

GLO1633


COMPLETION REPORT

GEOHERMAL PRODUCTION WELL P-88-1A

Sulphurdale, Utah

For

Mother Earth Industries, Inc.
7350 E. Evans, Suite B
Scottsdale, Arizona 85260



GEOHERMAL MANAGEMENT Co., Inc. P.O. Box 2980 Evergreen, CO. 80439-2980

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(LADY CLARA)

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7350 E. Evans, Suite B
Scottsdale, Arizona 85260

Prepared by
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P.O. Box 2980
Evergreen, Colorado 80439

July 1989

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COMPLETION REPORT FOR

P-881A

Sulphurdale, Utah

I. ABSTRACT

A geothermal production well designated P-88-1A and informally named "Lady Clara" was drilled on Fee land controlled by Mother Earth Industries, Inc. between the dates of February 17 and March 13, 1989. The well is 2670 ft. south and 1210 ft. east of the northwest corner of Section 7, T26S, R6W, SLB&M.

P-88-1A penetrated about 40 feet of Quaternary alluvium and 280 feet of variably altered ash-flow tuffs belonging to the Three Creeks Fm. (Ttb), both situated above a low angle fault delineating a slide block. These rocks overlie a 60 foot thick zone of dacitic lavas and air-fall breccias which in turn blanket 330 feet of coarse grained Ttb.

The lowermost formation is the Coconino Sandstone/Quartzite found below 930'KB. Steam was encountered at about 940'KB within the white, vitreous sandstone. The well was bottomed in fractured sandstone at 1177'KB.

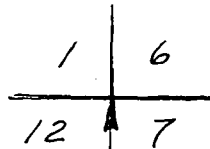
The prime contractor for the well was Sierra Drilling Inc.; surveys were done by Sunrise Engineering, Inc. of Fillmore, Utah; Safety Services were provided by Bell Safety of Evanston, Wyoming; wellsite geological supervision was by Geothermal Management Company, Inc. of Evergreen, Colorado; and petrographic examination of drill cuttings was done by Joseph Moore of Salt Lake City, Utah. All other activities were conducted by Mother Earth Industries, Inc.

II. LOCATION

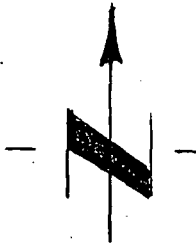
This report pertains to MEI geothermal production well F-88-1A located near Sulphurdale, in Beaver County, Utah within the Cove Fort-Sulphurdale KGRA.

Specifically, the well is on MEI controlled fee land approximately 2670 feet south and 1210 feet east of the northwest corner of Section 7, T26S, R6W, SLB&M. It is about 400 feet south of well 34-7A (Olga), about 150 feet southwest of exploratory well S-87-4, and about 70 feet northeast of exploration well S-88-1.

Figure 1 depicts the location of the well relative to the section corner; Plate I (in the pocket) is a survey plat of the entire MEI production area.



SECTION 7
 T.26S., R.6W.
 SLB # M




~ 2670'

~ 1210'

WELL SITE

P-88-1A

REVISIONS			By: GWH	Ckd: GWH
No.	Date	By	Date: 7/7/89	Scale: 1" = 600'
1			Dwng. No: ME1P881-1	Figure 1
2			 GEOHERMAL MANAGEMENT Co. P.O. Box 2980 Evergreen, CO. 80439-2980 (303) 670-3454	
3				
4				
5				
				LOCATION MAP P-88-1A
			SULPHURDALE, UTAH	

III. WELL DRILLING AND CONSTRUCTION HISTORY

In order to increase the amount of steam recoverable from the Sulphurdale geothermal field, production well P-88-1A was drilled as follows:

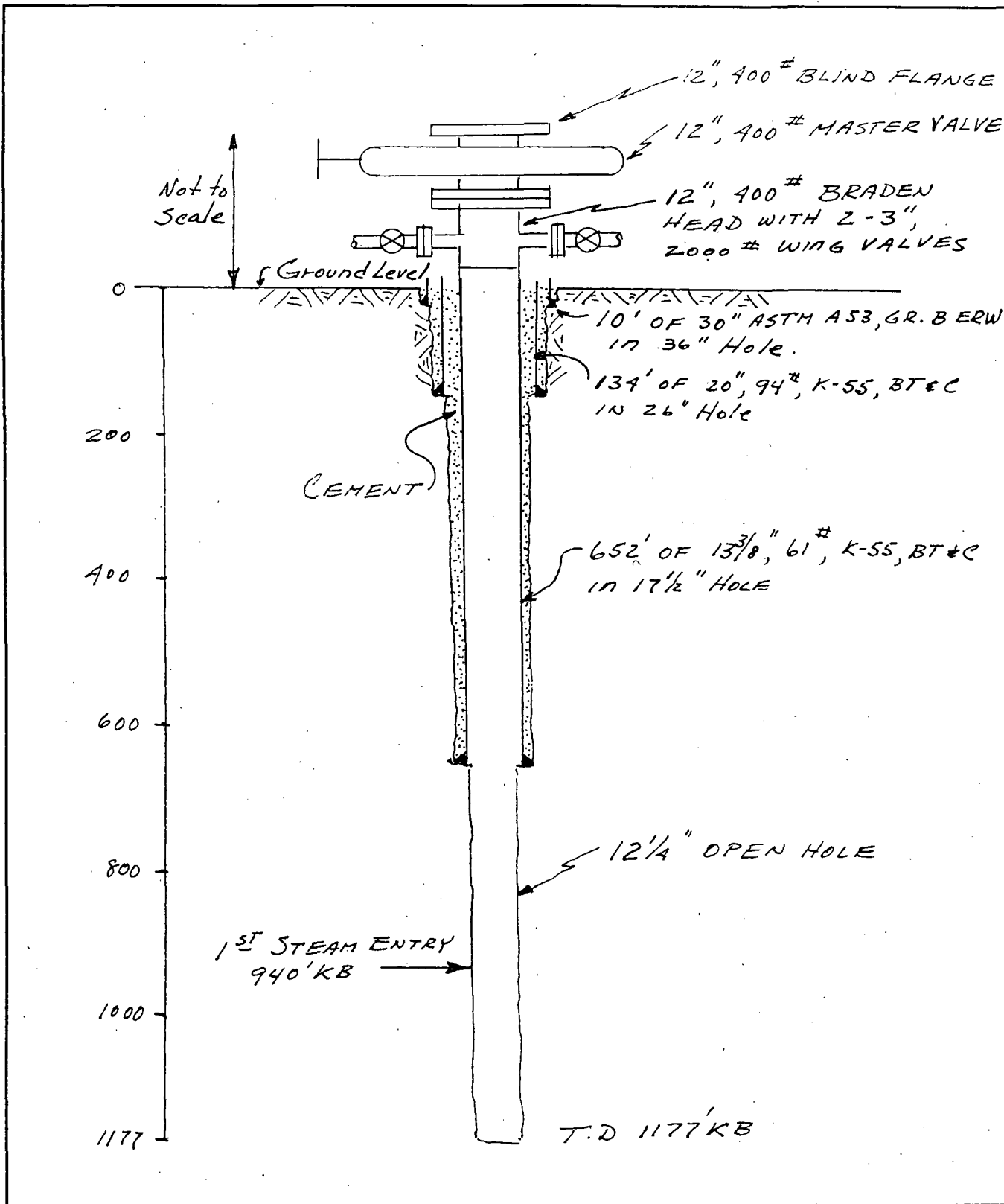
On February 24, 1989 the well was spudded and 30" diameter, standard wall, ASTM A53, Grade B ERW conductor casing was set at 10'KB and cemented in place. (KB=Ground Level plus 17 feet). On February 25, a 26" hole was drilled to 134'KB and 20" diameter, 94#/ft., K-55, BT&C surface casing was run and set (with difficulty) at 124'KB. Significant problems were encountered while cementing the casing (See Appendix A for detailed drilling history) and, as a result, the 20" casing ruptured at a depth of 43'KB offsetting the upper and lower segments about 6" from each other.


This situation was irreparable and so the rig was skidded 10 feet north and a second well was begun on March 4. Once again 10 feet of 30" conductor was set and cemented, and on March 5, drilling with a 26" bit penetrated to 138'KB, the setting point for the 20" surface casing.

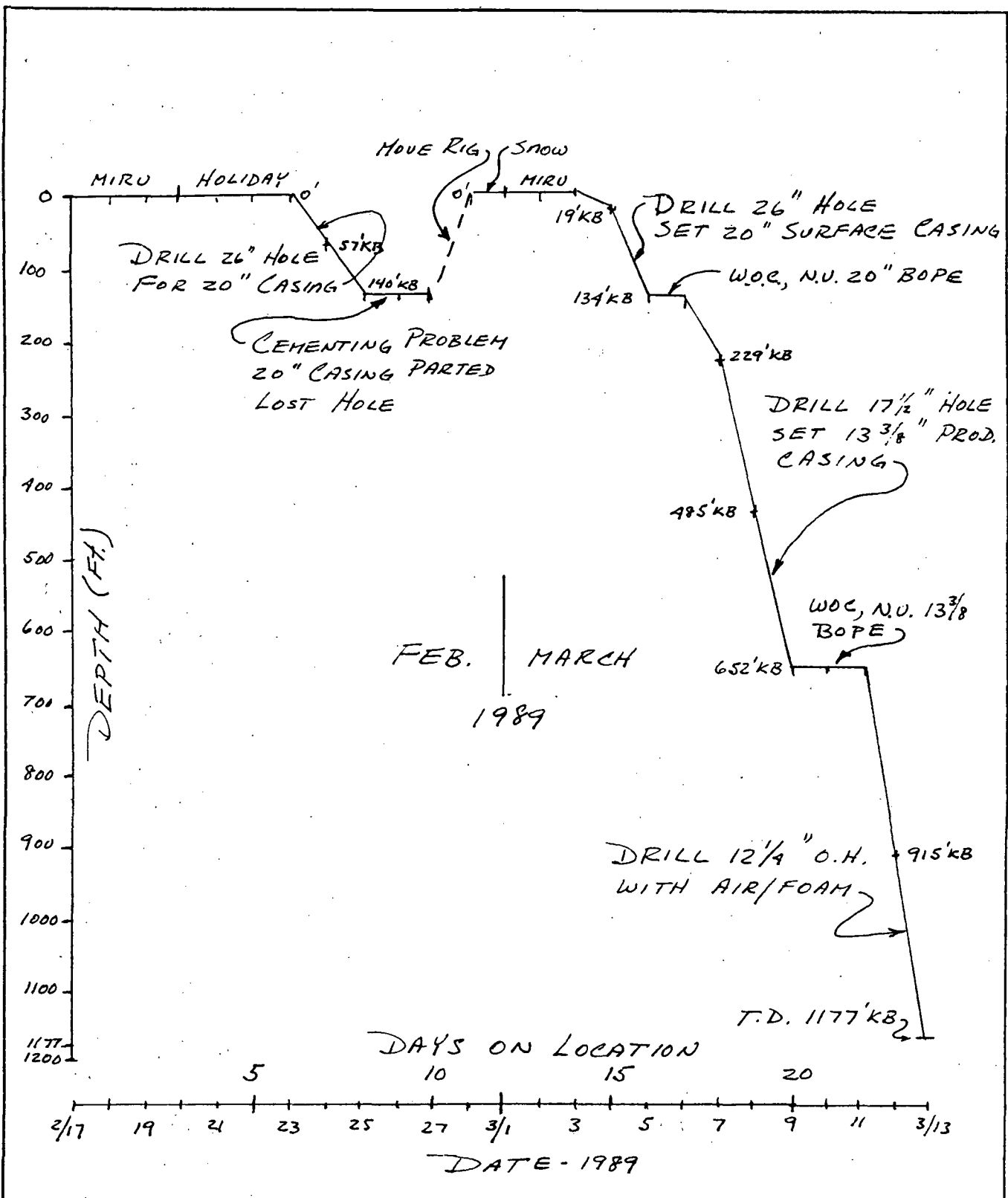
This casing was run and cemented successfully on March 6, and on March 7, a 17.5" hole was begun. On March 10, the 17.5" hole reached 652'KB at which depth 13.375", 61#/ft., K-55, BT&C was run and cemented without incident.

On March 12, following successful pressure testing of the 12" BOPE stack, a 12.25" diameter hole was drilled past 940'KB where the first steam entry was logged, to a total depth of 1177'KB.

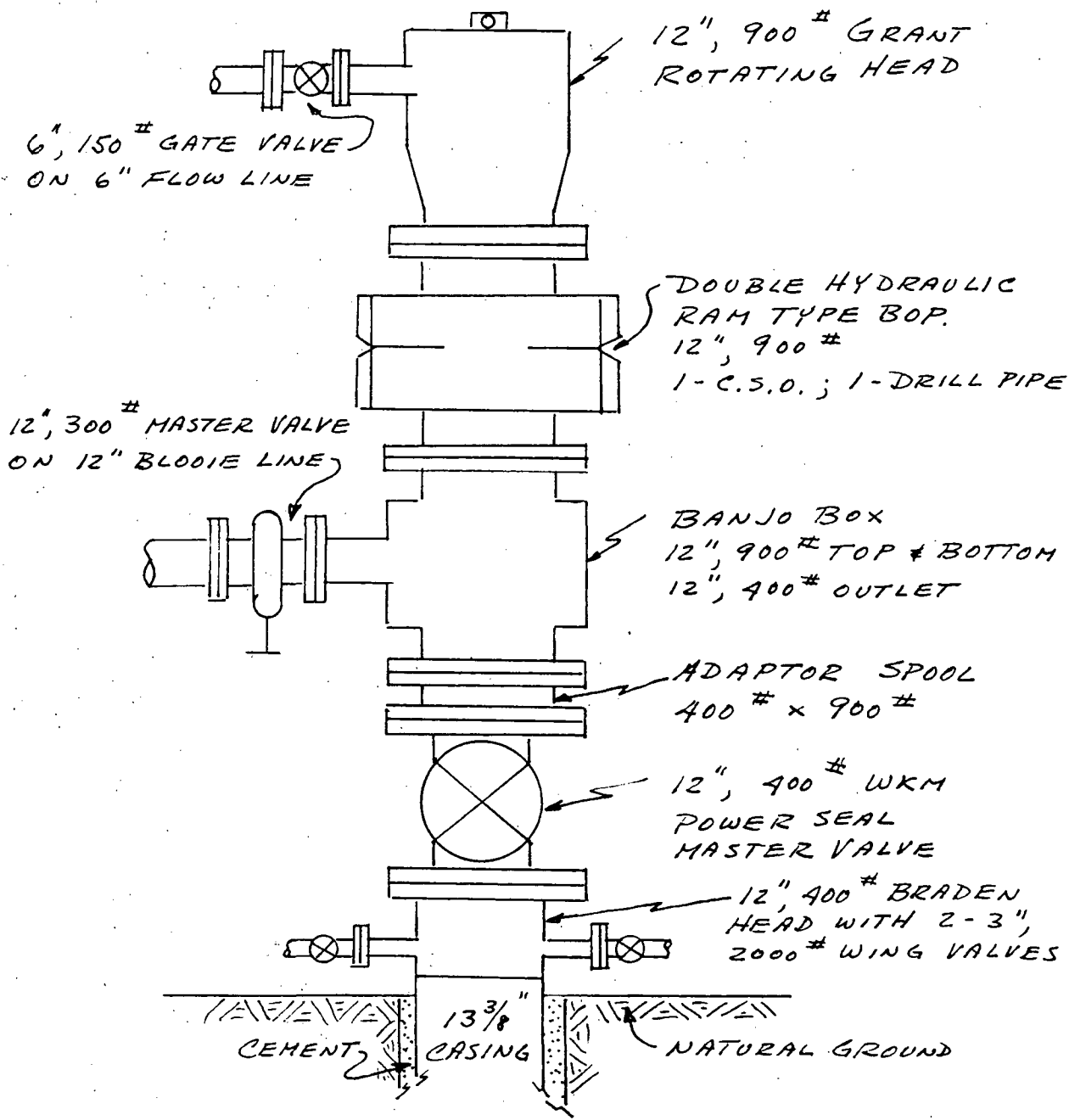
A drilling history, describing daily events between February 17 and March 13, 1989 plus a memorandum detailing Feb. 25-27 events, drilling activity sheets, and four reports accompany this document as Appendix A. Figure 2 is a profile of the well as completed; Figure 3 is a drilling curve showing the rate of drilling progress, and Figure 4 shows the Blowout Preventer stack used on the 13.375" casing. Appendix B, attached, is MEI's basic drilling procedure developed for production scale wells.




REVISIONS				By: GWH	Ckd: GWH
No.	Date	By		GEOHERMAL MANAGEMENT Co. P.O. Box 2980 Evergreen, CO. 80439-2980 (303) 670-3454 WELL PROFILE P-88-1A SULPHURDALE, UTAH.	Date: 7/7/89
1			Dwng. No: HEIP881-2		Figure 2
2					
3					
4					
5					



REVISIONS				By: GWH	Ckd: GWH
No.	Date	By		GEOHERMAL MANAGEMENT Co. P.O. Box 2980 Evergreen, CO. 80439-2980 (303) 670-3454 DRILLING CURVE P-88-1A SULPHURDALE, UTAH	Date: 7/7/89
1			Dwng. No: NE/P88-3		Figure 3
2					
3					
4					
5					



REVISIONS		
No.	Date	By
1		
2		
3		
4		
5		


GEOHERMAL MANAGEMENT Co.
 P.O. Box 2980 Evergreen, CO. 80439-2980 (303) 670-3454
 13 3/8" B.O.P.E. STACK P-88-1A
 SULPHURDALE, UTAH

By: GWH Ckd: GWH
 Date: 7/7/89
 Scale: NONE
 Dwng. No: ME/P881-4
 Figure 4

IV. GEOLOGY

The Cove Fort-Sulphurdale region, in southwestern Utah, comprises folded and faulted sedimentary and metasedimentary rocks of Paleozoic to Mesozoic age that are overlain, sequentially, by Oligocene to Miocene age ash-flow tuffs and Quaternary basalts. All of the rocks except the basalts have been intruded locally by Miocene quartz monzonite and/or latite porphyry stocks, sills, and dikes.

The rocks penetrated in P-88-1A comprise breccias and ash-flow tuffs (Ttb), reworked and hydrothermally altered to varying extents, that have been designated as the Three Creeks Tuff Member of the Bullion Canyon Volcanics (one of the oldest of the local volcanic units). The Three Creeks Tuff has three distinct zones: an upper and a lower zone of red to grey densely welded tuff and a middle zone of poorly welded white tuff. Only the lower zone of the Three Creeks Tuff has been mapped in the Cove Fort area of interest.

This lowermost zone of the Three Creeks Tuff has been further subdivided into two cooling units. The upper unit is characterized by euhedral plates of biotite up to several millimeters wide and euhedral (beta morphology) quartz crystals while the rocks of the lower cooling unit are mineralogically the same but much finer grained. The lower unit (tentatively correlated with the Wales Canyon Formation) is found in P-88-1A between 670 and 930'KB.

P-88-1A initially penetrated about 40 feet of alluvium and colluvium. From 40 to 280'KB, the rocks encountered were light to medium grey to red-brown, variably silicified ash-flow tuffs of the Ttb. These rocks are juxtaposed with dacitic lavas and airfall breccias along the low angle basal fault of a slide block. Both the lava and the breccias are strongly silicified. The lavas mantle more coarse grained, red-brown to grey ash-flow tuff which, in turn, overlies a fine grained, biotite-poor tuff herein correlated with the Wales Canyon fm.

At 930'KB, P-88-1A penetrated a conglomerate comprising various sedimentary and volcanic lithologies and at 940'KB the first significant steam entry was recorded. The production zone, drilled from 930 to 1177'KB is the white, vitreous, silicified, pyritic Coconino sandstone/quartzite. This rock is brittle and pervasively fractured so that prolific steam entries flowed via fractures at 1119, 1121, and 1132'KB.

Attached, as Appendix C, is a petrographic description of drill cuttings from this well together with some interpretive comments.

V. PERMITS

Because well P-88-1A was drilled on privately owned land and not on Federal property, the permitting required was minimal. Attached as Appendix D is a copy of the relevant permit from the Utah Division of Water Resources (UDWR). Archeological clearance for the well was given as a result of studies encompassing the whole prospect area that were previously accomplished and documented. When the BOP stack on P-88-1A was pressure tested in accordance with State regulations, the test was witnessed and approved by UDWR representative Kirk Fourbush.

VI. SUMMARY COST ESTIMATE

Attached to this report as Appendix E is a "Field Cost Estimate". This estimate for both hole P-88-1 and for well P-88-1A was \$205.99 per foot. The costs are higher than might have been had not the 20" casing parted on P-88-1, necessitating a move of the rig, and had the weather not been unusually cold even for Utah in February-March.

APPENDIX A

F-88-1/P-88-1A DRILLING HISTORY

2-17-89		
0700 - 1800	MIRU	
2-18-89		
0700 - 1800	MIRU	
2-19-89		
0700 - 1800	MIRU	
2-20-89		
0700 - 1600	MIRU	
2-21,22,23-89		
All Day	Vacations for crews	
2-24-89		
0800 - 1400	MIRU, Drill rat and mouse holes, set 10 feet of 30" conductor casing.	
1400 - 1530	Safety course by Bell Safety Inc.	
1530 - 2000	MU BHA to drill 26" hole for 20" surface casing.	
2000 - 2245	Spud and drill to 57'KB. KB=GL+17'.	
2245 - 2400	FOOH, RD 26" bit, PU 9" collar.	
2-25-89		
0000 - 0330	MU BHA and collar, RIH to 57'KB.	
0330 - 1030	Drill ahead to 140'KB.	
1030 - 1130	Swab hole, FOOH.	
1130 - 1200	Weld shoe on 20", 94#/ft., K-55, BT&C	
1200 - 2400	Run and set 20" surface casing at 124'KB, Cement with Redimix, displace with water, WOC.	
2-26-89		
0000 - 0400	WOC.	
0400 - 0630	RIH with 1" wash pipe, tag cement at 81'KB, CD water and slurry down to 91'KB.	
0630 - 0830	Wait for cement truck.	
0830 - 0930	Try to fill hole with neat cement. No luck, truck can not pump watery mixture.	
0930 - 1200	Cut hole in 30" conductor, fill annulus between 20" and 30" casings with neat mix, Cement seen at GL, WOC.	
1200 - 1600	WOC, MU accumulator.	
1600 - 1730	Repairs to rig.	
1730 - 2400	MU Hydril on 20" casing.	

