GL01637

COMPLETION REPORT

GEOTHERMAL EXPLORATORY WELL S-89-5

Sulphurdale, Utah

For

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

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

GL01037

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7350 E. Evans, Suite B
Scottsdale, Arizona 85260

Prepared by
Geothermal Management Company, Inc.
P.O. Box 2980
Evergreen, Colorado 80439

November 1989

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PLATE (in pocket)

COMPLETION REPORT FOR

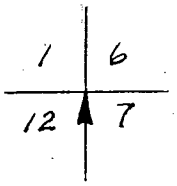
S-89-5
Sulphurdale, Utah

I. ABSTRACT

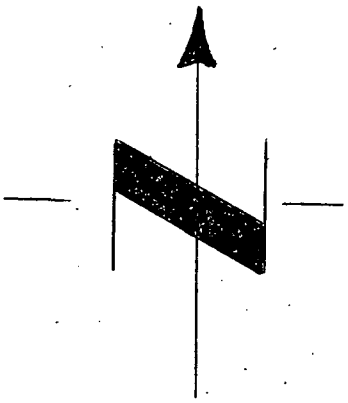
A geothermal exploratory "slim hole" designated S-89-5 was drilled on Fee land controlled by Mother Earth Industries, Inc. between the dates of June 10 and July 1, 1989. The well is 3684 ft. south and 225 ft. east of the northwest corner of Section 7, T26S, R6W, SLB&M.

After penetrating approximately 120 feet of acid leached alluvial materials and bedrocks typical of the local Sulphur Pit the well encountered a landslide block containing highly altered and fractured rocks of the upper portion of the Three Creeks Tuff (Tbt) member of the Bullion Canyon Volcanic series (Moore and Samberg, 1979), latite porphyry and lapilli tuffs, more Tbt and rocks thought to be the Wales Canyon Formation to 930 feet KB. A significant flow of steam was encountered at a depth of 960 feet within a white metasandstone or quartzite (Coconino Formation) and the well was drilled, through 190 feet of this formation, into limestone, to a total depth of 1211 feet KB.

The prime contractor for the well was Grimshaw 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.



SECTION 7
T26S, R6W. SLB&M



~3684'

WELL SITE
S-89-5

~225'

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LOCATION MAP 5-89-5

SULPHURDALE, UTAH

By: GWH | Ckd: GWH
Date: 10-30-89
Scale: 1" = 600'
Dwng. No: ME1895-1

Figure 1

II. LOCATION

This report pertains to MEI exploratory slim hole S-89-5 located near Sulphurdale, in Beaver County, Utah within the Cove Fort-Sulphurdale KGRA.

Specifically, the well is on MEI controlled fee land approximately 3684 feet south and 225 feet east of the northwest corner of Section 7, T26S, R6W, SLB&M. It is about 1910 feet from well 34-7A (Linda), about 1050 feet from the nearest previously drilled production well P-88-2 (Loretta), and about 490 feet southwest of exploration well S-89-1 and about 530 feet west-southwest of well S-89-4.

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.

