

Geol. Services

Walbel

Marion Co., Oregon

Breitenbush

Sunoco Energy Development Co.

U.S.A. 58-28

For Drill Hole

DAILY REPORTS

BREITENBUSH GEOTHERMAL PROSPECT

DAILY REPORT

SUNEDCO: Cascade Project

ID 94 ft.

Δ TD (24 hr) 7 ft.

Day 2

Time 0600

Date 2 Oct 1981

Current Status

Drilling ahead

Drilling Rates

87-94 ft. 0.75-1.0 ft/hr

Drilling Breaks

Lithology

87-94 ft. Dark gray aphanitic olivine microporphyratic basalt.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in

71°F

out

74°F

max/min

50 in, 52° out @ spud

visc. 35

wt. 8.7

filt.

LCM (lbs/bbl) 0

alk.

pH

CI

PP

1600psi

SPM

105

Mud Loss/Gain

Surveys

add comments on back of page

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DAILY REPORT

Day 3 Time 0600 Date 3 Oct 1981 TD 146 ft. Δ TD (24 hr) 52 ft.

Current Status Reaming to bottom

Drilling Rates Drilling Breaks

94-100 ft. 2.1 ft/hr  
100-110 ft. 11.5 ft/hr  
110-135 ft. 8.0 ft/hr

Lithology 94-146 ft. Dark gray aphanitic olivine microporphyratic basalt.

Gases

CO<sub>2</sub> N/D max/min  
H<sub>2</sub>S N/D  
C<sub>1</sub> N/D

Mud

Temp. in 72°F out 74°F  
max/min 74°F in, 74°F out @ 140 ft.

visc. 33 wt. 8.2 filt. 17 LCM (lbs/bbl) 0  
alk. 3 pH 9.0 CI < 50 PP 500 psi SPM 95  
MOB: 15,000 # RPM: 30-50

Mud Loss/Gain

Surveys 1° @ 119 ft.

POOH @ 146 Change BHA: add reamer, RIH: hit bridge @ 97 ft.

DAILY REPORT

SUNEDCO: Cascade Project

Date 4 Oct. 1981

Time 0600

Day 4

Δ TD (24 hr) 49 ft.

TD 195 ft.

Drilling ahead

Current Status

Drilling Breaks

Drilling Rates

155-160 ft. 14 ft/hr

146-195 ft. 2.5-6 ft/hr

Lithology 146-195 ft. Dark gray aphanitic olivine microporphyrritic basalt.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

80° F

out

82° F

max/min

min 74° F out @ 146 ft.

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

Cl

PP

SPM

Mud Loss/Gain

none observed

Surveys

184 ft. deviation 7/8°, no direction

DAILY REPORT

Date 5 Oct 1981

Time 0600

Day 5

Δ TD (24 hr) 55 ft.

TD 250 ft.

Current Status Drilling ahead

BMT 115 ft. 4 1/4 hr. 3/1/I

NB2 Sec M44N 16/16/18

Drilling Rates Drilling Breaks

195-216 ft. 2.5 ft/hr

216-221 ft. 5.8 ft/hr

221-238 ft. 15.5 ft/hr

238-249 ft. 1-2 ft/hr

Torquing, Increase WOB

Lithology 195-250 ft. Dark gray aphanitic basalt w/ tr. olivine microphenocrysts

altering to hematite and iddingsite; locally groundmass plagioclase laths are

sub-parallel; minor to tr. serpenitized shear plains, commonly associated w/

fine cxln pyrite; locally groundmass plag. and glass altered to very light

gray clay.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 78°F

out 79°F

max/min 72° min. @ 240, 84° max. @ 210

visc. 39 wt. 8.7 filit. 14 LCM (lbs/bbl) 0

alk. .2 pH 8.5 CI < 50 PP 500 psl SPM 100

WOB: 15-20,000# RPM: 15-20

Mud Loss/Gain None detected

Surveys 184 ft. 7/8

add comments on back of page

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DAILY REPORT

Date 6 Oct. 1981

Time 0600

Day 6

Δ TD (24 hr) 45 ft.

TD 294 ft.

Drilling ahead

Current Status

Drilling Breaks

Drilling Rates

249-265 ft. 5.5 ft/hr

265-294 ft. 1.5-2.5 ft/hr

MOB 30; RPM 40-50

Lithology 249-294 ft. Dark gray aphanitic olivine microporphyrilic basalt.

The olivine is altering to hematite and iddingsite. Locally the groundmass is altered to light gray clay. Other secondary minerals include antigorite and pyrite.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

Mud

Temp.

in

86° F

out

87° F

max/min

min 78° F out @ 250 ft.

visc.

43

wt. 8.9

filt. 14

LCM (lbs/bbl)

none

alk.

.1

pH 8.5

CI < 100

PP 500-650

SPM 128

Mud Loss/Gain none observed

Surveys 223 ft. deviation 1°, 55M

DAILY REPORT

Day 7 Time 0600 Date 6 Oct. 1981 TD 342 ft. Δ TD (24 hr) 48 ft.

Current Status POOH: preparing to open hole to 26 in.

Drilling Rates 294-315 ft. 2-5 ft/hr Drilling Breaks

315-342 ft. 7-12 ft/hr

Lithology 294-320 ft. Dark gray aphanitic basalt w/ secondary pyrite.

320-342 ft. Dark gray to exl lithic basaltic tuff. Cxl component consists of

plagioclase fragments. Lithics are dark gray to reddish volcanic fragments!

usually under 5 mm; and make up 20% of the rock volume. Fine disseminated

pyrite is common.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 86° F

out 88° F

max/min max 93° F @ 337 ft., adding water below 337 ft.

visc. 40 wt. 8.9 filt. LCM (lbs/bbl) none

alk. 0.1 pH 8.5 CI <50 PF 650 SPM 130

Mud Loss/Gain none observed

Surveys

SUNEDCO: Cascade Project

DAILY REPORT

USA 58-28

Day 15 Time 0600 Date 15 Oct 1981

TD 342 ft.

Δ TD (24 hr) 0 ft.

Current Status

Remaining to bottom @ 342 ft.

Drilling Rates

Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

Mud

Temp. in

61° F

out

62° F right after drilling through casing shoe @ 288 ft.

max/min

visc. 41

wt. 8.7

filc.

LCM (lbs/bbl) 0

alk. 1.2

pH 12.5

CI <100

PP 200 psi

SPM 125

Mud Loss/Gain none

Surveys none

WOB: 10,000# RPM: 35-40

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DAILY REPORT

Day 16 Time 0600 Date 16 Oct 1981 TD508 ft. Δ TD (24 hr) 166 ft.

Current Status RIM after adding money to BHA

Drilling Rates

Drilling Breaks

342-375 ft. 14.3 ft/hr

495-508 ft. 10 ft/hr

375-385 ft. 3.5 ft/hr

385-490 ft. 17 ft/hr

490-495 ft. 3.7 ft/hr

Lithology 342-370 ft. Dk gray to gray fossil, pyrite bearing lithic tuffaceous

sediments. 370-390 ft. Dark gray aphanitic olivine, plag. porphyritic basalt.

390-492 ft. Dark gray to brown gray pyrite bearing, locally carbonaceous, tuffs

and exl lithic tuffs.

492-496 ft. Dark gray aphanitic olivine, plag. porphyritic basalt.

496-508 ft. Dark gray to brown gray tuffs and exl lithic tuffs.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 75° F

out 76° F

max/min

76° max. @ 500 ft., 61° min. @ 350 ft. when back drilling

visc. 41

wt. 8.7

filt. 24

LCM (lbs/bbl) 0

alk. 1.2 pH 12.5 CI < 100 PP 400 psi SPM 100

WOB: 15-20,000# RPM: 55

Mud Loss/Gain none

Surveys none

Date 17 Oct 1981

Time 0600

Day 17

Δ TD (24 hr) 232 ft.

TD 240 ft.

Current Status Drilling ahead

Drilling Breaks

Drilling Rates

508-680 ft 15-17 ft/hr

680-700 ft 6.6 ft/hr

700-739 ft 19 ft/hr

Lithology 508-685 ft. Dark gray to brown gray pyrite bearing, locally carbonaceous tuffs and cxi lithic tuffs.

685-700 ft. Dark gray aphanitic olivine lag. porphyritic basalt.

700-740 ft. Gray to brown pyrite bearing cxi and lithic tuff, grading to strongly

montmorillonite altered, locally carbonaceous fine grained tuffaceous sediments.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

80°F

out

80°F

max/min

87° max. @ 660 ft, 74° min. @ 520 ft.

visc. 43

wt. 9.0

filt. 21

LCM (lbs/bbl) 0

alk. 6

pH 11.5

CI < 100

PP 400

psi 400

SPM 125

WOB: 30,000#

RPM: 75

Mud Loss/Gain None

Surveys

3/4° @ 455 ft.

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Day 18 Time 0600 Date 18 Oct 1981 TD 1006 ft. Δ TD (24 hr) 267 ft.

Current Status Drilling ahead

Drilling Rates

739-890 ft 14.5 ft/hr

890-900 ft 7 ft/hr

900-925 ft 11.6 ft/hr

925-935 ft 8.7 ft/hr

955-1006 ft 15 ft/hr

940-955 ft 8 ft/hr

935-940 ft 15 ft/hr

Lithology 740-800 ft. Gray to brown slightly carbonaceous fine grained tuff-aceous sediments w/ abundant secondary montmorillonite.

800-820 ft. Gray to dark gray cgl bearing cemented mafic tuff.

820-1006 ft. Brown to gray to light gray locally carbonaceous montmorillonite rich fine grained tuffaceous sediments w/ minor secondary pyrite.

Gases

CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 88° F

out 90° F

max/min

90° max. @ 1006 ft, 77° min. @ 750 ft, adding water.

visc. 39 wt. 9.1 filt. 12 LCM (lbs/bbl)

alk. .2 pH 11.0 CI <50 PP 600 psi SPM 120

MOB: 30,000# RPM: 75

Mud Loss/Gain None observed.

Surveys 695 ft. ½° N3E 935 ft. 1° N44W

Day 19 Time 0600 Date 19 Oct 1981 TD 1234 ft. Δ TD (24 hr) 228 ft.

Current Status

DN3 out @ 1044 ft. 44½ hrs, 649 ft, 4/6/I

NB4 SEC 17½ S84 16/16/18 In @ 1044 ft.

Drilling Rates

Drilling Breaks

1000-1040 ft 11 ft/hr

1040-1160 ft 28 ft/hr

1160-1120 ft 15 ft/hr

1190-1220 ft 31 ft/hr

Lithology 1006-1060 ft. Brown to gray, locally carbonaceous, montmorillonite rich tuffaceous sediments.

1060-1130 ft. Dark gray aphanitic olivine plag. porphyritic basalt.

1130-1180 ft. Brown to gray montmorillonite rich exl lithic mafic tuffaceous sed.

1180-1234 ft. Dark green to green gray qtz, hornblende, bearing euhedral exl

Lithic tuff.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

Cl

N/D

Mud

Temp. in 108°F

out 110°F

max/min

108/110

92/94

visc. 43

wt. 9.2

filt.

