - - - Dollars ($300,000.00)

   and with respect to all other types of Court Bonds the sum of Fifty Thousand - - - - - - - - - -

   Dollars ($ 50,000.00).

IN WITNESS WHEREOF, the said UNITED STATES GUARANTEE COMPANY has, pursuant to its By-Laws, caused these presents to be signed by its Vice-President and Assistant Secretary and its corporate seal to be hereto affixed this 19th day of January 1948.

UNITED STATES GUARANTEE COMPANY
By

Thos. R. Dew

THOS. R. DEW
Vice-President

UNITED STATES GUARANTEE COMPANY INCORPORATED 1889 NEW YORK

CANCELLED
DATE 8-14-53

Arthur P. Grier

Arthur P. Grier
Assistant Secretary

STATE OF NEW YORK } ss:
County of New York }

On this 19th day of January, 1948, before me personally came Arthur P. Grier, to me known and by me known to be Assistant Secretary of the UNITED STATES GUARANTEE COMPANY, the corporation described in and which executed the foregoing Power of Attorney and the said Arthur P. Grier n being by me duly sworn, did depose and say that he resides in the City of New York, in the State of New York; that he is Assistant Secretary of the UNITED STATES GUARANTEE COMPANY and knows the corporate seal thereof; that the seal affixed to the foregoing Power of Attorney is such corporate seal and was thereto affixed by authority of the By-Laws of said Company and that he signed said Power of Attorney as Assistant Secretary of said Company by like authority; that he is acquainted with Thos. R. Dew and knows him to be Vice-President of said Company, and that the signature of said Thos. R. Dew subscribed to said Power of Attorney is in the genuine handwriting of said Thos. R. Dew and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Acknowledged and Sworn to before me on the date above written.

WINIFRED A. ELLIS NOTARY PUBLIC RICHMOND COUNTY

Winifred A. Ellis
Notary Public

WINIFRED A. ELLIS
NOTARY PUBLIC, State of New York
Residing in Richmond County
Richmond County Clerk's No. 232
Cert. filed in New York County No. 258
Commission Expires March 30, 1950

(OVER)

CITY AND COUNTY OF NEW YORK: ss.

I, the undersigned, Assistant Secretary of the UNITED STATES GUARANTEE COMPANY, do hereby certify that the following is a true excerpt from the By-Laws of said Company as adopted by its Board of Directors on March 19th, 1919, and that the same has not since been amended or rescinded, to-wit:

"ARTICLE VII. EXECUTION OF BONDS, ETC.

All bonds, undertakings, contracts, powers of attorney and other instruments for and on behalf of the Company which it is authorized by law or its charter to execute, may and shall be executed in the name and on behalf of the Company by its President, or a Vice-President, jointly with its Secretary, or an Assistant Secretary, under their respective designations, except that:

(a) any officer or officers, agent or agents, attorney-in-fact or attorneys-in-fact designated in any resolution of the Board of Directors or Executive Committee adopted either before or after the making of this by-law, or in any power of attorney executed as provided for in this section, may execute in the manner prescribed in such resolution or power of attorney any such bond, undertaking or other obligation which he or they shall be empowered to execute by such resolution or power of attorney;"

And I further certify that I have compared the foregoing copy of the POWER OF ATTORNEY with the original thereof and the same is a correct and true copy of the whole of said original Power of Attorney and that said Power of Attorney has not been revoked.

And I further certify that said UNITED STATES GUARANTEE COMPANY is duly licensed to transact fidelity and surety business in each of the States of the United States and is also duly licensed to become sole surety on bonds, undertakings, etc., permitted or required by the laws of the United States.

Given under my hand and the seal of said Company at New York, N. Y., this 17th day of October 19 51

Assistant Secretary

Form 620

SINCLAIR OIL & GAS COMPANY

SINCLAIR BUILDING

TULSA, OKLAHOMA

August 10, 1953

Bond No.319

State Land Commissioners
State of Arizona
Phoenix, Arizona.