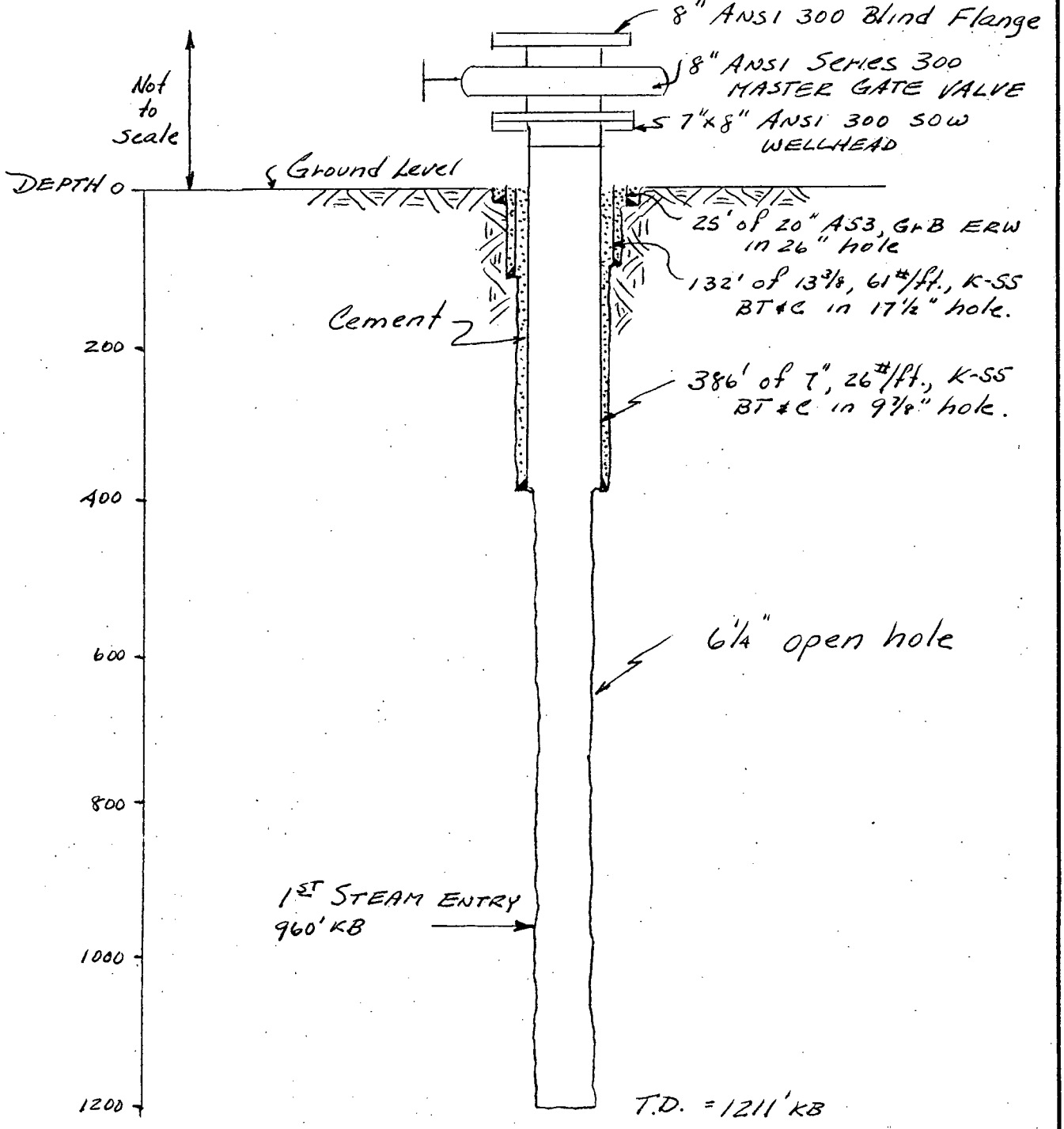
III. WELL DRILLING AND CONSTRUCTION HISTORY

In order to cost-effectively search for extensions of the dry steam geothermal resource discovered to date, exploratory well S-89-S was drilled in a "slim hole" configuration as follows:

On June 10, 1989, Grimshaw Drilling Co. moved its rig to the location of S-89-S and by 1700 hrs on June 11, a 26" hole had been drilled and a 20" conductor casing had been run, landed, and cemented at a depth of 25'KB. On June 13, a 17.5" hole was drilled with mud to 130'KB at which depth 130 feet of 13.375", 61#/ft, K-55, BT&C casing was set and cemented on June 14. After installation of a rotating head, the well was drilled from 130-413'KB by 2130 hrs on June 15 and on June 16, 386 feet of 7", 26#/ft., K-55, BT&C casing was run and cemented by Halliburton.

Installation and testing (witnessed and accepted by J. Solum, Utah State Engineer) of the 7" BOP stack and all appurtanences was completed by 2130 hrs on June 17 and the well was drilled to 500'KB by 0730 on June 18. Drilling was then suspended in order to repair the water swivel. On June 29, the well was drilled to 1046'KB, with the first steam encountered at 960'KB, 30 feet into the Coconino Sandstone. After solution of some bit plugging problems, the well was drilled, in limestone, to its total depth of 1211'KB by 2000 hrs on July 1, 1989

A drilling history, describing daily events between June 10 and July 1, 1989, drilling activity sheets, and tour 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 7" casing. Appendix B, attached, is MEI's basic drilling procedure developed for slim exploratory wells. Appendix F comprises the geolograph charts that graphically document drilling progress.