LCM (lbs/bbl) 0

alk. 0.1

pH 9.0

Cl

< 50

pp

1450

SPM

175

Mud Loss/Gain

Surveys

add comments on back of page

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DAILY REPORT

USA 58-28

Date 20 Oct 1981

Time 0600

Day 20

Δ TD (24 hr) 409 ft.

TD1643 ft.

Current status Drilling ahead

Drilling Breaks

Drilling Rates

1230-1246 ft 10 ft/hr	1425-1550 ft 30 ft/hr
1246-1250 ft 60 ft/hr	1550-1560 ft 11 ft/hr
1250-1364 ft 32 ft/hr	1560-1610 ft 27 ft/hr
1364-1425 ft 19 ft/hr	1610-1643 ft 19 ft/hr slowed to wrk on shkr

Lithology 1234-1510 ft Gray to green gray, locally brown gray, locally entaxitic

oxl bearing lithic turf. 1510-1535 ft: Dark green gray aphanitic micro-porphyrithic

andesite. 1535-1643 ft: Dark gray to brown gray to light green gray cxl bearing

lithic cemented turf.

Gases

CO <sub>2</sub>	N/D	max/min
H <sub>2</sub> S	N/D	
C <sub>1</sub>	N/D	
Temp.	in 116°F	out 120°F
	122/124 @ 1430 ft, 106/107 @ 1470, adding water.	

Mud Loss/Gain

Surveys 1435 ft. Deviation 3°, N24W

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Geol. Services

Date 21 Oct 1981

Time 0600

Day 21

△ TD (24 hr) 291

TD 1934 ft.

Current Status Drilling ahead.

Drilling Breaks

Drilling Rates

1921-1923 ft. 40 ft/hr

1643-1870 ft. 12-20 ft/hr

1923-1932 ft. 24 ft/hr

1870-1880 ft. 25 ft/hr

1932-1934 ft. 17 ft/hr

1880-1890 ft. 17 ft/hr

1890-1921 ft. 17 ft/hr

Lithology 1643-1760 ft. Green gray to gray locally brown clay altered cemented tuff. 1760-1850 ft. Purple gray eutaxitic crystal welded tuff. 1850-1900 ft. Green gray to gray, locally purple gray cxi bearing lithic cemented tuff. 1900-1934 ft. Dark gray to gray vesicular aphanitic plagioclase porphyritic andesite.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

CI N/D

Mud

Temp. in 128° F

out

130° F

max/min

118° in, 120° out @ 1650 ft.

visc. 37

wt. 9.3

filt.

LCM (lbs/bbl) 0

alk. pH 9.5

CI < 50

PP 1500 psi

SPM 172

0

Mud Loss/Gain

20 BBL/hr over shaker, declined @ 1922 ft. due to water gain down hole. Inflow measured at 15 BBL/hr by logger.

Surveys

1765 ft 2° N69W

1860 ft. 1.75° N55W

Current Status Drilling ahead

Drilling Rates  
 1934-2005 ft 17 ft/hr  
 2005-2012 ft 14 ft/hr  
 2076-2160 ft 13 ft/hr  
 2035-2076 ft 32 ft/hr

~~Drilling Breaks~~

Lithology 1934-2000 ft. Dark gray to gray, locally vesicular aphanitic  
 plagioclase porphyritic andesite.

2000-2295 ft. Green gray locally autoxic and welded lithic bearing tuff w/  
 trace clear angular feldspar cxi fragments.

Gases CO<sub>2</sub> N/D  
 H<sub>2</sub>S N/D  
 C<sub>1</sub> N/D

Mud Temp. in 130° F out 134° F

max/min 106/138 @ 2140 ft. 121/130 @ 2020 ft.

visc. 42 wt. 9.2 filt. LCM (lbs/bbl) 0  
 alk. 0.1 pH 9.0 CI <50 RP 1800 psi SPM 195

Mud Loss/Gain 30 BBL loss @ 20 BBL/hr starting @ 1962 ft.

Surveys 1971 ft. 1° N37W  
 2125 ft 1 1/2° S69W

Day 23

Time 0600

Date 23 Oct. 1981

TD 2575 ft.

Δ TD (24 hr) 280 ft.

Current Status Drilling ahead

Drilling Rates

2295-2312 ft.	23 ft/hr
2316-2337 ft.	24 ft/hr
2342-2365 ft.	24 ft/hr
2370-2397 ft.	20 ft/hr
2397-2401 ft.	40 ft/hr
2401-2575 ft.	9-18 ft/hr w/ mud pump problems

Lithology 2295-2430 ft. Green gray outcrtic purple bearing exl lithic welded

tuff.

2430-2510 ft. Green gray to gray, locally leached white, pyrite bearing, lithic

rich welded tuff.

2510-2575 ft. Orange brown exl bearing lithic cemented to lightly welded tuff.

Gases

CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

CI N/D

Mud

Temp. in 128° F

out 134° F, adding water

max/min

136° in, 142° out @ 2520 ft.

visc. 41

wt. 9.3

filt.

LCM (lbs/bbl)

0

alk. 0.1

PH 9.5

CI < 50

PP 750 psi

SPM 122

Mud Loss/Gain 2291 ft. 12 BBL loss @ 120 BBL/hr

Surveys 2383 ft 1.75° N78W

2470 ft 1.85° N64W BHT 276°F, 5 min on bottom



Day 24 Time 0600 Date 24 Oct. 1981 TD 2659 ft.  $\Delta$  TD (24 hr) 84 ft.

Running geophysical logs, preparing to run 13 3/8 inch casing.

Current Status

Drilling Rates

2575-2586 ft.	11 ft/hr
2586-2589 ft.	26 ft/hr
2638-2643 ft.	25 ft/hr
2643-2659 ft.	9 ft/hr

Drilling Breaks

Lithology 2575-2659 ft. Orange brown, locally gray green oil bearing lithic

cemented turf w/ tr to minor mylonite. Secondary minerals include local silicification of portions of the greenish turf, minor vein laumontite, and traces of vein quartz and calcite.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

Cl N/D

Mud Temp. in 122° F out 134° F, adding water and cleaning hole

max/min 122° in, 134° out @ 2659 ft.

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PF SPM

stopped drilling @ 1515 hrs (23 Oct), stopped circ. @ 1430 hrs (23 Oct)

Mud Loss/Gain

Surveys

Day 25 Time 0600 Date 25 Oct 1981  
TD 2659 ft.  $\Delta$  TD (24 hr) 0 ft.  
Cementing casing

Current Status

Cementing casing

Drilling Rates

Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain

Surveys

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Geol. Services

Day 26 Time 0600 Date 26 Oct 1981  
TD 2659 ft. Δ TD (24 hr) 0 ft.

Current Status Waiting on cement

Drilling Rates Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

Cl

PP

SPM

Mud Loss/Gain

Surveys

add comments on back of page

Day 27 Time 0600 Date 27 Oct 1981 TD 2659 ft. Δ TD (24 hr) 0 ft.

Current Status Drapping up BOP, constructing new flow line with gas-mud separator.

Drilling Rates Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain

Surveys

add comments on back of page

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SUNEDCO: Cascade Project  
DAILY REPORT

Day 28 Time 0600 Date 28 Oct 1981  
TD 2659 ft. Δ TD (24 hr) 0 ft.

Current Status Drilling cement, tagged cement at 2533 ft.

Drilling Rates Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

80°F

out

100°F

max/min

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

CI

PP

SPM

Mud Loss/Gain

Surveys

add comments on back of page

Waibel  
Geol. Services

Day 29 Time 0600 Date 29 Oct 1981

TD 2769 ft. Δ TD (24 hr) 110 ft.

Current Status Working on BOE

Drilling Rates

2659-2673 ft. 20 ft/hr

2673-2678 ft. 33 ft/hr

2678-2699 ft. 18 ft/hr

2699-2705 ft. 26 ft/hr

2705-2720 ft. 19 ft/hr

2720-2734 ft. 27 ft/hr

2734-2738 ft. 20 ft/hr

2738-2745 ft. 17 ft/hr

2745-2769 ft. 12 ft/hr

Lithology 2659-2745 ft: Gray to brownish gray to light greenish gray crystal

and lithic rich cemented tuffs and tuffaceous sediments. Crystals include qtz,

plagioclase, and sandstone; lithics are mostly sub angular to sub rounded and

are entirely volcanic. 2745-2769 ft. Light gray to light green gray recrystal-

lized porphyritic hornblende andesite. Secondary minerals include clays,

magnetite, hematite, celadonite, laumontite, tr. calcite, epidote(?).

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

117°F

out

120°F @ 2769 ft.

max/min

120/117 @ 2769 ft. 112/104 @ 2670 ft.

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain

Surveys

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Geol. Services

SUNEDCO: Cascade Project

DAILY REPORT

Day 30 Time 0600 Date 30 Oct 1981

TD 2769 ft. Δ TD (24 hr) 0 ft.

Current Status Working on BHA, preparing to RH.

Drilling Rates Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc. wt.

filt. LCM (lbs/bbl)

alk. pH

Cl

PP

SPM

Mud Loss/Gain

Surveys

add comments on back of page

Waibel

Geol. Services

Day 31 Time 0600 Date 31 Oct 1981  
 TD 2993 ft. Δ TD (24 hr) 224 ft.

Current Status Drilling ahead

Drilling Rates

2769-2800 ft. 13 ft/hr	2884-2920 ft. 14-18 ft/hr
2800-2854 ft. 17-21 ft/hr	2920-2930 ft. 25 ft/hr
2854-2855 ft. 30 ft/hr	2930-2985 ft. 18 ft/hr
2855-2884 ft. 23 ft/hr	2985-2993 ft. 12 ft/hr

Drilling Breaks

Lithology 2769-2825 ft. Light gray to light greenish gray rexlized hornblende

andesite, Brownish hornblende cxls, Imm, usually w/ reaction rims, in matrix of

plag. clays, and disseminated magnetite, 2825-2993 ft: Brownish gray to greenish

devitirified crystal and lithic rich tuffs. Relic pumice texture visible often,

welding apparent in places. Secondary minerals include clay, celandonte, calcite,

magnetite, hematite, and occasional pyrite. Vein minerals include heulandite,

and laumontite. N/D

Gases CO<sub>2</sub> max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 124° F out 128° F

max/min 128/124 @ 2993 ft. 113/106 @ 2790 ft. (adding water)

visc. 39

wt. 9.0

flit. 30

LCM (lbs/bbl) 0

alk. 0.2 pH 11.5 CI < 50 PP 1000 psi SPM 118

Mud Loss/Gain None

Surveys 2877 ft. 20N71W BHT 140°F, 15 min on bottom.



Current Status Drilling ahead after trip for washout.

Drilling Rates Drilling Breaks

Lithology 2993-3218 ft. Green gray to red brown cemented to welded cxi lithic

tuff. Cxls include subrounded qtz; euhedral to subhedral feldspar, locally

cloudy from metasomatic alteration; and euhedral to subhedral specular hematite.

Lithic fragments consist of subangular to rounded strongly altered volcanic

fragments, usually accounting for less than 30% of rock volume. Secondary vein

minerals include laumontite heulandite and tr calcite.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

128° F

out

132° F

max/min

136° F in, 141° F out, fluctuation due to water being added

visc. 38

wt. 9.0

fit. 32

LCM (lbs/bbl) none

alk. .35 pH 11.5 CI <100 PP 1000 SPM 110

Mud Loss/Gain

None observed.