Re: Bond for Drilling of Oil and Gas Well
Santa Fe Pacific - Coconino County, Arizona

Gentlemen:

Sinclair Oil & Gas Company under date of October 19, 1951, executed and filed a $10,000.00 Bond for Drilling Oil and Gas Well, under the provisions of the Arizona Conservation Act of 1951, with United States Guarantee Company (now Federal Insurance Company, as Surety.

Inasmuch as no oil and gas drilling operations are presently being conducted at this time in the State of Arizona and none contemplated in the very near future, it is our desire to withdraw and terminate the bond. In the event further operations are conducted a new bond will be executed and filed.

We therefore, hereby make formal request of termination of our bond, with a notice to our surety of such termination at 90 John Street, New York 38, New York.

A copy of your letter of termination for our file is requested.

Yours very truly,

SINCLAIR OIL & GAS COMPANY

R. W. Knopp - Manager
Lease Department.

PWM/

ARIZONA
STATE LAND DEPARTMENT

Noted by	To	Date

Ans. by Date

RECEIVED
AUG 13 1953
STATE LAND DEPT.

December 9, 1952

Mr. John G. Babbitt,
Vice-President,
Babbitt Ranches
P. O. Box 90
Flagstaff, Arizona

Dear Mr. Babbitt:

Your letter requesting a log of a well drilled by the Sinclair Oil Company has been received. We presume you meant the well drilled by them in Sec. 35, T. 28 N. Rge 1 W.

This company has filed with this department a notice to abandon and plug this well and according to the state law is not subject to inspection by the public until six months after completion.

We suggest that you contact Mr. J. T. Reeves, Division Superintendent of the Sinclair Oil Company, Box 1470, Midland, Texas in order to obtain any additional information.

Very truly yours,

Phillip W. Johnson, Geologist
State Land Department

By:

Sent copies of both letters to Phx.

mb

6

BABBITT RANCHES

P. O. Box 90
FLAGSTAFF, ARIZONA

CATARACT LIVESTOCK CO.
CO BAR LIVESTOCK CO.

December 3, 1952

CO

W

Mr. W. W. Lane
State Land Commissioner
State Land Department
Phoenix, Arizona

Dear Mr. Lane:

This last year the Sinclair Oil Company drilled a dry hole to a depth of some 3200-3300 feet on our Cataract ranch. It was on our deeded land on which the Santa Fe Railroad had reserved the mineral rights.

We have never had a log on this well and would greatly appreciate a copy of it, if it is public information.

Thanking you for your consideration of this matter -

Yours very truly,

CATARACT LIVESTOCK COMPANY

John G. Babbitt

John G. Babbitt, Vice President

C -

ARIZONA STATE LAND DEPARTMENT		
Noted by	To	Date
Ans. by:		Date

RECEIVED
DEC 5 1952
STATE LAND DEPT.

6

Additional correspondence regarding this well may be found in Sinclair Oil Company - Navajo Tribal #1 folder. (Sec. 28, T. 37N., R. 14E), especially letter releasing bond.

November 6, 1952

Mr. Phillip W. Johnson
P. O. Box 2270
Tucson, Arizona

Dear Phil:

Enclosed please find a copy of a letter from Mr. L. F. Shiplet of the Texas Company. Mr. Burger wishes to know if you can supply him with any information regarding this letter.

Also enclosed is a copy from the Four Corners Sample Cut. These samples were received in this office on November 1st and are from the Sinclair - Santa Fe No. Coconino County, Sec. 35, T. 28N, R.1W.

Regards.

mb
Encl. (2)

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May 7, 1952

Mr. J. T. Reeves
Division Superintendent,
Sinclair Oil & Gas Company
Box 1470
Midland, Texas

Dear Mr. Reeves:

In compliance with Mr. Bonnell's letter received in our office, we are inclosing three executed copies of O&G 55 application to abandon, plug, deepen and sidetract or perforate as prescribed under Oil and Gas Conservation Act of 1951.