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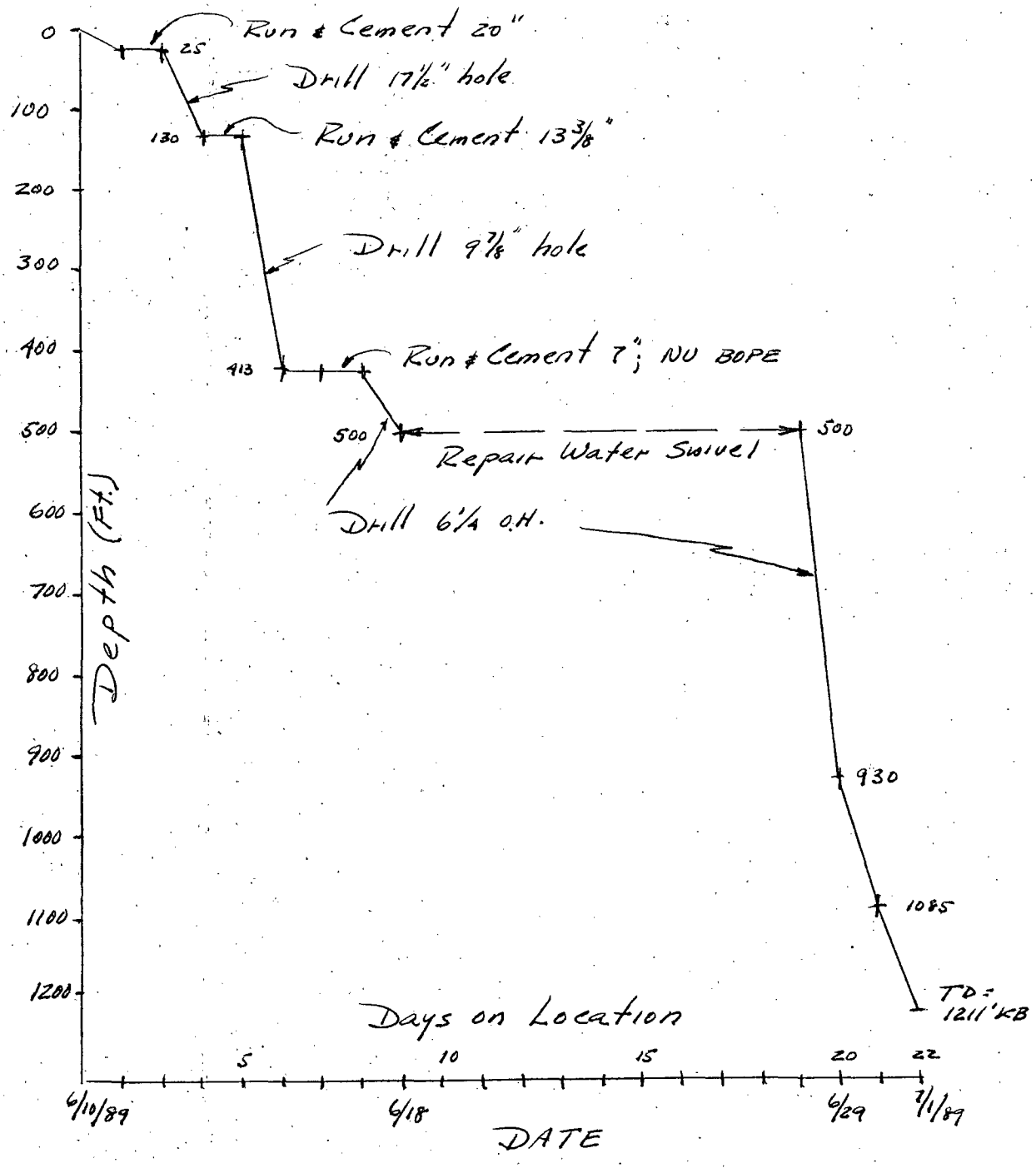
WELL PROFILE 5-89-5

