

# FILE NOTATIONS

Entered in NID File \_\_\_\_\_  
Entered On S R Sheet \_\_\_\_\_  
Location Map Pinned \_\_\_\_\_  
Card Indexed \_\_\_\_\_  
I W R for State or Fee Land \_\_\_\_\_

Checked by Chief \_\_\_\_\_  
Copy NID to Field Office \_\_\_\_\_  
Approval Letter \_\_\_\_\_  
Disapproval Letter \_\_\_\_\_

## COMPLETION DATA:

Date Well Completed 8-12-44  
OW \_\_\_\_\_ WW \_\_\_\_\_ TA \_\_\_\_\_  
GW \_\_\_\_\_ OS \_\_\_\_\_ PA

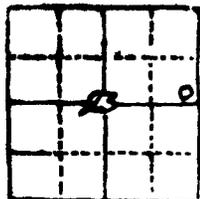
Location Inspected \_\_\_\_\_  
Bond released \_\_\_\_\_  
State of Fee Land \_\_\_\_\_

## LOGS FILED

Driller's Log \_\_\_\_\_  
Electric Logs (No. ) \_\_\_\_\_  
E \_\_\_\_\_ I \_\_\_\_\_ E-I \_\_\_\_\_ GR \_\_\_\_\_ GR-N \_\_\_\_\_ Micro \_\_\_\_\_  
Lat \_\_\_\_\_ Mi-L \_\_\_\_\_ Sonic \_\_\_\_\_ Others \_\_\_\_\_

(SUBMIT IN TRIPLICATE)

Legal Notice THIS IS A  
Law STATE  
Unit Utah



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

*Copies to Casper 4/7/44*  
ORIGINAL FORWARDED TO CASPER  
JUN 8 - 1944



SUNDRY NOTICES AND REPORTS ON WELLS

|   |                                     |   |  |
|---|-------------------------------------|---|--|
| NOTICE OF INTENTION TO DRILL.....                   | <input checked="" type="checkbox"/> | SUBSEQUENT REPORT OF WATER SHUT-OFF.....        |  |
| NOTICE OF INTENTION TO CHANGE PLANS.....            |                                     | SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING..... |  |
| NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....     |                                     | SUBSEQUENT REPORT OF ALTERING CASING.....       |  |
| NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL..... |                                     | SUBSEQUENT REPORT OF REDRILLING OR REPAIR.....  |  |
| NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....        |                                     | SUBSEQUENT REPORT OF ABANDONMENT.....           |  |
| NOTICE OF INTENTION TO PULL OR ALTER CASING.....    |                                     | SUPPLEMENTARY WELL HISTORY.....                 |  |
| NOTICE OF INTENTION TO ABANDON WELL.....            |                                     |   |  |

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

*Ref. no. 11*

May 29, 1944

Well No. 1 is located 2310 ft. from N line and 330 ft. from E line of sec. 23  
 SE $\frac{1}{4}$  SE $\frac{1}{4}$  NE $\frac{1}{4}$  Sec. 23 20S 21E S. L.  
( $\frac{1}{4}$  Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
Cisco Dome Grand Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the Ground above sea level is 5105 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

We propose to drill with rotary tools to an approximate depth of 6500' for the purpose of developing production in the Pennsylvania, coring and testing by drill stem, the productive zones encountered while drilling.

Approximately 300' of 13 3/8" OD, 48#, Seamless steel, grade H40, casing will be ran and cemented to the surface. If production is encountered, the oil string will consist of 700' of 7" OD, 23#, Seamless steel, grade N80 casing and 5800' of 7" OD, 23# Seamless steel, Grade J-55 casing set on top of or through the producing zone, whichever is deemed the best point. Enough cement will be used to provide an effective water shut off.

(SEE ATTACHED SHEET FOR APPROVAL)

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company CONTINENTAL OIL COMPANY

Address Rm. 1001 Continental Oil Bldg.

Denver 2, Colorado

By *[Signature]*

Title REGION MANAGER

C-DEEP

LOCATION  
1980 N/5 660 W/4  
S.L. 039195 B  
D.F. ELEV. 5197



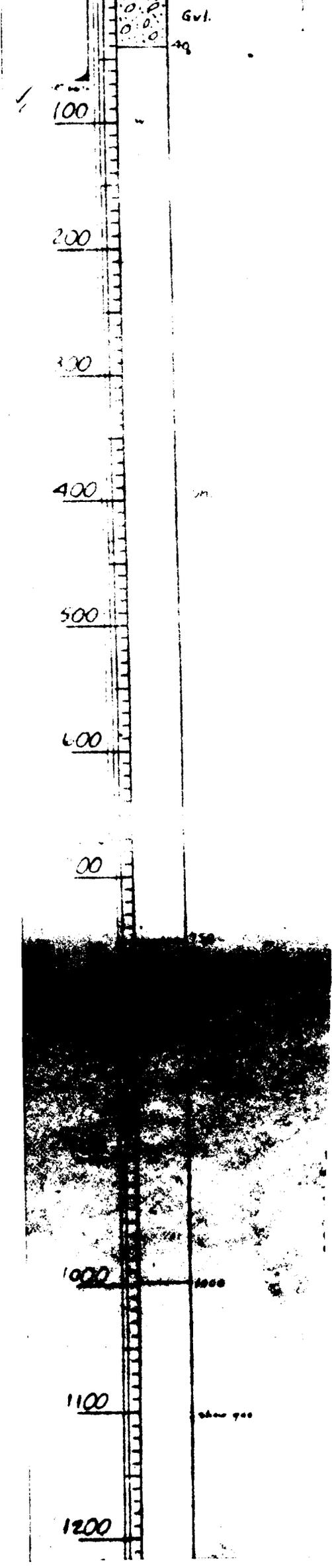
SPUDDED IN  
June 1, 1927

COMPLETED  
Aug 21, 1927

INITIAL PRODUCTION  
OIL WATER GAS  
9,295,810

Drawn RML

Checked RML



1300

1400

sh.

1500

1600



1800

1850

1900

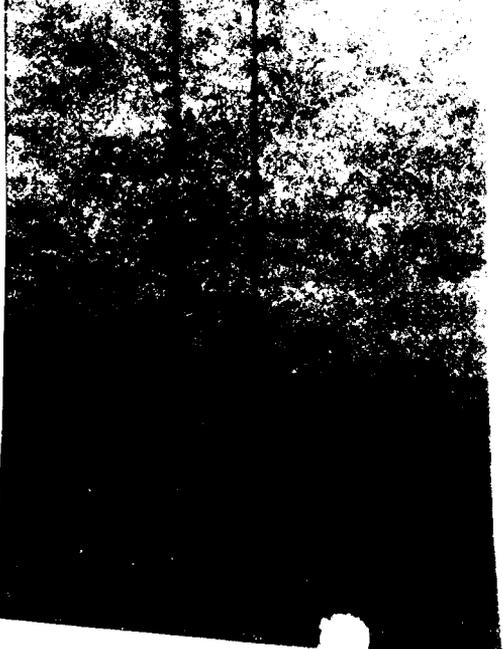
2000

00

00

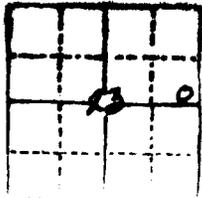
00

00



(SUBMIT IN TRIPPLICATE)

Land Office Salt Lake City  
Lease No. 042169  
Unit Cisco Dome



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

JUN 30 1944

ORIGINAL FORWARDED TO CASPER,  
*Hesperia "Operator"*



SUNDRY NOTICES AND REPORTS ON WELLS

|   |   |          |
|---|---|----------|
| NOTICE OF INTENTION TO DRILL.....                   | SUBSEQUENT REPORT OF WATER SHUT-OFF.....        |          |
| NOTICE OF INTENTION TO CHANGE PLANS.....            | SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING..... |          |
| NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....     | SUBSEQUENT REPORT OF ALTERING CASING.....       |          |
| NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL..... | SUBSEQUENT REPORT OF REDRILLING OR REPAIR.....  |          |
| NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....        | SUBSEQUENT REPORT OF ABANDONMENT.....           |          |
| NOTICE OF INTENTION TO PULL OR ALTER CASING.....    | SUPPLEMENTARY WELL HISTORY.....                 |          |
| NOTICE OF INTENTION TO ABANDON WELL.....            | <b>Notice of Casing Ran</b>                     | <b>X</b> |

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

June 27, 1944

Well No. 1 is located 2310 ft. from N line and 330 ft. from E line of sec. 23  
SE 1/4 SE 1/4 NE 1/4 Sec. 23 20S 21E  
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
Cisco Dome Grand Utah  
(County or Subdivision) (State or Territory)

The elevation of the ~~ground~~ ground above sea level is 5105 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drilled 17 1/2" hole to 345 feet. Ran 321' (thds. off) of new 13 3/8" OD, 48#, 8 Rd. thd. seamless, Grade H-40, Range 2 casing and set at 321' from ground level. Cemented with 214 sacks cement.

JUN 30 1944  
Approved \_\_\_\_\_  
*Castroptman*  
District Engineer

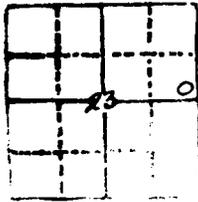
I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Continental Oil Company  
Address Room 1001  
Continental Oil Building  
Denver 2, Colorado

By J. C. Johnston  
Title Region Manager

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
CONSERVATION BRANCH**

Sec. 23  
T. 20 S.  
R. 21 E.  
S. L. Mer.  
Ref. No. 11



**INDIVIDUAL WELL RECORD**

**PUBLIC LAND:**

Land office Salt Lake City State Utah

Serial No. 063565 County Grand

~~Permitter~~  
or Lessee James E. Evans Field Cisco Dome Unit Area  
Union Oil Co. of California, assignee  
Operator Continental Oil Company District Utah

Well No. 1 Subdivision SE Cor. SE  $\frac{1}{4}$  NE  $\frac{1}{4}$  Sec.

Location 2310 feet from N. ~~W.~~ line and 330 feet from E. ~~W.~~ line of  $\frac{1}{4}$   $\frac{1}{4}$  Sec. 23

Drilling approved June 7, 1944 Well elevation 5105 feet

Drilling commenced June 22, 1944 Total depth 4744 feet

Drilling ceased August 17, 1944 Initial production

Completed for production \_\_\_\_\_, 19\_\_\_\_ Gravity A. P. I. \_\_\_\_\_

Abandonment approved September 22, 1944 Initial R. P. \_\_\_\_\_

**Geologic Formations**

**Productive Horizons**

| Surface       | Lowest tested   | Name                       | Depths | Contents   |
|---------------|-----------------|----------------------------|--------|------------|
| <u>Mancos</u> | <u>Moenkopi</u> | <u>- overlying Granite</u> |        | <u>Dry</u> |

**WELL STATUS**

| YEAR | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
|------|------|------|------|------|-----|------|------|------|-------|------|------|------|
| 1944 |      |      |      |      |     | Drg  | Drg  | Abd  | P&A   |      |      |      |
|      |      |      |      |      |     |      |      |      |       |      |      |      |
|      |      |      |      |      |     |      |      |      |       |      |      |      |
|      |      |      |      |      |     |      |      |      |       |      |      |      |

REMARKS

*Supervised by Department of Salt*

23-208-21E CISCO DOME UNIT - Grand County JUN 1944  
SE SE 1/4 NE 1/4, Continental Oil Company Well No. 1, (Salt Lake  
063565) Ref. No. 11

STATUS: Dry - T.D. 285' (Visited 6-23-44)

REMARKS: ~~NEW~~ ~~DEVELOPED~~ WELL. Drilling commenced

JUN 1944  
June 22, 1944. Preparing to set 13 3/8" conductor.  
Manning and Brown, drilling contractor. Objective,  
Pennsylvanian at approximately 6500'.