Surveys 3027 ft. deviation 2° N79W, max temp therm, 146° F, 15 min on bottom.

Date 2 Nov, 1981

Time 0600

Day 33

TD 3324 ft. Δ TD (24 hr) 106 ft.

Current Status

Waiting on rig parts

Drilling Breaks

Drilling Rates

3218-3240 ft. 14 ft/hr

3240-3324 ft. 15-21 ft/hr

Lithology 3218-3324 ft. Dark green gray to red brown, locally silica

metasomatized cgl lithic tuff w/ volcanic lithic fragments making up from 15 to

70% of rock volume. Cgl volume is usually less than 1%, and consists of clear

feldspar w/ lesser qtz and specular hematite. Secondary laumontite is common,

calcite is rare.

Cases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

134° F

out

140° F

max/min

climbing slowly from 128/132° F

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

CI

PF

SPM

Mud Loss/Gain

None detected

Surveys 3225 ft. deviation 2° N52W, max temp therm, 158° F, 15 min on bottom.

TD 3324 ft.  $\Delta$  TD (24 hr) 0

Current Status Repairing generators

Drilling Rates Drilling Breaks

Lithology


Gases CO<sub>2</sub> max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud Temp. in out

max/min

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain

Surveys


add comments on back of page

Waibel  
Geol. Services

Date 4 Nov. 1981

Time 0600

Day 35

Δ TD (24 hr) 361 ft.

TD 3685 ft.

Current Status Drilling until 0545, now working on generator.

Drilling Breaks

Drilling Rates

3324-3670 ft. 20-30 ft/hr

3670-3685 ft. 40-60 ft/hr

Lithology 3324-3480 ft. Dk green gray to brown gray cxi bearing lithic tuff.

3489-3490 ft. Dk green gray chlor. & clay altered plagioclase hornblende

3490-3630 ft. Dk brown gray to dk green gray, porphyritic andesite.

locally silicified cxi bearing lithic tuff. 3630-3660 ft. Green gray to

gray chlorite and clay altered plag., hornblende, augite porphyritic andesite.

3660-3685 ft. Light gray to light green gray hornfelsic eutaxitic welded tuff.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 135° F

out 142° F

max/min

climbed steady from 1180 @ 3324 ' to 1420 @ 3685'

visc. 39

wt. 9.0

filt. 33

LCM (lbs/bbl) none

alk. .35

pH 11.4

CI <100

PP 1100

SPM 120

Mud Loss/Gain none observed

Surveys 3441 ft. deviation 2° N42W, M.R.T.s 164 & 166° F, 15 min on bottom

Day 36 Time 0600 Date 5 Nov 1981

TD 3766 ft. Δ TD (24 hr) 85 ft.

Current Status Magna-glowing drill collars.

Drilling Rates 3685-3766 ft. 20 ft/hr

Drilling Breaks

Lithology 3685-3700 ft. Light gray to light green gray metasomatized

eutaxitic welded tuff. Relic glass shard and pumice textures visible.

3700-3766 ft. Light green gray to brown gray slightly silicified cxi lithic

tuff. Secondary clay, silica, chlorite, magnetite, hematite and veins of calcite,

laumontite, tr. pyrite. Possible thin hornblende andesite flow between

3710 and 3720.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud Temp. in out

max/min 144° F @ 3720 ft.; 133° F @ 3685 ft. white adding water.

visc. -- wt. 9.1 filit. 23 LGM (lbs/bbl) 0

alk. -- pH 10.9 CI <50 FP 1100 SPM 120

Mud Loss/Gain

Surveys 3691 ft. 2° N37W 162° F BHT, 15 min on bottom.

Date 6 Nov 1981

Time 0600

Day 37

Δ TD (24 hr) 141 ft.

TD 3907 ft.

Current Status Drilling ahead

Drilling Rates 3766-3907 ft. 25 ft/hr

Lithology 3766-3800 ft. Brown gray to green gray devitrified lithic tuff.

3800-3820 ft. Dark gray to dark green gray chloritized porphyritic pyroxene

andesite/basalt. Chlorite, clay, and minor calcite alteration of groundmass.

Up to 35% secondary vein fillings of zeolite (including laumontite), and

minor calcite. 3820 to 3870 ft. Dark gray to brownish gray locally green gray

metasomatized lithic tuff. 30 to 40% mm size, angular matrix lithics.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

130°F

out

139°F

max/min

140 max, @ 3870 ft., 119 min, @ 3770 when breaking circ.

visc. 45

wt. 9.2

filt. 26

LCM (lbs/bbl) 0

alk. 25/45 pH 11.1 CI 550 PP 1050 SPM 105

WOB. 35-40,000# RPM. 80-85

Mud Loss/Gain

Surveys 3895 ft. 2° N27W No temp. thermometers broke.

Day 38 Time 0600 Date 7 Nov 1981

ID 4230 ft.

Δ TD (24 hr) 323 ft.

Current Status

Drilling ahead

Drilling Rates

Drilling Breaks

3907-4065 ft. 20 ft/hr

4065-4150 ft. 15 ft/hr

4150-4230 ft. 10-12 ft/hr (decrease MOB to 25/30 @ 4144 after 2 1/2 survey)

Lithology

Orange-red to red-gray to locally green-gray devitrified cemented

crystal bearing lithic tuff. Crystal component mostly altered feldspars and

occ. qtz. Lithic component is angular to subrounded sub mm size mafic

volcanics, unsorted, and makes 10 to 25% of the total. Tuff altered to clay,

hematite, zeolites, minor calcite, silica, chlorite locally, tr. pyrite.

Vein minerals up to 15% include laumontite, other zeolites, chlorite, calcite,

minor qtz, tr. pyrite.

CO<sub>2</sub> max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

134°F

out

142°F

max/min

145 max @ 4160 (88BTL/hr H<sub>2</sub>O in); 120 min @ 4010 (703BTL/hr H<sub>2</sub>O)

visc. 50 wt. 9.3 fit. 18.5 LCM (lbs/bbl) 0

alk. 15/.25 pH 10.6 CI < 50 PP 1050 SPM 105

MOB. 25/30,000# RPM 80/85

Mud Loss/Gain

3970 ft. 45 BBL/45 min to 10 BBL/60 min to 0.

4027 ft. 4032 ft. 30 BBL in 20 min.

Surveys

4144 ft. 2 1/2° N32W, BHT 172° 15 min on bottom.

Date 8 Nov 1981

Time 0600

Day 39

Δ TD (24 hr) 177 ft.

TD 4407 ft.

Current Status Drilling ahead after tripping for dope brush & BHA change.

BN 7, 625 ft., 39 hrs, 2-3-I

NB 8, 4n @ 4391 ft., STC F-3, 12-12-18

Drilling Rates Drilling Breaks

4230-4280 ft. 11-14 ft/hr

4280-4330 ft. 18-25 ft/hr (incr. WOB)

4330-4382 ft. 25-30 ft/hr

4382-4391 ft. 9 ft/hr tripped @ 4391 ft. WOB 40; RPM 75

4391-4407 ft. 14 ft/hr

Lithology 4230-4270 ft. Dark gray to orange gray to green gray devitrified

crystal bearing lithic tuff w/ secondary zeolites, minor pyrite, chlorite, tr

calcite. 4230-4310 ft. Gray to dk gray locally silicified, sheared & recrystallized

clay altered tuff w/ abundant secondary laumontite.

4310-4407 ft. Green gray strongly clay altered cgl bearing tuff w/ secondary

clay, calcite, laumontite, minor chlor., tr pyrite, & tr epidote.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in

118° F

out

130° F after trip

max/min

130° in/140° out @ 4280 ft., then adding water.

visc. 38

wt. 9.1

filt. 16.5

LCM (lbs/bbl) none

alk. 1.25

pH 10.2

CI <100

PP 1100

SPM 116

Mud Loss/Gain none detected

4237 ft. deviation 2 1/2° N40W; M.R.T. 178° F, 15 min on bottom

4329 ft. deviation 2 1/2° N24W; M.R.T. 178° F, 15 min on bottom



Date 9 Nov 1981

Time 0600

Day 40

Δ TD (24 hr) 23 ft.

TD 4430 ft.

Running in hole after tripping for fish. Washout was

in a drill collar.

Drilling Breaks

Drilling Rates

4407-4430 ft. 16 ft/hr

Lithology Only two samples recovered since last trip: 4391-4400 and 4400-4410.

Both samples are dominated by mixed tuffaceous slough from up hole.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

out

max/min

1340 F out @ 4410 ft., after trip.

visc.

wt. 9.0

filt. 16

LCM (lbs/bbl)

none

Mud Loss/Gain

none observed

Surveys

add comments on back of page

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TD 4729 ft.  $\Delta$  TD (24 hr) 85 ft.

Current Status Drilling ahead

Drilling Rates 4430-4729 ft. 17 ft/hr  
 Drilling Breaks

Lithology 4430-4510 ft. Gray to brown gray cgl bearing lithic tuff w/ zeolite

cementing. Secondary laumontite is common, w/ lesser chlorite, calcite, & pyrite. 4510-4650 ft. Dark gray to dark green gray holocxl n augite plag. andesite/basalt shallow intrusive w/ secondary chlorite, laumontite, massive dk green serpentine, pyrite.

4650-4729 ft. Green gray chlor & clay altered cgl bearing lithic tuff, grading

Gases CO<sub>2</sub> N/D max/min  
 H<sub>2</sub>S N/D  
 C<sub>1</sub> N/D  
 Mud Temp. in 132° F out 139° F, adding water all night

max/min 146° @ 4605'; 126° @ 4440' after breaking circ.

visc. 37 wt. 9.1 filit. 15 LCM (lbs/bbl) none  
 alk. .08-.12 pH 9.7 CI >100 FP 1000 SPM 110

Mud Loss/Gain None observed.

Surveys 4529 ft. deviation 2 $\frac{1}{2}$ ° N44W; M.R.T. 240-250° F est. (250 reading off scale)

Day 42 Time 0600 Date 11 Nov 1981  
 TD 5006 ft. Δ TD (24 hr) 277 ft.

Current Status Drilling ahead

Drilling Rates Drilling Breaks

4729-4900 ft.	13 ft/hr
4900-4950 ft.	17 ft/hr
4950-5006 ft.	13 ft/hr
MOB 35; RPM 70	

Lithology 4729-5006 ft. Dark orange gray, locally clay and chlorite altered to a green gray, cgl bearing lithic tuff. The crystal population consists of occasional cloudy (albitized?) plagioclase fragments. The lithic fragments are clay altered, appear to be derived from intermediate to basic volcanic sources, and make up from 10% to 80% of the rock. Fine cgl clear to white zeolite is a common cementing agent. Silica veins w/ minor pyrite are assoc. w/ the green gray altered portions.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 135° F out 143° F

max/min 131° out @ 4740' (adding water); 146° out @ 4770' & 4790'

visc. 48 wt. 9.2 filt. 14 LCM (lbs/bbl) none

alk. .05-.08 pH 9.8 CI < 100 PP 1000 SPM 119

Mud Loss/Gain none observed

Surveys 4748 ft. deviation 2 1/2° N40W; K.R.T. 198° F, 15 min on bottom

4963 ft. deviation 2 1/2° N35W; K.R.T. 200-202° F, 15 min on bottom

Day 43 Time 0600 Date 12 Nov 1981

TD 5150 ft.