2-27-89

0000 - 0500 MU rotating head and flow line, need new flange to install Hydril.
0500 - 0600 RIH with 17.5" bit, drill cement from 19' to 43'KB. Bit bouncing; no progress.
0600 - 0630 PQQH to inspect bit, Bit appears to have been running on iron, LD 17.5" bit, PU 12.25" bit, RIH.
0630 - 0730 Drill 15 minutes while bouncing, then progress resumed at 10-15'/hr. Drilled Kelly down, then blew hole dry.
0730 - 0800 PQQH; Inspect hole with sunlight & mirror, Note 20" casing parted at 43'KB, 6" ledge of cement visible.
0800 - 1900 PQQH, rig down preparatory to skidding rig.

The Memorandum below details the events of Feb. 25-27, 1989.

MEMORANDUM

To: Mother Earth Industries, Inc.
From: G.W. Hutterer
Date: March 2, 1989
Re: Drilling, Casing, and Cementing Events on P-88-1;
February 25 - 27, 1989

Presented below is a sequential listing of the events that occurred on 2/25-27/89 while drilling, installing 20" surface casing, and attempting to cement this casing on well P-88-1. The purpose of this memo is the documentation of these events so that in the future, we can better avoid the mistakes that led to the forcible separation of the 20" casing and the costly and time-consuming consequences.

1. P-88-1 was drilled to what I was told was 140'KB at 0800 hrs on 2/25/89. When the drill string was measured while pulling out of the hole, I was informed that we had drilled not to 140'KB, but to 134'KB. The difference was caused by the driller forgetting that one set of subs had been removed from the bottom hole assembly after drilling the first "Kelly-down".

2. I decided that the "loss" of 6' of hole was not critical in light of the relatively fresh quality of the cuttings examined and that we should set and cement the 20" surface casing at 117'GL. (GL=KB-17'). This plan would give us about 87' of cemented bedrock since the Gal-Tbt contact was estimated, from the cuttings, to be at about 45-47'KB.

8. We were worried that all of the jarring might have jammed loose rock into the flipper valve preventing it from opening; therefore more pure water was pumped into the casing in order to learn if the valve was free. Water was observed rising on the outside of the casing, thus assuring us that the valve had not been jammed closed. Obviously, the water levels inside and outside the casing soon equalized with several tens of feet of water on both sides of the casing.

7. The driller continued picking up and dropping the casing and continued gaining a few inches each time. Eventually, joint number 4 was added to the casing string and the casing was landed at 124 KB. I was so advised and I decided that we could still live with 77% of cemented bedrock. I therefore approved the cementing of the 20' casing at 124 KB (107 GL). I now believe that the surging of the casing loosened the bit and that as the casing fell, bits of loose rock probably were "pumped" upward into the water that had been put into the hole. This loose rock then settled into place around the casing creating an impediment to the cement that was later pumped into the casing, out of the shoe, and up around the casing.

6. The driller tried picking up the casing 3-10 feet and then dropping it to achieve penetration and by so doing he was able to gain several inches each time. Day Grimshaw noted that the casing pulled up freely each time and he concluded that the casing was not hitting fill and that one collar might be sticking in a tight spot. Accordingly he ordered water to be run into the casing (and into the hole) through the open flipper valve in the cementing shoe) to lubricate and "add weight" to the casing. (I'm not sure how weight was to be added by this procedure since the water would run right through the casing).

5. When the rig was fixed, a try was made to continue setting the casing, but it stuck at about 116 KB.

4. At about 1300 hrs, while running casing, a hydraulic hose failed and for two hours, until about 1500 hrs, the rig was shut down. This meant that the hole was open and exposed to the air from 0800 to about 1500 hrs or 7 hours.

3. By 1300 hrs, joints numbers 1, 2, and 3 had been made up, (The joints were about 40', 40', and 37' long while the shoe of each joint, and run into the 26" hole to about 92 KB. tack welded with 4 - 2" beads on the top and on the bottom was 2' long).

9. Carling Cement of Filmore and a pump truck from Parawan had been on site for several hours. Jay Grimshaw had visually inspected the dry cement in the trucks and seen it to be powdery and fine. I later learned that each truck contained 20,000 lbs. of $-3/8$ " "sand". (This is really "gravel" and not "sand"). Pumping then began through a 2" valve attached to a $1/4$ " steel plate that had been welded with a single pass onto the top casing joint. About 15 minutes after the start of pumping, pressure built up and the cement flow slowed. Suddenly the casing "jumped" a little, the pressure was relieved, and cement flow resumed. I now believe that the cement dissociated when it hit the water in the casing and that the gravel fell quickly into the flapper valve thus temporarily plugging it. When the casing "jumped", it freed the plug for a while.

10. After another 5 minutes of pumping, the hole really plugged up and the hose from the pump truck ruptured. This plugging was probably due to the barrier to cement created by the settled formation fragments together with gravel, segregated from the cement, that filled the bottom of the shoe.

11. Since we could get no more cement into the well and the cement was rapidly setting up in the cement trucks, Jay Grimshaw ordered the cementing terminated and the drill rig pumps to be hooked up to the 2" valve on top of the casing. His intent was to chase the cement in the casing with water and so to force most of it out of the casing and up around the outside where it was needed.

12. When the rig pump was started, the pressure immediately registered 500 psi and about 10 seconds later, there was a loud noise, the casing "jumped" about 4" (it had previously been chained down to the rig floor) and then the casing settled back to within about 1" of its original position. The $1/4$ " plate on the top of the casing was bulged significantly but did not break its welded bond.

13. The pressure on the water pump immediately dropped and water flowed from the bloopie line thus suggesting to us at the time that the water was properly chasing the cement as we wished. The pumping was stopped after a short time so as not to pump water out of the shoe and into the annulus.

14. After unhooking the rig pump hose from the 2" valve, the valve was opened slightly to see if it was on positive pressure as we anticipated. Surprisingly, the casing was on suction. We interpreted this to mean that there was still more cement inside the casing than on the outside and that

19. Jay found it hard to believe that there was steel in the hole so he ordered a 12.25" bit run into the hole with the intention of reaming out to 17.5". The 12.25" bit ran into something at 43.4KB, but was finally run in a full Kelly length (55.4KB).

18. In order not to waste time waiting for the right flange for the Hydril, a 17.5" bit was used to drill out the cement inside the 20" casing. All went well until about 43.4KB (26.6L) when the bit began to bounce. The driller said that it "feels like steel in the hole". The bit was pulled out of the hole and several teeth were seen to be broken off. Jay G. was notified.

17. On Monday, 2/27/89, the 30" conductor was cut off, the 20" casing was cut off, and a Braden Head was landed. An attempt was made to nipple up the Hydril, but an incorrect flange thwarted this operation.

16. By 0900 hrs, tries had been made to pump a neat cement grout (no sand at all) into the top of the annulus. Unfortunately, the pump on the pump truck would not pick up the very heavy grout and the cement was eventually poured into the annulus through a hole cut for the purpose in the 30" conductor casing. The cement level inside and outside of the 20" casing was seen to be about 1' above ground level and operations were shut down to wait for the cement to harden.

15. On Sunday, 2/26/89, a 1" tremie pipe was poked down the annulus to about 64.6L. Jay G. ordered air blown through this pipe to clean out any water in the annulus and when this was done, the pipe was poked down another 10 feet to about 74.6L. The latter was possible because the water pumped into the casing after the casing "jumped" actually traveled out of the casing at 26.6L and out the biocline, with water resting on the cement in the annulus up to the 26.6L level thus diluting the top 10' of the annulus cement. After the annulus was blown dry, I was told that there was "connection" between the outside and inside of the well. I was very surprised, but others suggested that it was not strange and that it was possible via channels created by the water that had been pumped in.

the levels would equalize if we left the valve open. This was done and, estimating that we had pumped about 6.5 cu.yds. of cement into the casing and the annulus, we shut down for the night expecting to find cement at about 70.6L in the morning when a "top job" would have to be done.

20. Using a mirror and reflected sunlight to illuminate the bore, after setting drilling dust with some water, one could plainly see that the 20" casing had parted at the joint between sections 2 and 3 and that the top piece was displaced about 6" to the northwest from the bottom piece of pipe. This left a crescent shaped, cement filled area about 6" wide in the southeast quadrant of the hole. Obviously, the parted pipe explained the air connection noticed during dryout of the annulus (not channeling).

21. The rest of 2/27/89 was spent on problem resolution including options, costs, and on calls to MEI-SLC and MEI-AZ.

It is not hard to understand how the casing became stuck and how pressure built up during pumping operations but it is very hard to believe that the 20" casing joint failed under just 500 psi when the single pass weld on the 1/4" cementing plate held firm. The joint had been made up especially well and then tack welded; the only conclusion is that the casing and/or threads must have been defective.

In the future, holes will be recleaned prior to casing installation if they have been sitting open for an extended period of time. The cleanout will be done with the casing partially in the hole if possible, or if necessary, with the casing withdrawn and the bit reinserted. Casing will henceforth be lowered slowly into holes to preclude surging and degradation of the formation, and pure water will never more proceed cement into a casing. Multiple checks will be made to confirm that no gravel is in the cement and that all cement used is of Beothermal Grade. Pumping will be accomplished by B.J. Titan or Halliburton and local firms will no longer be used. Finally, casing joints will be made up with 10,000 pounds of torque (single pull) and Loc-Tite will be used on the threads instead of welds so that the casing can be removed from the hole for recleaning if necessary. Careful implementation of all of these precautions should prevent casing separation and the failure of cement jobs in the future.

2-28-89 0700 - 1300 RDMO, prepare to skid the rig 10' north.

3-1-89 All Day Three (3) feet of snow, site inaccessible.

3-2-89

0700 - 1800 MIRU P-88-1A.

3-3-89	0830 - 1800	MIRU
3-4-89	0700 - 1230	MIRU
	1230 - 2300	Set 10' of 30" conductor casing
	2300 - 2400	Spud P-88-1A, D-111 26" hole to 19'KB.
3-5-89	0000 - 0330	Repairs, thaw lines.
	0430 - 0430	DA 19-58'KB.
	0430 - 0600	Make connection.
	0600 - 0730	DA 58-78'KB.
	0730 - 0900	Connection, MU mud.
	0900 - 0930	DA 78-109'KB.
	0930 - 1100	DA 109-138'KB, Setting point for 20" surface casing.
	1100 - 1200	Wiper trip.
	1200 - 1315	RH, tag bottom, no fill.
	1315 - 1830	Circulate and condition hole, prepare to run casing.
	1830 - 1900	FOOH
	1900 - 2400	FU, weld, and run 20", 94#/ft, K-55, B1&C surface casing to 133'KB.
3-6-89	0000 - 0530	RU to cement with Dowell/Schlumberger
	0530 - 1200	MOC.
	1200 - 1500	CO 20' casing and weld on flange.
	1500 - 1800	NU BOPE on 20" casing.
	1800 - 2400	Tighten bolts on BOPE and repair pump for pressure test.
3-7-89	0000 - 0715	Prepare to pressure test BOPE, test at 100 psi for 30 minutes, OK.
	0715 - 1015	MU BHA.
	1015 - 1200	Weld broken rotating head.
	1200 - 1430	RH with 17.5", Y13 Reed, Medium Soft Formation bit, tag cement at 113'KB,
	1430 - 1530	DA to 139'KB.
	1530 - 1530	DA 139-170'KB.
	1530 - 2000	Circulate hole for survey, swab hole, CO fill and tight spot at 130'KB.
	2000 - 2030	Survey #1 at 160'KB: .75 degrees, 55ZE.
	2030 - 2200	DA 170-199'KB, circulate.
	2200 - 2400	DA 199-229'KB, (30'/hr rate).

3-8-89

0000 - 0230 DA 229-258'KB, Fractures at 235 and 258'KB.
0230 - 0430 DA 258-289'KB, drilling break 289-290'KB.
0430 - 0800 DA 289-320'KB.
0800 - 0815 Survey #2 at 310'KB: 1.5 degrees, S47E.
0815 - 1015 DA 320-351'KB. Fractures at 320-335'KB.
1015 - 1200 DA 351-376'KB.
1200 - 1300 DA 376-381'KB.
1300 - 1730 DA 381-411'KB, fracture at 383'KB.
1730 - 2100 DA 411-441'KB, Tight connection, wiper
trip, hole cleaning up well.
2100 - 2115 Survey #3 at 431'KB: 1.75 degrees, S31E.
2115 - 2215 DA 441-472'KB, fracture at 454'KB.
2215 - 2400 DA 472-485'KB.

3-9-89

0000 - 0145 DA 485-502'KB.
0145 - 0445 DA 502-532'KB.
0445 - 0700 DA 532-547'KB, fracture at 532'KB.
0700 - 0930 DA 547-562'KB, circulate and condition
hole for Survey #4.
0930 - 0945 Survey #4 at 552'KB: 1.0 degrees, S14E.
0945 - 1100 DA 562-593'KB.
1100 - 1200 DA 593-603'KB, 15' fill at 593' connection.
1200 - 1315 DA 603-622'KB, fracture at 612-614', 618,
and 621'KB.
1315 - 1500 DA 622-652'KB, fracture at 645'KB.
1500 - 2400 MU new mud at 35 second viscosity, pump
mud in hole, circulate and condition, short
trip, bridge at 133'KB, CO bridge, no fill
652 is setting point for 13.375" casing.

3-10-89

0000 - 0130 Circulate and condition hole.
0130 - 0230 PDDH.
0230 - 0730 RU and run 17 joints of 13.375", 61#/ft,
K-55, BT&C production casing.
0730 - 1000 RU Dowell/Schlumberger, pump 27 bbls water,
535 sax Class G cement with 40% D66 and
silica flour. Displace with 94 bbls water.
409-500 psi held for 3 minutes, float leak.
1000 - 2400 WOC, miscellaneous repairs and clean-up,
cut off casings, NU BOPE, flow lines,
a Braden Head with two 3", 2000# wing
valves, a 12" 400# Master Valve, 400# to
900# adapter flange, a 900# (top and
bottom) by 400# (outlet) Banjo Box, a
12", 900#, double gate (CSO and Pipe)
BOP, and a 12", 900# rotating head.

3-11-89

0000 - 1200 Continue NU BOPE.
1200 - 1700 Test blind rams at 600 psi, OK.
1700 - 1800 RIM with 12.25" BHA.
1800 - 1900 Test pipe rams at 950 psi, witnessed and approved by Kirk Fourbush of UDWR.
1900 - 2400 Rig up to drill, move equipment onto site.

3-12-89

0000 - 0400 Prepare to drill.
0400 - 1115 Drill cement 597-652'KB.
1115 - 1600 DA 652-747'KB, drilling break 713-720'KB.
1600 - 1615 DA 747-757'KB, BOP drill: 40 seconds to briefing area, 2.5 minutes to close hole.
1615 - 1830 DA 757-777'KB, Level derrick.
1830 - 2015 DA 777-790'KB.
2015 - 2100 DA 790-807'KB, Survey #5 at 797'KB: 1.25 degrees, no azimuth, (no monel in hole).
2100 - 2400 DA 807-915'KB, fractures at 866-869, 108' drilled in 3 hrs. 36'/hr average.

3-13-89

0000 - 0100 DA 915-940'KB. First steam entry, shift steam flow to banjo box bloopie line.
0100 - 0330 DA 940-987'KB, drilling break 970-985, fracture at 965'KB.
0330 - 0630 DA 947-1046'KB, drilling break 1015-1035, fracture at 1011'KB.
0630 - 0735 DA 1046-1108'KB, fracture at 1090-1095'KB.
0735 - 0745 DA 1108-1138'KB, fractures at 1115, 1119, 1122, and 1133'KB.
0745 - 1200 DA 1138-1168'KB, fractures at 1138, 1159-1162, hard rock 1162-1168'KB.
1200 - 1430 DA 1168-1177'KB in hard, brittle, fractured sandstone/quartzite fm. TD at 1177'KB.
1430 - 2130 POOH, miscellaneous repairs, hole complete.

NET DRILLING ACTIVITY LOG WELL # [P88-1A]

DATE: [3-15-89]

TIME	DEPTH	NAME	COMMENTS
07:00		Mikesuch	Rig Down; Finish Nipping Down BOP'S, Pull OUT unhook Rotary table + pull out sub structure. Rig Down mud tanks + put all lines in place to move, move. Pdg house, Lower Doug house, Parts house, Light plant, water tank, Junk basket, slate shaker tank, PICK UP all lines, + winterizing, steam heaters, lights + move ABOVE to old location Lower Derrick, Roll UP cables and Attempt to move Rig.
19:30			Rig became stuck on location try to pull Rig out w/ cat + Rig up truck could not pull Rig out. Finish moving pads F/ Rig

005 Jan 08, 89 11:34 P.05

WELL	DATE	COMMENTS
P88-1	3-15-89	
Krichins	Rig down	Trips skip out sub, Loosen
		Guided Lines. Remove same, scope down rig
		Set Down Dog house with forklift, Load
		Buildings with Rig up track, Lower Derrick
		Spool cables. Drive Rig in to soft fill
		and were stuck Broke 3 Bridel Lines in
		Attempt to pull out Rig
1900		

NET DRILLING ACTIVITY LOG WELL # [P88-1A]

DATE [3-14-89]

TIME DEPTH NAME

COMMENTS

0700 1177 M. Sweet Rig Down, Break Kelly, Rig Down Floor, set front end out +
 move to stack out sight, nipple down B.P.S. + Blowie line
 Break steam lines + Rt away. Load land + marine equip.
 + sent to machine shop. Clean mud tanks +
 Break lines. Repair wrench line. UNload Drill collars,
 Drill Pipe, Kelly, Land + marine equip., Pipe Racks, catwalk
 stacks, Extra Blowie line. send it all to old
 location. set out Grant Rotating hand + all
 Extra parts out on location.

19:00

M. M. Sweet

WELL # [P88-1] DATE [3-14-89]	TIME	DEPTH NAME
<p>REPAIR WRENCH pry out of sleeve Break down pits stand pipe line to pump Break Kelly and bore 1/2 down swivel, set out cat walk because slide and stakes nipple down bore line and flow line set out same nipple down Rotate head set out same, nipple down D661 Gate and set out pull bolts from Bango load truck with load & Marine equip Unload at stack site, load lift subs and X over subs (old) on Marking shops Truck (Thompsons) stack grant equip Edge of loc. Clean pits pump water Flood For cleaning pits</p>	<p>Kirkhirs</p>	<p>0700</p>
		<p>1900</p>

NEI DRILLING ACTIVITY LOG WELL # (P88-1A) DATE (3-13-89)

TIME	DEPTH	NAME	COMMENTS
0001	915	m. 5044	Drilling F/ 915' Conn 927'
0030	927'		Conn @ 927'
0100	940'		Steam came in @ approx. 940' DRLg
0130			Shot in Blow Line - Flow out Blow Line Check For Blow Line Plugging off
0145	957		Conn 957.
0200	957		DRLg F/ 957- 987 DRLg Break F/ 970-985 Frac @ 965'
0230	987		Conn @ 987 Float in string washed out -
0345	987		DRLg F/ 987 - 1017
0515	1017		Conn @ 1017 DRLg Break F/ 1015 - 1017 + 1011 Fract.
0530	1017		DRLg F/ 1017-1046 DRLg Break F/ 1017-1035
0615	1046		Conn @ 1046
0630	1046		DRLg F/ 1046-1078
0710	1078		Conn @ 1078
0715	1078		DRLg F/ 1078-1108 Frac @ 1090'-1095'
0735	1108		Conn @ 1108 1113' DRLg Fracture - 1115'
0745	1138		DRLg F/ 1108-1138 DRLg Fracture @ 1119' to 1133'
0935	1138		Conn @ 1138 Small Fracture F/ (1133'-1138')

NET DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-13-89]

TIME	DEPTH	NAME	COMMENTS
1200		KRichins	Drlg F/1168 Fractured formation 3'
			F/1171 Hard Formation
1310			F/1172 Increase Drlg Rate Fractures to
1430			1177
1445			L/DOWN Drillpipe and Drill collars
1700			shut in well, Break Bit sub & Bit L/DOWN
			Rotate Rubber
1800			Repair Belts on Koomcy motor
1900			Remove Rotary Drive Bushing Ft Kelley
			One came Apart Reassemble same
2100			✓ for steam washes OK
			shut down will return 0700

005.01.09.09 11:34 P.05

NET DRILLING ACTIVITY LOG WELL # [P88-1]		DATE [3-12-89]	
TIME	DEPTH	NAME	COMMENTS
1200		KRichins	Drlg F/ 675 To 687
1230			Conn no fill
1245			Drlg F/ 687 To 713
1515			Increase Drlg Rate F 713 To 720
1530			Conn @ 717
1545			Drlg F 717 To 747
1545			Conn @ 747 no fill
1600			Drlg F 747 To
1615			B.O.P Drills 40 sec to Brief Area
			2 min 30 sec pick up stab Drill pipe Valve and Tighten same, close pipe Rames ✓ BOP's
1630			Drlg F 757 To 777 shovel pea Gravel in Cellar, steam clean cat, pick up around Loc. Repair Steamy leaks around Rig
1750			Conn @ 777 Reset Rotate Rubber, Level Derrick
1830			Drlg F/ 777 To 790' Drlg Rate Increase
2015			Drlg F/ 790' To 807'
2045			Survey @ 797 1 1/4° Drill Ahead

NET DRILLING ACTIVITY LOG WELL # [P18848] DATE [3-12-89]

TIME	DEPTH	NAME	COMMENTS
0001		Mikes with	PICK UP 8-6 1/2" Drill collars + trip in hole
0200			Repair Air starter on Air Booster + Install rotating head
0300			Finish trip in hole tog cement @ 597'
330	7'		UNLOAD HOLE
345			Repair blow line
400			Drly cement
415			Drly float collar + shoe w/ 3-5000 bit wt. 40-55 RPM - 225# Air foam press.
3000			Repair "Grant" rotating head. BUSLING
1015			Drly float collar + shoe w/ same AS ABOVE
1145			Drly new formation F/ 52
1200			Drly 6.75'

005 1705 JAN 05 09 11:54 P.05

NET DRILLING ACTIVITY LOG WELL # [P88-1] DATE [3-11-89]

TIME	DEPTH	NAME	COMMENTS
1200		KRichies	nipple up Flow line Install Valve and extension to same Install Gauge on well Head Hook up Kill Line
1700			Pressure test Blind Rams 600 psi.
1800			Trip IN 9" Drill collars / STD Drill pipe
1900			Test Pipe Rams @ 950 psi
2000			set catwalk, stairs, Beaver slide
2100			Lay DOWN 9" Drill collars
2230			strap and Caliper 6 1/2" Drill collars truck 1 more 6 1/2 From old LOC.
2330			pick up 6 1/2 Bit sub, Float and Bit 1 1/4" dia.
2400			Trip in

3-11-89 12:00 PM 11:34 P.05

DRILLING ACTIVITY LOG

P88-1

DATE [3-10-89]

TIME	DEPTH	NAME	REMARKS
1200		KRichins	W. O. Cement Truck all Equipment NEEDED For Nipple UP, From Last Location
1300			Open Valve on cement Head
1730			pull Flow line, Remove Cement Head
1800			cut 20" @ biton of Celler p/u Hydrill
			cut 13 3/8 casing, lay DOWN some
1930			set out Hydrill set out xover spool
2030			make final cut on 13 3/8 set weld on casing Head, and weld
2400			still welding

WELDING ACTIVITY LOG WELL # P88 1A

DATE [3-10-89]

TIME	DEPTH	NAME	COMMENTS
0001		M Sweet	Circ + condition Hole w/ mud. E/ 13 7/8 casing
0130			TRIP OUT TO RUN casing
230			Rig up Floor to run casing
0330			Run 17 JTS K55 13 3/8 casing
0730			Rig up D.S. + cement. Pump 27 bbl. water, 535 sacks CLASS. G. cement w/ 40% D ₆₆ + silica flour. Displace w/ 94 BBL. water 490-500 PSI Held 3 min. OK. <u>Floot did not</u> <u>Hold.</u>
1000			Wait on cement. Pump cellar, cut hole in 26 casing and drain cement + F/ stack, and wash same. Clean floor Pick up tools, Round up tools to nipple up BOPS.
1200			waiting on cement.