23-208-21E CISCO DOME (UNIT) - Grand County JUN 1944  
SE SE 1/4 NE 1/4, Continental Oil Company Well No. 1 (Salt  
Lake 063565), Ref. No. 11

STATUS: Drg - T.D. 3771' (7-30-44)

REMARKS: 338' 13 3/8" 48# conductor cemented with  
214 sacks. Morrison sand encountered 2149' (Approx.).  
Drilling has continued in shale and sand.

23-208-21E CISCO DOME (UNIT) - Grand County JUN 1944  
SE SE 1/4 NE 1/4, Continental Oil Company Well No. 1 (Salt  
Lake 063565), Ref. No. 11

STATUS: Abd - T.D. 4744' (Visited 8-23-44)

REMARKS: DRY HOLE OR FAILURE. Granite from 4417-4744'.  
Hole mudded from 4744-2093'; 36-sack cement plug 2093-  
2002' (Dakota sand); heavy mud from 2002-341'; 25-sack  
cement plug 341-313'. Bottom of 13 3/8" conductor  
at 321' below ground level. 13 3/8" casing cemented  
in place remains in hole. 4" regulation marker cemented  
in top of casing on August 19. Location being cleaned  
up. Drilling ceased August 17. Lowest tested Moenkopi  
overlying granite.

AUG

(COPY)

Rec'd USGS  
Salt Lake City, Ut.  
8-26-44

UNIT NO. 1

Union-Continental-Mountain Fuel  
2310' SNL, 330' WEL Section 23-20S-21E  
Cisco Dome  
Grand County, Utah  
Salt Lake 063565

ELEVATION: 5105' Ground  
5123' R. T.  
Commenced: 6-22-44  
Completed: 1-17-45

1800 - 1820 Gray shale  
1820 - 1850 Light gray silty shale with some glauconite  
1850 - 1860 Gray shale  
1860 - 1890 Gray, fine to very fine silty shale  
1890 - 1978 Gray shale with bentonite streaks  
1978 - 1988 CORED Rec. 7' gray, micaceous shale  
1988 - 2002 Gray shale  
2002 Top bentonite marker above Dakota  
2002 - 2013 White bentonite  
2013 - 2020 Gray shale  
2020 - 2030 CORED Rec. 5'3"  
  
1½' white bentonite  
3' dark gray shale  
6" fine, gray, sandy shale  
3" fine to medium, buff, shaly sandstone - sour  
gas odor  
  
TOP DAKOTA 2025'  
  
2030 - 2040 CORED Rec. 8'  
  
1½' light gray, very fine silty to sandy shale  
2' Gray bentonite shale  
2' light gray shale  
2½' dark gray-brown carbonaceous shale  
  
2040 - 2048 Gray, silty shale with some hard gray, fine quartzitic  
sandstone associated  
2048 - 2049 CORED Rec. 1' gray, very fine to fine sandy and  
silty shale  
2049 - 2070 Medium to coarse, subangular to rounded, white to  
light gray sand and sandstone, some quartzitic  
2070 - 2075 Coarse, rounded, sand and sand conglomerate; some  
gray to white translucent chert  
2075 - 2077 Same  
2077 - 2081 CORED Rec. 1' dark gray shale with scattered sand  
grains included  
2078 - 2080 Coarse to very coarse, rounded, sand and chert  
conglomerate; abundant translucent to brown-gray chert;  
quartzitic pebbles

Cisco Unit No. 1 - Sample Log

Page 2

- 2080 - 2085 Gray to dirty gray, very coarse, quartzitic sand and chert conglomerate  
2085 - 2093 Gray to brown quartzite; some white to gray chert  
2093 - 2095 Light gray to light green, fine to medium, quartzitic sand

TOP MORRISON 2093'

- 2095 - 2101 Light green shale  
2101 - 2105 Light gray to tan, cryptocrystalline limestone  
2105 - 2110 Light green, sandy shale associated with light green to buff limestone and limestone nodules  
2110 - 2127 Light green, sandy shale  
2127 - 2131 Light gray shale with gray streaks  
2131 - 2138 Light gray, fine to coarse sandstone and conglomeratic sandstone with abundant, coarse, red quartz grains included; abundant gray chert  
2128 - 2170 Red shale, mottled, light gray and light green  
2170 - 2174 Red shale mottled light gray to light green  
2174 - 2179 Light gray to white, fine, quartzitic sandstone  
2179 - 2189 Purple shale mixed with light green shale mottled red  
2189 - 2194 White fine to medium quartzitic sand  
2194 - 2201 Light green, purple, red shales  
2201 - 2210 White, fine, quartzitic sand  
2210 - 2215 Light green and red shale with some pink, fine to medium sandstone associated  
2215 - 2220 Light green shale with some red mottling  
2220 - 2227 Dark maroon, fine, quartzitic sandstone and quartzite and maroon shale and mudstone  
2227 - 2242 Light green shale mottled red with trace of light gray shale  
2242 - 2250 Light gray to white shale and mudstone with some white quartzite; some white chert  
2250 - 2260 Red shale, mudstone, and quartzite  
2260 - 2270 Light gray to white shale and mudstone; some light green shale  
2270 - 2280 Purple mudstone and shale; some light green shale mottled red  
2280 - 2320 Red shale, mudstone, and some red quartzite  
2320 - 2330 Light gray and light green shale  
2330 - 2334 White mottled gray, coarse, rounded to subrounded quartz and white chert conglomerate  
2334 - 2343 White, fine to medium, quartzitic sandstone with white chert cement; abundant red-brown chert; some red chert  
2343 - 2358 Red to maroon shale; some light gray shale  
2358 - 2360 Red, very finely crystalline limestone  
2360 - 2370 Red to pink, fine quartzitic slightly limy sandstone; some white  
2370 - 2386 Red, sandy mudstone and shale with some pink, limy sandstone as above  
2386 - 2389 Light gray, marly limestone and cryptocrystalline limestone; some sandy and quartzitic

Cisco Unit No. 1 - Sample Log

Page 3

- 2389 - 2402 Light green shale mottled red with some medium, gray, quartzitic sandstone
- 2402 - 2410 Medium, gray to clear, limy, quartzitic sandstone; trace of gray to white chert; majority of interval occupied by light gray to white, fine to medium, quartzitic sandstone
- 2410 - 2417 Light green shale mottled red
- 2417 - 2429 Coarse to very coarse, angular to subangular, clear to light gray, slightly porous sand and sandstone; some chert included
- 2429 - 2435 Light green, sandy shale
- 2435 - 2445 CORED Rec. 5'
- 2' light gray-green sandy shale
- 1 light gray to white, limy, fine to medium sandstone
- 2 sandstone as above with some quartzitic
- 2445 - 2453 Light gray shale
- 2453 - 2460 Coarse to very coarse, angular to subangular, clear quartz and white chert, conglomerate; altered and unaltered chert present; much gilsonite specks
- 2460 - 2462 CORED Rec. 1'8"
- 1' gray, coarse to very coarse, rounded to subangular quartz, chert and limestone conglomerate; dark gray rounded limestone nodules
- 8" light gray-green, sandy shale with some white calcite veins
- 2462 - 2464 CORED Rec. 2'
- 1' light gray to green-gray, very finely crystalline limestone
- 1 light green shale and sandy shale
- 2464 - 2485 Light green to light gray, sandy shale with gray-tan, cryptocrystalline limestone nodules from 2470-2485
- 2485 - 2494 Light green, very fine, calcareous sandstone
- 2494 - 2504 Light green to light gray sandy shale
- 2504 - 2511 Light dirty gray to dirty dark gray to dirty brown, fine to medium, quartzitic, calcareous sandstone; color may be due to finely disseminated black to brown mineral
- SALT WASH SANDSTONE OF MORRISON 2504'
- 2511 - 2521 CORED Rec. 5'1"
- 1½' gray, fine, slight calcareous sandstone with a thin interbed of coarse to very coarse, subrounded to subangular, gray sandstone; very faint petroliferous odor on fresh break

Cisco Unit No. 1 - Sample Log

Page 4

1½' hard green shale, some sandy  
2'1" light green, fine to medium, calcareous sandstone becoming fine to medium to coarse toward base

All sandstones in core are tight

2521 - 2531 CORED Rec. 5'

1½' hard, light gray, medium, subangular to sub-rounded, calcareous sandstone; abundant black gilsonite or dead oil specks; abundant white to light green shale inclusions; gas odor and light distillate stain on fresh breaks; tight  
3½' medium to coarse sandstone as above; abundant tan clay (?) inclusions; odor and light stain as above; bleeding light tan oil in spots; tight

Mud cut with gas and light tan oil

2531 - 2541 CORED Rec. 10'

3' hard, light gray, medium, subangular to sub-rounded, crossbedded, calcareous sandstone as above; gas odor and light distillate stain on breaks, bleeding light yellow-green oil in spots; slightly porous to tight; abundant black dead oil or gilsonite specks  
1 hard, light gray to white, fine, calcareous, crossbedded sandstone; tight; at base trace of light gray-green sandy shale with dark oil stained spots  
6 light gray, fine to very fine, calcareous sandstone with small green shale inclusions; good gas odor and light distillate stain on fresh breaks; bleeding light yellow-green oil in spots, mostly tight

Mud cut with gas and light yellow-green oil

2541 - 2547 CORED Rec. 5'

3' light gray, hard sandstone as above; cross-bedded; odor and light stain as above; bleeding light oil in spots, mostly tight  
2 sandstone as above with trace of light green, sandy shale to shaly sand; odor, stain, bleeding spots as above

Cisco Unit No. 1 - Sample Log

Page 5

- 2547 - 2557    CORED    Rec. 5'
- $\frac{1}{2}$ '    light gray, medium to coarse, subrounded to subangular sandstone with green shale inclusions; odor and light stain on fresh breaks; gilsonite or dead oil specks disseminated; slightly porous to tight
- 4       light gray, fine to medium, calcareous sandstone; tight; odor, stain, bleeding spots
- $\frac{1}{2}$       light gray-white, fine to very fine, very limy soft sandstone; mostly tight; abundant large green shale inclusions; faint gas odor
- 2557 - 2570    Red shale, light green shale, and light gray to white to light green, fine, calcareous sandstone and shaly sandstone interbedded
- 2570 - 2583    Light gray to white to light green, fine to medium, quartzitic sandstone and light green, sandy shale interbedded; some green, finely crystalline limestone associated; trace white to pink chert
- 2583 - 2596    Light gray, sandy shale with buff to brown limestone nodules
- 2596 - 2604    Clear to light gray, fine to medium to coarse, quartzitic, subangular to subrounded sandstone; trace of white altered chert associated; also trace dark brown to orange, unaltered chert
- 2604 - 2612    Light green and light gray sandy shale
- 2612 - 2620    Light gray to light brown, subrounded sandstone
- 2620 - 2630    Light gray to gray, fine to medium, quartzitic sandstone; some coarse; trace translucent to pink chert; trace light green shale
- 2630 - 2635    Light gray, sandy shale
- 2635 - 2647    Light gray, very finely crystalline limestone streaks associated with light gray to light green to white, fine, calcareous sandstone
- 2647 - 2658    Light green shale and green shaly limestone intermixed with light green-gray, fine, sandy, shaly limestone to sandy shale and shaly sandstone; white to buff, fine to medium, subangular to subrounded, calcareous, quartzitic sandstone to sandy limestone with some red inclusions
- 2658 - 2672    Red, calcareous, silty shale to silty, shaly limestone
- 2672 - 2680    Light green-gray to gray-white calcareous, silty shale to silty, shaly, limestone; some light gray-tan dense limestone; light gray-green, very fine, calcareous sandstone and siltstone at base
- 2680 - 2685    Red to pink, finely crystalline limestone and red shale
- 2685 - 2690    Gray, dense limestone; light gray-white, fine to very fine, calcareous sandstone to silty limestone
- 2690 - 2701    Gray to dark gray to gray-brown, medium, subangular to subrounded, quartzitic and calcareous sandstone; trace dark brown, dead oil stain