Δ TD (24 hr) 144 ft.

Current Status Running in hole after tripping for washout.

Drilling Rates

5006-5025 ft. 12 ft/hr

5025-5080 ft. 15 ft/hr

5080-5150 ft. 11 ft/hr

MOB 35; RPM 70

Lithology 5006-5150 ft. Dark orange gray, locally altered to green gray.

cxl bearing lithic tuff. Lithic component ranges from 10 to 80% of rock, with

the percent increasing with depth. Fine cxln clear to white zeolite (laumontite?)

acts as a major cementing agent. Secondary laumontite, with lesser calcite,

occur as vein and vug fillings. Silica veins w/ associated chlorite and minor

pyrite are associated w/ The green gray & clay altered zones.

Gases

CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

Cl N/D

Mud

Temp. in 138° F

out 146° F @ 5130'; 154° F @ 5136' (last bottoms up)

max/min

visc. 35 wt. 9.1 filt. 13 LCM (lbs/bbl) none

alk. 08-.2 pH 10.4 Cl <100 PF 950 SPM 112

Mud Loss/Gain

none observed.

Surveys

add comments on back of page

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Geol. Services

Date 13 Nov 1981

Time 0600

Day 44

Δ TD (24 hr) 201 ft.

TD 5351 ft.

Current Status Drilling ahead

Drilling Breaks

Drilling Rates

5150-5300 ft. 9 ft/hr

5300-5313 ft. 13 ft/hr

5313-5351 ft. 8.5 ft/hr

Lithology 5150-5351 ft. Dark gray to dark orange gray devitrified, locally eutaxitic, feldspar and magnetite bearing lithic tuff. Lithics consist of mixed intermediate to mafic volcanic fragments, and make up from 5% to 30% of rock volume. Secondary minerals include clay, laumontite, hematite, hydrous Fe oxides; minor calcite, chlorite, and tr pyrite.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 138° F

out 145° F (adding water)

max/min 154° out @ 5240 ft.

visc. 42 wt. 9.2 filt. 14 LCM (lbs/bbl) none

alk. .08-.2 pH 9.9 CI <100 FP 1100 SPM 110

Mud Loss/Gain none observed

Surveys 5178 ft. deviation 2 1/2° N36W; M.R.T. 200° F after trip, 15 min on bottom

Date 14 Nov 1981

Time 0600

Day 45

Δ TD (24 hr) 130 ft.

TD 5481 ft.

Current Status Drilling ahead after tripping for bit change.

BN 8; 1006 ft.; 80 hrs.; 2.4-in

NB 9; Security 844F; 12-12-18; 4n @ 5397 ft.

Drilling Rates Drilling Breaks

5351-5380 ft. 10 ft/hr WOB 25

5380-5455 ft. 9 ft/hr WOB 4ncr. to 35

5455-5465 ft. 15 ft/hr

5465-5481 ft. 10 ft/hr

Lithology 5351-5450 ft. Dark gray to dark orange gray devitrified cxi bearing

lithic tuff. 5450-5470 ft. Orange brown to light brown gray qtz and feldspar

bearing tuff, locally strongly silicified.

5470-5481 ft. Dark gray to dark orange gray devitrified cxi bearing lithic tuff.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 136° F

out 144° F, increasing after trip

max/min

1480 @ 5380 ft.

visc. 41 wt. 9.3 filt. 12 LCM (lbs/bbl) none

alk. .05-.2 pH 9.9 CI > 100 PF 1100 SPM 110

Mud Loss/Gain

none observed

Surveys 5397 ft. deviation 3° N22W; M.R.T. 192/194° F, 15 min on bottom.

Date 15 Nov 1981

Time 0600

Day 46

Δ TD (24 hr) 19 ft.

TD 5500 ft.

Current Status Flashing

Drilling Breaks

Drilling Rates

5421-5500 ft. 8 ft/hr

Lithology Dark gray to dark orange gray cgl bearing lithic tuff.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

Cl

N/D

Mud

Temp. in

136° F

out

147° F

max/min

visc. wt. filt. LCM (lbs/bbl)

alk. pH Cl PP SPM

Mud Loss/Gain

none observed.

Surveys 5429 ft. deviation 2 1/2° N40W; M.R.T. 188/202° E, 15 min on bottom

TD 5500 ft.      Δ TD (24 hr) 0 ft.  
Day 47      Time 0600      Date 16 Nov 1981

USA 58-28

Current Status      Running into hole after fishing job.

Drilling Rates      Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

Cl

PP

SPM

Mud Loss/Gain

Surveys

add comments on back of page

Waibel

Geol. Services



Day 48 Time 0600 Date 17 Nov 1981  
 ID 5700 ft. Δ TD (24 hr) 200 ft.

Current Status Drilling ahead

Drilling Rates

Drilling Breaks

5500-5535	8 ft/hr	5550-5650	10 ft/hr
5535-5540	16 ft/hr	5650-5660	14 ft/hr
5540-5545	8 ft/hr	5660-5685	10 ft/hr
5545-5550	16 ft/hr	5685-5700	28 ft/hr

No mud loss ass. w/ drill breaks.

Lithology 5500-5685' Gray to reddish brown cgl bearing deformed lithic turf.

Matrix altered to clay, Fe oxides, and minor zeolites. Secondary vein minerals include much laumontite, lesser calcite and cryptocoxin SiO<sub>2</sub>, tr. pyrite.

5685-5700 ft. Light gray to light greenish gray fine grained granular, sparsely porphyritic altered basaltic/andesitic shallow intrusive. Groundmass is plagioclase, minor calcite, diss. magnetite. Flag phenos alt'd to clay and zeolite.

Occ. alt'd hornblende(?), much secondary vein laumontite, minor calcite. Gases CO<sub>2</sub> max/min

H <sub>2</sub> S	N/D
C <sub>1</sub>	N/D

Mud Temp. in 143°F out 150°F

max/min 152/144 @ 5590 ft. 146/136 @ 5510 ft.  
 visc. 39 wt. 9.1 filit. 13 LCM (lbs/bbl) 0  
 alk. 05/.2 pH 9.2 CI <50 PP 1200 psi SPM 120  
 wob. 35,000# RPM. 65  
 Mud Loss/Gain None

Surveys None (no money in BHA)

DAILY REPORT

Date 18 Nov 1981

Time 0600

Day 49

Δ TD (24 hr) 164 ft.

TD 5864 ft.

Fishing, pin on jar broke

Current Status

Drilling Breaks

Drilling Rates

5700-5864 ft. 12 ft/hr

Lithology 5700-5864 ft. Light gray to light green gray fine crystalline plagioclase, hornblende porphyritic basaltic/andesitic shallow intrusive. Groundmass

consists of plagioclase and secondary calcite and green clay. Plagioclase phenocrysts altered

in part to clay and zeolite. Augite appears fresh. Hornblende has chlorite

reaction rims. Secondary vein minerals include laumontite, calcite, and some

chlorite.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

Cl N/D

Mud Temp. in out

max/min 153° out @ 5720';

visc. 40 wt. 9.2 filt. 14 LCM (lbs/bbl) none

alk. 05-15 pH 9.8 Cl <100 PP 1200 SPM 120

Mud Loss/Gain none observed

Surveys 5737 ft. deviation 2 1/2° (no direction)

M.R.T. 209° & 222° F, 15 min on bottom

add comments on back of page

Day 50 Time 0600 Date 19 Nov 1981  
 TD 5892 ft. Δ TD (24 hr) 28 ft.

Current Status Drilling ahead, back on bottom @ 0230

Drilling Rates Drilling Breaks

5864-5875 ft. 8.5 ft/hr  
 5875-5880 ft. 6 ft/hr  
 5880-5885 ft. 9 ft/hr  
 5885-5892 ft. 6 ft/hr

WOB max 30

RPM 70

Lithology 5864-5892 ft. Light gray to light green gray fine crystalline plagioclase, hornblende porphyritic basaltic/andesitic shallow intrusive. Groundmass

augite, hornblende, green clay, & zeolite. Augite appears fresh. Hornblende

locally altered to chlorite. Secondary laumontite and calcite common.

Gases

CO<sub>2</sub> N/D  
 max/min

H<sub>2</sub>S

N/D

Cl

N/D

Mud

Temp. in 142° F

out 150° F

max/min

rapid recovery after fishing

visc. 40

alk. 1-.28

PH 9.8

CI <100

FP 1000

SPM 117

LCM (lbs/bbl) none

filtr. 14

none

Mud Loss/Gain none observed

Surveys

add comments on back of page

Date 20 Nov 1981

Time 0600

Day 51

Δ TD (24 hr) 124 ft.

TD 6016 ft.

Current Status Drilling ahead, after tripping to add shock sub.

Drilling Breaks

Drilling Rates

5895-5905 ft. torquing up on bit

5892-5953 ft. 7 ft/hr

5900-5901 ft. 60 ft/hr

5953-6016 ft. 9 ft/hr

Lithology 5892-5900 ft. Green gray clay and chlor. altered hornblende porphyritic andesite, locally silicified. Secondary minerals include clay, chlor, magnetite, disseminated and vein calcite, silica, laumontite, and pyrite.

5900-6016 ft. Brown to red brown cgl and lithic bearing turf, varying between welded and cemented, w/ fluctuating minor secondary laumontite and calcite.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

Cl

N/D

Mud

Temp. in 154° F

out 161° F

max/min

146° F @ 5950 ft. (after trip)

visc. 51 wt. 9.2 filt. 16 LCM (lbs/bbl) none

alk. 1-.12 pH 9.8 Cl <100 pp 1500 (filtered) SPM 110

Mud Loss/Gain

none observed

Surveys 5936 ft. deviation 2 3/4, no direction

M.R.T. 203°-215° F, 15 min on bottom

add comments on back of page

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Current Status Drilling ahead

Drilling Rates

6016-6100 ft. 7.5 ft/hr  
WOB 25; RPM 60

6100-6220 ft. 9.5 ft/hr  
WOB 31; RPM 75

Lithology 6016-6220 ft. Brown to brown gray, locally eutaxitic, exl lithic

tuff, intermittently cemented and welded. Cxl fraction consists of feldspar

(sandstone?) and lesser amounts of Qtz, w/ trace magnetite. The lithic fraction

consists of mixed volcanic fragments. Secondary minerals consist of clay, tr

hematite, and tr laumontite. At 6063-65 ft. & 6172-74 ft. small, intense pyrite

zones were encountered (faults), with no associated mineralization.

Gases

CO<sub>2</sub> N/D  
max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in 147° F  
out 155° F

max/min 161° F @ 6060 ft., followed by adding much water.

visc. 43 wt. 9.2 filtr. 18 LCM (lbs/bbl) none

alk. 0.02-.2 pH 10.1 CI <100 PP 1550 SPM 110

Mud Loss/Gain

none observed

Surveys

Day 53 Time 0600 Date 22 Nov 1981  
TD 6247 ft. Δ TD (24 hr) 27 ft.

Current status Bringing fish ( 2 collars, reamer, shock sub, & bit ) out

of hole.

Drilling Rates 6220-6247 ft. 10 ft/hr  
Drilling Breaks WOB 33; RPM 60

Lithology 6220-6247 ft. Brown gray to brown exl lithic cemented turf w/ local  
welded zones. Secondary minerals include clay, & traces of hematite and laumontite.