1989 Jan 05:09 11:54 P.00

FIELD DRILLING ACTIVITY LOG WELL # [P88-1] DATE [3-9-89]

TIME	DEPTH	NAME	COMMENTS
0001		M. Swett	Drlog F/ 485'-502
0130			conn @ 502' 5' of fill
0145			Drlog F/ 502-532
0415			Circ + condition F/ connection
0430			conn. @ 532
0445			Drlog F/ 532-547
0630			Repair Grant Rotating head.
0700			Drilling F/ 547 - bed fracture @ 552
0915			Circ + condition F/ survey (Rig Service)
09:30			Survey @ 552' = S14E +1°
0945			Drilling 562-593
1100			conn @ 593
1115			Drilling F/ 593 15' of fill
1200			Depth @ 1200 = 603

105 JAN 06:59 11:54 P.05

WELD DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-9-89]

TIME	DEPTH	NAME	COMMENTS
1200		KRichins	Drlyg F/603' To 622' Fractured Formation @ 612' to 614' and F/618 to 621
1300			Conn @ 622' 4 TO 5' Fill
1315			Drlyg F/622' TO
1430			Fracture @ 645
1500			T D @ 652' circ with soap & water
1600			cond mud in pits
1700			PUMP 100 bbls mud in Hole
1730			Fill pits with water and Gcd up to 35VISC
1930			PUMP MUD IN Hole Approx 250 BB/S
2030			Break Circ and circ and cond mud
2250			Shorttrip out of Hole - light Bridge
2400			@ 133' went Back Through Did not Hit it Back to Bottom

100
100
100

TIME	DEPTH NAME	COMMENTS
1200		Drlg F/ 376 To 381
1230		Service Rig, Tighten bolts on Rotary Drive line
1300		CONN @ 381, Drlg F/ 381 To 383 hit small frac-
		ture still Drlg @ 386
1700		CONN @ 411, put 5 Gal Gear Lube in Rotary table
1730		Drlg F/ 411 To 441
2030		CONN @ 441, CONN Tight work Pipe 3 times
		Sweep Hole, Hole cleaned up Good
2100		Survey @ 431' 1/2 @ 531 E
2115		Kelley up Drlg F/ 441' To
2130	JCH	JEH apprentice diller F/ 446 T/ 454
2143		Fracture @ 454
2215		CONN @ 472 To
2400		Depth @ 485'

WELL DRILLING ACTIVITY LOG

DATE: 3/8/89 HJ

TIME	DEPTH	NAME	COMMENTS
2400		mile south	DRLG FL 229
0230			conn. 258 Fractured 235-258
0245			Drilling FL 258' to 289'
0415			circ + condition FL connection
0430			Conn @ 289' Drlg Break @ 280-290' bit wt. 8-9000 (70-90 RPM)
0445			DRLG FL 289-320 (Air Press. 320 @ compressor 2660 cmt)
0800			circ + condition FL survey (7 gal. Soc P. 5 gal Polymer)
0815			Survey @ 310' = 1 1/2° 47SE
0830			DRLG FL 320-351 Fracture @ approx 320-335
1015			Conn @ 351
1030			Drilling FL 351-
1200			Total Depth @ 1200 Hrs 376

03 JAN 06:09 11:34 P.08

DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-7-89]

TIME	DEPTH	NAME	COMMENTS
1200		KRichins	set Rotating Rubber and Rotary Drive
1300			tag cement @ 113' Drlg cement with 17 1/2" bit
1430			CONN @ 139' pull Rotary Drive off Kelly set Bushings in table Rotate Blow String Down 6' set Rotary Rubber Install Drive on Kelley
1530			Drlg F/ 139' To 170'
1630			CIRC and clean Hole For Survey @ 160' CONN depth @ 170.43'
1730			could not get CONN IN Hole set back in chase hole, Kelley up to clean Hole
1800			Ream & fill to 170' tight hole @ 130' Ream and circ again
2000			set slips level Derrick
2030			Survey @ 160' 3/4° S 52° E 41'
2045			Drlg F/ 170' To 199'
2130			CIRC clean Hole for CONN
2145			CONN @ 199'
2200			Drlg F/ 199' To 229'
2400			CONN @ 229'

003 JAN 06 09 11:54 P.00

DATE	TIME	DEPTH	NAME	COMMENTS
3-7-89		2400	Mikesett	Set mouse hole + Pick up Kelly to pressure test
		0130		Repair mud pump Rig up floor while waiting for welder
		6:00		Pressure test ROPS For 30 minutes @ 100 PSI Held OK
		7:15		Pick up 12" bit, 8" monel drill collar, install bottom hole joint
				Drilling head pickup + run cross over sub. Run DES. Pick up Kelly and rotating head. Rigber, attached to sub. ROPS. Rotating head broken
		10:15		waiting for welder, preparing rig to drill
		11:45		Repair broken wild ch. Rotating head.

WELL DRILLING ACTIVITY LOG WELL # (P88-1) DATE (3-6-89)

COMMENTS

TIME	DEPTH	NAME	COMMENTS
1200		KRakins	Cut 30" pick up 2 feet more flow line
1300			Cut Ruff cut on 20" Lay Down 30' suck out 20" casing 6' down
1400			Make fine cut on 20" to weld on Flange
1500			weld on 20" Flange
1600			Pick up X over speed hook up Koomney wire in motor and pressure up
1700			snub in Hy Drill
1730			snub in Rotate Flange
1800			Nipple up B.O.P.'S
2000			Set in Flow stand nipple up Flow line
2200			Tighten Belts on Blowout preventors and pressure up Koomney
2400			Relieve Pump + Pressure to test Blowout preventors

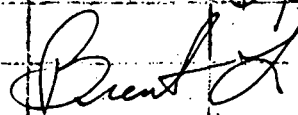
WEL DRILLING ACTIVITY LOG No. 1 [Page 1] DATE [3-5-89]

TIME	DEPTH	NAME	COMMENTS
1200		Tex R Pass	pull out of Hole - lay Down 1 Joint
	12 45		of Drill pipe. clean up BIT
12 45	13 15		Trip Back in Hole - pick 1 Joint of Drill pipe Back
13 15			u.P. Kelly up and circulate To Bottom.
	13 15		No Fill.
13 15			circulate and condition Hole To Run
			20 inch casing. wait on cementers To get
	18 30		on location. weld shoe on casing
18 30	19 00		POH TO Run 20" Casing lay Down BIT
19 00			Rig up Tongs and Elevators and Run
			20 inch casing. weld Joints Together
	13 7 1/2		1 st and 2 nd , and weld collars the others
2426			

2025 JAN 08:09 11:54 P.00

NO DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-4-89]

TIME	DEPTH	NAME	COMMENTS
0700		Tex R. Ross	Build air and start Rig. Level Derrick Hook up Drive line to Rotary table. Rig up Tongs. set floor plate in place. pick Kelly Hose up on floor. pick up Flow conductor pipe and weld on to conductor pipe. pick up Kelly and Kelly sock. pick up Flow line. weld Extension on flow line. Look for Joint of 3 inch pipe to extend mud line. Weld a 9 Foot Extension on to mud line. set pipe and Drill collars on pipe rack. Spud in at 2300 hours Truck got Here with 20 inch casing pull Truck on location with Dozer and unload 20 inch casing
	2300		
2300	2400		Spud in.
			

2025 Jan 06:09 11:54 P100

DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-4-89]

TIME	DEPTH	NAME	COMMENTS
0700		KRichins	Loosen Guided WIRES Level Derrick
			Pull of flange from steam trap on
			prod. Line. Repair with welder.
			track 30" conductor to welder
			Attempt to stab Flange and Valve on
			Steam Leak (no go) pull Bolt's From Flange
0900			Tighten Guided WIRES
			- put bolt in one hole on flange and Attempt
			to turn valve and flange over 2" hole
1230			to stop steam leak - (Leak Repaired)
			set conductor turn Flow Nipple toward shaker
			weld 30" together
			Fire forklift with macanic to haul drill pipe and
1300			Collars, uncover Kelly and nurse hole
			Brent

1989 Jan 06:09 11:54 P.00

WELD DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [3-3-89]

TIME	DEPTH	NAME	COMMENTS
0830		Kw Rubin	ONE Crew Arrived to Location
1000		Tex Ross	Arrived to Location -
			<p>Approx 2' To 3' of snow fell through the night - Warm Cat up to push snow off loc & Roads - pull out the ones that were stuck - Thaw out Diesel R Drain off H₂O - made up mud line to re fabricate to fit pump - welder come out could not get around so B. Larsen sent him home for the day - Clean snow off MEI trailer so heater would vent & hot H₂O - Search for dead men - extend mask to full length & tie down - center blocks over hole - shovel snow around rig to find things & make pathways</p> <p>could not get fork lift started -</p>
1800		Brent Larsen	

703 Jan 06:09 11:54 P.00

NET DRILLING ACTIVITY LOG # [P88-1] DATE [3-2-89]

TIME	DEPTH	NAME	COMMENTS
0700		Tex RRoss KW Rch B Jensen	<p>Move Rig out. skid Rig mats up Hole. move sub over Hole. pin sub Rig mat. Back Rig up to sub. skid Top Dog House in place. set Drilling line spool in place. skid suit cases up in place. skid water Tank in place. set Junk Rack and Diesel Tank in place. set light plant in place. set Bottom parts House in place. string out Guy wires. Raise Derrick to half mast. Hook up water lines and steam lines. set pipe Racks in. set cat walk in place. set Beaver slide in place. set steps in place.</p>
1800			

005 Jan 08:09 11:54 P.00

NET DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [2-28-89]

TIME	DEPTH	NAME	COMMENTS
0700	0730	Tex R. Ross	Start aircompressor. Build air and start Rig
0730			cut 20" casing off Below ground level, and
	0830		set out. Lay Down steps from Rig to Drillers
0830	0930		Console. Scope Derrick Down and Lay Derrick
093			over. coil up Guy Lines. Break Steam lines
			hose. coil up power cords. set ground Heaters
			out of way. move Bottom parts House. move
			light plant. move Junk Rack and Diesel
	1300		Tank. move sub away from Rig

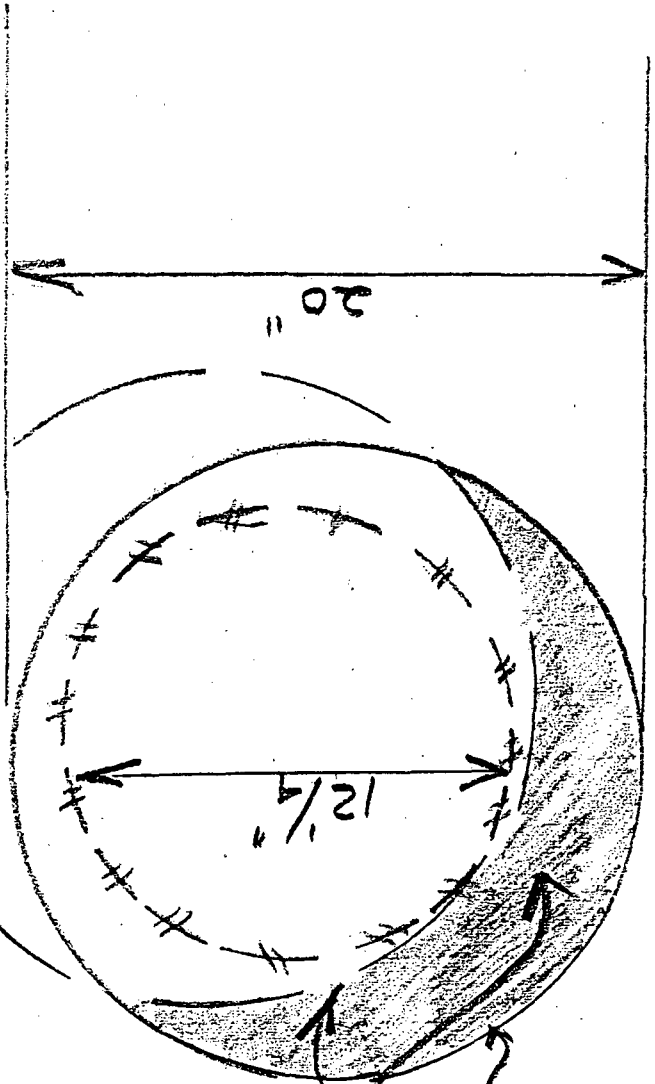
009 Jan 08:08 11:54 P.00

WELL DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [2-27-89]

TIME	DEPTH	NAME	COMMENTS
1200		Yex Rose	Take Kelly Hose off swivel and pick up Kelly and
	1500		Break Kelly. Rig Down floor. Set Beaver slide out
1500			set steps out away from sub. take Rotary
	1600		table Drive Line off. Take air equipment
1600			Down. Take Right angle Drive off. coil up air hoses
			To number one pump. coil up power cords to mud
	1900		adjustors. take Guy wires loose from Dead man's

JAN 06 09 11:54 P.00



Bottom Piece
of
20" casing

Ledge (cement)

Top Piece

NET DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [2-27-89]

TIME	DEPTH	NAME	COMMENTS
0630		Krichms	RUN 12 1/4. Approx 15 min Bouncing then smoothed out Drlg Approx 4 to 6 min per foot Drilled Kelley Down with Air and mist then dried Hole with Just Air.
0730			Reflect SUN with MIRROR DOWN casing casing had parted at 43' From top of Drlg Bushings Bottom part of casing was cocked over Approx 6"
0800			clean floor of Equip Lay down Drill collars From Derrick Lay down Kelley Hang Kelley hose side of Derrick Lay Down Kelley move pipe from catwalk move catwalk, Drill pipe, set out stairs beaver slide eat. get ready to move sub move pipe and pipe racks Boil line, Flowline and stand move oil drums, Repair Air pump on forklift
1800			

TIME	DEPTH NAME	COMMENTS
2400		Kirkhins Attempt to set Hydrill (no go) 3000 King pattern
0100		to 2000 Flange.
0100		Haul 17 1/2 Bit Breaker and 20" Hose 25' in length. Haul from old loc. also search for Xover spool
0200		Xover spool
0200		set out Hydrill to matton board skid to end of matton board with cat.
0230		Nipple up Rotac Head to weld on flange
0330		(remalong 20" hose to flow nipple on Rotac head
0330		Kelley up pick up 2 Xovers strip on Rotac spool set same.
0430		Drill out 4' cement to make Room for Rotac Rubber, set same
0500		Drill cement from 19' to 43' Bit started to Bounce and stoped Drly pull Rotary Spool
0600		Trip out Bit Appeared to have RUN ON IRON.
0600		Lay down 17 1/2" bit and 1 Xover pickup 12' set Rotary spool Run in bit set Rotary Rubber.

DATE: (2-27-89)

888-1

NET DRILLING ACTIVITY LOG WELL # [P88-1] DATE [2-26-89]

TIME	DEPTH	NAME	COMMENTS
2400	0900	KRichins	wait ON Cement
0400			trip IN 1" to 64.5 Tie IN AIR COMP to 1" Blow out BACK SIDE. Trip IN 10' more feet 1" Blow Again 74.5' Ground Level
0630	0830		wait ON cement truck
0830			Trip IN 2" to 41 foot Ground Level Attempt to cement through 1" Attempt 2" pump truck failed to pump slurry.
0930	0930		Pull out 1" pull out 2".
			Cut hole IN 30", fill Between 30" and 20" With neat cement, 9 YARDS IN Allowing 2 To 3 yards to flow Back to shoe at 107'. Center 20" wait ON cement, cement at ground level, pump water out of cellar Rig UP pump at Lake to fill pits with cold water
	1200		

003 Jan 10:09 11:54 P.00

WEL DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [2-26-89]

TIME	DEPTH	NAME	COMMENTS
1200		Tex R. Ross	wait on Top job cement. Set Remote control up on Rig floor. Hook up Remote control line to unit. Hook up 2 accumulator lines to accumulator. Hook air to accumulator.
1330	1600		Hook air hose to Remote control. Rig up air hose for air gun. fix some steam leaks around Rig
1730	1830		Mix Gel in mud Tanks to 32 viscosity.
1830	1900		Lay Down mouse Hole. pump up accumulator
1900	2000		Nipple Down Blewby line. Rig up pickup line and Hook on to 20" casing.
2000	2100		cut off conductor pipe and 20" casing and
2100	2300		Lay Down. Weld Nipple up Flange on.
2300	2400		pick up Hydrill and Nipple up

DRILLING ACTIVITY LOG WELL # [P88-1]

DATE: [2-25-89]

TIME	DEPTH	NAME	COMMENTS
2400		KRichins	pick up Drill collar (9") make up Assembly not enough crown room. Lay Down collar set Kelley Back. Pick up Drill collar strip on Rotate Head screw on bit.
0230			
0230	0330		Bucket up Rotate Head and Rubber
0330	1030		Drig F/ 84' To 137' 140" (26" Hole)
1030			Sweep hole, trip out, stand 1 Back (25ts) Lay 1 Down, Break Bit set out same
11:30			Pick up shoe and 1 Joint casing weld with welder
	1200		

DRILLING ACTIVITY LOG WELL # [P33-1] DATE [2-25-89]

TIME	DEPTH	NAME	COMMENTS
1200		Tex. R. Ross	<p>Pick up and Run 20' casing. weld each joint Repair Hydraulic Hose Between #1 and #2 meters Put Bands on Hose, would not hold. Replace Hose with new one. Run 20' casing. Hit Bridge at 117' Ground level. Fill pipe with H₂O and work casing Down. casing set @ 107' ground level. Cut casing off @ Rotary table. Weld casing Head on to pump cement. Cement casing. Displace cement with water for 17 minutes. Wait on cement.</p>
2400			<p>Key Down casing Tongs and Elevators.</p>

TIME	DEPTH	NAME	COMMENTS
8:00			PICK UP IN LAY & BOTTOM HOLE ASSEMBLY
10:00	10'00		MAKS UP BIT, & CROSSOVER SUBS, HELP AIR HAND BIT UP AIR TO MANIFOLD DRILL
10:00	10'00		MOUSE HOLE & RAT HOLE BIT LAY DOWN 1 3/4" BIT PICK UP 2 1/2" BIT SUBS FIX STEAM LEAKS HOOD UP BLOOE LINE AND STAND
20:00	20'00		Spud in & Drill - took up plywood on steam line
22:45	22'45		Kelly Down 57' 22:45
22:45	24'00		FULL OUT OF HOLE BREAK OUT 2 1/2" BIT LAY DOWN X-O SUBS & PICK UP 9" DRILL collar

WEL DRILLING ACTIVITY LOG WELL # [8-88] DATE [2-24] 1989
 Dave B. [unclear] COMMENTS

NET DRILLING ACTIVITY LOG WELL # [P88-1]

DATE [Feb 24-89]

TIME	DEPTH	NAME	COMMENTS
0800		KRichins	pull Kelley sock From Kelly with cat. pick up Kelley and make up to swivel. pick up Kelley hose and union to swivel, tie safety chain, pick up change over subs, Lay Down Change over subs, pick up new change over subs Brought By Land and marine, pick up 12 1/2 bit used to drill Rat hole and Mouse hole, help Welder weld 8" suction From pit to pump. Fire up Air comp Drill mouse hole and Rat hole
	1400		H ₂ S school
1400	1530		
1530	1600		Repair steam leaks pick up Xover subs

1008 Jan 05 09 11:54 P.00

WELL # IP80-1] DATE 12-20-89]

TIME DEPTH / NAME COMMENTS

0700 - Jerry Kelley Install master valve, 8 ft blow nipple, unload hand and

marine Kelley tongs, XO subs, accumulator and control box, blow out preventer and hydrill, set Kelley on act walk and rotary bushing, replumb 2 1/2" main steam, off plot hole, fix steam locks, wire main electric line with electrician. pull land and marine hot shot truck with the D-7 catipillar, inventory all land and marine equipments, hood slips, elevators, and drill collar slips on land and marine salesman. Repull ~~land~~ land and marine with D-7 again.