Cisco Unit No. 1 - Sample Log  
Page 6

2701 - 2705½ CORED Rec. 3'4"

- 4" light gray-brown, very fine, quartzitic sandstone and siltstone; in part very micaceous
- 2' gray to dark gray, fine to medium, sub-rounded to rounded, slightly calcareous sandstone; some quartzitic, spots and streaks of black to brown dead oil stain; oily taste and slight odor; saturated in spots with water; slightly porous in spots; mostly tight
- 1' white, calcareous, fine to medium, sub-rounded to rounded, tight sandstone

2705½ - 2710 CORED Rec. 4½'

- 1' dark gray-green mudstone; some finely sandy; very hard
- 2 light gray, very hard, crossbedded, very fine, calcareous and quartzitic sandstone
- 1'3" top 3" dark green, very hard, mudstone; some slightly sandy, grading into 1' dark red, very hard, slightly sandy and micaceous mudstone
- 3" light green, very hard, slightly micaceous mudstone; quartzitic in part

2710 - 2717 Red shale and mudstone  
2717 - 2720 Red to pink, very finely crystalline limestone  
2720 - 2727 Red to pink, fine to medium, subrounded to subangular, calcareous sandstone  
2727 - 2735 Red shale with red to pink limestone interbed  
2735 - 2741 Green sandy shale  
2741 - 2749 Buff to clear, medium to coarse, subangular to subrounded sand; some soft, white gypsum(?); gilsonite(?) specks throughout

TOP ENTRADA 2741'

2749 - 2755 CORED Rec. 3' gray to clear, rounded to subrounded, slightly to fairly porous sandstone; dark brown dead oil(?) specks throughout; seems to be a water sand

2755 - 2765 CORED Rec. 4½' light gray to light tan, medium sandstone as above; dark brown dead oil specks throughout; seems to be a water sand

2765 - 2780 Gray to light tan, medium to coarse, subangular to sub-rounded sandstone; dead oil(?) stained specks

Cisco Unit No. 1 - Sample Log  
Page 7

- 2780 - 2790 Gray to light tan sandstone as above; dead oil(?) stained specks; some dark brown quartzitic sandstone
- 2790 - 2800 Gray to dirty gray-brown medium sandstone as above; some dead oil(?) stained specks; much white, soft, mineral, gypsum(?) or altered chert(?)
- 2800 - 2823 Light gray to white sandstone as above; some dirty brown streaks; much soft, white mineral as above; around 2815 black specks of asphalt or gilsonite begin to appear between grains
- 2823 - 2833 CORED Rec. 2½'
- Top - light tan to buff, medium to coarse, sub-angular to subrounded, slightly porous sandstone; trace green shale parting
- Bottom - light gray to white medium sandstone as above; slight to fair porosity; black asphalt or gilsonite specks scattered among grains
- 2833 2860 Light tan to dirty brown, medium to coarse, sandstone as in core; some coarse, rounded, frosted and pitted grains; black asphaltic or gilsonitic specks among some grains
- 2860 - 2880 Light gray to dirty gray sandstone as above; asphaltic or gilsonitic specks scattered throughout; trace clear translucent chert
- 2880 - 2905 Gray to white sandstone as above
- 2905 - 2997 Buff to light tan, fine to coarse, rounded to subrounded sand and sandstone; coarse grains are frosted and pitted; trace fine, orange sandstone at 2960 - 2970
- 2997 - 3007 CORED Rec. 10'
- 4' buff, fine to medium, rounded to subrounded, soft sand with argillaceous sand streaks
- 6 buff, fine to medium, rounded to subrounded sandstone with coarse, rounded and frosted grains throughout
- 3007 - 3090 Buff, fine to medium to coarse sand and sandstone as above; some pink-buff grains; trace pink-white chalcedony
- 3090 - 3100 Buff, fine to coarse, rounded to subrounded soft sand and sandstone as above CORED Rec. 6'
- 3100 - 3150 Light gray to white to buff sand and sandstone as above
- 3150 - 3160 CORED Rec. 9'8" light buff, fine to medium to coarse, rounded to subrounded sandstone; few scattered pink grains
- 3160 - 3172 Buff to white, fine to medium to coarse sandstone as above
- 3172 - 3176 Red, very fine sandstone with some mica

TOP CARMEL 3172'

3176 - 3187 CORED Rec. 11'

- 1' gray-tan, mottled pinkish gray, very fine, slightly calcareous, very micaceous, quartzitic siltstone; abundant muscovite
- 4 red to pink, very fine sandstone
- 4 red to pink sandstone as above with light green-white spots; some white medium crystalline calcite spots
- 2 red to pink, very fine to fine, with medium to coarse, rounded to subrounded grains associated

3187 - 3193 Red to pink sandstone as in core  
3193 - 3200 Buff-pink, fine, sandstone with some medium to coarse, rounded to subrounded grains

TOP NAVAJO 3193'

3200 - 3220 Buff-pink sandstone as above  
3220 - 3250 Buff, fine to medium to coarse sandstone as above  
3250 - 3260 Buff to white sandstone as above; much black mineral scattered among some grains  
3260 - 3270 Buff to white sandstone as above; much hard and quartzitic; trace small green shale inclusions  
3270 - 3280 Buff, fine sandstone; some medium to coarse, rounded to subrounded  
3280 - 3290 Light buff-pink, fine, sandstone with some muscovite flakes; some light green shaly sandstone  
3290 - 3300 Light buff-white to light gray, fine to very fine, micaceous sandstone; some light green, micaceous, shaly sandstone  
3300 - 3310 Light buff to light buff-pink, fine to very fine, micaceous sandstone  
3310 - 3320 White, fine to medium, quartzitic sandstone with some small green shale inclusions; a thin interbed of very fine, red, micaceous siltstone and sandstone and shale  
3320 - 3325 CORED Rec. 4½'

- 2½' light green-white to light gray-white, very micaceous, fine to very fine sandstone; some quartzitic, muscovite abundant, small amount green mica; abundant small, green shale inclusions and streaks; many pink grains
- 1 red to green, very fine, very micaceous, quartzitic siltstone; muscovite abundant; some green mica present
- 1 maroon, micaceous shale

3325 - 3328 Light gray-white, fine sandstone, very micaceous

Glauco Unit No. 1 - Sample Log  
Page 9

3328 - 3337 CORED Rec. 9'

8'8" brick red, mudstone and shale with some mica; some very finely silty and quartzitic  
4" light green, very fine, quartzitic siltstone

3337 - 3344 CORED Rec. 7'

1' dark red to salmon pink, very fine, very micaceous siltstone and shale with some light green, very fine quartzitic siltstone at top and base; bedding planes suggest thin lensing  
5 brick red to salmon pink, very fine, very micaceous siltstone and shale; bedding planes suggest thin lensing  
1 same at the 1' above

3344 - 3345 Same as lower part of above core

3345 - 3365 Light pinkish lavender, medium to coarse, angular to sub-angular, very micaceous sandstone, with green shale pillets and red shale inclusions; some quartzitic

3365 - 3376 Light pinkish lavender, medium to coarse sandstone as above

3376 - 3384 Green shale

3384 - 3390 Light pinkish lavender to white sandstone as above

3390 - 3400 Light pinkish lavender to pink-red, medium to coarse, sub-angular to subrounded sandstone; some quartzitic; some very coarse grains

3400 - 3410 Sandstone as above with red shale interbedded

3410 - 3420 Sandstone as above

3420 - 3478 Light pink-white, medium sandstone as above

3478 - 3490 Buff to buff-pink, fine to medium, subangular to angular sand and sandstone with pink grains; some fine, red to pink sandstone

3490 - 3500 Same as above with trace of light gray, finely crystalline limestone

3500 - 3530 Buff to buff-pink, medium sandstone as above; some subrounded grains

3530 - 3535 Same as above; some coarse, subrounded, orange sandstone

3535 - 3545 CORED Rec. 10'

4' buff-pink with buff-lavender streaks, fine, sub-rounded to subangular, highly crossbedded sandstone; abundant pink grains and black specks  
1 pink-red, fine, subangular, hard sandstone; cross-bedded; some medium grains  
5 sandstone as in first 4'; some interbedded and crossbedded, light pink-prange, subrounded, medium to coarse sandstone

Cisco Unit No. 1 - Sample Log

Page 10

|             |   |
|-------------|---|
| 3545 - 3550 | Light pink, fine sandstone with some mica   |
| 3550 - 3580 | Light pink-orange to light pink, medium, subrounded sandstone; some fine, light pink sandstone  |
| 3580 - 3590 | Fine, pink sandstone  |
| 3590 - 3600 | Light pink-orange to light pink, medium, subrounded sandstone   |
| 3600 - 3610 | Fine to medium sandstone as above; some purple-green, finely crystalline limestone nodules  |
| 3610 - 3640 | Subrounded to subangular sand and sandstone as above  |
| 3640 - 3650 | Pink, fine to very fine, slightly micaceous sandstone   |
| 3650 - 3658 | Light pink-orange sandstone; fine to medium, subrounded to subangular   |
| 3658 - 3665 | Light red to pink, fine, subrounded sandstone   |
| 3665 - 3695 | Light pink-orange to light pink, medium, subrounded sandstone; some coarse  |
| 3695 - 3700 | Light red to pink, fine, subrounded sandstone   |
| 3700 - 3710 | Light pink-orange to light pink, medium to coarse, subrounded sandstone   |
| 3710 - 3720 | Light pink-orange to light pink, medium, subrounded sandstone; some light red, fine sandstone   |
| 3720 - 3730 | Same as above with a thin bed of light gray, very finely crystalline limestone  |
| 3730 - 3737 | Sandstone as above  |
| 3737 - 3742 | <u>CORED</u> Rec. 2'  |
|             | $\frac{1}{2}$ ' light pink-orange, fine to medium, subangular to subrounded, thin-bedded sandstone  |
|             | $1\frac{1}{2}$ ' light pink-orange to red, fine to medium, argillaceous sand and sandstone to sandy clay; fragments light pink to red, fine, micaceous sandstone included; light gray-white chert fragments abundant in a light gray shale which seems mixed with the above sand; all this mixture may be due to worn out core head grinding cavings and sandstone fragments into a sandy drilling mud matrix |
| 3742 - 3745 | Pink to red, fine sandstone   |
| 3745 - 3750 | Light gray-green, dense, nodular limestone associated with some green shale; some red-brown limestone nodules   |
| 3750 - 3770 | Light pink to pink orange, fine to medium sandstone; abundant soft, pink-white gypsum   |
| 3770 - 3780 | Buff-pink, fine sandstone; some medium  |
| 3780 - 3785 | Pink to red, fine to very fine sandstone; much quartzitic; some white, fine, quartzitic sandstone; much buff-pink, very fine, quartzitic sandstone with light green shale flakes associated   |
| 3785 - 3790 | Brick red shale; some very finely micaceous   |
| 3790 - 3796 | Pink to red, fine to very fine sandstone as above   |
| 3796 - 3800 | Light pink-white to buff-pink, fine to very fine, quartzitic sandstone with some light green shale flakes   |