Gases

CO<sub>2</sub> N/D max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

134° F

out

148° F, adding much water

max/min

159° F after survey @ 6230 ft.

visc.

wt.

filt.

LCM (lbs/bbl)

alk.

pH

Cl

PP

SPM

Mud Loss/Gain

none observed

Surveys

6230 ft. deviation 3 1/2° (no direction), M.R.T. 208-222° F, 15 min on bottom

add comments on back of page

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Geol. Services

Date 23 Nov 1981

Time 0600

Day 54

Δ TD (24 hr) 125 ft.

TD 6371 ft.

Current Status Drilling ahead

BM 10: 382 ft.; 48 hrs; 2-2-in

NB11: STC SVH; 15-15-15; in @ 6246 ft.

Drilling Breaks

Drilling Rates

6274-6275 ft. 20 ft/hr

6247-6371 ft. 10-12 ft/hr

MOB 25; RPM 80

Lithology 6247-6268 ft. Gray-brown to red-brown cgl and lithic bearing lithic

tuff. 6268-6280 ft. Green-gray to dark green-gray fine to medium grained slag

porphyritic diorite with trace remnant hornblende cxls. 6280-6350 ft. Gray-brown

to red-brown cgl lithic tuff with occ. oolitic texture as above. 6350 to 6371 ft

Mixture of brown tuff s/a, and white to very light green strongly metasomatized

tuff. Tuff largely altered to clay (illite?), albite, calcite, minor chlorite.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in

145° F

out

153° F

adding some water

max/min

154° F @ 6340 ft.

visc. 40

wt. 9.1

filt. 17

LCM (lbs/bbl) none

alk. 08-.2

pH 9.9

CI < 100

PP 1100

SPM 111

Mud Loss/Gain

none observed

Surveys

add comments on back of page

Waibel  
Geol. Services

Surveys  
 6378 ft. 3° 224/238° EBT 5 min on bottom  
 6467 ft. 3° 205/218° EBT

Mud Loss/Gain  
 None

alk. 07/22 pH 9.7 CI < 100 PP SPM  
 visc. 37 wt. 9.1 fit. 16.5 LCM (lbs/bbl) 0  
 max/min 153/142 @ 6410 139/124 @ 6460 w/ mud cooler on.

Mud Temp. in out  
 C<sub>1</sub> N/D  
 H<sub>2</sub> N/D  
 Gases CO<sub>2</sub> N/D max/min

Calcite veining present, scellite fillings decreasing.  
 clay (illite), albite, calcite, minor chlorite, pyrite and magnetite.  
 Metasomatized material proportion increases with depth. Rock has been altered to white strongly metasomatized tuffs texturally similar to the brown material bearing tuffs, which are devitrified and locally sheared; and very light green  
 Lithology 6371-6466 ft. Mixture of brown gray to brown red cxi and lithic

Drilling Rates  
 6372-6430 ft. 9 ft/hr  
 6430-6467 ft. 6 1/2 ft/hr

Drilling Breaks

\*\*\* Mud cooler on at 6440 ft. \*\*\*  
 BN 11 220 ft 24 hrs 4-2-I NB 12 HTC OMV 3-15 jets  
 Current Status RIH after tripping for bit change

ID 6466ft. Δ TD (24 hr) 94 ft.  
 Day 55 Time 0600 Date 24 Nov 1981



Surveys 6567 ft. 3 3/4 N25W 215/224° F BHT 5 min on bottom.

Mud Loss/Gain none observed

alk. .07-2.0 pH 10.4 CI >100 PP 1100 SPM 110  
 visc. 32 wt. 9.1 flit. 22 LCM (lbs/bbl) none

max/min 141/132 @ 6490 134/122 @ 6560

Mud

Temp. in 124° F out 134° F

C<sub>1</sub>

N/D

H<sub>2</sub>S

N/D

Gases

CO<sub>2</sub>

max/min

N/D

20% brown tuff / 80% altered tuff.

vein mineral, along with minor cryptoclinal SiO<sub>2</sub>. Mixture varies from 50/50 to

chlorite, and tr Fe oxides. Zeolites decreasing, and calcite is dominant

Strongly altered material recrystallized to white clay, albite, calcite, minor

dehydrated tuff and white to very light green strongly metasomatized tuff.

Lithology 6466-6569 ft. Mixture of brown-gray to red-gray cgl and lithic bearing

6560-6569 ft. 3.5 ft/hr

6466-6560 ft. 9 ft/hr

Drilling Rates

Drilling Breaks

BN 12 GTC IWV 15/15/15 6-8-1 13 3/4 hrs 103 ft.

Current Status Out of hole for bit change.

TD 6569 ft.

Δ TD (24 hr) 103 ft.

DAILY REPORT

Day 56

Time 0600

Date 25 Nov 1981

SUNEDCO: Cascadia Project

USA 58-28

Date 26 Nov. 1981

Time 0600

Day 57

△ TD (24 hr) 99 ft.

TD 6668 ft.

DRILLING AHEAD

Current Status

BN 12 103 ft. 13.5 hrs, 6/8/I

BN 13 SEC 84# 15-15-15 in @ 6569 ft.

Drilling Breaks

Drilling Rates

6570-6590 ft. 9 ft/hr MOB 25,000

6590-6650 ft. 13-14 ft/hr MOB 35,000

6650-6668 ft. 13 ft/hr MOB 35,000

Lithology 6569-6668 ft. Mixture of red-brown to gray-brown exl lithic turf, and

white to very light green strongly metasomatized to locally hornfelsed turf.

Altered material is altered to crypto exln SiO<sub>2</sub>, albite, calcite, illite (?).

and local chlorite. Vein minerals include crypto exln SiO<sub>2</sub>, quartz, calcite,

minor chlorite, tr. pyrite and drusey qtz (often ass.w/ chlorite). Zeolites

very rare. Amount of SiO<sub>2</sub> seems to be increasing.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

Cl

N/D

Mud

Temp. in

108°F

out

124°F

max/min

138/126 continuous, 132/122 @ 6570 ft. cooler on.

visc. 41

wt. 9.0

flit. 19

LCM (lbs/bbl) none

pp 1050 psi

SPM 115

MOB 30,000 f RPM 70

Mud Loss/Gain None

Surveys 6653 ft. 3.75° N15W 196/224 BHT Tool stuck in shock sub

add comments on back of page

Maibel  
Geol. Services

DAILY REPORT

Day 58 Time 0600 Date 27 Nov 1981 TD 6948 ft. Δ TD (24 hr) 280 ft.

Current Status Drilling ahead

Drilling Rates 6668-6805 ft. 12 ft/hr 6805-6948 ft. 14 ft/hr  
wob 30,000 wob 35,000  
Drilling Breaks

Lithology White to very light green hornblended turf. Fine crystalline mass of crypto exln S102, albite, illite(?), chlorite locally, tr. disseminated pyrite, tr. drusey qtz locally. Vain minerals include crypto-exln S102, qtz, very minor calcite and chlorite, only trace amounts of zoolite. Pyrite increasingly scarce with depth, also local areas of very light brown staining are present. Minor mylonite is persistent.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

121° F

out

133° F

max/min

136/123 6700 to 6770 ft. 132/120 @ 6680 ft.

visc. 38

wt. 9.1

filtr. 18.5

LCM (lbs/bbl) 0

alk. 07/.15

pH 9.9

CI <50

PP 1050

SPM 118

MOB 35,000~~F~~ RPM 70

Mud Loss/Gain

None

Surveys

6804 ft. 3<sup>o</sup> No direction available, 200/215<sup>o</sup> BHT.

DAILY REPORT

Date 28 Nov 1981

Time 0600

Day 59

Δ TD (24 hr) 112 ft.

TD 7060 ft.

Working on BHA after washout in DP Current Status

Drilling Rates

6948-7005 ft. 13 ft/hr

7005-7060 ft. 8 ft/hr

Drilling Breaks

6968-6969 ft. 23 ft/hr

Lithology 6948-7060 ft. White to light green gray, w/ some orange brown staining below 7000 ft., hornfelsed siltstone turf w/ only occasional remnant of original texture. Secondary minerals include abundant cryptoclin silica and vein qtz.; moderate amounts of calcite, clay (illite?), albite (?); trace amounts of pyrite, chlorite, laumontite, and possibly some siderite. There has been nothing observed to prove current hydrothermal activity.

Gases

CO<sub>2</sub> N/D

H<sub>2</sub>S N/D

CO<sub>1</sub> N/D

Mud

Temp. in 122° F

max/min 134° @ 7050 ft.; 130° @ 6950 ft.

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain none observed

Surveys 6960 ft., deviation 4°, no Dir.; M.R.T. 207° & 215° F

Date 29 Nov 1981

Time 0600

Day 60

Δ TD (24 hr) 121 ft.

TD 7181 ft.

Current Status Drilling ahead

Drilling Rates

Drilling Breaks

7060-7125 ft. 7 ft/hr

7080-7085 ft. 6 ft/hr w/ torquing

7125-7140 ft. 11 ft/hr

7140-7181 ft. 7 ft/hr

MOB 30: RPM 70

Lithology 7060-7120 ft. White to light green gray to light orange brown

hornfelsed silice tuff w/ secondary silica, calcite, albite, clay, hematite,

chlorite, and laumontite. 7120-7130 ft. Hornfelsed tuff as before, with

abundant shearing. 7130-7181 ft. Hornfelsed tuff w/ increasing amounts of strongly

metasomatized andesite/ micro diorite containing tr primary qtz., secondary

albite, and commonly brecciated w/ the hornfelsed tuff.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 125° F

out

137° F, cooler on, mixing mud

max/min

137° @ 7170 ft.; 130° @ 7060 ft. (118° in)

visc. 39 wt. 9.1 flt. 22 LCM (lbs/bbl) none

alk. 06-.2 pH 9.6 CI < 100 PP 1100 SPM 115

Mud Loss/Gain none observed

7114 ft. directional 3 1/2 @ N23W; M.R.T. 220° & 220° F, 4 min on bottom

Current Status POH for washout, second washout in 24 hrs.

BN 13: out @ 7220 ft.: 651 ft.: 62 1/2 hrs.: 4-4-1n

NB 14: 12 1/2" : Smith R-3: 15-15-15

Drilling Rates Drilling Breaks

7181-7220 ft. 10 ft/hr

7220-7229 ft. 7 ft/hr

WOB 30: RPM 70

Lithology 7181-7210 ft. Hornfelsed turf with up to 70% metasomatized andesite/

micro diorite w/ tr primary qtz, secondary chlorite, hematite, silica, albite,

clay, minor calcite, tr laumontite, and tr pyrite. This section contains many

zones of precipitation w/ turf & and./dlo. that has subsequently been silicified.

7210-7229 ft. no samples recovered due to tripping for washouts.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

140° F

out

150° F, not sure mud cooler is 100% functioning.

max/min

visc. 39 wt. 9.1 fit. 20 LCM (lbs/bbl) none

alk. 05-.2 pH 9.4 CI <100 PP 1000 SPM 115

Mud Loss/Gain none observed

Surveys

Day 62 Time 0600 Date 1 Dec 1981 TD 7348 ft. Δ TD (24 hr) 119 ft.