No accidents

TIME	DEPTH	ACTIVITY LOG WELL # [P88-1]	DATE [Feb 19-89]
		COMMENTS	
0700	KWRichins	ADJUST Cables, SCOPE Rig wrench DOWN Jacks to center BLOCK (off Drlg side) GUIDED Rig to dead men. Install Bearing on Rotary Drive, Replace Drive chain. CUT 4" OFF Drive Line shaft Install same. Set Floor plate, wt Indicator, Install Diaphragm To dead line pick up Bails and Swivel finish wind walls, grease Rig, Help plum Steam system, Finish Running Rig Lines Move lifting subs to cat walk, Slips and Elevators Finish Leveling Loc. with cat DRUM hose used to fill water tank Pick up bit to floor for use of Drilling Get hole and mense hole, Clean UP parts and tools Rig up Complete.	
1800		Brent Janzen	
		No Accidents	

NET DRILLING ACTIVITY LOG WELL # [P88-1] DATE [2-19-89]

TIME	DEPTH	NAME	COMMENTS
0700		Tex R. Ross	Start light plant and start Rig. Scope Derrick To Fall mask. Hook Gyp wires To Dead mans and Tighten them up. Hook up main steam lines. Hook up Return Steam lines. Finish Hooking up water lines. Hook up main water line To Fill water tank. Hook up air Hoses From console To Throttle and pump clutch To number one pump. put suction and Discharge valves in Number one pump. Rig up steam Heater for Parts House. put Tarps around Rig. Pick up extra Hoses- pipe fittings and pipe and put away.
	1800		Break down

105 JAN 05 09 11:54 P.00

DATE	TIME DEPTH NAME	COMMENTS
DATE (F-6 18, 89)	0700	Set Dog house, dig guy anchors cement same
		plum in rig, set lights, finish setting buildings with trucks, plum steam to pits from test hole to haul raise rig adjust legs, set dly platform pin brake arm, rig up frame hang traps go get vibrate hose from other mud pump Union up 2 hoses to hard line on mud line. Bolt up Drive line (bottom) Help set pipe racks and drill collars and Drill pipe. grease crown. Help Rig up Air Comp. Change Battery on Lite plant Cut out Road with cat Build Road to get to guy Anchors with cat Install Bull plug in mud line Adjust guy lines around Rig. Set Dly consol stairs with cat cat 10 hands, could not get to it with Truck NO Accidents!
	1800	34 joints Drill pipe on loc. 11 hrs

NEW DRILLING ACTIVITY LOG WELL # 1888-1] DATE (Feb 17-89)			
TIME	DEPTH	NAME	COMMENTS
0700	1888	K Rickins	UN PIN SKID FROM SUB SLIDE SUB OUT MOVE SKID TO NEW LOC. Bust MUD PITS FROM FROZEN Ground move MUD PUMP TO LOC AND PITS Level high spots with backhoe drag sub to new Loc with cat set mud pump and pits set sub and pin Derrick SKID Level and Center same. truck Light plant to new Loc. Jump start Gen. start Rig and Back up to sub set jacks, cat skin Loc for catwalk and set sawz, set suitcase's, set diesel tank on back put in place set light plant and parts house Flange and Union pits set mud line Along suitcase set Dog house matton board and parts building put new torch in parts house
			B. Jansen
			Re Derrick hand helped Macanic Repair Forklift (5 hrs)

~~1888~~
1800

NET DRILLING ACTIVITY LOG WELL # [P88-4] DATE [2-17-89]

TIME	DEPTH	NAME	COMMENTS
0700	1100	Tex R. Ross	Load Dog House and move to New Location. move sub away from well head and move to New Location. Load and move mud Tanks to New Location. Load Number one pump and move to New Location. Set number one pump in place. Set mud Tanks in place and Hook up mud lines Between Tanks. Set and line sub over Hole. Set suit cases in place and Hook up lines Between suit cases. Set mats for Top Dog. Back Rig up to sub. Set Junk Rack and Diesel Tank in place. Set Light plant in place. Set parts House in place.
	1800		B Jansen

1989 JAN 06:09 11:54 P.00

NET DRILLING ACTIVITY LOG WELL # P88-1]

DATE [Feb 16 1989]

TIME	DEPTH	NAME	COMMENTS
0700		KRichins	<p>SPool Guy WIRES, Remove Lights From pits screw up Derrick supports and Load plates on back of Rig AIR up TIRE on Rig Help Load AIR Drilling Equip get Diesel tank Ready to Load, Attempt to Repair Fork Lift clutch fill back hoe with fuel stick fuel tank Half full. Load heaters and Lights in parts house, Break pop off and Valve From pump suction Break 2 vibrate Hoses Load up on Diesel skid, Load out Buildings with trucks, stairs parts ect. Help Drive Rig off Loc. to new Loc. Help spidal Load Rotate parts, pull ground Rod From Ground, help cement seller and Conductor, set off Dog house with Forklift Hands (help moanie fix clutch.)</p>
1800			<p>B Larsen</p>

2025 JAN 05 09 11:54 P.06

MEI

P88-1

2-15-89

0700

K.W. Richins Though + Chip out Elec. Cords from
The Ice, & coil them up. Rig Down
Winterizing frame, Stack on rig floor, Put Elevators,
Slips - lifting sub's in junk basket, Break out mud
lines from #1 & #2 mud pumps, Put pop-off lines
on walkway on mud R's, Put Steam Heaters in
mud Trailer, Rig Down - WT indicator - & Air lines
Set Down Floor Control for Accumulator - Rig Down
mud R's Completely - Pull off Drive lines on Rig
Put Away all Ground lights, Take Down
Guy lines, Scope Down Derrick & Lay over.
Lay Down Stairs in front of sub + rear.
Fold Down Driller stand, Coil up Guy lines -
fill Rig with fuel & Drain Air R's,
15 min Safety meet. Held by (B. Larsen)

18:30

(B. Larsen) Tie up loose lines on Rig - Ready for transport

unload Parts Delivered For MEI.

Kill Richards Rig Down floor & windows nipple down Flowline
 Bays valves & 3013 line nipple down stack &
 Rotate head, set out same. coil up Keowny
 Measure ground level for cat operator on New Loc.
 Transfer fuel to rig coil up electric wires
 Put Kelly hose down side of Derrick, move
 Air drilling manifold & hoses to camp.
 Move heater to keep chilling console thawed
 Retarp around bottom of rig
 Disconnect control wire to Keowny and coil
 Disconnect power to Keowny and coil
 Bleed pressure off Keowny Kill Rig Drain
 Air tanks fill forklift and rig with fuel
 Add 10 gal Hyd oil to forklift
 Brake down pits coil electric wires

Johnson

1800

0700

2-14-89 P 88-2

WELL #	DATE	COMMENTS	TIME	DEPTH	NAME
P-88-1	Feb 13/89				
		Repair Steam line, Rig up Lay Down line	5900		Krichins
		Adjust Rollars on Brake Rims, start			
		Motors, Fill torque converters with oil			
		add 10 Gal Hyd oil for wenchers clear			
		off catwalk Thaw Frozen Hyd equip	1300		
		Lay Down Drill pipe Lay Down Bells & elevators	1300		Del. Ross
		Get drum of Hyd oil with Backhoe	1530		
		Brake Kelley, Lay Down Weiss hole, Kelley	1530		
		and Kelley sock Brake Kelley hose			
		Rig Down survey line Repair Hyd. System	1730		
		Lay Down temps Lay Down Subs	1730	1800	
		Total 9 hrs			

Beard

Feb

MEI DRILLING ACTIVITY LOG WELL#: [P88-2] DATE: [2-3-89]

TIME	DEPTH	NAME	COMMENTS
0700	1600	K/Richins	<p>Place 8" 300 under flow line with Backhoe for welder, work on Rotary Drive Bearing with welder, Repair throttle on Rig motors & set same with mechanic, Help Repair Fork lift, cover work area on Rotary Drive with plastic plastic & Rope, Draw Draw schematic of prod. line for new loc and measure Bowie Line & Banjo line haul pump up from pond Buckel up Door ways to Rig floor shut Down Rig motors & Air comp. Bleed Air Lines.</p>
		B.D.	

FILE NO. 1703 JAN 06, 89 11:34 P.M.

MEI DRILLING ACTIVITY LOG WELL # 1P88-2 DATE [Feb 2-89]

TIME	DEPTH	NAME	COMMENTS
700	1100	KWRichins	Remove rusty bolts F/ pipe & Blind Rams Rebuild same, Install in BOP'S
1100	1200		Haul Rotary Rubbers to Rig floor (5) Remove 2 USED Rubbers F/ heads
1200	1330		Draw Schematic of Rig & Measure For Rig move, Repair DTK tape, Pull large water tank off loc w/ at
1330	1500		Replace turn bucket on BOP, Repair SKIRTING TO Keep Rig warm, work BOP ✓ OK No parts & tools Around loc. Haul of old Rotary Rubbers Remove Float F/ Bit sub
1500	1600		Nipple down old Kookey and Attempt to Lift out of building w/ backhoe unsuccessful
1600	1800	B.S.	Bucket down tarps around Rig Floor Strat Strat in up floor subs tongs chains tong leads set Clean up tools & work Bench, Install guard on grinder and mount to bench, Place tarp around front of Light plant.

1 001 205 1703 Jan 06, 89 11:54 P:05 54

LEASE	WELL NO. P88-1	API WELL NUMBER	DATE 2-24-89
OPERATOR MOTHER EARTH INC	CONTRACTOR SIERRA DRILLING		RIG NO.
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Brent Jones</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE	WT./FT.	GRADE	TOOL JT O.D.
TYPE THREAD	STRING NO.	PUMP NO.	PUMP MANUFACTURER
TYPE	STROKE LENGTH		

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET
LAST CASING TUBING OR LINER	RKB. TO CSG. NO.	SET AT	SIZE	NO. LINES
			FT. CUT OFF	PRESENT LENGTH
			TON ML. OR TRIPS SINCE LAST CUT	
			CUMULATIVE TON ML. OR TRIPS	

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	FT.	FT.	BIT NO.	TIME	WEIGHT	PRESSURE GRADIENT
1	RIG UP AND TEAR DOWN		2			SIZE			
2	DRILL ACTUAL		2 3/4			IADC CODE			
3	REAMING					MFG.			VISC.-SEC.
4	CORING					TYPE			PV/YP
5	CONDITION MUD & CIRCULATE					SER. NO.			GELS
6	TRIPS					JETS 1/32" /FA in ²			W.-CC'S
7	LUBRICATE RIG					DEPTH OUT			pH
8	REPAIR RIG					DEPTH IN			SOLIDS %
9	CUT OFF DRILLING LINE					TOTAL FTG.			MUD & CHEMICALS ADDED
10	DEVIATION SURVEY					TOTAL HRS.			TYPE AMT. TYPE AMT.
11	WIRE LINE LOGS					WT. OF STRING			
12	RUN CASING & CEMENT					GPM/PUMP-PSI			
13	WAIT ON CEMENT								
14	NOZZLE UP S.O.P.								

FOOTAGE		DR. D. IN. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
DEVIATION RECORD												
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS								
8:00	10:00	2	1	RICH UP KELLEY & BHA								
10:00	20:00	10	21	DRILL mouse HOLE & RAT HOLE								
20:00	22:45	2 3/4	2	SPUD IN & DRILL SURFACE HOLE TO 62'								
22:45	24:00	1 1/4	22	FULL OUT OF HOLE BREAK OUT 26" BIT LAY DOWN W/ SNOS & PICK UP 9" DRILL COLLECTOR								

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	FT.	FT.	BIT NO.	TIME	WEIGHT	PRESSURE GRADIENT
15	TEST B.O.P.					SIZE			
16	DRILL STEM TEST					IADC CODE			
17	PLUG BACK					MFG.			VISC.-SEC.
18	SQUEEZE CEMENT					TYPE			PV/YP
19	FISHING					SER. NO.			GELS
20	DIR. WORK					JETS 1/32" /FA in ²			W.-CC'S
21	DRILL HOLE		10			DEPTH OUT			pH
22	DRILL HOLE		1 1/4			DEPTH IN			SOLIDS %
23	DRILL HOLE					TOTAL FTG.			MUD & CHEMICALS ADDED
24	DRILL HOLE					TOTAL HRS.			TYPE AMT. TYPE AMT.
25	DRILL HOLE					WT. OF STRING			
26	DRILL HOLE					GPM/PUMP-PSI			

FOOTAGE		DR. D. IN. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
DEVIATION RECORD												
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS								
0800	1000	2	1	Pick up Kelley and Kelley Hase and lower subs								
1000	1200	2	8	Repair steam leaks around Rig								
1200	1600	4	21	Help Drill mouse hole and Rat hole, Buckled up suction from pit to pump with Dresser sleeve and welder								

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	FT.	FT.	BIT NO.	TIME	WEIGHT	PRESSURE GRADIENT
27	DRILL HOLE					SIZE			
28	DRILL HOLE					IADC CODE			
29	DRILL HOLE					MFG.			VISC.-SEC.
30	DRILL HOLE					TYPE			PV/YP
31	DRILL HOLE					SER. NO.			GELS
32	DRILL HOLE					JETS 1/32" /FA in ²			W.-CC'S
33	DRILL HOLE					DEPTH OUT			pH
34	DRILL HOLE					DEPTH IN			SOLIDS %
35	DRILL HOLE					TOTAL FTG.			MUD & CHEMICALS ADDED
36	DRILL HOLE					TOTAL HRS.			TYPE AMT. TYPE AMT.
37	DRILL HOLE					WT. OF STRING			
38	DRILL HOLE					GPM/PUMP-PSI			

FOOTAGE		DR. D. IN. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
DEVIATION RECORD												
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS								

LEASE	WELL NO. P88-1	API WELL NUMBER	DATE 2-25-88
OPERATOR Mother Earth INC SIGNATURE OF OPERATOR'S REPRESENTATIVE Brent Jensen	CONTRACTOR Sierra Drilling SIGNATURE OF CONTRACTOR'S TOOL PUSHER		RIG NO. 1
D.P. SIZE	WT./FT.	GRADE	TOOL JT G.D.
			TYPE THREAD
			STRING NO.
			PUMP NO.
			PUMP MANUFACTURER
			TYPE
			STROKE LENGTH

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
SIZE 20"	MAKE	WT. & GR.	NO. JOINTS	FEET
			RKB. TO CSC. NO.	SET AT
LAST CASING TUBING OR LINER				
			NO. LINES	FT. SLIPPED
			FT. CUT OFF	PRESENT LENGTH
			TON ML OR TRIPS SINCE LAST CUT	
			CUMULATIVE TON ML OR TRIPS	

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	NORM.	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT
1	RIG UP AND TEAR DOWN				STB RMR	OD	FT.	IADC CODE			
2	DRILL ACTUAL				D.C. ID	OD	FT.	MFG.			VISC.-SEC.
3	REAMING				STB RMR	OD	FT.	TYPE			PV/YP
4	CORING				D.C. ID	OD	FT.	SER. NO.			GELS.
5	CONDITION MUD & CIRCULATE				STB RMR	OD	FT.	JETS 1/32" /1FA in ²			ML -CC'S
6	TRIPS							DEPTH OUT			pH
7	LUBRICATE RIG							DEPTH IN			SOLIDS %
8	REPAIR RIG				STANDS DP	FT.		TOTAL FTG.			MUD & CHEMICALS ADDED
9	CUT OFF DRILLING LINE				SINGLES DP	FT.		TOTAL HRS.			TYPE AMT. TYPE AMT.
10	DEVIATION SURVEY				KELLY DOWN	FT.		OUT STRUC.			
11	WIRE LINE LOGS				TOTAL	FT.		1 1 0 0 1 1			
12	RUN CASING & CEMENT							B G O R			
13	WAIT ON CEMENT				WT. OF STRING	LBS.		GPM/PUMP-PSI			
14	NEPPLE UP B.O.P.										
15	TEST B.O.P.										
16	DRILL STEM TEST										
17	PLUG BACK										
18	SQUEEZE CEMENT										
19	FISHING										
20	DNR. WORK										
21											
22	Casing										
23											
COMPLETION											
A.	PERF'RTH										
B.	TBC TRIPS										
C.	TREATING										
D.	SWABBING										
E.	TESTING										
F.	ADDT'VFL										
G.											
TOTALS											
DAY WORK TIME SUMMARY (OFFICE USE ONLY)											
HRS. W/CONTR. D.P.											
HRS. W/OPR. D.P.											
HRS. W/D.P.											
HRS. STANDBY											

FOOTAGE		DL-D R/L-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LINER SIZE S.P.M.	METHOD RUN
FROM	TO									
2400	0230	3 1/2	6	Pick up Btm Hole drill collar xover to Kelley pull up to pick up bit, not enough crown Lay Down btm hole set Kelley Back strip ON Rotate head pick up bit and Kelley up Bucket up Rotate head and Rubber						
0230	0330	1	21	SPUD 26" Hole F/84' to 137', clean hole						
0330	1030	2	6	Trip out 1ST Lay down 1st Drill Collars						
1030	1200	1 1/2	22	Pick up 20" casing weld shoe						DRILLER Kerry Rabin

NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	
STB RMR	OD	FT.	IADC CODE				
D.C. ID	OD	FT.	MFG.			VISC.-SEC.	
STB RMR	OD	FT.	TYPE			PV/YP	
D.C. ID	OD	FT.	SER. NO.			GELS.	
STB RMR	OD	FT.	JETS 1/32" /1FA in ²			ML -CC'S	
			DEPTH OUT			pH	
			DEPTH IN			SOLIDS %	
STANDS DP	FT.		TOTAL FTG.			MUD & CHEMICALS ADDED	
SINGLES DP	FT.		TOTAL HRS.			TYPE AMT. TYPE AMT.	
KELLY DOWN	FT.		OUT STRUC.				
TOTAL	FT.		1 1 0 0 1 1				
			B G O R				
WT. OF STRING	LBS.		GPM/PUMP-PSI				

FOOTAGE		DL-D R/L-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LINER SIZE S.P.M.	METHOD RUN
FROM	TO									
152.88				Pick up Forming and Casing Equip.						

NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	
STB RMR	OD	FT.	IADC CODE				
D.C. ID	OD	FT.	MFG.			VISC.-SEC.	
STB RMR	OD	FT.	TYPE			PV/YP	
D.C. ID	OD	FT.	SER. NO.			GELS.	
STB RMR	OD	FT.	JETS 1/32" /1FA in ²			ML -CC'S	
			DEPTH OUT			pH	
			DEPTH IN			SOLIDS %	
STANDS DP	FT.		TOTAL FTG.			MUD & CHEMICALS ADDED	
SINGLES DP	FT.		TOTAL HRS.			TYPE AMT. TYPE AMT.	
KELLY DOWN	FT.		OUT STRUC.				
TOTAL	FT.		1 1 0 0 1 1				
			B G O R				
WT. OF STRING	LBS.		GPM/PUMP-PSI				

FOOTAGE		DL-D R/L-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LINER SIZE S.P.M.	METHOD RUN
FROM	TO									
1200	1300	1	12	Pick up and Run 20' casing						
1300	1430	1 1/2	8	Repair Hydraulic Hose Between #1 and #2 meters Run 20 casing Hit Bridge @ 97' ground level						
1430	1730	1 1/2	12	Fill pipe with H ₂ O and work casing down casing set @ 107' ground level						
1730	1900	1 1/2	12	cut off casing @ Rotary Table and weld casing Head on						
1900	2000	1	12	Cement casing						
2000	2400	4	13	Wait on cement						DRILLER Jerry Rabin

LEASE	WELL NO. P88-1	API WELL NUMBER	DATE 2-26-89
OPERATOR Mother Earth INC	CONTRACTOR SIERRA Drlg		RIG NO.
SIGNATURE OF OPERATOR'S REPRESENTATIVE		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE	WT./FT.	GRADE	TOOL JT O.D.
			TYPE THREAD
			STRING NO.
			PUMP NO.
			PUMP MANUFACTURER
			TYPE
			STROKE LENGTH

FIELD OR DIST. Steam Field	COUNTY Beaver	STATE Utah	WIRE LINE RECORD	REEL NO.
SIZE 20"	MAKE	WT. & GR.	NO. JOINTS 3	FEET 107
LAST CASING TUBING OR LINER			SET AT	
			NO. LINES	FT. SLIPPED
			FT. CUT OFF	PRESENT LENGTH
			TON MI. OR TRIPS SINCE LAST CUT	
			CUMULATIVE TON MI. OR TRIPS	

TIME DISTRIBUTION - HOURS					NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
CODE NO.	OPERATION	MORN.	DAY	EVE.				
1	RIG UP AND TEAR DOWN							
2	DRILL ACTUAL							
3	REAMING							
4	CORING							
5	CONDITION MUD & CIRCULATE							
6	TRIPS		2					
7	LUBRICATE RIG							
8	REPAIR RIG							
9	CUT OFF DRILLING LINE							
10	DEVIATION SURVEY							
11	WIRE LINE LOGS							
12	RUN CASING & CEMENT		1					
13	WAIT ON CEMENT		B 8					
14	SHUPL UP B.O.P.		1					

TIME DISTRIBUTION - HOURS					NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
CODE NO.	OPERATION	MORN.	DAY	EVE.				
15	TEST B.O.P.							
16	DRILL STEM TEST							
17	PLUG BACK							
18	SQUEEZE CEMENT							
19	FISHING							
20	DIR. WORK							
21	Blow hole							
22	Weld Flange		2					
23	Cut off		1					

TIME DISTRIBUTION - HOURS					NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
CODE NO.	OPERATION	MORN.	DAY	EVE.				
TOTALS			12					
DAY WORK TIME SUMMARY (OFFICE USE ONLY)								
MRS. W/CONTR. O.P.								
MRS. W/OPR. O.P.								
MRS. W/D.P.								
MRS. STANDBY								

FOOTAGE		DRL'D SOLID CORE C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'S	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LIDER SIZE S.P.M.	METHOD RUN
FROM	TO									
DEVIATION RECORD										
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									
2400	0400	4	13	wait on Cement						
0400	0500	1	6	Trip in 1" to 64.5'						
0500	0530	1/2	21	Tie in Air comp to 1" 64.5' Ground Level						
0530	0600	1/2	28	Blow out Back side						
0600	0630	1/2	6	Trip in 10' more feet 1" to 74.5' Blow Again						
0630	0830	2	13	W.O.C. truck						
0830	0900	1/2	6	Trip in 2" to 41' Ground Level						
0900	0930	1/2	12	Attempt to cement through 1" then 2" <i>DRILLER Key W. R. H.</i>						

FOOTAGE		DRL'D SOLID CORE C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'S	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LIDER SIZE S.P.M.	METHOD RUN
FROM	TO									
DEVIATION RECORD										
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									
0930	10:00	1/2	12	cut hole in 30" pour cement Down Backside						
10:00	10:00			LAY DOWN 2" and 1"						
10:00	1200	2	13	W.O.C. Center Casing						

FOOTAGE		DRL'D SOLID CORE C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'S	PUMP PRESS	PUMP NO. LINER SIZE S.P.M.	PUMP NO. LIDER SIZE S.P.M.	METHOD RUN
FROM	TO									
DEVIATION RECORD										
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									
1200				W/O Top Gob cement / mix mud in mud for 33 vis. Rio to Acc						