Cisco Unit No. 1 - Sample Log  
Page 11

- 3800 - 3807 Light buff-pink, fine to very fine, quartzitic sandstone; some fine, red sandstone with some red shale associated
- 3807 - 3812 Red shale; some micaceous
- 3812 - 3820 White, very fine, slightly micaceous sandstone interbedded with red to pink, calcareous and micaceous sandstone
- 3820 - 3830 Red, very fine, calcareous sandstone and siltstone, some shaly
- 3830 - 3834 Red shale
- 3834 - 3840 Red siltstone and sandstone, as above
- 3840 - 3860 Brick red, very fine, shaly, calcareous siltstone and sandstone to silty shale
- 3860 - 3869 Sandstone as above; slight trace purple mottled green, dense, nodular limestone
- 3869 - 3880 Red-brown, very fine, calcareous shaly siltstone
- 3880 - 3930 Red-brown, very fine, shaly siltstone as above; trace gray, dense limestone at 3904
- 3930 - 3943 Reddish chocolate to red-brown, very fine, calcareous siltstone and round, calcareous siltstone and limestone pellets surrounded by a pink-white limestone matrix; some coarse, rounded quartz grains; appears conglomeratic
- 3943 - 3950 Light green to white, very micaceous, waxy, slightly silty clay with coarse quartz grains included; much very coarse, clear to red, quartz grains; some pink-orange, translucent chert; some brown-red, very micaceous, shaly siltstone
- 3950 - 3980 Brown-red, very micaceous, shaly siltstone and clay; some slightly calcareous; abundant biotite and muscovite; slight green, micaceous, waxy clay associated
- 3980 - 3990 Red to pink, very fine, very micaceous, shaly siltstone and sandstone; some shale; some light gray, clayey silt
- 3990 - 3996 Red-brown as above; some very coarse slightly arkosic, quartz conglomerate
- 3996 - 4004 CORED Rec. 8'

- 4' brown-red to chocolate, very fine, thin bedded shaly siltstone with abundant biotite and muscovite aligned parallel to bedding planes; thin lenses, streaks, and beds of very coarse slightly arkosic, quartz conglomerate; quartz pebbles are subrounded to subangular and are clear to red in color; abundant large flakes of muscovite and biotite and some feldspar grains are associated; white limestone serves as cementing agent in places; some red to light green shale is included
- 3'8" pink to red-brown, very fine, thin bedded, very micaceous siltstone; some bedding planes are wavy; some chocolate brown, micaceous mudstone and silty

- mudstone is present; contact between pink and chocolate is irregular, suggesting channeling; some streaks of very coarse quartz grains
- 4" Very coarse, clear to red quartz grains, biotite, muscovite, slightly arkosic conglomerate; trace of orthoclase; trace of hornblende; calcareous cementing material; cross bedded at top; light green to white to red-brown in color
- 4004 - 4010 Slightly arkosic quartz conglomerate as in core
- 4010 - 4030 Red-brown, very fine, calcareous, very micaceous, shaly siltstone and siltstone; some slightly arkosic conglomerate streaks
- 4030 - 4040 Light chocolate to tan, very fine, calcareous; micaceous siltstone and sandstone
- 4040 - 4043 Red-brown, very fine, very micaceous siltstone and silty mudstone
- 4043 - 4050 Slightly arkosic quartz conglomerate as above
- 4050 - 4060 Light gray, very coarse arkose; quartz grains, white to pink feldspar, biotite, muscovite, and green mica; some fine, light gray-green, micaceous sandstone associated
- 4060 - 4100 As above - white feldspar
- 4100 - 4130 As above - white to pink feldspar; granite fragments; grains predominately angular
- 4130 - 4150 Light gray arkose; quartz, white feldspar, biotite, muscovite, and abundant green mica; some chlorite(?); some ferromagnesian mineral
- 4150 - 4180 Light gray to pink coarsely crystalline biotite and green micaceous granite wash or arkose
- 4180 - 4289 Same
- 4289 - 4395 Same
- 4395 - 4417 Granite
- 4417 - 4422 CORED Rec. 2'
- Coarsely crystalline biotite granite; some chlorite; a dearth of quartz; abundant green mica and pink feldspar
- 4422 - 4550 Granite
- 4550 - 4554 CORED Rec. 1'
- Coarsely crystalline biotite and green mica granite; highly fractured with evidence of weathering along fracture planes; also secondary deposition of chlorite, green clay, reddish clay, and white calcareous material. These deposited as thin films. Fracturing often occurs along feldspar planes which are generally coated with a light pink to red clayey material. Fracture planes show rounding or abrasion. The fractures intersect. Dips on fracture planes vary as follows:

Cisco Unit No. 1 - Sample Log  
Page 13

1. One piece exhibits a dip of 42 degrees to 43 degrees
2. A second piece exhibits dips ranging from 47 to 48, to 69, to 90 degrees

4554 - 4557 CORED Rec. 1½'

Granite, Fracture plane dips of 20 degrees and 68 degrees recorded

4557 - 4560

Granite

4560 - 4580

Granite; abundant white, powdery clay (decomposed feldspar?)

4580 - 4650

Same

4650 - 4738

Granite

4738 - 4743

CORED Rec. 1½'

Coarsely crystalline, biotite and green mica granite as above

4744

TOTAL DEPTH

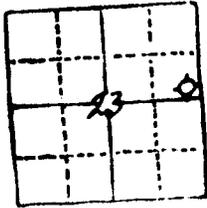
TOPS

|   |             |
|---|-------------|
| Bentonite                               | 2002'       |
| Dakota                                  | 2025        |
| Morrison                                | 2093        |
| Salt Wash 2504-2557'                    |             |
| Entrada                                 | 2741        |
| Carmel                                  | 3172        |
| Navajo                                  | 3193        |
| Kayenta                                 | 3262        |
| Wingate                                 | 3478        |
| Chinle                                  | 3781        |
| Moenkopi                                | 3944        |
| Arkose                                  | 4044        |
| Granite(?) arkose, or weathered granite | 4152 - 4395 |
| Granite                                 | 4395 - 4744 |

W. O. Ham, Jr.  
August 24, 1944

(SUBMIT IN TRIPLICATE)

U. S. Land Office **Salt Lake City**  
 Lease or permit No. **063565**  
**Cisco Unit**



UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY

AUG 20 1944



SUNDRY NOTICES AND REPORTS ON WELLS

|  |   |  |  |
|--|---|--|--|
| NOTICE OF INTENTION TO DRILL                   |   | SUBSEQUENT REPORT OF WATER SHUT-OFF        |  |
| NOTICE OF INTENTION TO CHANGE PLANS            |   | SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING |  |
| NOTICE OF INTENTION TO TEST WATER SHUT-OFF     |   | SUBSEQUENT REPORT OF ALTERING CASING       |  |
| NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL |   | SUBSEQUENT REPORT OF REDRILLING OR REPAIR  |  |
| NOTICE OF INTENTION TO SHOOT OR ACIDIZE        |   | SUBSEQUENT REPORT OF ABANDONMENT           |  |
| NOTICE OF INTENTION TO PULL OR ALTER CASING    | X | SUPPLEMENTARY WELL HISTORY                 |  |
| NOTICE OF INTENTION TO ABANDON WELL            |   |  |  |

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

August 19, 1944

Well No. 1 is located 2310 ft. from N line and 330 ft. from E line of sec. 23  
SE 1/4 SE 1/4 NE 1/4 Sec. 23 208 21E (Meridian)  
(1/4 Sec. No. Sec. No.) (Twp.) (Range)  
Cisco Dor Grand Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the ~~drick~~ ground floor above sea level is 5105 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drilled to a total depth of 4744' - hole dry. In granite from 4417' to 4744'. A cement plug is to be placed through the entire Dakota Sand section. A 25-sack plug is to be placed in the bottom of the 13 3/8" surface casing and a 10-sack plug to be placed in the top with a piece of 4" pipe cemented in the top as a marker.

This confirms my Western Union night message to Mr. C. A. Hauptman at Salt Lake City, Utah on August 17, 1944. Approval received from Mr. Hansen of Casper on August 19, 1944.

Approved AUG 19 1944  
*C. A. Hauptman*  
 District Engineer

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Continental Oil Company

Address 1755 Glenarm Place

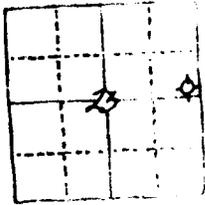
Room 1001

Denver 2, Colorado

By J. Johnston  
 Title Region Manager

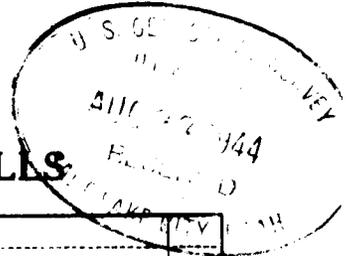
(SUBMIT IN TRIPLICATE)

U. S. Land Office **Salt Lake City**  
Lease or permit No. **063565**  
**Ciseo Unit**



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SEP 25 1944



SUNDRY NOTICES AND REPORTS ON WELLS

|   |  |   |   |
|---|--|---|---|
| NOTICE OF INTENTION TO DRILL.....                   |  | SUBSEQUENT REPORT OF WATER SHUT-OFF.....        |   |
| NOTICE OF INTENTION TO CHANGE PLANS.....            |  | SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING..... |   |
| NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....     |  | SUBSEQUENT REPORT OF ALTERING CASING.....       |   |
| NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL..... |  | SUBSEQUENT REPORT OF REDRILLING OR REPAIR.....  |   |
| NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....        |  | SUBSEQUENT REPORT OF ABANDONMENT.....           | X |
| NOTICE OF INTENTION TO PULL OR ALTER CASING.....    |  | SUPPLEMENTARY WELL HISTORY.....                 |   |
| NOTICE OF INTENTION TO ABANDON WELL.....            |  |   |   |

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

August 24

1944

Well No. 1 is located 2310 ft. from N line and 330 ft. from E line of sec. 23  
SE 1/4 SE 1/4 NE 1/4 Sec. 23 20S 21E  
(1/4 and Sec. No.) (Twp.) (Range) (Meridian)  
Ciseo Grand Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the ground ~~derrick floor~~ above sea level is 5105 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

All measurements from Kelly Bushing which is 17' above ground level.

On August 19, 1944 filled hole with heavy mud 4744-2093. Cemented from 2093-2002 with 36 sacks of cement. Heavy mud from 2002-341. Cemented from 341' to 313' with 25 sacks cement, this is 3' out of <sup>13 3/8"</sup> ~~10 3/4"~~ OD casing and 25' in casing. Cement plug placed in top of <sup>13 3/8"</sup> ~~10 3/4"~~ casing with a 4" pipe marker.

Inspected on Sept. 22, 1944 and found to be in satisfactory condition.