Very truly yours,

James R. Burger,
Deputy State Land Commissioner

JRB:mb
Enclosures

Sinclair Oil & Gas Co.
324 No. San Francisco
Flagstaff, Arizona
May 6, 1952

W. W. Lane
State Land Commissioner
State Land Department
Phoenix, Arizona

Dear Mr. Lane:

In accordance with our telephone conversation of Sunday, April 27, 1952, and subsequent conversation of Sunday, May 4, 1952, we plugged our Santa Fe Pacific Well No. 1, Section 35-28N-1W, Coconino County, Arizona, as follows:

> The 9-5/8" casing was shot off at 1934' and 51 joints (1934') were recovered. The open hole contained drilling mud of 98 viscosity and as much loss circulation material as the mud would carry. A cement plug was placed from 1236' to 1276', surface measurements, and withstood over 20,000 pounds weight. The mud above the plug was lightened up in order that the Cataract Livestock Company could attempt to develop a water well from 560' to 1140' and not have to contend with a heavy laden drilling mud. A cap was placed on the 13-3/8" surface casing, and the rig torn down, now in the process of being moved.

Yours very truly,

Robert A. Bonnell, Jr.

RAB:ldb
cc- J. T. Reeves, Division Superintendent
Sinclair Oil & Gas Company
Box 1470
Midland, Texas

b

May 3, 1952.

AIRMAIL
SPECIAL DELIVERY

R. A. Bonnell, Jr.,
Sinclair Oil and Gas Company,
324 North San Francisco,
Flagstaff, Arizona.

Dear Mr. Bonnell:

We have your application to abandon and plug well number one which is being drilled by the Sinclair Oil and Gas Company in Section 35, Township 28 North, Range 1 West.

We note that your proposed plan of plugging consists of placing a cement plug at approximately 1200 feet; however, we do not believe this is adequate. Your application to plug is being approved therefore, subject to mudding of the hole from 3544 feet to the bottom of a cement plug at 1960 feet. This method will insure the plug holding, and will also protect from possible contamination from below the water sand which was encountered at 1916 feet. This should be in addition to the cement plug which you propose to place in at approximately 1200 feet in the well.

In the event that a plugging procedure as outlined above is followed, your application to abandon will be approved without further delay, and approved copies sent to your Midland, Texas office, in accordance with your request.

May we hear from you in regard to this matter?

Yours very truly,

W. W. Lane,
State Land Commissioner.

WWL:JRB:FC

6

W. W. LANE
STATE LAND COMMISSIONER

OFFICE OF
State Land Department
STATE OF ARIZONA
Phoenix, Arizona

May 1, 1952

Mr. J. R. Burger
Deputy State Land Commissioner
407 Capitol Annex
Phoenix, Arizona

Dear Pete:

In reply to your request for an okey on the proposed plugging program for the Sinclair Oil Company I would like to suggest just one addition. I believe their proposed plan should include the mudding of the hole from 3544 to the bottom of the proposed cement plug, 1960. This will insure the plug holding and it will also protect from possible contamination from below the water sand which they encountered at 1916, and which undoubtedly is the stratum which is going to be developed for water.

Very truly yours,

Phil

Phillip W. Johnson
Geologist

PWJ/pj

Enc.

Approve subject to mudding to ?

RECEIVED
MAY 2 1952
STATE LAND DEPT.

6

November 7, 1951

The Valley National Company - Insurance
P. O. Box 31
Phoenix, Arizona

Attention: Mr. John G. Howard

Gentlemen:

We are in receipt of Bond in the amount of $10,000.00, issued by the United States Guarantee Company through your company, on behalf of the Sinclair Oil & Gas Company in favor of the State of Arizona, which has been duly approved this 6th day of November, 1951, and placed on file.

Very truly yours

W. W. Lane
State Land Commissioner

WWL/bl

6

THE VALLEY NATIONAL COMPANY

Insurance

Telephone: 2-6547

P.O. BOX 31
23 EAST MONROE ST.
PHOENIX, ARIZONA

October 23, 1951

State Land Commissioner
State of Arizona
Phoenix, Arizona

Re: Sinclair Oil & Gas

Gentlemen:

At the request of Sinclair Oil & Gas Company we are pleased to enclose a bond which we have countersigned as Resident Agent.

Yours very truly,

John G. Howard

JGH/cw

c:
Sinclair Oil & Gas
Tulsa, Okla

6