LEASE	WELL NO. P88-1	API WELL NUMBER	DATE 2-22-89
OPERATOR Mother Earth Inc	CONTRACTOR SIERRA Drlg co		RIG NO. 1
SIGNATURE OF OPERATOR'S REPRESENTATIVE Brent Larsen		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE	WT./FT.	GRADE	TOOL JT Q.D.
			TYPE THREAD
			STRING NO.
			PUMP NO.
			PUMP MANUFACTURER
			TYPE
			STROKE LENGTH

FIELD OR DIST. Steam Field	COUNTY Beaver	STATE Utah	WIRE LINE RECORD	REEL NO.
SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET
				RBL. TO CSG. NO.
				SET AT
LAST CASING TUBING OR LINER				
SIZE	NO. LINES	FT. SLIPPED		
FT. CUT OFF		PRESENT LENGTH		
				TON ML. OR TRIPS SINCE LAST CUT
				CUMULATIVE TON ML. OR TRIPS

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	TIME	
1	RIG UP AND TEAR DOWN	10	1				SIZE	WEIGHT	
2	DRILL ACTUAL	2			STB RMR OD	FT.	IADC CODE	PRESSURE GRADIENT	
3	REAMING				D.C. ID	OD	FT.	MFG.	VISC.-SEC.
4	CORING				STB RMR OD	FT.	TYPE	PV/YP	
5	CONDITION MUD & CIRCULATE				D.C. ID	OD	FT.	SER. NO.	GELS
6	TRIPS	4			STB RMR OD	FT.	JETS 1 1/2" /TFA 5/8"	WL -CC'S	
7	LUBRICATE RIG						DEPTH OUT	pH	
8	REPAIR RIG						DEPTH IN	SOLIDS %	
9	CUT OFF DRILLING LINE				STANDS DP	FT.	TOTAL FTG.	MUD & CHEMICALS ADDED	
10	DEVIATION SURVEY				SINGLES DP	FT.	TOTAL HRS.	TYPE	AMT.
11	WIRE LINE LOGS				KELLY DOWN	FT.	OUT STRUC.		
12	RUN CASING & CEMENT				TOTAL	FT.	1 0 0 L		
13	WAIT ON CEMENT						B G O R		
14	NIPPLE UP B.O.P.	2			WT. OF STRING	LBS.	GPM/PUMP-PSI		

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	TIME	
15	TEST B.O.P.						SIZE	WEIGHT	
16	DRILL STEM TEST				STB RMR OD	FT.	IADC CODE	PRESSURE GRADIENT	
17	PLUG BACK				D.C. ID	OD	FT.	MFG.	VISC.-SEC.
18	SQUEEZE CEMENT				STB RMR OD	FT.	TYPE	PV/YP	
19	FISHING				D.C. ID	OD	FT.	SER. NO.	GELS
20	DIR. WORK				STB RMR OD	FT.	JETS 1 1/2" /TFA 5/8"	WL -CC'S	
21							DEPTH OUT	pH	
22					STANDS DP	FT.	TOTAL FTG.	SOLIDS %	
23					SINGLES DP	FT.	TOTAL HRS.	MUD & CHEMICALS ADDED	
A.	PERF'RTM				KELLY DOWN	FT.	OUT STRUC.		
B.	TBG TRIPS				TOTAL	FT.	1 0 0 L		
C.	TREATING						B G O R		
D.	SWABBING				WT. OF STRING	LBS.	GPM/PUMP-PSI		
E.	TESTING								
F.	ADD'T'L								
G.									

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	TIME	
TOTALS		18					SIZE	WEIGHT	
HRS. W/CONTR. D.P.					STB RMR OD	FT.	IADC CODE	PRESSURE GRADIENT	
HRS. W/OPR. D.P.					D.C. ID	OD	FT.	MFG.	VISC.-SEC.
HRS. W/D.P.					STB RMR OD	FT.	TYPE	PV/YP	
HRS. STANDBY					D.C. ID	OD	FT.	SER. NO.	GELS
					STB RMR OD	FT.	JETS 1 1/2" /TFA 5/8"	WL -CC'S	
							DEPTH OUT	pH	
					STANDS DP	FT.	TOTAL FTG.	SOLIDS %	
					SINGLES DP	FT.	TOTAL HRS.	MUD & CHEMICALS ADDED	
					KELLY DOWN	FT.	OUT STRUC.		
					TOTAL	FT.	1 0 0 L		
							B G O R		
					WT. OF STRING	LBS.	GPM/PUMP-PSI		

FOOTAGE		DR. D. RBL. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE S.P.A.	PUMP NO. LINER SIZE S.P.A.	METHOD RUN
FROM	TO									
2400	0100		14	Attempt to set Hydrill (nogo)						
0100	0200		14	Nipple up Rotate Head to weld on flange						
0200				set out Hydrill Run 20" Hose For Flowline						
0430	0430	2 1/2	6	Kelley up strip on equip plus 17 1/2" bit						
0430	0600	1 1/2	2	Drlg Fl 19' to 43'						
0600	0630	1/2	6	Trip out L/P 1 1/2 p/w 12 1/4 Trip in						
0630	0700	1/2	2	Orly to 56'						
0700	0800	1	6	Tripout casing parted @ 93' Driller <i>[Signature]</i>						

FOOTAGE		DR. D. RBL. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE S.P.A.	PUMP NO. LINER SIZE S.P.A.	METHOD RUN
FROM	TO									
0800	1800	10	1	clean floor 4/2 D.C.'s ok to F Derrick 4/2 Kelley Move						
				Cat walk Drill Pipe pipe racks to skid sub Forward						
				Move flow, Boie, end stand						
				Move Hydrill Repair Air pump on Arklet						
				MOVE all Land & working equip						

FOOTAGE		DR. D. RBL. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE S.P.A.	PUMP NO. LINER SIZE S.P.A.	METHOD RUN
FROM	TO									
200				Lay Down Kelley & Rig Down floor						
				set Beaver slide and steps out						
1900	8	1		Tear Down Rig						

LEASE _____ WELL NO. _____ API WELL NUMBER _____ DATE 11-28-89

OPERATOR M.E.I. CONTRACTOR Sierra Drilling RIG NO. 1

SIGNATURE OF OPERATOR'S REPRESENTATIVE Brent Jensen SIGNATURE OF CONTRACTOR'S TOOL PUSHER _____

D.P. SIZE	WT./FT.	GRADE	TOOL JT. O.D.	TYPE THREAD	STRING NO.	PUMP NO.	PUMP MANUFACTURER	TYPE	STROKE LENGTH

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD		REEL NO.
			SIZE	NO. LINES	
			FF. CUT OFF	PRESENT LENGTH	
			TON MI. OR TRIPS SINCE LAST CUT		
			CUMULATIVE TON MI. OR TRIPS		

TIME DISTRIBUTION - HOURS				DRILLING ASSEMBLY (At end of hour)			BIT RECORD			MUD RECORD		
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.
1	RIG UP AND TEAR DOWN	6			STB RMR	00		IADC CODE				
2	DRILL ACTUAL				D.C. ID	00		MFG.				
3	REAMING				STB RMR	00		TYPE				
4	CORING				D.C. ID	00		SER. NO.				
5	CONDITION MUD & CIRCULATE				STB RMR	00		JETS 1/32" /FA in ²				
6	TRIPS							DEPTH OUT				
7	LUBRICATE RIG							DEPTH IN				
8	REPAIR RIG				STANDS DP			TOTAL FTG.				
9	CUT OFF CIRCULATING LINE				SINGLES DP			TOTAL HRS.				
10	DEVIATION SURVEY				KELLY DOWN			CUT STRUC.				
11	WIRE LINE LOGS				TOTAL			I O D I L				
12	RUN CASING & CEMENT				WT. OF STRING	LBS.		B G G O R				
13	WAIT ON CEMENT							GPM/PUMP-PSI				
14	MIDDLE UP B.O.P.											

FOOTAGE		D.R.-D R.M.-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)		ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO												
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION			
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS									
FROM	TO			2700 1300 6 1 Rig DOWN to skid Rig									

TIME DISTRIBUTION - HOURS				DRILLING ASSEMBLY (At end of hour)			BIT RECORD			MUD RECORD		
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.
15	TEST B.O.P.				STB RMR	00		IADC CODE				
16	DRILL STEM TEST				D.C. ID	00		MFG.				
17	PLUG BACK				STB RMR	00		TYPE				
18	SQUEEZE CEMENT				D.C. ID	00		SER. NO.				
19	FISHING				STB RMR	00		JETS 1/32" /FA in ²				
20	DR. WORK							DEPTH OUT				
21								DEPTH IN				
22					STANDS DP			TOTAL FTG.				
23					SINGLES DP			TOTAL HRS.				
24					KELLY DOWN			CUT STRUC.				
25					TOTAL			I O D I L				
26					WT. OF STRING	LBS.		B G G O R				
27								GPM/PUMP-PSI				

FOOTAGE		D.R.-D R.M.-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)		ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO												
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION			
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS									
FROM	TO												

TIME DISTRIBUTION - HOURS				DRILLING ASSEMBLY (At end of hour)			BIT RECORD			MUD RECORD		
CODE NO.	OPERATION	MORN.	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.
28					STB RMR	00		IADC CODE				
29					D.C. ID	00		MFG.				
30					STB RMR	00		TYPE				
31					D.C. ID	00		SER. NO.				
32					STB RMR	00		JETS 1/32" /FA in ²				
33								DEPTH OUT				
34								DEPTH IN				
35					STANDS DP			TOTAL FTG.				
36					SINGLES DP			TOTAL HRS.				
37					KELLY DOWN			CUT STRUC.				
38					TOTAL			I O D I L				
39					WT. OF STRING	LBS.		B G G O R				
40								GPM/PUMP-PSI				

FOOTAGE		D.R.-D R.M.-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)		ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO												
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION			
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS									
FROM	TO			2700 1300 6 1 Tear Down Rig and get Ready To SKID									

188-1

UAI 3589

E I
 SIGNATURE OF OPERATOR'S REPRESENTATIVE
Brent Jansen

CONTRACTOR
Sierra Drllg
 SIGNATURE OF CONTRACTOR'S TOOL PUSHER
 RIG NO. **1**

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
	Beaver	Utah		
SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET
LAST CASING TURNING OR LINER				
SIZE	NO. LINES	FT. SLIPPED	FT. CUT OFF	
			PRESENT LENGTH	
TON M. OR TRIPS SINCE LAST CUT				
CUMULATIVE TON M. OR TRIPS				

TIME DISTRIBUTION - HOURS			
CODE NO.	OPERATION	MORN.	DAY
1	RIG UP AND TEAR DOWN		
2	DRILL ACTUAL		
3	REAMING		
4	CORING		
5	CONDITION MUD & CIRCULATE	5 1/2	
6	TRIPS	1 1/2	
7	LUBRICATE RIG		
8	REPAIR RIG		
9	BIT OFF DRILLING LINE		
10	DEVIATION SURVEY		
11	WIRE LINE LOGS		
12	RUN CASING & CEMENT		
13	WAIT ON CEMENT	5	
14	MAKE UP B.O.P.		

NO.		DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD			
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.	PV/YP	GELS
STB RMR	OD	FT.	IADC CODE						
D.C. ID	OD	FT.	MFG.						
STB RMR	OD	FT.	TYPE						
D.C. ID	OD	FT.	SER. NO.						
STB RMR	OD	FT.	JETS 1/2" /TFA in ²	1/20's					
			DEPTH OUT	16'					
			DEPTH IN	19'					
STANDS DP	FT.	TOTAL FTG.	TOTAL HRS.						
SINGLES DP	FT.								
KELLY DOWN	FT.								
TOTAL	FT.								
WT. OF STRING	LBS.								

COMPLETION			
A.	PERF'R'TH		
B.	TBC TRIPS		
C.	TREATING		
D.	SWABBING		
E.	TESTING		
F.	ADDT'L		
G.			
TOTALS			

NO.		DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD			
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.	PV/YP	GELS
STB RMR	OD	FT.	IADC CODE						
D.C. ID	OD	FT.	MFG.						
STB RMR	OD	FT.	TYPE						
D.C. ID	OD	FT.	SER. NO.						
STB RMR	OD	FT.	JETS 1/2" /TFA in ²						
			DEPTH OUT						
			DEPTH IN						
STANDS DP	FT.	TOTAL FTG.	TOTAL HRS.						
SINGLES DP	FT.								
KELLY DOWN	FT.								
TOTAL	FT.								
WT. OF STRING	LBS.								

DAY WORK TIME SUMMARY (OFFICE USE ONLY)			
MRS. W/CONTR. D.P.			
MRS. W/OPR. D.P.			
MRS. W/D.P.			
MRS. STANDBY			
TOTAL DAY WORK			

NO.		DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD			
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT	VISC.-SEC.	PV/YP	GELS
STB RMR	OD	FT.	IADC CODE						
D.C. ID	OD	FT.	MFG.						
STB RMR	OD	FT.	TYPE						
D.C. ID	OD	FT.	SER. NO.						
STB RMR	OD	FT.	JETS 1/2" /TFA in ²						
			DEPTH OUT						
			DEPTH IN						
STANDS DP	FT.	TOTAL FTG.	TOTAL HRS.						

FOOTAGE	DL-D	DL-E	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM												

DEVIATION RECORD	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
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TIME LOG	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
FROM	TO		
2400	0330	3 1/2	Flow pump suction and change Repair paper
	0330	3 1/2	Install throttle on pump and clutch
	0330	430	Drllg F/19' TO 58'
	0430	0600	Conn / PLU 9" D.C.
	0600	0730	Drllg F/58' TO 78'
	0730	0900	get make up water, pump out mouse hole
	0900	1100	Drllg F/78' TO 138'
	1100	1200	TO circ lhr for wire trip

FOOTAGE	DL-D	DL-E	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM												

DEVIATION RECORD	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
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TIME LOG	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
FROM	TO		

FOOTAGE	DL-D	DL-E	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM												

DEVIATION RECORD	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
------------------	-------	------	-----------	-------	------	-----------	-------	------	-----------

TIME LOG	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
FROM	TO		
1200	1245	2 1/2	pull out of hole - lay down 1 Jnt DP
	1245	3	Clear up Bit
	1315	3	TRIP IN - Kelly UP

LEASE	WELL NO. P88-1	API WELL NUMBER	DATE 3-6-89
OPERATOR M E I	CONTRACTOR SIERRA		RIG NO. 1
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Brent Jensen</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE	WT./FT.	GRADE	TOOL JT O.D.
			TYPE THREAD
			STRING NO.
			PUMP NO.
			PUMP MANUFACTURER
			TYPE
			STROKE LENGTH

FIELD OR DIST.	COUNTY Benaver	STATE Utah	WIRE LINE RECORD	REEL NO.
SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET
			RRB. TO CSG. NO.	SET AT
LAST CASING TUBING OR LINER				
SIZE				NO. LINES
				FT. SLIPPED
				FT. CUT OFF
				PRESENT LENGTH
				TON MI. OR TRIPS SINCE LAST CUT
				CUMULATIVE TON MI. OR TRIPS

TIME DISTRIBUTION - HOURS					NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORNL	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	WEIGHT	TIME
1	RIG UP AND TEAR DOWN				STB RMR	OD	FT.	IADC CODE		
2	DRILL ACTUAL				D.C. ID	OD	FT.	MFG.		
3	REAMING				STB RMR	OD	FT.	TYPE	PV/YP	/ / / / /
4	CORING				D.C. ID	OD	FT.	SER. NO.	GELS	/ / / / /
5	CONDITION MUD & CIRCULATE	1/2			STB RMR	OD	FT.	JEIS 1 3/2" /FA in ²	ML -CC'S	
6	TRIPS							DEPTH OUT	pH	
7	LUBRICATE RIG							DEPTH IN	SOLIDS %	
8	REPAIR RIG				STANDS DP	FT.		TOTAL FTG.	MUD & CHEMICALS ADDED	
9	CUT OFF DRILLING LINE				SINGLES DP	FT.		TOTAL HRS.	TYPE	AMT.
10	DEVIATION SURVEY				KELLY DOWN	FT.				
11	WIRE LINE LOGS									
12	RUN CASING & CEMENT	3 1/2								
13	WAIT ON CEMENT	8								
14	RIPPLE UP B.O.P.									
15	TEST B.O.P.									
16	DRILL STEM TEST									
17	PLUG BACK									
18	SQUEEZE CEMENT									
19	FISHING									
20	DIR. WORK									
21										
22										
23										
COMPLETION										
A	PERF'D TH									
B	TBG TRIPS									
C	TREATING									
D	SWABBING									
E	TESTING									
F	ADDITIONAL									
G										
TOTALS										
DAY WORK TIME SUMMARY (OFFICE USE ONLY)										
HRS. W/CONTR. D.P.										
HRS. W/OPR. D.P.										
HRS. W/O D.P.										
HRS. STANDBY										

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							
FROM	TO										
2400	0100	1	12	NIPPLE UP CEMENT SURGE Chain DOWN casing							
0100	0130	1/2	5	CIRC and cmd hole							
0800	0200	1/2	12	Rig UP to cement							
0200	0330	1 1/2	12	CEMENT							
0330	0400	1/2	12	Rig DOWN Dowell							
0400	1200	8	13	WAIT ON CEMENT							
											DRILLER <i>Kay White</i>

TIME DISTRIBUTION - HOURS					NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORNL	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	WEIGHT	TIME
1	RIG UP AND TEAR DOWN				STB RMR	OD	FT.	IADC CODE		
2	DRILL ACTUAL				D.C. ID	OD	FT.	MFG.		
3	REAMING				STB RMR	OD	FT.	TYPE	PV/YP	/ / / / /
4	CORING				D.C. ID	OD	FT.	SER. NO.	GELS	/ / / / /
5	CONDITION MUD & CIRCULATE				STB RMR	OD	FT.	JEIS 1 3/2" /FA in ²	ML -CC'S	
6	TRIPS							DEPTH OUT	pH	
7	LUBRICATE RIG							DEPTH IN	SOLIDS %	
8	REPAIR RIG				STANDS DP	FT.		TOTAL FTG.	MUD & CHEMICALS ADDED	
9	CUT OFF DRILLING LINE				SINGLES DP	FT.		TOTAL HRS.	TYPE	AMT.
10	DEVIATION SURVEY				KELLY DOWN	FT.				
11	WIRE LINE LOGS									
12	RUN CASING & CEMENT									
13	WAIT ON CEMENT									
14	RIPPLE UP B.O.P.									
15	TEST B.O.P.									
16	DRILL STEM TEST									
17	PLUG BACK									
18	SQUEEZE CEMENT									
19	FISHING									
20	DIR. WORK									
21										
22										
23										
COMPLETION										
A	PERF'D TH									
B	TBG TRIPS									
C	TREATING									
D	SWABBING									
E	TESTING									
F	ADDITIONAL									
G										
TOTALS										
DAY WORK TIME SUMMARY (OFFICE USE ONLY)										
HRS. W/CONTR. D.P.										
HRS. W/OPR. D.P.										
HRS. W/O D.P.										
HRS. STANDBY										

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							
FROM	TO										
1200	1400	2	21	Cut of casing Lay DOWN 30" & 20"							
1400	1500	1	21	weld on casing Flange							
1500				No spool, Hydrill, Rotate Flange, Flow stand and Flowline							
2200	2400	7	14								
2200	2400	14	14	Tighten Bolt's on B.O.P.'S pressure up Ramsey							
											DRILLER <i>Kay White</i>

TIME DISTRIBUTION - HOURS					NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORNL	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	WEIGHT	TIME
1	RIG UP AND TEAR DOWN				STB RMR	OD	FT.	IADC CODE		
2	DRILL ACTUAL				D.C. ID	OD	FT.	MFG.		
3	REAMING				STB RMR	OD	FT.	TYPE	PV/YP	/ / / / /
4	CORING				D.C. ID	OD	FT.	SER. NO.	GELS	/ / / / /
5	CONDITION MUD & CIRCULATE				STB RMR	OD	FT.	JEIS 1 3/2" /FA in ²	ML -CC'S	
6	TRIPS							DEPTH OUT	pH	
7	LUBRICATE RIG							DEPTH IN	SOLIDS %	
8	REPAIR RIG				STANDS DP	FT.		TOTAL FTG.	MUD & CHEMICALS ADDED	
9	CUT OFF DRILLING LINE				SINGLES DP	FT.		TOTAL HRS.	TYPE	AMT.
10	DEVIATION SURVEY				KELLY DOWN	FT.				
11	WIRE LINE LOGS									
12	RUN CASING & CEMENT									
13	WAIT ON CEMENT									
14	RIPPLE UP B.O.P.									
15	TEST B.O.P.									
16	DRILL STEM TEST									
17	PLUG BACK									
18	SQUEEZE CEMENT									
19	FISHING									
20	DIR. WORK									
21										
22										
23										
COMPLETION										
A	PERF'D TH									
B	TBG TRIPS									
C	TREATING									
D	SWABBING									
E	TESTING									
F	ADDITIONAL									
G										
TOTALS										
DAY WORK TIME SUMMARY (OFFICE USE ONLY)										
HRS. W/CONTR. D.P.										
HRS. W/OPR. D.P.										
HRS. W/O D.P.										
HRS. STANDBY										

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD		DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							
FROM	TO										

WELL NO. P 88-1		API WELL NUMBER		DATE 3-7-89	
CONTRACTOR SIERRA		RIG NO. 1		FIELD OR DIST.	
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Brent Jones</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER		COUNTY Beaver	
STATE Utah		WIRE LINE RECORD		REEL NO.	
SIZE		MAKE		WT. & GR.	
NO. JOINTS		FEET		RKB. TO CSG. YD.	
SIZE		NO. LINES		FT. SLIPPED	
FT. CUT OFF		PRESENT LENGTH			
TON AL. OR TRIPS SINCE LAST CUT		CUMULATIVE TON AL. OR TRIPS			
SIZE		WT./FT.		GRADE	
TOOL JT. Q.D.		TYPE		THREAD	
STRING NO.		PUMP NO.		PUMP MANUFACTURER	
TYPE		STROKE LENGTH			

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	BIT NO.	SIZE	IADC CODE	MFG.	TYPE	SER. NO.
UP AND DOWN						1	17 1/2	1.30 FT.	2	17 1/2	
A. ACTUAL						1	XO 17 1/2	2.90			11115
WING						1	D.C. 17 1/2	2.10	2.10	FT.	Reed
WING						2	9 1/2	62.5	FT.		135
CONDITION MUD											839573
CALCULATE											
WASTE											
RECATE RIG											
AIR RIG											
OFF											
LINE SURVEY											
LINE LOGS											
CASING											
MENT											
LE UP											
P.											
T.B.G.P.											
A. STEM TEST											
G. BACK											
FREE CEMENT											
ENG											
WORK											
Don't work											
A. PERFORM											
B. TOG TRIPS											
C. TREATING											
D. SWABBING											
E. TESTING											
F. ADDIT'L											
G.											