SEP 22 1944  
C. Hauptman

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Continental Oil Company

Address 1755 Glenarm Place

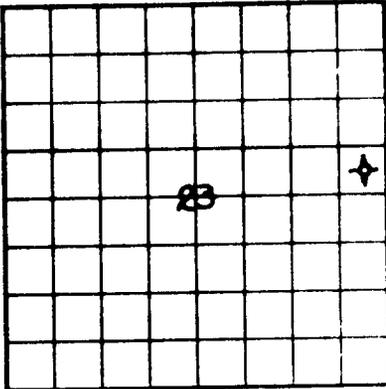
Room 1001

Denver 2, Colorado

By J. Johnston

Title Region Manager

U. S. LAND OFFICE 069969  
SERIAL NUMBER  
LEASE OR PERMIT TO PROSPECT (Cross Only)



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY



AUG 23 1944  
LOG OF OIL OR GAS WELL

LOCATE WELL CORRECTLY

Company Continental Oil Company Address Denver, Colorado  
Lessor or Tract Cisco Unit Field Cisco Cone State Utah  
Well No. 1 Sec 23 T 20S R 21E Meridian County Grand  
Location 2110 ft. S of 3 Line and 110 ft. W of 1 Line of Sec. 21 Tr. Elevation 5109  
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed J. H. Johnston  
Title Region Manager

Date August 23, 1944

The summary on this page is for the condition of the well at above date August 17

Commenced drilling June 22, 1944 Finished drilling August 17, 1944

OIL OR GAS SANDS OR ZONES  
(Denote gas by G)

No. 1, from 2025 to 2093 No. 4, from \_\_\_\_\_ to \_\_\_\_\_  
No. 2, from 2504 to 2557 No. 5, from \_\_\_\_\_ to \_\_\_\_\_  
No. 3, from \_\_\_\_\_ to 2557 No. 6, from \_\_\_\_\_ to \_\_\_\_\_

IMPORTANT WATER SANDS

No. 1, from \_\_\_\_\_ to \_\_\_\_\_ No. 3, from \_\_\_\_\_ to \_\_\_\_\_  
No. 2, from \_\_\_\_\_ to \_\_\_\_\_ No. 4, from \_\_\_\_\_ to \_\_\_\_\_

(Threads 215)

CASING RECORD (From Ground Level)

| Size casing    | Weight per foot | Threads per inch | Make        | Amount     | Kind of shoe | Casing pulled from  | Perforated |    | Purpose |
|----------------|-----------------|------------------|-------------|------------|--------------|---------------------|------------|----|---------|
|                |                 |                  |             |            |              |                     | From       | To |         |
| <u>13 3/8"</u> | <u>48#</u>      | <u>8-Rd</u>      | <u>H-40</u> | <u>321</u> | <u>Baker</u> | <u>Left in hole</u> |            |    |         |

MUDDING AND CEMENTING RECORD

| Size casing    | Where set       | Number sacks of cement | Method used   | Mud gravity | Amount of mud used |
|----------------|-----------------|------------------------|---|-------------|--------------------|
| <u>13 3/8"</u> | <u>321' Ord</u> | <u>11</u>              | <u>rammed plug down after cement with contractor's equipment.</u> |             |                    |

PLUGS AND ADAPTERS

Heaving plug Material Length Depth set

OLD MARK

**SHOOTING RECORD**

| Size | Shell used | Explosive used | Quantity | Date | Depth shot | Depth cleaned out |
|------|------------|----------------|----------|------|------------|-------------------|
|      |            |                |          |      |            |                   |
|      |            |                |          |      |            |                   |
|      |            |                |          |      |            |                   |

**TOOLS USED**

Rotary tools were used from \_\_\_\_\_ feet to \_\_\_\_\_ feet, and from \_\_\_\_\_ feet to \_\_\_\_\_ feet  
 Cable tools were used from \_\_\_\_\_ feet to \_\_\_\_\_ feet, and from \_\_\_\_\_ feet to \_\_\_\_\_ feet

**DATES**

Put to producing \_\_\_\_\_, 19\_\_\_\_  
 The production for the first 24 hours was \_\_\_\_\_ barrels of fluid of which \_\_\_\_\_ % was oil; \_\_\_\_\_ % emulsion; \_\_\_\_\_ % water; and \_\_\_\_\_ % sediment. Gravity, °Bé. \_\_\_\_\_  
 If gas well, cu. ft. per 24 hours \_\_\_\_\_ Gallons gasoline per 1,000 cu. ft. of gas \_\_\_\_\_  
 Rock pressure, lbs. per sq. in. \_\_\_\_\_

**EMPLOYEES**

\_\_\_\_\_, Driller  
 \_\_\_\_\_, Driller  
 \_\_\_\_\_, Driller  
 \_\_\_\_\_, Driller

**FORMATION RECORD**

| FROM  | TO   | TOTAL FEET | FORMATION                      |
|-------|------|------------|--------------------------------|
| 0     | 17   | 17         | Kelly washing to ground        |
| 17    | 145  | 128        | Surface soil and black shale   |
| 145   | 900  | 355        | Shale                          |
| 900   | 1420 | 720        | Sandy shale                    |
| 1420  | 2025 | 605        | Shale and shells               |
| 2025  | 2093 | 68         | Devota Sand                    |
| 2093  | 2197 | 104        | Sand and shale (Top Morrison)  |
| 2197  | 2207 | 10         | Sand                           |
| 2207  | 2328 | 121        | Sand and shale                 |
| 2328  | 2338 | 10         | Sand                           |
| 2338  | 2405 | 67         | Sandy shale                    |
| 2405  | 2504 | 99         | Sand and shale                 |
| 2504  | 2557 | 53         | Salt wash sand                 |
| 2557  | 2741 | 184        | Shale and sand (Base Morrison) |
| 2741  | 3172 | 431        | (Entrada) sandstone            |
| 3172  | 3193 | 21         | (Gurnal) sandstone             |
| 3193  | 3262 | 69         | (Navajo) sandstone             |
| 3262  | 3478 | 216        | (Haystack) sand and shale      |
| 3478  | 3781 | 303        | (Wingate) sandstone            |
| 3781  | 4040 | 259        | Red beds                       |
| 4040  | 4132 | 92         | Argillaceous                   |
| 4132  | 4395 | 263        | Granite wash                   |
| 4395  | 4744 | 349        | Granite                        |
| FROM- | TO   | TOTAL FEET | FORMATION                      |

FORMATION RECORD—Continued

Continental-Union Well - Cisco Dome  
Grand County, Utah

Sec. 23, T 20 S., R. 21 E.

1755 Glenarm Street  
Denver 2, Colorado  
August 21, 1944

43-019-10231

Mr. A. E. Brainerd  
Continental Oil Company  
Denver, Colorado

Dear Mr. Brainerd:

I should like to review for you a few important points about the Continental Cisco Unit #1, 23-20S-21E, Grand County, Utah.

At 3762' a steel line measurement was made and the hole was found to be one foot short. No correction was made at that time. However, when the well was completed, another measurement, confirmed by the Schlumberger, indicated that the hole was still one foot short. My log has now been corrected, and all tops given below have taken into account this correction.

#### FORMATION TOPS

All formation tops are measured from the top of the Kelly bushing (elev. 5123'). In all cases an effort has been made to pick these tops on the basis of drilling time and samples; thus lag has been taken into consideration.

Drilling time very clearly indicated the tops of the Entrada and Carmel formations, and, I believe, it clearly showed the top of Wingate. However, in the case of the granite, drilling time was of little value.

|           |            |          |       |
|-----------|------------|----------|-------|
| Bentonite | 2002'      | Kayenta  | 3262' |
| Dakota    | 2025'      | Wingate  | 3478' |
| Morrison  | 2093'      | Chinle   | 3781' |
| Salt Wash | 2504-2557' | Moenkopi | 3944' |
| Entrada   | 2741'      | Arkose   | 4044' |
| Carmel    | 3172'      | Granite  | 4152' |
| Navajo    | 3193'      |          |       |

Discussion of Disputable Tops ... According to the cuttings, the following contacts appear to be transitional: (1) Carmel-Navajo and (2) Navajo-Kayenta.

Other contacts which may be transitional are: (1) Kayenta-Wingate, (2) Wingate-Chinle, and (3) Arkose-Granite.

It is entirely possible that the granite top is at 4130'. However, I would prefer to place it at 4152' on the basis of samples.

#### SECTION BELOW WINGATE

Red Beds ... The entire red and brown silt and shale section below the Wingate sandstone may be considered as being all Chinle on the grounds that no Shinarump is present. As for myself, I believe that the lithology from 3944-4044' is more strongly indicative of Moenkopi than of Chinle. Thus, I have split these beds into two formations: (1) Chinle...3781-3944' & Moenkopi - 3944-4044'.

Arkose and Granite... I am convinced that an arkose is present in the section from 4044-4152'. Whether this arkose can be considered as part of the Cutler is a mute question. Two facts should be remembered before placing it in the Cutler: (1) The physical characteristics of the arkose do not resemble those of the Cutler arkoses.

(2) As Mr. Max Krueger has pointed out, in this area an arkose is to be expected when drilling from a sedimentary section into granite.

For these two reasons I would prefer not to place this arkose in the Cutler.

#### OIL AND GAS SHOWS

Attention should be called to the following oil and gas shows:

- (1) Sour gas odor from core at 2025'.
- (2) The Salt Wash sand from 2511-57' had a gas odor, light stains on some fresh breaks, and in spots bled light tan and light green oil. The sand was generally tight throughout. After standing a few hours, cores of the sand showed no signs of staining or trace of odor.
- (3) From 2741-2900' the Entrada exhibited spots and streaks which had asphaltic, or gilsonitic, specks scattered among the grains.
- (4) From 2700-03' a medium to fine, tight, water sand was heavily stained with black, dead oil.

#### CONCLUSIONS

The following conclusions were arrived at concerning the well:

1. The Dakota has a very poor gas show.
2. The Salt Wash sand of the Morrison formation has a poor oil and gas show.
3. The section drilled is very similar to that in the Utah Southern #1 State, 26-21S-23E, Grand County, Utah.
4. The Shinarump is absent.
5. The Moenkopi is present.
6. It is very doubtful that the arkose from 4044-4152' should be placed in the Cutler.
7. Granite can and will drill as fast as some sands.