Current Status Drilling ahead

Drilling Rates Drilling Breaks

7229-7245 ft. 7 ft/hr

to 7285 ft., WOB 30; RPM 50

7245-7295 ft. 10 ft/hr

from 7285 ft., WOB 27; RPM 50

7295-7348 ft. 5.4 ft/hr

Lithology 7229-7300 ft. Green gray to red gray rextized qtz bearing lithic turf w/mod. well preserved relict texture. Qtz fragments are the only remaining primary mineral. Secondary minerals include silica, chlorite, calcite, clay, albite (?), hematite, and tr laumontite. Moderate shearing present throughout.

7300-7330 ft. Gray, locally green gray & chloritized, aphanitic andesite. 7330-7348 ft. White to light greenish white hornfelsed qtz bearing turf.

Cases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

131° F

out

143° F, mud cooler on

max/min

144° F out @ 7270 ft.

visc. 39

wt. 8.95

filt. 25

LCM (lbs/bbl)

none

alk. 07-.2

pH 9.9

CI < 100

PP

1100

SPM

115

Mud Loss/Gain

none observed

Surveys 7255 ft. directional 40° @ N24W; M.R.T. 205° & 210° F, 4 min on bottom

Surveys

7422 ft. 3 1/2" N21W, BHT 200/205 ft.

affects on drilling (rate, torque, bouncing of WOB etc.)

Mud Loss/Gain 7356-7357 ft. 6 HBL loss in 2.4 min. (150 HBL/hr), no other

WOB 27,000# RPM 50

alk. 07/15 pH 10.5 CI < 50 PP 1200 SPM 115

visc. 40 wt. 8.9 filc. 20 LCM (lbs/bbl) NONE

max/min 130/142 more or less continuous.

Mud

Temp. in

128°F

out

141°F

C<sub>1</sub>

N/D

H<sub>2</sub>S

N/D

CO<sub>2</sub>

N/D

max/min

Cases

Thin vein fillings of crypte exln SiO<sub>2</sub>, calcite, chlorite, tr. pyrite.

7405-7453 ft. Dark gray to dark greenish gray aphanitic andesite.

Relic textures limited to qtz cxi clasts, and ghosts of lithic clasts.

qtz, albite (?), feldspar (?), calcite, chlorite, tr. pyrite, tr. laumontite.

qtz bearing lithic tuff. Rock is silicified and recrystallized to cryptocrln SiO<sub>2</sub>.

Lithology 7448-7405 ft. White to greenish-white, to yellow-white hornfelsed

Drilling Rates

7348-7453 ft. 5 ft/hr

Drilling Breaks

Current Status

Drilling ahead, with moderate torque from 7360 ft. to TD.

TD 7453 ft.

Δ TD (24 hr) 105 ft.

Day 63

Time 0600

Date 2 Dec. 1981

DAILY REPORT

SUNEDCO: Cascade Project

USA 58-28



Date 3 Dec 1981

Time 0600

Day 64

Δ TD (24 hr) 99 ft.

TD 7552 ft.

Drilling ahead

Current Status

Drilling Breaks

Drilling Rates

7453-7520 ft. 4.6 ft/hr

MOB 31-34: RPM 50

7520-7552 ft. 3.8 ft/hr

slight forging throughout

Lithology 7453-7500 ft. Dark green gray, locally light gray chlorite to clay

altered hornblende and plg. bearing aphanitic andesite.

7500-7545 ft. Gray to dark gray reoxidized volcanlastic sediments w/ secondary

calcite & lesser amounts of cryptokln silica.

7545-7552 ft. Light green gray chlorite altered meta-tuff/ tuffaceous sediments

w/ remnant clear feldspar and qtz cxls.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

126° F

out

138° F steady

max/min

visc. 38

wt. 8.85

filt. 21

LCM (lbs/bbl) none

alk. 04-.2

pH 10.5

Cl < 100

PP

1100

SPM

115

Mud Loss/Gain

none observed

Surveys none

add comments on back of page

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Geol. Services

DAILY REPORT

Day 65 Time 0600 Date 4 Dec 1981

TD 7598 ft.

Δ TD (24 hr) 49 ft.

Current Status Tripped @ 7587 ft. for bit change; drilled 11 ft. & pool for

Washout. BN 14; 367 ft.; 64 hrs.; 3-3-I

NB 15; SEC 586F; 15-15-15; 1m @ 7587 ft.

Drilling Rates

Drilling Breaks

7549-7565 ft. 4 ft/hr

MOB 32; RPM 50 to 7585 ft.

7565-7598 ft. 6.6 ft/hr

MOB 25; RPM 60 below 7585 ft.

Light torquing throughout.

Lithology 7549-7598 ft. Light green gray chlorite altered meta-tuff/

tuffaceous sed.w/ remnant subhedral clear feldspar cxls & anhedral qtz

cxls.

Gases

CO<sub>2</sub> N/D

max/min

H<sub>2</sub>S N/D

C<sub>1</sub> N/D

Mud

Temp. in 116° F

out 135° F

max/min

max out 140° F @ 7550 ft.

visc. 39

wt. 8.8

filt. 20

LCM (lbs/bbl) none

SPM 115

alk. 04-.1

pH 10.4

CI >100

PP 1100

SPM 115

Mud Loss/Gain

none observed

Surveys 7577 ft. directional, 5 1/2° @ N71W; M.R.T. 202° F & one broken therm.

Surveys none

Mud Loss/Gain none observed

alk. 1-.15  
 pH 10.4  
 CI >100  
 PP 1100  
 SPM 115  
 LCM (lbs/bbl) none  
 filt. 20  
 wt. 8.8  
 visc. 42

Mud Temp. in 128° F  
 out 142° F  
 mud cooler on

Gases  
 CO<sub>2</sub> N/D  
 H<sub>2</sub>S N/D  
 C<sub>1</sub> N/D  
 max/min

Lithology 7598-7654 ft. Very light gray to light green gray locally silicified  
 meta-tuff w/ 2-5% qtz cxl fragments. Metamorphic grade is chlorite-albite;  
 other secondary minerals include very localized silicification and tr pyrite.

Drilling Rates 7598-7654 ft. 4.4 ft/hr.  
 Drilling Breaks WOB 30; RPM 60  
 slight torquing throughout

Current Status Drilling ahead.

TD 7654 ft. Δ TD (24 hr) 56 ft.

7689 ft. directional 6 1/2°, N15W; M.R.T. 202° & 205° F, 5 min on bottom. Surveys

Mud Loss/Gain none observed

alk. 1-.15 pH 10.4 CI >100 PP 1100 SPM 115  
 visc. 41 wt. 8.85 filt. 21 LCM (lbs/bbl) none

max/min max out 140° F

Mud Temp. in 120° F out 138° F mud cooler on

C<sub>1</sub> N/D

H<sub>2</sub>S N/D

Gases CO<sub>2</sub> N/D max/min

and in healed microfractures.

kiloblastic albite; cryptoxin silica; and tr pyrite as inclusions in qtz cxls

Secondary minerals include chlorite in former mafic cxl & lithic sites; poi-

qtz. Most relict texture has been obliterated by subsequent alteration.

meta-tuff w/ appx 5% of rock consisting of angular to subrounded fragments of

Lithology 7654-7734 ft. Very light gray to light green gray locally silicified

7654-7734 ft. 4-5 ft/hr

MOB 30; RPM 60

Drilling Rates

Drilling Breaks

slight torque throughout

Current Status

Tripping for washout @ 7734 ft.

TD 7734 ft

Δ TD (24 hr) 80 ft

Day 67

Time 0600

Date 6 Dec 1981

DAILY REPORT

SUNEDCO: Cas Project

USA 58-28

ID 7752 ft. Δ TD (24 hr) 18 ft.

Current Status Out of hole after washout.

BN 15 SEC 886F 147 ft., 34½ hr. 4-1-I

NB 15 HTC K55R, 12½"- 15/15/15, in @ 7734 ft.

Drilling Rates Drilling Breaks

7734-7752 ft. 7.5ft/hr

WOB 30; RPM 60

Lithology 7734-7752 ft. Very light gray to light green gray locally silicified

metatuff, with approx 5% angular to subrounded Qtz fragments. Most relic text-

ture obliterated. Secondary minerals include chlorite, localized in former

mafic mineral sites, poikiloblastic albite, cryptoclin SiO<sub>2</sub>, Tr. pyrite ass.

W/Qtz and in filled microfractures.

Gases

CO<sub>2</sub> N/D  
 H<sub>2</sub>S N/D  
 C<sub>1</sub> N/D

max/min

Mud

Temp. in 122° F  
 out 140° F

max/min

140/122

138/120

visc. 36 wt. 8.75 filt. 20 LCM (lbs/bbl) none

alk. 1.15 pH 10.7 CI <50 PP 1000 SPM 115

Mud Loss/Gain none observed

Surveys none

Surveys 7815 ft. 64° S37E, 220° and 225° BHT.

Mud Loss/Gain None

MOB 30,000# RPM 60 No torquing

alk. 1.15 pH 10.3 CI < 50 PP 1100 SPM 115

visc. 37 wt. 9.0 filt. 19 LCM (lbs/bbl) 0

max/min

130/142 124/136

Mud Temp. in 124° F out 142° F

C<sub>1</sub>

N/D

H<sub>2</sub>S

N/D

CO<sub>2</sub>

N/D

max/min

Lithology White to light greenish-white siltified, locally chloritized meta-tuff. Rock is 15% sub-mm, subhedral to anhedral quartz cxls, commonly embayed, commonly with inclusions. Sub-mm anhedral to subhedral white siltified feldspars compose 5%. Matrix is altered mostly to cryptocrystalline SiO<sub>2</sub>, albite, Qtz, minor chlorite localized in relic matrix mineral or lithic sites. Patches of yellow to brown clay are common. Minor calcite, tr. pyrite present.

Drilling Rates 7752-7836 ft. 6 ft/hr

Drilling Breaks

Current Status Drilling ahead

TD 7836 ft.

Δ TD (24 hr) 84 ft.

Day 69

Time 0600

Date 8 Dec. 1981

DAILY REPORT

SUNEDCO: Cascade Project

USA 58-28

DAILY REPORT

Day 70 Time 0600 Date 9 Dec 1981 TD 7900 ft. Δ TD (24 hr) 64 ft.

Current Status Just back to drilling after tripping to change bit.

BN 16, 266 ft., 4 1/2 hrs, 3/2 hr

NB 17, SEC MB9TF, 15-15-15, 4m @ 7900 ft.

Drilling Rates Drilling Breaks

7836-7900 ft. 6 ft/hr

Lithology White to light greenish gray siltstone, locally chertized.

meta-tuff. 10 to 15% subhedral to anhedral commonly embayed qtz crls. Matrix

is altered to cryptocrystalline SiO2, albite, qtz, minor clay, minor localized

chlorite in matrix mineral or lithic sites, minor calcite, pyrite tr. to lacking.

Gases

CO2 N/D

max/min

H2S

N/D

C1

N/D

Mud

Temp. in

122°F

out

136°F

max/min

130/142

126/136

visc. 37

wt. 8.9

filt. 20

LCM (lbs/bbl) 0

alk. 0.05/0.2

pH 10.2

CI >50

PP 1100

SPM 115

MOB 30,000# RPM 60

Mud Loss/Gain None

Surveys 7892 ft. 6 1/2 S22E 210/218° EHT

Day 71 Time 0600 Date 10 Dec 1981  
 TD 8041 ft. Δ TD (24 hr) 141 ft.