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	BIT NO.	SIZE	IADC CODE	MFG.	TYPE	SER. NO.
UP AND DOWN						1	17 1/2	1.50 FT.	2	17 1/2	
A. ACTUAL						1	B 5 1/2	2.90			
WING						1	D.C. 17 1/2	2.10	2.10	FT.	
WING						3	9 1/2	93.65	FT.		
CONDITION MUD											
CALCULATE											
WASTE											
RECATE RIG											
AIR RIG											
OFF											
LINE SURVEY											
LINE LOGS											
CASING											
MENT											
LE UP											
P.											
T.B.G.P.											
A. STEM TEST											
G. BACK											
FREE CEMENT											
ENG											
WORK											
Don't work											
A. PERFORM											
B. TOG TRIPS											
C. TREATING											
D. SWABBING											
E. TESTING											
F. ADDIT'L											
G.											

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	BIT NO.	SIZE	IADC CODE	MFG.	TYPE	SER. NO.
UP AND DOWN											
A. ACTUAL											
WING											
WING											
CONDITION MUD											
CALCULATE											
WASTE											
RECATE RIG											
AIR RIG											
OFF											
LINE SURVEY											
LINE LOGS											
CASING											
MENT											
LE UP											
P.											
T.B.G.P.											
A. STEM TEST											
G. BACK											
FREE CEMENT											
ENG											
WORK											
Don't work											
A. PERFORM											
B. TOG TRIPS											
C. TREATING											
D. SWABBING											
E. TESTING											
F. ADDIT'L											
G.											

FIELD OR DIST.		COUNTY		STATE		WIRE LINE RECORD		REEL NO.	
		Beaver		Utah					
LAST CASING TUBING OR LINER		SIZE		MAKE		WT. & GR.		NO. JOINTS	
		SIZE		NO. LINES		FT. SLIPPED			
		FT. CUT OFF		PRESENT LENGTH					
		TON AL. OR TRIPS SINCE LAST CUT		CUMULATIVE TON AL. OR TRIPS					

FOOTAGE		DR. D	CORE	FORMATION		ROTARY	WT. ON	PUMP	PUMP NO.	PUMP NO.	METHOD
FROM	TO	IN. - R	NO.	(SHOW CORE RECOVERY)	DEPTH	RPM	BIT	PRESS	LINE SIZE	S.P.M.	LINE SIZE
DEVIATION RECORD		DEPTH		DEV.		DIRECTION		DEPTH		DEV.	
TIME LOG		ELAPSED TIME		CODE NO.		DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					
FROM	TO										
2900	0130	1 1/2	1	Set mouse hole + pick up Kelly to Press. test							
0130	0600	4 1/2	8	Repair mud pump + repress to Press. test							
0600	0715	1 1/4	15	Press test BOP Fl 30 min @ 100 PSI OK							
0715			6	Pick up 17 1/2 bit maul X 9 1/2 RIG UP Great Rotating head.							
	10:15	3	6	Run in 2 DCS try to En stall Rotating head Rubber							
12:15	11:45	1 1/2	21	Luton welder							
11:45	1200	1 1/4	8	bear rotating head.							
				Incl 38							
DRILLER <i>Michael</i>											

FOOTAGE		DR. D	CORE	FORMATION		ROTARY	WT. ON	PUMP	PUMP NO.	PUMP NO.	METHOD
FROM	TO	IN. - R	NO.	(SHOW CORE RECOVERY)	DEPTH	RPM	BIT	PRESS	LINE SIZE	S.P.M.	LINE SIZE
DEVIATION RECORD		DEPTH		DEV.		DIRECTION		DEPTH		DEV.	
TIME LOG		ELAPSED TIME		CODE NO.		DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					
FROM	TO										
1200	1300	1	22	Set Rotary Rubber and Drive Bushing							
1300	1430	1 1/2	2	Tag cement @ 113' Drill out 139'							
1430	1630	2	2	Dilig Fl 139 to 170							
1630	2030	4	3	Try survey tight hole @ 130'							
2030	2200	1 1/2	10	Survey @ 1/4" 552 E							
2200	2400	3	2	Dilig Fl/170' To							
DRILLER <i>Ken</i>											

FOOTAGE		DR. D	CORE	FORMATION		ROTARY	WT. ON	PUMP	PUMP NO.	PUMP NO.	METHOD
FROM	TO	IN. - R	NO.	(SHOW CORE RECOVERY)	DEPTH	RPM	BIT	PRESS	LINE SIZE	S.P.M.	LINE SIZE
DEVIATION RECORD		DEPTH		DEV.		DIRECTION		DEPTH		DEV.	
TIME LOG		ELAPSED TIME		CODE NO.		DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					
FROM	TO										

DAILY DRILLING REPORT REPORT NO.

LEASE	WELL NO.	API WELL NUMBER	DATE
	P98-1		3-8-81
OPERATOR	CONTRACTOR		RIC NO.
M.F.I.	SEERRA		1
SIGNATURE OF OPERATOR'S REPRESENTATIVE	SIGNATURE OF CONTRACTOR'S TOOL PUSHER		
D.P. SIZE	WT./FT.	GRADE	TOOL JT O.D.
4 1/2	1160	E	64 XH
TYPE THREAD	STRING NO.	PUMP NO.	PUMP MANUFACTURER
1	1	1	
TYPE	STROKE LENGTH		

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
	Beaver	Utah		
LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS
	FEET	RRB. TO CSC. NO.	SET AT	
	SIZE	NO. LINES	FT. SLIPPED	
	FT. CUT OFF	PRESENT LENGTH		
	TOM ML OR TRIPS SINCE LAST CUT			
	CLIMBATIVE TOM ML OR TRIPS			

TIME DISTRIBUTION - HOURS	NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
1. INC UP AND TEAR DOWN	1	BIT 17 1/2 1.30 FT.	BIT NO. 2	TIME
2. DRILL ACTUAL	11 1/2	B50B 2.90	SIZE 17 1/2	WEIGHT
3. REAMING	1	STB 25.55 FT.	IADC CODE 11115	PRESSURE GRADIENT
4. CORING		D.C. ID 2.10 FT.	MFG. Recd.	VISC.-SEC.
5. CONDITION MUD & CIRCULATE	1/4	STB 93.65 FT.	TYPE 15	PV/YP
6. TRIPS		D.C. ID 3.60 FT.	SER. NO. 834775	GELS
7. LUBRICATE RIG	1/2	STB 129.30	JETS 1/32" /TFA 1/2"	ML-CC'S
8. REPAIR RIG		BHA = 129.30	DEPTH IN 132'	PH
9. CUT OFF DRILLING LINE		STANDS UP 181.95 FT.	DEPTH OUT 132'	SOLIDS %
10. DEVIATION SURVEY	1/4	SINGLES OF 29.91 FT.	TOTAL FTG. 18	MUD & CHEMICALS ADDED
11. WIRE LINE LOGS		KELLY DOWN 35 FT.	TOTAL HRS. 18	TYPE AMT. TYPE AMT.
12. RUN CASING & CEMENT		TOTAL 376.16 FT.	OUT. STRUC. 110 D L	
13. WAIT ON CEMENT		WT. OF STRING 113,000 LBS.	B G O R	
14. MIPPLE UP B.O.P.			GPM/PUMP-PSI	

FOOTAGE	DRILLING	CORE	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
229	376	D	Wellhead Tub	70	903-500	150	2	Stand	Air Foam
DEVIATION RECORD									
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
310		1/2	475E						
TIME LOG									
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					
0001	0800	9	2	Drilling @ 2660 cm F w/ 13 GPM (1.5 min)					
0800	0815	1/4	5	Circulate condition 7 GPM sand 5 GPM Polymer					
0815	0830	1/4	10	Survey @ 310' 1/2 475E					
0830	1200	3 1/2	2	Drilling					
Fuel @ 0:10 = 33"									

COMPLETION	NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
A. PERM' WITH	1	BIT 17 1/2 1.30 FT.	BIT NO. 2	TIME
B. TBC TRIPS	1	BHSub 2.90	SIZE 17 1/2	WEIGHT
C. TREATING	1	STB 25.55 FT.	IADC CODE 11115	PRESSURE GRADIENT
D. SWABBING	1	D.C. ID 2.10 FT.	MFG. Recd	VISC.-SEC.
E. TESTING	1	STB 93.65 FT.	TYPE 15	PV/YP
F. ADDIT'VL	3	D.C. ID 3.60 FT.	SER. NO. 834775	GELS
G.		STB 129.30	JETS 1/32" /TFA 1/2"	ML-CC'S
		BHA 129.30	DEPTH IN 132'	PH
		STANDS UP 302.75 FT.	DEPTH OUT 132'	SOLIDS %
		SINGLES OF 80.50 FT.	TOTAL FTG. 28 1/2	MUD & CHEMICALS ADDED
		KELLY DOWN 23' FT.	TOTAL HRS. 28 1/2	TYPE AMT. TYPE AMT.
		TOTAL 488.25 FT.	OUT. STRUC. 110 D L	
		WT. OF STRING 114,000 LBS.	B G O R	
			GPM/PUMP-PSI	

FOOTAGE	DRILLING	CORE	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
376	485	A		60	6	200	2	Stand	Air E Foam
DEVIATION RECORD									
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
TIME LOG									
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					
1200	1230	1/2	2	Drig F/376 To 381'					
1230	1300	1/2	7	Service Rig					
1300	2030	7 1/2	2	Drig F/381 To 441					
2030	2100	1/2	5	Sweep hole for Survey					
2100	2130	1/2	10	Survey @ 431' 1/2 531E					
2130	2400	2 1/2	2	Drig F/441 To 485					

TOTALS	NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
12 1/2				
HRS. W/CONTR. D.P.				
HRS. W/OPR. D.P.				
HRS. W/D.P.				
HRS. STANDBY				

FOOTAGE	DRILLING	CORE	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000#	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
DEVIATION RECORD									
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
TIME LOG									
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS					

WELL NO. P 88-1		API WELL NUMBER		DATE 3-9-89	
CONTRACTOR SIERRA		RIG NO. 1		FIELD OR DIST.	
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Grant Jensen</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER		COUNTY Beaver	
STATE Utah		WIRE LINE RECORD		REEL NO.	
SIZE	WT./FT.	GRADE	TOOL JT O.D.	TYPE	THREAD
16.60	E	65	XH	1	

SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKD. TO CSG. NO.	SET AT	SIZE	NO. LINES	FT. SLIPPED	
							1 1/2	8		
LAST CASING TUBING OR LINER							PRESENT LENGTH			
TON/AL OR TRIPS SINCE LAST CUT							CUMULATIVE TON/AL OR TRIPS			

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	FT.	FT.	BIT NO.	SIZE	TIME	WEIGHT
UP AND LR DOWN											
LL ACTUAL	11	20									
WING											
DRILLING											
FORMATION MUD CALCULATE	1/4	3/4									
PS											
INDICATE RIG	1/2										
FAIR RIG											
OFF LOGGING LINE											
VARIATION SURVEY	1/4										
LINE LOGS											
CASING ELEMENT											
ITEM											
FILE UP											
ST B.O.P.											
ILL STEM TEST											
LOG BACK											
REEZE CEMENT											
WING											
WORK											

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	FT.	FT.	BIT NO.	SIZE	TIME	WEIGHT
UP AND LR DOWN											
LL ACTUAL											
WING											
DRILLING											
FORMATION MUD CALCULATE											
PS											
INDICATE RIG											
FAIR RIG											
OFF LOGGING LINE											
VARIATION SURVEY											
LINE LOGS											
CASING ELEMENT											
ITEM											
FILE UP											
ST B.O.P.											
ILL STEM TEST											
LOG BACK											
REEZE CEMENT											
WING											
WORK											

TIME DISTRIBUTION - HOURS				NO.		DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORN.	DAY	EVE.	1	2	FT.	FT.	BIT NO.	SIZE	TIME	WEIGHT
UP AND LR DOWN											
LL ACTUAL											
WING											
DRILLING											
FORMATION MUD CALCULATE											
PS											
INDICATE RIG											
FAIR RIG											
OFF LOGGING LINE											
VARIATION SURVEY											
LINE LOGS											
CASING ELEMENT											
ITEM											
FILE UP											
ST B.O.P.											
ILL STEM TEST											
LOG BACK											
REEZE CEMENT											
WING											
WORK											

FOOTAGE		DR. D. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
485	603				600	125				
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
				552	10	S14E				
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									
0001	0630	6 1/2	2	Drilling						
0630	0700	7	8	Repair Grant Rotating Head						
0700	0715	2 1/4	2	Drilling						
0715	0730	1 1/4	5	circ + condition of survey						
0730	0745	1 1/4	10	Survey @ 552' = S14E 10						
0745	1200	2 1/4	2	Drilling						
				Diesel @ 06:00 = 62 1/2"						
				Drilled @ 12:00 = 62 1/2"						

FOOTAGE		DR. D. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
603	652	D			600	100				Mud Soap mix
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									
1200	1500	3	2	Drilling 603' To 652'						
1500	1600	1	5	Blow-Hole down						
1600	2020	4 1/2	21	Direct Flow Line to shaker, Fi 11 Hole with mud						
2020	2300	2 1/2	5	Start Circ and mud Hole						
2300	2400	1	6	short trip & stop Drill APC 1' Fill						

FOOTAGE		DR. D. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	
TIME LOG		ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO									

LEASE	WELL NO. P55-17A	API WELL NUMBER	DATE 3-10-59
OPERATOR MFI	CONTRACTOR Siem		RIG NO. 1
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Brent Jensen</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE 4 1/2	W1./FT. 16.60	GRADE E	TOOL JT. O.D. 4 1/4
TYPE THREAD XH	STRING NO. 1	PUMP NO.	PUMP MANUFACTURER
		TYPE	STROKE LENGTH

FIELD OR DIST.	COUNTY Beaver	STATE Utah	WIRE LINE RECORD	REEL NO.
SIZE 1 3/8	MAKE K55	WT. & GR. 17	NO. JOINTS 64271	FEET
LAST CASING TUBING OR LINER				
ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE
FORMATION (SHOW CORE RECOVERY)				
DEVIATION RECORD				
TIME LOG				

TIME DISTRIBUTION - HOURS	NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
1	BIT	17 1/2	BIT NO.	TIME
		2.90	SIZE	34
		25.55	IADC CODE	
		2.10	MFG.	
		95.65	TYPE	
		3.60	SER. NO.	
		129.30	JETS 1/32" /TFA in ²	
		483.60	DEPTH OUT	
		40	DEPTH IN	
		652.98	TOTAL FTG.	
		14.00	TOTAL HRS.	
			WT. OF STRING	

FOOTAGE	DR. D. RM. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
652.98 - 700			TD for casing						
DEVIATION RECORD									
TIME LOG									
0001	0130	1 1/2	5						Circ & Coad Hole w/ mud
0130	0230	1	6						TOH to run casing
0230	0330	1	21						Rig up insert floor to run casing
0330	0230	4	12						Run casing
0500	1000	2 1/2	12						Rig up D.S. + cement pumped 27 bbl. water 55-
1000	1200	2	2						wait on cement (Success & cement w/ 40% D66 silica flour, displacem/ 94 bbl water
Log down @ 1000 450-500 psi Hold 3 min at float drill									

NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
	BIT	BIT NO.	TIME
		SIZE	WEIGHT
		IADC CODE	PRESSURE GRADIENT
		MFG.	VISC. SEC.
		TYPE	PV/TP
		SER. NO.	CELLS
		JETS 1/32" /TFA in ²	ML -CC'S
		DEPTH OUT	pH
		DEPTH IN	SOLIDS %
		TOTAL FTG.	MUD & CHEMICALS ADDED
		TOTAL HRS.	TYPE AMT. TYPE AMT.
		WT. OF STRING	

FOOTAGE	DR. D. RM. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
DEVIATION RECORD									
TIME LOG									
1200	1730	5 1/2	13						N.O. CEMENT
1730	1800	1/2	14						pull flow line Remove cement head
1800									cut 2 1/2" @ bottom of collar, lift Hydrill
	1930	1 1/2	14						cut 1 3/8 lay down same set after Hydrill
1930	2030	1	14						set out Xover spool, more cut surface flow line
2030	2400	3 1/2	19						make final cut on 1 3/8 set w/ld on flange and us
EMIL @ 0600 57"									

NO.	DRILLING ASSEMBLY (At end of hour)	BIT RECORD	MUD RECORD
	BIT	BIT NO.	TIME
		SIZE	WEIGHT
		IADC CODE	PRESSURE GRADIENT
		MFG.	VISC. SEC.
		TYPE	PV/TP
		SER. NO.	CELLS
		JETS 1/32" /TFA in ²	ML -CC'S
		DEPTH OUT	pH
		DEPTH IN	SOLIDS %
		TOTAL FTG.	MUD & CHEMICALS ADDED
		TOTAL HRS.	TYPE AMT. TYPE AMT.
		WT. OF STRING	

FOOTAGE	DR. D. RM. R. CORE. C.	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 #	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
DEVIATION RECORD									
TIME LOG									
DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS									

WELL NO. **P 98-1A** API WELL NUMBER DATE **3-11-89**

ERATOR **V.F.I.** CONTRACTOR **SIERKA** RIG NO. **1**
 NATURE OF OPERATOR'S REPRESENTATIVE SIGNATURE OF CONTRACTOR'S TOOL PUSHER

P. SIZE	WT./FT.	GRADE	TOOL JT O.D.	TYPE	THREAD	STRING NO.	PUMP NO.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1 1/2	16.80	E	6 1/2	XH	1					

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
	Beaver	Utah	SIZE 1 1/2	NO. LINES 8
LAST CASING TUBING OR LINER	SIZE 1 3/8	MAKE 1555	WT. & GR.	NO. JOINTS 17
			FEET 647.77	
			RBL. TO CASC. NO.	SET AT
			FT. CUT OFF	PRESENT LENGTH
			TOM BL. OR TRIPS SINCE LAST CUT	
			CUMULATIVE TOM BL. OR TRIPS	

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORNING	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT
DR UP AND TEAR DOWN				STB RMR	OD	FT.	IADC CODE		PRESSURE GRADIENT
DRILL ACTUAL				D.C. ID	OD	FT.	MFG.		VISC.-SEC
TEAMING				STB RMR	OD	FT.	TYPE		PV/YP
DRIVING				D.C. ID	OD	FT.	SER. NO.		GELS
CONVENTION MUD CIRCULATE				STB RMR	OD	FT.	JETS 1 1/2" /1FA		WL -CC'S
TRIPS							DEPTH OUT		PH
LUBRICATE RIG							DEPTH IN		SOLIDS %
REPAIR RIG				STANDS DP	FT.	TOTAL FTG.			MUD & CHEMICALS ADDED
SHUT OFF HOISTING LINE				SINGLES DP	FT.	TOTAL HRS.			TYPE AMT. TYPE AMT.
DEVIATION SURVEY				KELLY DOWN	FT.				
WIRE LINE LOGS				TOTAL	FT.				
WIN CASING CEMENT				WT. OF STRING	LSB.				
PUT ON CEMENT									
RIPPLE UP L.O.P.									
EST B.O.P.									

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORNING	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT
DRILL STEIN TEST				STB RMR	OD	FT.	IADC CODE		PRESSURE GRADIENT
LUG BACK				D.C. ID	OD	FT.	MFG. Hughes		VISC.-SEC
QUEEZE CEMENT				STB RMR	OD	FT.	TYPE J-11		PV/YP
TRISING				D.C. ID	OD	FT.	SER. NO. 12487		GELS
HR WORK				STB RMR	OD	FT.	JETS 1 1/2" /1FA		WL -CC'S
							DEPTH OUT		PH
							DEPTH IN		SOLIDS %
				STANDS DP	FT.	TOTAL FTG.			MUD & CHEMICALS ADDED
				SINGLES DP	FT.	TOTAL HRS.			TYPE AMT. TYPE AMT.
				KELLY DOWN	FT.				
				TOTAL	FT.				
				WT. OF STRING	LSB.				

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
OPERATION	MORNING	DAY	EVE.	BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT
W/CONTR. D.P.				STB RMR	OD	FT.	IADC CODE		PRESSURE GRADIENT
W/OPR. D.P.				D.C. ID	OD	FT.	MFG.		VISC.-SEC
WD/D.P.				STB RMR	OD	FT.	TYPE		PV/YP
STANDBY				D.C. ID	OD	FT.	SER. NO.		GELS
DAY WORK				STB RMR	OD	FT.	JETS 1 1/2" /1FA		WL -CC'S
							DEPTH OUT		PH
							DEPTH IN		SOLIDS %
				STANDS DP	FT.	TOTAL FTG.			MUD & CHEMICALS ADDED
				SINGLES DP	FT.	TOTAL HRS.			TYPE AMT. TYPE AMT.
				KELLY DOWN	FT.				
				TOTAL	FT.				
				WT. OF STRING	LSB.				