TOTAL DEPTH . . . . . 4744

Yours very truly,

(s) W. O. Ham, Jr.

|           |   |
|-----------|---|
| 1800-20   | Grey shale                                  |
| 1820-50   | Light grey silty shale with some glauconite |
| 1850--60  | Grey shale                                  |
| 1860-90   | Grey, fine to very fine silty shale         |
| 1890-1978 | Grey shale with bentonite streaks           |
| 1978-1988 | CORED, recovered 7' grey, micaceous shale   |
| 1988-2002 | Grey shale                                  |
| 2002----- | Top Bentonite marker above Dakota           |
| 2002-2013 | White bentonite                             |
| 2013-2020 | Grey shale                                  |
| 2020-2030 | CORED, recovered 5'3"                       |

- (1) 1½' --- white bentonite
- (2) 3' --- dark grey shale
- (3) 6" --- fine, grey, sandy shale
- (4) 3" --- fine to medium, buff, shaly sandstone.  
Sour gas odor.

|  |  |
|--|--|
| Top Dakota<br>2030-2040  | 2025' (+3080)<br>CORED, recovered 8'<br>(1) 1½' --- light gray, very fine silty to sandy shale<br>(2) 2' --- gray bentonite (?) shale<br>(3) 2' --- light gray shale<br>(4) 2½' --- dark gray-brown carbonaceous shale |
| 2040-48  | Gray, silty shale with some hard gray, fine quartzitic sandstone associated.   |
| 2048-49  | CORED, recovered 1' -- Gray, very fine to fine sandy and silty shale.  |
| 2049-70  | Medium to coarse, subangular to rounded, white to light gray sand and sandstone. Some quartzitic.  |
| 2070-75  | Coarse, rounded, sand and sand conglomerate. Some gray to white translucent chert.   |
| <p>It is evident that the Dakota is running low. The top of the Dakota in our well seems to be about 27 feet lower than the Dakota top in the Crystal # 4.</p> |  |
| 2075-77  | As above.  |
| 2077-81  | CORED, recovered 1', dark gray shale with scattered sand grains included.  |
| 2078-80  | Coarse to very coarse, rounded, sand and chert conglomerate. Abundant translucent to brown-gray chert. Quartzitic pebbles. (This indicated by samples.)  |
| 2080-85  | Gray to dirty gray, very coarse, quartzitic sand and chert conglomerate.   |
| 2085-93  | Gray to brown quartzite. Some white to gray chert.   |
| 2093-95  | Light gray to light green, fine to medium, quartzitic sand. TOP MORRISON at 2093.  |
| 2095-2101  | Light green shale.   |
| 2101-05  | Light gray to tan, cryptocrystalline limestone.  |
| 2105-10  | Light green, sandy shale associated with light green to buff limestone and limestone nodules.  |
| 2110-27  | Light green, sandy shale   |
| 2127-31  | Light gray shale with gray streaks   |
| 2131-38  | Light gray, fine to coarse sandstone and conglomeratic sandstone with abundant, coarse, red quartz grains included. Abundant gray chert.   |
| 2138-70  | Red shale, mottled, light gray & light green.  |
| 2170-74  | Red shale, mottled, light gray to light green.   |
| 2174-79  | Light gray to white, fine, quartzitic sandstone.   |
| 2179-89  | Purple shale mixed with light green shale mottled red.   |
| 2189-94  | White fine to medium quartzitic sand.  |
| 2194-2201  | Light green, purple, red shales.   |
| 2201-10  | White, fine, quartzitic sand.  |
| 2210-15  | Light green and red shale with some pink, fine to medium sandstone associated.   |

In my first report to you I made an error in calculating the actual elevation above sea level of the top of the Dakota. All tops I have given you and will give you are measured from the Kelly bushing. The elevation of the Kelly bushing is 5123 feet.

On this basis the tops of the Dakota and Morrison are as follows:

|              |                |
|--------------|----------------|
| Top Dakota   | 2025 (+3098')  |
| Top Morrison | 2093' (+3030') |

This correction makes the Dakota top 9' lower than the Dakota top in the Crystal #4, rather than 27' as I reported on July 6.

- 2215-20 Light green shale with some red mottling.
- 2220-27 Dark maroon, fine, quartzitic sandstone and quartzite and maroon shale and mudstone.
- 2227-42 Light green shale mottled red with trace of light gray shale.
- 2242-50 Light gray to white shale and mudstone with some white quartzite. Some white chert.
- 2250-60 Red shale, mudstone, and quartzite. Some white chert.
- 2260-70 Light gray to white shale and mudstone. Some light green shale.
- 2270-80 Purple mudstone and shale. Some light green shale mottled red.
- 2280-2320 Red shale, mudstone, and some red quartzite.
- 2320-30 Light gray and light green shale
- 2330-2334 White mottled gray, coarse, rounded to subrounded quartz and white chert conglomerate
- 2334-43 White, fine to medium, quartzitic sandstone with white chert cement. Abundant red-brown chert. Some red chert.
- 2343-58 Red to maroon shale. Some light gray shale.
- 2358-60 Red, very finely crystalline limestone.
- 2360-70 Red to pink, fine, quartzitic, slightly limey sandstone. Some white.
- 2370-86 Red, sandy mudstone and shale with some pink, limey sandstone as above.
- 2386-89 Light gray, marly limestone and cryptocrystalline limestone. Some sandy and quartzitic.
- 2389-2402 Light green shale mottled red with some medium, gray, quartzitic sandstone.
- 2402-10 Medium, gray to clear, limey, quartzitic sandstone. Trace of gray to white chert. Majority of interval occupied by light gray to white, fine to medium, quartzitic sandstone
- 2410-17 Light green shale mottled red.
- 2417-29 Coarse to very coarse, angular to subangular, clear to light gray, slightly porous sand and sandstone. Some chert included.
- 2429-35 Light green, sandy shale.
- 2435-45 CORED, recovered 5'
- (1) 2' light gray-green, sandy shale
  - (2) 1' light gray to white, limey, fine to medium sandstone
  - (3) 2' Sandstone as above with some quartzitic.
- 2445-53 Light gray shale
- 2453-60 Coarse to very coarse, angular to subangular, clear quartz and white chert conglomerate. Altered and unaltered chert present. Much gilsonite specks.
- 2460-62 CORED, recovered 1'8"
- (1) 1' gray, coarse to very coarse, rounded to subangular quartz, chert and limestone conglomerate. Dark gray rounded limestone nodules.
  - (2) 8" light gray-green, sandy shale with some white calcite veins.
- 2462-64 CORED, recovered 2'
- (1) 1' light gray to green-gray, very finely crystalline limestone.
  - (2) 1' light green shale and sandy shale.
- 2464-85 Light green to light gray, sandy shale with gray-tan, cryptocrystalline limestone nodules from 2470-85.
- 2485-94 Light green, very fine, calcareous sandstone.

- 2494-2504 Light green to light gray sandy shale.  
 2504-11 Light dirty gray to dirty dark gray to dirty brown, fine to medium, quartzitic, calcareous sandstone. Color may be due to finely disseminated, black to brown mineral.
- 2511-21 CORED, recovered 5' 1"  
 (1) 1½' Gray, fine, slightly calcareous sandstone with a thin interbed of coarse to very coarse, sub-rounded to subangular, gray sandstone. Very faint petroliferous odor on fresh break.  
 (2) 1½' hard green shale. Some sandy.  
 (3) 2' 1" light green, fine to medium, calcareous sandstone becoming fine to medium to coarse toward base.  
 All sandstones in core are tight.
- Our samples have been getting bad from about 2430 on down; therefore I can't vouch for the complete accuracy of my description from 2470-2500.
- 2521-31 CORED, recovered 5'  
 (1) 1½' hard, light gray, medium, subangular to sub-rounded, calcareous sandstone. Abundant black gilsonite or dead oil specks. Abundant white to light green shale inclusions. Gas odor and light distillate stain on fresh breaks. Tight.  
 (2) 3½' medium to coarse sandstone as above. Abundant tan clay (?) inclusions. Odor and light stain as above. Bleeding light tan oil in spots. Tight.  
 Mud cut with gas and light tan oil.
- 2531-41 CORED, recovered 10'  
 (1) 3' hard, light gray, medium, subangular to sub-rounded, crossbedded, calcareous sandstone as above. Gas odor and light distillate stain on breaks. Bleeding light yellow-green oil in spots. Slightly porous to tight. Abundant black dead oil or gilsonite specks.  
 (2) 1' hard, light gray to white, fine calcareous, cross-bedded sandstone. Tight. At base trace of light gray-green sandy shale with dark oil stained spots.  
 (3) 6' light gray, fine to very fine, calcareous sandstone with small green shale inclusions. Good gas odor and light distillate stain on fresh breaks. Bleeding light yellow-green oil in spots. Mostly tight.  
 Mud cut with gas and light yellow-green oil.
- 2541-47 CORED, recovered 5'  
 (1) 3' light gray, hard sandstone as above. Crossbedded. Odor and light stain as above. Bleeding light oil in spots. Mostly tight.  
 (2) 2' sandstone as above with trace of light green, sandy shale to shaly sand. Odor, stain, bleeding spots as above.
- 2547-57 CORED, recovered 5'  
 (1) ½' light gray, medium to coarse, subrounded to sub-angular sandstone with green shale inclusions. Odor and light stain on fresh breaks. Gilsonite or dead oil specks disseminated. Slightly porous to tight.  
 (2) 4' light gray, fine to medium, calcareous sandstone. Tight. Odor, stain, bleeding spots.

- (3)  $\frac{1}{2}$ ' light gray-white, fine to very fine, very limey, soft sandstone. Mostly tight. Abundant large green shale inclusions. Faint gas odor.

2557-70 Red shale, light green shale, and light gray to white to light green, fine, calcareous sandstone and shaly sandstone interbedded.

I believe that the top of the Salt Wash sandstone member of the Morrison formation is at 2504'. Because of the general tightness, calcareous nature, and lack of saturation in the upper part of the Salt Wash, I did not feel it necessary to take a drill stem test. If we should not get any better shows later on, then the Salt Wash might warrant testing.

- 2570-85 Light gray to white to light green, fine to medium, quartzitic sandstone and light green, sandy shale interbedded. Some green, finely crystalline limestone associated. Trace of white to pink chert.
- 2583-96 Light gray, sandy shale with buff to brown limestone nodules.
- 2596-2604 Clear to light gray, fine to medium to coarse, quartzitic, subangular to subrounded sandstone. Trace of white altered chert associated. Also trace of dark brown to orange, unaltered chert.
- 2604-12 Light green and light gray sandy shale.
- 2612-20 Light gray to light brown, subrounded sandstone.
- 2620-30 Light gray to gray, fine to medium, quartzitic sandstone. Some coarse. Trace of translucent to pink chert. Trace of light green shale.
- 2630-35 Light gray, sandy shale.
- 2635-47 Light gray, very finely crystalline limestone streaks associated with light gray to light green to white, fine, calcareous sandstone.
- 2647-53 Light green shale and green shaly limestone to sandy shale and shaly sandstone. White to buff, fine to medium, subangular to subrounded, calcareous, quartzitic sandstone to sandy limestone with some red inclusions.
- 2658-72 Red, calcareous, silty shale to silty, shaly limestone.
- 2672-80 Light green-gray to gray-white, calcareous, silty shale to silty, shaly limestone. Some light gray-tan, dense limestone. Light gray-green, very fine, calcareous sandstone and siltstone at base.
- 2680-85 Red to pink, finely crystalline limestone and red shale.
- 2685-90 Gray, dense limestone. Light gray-white, fine to very fine, calcareous sandstone to silty limestone.
- 2690-2701 Gray to dark gray to gray-brown, medium, subangular to subrounded, quartzitic and calcareous sandstone. Trace of dark brown, dead oil stain.
- 2701-05 $\frac{1}{2}$  CORED, recovered 3'4"
- (1) 4" light gray-brown, very fine, quartzitic sandstone and siltstone. In part very micaceous.
- (2) 2' gray to dark gray, fine to medium, subrounded to rounded, slightly calcareous sandstone. Some quartzitic. Spots and streaks of black to brown dead oil stain. Oily taste and slight odor. Saturated in spots with water. Slightly porous in spots. Mostly tight.