Current Status Drilling ahead

Drilling Rates Drilling Breaks

7900-7960 ft. 5.5 ft/hr

7960-8041 ft. 6-8 ft/hr

8016-8017 ft. 10 ft/hr

8003-8004 ft. 10 ft/hr

MOB 35; RPM 60

Lithology 7900-8041 ft. White to light green white, silicified, chlorite

and albite grade, quartz bearing meta-tuff. Clear subhedral to anhedral, commonly

employed quartz fragments is the only surviving primary mineral phase. Secondary

minerals include albite, chlorite, calcite, and trace pyrite which shows recent

Fe oxidation.

Gases CO<sub>2</sub> N/D max/min

H<sub>2</sub>S N/D

O<sub>2</sub> N/D

Mud

Temp. in 130° F

out 143° F, mud cooler on

max/min

142° min; 143° F max

visc. 41 wt. 8.9 filt. 18 LCM (lbs/bbl) none

alk. 05-0.2 pH 10.2 CI <100 PF 1100 SPM 115

Mud Loss/Gain none observed

Surveys none



Date 11 Dec 1981

Time 0600

Day 72

Δ TD (24 hr) 19 ft.

TD 8060 ft.

Running geophysical logs

Current Status

Stopped drilling @ 0900; stopped circulating @ 1200

Drilling Breaks

Drilling Rates

8041-8060 ft. 7 ft/hr

Lithology 8041-8060 ft. white to light green, silicified, chlorite and albite grade meta-tuff.

Gases

CO<sub>2</sub>

N/D

max/min

H<sub>2</sub>S

N/D

C<sub>1</sub>

N/D

Mud

Temp. in

134° F

out

150° F bottoms up after survey

max/min

min 142° F

visc.

wt.

filt.

LCM (lbs/pbl)

alk.

ph

cl

pp

SPM

Mud Loss/Gain

none observed

Surveys

8045 ft. deviation 6 1/2° N11W; M.R.T. 211° F & 217° F, 5 min on bottom

Current Status Flow testing

Drilling Rates

Drilling Breaks

Lithology

Gases

CO<sub>2</sub>

max/min

H<sub>2</sub>S

C<sub>1</sub>

Mud

Temp. in

out

max/min

visc. wt. filt. LCM (lbs/bbl)

alk. pH CI PP SPM

Mud Loss/Gain

Surveys

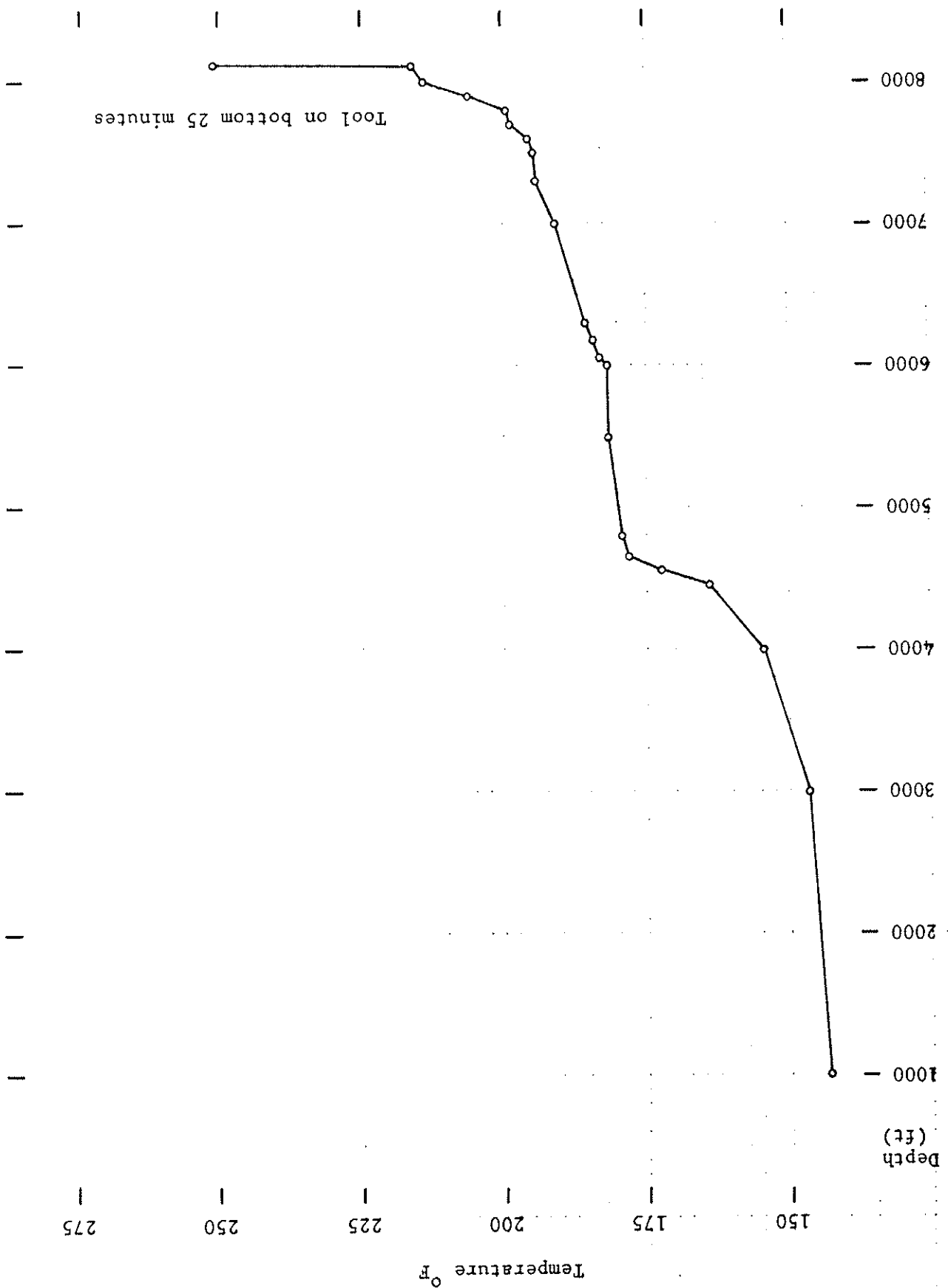
10 Dec. 1981

Prueft Kuster Tool Survey  
Table of slope change points

TD 8060 Ft.  
 Stopped drilling: 0900 hrs. 10 Dec. 1981  
 Stopped circulation: 1200 hrs. 10 Dec. 1981  
 Stylus engaged: 1725 hrs.  
 On bottom: 2035 hrs.  
 Off bottom: 2100 hrs.  
 Stylus disengaged: 2135 hrs.  
 Clock on CT #109 malfunctioned.

Depth	Temp
(ft)	(°F)
1000	143.00
3000	147.75
4000	154.51
4550	164.35
4650	172.55
4800	178.29
5500	179.11
6000	182.19
6050	183.21
6175	183.83
6300	185.26
7000	191.61
7300	194.06
7500	194.88
7600	195.29
7700	198.76
7800	199.78
7900	206.53
8000	214.70
8060 on bottom:	216.30
8060 after 30 min:	251.00

T.D. 8060 ft.  
 Prueft Kuster tool temperature survey  
 Tool # 118  
 USA 58-28  
 10 Dec. 1981



CT #109

2450	207.11
3250	218.66
4350	199.13
5550	216.14
6150	220.97
6550	229.16
7250	238.14
7850	281.86
8055	284.21

after 30 min:

CT #118

2950	204.69
3950	215.51
6350	217.35
7050	223.28
7450	231.86
8055	243.50
8055	261.89
8055	285.99

on the bottom:

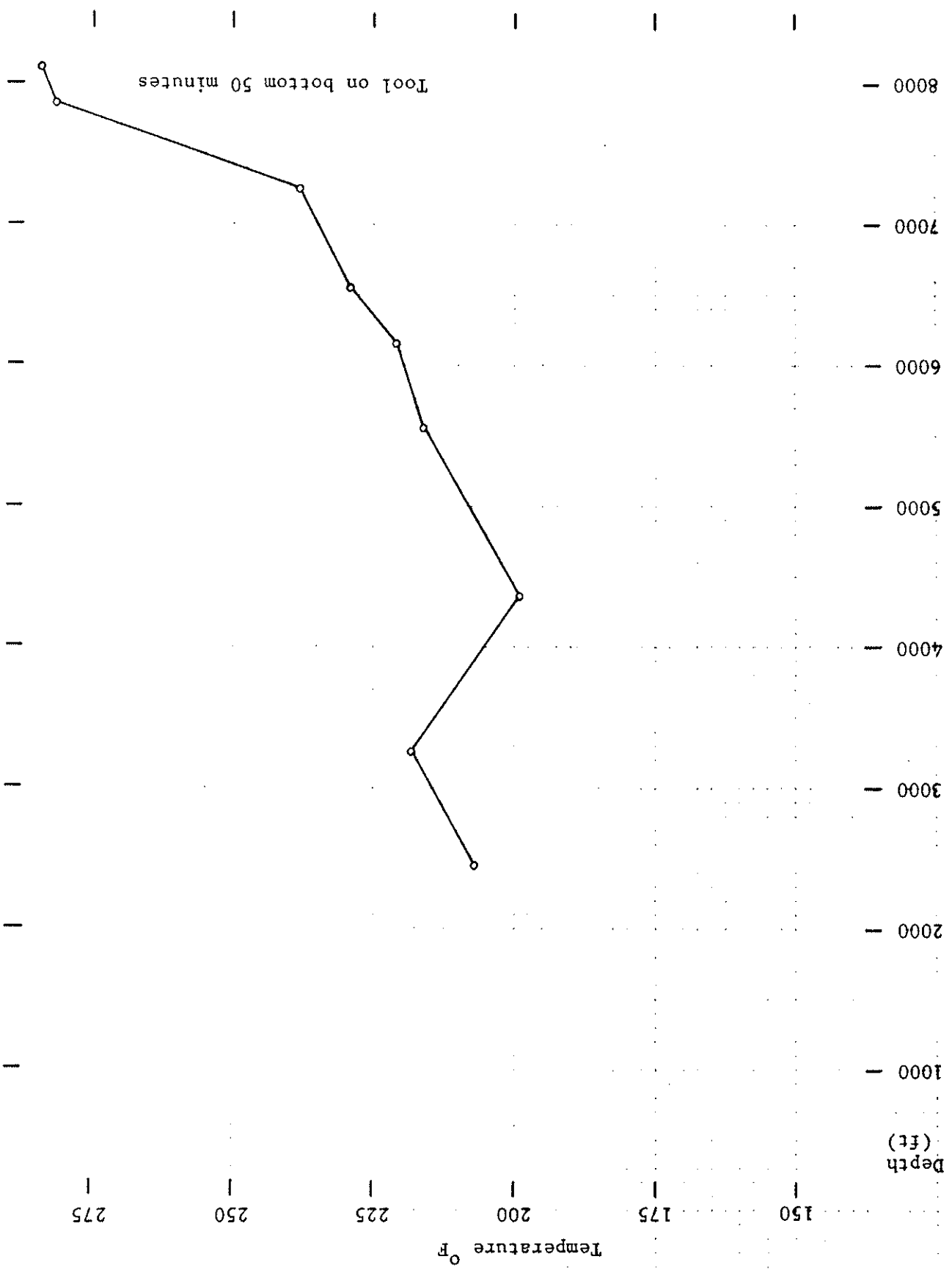
after 30 min:

Prueft Kuster Tool Survey  
 Continuous temperature survey, no stops.  
 Table of slope change points for each tool.