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD											
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION		
TIME LOG											
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							
0200	0145	17 1/2	19	Weld + test wellhead test 2500' F/15min OK							
0145	0200	1/4	21	held safety meeting about safe nipple up, + general safety							
0200	1200	10	14	NIPPLE UP							
Fuel @ 1200 = 51"											

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD											
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION		
TIME LOG											
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							
1200	1700	5	19	Nipple up BOP's							
1700	2000	3	15	Test BOP Blind and pipe Rams							
2000	2230	2 1/2	1	set catwalk chairs Reamer slide Lay Down 9"							
2230	2400	1 1/2	6	strap and caliper 1/2 D's, Pick up some							
3-11-89 5:10pm to 5:25pm											
BLIND RAM TEST - 600 PSI - 15 MIN. NO LOSS - OK (K)											
PIPE RAM TEST - 910 PSI 30min 600PSI loss in 30min OK (K)											

FOOTAGE		DR. D. RMR. CORE. C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	PUMP NO. S.P.M. LINER SIZE	METHOD RUN
FROM	TO										
DEVIATION RECORD											
DEPTH		DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION		
TIME LOG											
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS							

LEASE	WELL NO. P 38-1A	API WELL NUMBER	DATE 3-12-87
OPERATOR M.E.P.	CONTRACTOR Sierra		RIG NO. 1
SIGNATURE OF OPERATOR'S REPRESENTATIVE <i>Brent Jensen</i>		SIGNATURE OF CONTRACTOR'S TOOL PUSHER	
D.P. SIZE 4 1/2	WT./FT. 16.60	GRADE E	TOOL JOINT 6 1/2
TYPE THREAD XH	STRING NO. 1	PUMP NO. 1	PUMP MANUFACTURER
TYPE	STROKE LENGTH		

FIELD OR DIST.	COUNTY Beaver	STATE Utah	WIRE LINE RECORD	REEL NO.
LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS
	4 1/2			
	FEET	RKB. TO CSC. NO.	SET AT	
	NO. LINES	FT. SLIPPED		
	8			
	FT. CUT OFF		PRESENT LENGTH	
	TON. OR TRIPS SINCE LAST CUT			
	CUMULATIVE TON. OR TRIPS			

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	MORN.	DAY	NO.	FT.	BIT NO.	SIZE	TIME	WEIGHT
1	RIG UP AND TEAR DOWN			1	1.00	3	12 1/4		
2	DRILL ACTUAL	3/4		1	3.63	437K			
3	REAMING			8	249.11	HTC			
4	CORING					J-11			
5	CONDITION MUD & CIRCULATE					122437			
6	TRIPS	2 1/2				JETS 1/32 IFA in ²	3/163		
7	LUBRICATE RIG					DEPTH OUT			
8	REPAIR RIG	1 1/4				DEPTH IN	652		
9	CUT OFF DRILLING LINE					TOTAL FTG.			
10	DEVIATION SURVEY			6	363.40	TOTAL HRS.	74		
11	WIRE LINE LOGS			1	3083				
12	RUN CASING & CEMENT					CUT STRIK.	110DL		
13	WAIT ON CEMENT					BIGDR			
14	HIPPLE UP & D.P.					WT. OF STRING	1400	LBS.	
15	TEST B.O.P.					GP/M/PUMP-PSI			
16	DRILL STEM TEST								
17	PLUG BACK								
18	SQUEEZE CEMENT								
19	FISHING								
20	DRILL WORK								
21									
22	Drly cement	7							
23	Annul 1200	1/4							
COMPLETION				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
A.	PERF'W'N			1	1.00	3	12 1/4		
B.	TBO TRIPS			1	3.63	437K			
C.	CREATING			8	249.11	HTC			
D.	SWABBING					J-11			
E.	TESTING					122437			
F.	ADD'FWL					JETS 1/32 IFA in ²			
G.						DEPTH OUT			
						DEPTH IN	652		
						TOTAL FTG.			
						TOTAL HRS.	124		
						CUT STRIK.	110DL		
						BIGDR			
						WT. OF STRING	1900	LBS.	
						GP/M/PUMP-PSI			
TOTALS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
				1	1.00	3	12 1/4		
				1	3.63	437K			
				8	249.11	HTC			
						J-11			
						122437			
						JETS 1/32 IFA in ²			
						DEPTH OUT			
						DEPTH IN	652		
						TOTAL FTG.			
						TOTAL HRS.	124		
						CUT STRIK.	110DL		
						BIGDR			
						WT. OF STRING	1900	LBS.	
						GP/M/PUMP-PSI			

FOOTAGE		DRILL CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
652	675		D							
DEVIATION RECORD										
TIME LOG										
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
0001	0005	2	6	Pick up 6 1/2 Dec. + Trip In change Rotating Head Ruber						
0005	0300	1	8	Repair Air starter on Air booster + Install Rotating head						
0300	0330	1/2	6	Final trip In 194 Cement @ 597'						
0330	0245	1/4	23	Unload Hake						
0345	1400	1/4	8	Repair Bore line						
1400	0415	1/4	22	Drly. cement						
0415	1000	5 1/2	22	Drly float collar + cement						
1000	1015	1/4	8	Repair Grant Rot Head Drive						
DRILLER: <i>M. J. [Signature]</i>										

FOOTAGE		DRILL CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
747	915		D							
DEVIATION RECORD										
TIME LOG										
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
1015	1115	1	21	Drly float collar + shoe						
1115	1200	3/4	2	Drly new formation						
DRILLER: <i>M. J. [Signature]</i>										

FOOTAGE		DRILL CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000'	PUMP PRESS	PUMP NO.	PUMP NO.	METHOD RUN
FROM	TO									
675	915		D							
DEVIATION RECORD										
TIME LOG										
FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
1200	1600	4	2	Drly F/675 to 747						
1600	1630	1/2	21	B o P Drill Level Derrick ✓ B O P'S						
1630	1400	7 1/2	2	Data F 747 to 915						

LEASE	WELL NO.	API WELL NUMBER	DATE
	188-1A		3-13-81
OPERATOR	CONTRACTOR		RIG NO.
MEI.	SICORG		1
SIGNATURE OF OPERATOR'S REPRESENTATIVE	SIGNATURE OF CONTRACTOR'S TOOL PUSHER		
<i>Brent Jones</i>			
D.P. SIZE	WT./FT.	GRADE	TOOL JT G.D.
4E	11.60	E	6 1/2 XH
TYPE THREAD	STRING NO.	PUMP NO.	PUMP MANUFACTURER
	1		
		TYPE	STROKE LENGTH

FIELD OR DIST.	COUNTY	STATE	WIRE LINE RECORD	REEL NO.
	Beaver	Utah		
LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS
	13 3/4	K55		622
				652
			RHS. TO CSG. NO.	SET AT
	SIZE	NO. LINES	FT. SLIPPED	
	1 1/8	8		
	FT. CUT OFF		PRESENT LENGTH	
	TOM IN. OR TRIPS SINCE LAST CUT			
	CUMULATIVE TOM IN. OR TRIPS			

TIME DISTRIBUTION - HOURS				NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
CODE NO.	OPERATION	NORM.	DAY	FT.	BIT NO.	SIZE	TIME	WEIGHT	PRESSURE GRADIENT
1	RIG UP AND TEAR DOWN				1234	1.00			
2	DRILL ACTUAL	12			bitsub	3.63			
3	REAMING				D.C. ID	249	11 FT.		
4	CORING				STB RMR				
5	CONDITION MUD & CIRCULATE				D.C. ID				
6	TRIPS				STB RMR				
7	LUBRICATE RIG								
8	REPAIR RIG								
9	OUT OFF DRILLING LINE								
10	DEVIATION SURVEY				STANDS DP	30.22	FT.		
11	WIRE LINE LOGS				SINGLES DP	40	FT.		
12	RUN CASING & CEMENT				KELLY DOWN				
13	WAIT ON CEMENT				TOTAL	117.7	FT.		
14	MUFFLE UP B.G.P.				WT. OF STRING	20,000	LBS.		
15	TEST B.G.P.								
16	DRILL STEM TEST								
17	PLUG BACK								
18	SQUEEZE CEMENT								
19	FISHING								
20	DR. WORK								
21									
22									
23									
COMPLETION				STANDS DP		TOTAL FTG.		MUD & CHEMICALS ADDED	
A. PERM'RYM				SINGLES DP		TOTAL HRS.		TYPE	
B. TBC TRIPS				KELLY DOWN		TOTAL HRS.		AMT.	
C. TREATING				TOTAL		TOTAL HRS.		TYPE	
D. SHABBING				WT. OF STRING		TOTAL HRS.		AMT.	
E. TESTING				LBS.		TOTAL HRS.		TYPE	
F. ADD'YML				GPM/PUMP-PSI		TOTAL HRS.		AMT.	
G.						TOTAL HRS.		AMT.	

FOOTAGE		DR. D. R.H.-R. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
915	1168	D			54	22.5	375					
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
TIME LOG				ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO					DRG Steam I.A. @ 940' Dely Break @ 970' - 985' Fractures @ 965' Dely Break Elong in string washed out @ Apr 0330, Dely Break F/1015 - 1035; Frac. @ 1011, Frac. @ 1090 to - 1095, 1113 to - 1115 DRG Fractures 1119 - 1138 very Badly F/ 1133 - 1138, Smaller Fractures F/ 1139 to 1168						
1200	17					Fuel @ 06:00 44"						

NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT
STB RMR	OD	FT.	IADC CODE		PRESSURE GRADIENT
D.C. ID	OD	FT.	MFG.		VISC.-SEC.
STB RMR	OD	FT.	TYPE		PV/YP
D.C. ID	OD	FT.	SER. NO.		GELS
STB RMR	OD	FT.			ML.-CC'S
			JETS 1/32" /FA h2		pH
					SOLIDS %
			DEPTH OUT		
			DEPTH IN		
			TOTAL FTG.		
			TOTAL HRS.		
			OUT. STRUC.		
			I O D L		
			B G O R		
			WT. OF STRING		
			LBS.		
			GPM/PUMP-PSI		

FOOTAGE		DR. D. R.H.-R. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
1200	1430				2 1/2	2						
1430	1700				2 1/2	6						
1700	2100				4	1						
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
TIME LOG				ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO					DRG F/1168 TO 1177 Lay Down string Start to Rig Down Repair Belts on Kookey						

NO. DRILLING ASSEMBLY (At end of hour)		BIT RECORD		MUD RECORD	
BIT	FT.	BIT NO.	SIZE	TIME	WEIGHT
STB RMR	OD	FT.	IADC CODE		PRESSURE GRADIENT
D.C. ID	OD	FT.	MFG.		VISC.-SEC.
STB RMR	OD	FT.	TYPE		PV/YP
D.C. ID	OD	FT.	SER. NO.		GELS
STB RMR	OD	FT.			ML.-CC'S
			JETS 1/32" /FA h2		pH
					SOLIDS %
			DEPTH OUT		

FOOTAGE		DR. D. R.H.-R. CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	WT. ON BIT 1000 P	PUMP PRESS	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
FROM	TO											
DEVIATION RECORD				DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION
TIME LOG				ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS						
FROM	TO											

**Production Well Drilling Program
Cove Fort - Sulphurdale KGRA**

Objective: Drill/Complete steam production well to $\pm 2000'$ TD. Conductor casing 20" set at $\pm 60-120'$, 13 3/8" production casing set at $\pm 400-900'$, 12 1/4" open hole to 2000' or producing formation.

September, 1987
Updated October, 1988

Mother Earth Industries, Inc
Production Office
3761 South 700 East
Salt Lake City, UT 84106
801-263-8300

Abbreviated sequence of operations:

1. Prepare location and sump per attached dwgs.
2. MIRU rotary rig on conductor.
3. Drill 26" hole to 60-120' GL. Optionally, rathole digger may be utilized instead of rig.
4. Run 20" conductor pipe to TD and cement from TD to surface. WOC.
5. Install master valve and rotating head/diverter on 20" conductor, optionally as required. PU 17 1/2" drilling assembly and drill out 20" conductor using mud. Drill 17 1/2" hole to approx. 400'-900'. Take directional surveys approx. every 200 feet. Maintain straight hole as is possible, max. deviation 4 degrees at TD. Maximum allowable rate of change 1.5 degrees/100'.
6. Run and cement 13 3/8" casing. WOC 8-12 hrs, as req'd.
7. Install wellhead and 12" BOP equipment on 13 3/8" casing. Test BOP to 750 psig; witnessed by BLM and Utah Div. of Water Resources representative.
8. RU compressors; Drill 12 1/4" hole with air/foam, as appropriate, to 2000' or commercial production.
9. Perform rig test to obtain approximate flowrate, WHP, WHT. Run downhole surveys per engineer and geologist direction. Run logs as required by regulatory agencies.
10. POOH, laydown drillpipe and tools, RDMO, release rig, return rental equipment.
11. Prepare and submit completion reports to appropriate agencies.

Detailed sequence of operations:

(Note: All operations are to be in accordance with approved Plan of Operations for CFS KGRA)

1. Prepare location and sump per attached drawings. Prepare 3' deep well cellar using 8' diam culvert, with gravel in bottom and drain to sump.
2. MIRU rotary rig, drill 26" hole to approx. 60-120' GL, subject to confirmation of competent formation.
- 2a.(optional) Mob. rathole digger to drill 26" hole to approx 60-120' GL.
3. Set 20" casing in hole; cement from TD to surface with Redi-mix cement.
4. (MIRU rotary rig, centered on conductor.) Install extension as reqd. on 20" conductor to bring it up under the rotary table, and install return flowline to pit. Optionally, install master valve and rotating head w/diverter line and valve on the 20" conductor. Install H2S monitoring equipment per attachment. At this point, all rig personnel are required to have current H2S certification from H2S safety company man. All personnel shall be familiar with attached H2S alarm procedure.
5. Spud well with 17 1/2" drilling assembly and drill w/ mud to approx. 400', or casing point as determined by well supervisor and geologist. Collect, clean, and clearly label cuttings every 10', as directed by geologist.
6. At casing depth, RIH and run E-logs per permit requirements. RIH and circulate following logging.
7. Run 13 3/8" casing per attached casing program with stab-in float collar located 1 jt above shoe on bottom.
8. RIH with stab-in tool, stab into float collar. Circulate hole clean, minimum 2 full circulations.
9. Cement 13 3/8" casing per attached cementing program. Preserve cement samples.
10. WOC 12 hrs or as dictated by samples.
11. Cut off 13 3/8" casing and install 13 3/8" SOW x 12"-400 casing head w/ two 3" wing outlets with 3" 2000 psi wing valves, with 3" companion flanges. All wellhead installation shall be in strict accordance with

manufacturer's written procedure. NU 12"-400 master valve and 12" BOP stack per attached drawing.

12. Notify BLM and Utah Division of Water Resources representatives; test BOP to 750 psig with BLM and Utah representatives present, or in accordance with permit requirements. Test witnesses are requested to document successful test completion on tour sheets. H2S safety man to be present on location.

13. RIH with 12 1/4" bit, drill out cement, float collar, and shoe using mud. Drill additional 30' into formation, circulate/displace mud out of hole with clear water.

14. POOH, PU stabilizers, per BHA program. RU compressors, RIH blowing hole dry with air.

15. Drill 12 1/4" hole with air system to 2000' or commercial steam production. Collect cuttings if possible. If steam fracture is encountered, drill ahead while flowing per geologist and engineer direction.

16. POOH, perform rig test to determine approximate flowrate, wellhead pressure, wellhead temperature, noncondensable gas content, condensate pH, etc. Test long enough to ascertain native geothermal fluids being produced, short-term pressure stability, and adequate cleanup.

17. If production is non-commercial per engineer, drill ahead or sidetrack as req'd. Obtain authorizations from appropriate agency personnel prior to

18. On completion of drilling operations, laydown drillpipe, ND BOP, return rental equipment, RDMO rig, cleanup location.

19. Prepare and submit completion reports, as req'd. Re-contour and reclaim/revegetate location as required per approved Plan of Operations and BLM/Forest Service direction.

H2S Safety

The H2S safety company will be called out to perform certification training, install and maintain properly operating H2S monitors, and provide on-location advice and expertise regarding safety related items. The monitors will be rigged up prior to spudding the hole, and the safety man will be available on location after drilling out the production casing.

In all matters of safety, the H2S safety man has the FINAL WORD on procedures.

H2S monitors will be installed at the following locations:

1. Mud return line
2. Vicinity of floor
3. Vicinity of wellhead/BOP's
4. Additional locations per Safety Man direction, MEI/contractor recommendations.

Windssocks will be installed as to be visible from various areas of location. An H2S warning sign (with green/yellow/red warning flags) is to be installed on the access road, and the appropriate flag will be displayed, depending on current operations. Two different briefing areas will be established, to allow safe briefing in any wind condition. Emergency breathing equipment (5 min. and working-size Scott Air Packs; workline hose; high-pressure air bottles in safety trailer, etc.) will be available.

Prior to spud, all rig personnel shall successfully complete an H2S training/certification course presented by the safety man. This will include Air Pack use, operation and location of H2S monitors around the rig, location and use of briefing areas, and general information regarding safety. Throughout drilling operations, rig personnel will have procedural update briefings, safety meetings, etc., as needed.

H2S ALARM PROCEDURE
POST PROMINENTLY IN DOGHOUSE

IN CASE OF H2S ALARM:

1. MASK UP WITH ESCAPE UNIT
2. GO IMMEDIATELY TO THE UPWIND BRIEFING
AREA

NO EXCEPTIONS UNLESS DIRECTED BY H2S
SAFETY MAN ON LOCATION

Casing/Cementing Program

String	Hole Size	Casing size	Weight	Grade	Thread	Top	Bottom
Conductor	26"	20"	94ppf	K-55	BT&C	0'	40-80'
Production	17 1/2"	13 3/8"	61ppf	K-55	BT&C	0'	400'

All casing string settings approximate subject to confirmation that actual formation is appropriately competent.

Conductor to be cemented with locally available Redi-Mix. 13 3/8 production string to be cemented as follows:

Shoes, collars: Run stab-in float collar one joint above casing guide shoe on bottom. Tack weld bottom of collars on bottom 3 joints, including float collar. Clean and Thread-Lock all threads on float collar.

Centralizers: Run centralizer in middle of bottom 2 jts. Then one centralizer on every other collar to within 100 feet of surface. No scratchers.

Lead slurry: 1:1 ratio of Class H cement: perlite, +3% gel + 40% S-8 (silica flour) + .75% CD-31 (friction reducer)

Tail slurry: Class H cement + 40% S-8 (silica flour) + .65% CD-31 (friction reducer)

Both cement stages should be retarded to give 2-3 hours at approximately 280 Deg F.

Volumes: 60' 13 3/8" csg in 20" 94 ppf csg.(19.124" i.d.): 61.2 cu. ft.

340' 13 3/8" csg in 17 1/2" OH: 236.2 cu. ft.

Using 30%/100% excess in casing/open hole, total volume: 552 cu. ft.

Using stab-in tool on drillpipe, stab into float collar. Cement through drillpipe. Pump Lead Slurry until good returns are observed at surface. Then pump Tail Slurry. Pump enough water to clear surface equipment, then pull drillpipe out of float collar, dropping cement from drillpipe on top of float collar.

WOC 12 hrs or until samples have set. Observe cement; if falling, bring back to surface adding cement with 1" pipe.

Blowout Prevention equipment, 13 3/8" casing

All BOP equipment capable of passing 12 1/4" bit/BHA.

From casing going up:

1. 13 3/8" SOW x 12"-400 casing head w/ two 3" wing outlets with 3" 2000 psi wing valves, with 3" companion flanges.
2. 12" 400 RTJ WKM Power Seal through-conduit gate valve, with geothermal trim for steam service with 300 Deg F steam containing approx. 7% carbon dioxide and approx. 0.1% H₂S
3. (Crossover/DSA as req'd: 12"-400 x 12"-900) 12" 900 series Banjo Box, with 12" bleed Line, and 10" or 12" bleed line valve, reducers as req'd on bleed line.
4. 12" 900 series double gate ram preventer, 1 ram CSD, 1 ram drillpipe
5. 12" 900 series rotating head, with high temperature/H₂S rubbers.

LITHOLOGIC LOG OF MEI WELL P-88-1A

Prepared for
Mother Earth Industries, Inc.
7350 E. Evans Road, Suite B
Scottsdale, Arizona 85260

By
Joseph N. Moore
Salt Lake City, Utah

April, 1989

dacite rests on coarse-grained Three Creeks Tuff.

Domes and hypabyssal intrusions of intermediate composition have been mapped in the Sulphurdale area by Moore and Samberg (1979). These rocks, which they called latite porphyry, typically carry phenocrysts of plagioclase, pyroxene, and pseudomorphs of an iron-bearing mineral that may be either hornblende or biotite. Field relationships demonstrated that the latites were emplaced after deposition of the Three Creeks Tuff at 27 my but prior to eruption of the Osiris Tuff 22 my ago. Moore and Samberg (1979) suggested that the volcanic activity which produced the latite domes was related to emplacement of a large quartz-monzonite intrusion located beneath Sulphurdale. Although intermediate composition lava flows containing phenocrysts of plagioclase, hornblende and biotite occur beneath the Three Creeks Tuff in the lower member of the Bullion Canyon Volcanics, none are known to occur within this ash-flow ⁷⁶¹ sequence. These lava flows are typically altered to mixtures of quartz, illite, epidote, and calcite. The absence of similar propylitic alteration in the dacite porphyry in S-88-1, suggests, but does not prove, that it was erupted after deposition of the Three Creeks Tuff and is correlative with latite volcanism.

Q2
IS THE 761
4/1/70
5/1/70
SUN D...
...

The dacite porphyry in P-88-1A is underlain by reddish-brown to gray coarse-grained Three Creeks Tuff (340 - 670 feet). Although the ash-flows are generally only weakly to moderately altered between 340 and 580 feet they are strongly altered between 580 and 670 feet.

Between ⁶⁷⁰ and 930 feet, P-88-1A penetrated a fine-grained ash-flow tuff that is mineralogically similar to the overlying Three Creeks Tuff. The fine-grained ash-flow tuffs are reddish-brown to light gray in color. As in the overlying ash-flow tuffs, the color of the matrix appears to be a function of the extent of hydrothermal alteration. In contrast to P-88-1A, the upper contact between the coarse- and fine-grained Three Creeks Tuff in S-88-1 was encountered at a depth of 655 feet. The base

761?

of the fine-grained ash-flow tuffs in S-88-1 was found at 825 *Surface*
feet. *100' thickness? Wavy* *of form? 127E*

Chips collected from depths below 930 feet in P-88-1A consists mainly of a white, vitreous quartzite. Thin sections from the ^{base} of S-88-1 show that the chip samples contain quartz-rich sedimentary rocks ranging from quartzites cemented by quartz overgrowths to fine-grained sandstones and siltstones cemented by clay minerals (illite or illite/smectite) and calcite. In addition, fragments of fine-grained limestone are present in some of the chip samples. *S-88-1*

The basement rocks in the Cove Fort-Sulphurdale area include sandstones, siltstones, and limestones that range in age from Triassic to Pennsylvanian. These sedimentary deposits are capped by the Tertiary or upper Cretaceous Price River Conglomerate which contains clasts of the basement rocks.