- (3) 1 white, calcareous, fine to medium, sub-  
rounded to rounded, tight sandstone.
- 2705 $\frac{1}{2}$ -10 CORED, recovered 4 $\frac{1}{2}$ '
- (1) 1' dark gray-green mudstone. Some finely sandy.  
Very hard.
- (2) 2' light gray, very hard, crossbedded, very  
fine, calcareous and quartzitic sandstone.
- (3) 1'3" top 3" dark green, very hard, mudstone. Some  
slightly sandy, grading into 1' dark red, very  
hard, slightly sandy and micaceous mudstone.
- (4) 3" light green, very hard, slightly micaceous mud-  
stone. Quartzitic in part.
- 2710-17 Red shale and mudstone.
- 2717-20 Red to pink, very finely crystalline limestone.
- 2720-27 Red to pink, fine to medium, subrounded to subangular, calcareous  
sandstone.
- 2727-35 Red shale with red to pink limestone interbed.
- 2735-41 Green sandy shale.
- 2741-49 Buff to clear, medium to coarse, subangular to subrounded sand.  
Some soft, white gypsum (?). Gilsonite (?) specks throughout.
- 2749-55 CORED, recovered 3' gray to clear, rounded to subrounded,  
slightly to fairly porous sandstone. Dark brown dead oil (?)  
specks throughout. Seems to be a water sand.
- 2755-65 CORED, recovered 4 $\frac{1}{2}$ ' light gray to light tan, medium sandstone  
as above. Dark brown dead oil specks throughout. Seems to be  
a water sand.
- 2765-80 Gray to light tan, medium to coarse, subangular to subrounded  
sandstone. Dead oil (?) stained specks.
- 2780-90 Gray to light tan sandstone as above. Dead oil (?) stained  
specks. Some dark brown quartzitic sandstone.
- 2790-2800 Gray to dirty gray-brown medium sandstone as above. Some  
dead oil (?) stained specks. Much white, soft mineral.  
(Gypsum (?) or altered chert ?).
- 2800-23 Light gray to white sandstone as above. Some dirty brown streaks  
Much soft, white mineral as above. Around 2815 black specks  
of asphalt or gilsonite begin to appear between grains.
- 2823-33 CORED, recovered 2 $\frac{1}{2}$ ' Top --- Light tan to buff, medium  
to coarse, subangular to subrounded, slightly porous sandstone.  
Trace of green shale parting. Bottom---Light gray to white  
medium sandstone as above. Slight to fair porosity. Black  
asphalt or gilsonite specks scattered among grains.
- 2833-60 Light tan to dirty brown, medium to coarse, sandstone as in  
core. Some coarse, rounded, frosted and pitted grains.  
Black asphaltic or gilsonitic specks among some grains.

The top of the Entrada is at 2741' according to drilling time and samples.  
In the July 16th report I called this sand Morrison (?).

As yet I have seen none of the orange-red color so often used in describing  
the Entrada.

If the section from 2093 to 2741 is all assigned to the Morrison, then 643'  
of Morrison is present, or about 45' less than in the Utah Oil #2., 30-20S-22E.

There is a possibility, however, that the section from 2708 to 2741 is Summerville. In this case 615' of Morrison is present and 83' of Summerville. In either instance it is obvious that our section has thinned up.

2860-80 or Light gray to dirty gray sandstone as above. Asphaltic or gilsonitic specks scattered throughout. Trace of clear translucent chert.

2880-2905 Gray to white sandstone as above.

2905-97 Buff to light tan, fine to coarse, rounded to subrounded sand and sandstone. Coarse grains are frosted and pitted. Trace of fine, orange sandstone at 2960-70.

2997-3007 CORED, recovered 10'

(1) 4' Buff, fine to medium, rounded to subrounded, soft sand with argillaceous sand streaks.

(2) 6' Buff, fine to medium, rounded to subrounded, sandstone with coarse, rounded and frosted grains throughout.

3007-90 Buff, fine to medium to coarse sand and sandstone as above. Some pink-buff grains. Trace of pink-white chalcedony.

3090-3100 Buff, fine to coarse, rounded to subrounded soft sand and sandstone as above. CORED, recovered 6'

Yesterday I went into the Colorado canyon country southwest of Cisco and took a first hand look at the section exposed there. In addition I collected hand samples and gave them a bit of study.

From this rather cursory study I have concluded that in our well no Carmel is present. I believe that the Entrada rests upon the Navajo and that the contact between these two formations is rather difficult to determine. The hand specimens I have show the Entrada and Navajo to be very similar in character. However, the grain size of the Navajo seems to be distributed over a greater range than that in the Entrada. Furthermore, there seems to be a large number of very coarse, rounded grains in the Navajo. On the basis of these two differences I believe that the top of the Navajo is at 2905'.

3100-50 Light gray to white to buff sand and sandstone as above.

3150-60 CORED, recovered 9' 8" Light buff, fine to medium to coarse, rounded to subrounded sandstone. Few scattered pink grains.

3160-72 Buff to white, fine to medium to coarse sandstone as above.

3172-76 Red, very fine sandstone with some mica.

3176-87 CORED, recovered 11'

(1) 1 gray-tan, mottled pinkish gray, very fine, slightly calcareous, very micaceous, quartzitic siltstone. Abundant muscovite.

(2) 4' red to pink, very fine sandstone.

(3) 4' red to pink sandstone as above with light green-white spots. Some white, medium crystalline calcite spots.

(4) 2 Red to pink, very fine to fine, with medium to coarse, rounded to subrounded grains associated.

3187-93 Red to pink sandstone as in core.

3193-3200 Buff-pink, fine, sandstone with some medium to coarse, rounded to subrounded grains.

I am tentatively calling the formation we are now drilling the Kayenta and place the top (according to drilling time and samples) at 3172'.

|           |  |
|-----------|--|
| 3200-3220 | Buff-pink sandstone as above.  |
| 3220-50   | Buff, fine to medium to coarse sandstone as above.   |
| 3250-60   | Buff to white sandstone as above. Much black mineral scattered among some grains.  |
| 3260-70   | Buff to white sandstone as above. Much hard and quartzitic. Trace of small green shale inclusions.   |
| 3270-80   | Buff, fine sandstone. Some medium to coarse, rounded to subrounded.  |
| 3280-90   | Light buff-pink, fine, sandstone with some muscovite flakes. Some light green shaly sandstone.   |
| 3290-3300 | Light buff-white to light gray, fine to very fine, micaceous sandstone. Some light green, micaceous, shaly sandstone.  |
| 3300-10   | Light buff to light buff-pink, fine to very fine, micaceous sandstone.   |
| 3310-20   | White, fine to medium, quartzitic sandstone with some small green shale inclusions. A thin interbed of very fine, red, micaceous siltstone and sandstone and shale.  |
| 3320-25   | CORED, recovered 4½'   |
|           | (1) 2½' Light green-white to light gray-white, very micaceous, fine to very fine sandstone. Some quartzitic. Muscovite abundant. Small amount of green mica. Abundant small, green shale inclusions and streaks. Many pink grains. |
|           | (2) 1' Red to green, very fine, very micaceous, quartzitic siltstone. Muscovite abundant. Some green mica present.   |
|           | (3) 1' Maroon, micaceous shale.  |

In my report of July 20 I stated that I did not believe any Carmel was present in our well. I should like to revise this statement, for it would appear that the section from 3172 to 3193 is Carmel.

At this writing the following facts seem to be true:

1. Top of Carmel ... 3172 (according to drilling time and samples)
2. Top of Navajo ... 3193 (according to samples)
3. According to the cuttings the Carmel seems to grade into the Navajo.

|         |  |
|---------|--|
| 3325-28 | Light gray-white, fine sandstone. Very micaceous.  |
| 3328-37 | CORED, recovered 9'  |
|         | (1) 8'9" Brick red, mudstone and shale with some mica. Some very finely silty and quartzitic.  |
|         | (2) 4" Light green, very fine, quartzitic siltstone.   |
| 3337-44 | CORED, recovered 7'  |
|         | (1) 1' Dark red to salmon pink, very fine, very micaceous siltstone and shale with some light green, very fine, quartzitic siltstone at top and base. Bedding planes suggest thin lensing. |
|         | (2) 5' Brick red to salmon pink, very fine, very micaceous siltstone and shale. Bedding planes suggest thin lensing.   |
|         | (3) 1' Same as (1).  |

- 3344-45 Same as lower part of above core.  
 3345-65 Light pinkish lavender, medium to coarse, angular to sub-angular, very micaceous sandstone, with green shale pillets and red shale inclusions. Some quartzitic.

Apparently, as is often the case, the Navajo-Kayenta contact is transitional. We were definitely in the Kayenta at 3324; however, the top of the Kayenta may be as high as 3262.

- 3365-76 Light pinkish lavender, medium to coarse sandstone as above.  
 3376-84 Green shale.  
 3384-90 Light pinkish lavender to pink-red, medium to coarse, sub-angular to sub-rounded sandstone. Some quartzitic. Some very coarse grains.  
 3400-10 Sandstone as above with red shale interbedded.  
 3410-20 Sandstone as above.  
 3420-30 Light pinkish lavender to pink-red, micaceous sandstone as above. Some quartzitic. Green shale pillets included.  
 3430-40 Light pink-white sandstone, medium to coarse, subangular to subrounded. Some green shale pillets. inter  
 3440-60 Light orange-pink sandstone as above. Thin bed of red, fine to medium, micaceous sandstone and shale at 3450.  
 3460-78 Light pink-white, medium sandstone as above.  
 3478-90 Buff to buff-pink, fine to medium, subangular to angular sand and sandstone with pink grains. Some fine, red to pink sandstone.  
 3490-3500 Same as above with trace of light gray, finely crystalline limestone.  
 3500-30 Buff to buff-pink, medium sandstone as above. Some sub-rounded, orange sandstone.  
 3535-45 CORED, recovered 10'  
     (1) 4' Buff-pink with buff-lavender streaks, fine, subrounded to subangular, highly crossbedded sandstone. Abundant pink grains and black specks.  
     (2) 1' Pink-red, fine, subangular, hard sandstone. Crossbedded. Some medium grains.  
     (3) 5' Sandstone as in (1). Some interbedded and crossbedded, light pink-orange, subrounded, medium to coarse sandstone.  
 3545-50 Light pink, fine sandstone with some mica.  
 3550-80 Light pink-orange to light pink, medium, subrounded sandstone. Some fine, light pink sandstone.  
 3580-90 Fine, pink sandstone.  
 3590-3600 Light pink-orange to light pink, medium, subrounded sandstone.  
 3600-10 Fine to medium sandstone as above. Some purple-green, finely crystalline limestone nodules.  
 3610-40 Subrounded to subangular sand and sandstone as above.  
 3640-50 Pink, fine to very fine, slightly micaceous sandstone.  
 3650-58 Light pink-orange sandstone. Fine to medium, subrounded to subangular.  
 3658-65 Light red to pink, fine, subrounded sandstone.  
 3665-95 Light pink-orange to light pink, medium, subrounded sandstone. Some coarse.  
 3695-3700 Light red to pink, fine, subrounded sandstone.  
 3700-10 Light pink-orange to lightpink, medium to coarse, subrounded sandstone.