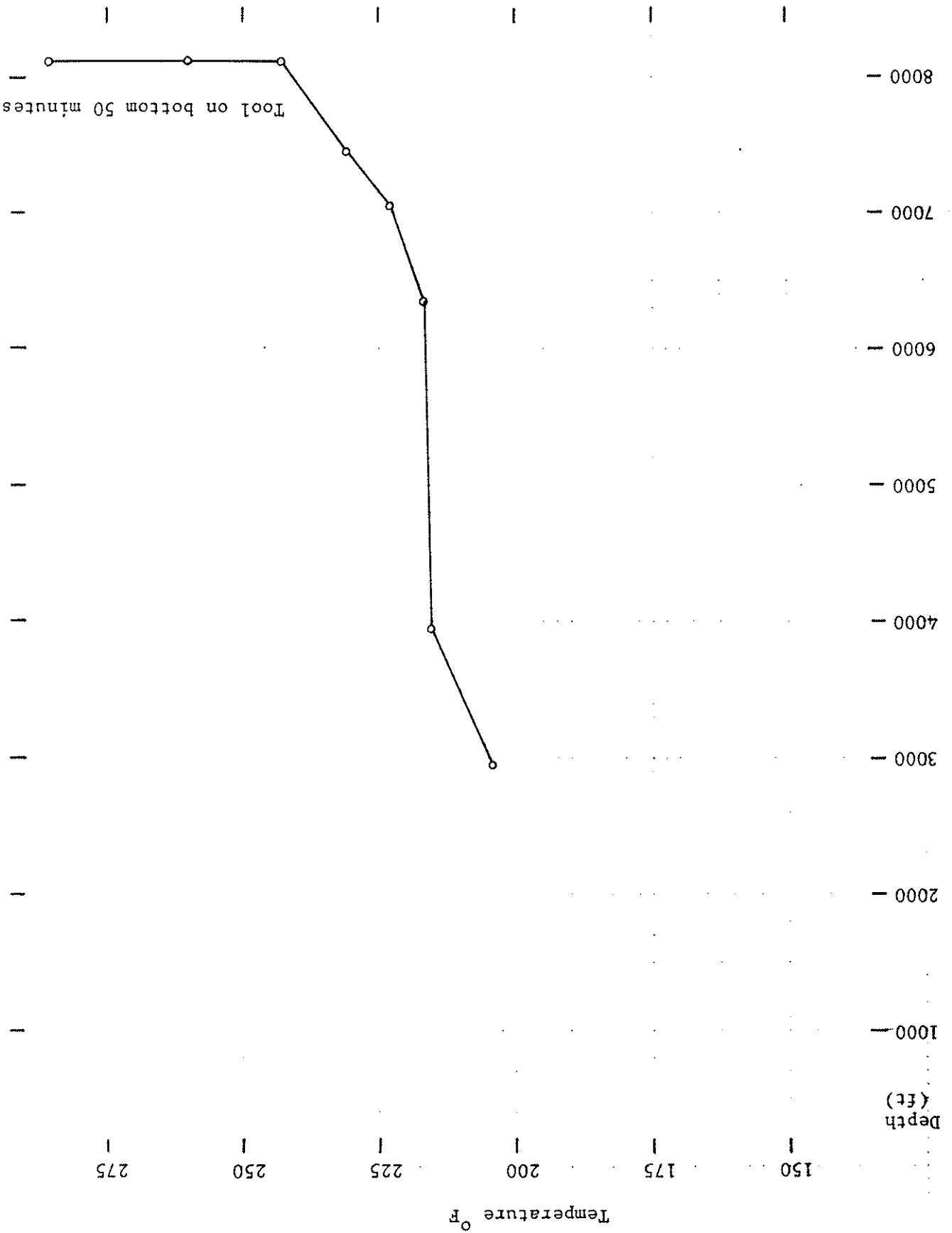
Stopped drilling: 0900 hrs. 10 Dec. 1981  
 Stopped circulation: 1200 hrs. 10 Dec. 1981  
 Stylus engaged: 0907 hrs. 12 Dec. 1981  
 On bottom: 1203 hrs.  
 Off bottom: 1233 hrs.  
 Stylus disengaged: 1326 hrs.

TD 8060 ft.  
12 Dec. 1981

T.D. 8060 ft.  
Pruett Kuster tool temperature survey  
Tool # 109  
USA 58-28  
12 Dec. 1981



Tool on bottom 50 minutes



T.D. 8060 ft.  
 Prnett Kuster tool temperature survey  
 Tool # 118  
 USA 58-28  
 12 Dec. 1981

DEPTH (TIH)	TIME	PRESS (PSI)	LIFT (PSI)	REMARKS
454	1110	1112	10	Air on.
	1114	1114		5" mud @ weir.
	1214	1214		Air off.
	1216	1216	0	No fluid.
	1220	1220		Air on.
1012	1257	1257	10	Air on.
	101	101		6" mud @ weir.
	103	103		Air off.
	203	203		Air on.
	207	207	0	No fluid.
	210	210		Air off.
	310	310		Air on.
	314	314	0	No fluid.
	320	320		Air off.
1478	402	402	2	Air on.
	412	412		6" mud @ weir.
	415	415		Air off.
	515	515		Air on.
	525	525	0	2" mud @ weir.
	530	530		Air off.
	630	630		Air on.
	636	636	2	2" mud @ weir.
	640	640		Air off.

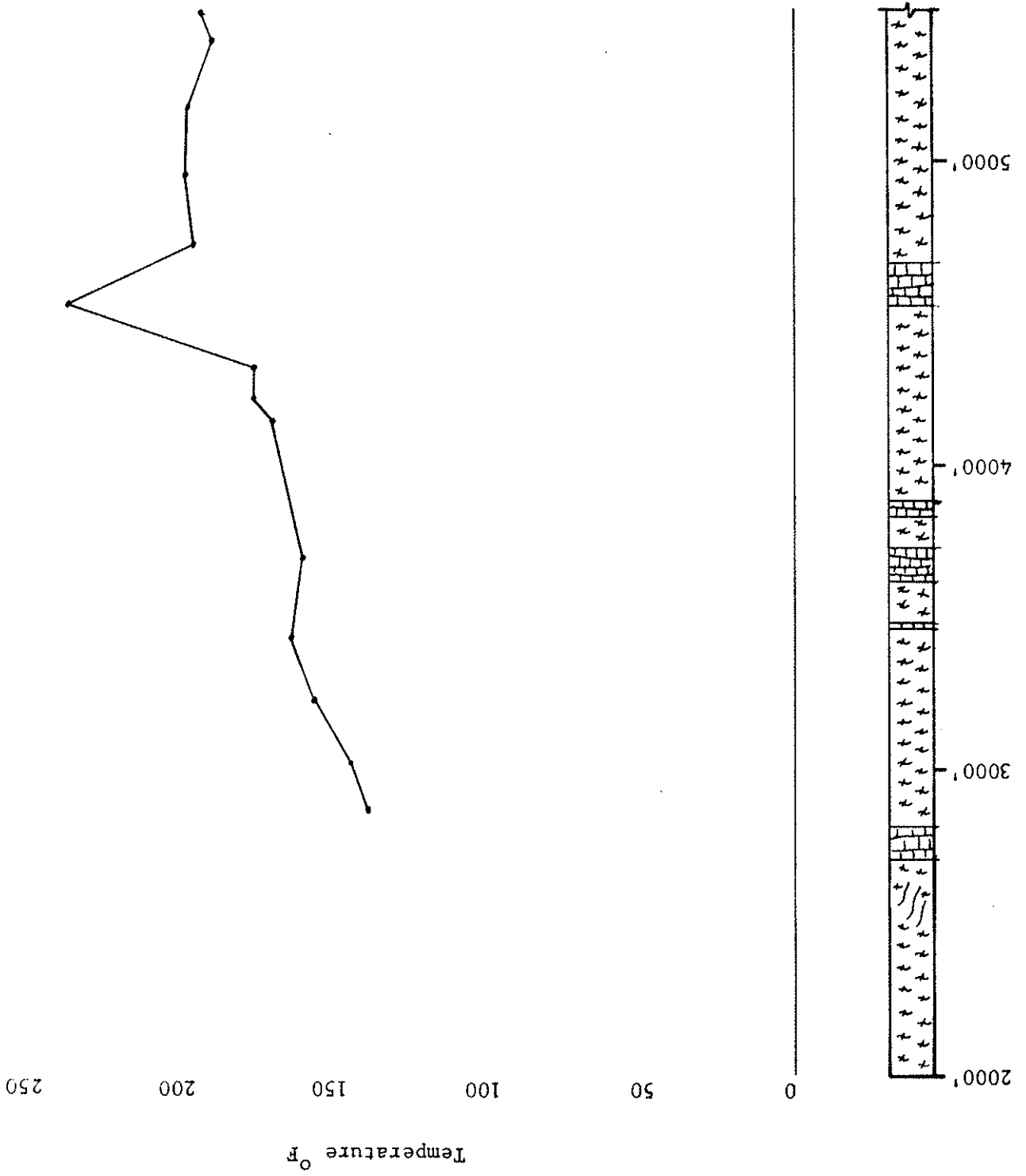


DIRECTIONAL SURVEYS AND  
MAXIMUM RECORDING THERMOMETER DATA

Depth (ft)	Deviation	MRT Temp °F.
119	1°	---
184	7/8°	---
223	1°	---
455	3/4°	---
695	1/2°	---
935	1°	---
1185	3/4°	---
1435	1/2°	---
1765	2°	---
1860	1 3/4°	---
1971	1°	---
2125	1 1/2°	---
2383	1 3/4°	---
2470	1 7/8°	---
2877	2°	140
3027	2°	146
3225	2°	158
3441	2°	164, 166
3691	2°	162
3895	2°	---
4144	2 1/2°	172
4237	2 1/2°	178
4329	2 1/2°	178
4529	2 1/4°	240, 250
4748	2 1/4°	198
4963	2 1/4°	200, 202
5178	2 1/2°	200
5397	3°	192, 194
5489	2 1/2°	188, 202
5737	2 1/2°	209, 222
5936	2 3/4°	203, 215
6230	3 1/4°	208, 222
6378	3°	224, 238
6467	3 1/2°	205, 218
6567	3 1/2°	215, 224
6653	3 3/4°	196, 224
6804	3 1/2°	200, 215
6960	4°	207, 215
7114	3 1/2°	220, 220
7255	4°	205, 210
7422	3 1/2°	200, 205
7577	5 1/2°	202
7689	6 1/4°	202, 205
7815	6 1/2°	220, 225
7892	6 1/2°	210, 218
8045	6 1/2°	211, 217

Maximum Recording Thermometer Data

USA 58-28



• (?)