The sedimentary rocks in P-88-1A are capped by a silicified fragmental horizon. Thin sections from the upper part of the sedimentary section in S-88-1 show that individual chips contain fragments of both sedimentary and volcanic lithologies in a matrix of calcite and fine-grained quartz. The variety of lithologies present in the chips suggests that the rock underlying the Three Creeks Tuff is an altered conglomerate and not a hydrothermal or fault breccia. *Price River? How thick? Overlain by clayey - illite cement?*

Hydrothermal Alteration

Hydrothermal alteration of the rocks in P-88-1A is typical of moderate temperature regimes (less than 200° to 250° C). Thin section examination of samples from the adjacent well, S-88-1, indicates that hydrothermal alteration has produced mineral assemblages consisting of quartz, clays, iron oxides, and pyrite.

Four zones of intense silicification were observed during logging of the cuttings from P-88-1A. These zones occur at 40 to 140 feet, 280 to 340 feet (hematite breccia), 580 to 670 feet, and 900 to 930 feet.

Pyrite is the only sulfide mineral observed in the cuttings from P-88-1A. It is closely associated with the silicified zones occurring in the lower half of the well. *See above*

Thin sections of cuttings from S-88-1 show that the clay minerals present in the altered rocks include kaolin, smectite, interlayered illite/smectite, chlorite/smectite, and celadonite. Light green smectite and interlayered illite/smectite are present throughout this well as alteration products of biotite, hornblende, and feldspar phenocrysts. These sheet silicates are frequently associated with iron oxides (magnetite and hematite), sphene, and calcite in the altered ferromagnesium minerals and with calcite in the altered feldspars. Bright green celadonite appears to be present in the rocks below about 700 feet.

Kaolin is present in the silicified ash-flow tuffs encountered in the upper 140 to 155 feet of wells P-88-1A and S-88-1. A thin section cut at 65-75 feet in S-88-1 shows that the kaolin occurs mainly as a fine-grained alteration product of the feldspar and biotite phenocrysts. Its presence in P-88-1A at 100 feet was confirmed by X-ray analysis of the cuttings.

The presence of kaolin is indicative of alteration by fluids with low pH's whereas alteration assemblages characterized by illite/smectite are more typical of near neutral fluids. Both types of alteration are present in the shallow samples of the Three Creeks Tuff suggesting that these rocks have been affected by two distinct fluid types. The presence of silicification associated with secondary illite/smectite in the shallowest samples furthermore suggests that the bulk of the alteration produced by the near neutral fluids predates the active geothermal system. In contrast, acid waters are currently being formed by oxidation of hydrogen sulphide released through gas vents located around Sulphurdale. Thus, the kaolin is probably related to recent geothermal activity.

Veins containing various proportions of calcite, quartz, smectite, and illite(?) are found throughout the wells studied.

Sulphurdale
3000' level
3000' level
3000' level

In places, barite or anhydrite are also present. Thin sections show that the veins cut all rock types and alteration assemblages. Because of the small size of the chips, it has not been possible to establish the relative ages of the veins from crosscutting relationships.

Structural Relationships

The distribution of alteration assemblages and rock types in P-88-1A suggests that the well crossed faults at 280, and 630 feet. At 280 feet, dacite porphyry is overlain by Three Creeks Tuff. If as suggested, the dacite porphyry postdates the ash-flow tuffs, then this fault is probably a low angle normal fault associated with the large scale landslide blocks that occur at Sulphurdale. The orientation of the fault at 630 feet cannot be deduced from the stratigraphic relationships. However, the presence of silicification in ash-flow tuffs at these depths implies that the faults are post Miocene in age and therefore the sense of movement is likely to be normal.

Glide block

no further fracturing

The presence of sedimentary rocks at shallow depths in all MEI wells except 24-7 implies that the wells located to the south of 24-7 are drilled into an upthrown fault block. The faults which bound this block must have been active prior to the deposition of the Three Creeks Tuff since the lower member of the Bullion Canyon Volcanics is absent in MEI wells drilled to the south of 24-7. A long period of activity on the east-west fault located just south of well 24-7 is indicated by the juxtaposition of the Three Creeks and Red Tuffs on the hill just south of this well. The depth to the sedimentary basement is significant because it appears to be the primary reservoir in the MEI wells.

no further fracturing

yes

Summary and Conclusions

Lithologic and alteration studies of MEI wells P-88-1A and S-88-1 indicate that the steam produced by these wells is contained in fractured sedimentary rocks that underlie the Three

Creeks Tuff. An altered conglomerate containing fragments of quartzite, siltstone, limestone, and lava flows marks the contact between the Three Creeks Tuff and the sedimentary basement in these wells.) need
to see
this

A distinctive dacite porphyry and breccia was encountered at a depth of about 300 feet in both P-88-1A and S-88-1. The dacite may be correlative with latite flows and domes that intrude and overlie the Three Creeks Tuff. The dacite flows are in turn, overlain by coarse-grained Three Creeks Tuff that may be part of a thick gravitational glide block which moved from the east to west.

At least two periods of hydrothermal alteration have affected the rocks in P-88-1A. The initial period of alteration was characterized by the deposition of quartz, mixed layer clays, calcite, iron oxides, sphene, and pyrite in of the volcanic rocks and the conglomerate at the base of the volcanic section. This alteration appears to be related primarily a hydrothermal system developed above a Tertiary quartz monzonite intrusion that underlies the Sulphurdale area. Secondary minerals related to the present geothermal system include kaolin and minor anhydrite. These minerals occur in the upper 150 feet of P-88-1A.

References

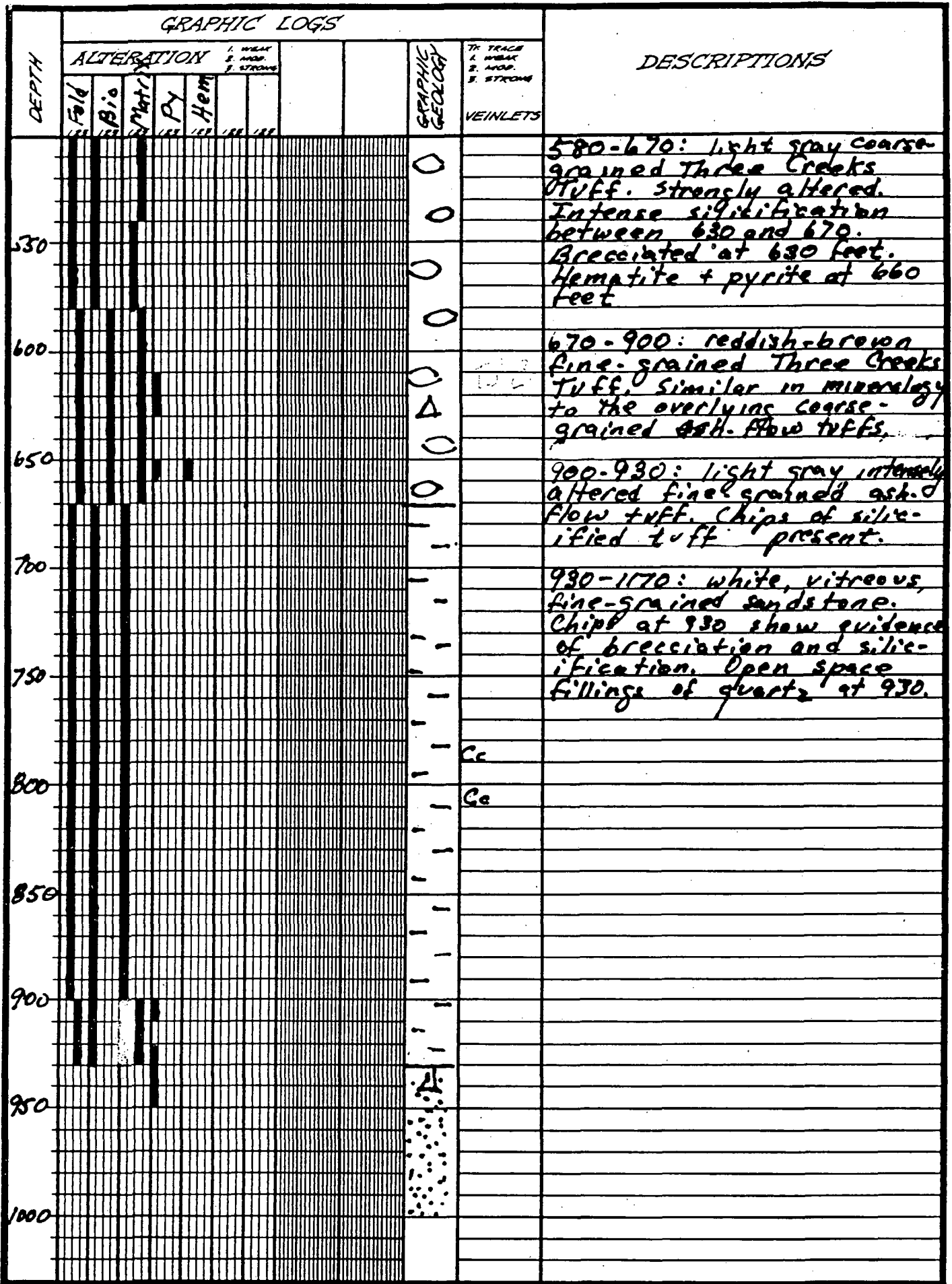
Moore, J.N. and Samberg, S.M., 1979, Geology of the Cove Fort-Sulphurdale KGRA: University of Utah Research Institute Report 18, 44p.

GRAPHIC LOGS										DESCRIPTORS	DESCRIPTIONS
DEPTH	ALTERATION					GRAPHIC GEOLOGY	VEINLETS	1. WEAK 2. MOD. 3. STRONG			
	Feld	Bio	Matrix	Py	Hem						
0											0-40: No sample
50						N.S.					40-80: light gray coarse-grained Three Creeks Tuff. Alteration is strong although few biotite phenocrysts are still present
100											80-140: medium gray coarse-grained Three Creeks Tuff, strong alteration. biotite has been destroyed and numerous small cavities are present where phenocrysts have been removed. The matrix is silicified. Traces of anhydrite are present at 100-110 feet.
150											
200											140-280: red-brown coarse grained Three Creeks Tuff. Moderately altered. Traces of green smectite common at 160 and 240-280 feet.
250											
300											280-340: dacite porphyry containing plagioclase biotite and hornblende(?) red fragments of hematite stained, silicified air fall deposits related to eruption of dacite
350											340-580: red-brown to gray coarse-grained Three Creeks Tuff. Weak to moderate alteration. Fragments of dacite air-fall deposits at 390-400 feet (sluffed)
400											
450											
500											

DRILL HOLE P-88-1A
 LOCATION _____



LOGGED BY JDM



DRILL HOLE P-88-1A
 LOCATION _____



LOGGED BY JNM



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

Appendix D

Norman H. Bangertter
Governor
Dee C. Hansen
Executive Director
Robert L. Morgan
State Engineer

1636 West North Temple, Suite 220
Salt Lake City, Utah 84116-3156
801-538-7240

December 6, 1988

Mr. Jay C. Hauth, Operations Manager
Mother Earth Industries, Inc.
3761 South 700 East, Suite 200
Salt Lake City, UT 84106

RE: Request to Drill Production Holes P88-1 and P88-2
Expiration Date: May 5, 1989

Dear Mr. Hauth:

Reference is made to your request of October 27, 1988, which was received by the State Engineer about October 31, 1988, to drill two production geothermal wells as part of MEI's continued field development program at the Cove Fort/Sulfurdale KGRA. The location of the well is to be:

P88-1 South 2710 feet and East 1152 feet from the NW
Corner of Section 7, T26S, R6W, SLB&M, which is
within about 25 feet of S88-1.

P88-2 South 2951 feet and East 990 feet from the NW
Corner of Section 7, T26S, R6W, SLB&M, which is
within about 25 feet of S88-3.

By this letter you are hereby granted permission to drill, subject to the following conditions:

1. Your request is approved as a test well application only. If, at a later date, it is desired to bring the well to production, it will be necessary to obtain the State Engineer's approval on the appropriate water right application(s) at or previous to that time. The approval of this request does not grant production or use of geothermal fluids from the well(s) until proper procedures have been followed.
2. This approval is conditioned upon the proper easements and trespass agreements being obtained from Delano Development Company, the fee holder of the land where the proposed wells will reside. A copy of such agreements shall be provided the Division of Water Rights before this approval is considered final.

3. The driller must be bonded and have a current Utah water well driller's license from the Division of Water Rights.
4. The owner/operator of the wells must post a bond in the amount of \$10,000 for each well or \$50,000 to cover all wells drilled within the state.
5. The wells may be drilled to a maximum depth of 2000 feet, more or less. The applicant must obtain written permission from the State Engineer prior to drilling to a depth significantly beyond 2000 feet, i.e., to a depth requiring changes or additions to the Plan of Operations submitted to the State Engineer, or posing a threat to the safety of personnel or the structural integrity of the well.
6. The applicant must notify the Division of Water Rights at least 24 hours prior to 1) the commencement of drilling, and 2) testing the BOP equipment and the surface casing, so that a representative may be on site for the inspections. The applicant must also notify the Division prior to testing the well for flow or resource characteristics so that a representative of the Division may observe the test.
7. The casing shall be installed according to the schedule in the plan of operations in the request to drill, summarized as follows:
 - A. The conductor casing (20 inch) shall be installed to a depth of 60-120 feet and the annular space shall be cemented back solid to the surface.
 - B. The surface casing (13 3/8 inch) shall be set to a depth of 400-900 feet and cemented back to the surface. Blow-out prevention equipment shall be installed and tested before drilling further.
 - C. The well may be drilled open-hole below the surface casing.

Any variances from the Plan of Operations must be approved by the State Engineer prior to their implementation.

8. The BOP Equipment and the surface casing shall be pressure tested in accordance with federal regulations as contained in Federal GRO Order No. 2. The applicant shall notify the Division prior to the test so that a representative of the Division may witness the test.

9. Mud return temperatures shall be monitored and recorded at least with the addition of each new drill pipe, or 30 feet, whichever is less. If the return temperatures reach 125 degrees Fahrenheit before the surface casing has been set, drilling shall cease immediately until casing has been set and/or BOP equipment has been installed and successfully tested.
10. The driller shall take all necessary precautions to prevent fires, blow-outs, or others hazards and to conduct all activities in a safe and workmanlike manner. The driller shall be prepared with proper equipment and drilling techniques to handle either artesian or thermal pressure, or both, particularly in the bedrock layers which apparently form the reservoir matrix. The driller shall utilize such equipment as is necessary to contain the well at any stage, whether above or within the bedrock layer. Appropriate H2S warning devices shall be utilized during all drilling and testing operations, and personnel shall be instructed in proper emergency procedures and the use of emergency equipment.
11. The applicant shall provide for proper and safe disposal of any geothermal fluids produced during the drilling or testing of the well. Plans for disposal pits or other facilities must be approved by the State Engineer prior to the commencement of testing. No more water may be diverted from any of the wells than is necessary to conduct the tests associated with drilling. Any extended flow test to determine the production capabilities of the well must be approved in writing by the State Engineer prior to the commencement of testing.
12. In case of any emergency, the applicant shall immediately notify the Division at one of the numbers listed below:

	Work	Home
Gerald Stoker	(801) 586-4231	
John Solum	(801) 538-7406	(801) 546-1979
Kent Jones	(801) 538-7405	(801) 561-9901

It is the responsibility of the applicant to notify the Division.

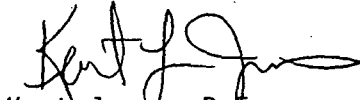
13. The applicant shall submit to the Division all drilling reports and logs at the completion of drilling, and geologic data, chemical analyses, and test results at the completion of testing or earlier if the State Engineer determines that the information is necessary for immediate decisions regarding the management of the resource. This information will, at the request of the applicant, be held confidential until it is released by the applicant.

This is permission for the licensed driller to begin drilling the geothermal test well. Note that the expiration date of this letter is May 5, 1989.

Please notify Gerald Stoker, the Area Engineer, at 586-4231 or John Solum, at 538-7406 prior to the commencement of drilling operations so that a representative of the Division may be on site when drilling is begun.

This is not permission for you to develop a final test well to be used for production purposes, but is only intended to develop sufficient information to determine if a likely geothermal resource is available in the area. It is the responsibility of the applicant to obtain proper water rights and other necessary permits.

Yours very truly,

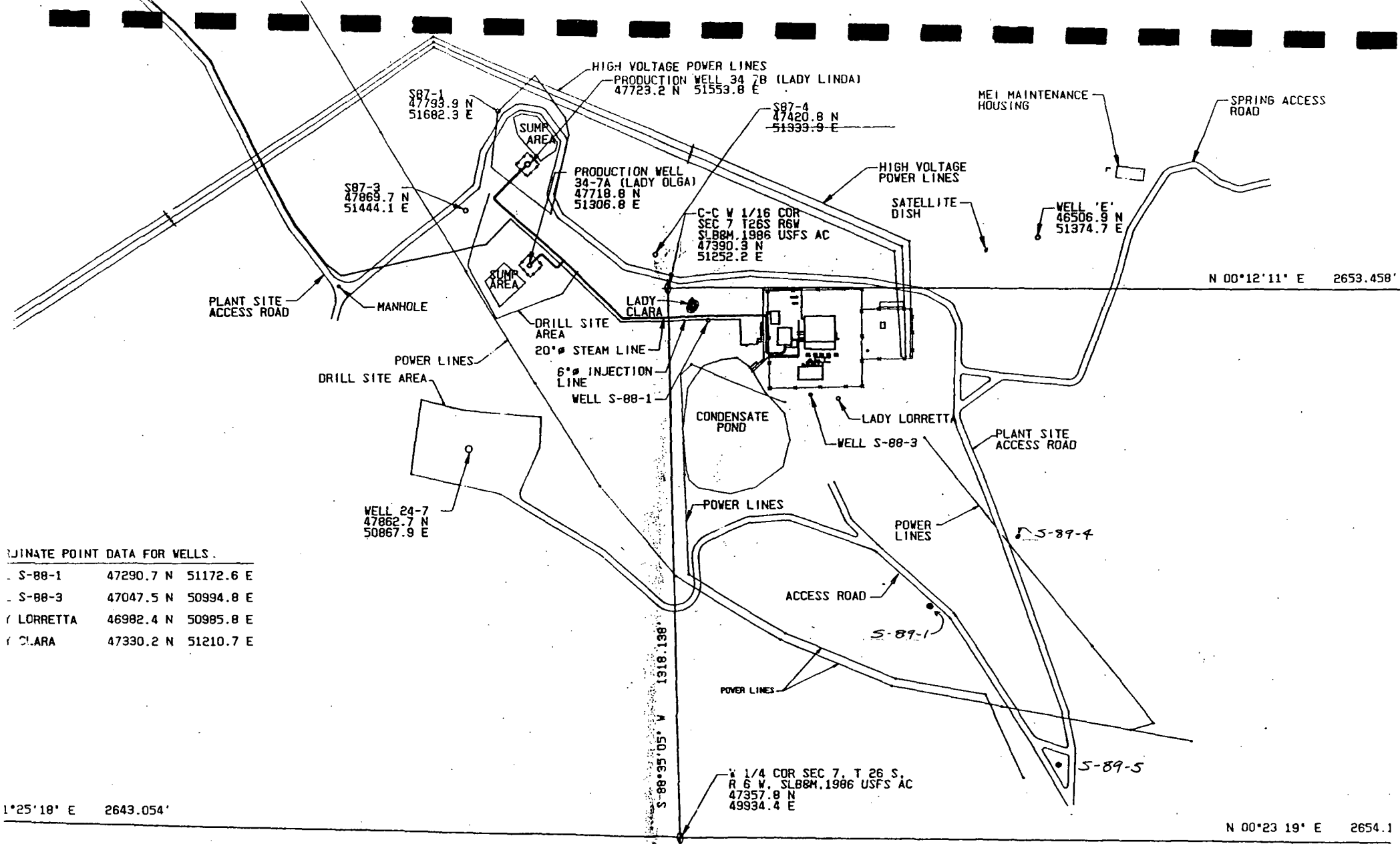


Kent Jones, P.E.
Directing Appropriations Engineer

KLJ:JS:rc

cc: Gerald W. Stoker
Jerry Bronicel
Delano Development Company

P88- 1A (Clara)			
Daily field cost estimate summary			
JCH 3/23/89			
Date	Daily Cost	Cum Cost	Comments
Prior to 2/1/89:		65,712	WH, csg
2/1/89	3242.00	68,954	Start rigdown on P88- 2
2/2/89	660.37	69,614	
2/3/89	745.50	70,360	
2/4/89		70,360	
2/5/89		70,360	
2/6/89		70,360	
2/7/89		70,360	
2/8/89		70,360	
2/9/89		70,360	
2/10/89		70,360	
2/11/89		70,360	
2/12/89		70,360	
2/13/89	1655.43	72,015	Building location
2/14/89	1314.00	73,329	
2/15/89	1378.00	74,707	
2/16/89	3882.73	78,590	set/cmt conductor , move rig
2/17/89	4646.50	83,237	
2/18/89	7521.40	90,758	
2/19/89	2382.00	93,140	
2/20/89	1250.00	94,390	
2/21/89		94,390	
2/22/89		94,390	
2/23/89		94,390	
2/24/89	5901.81	100,292	Drilling 26" hole
2/25/89	8295.63	108,587	cmt 20" csg, parted
2/26/89	4411.56	112,999	
2/27/89	5175.00	118,174	
2/28/89	1500.00	119,674	Start rigdown for move 10'N
3/1/89	3599.10	123,273	rathole driller: cond, rh, mh
3/2/89	3614.00	126,887	skid rig
3/3/89	1850.00	128,737	big snow
3/4/89	8719.60	137,457	
3/5/89	10203.81	147,660	dr lg 26" hole on P88- 1A
3/6/89	2412.50	150,073	cmt 20" csg, NU
3/7/89	6095.30	156,168	start dr lg 17 1/2"
3/8/89	14391.02	170,559	
3/9/89	25099.00	195,658	
3/10/89	6616.00	202,274	run/cmt 13 3/8 csg
3/11/89	8444.00	210,718	NU 12" stack
3/12/89	9805.31	220,524	dr lg 12 1/4"
3/13/89	13724.01	234,248	
3/14/89	3280.31	237,528	Start rigdown
3/15/89	2570.00	240,098	moving rig
3/16/89	2360.00	\$242,458	rig moved to yard



COORDINATE POINT DATA FOR WELLS.

S-88-1	47290.7 N	51172.6 E
S-88-3	47047.5 N	50994.8 E
LORRETTA	46982.4 N	50985.8 E
CLARA	47330.2 N	51210.7 E

1°25'18" E 2643.054'

N 00°23'19" E 2654.1

Plate I
1"=300'