|  |   |
|--|---|
| 3344-45  | Same as lower part of above core.   |
| 3345-65  | Light pinkish lavender, medium to coarse, angular to sub-angular, very micaceous sandstone, with green shale pellets and red shale inclusions. Some quartzitic. |
| Apparently, as is often the case, the Navajo-Kayenta contact is transitional. We were definitely in the Kayenta at 3324; however, the top of the Kayenta may be as high as 3262. |   |
| 3365-76  | Light pinkish lavender, medium to coarse sandstone as above.  |
| 3376-84  | Green shale.  |
| 3384-90  | Light pinkish lavender to white sandstone as above.   |
| 3990-3400  | Light pinkish lavender to pink-red, medium to coarse, sub-angular to sub-rounded sandstone. Some quartzitic. Some very coarse grains.                           |
| 3400-10  | Sandstone as above with red shale interbedded.  |
| 3410-20  | Sandstone as above.   |
| 3420-30  | Light pinkish lavender to pink-red, micaceous sandstone as above. Some quartzitic. Green shale pellets included.  |
| 3430-40  | Light pink-white sandstone, medium to coarse, subangular to subrounded. Some green shale pellets.   |
| 3440-60  | Light orange-pink sandstone as above. Thin interbed of red, fine <del>light</del> to medium, micaceous sandstone & shale at 3450.                               |
| 3460-78  | Light pink-white, medium sandstone as above.  |
| 3478-90  | Buff to buff-pink, fine to medium, subangular to angular sand and sandstone with pink grains. Some fine, red to pink ss.  |
| 3490-3500  | Same as above with trace of light gray, finely crystalline limestone. /grains   |
| 3500-36  | Buff to buff-pink, medium sandstone as above. Some subrounded   |
| 3530-35  | Same as above. Some coarse, subrounded, orange sandstone.   |
| 3535-45  | CORED, recovered 10'  |
|  | (1) 4' Buff-pink with buff-lavender streaks, fine, subrounded to subangular, highly crossbedded sandstone. Abundant pink grains and black speck                 |
|  | (2) 1' Pink-red, fine, subangular, hard sandstone. Crossbedded. Some medium grains.   |
|  | (3) 5' Sandstone as in (1). Some interbedded and cross bedded, light pink-orange, subrounded, medium to coarse sandstone.                                       |
| 3545-50  | Light pink, fine sandstone with some mica.  |
| 3550-80  | Light pink-orange to light pink, medium, subrounded sandstone. Some fine, light pink sandstone.   |
| 3580-90  | Fine, pink sandstone.   |
| 3590-3600  | Light pink-orange to light pink, medium, subrounded sandstone.  |
| 3600-10  | Fine to medium sandstone as above. Some purple-green, finely crystalline limestone nodules.   |
| 3610-40  | Subrounded to subangular sand and sandstone as above.   |
| 3640-50  | Pink, fine to very fine, slightly micaceous sandstone.  |
| 3650-58  | Light pink-orange sandstone. Fine to medium, subrounded to subangular.  |
| 3658-65  | Light red to pink, fine, subrounded sandstone.  |
| 3665-95  | Light pink-orange to light pink, medium, subrounded sandstone. Some coarse.   |
| 3695-3700  | Light red to pink, fine, subrounded sandstone.  |
| 3700-10  | Light pink-orange to light pink, medium to coarse, subrounded sandstone.  |

|           |  |
|-----------|--|
| 3710-20   | Light pink-orange to light pink, medium, subrounded sandstone. Some light red, fine sandstone.   |
| 3720-30   | Same as above with a thin bed of light gray, very finely crystalline limestone.  |
| 3730-37   | Sandstone as above.  |
| 3737-42   | CORED, recovered 2'  |
|           | (1) $\frac{1}{2}$ ' Light pink-orange, fine to medium, subangular to subrounded, thin-bedded sandstone.  |
|           | (2) $1\frac{1}{2}$ ' Light pink-orange to red, fine to medium, argillaceous sand and sandstone to sandy clay. Fragments of light pink to red, fine, micaceous sandstone included. Light gray-white chert fragments abundant in a light gray shale which seems to be intimately mixed with the above sand. All this mixture may be due to worn out core head grinding cavings and sandstone fragments into a sandy drilling mud matrix. |
| 3742-45   | Pink to red, fine sandstone.   |
| 3745-50   | Light gray-green, dense, nodular limestone associated with some green shale. Some red-brown limestone nodules.   |
| 3750-70   | Light pink to pink orange, fine to medium sandstone. Abundant soft, pink-white gypsum.   |
| 3770-80   | Buff-pink, fine sandstone. Some medium.  |
| 3780-85   | Pink to red, fine to very fine sandstone. Much quartzitic. Some white, fine, quartzitic sandstone. Much buff-pink, very fine, quartzitic sandstone with light green shale flakes associated.   |
| 3785-90   | Brick red shale. Some very finely micaceous.   |
| 3790-96   | Pink to red, fine to very fine sandstone as above.   |
| 3796-3800 | Light pink-white to buff-pink, fine to very fine, quartzitic sandstone with some light green shale flakes.   |
| 3800-07   | Light buff-pink, fine to very fine, quartzitic sandstone. Some fine, red sandstone with some red shale associated.   |
| 3807-12   | Red shale. Some micaceous.   |
| 3812-20   | White, very fine, slightly micaceous sandstone interbedded with red to pink, calcareous and micaceous sandstone.   |
| 3820-30   | Red, very fine, calcareous sandstone and siltstone. Some shaly.  |
| 3830-34   | Red shale.   |
| 3834-40   | Red siltstone and sandstone as above.  |
| 3840-60   | Brick red, very fine, shaly, calcareous siltstone and sandstone to silty shale.  |
| 3860-69   | Sandstone as above. Slight trace of purple mottled green, dense, nodular limestone.  |
| 3869-80   | Red-brown, very fine, calcareous shaly siltstone.  |

At 3478 there is a marked change in the drilling time and a slight change in the lithology. I believe that this is the top of the Wingate sandstone.

As you know, the contact between the Wingate and the Chinle is sharp in some places and transitional in others. At 3780 there is a slight change in drilling time and a definite change in lithology. Again there is a change in drilling time at 3807, more marked than at 3780. It is possible that the section between these two depths represents a transitional zone between the Wingate and the Chinle. However, I am inclined to place the Wingate-Chinle contact at 3780. Top Chinle.

In our well the Glen Canyon group is not less than 587' thick and not more than 635' thick. In the Utah Southern #1 State the thickness of the Glen Canyon, according to the cross section I have, is about 630'. It would appear, therefore, that this group of formations thins to the north in about the same degree as it thins to the east. This fact may be an indication as to what we will go into after the Chinle. In any event, the next 250' should prove extremely interesting.

- 3880-3930 Red-brown, very fine, shaly siltstone as above. Trace of gray, dense limestone at 3904.
- 3930-43 Reddish chocolate to red-brown, very fine, calcareous siltstone\*and limestone pellets surrounded by a pink-white limestone matrix. Some coarse, rounded quartz grains. Appears conglomeritic. \*(and round, calcareous siltstone),
- 3943-50 Light green to white, very micaceous, waxy, slightly silty clay with coarse quartz grains included. Much very coarse, clear to red, quartz grains. Some pink-orange, translucent chert. Some brown-red, very micaceous, shaly siltstone.
- 3950-80 Brown-red, very micaceous, shaly siltstone and clay. Some slightly calcareous. Abundant biotite and muscovite. Light green, micaceous, waxy clay associated.
- 3980-90 Red to pink, very fine, very micaceous, shaly siltstone and sandstone. Some shale. Some light gray, clayey silt.
- 3990-96 Red-brown as above. Some very coarse, slightly arkosic, quartz conglomerate.
- 3996-4004 CORED, recovered 8'
- (1) 4' Brown-red to chocolate, very fine, thin bedded shaly siltstone with abundant biotite and muscovite aligned parallel to bedding planes. Thin lenses, streaks, and beds of very coarse, slightly arkosic, quartz conglomerate. Quartz pebbles are subrounded to subangular and are clear to red in color. Abundant large flakes of muscovite and biotite and some feldspar grains are associated. White limestone serves as cementing agent in places. Some red to light green shale is included.
- (2) 3'8" Pink to red-brown, very fine, thin bedded, very micaceous siltstone. Some bedding planes are wavy. Some chocolate brown, micaceous mudstone and silty mudstone is present. The contact between the pink and chocolate is irregular, suggesting channeling. Some streaks of very coarse quartz grains.
- (3) 4" Very coarse, clear to red quartz grains, biotite, muscovite, slightly arkosic conglomerate. Trace of orthoclase. Trace of hornblende. Calcareous cementing material. Cross-bedded at top. Light green to white to red-brown in color.
- 4004-10 Slightly arkosic quartz conglomerate as in core.
- 4010-30 Red-brown, very fine, calcareous, very micaceous, shaly siltstone and siltstone. Some slightly arkosic conglomerate streaks.
- 4030-40 Light chocolate to tan, very fine, calcareous, micaceous siltstone and sandstone.
- 4040-43 Red-brown, very fine, very micaceous siltstone and silty mudstone.
- 4043-50 Slightly arkosic quartz conglomerate as above.

I believe we are now in the Moenkopi and am inclined to place the top at 3943.

4050-60 Light gray, very coarse arkose. Quartz grains, white to pink feldspar, biotite, muscovite, and green mica. Some fine, light gray-green, micaceous sandstone associated.

4060-4100 As above. White feldspar.

4100-30 As above. White to pink feldspar. Granite fragments. Grains predominantly angular.

4130-50 Light gray arkose. Quartz, white feldspar, biotite, muscovite, and abundant green mica. Some chlorite (?). Some ferromagnesian mineral.

4150-30 Light gray to pink arkose as above. White to pink feldspar. Granite or pegmatic fragments.

The arkose we are drilling in would appear to be the Cutler, although it lacks the characteristic light purple color of the Cutler. On the basis of samples I would place the top at 4043.

4180-4280 Arkose as above. Some granite or pegmatite fragments.

4280-89 Arkose as above.

4289-4390 Arkose as above. Sample from 4380-90 contains some fragments that are mineralized with a dark gray, metallic mineral.

4390-4417 Arkose as above.

4417-4422 CORED, recovered 2' Coarsely crystalline biotite granite. Some chlorite. A dearth of quartz. Abundant green mica and pink feldspar. The drilling time does not indicate that granite is being drilled. For this reason this core may represent one of the following:

- (1) A relatively soft weathered zone resting on fresh granite. However, there is no evidence of weathering in the sample.
- (2) A zone of granite boulders in arkosic material.
- (3) Reconsolidated granite wash. This seems unlikely as the grains interlock as in an igneous rock.

4422-4470 Arkose (?) as above. Abundant granite fragments.

4470-4510 Arkose (?) as above. Abundant pink feldspar.

4510-4550 Arkose (?) as above.

4550-54 CORED, Rec. 1  
Coarsely crystalline biotite and green mica granite. Highly fractured with evidence of weathering along fracture planes. Also secondary deposition of chlorite, green clay, reddish clay, and white calcareous material. These are deposited as thin films. Fracturing often occurs along feldspar planes which are generally coated with a light pink to red clayey material. Fracture planes show rounding, or abrasion. The fractures intersect. Dips on fracture planes vary as follows:

- (1) One piece exhibits a dip of 42 degrees to 43 degrees.
- (2) A second piece exhibits dips ranging from 47, to 48 to 69 to 90 degrees.

4554-57 CORED, Red. 1½' Granite as above. Fracture plane dips of 20 degrees and 63 degrees recorded.

4557-60 Arkose (?) as above.

4560-80 As above. Abundant white, powdery clay (decomposed feldspar?)

4580-4630 Arkose (?) as above. Abundant white powdery clay (decomposed feldspar?)

4630-50 Arkose (?) as above. Some white to pink, powdery clay (decomposed feldspar?)

4650-90 Arkose (?) as above.  
4690-4738 Granite as above.  
4738-4743 CORED, recovered  $1\frac{1}{2}$ ' Coarsely crystalline, biotite, and green mica granite as above.

\*\*\*\*\*

A copy of Mr. W. O. Ham's letter (under date of August 21, 1944) to Mr. A. E. Brainerd with cc to Mr. Krueger, precedes the above well log on Cisco Dome.