SULPHURDALE, UTAH

By: GWH | Ckd: GWH
Date: 10-30-89
Scale: 1" = 200' Vert.
Dwng. No: Mei 895-2

Figure 2



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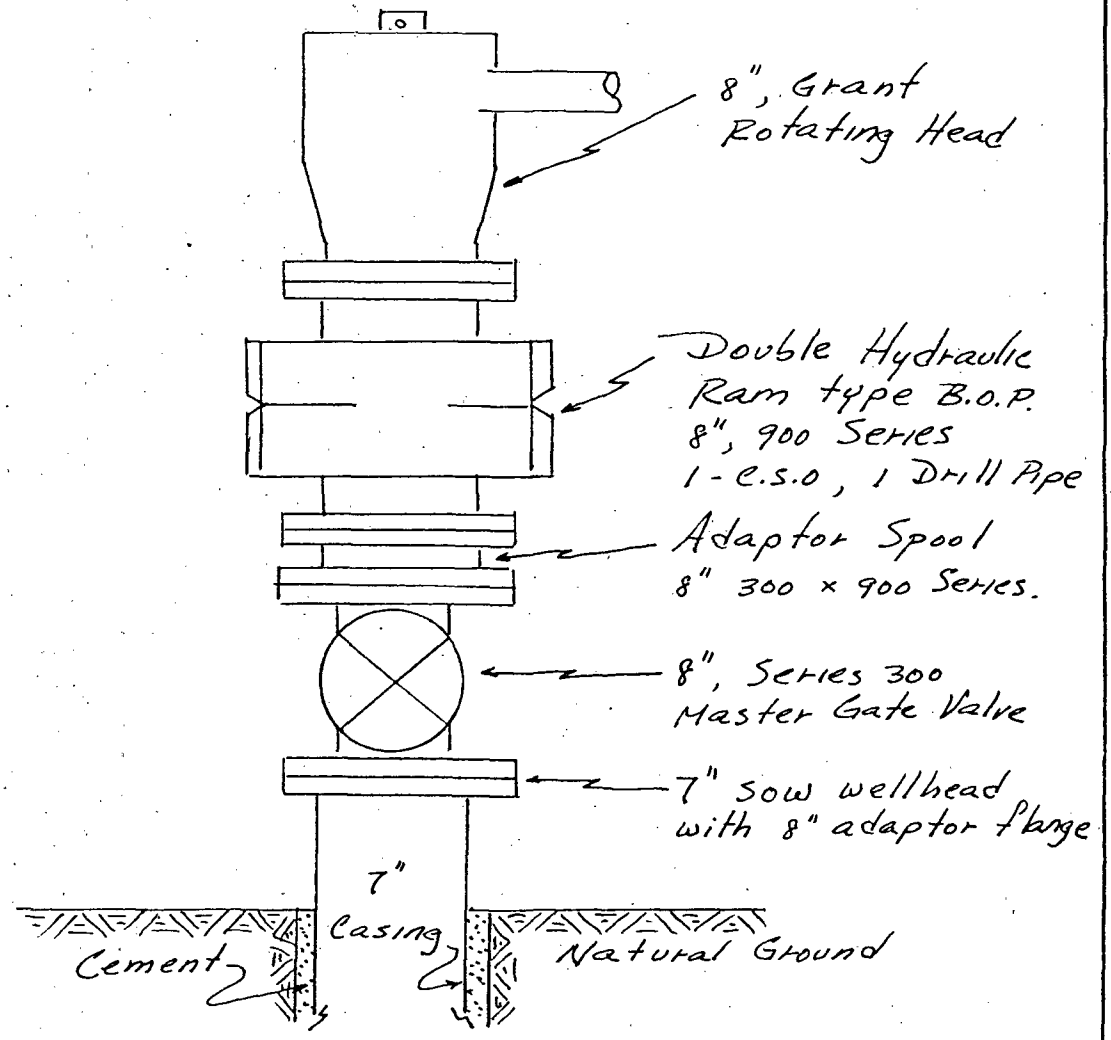
DRILLING CURVE 5-89-5

SULPHURDALE, UTAH.

By: GWH	Ckd: GWH
Date: 10-30-89	
Scale: 1" = 100' Vert.	
Dwng. No: ME1895-3	

Figure 3



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7" B.O.P.E. STACK 5-89-5

SULPHURDALE, UTAH

By: GWH | Ckd: GWH
Date: Oct. 30, 1989
Scale: None
Dwng. No: ME1895-4

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 S-89-5 include breccias and ash-flow tuffs, 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 correllated with the Wales Canyon Formation) is found in S-89-5 at a depth of about 730 feet.

S-89-5 initially penetrated approximately 120'KB of alluvium, colluvium, comprising leached, silicified, and variably pyritized fragments of Three Creeks Tuff (Tbt), rhyolitic ash-flow tuff and latite porphyry that are typical of the materials found in the main Sulphur Pit. From 120 to 230'KB, a zone of reworked Tbt, possibly created along a landslide movement plane, was penetrated. This zone was characterized by accumulations of Tbt phenocrysts without the normal rock matrix, argillically altered rock fragments, sulfide aggregates, and pieces of latite porphyry.

From 230-440'KB, the well penetrated brown to pink latite porphyry flows and an intercalated layer of lapilli tuff between 370 and 380'KB. The latite is younger than the Tbt, and the lapilli tuff represents a break in the extrusion of the porphyry.

Below the latite, from 450-730'KB, the Tbt was again drilled and from 730-930'KB, the fine grained tuffs of the Wales Canyon Fm were transected. The white vitreous Coconino Sandstone was found between 930 and 1120'KB and the first steam entry was recorded, within the Coconino, at 960'KB. For the first time, an MEI well penetrated the sandstone, entering limestone that was drilled to the final well depth of 1211'KB. This sequence is correlative with that drilled in Union well 42-7 and suggests that S-89-5 is down dropped about 300 feet relative to S-89-4.

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

V. PERMITS

Because well S-89-5 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 S-89-5 was pressure tested in accordance with State regulations, the test was witnessed and approved by UDWR representitive John Solum.

VI. SUMMARY COST ESTIMATE

Attached to this report as Appendix E is a "Field Cost Estimate" for the drilling of S-89-5. The costs are higher than those for some of the other slim holes previously drilled by MEI because: 1) The well took longer to drill due to lost circulation problems, a major repair that necessitated remobilization of several service firms, 2) because the depth of the well was considerably greater than that for other exploratory wells and 3) because of problems with bit plugging that required extra trips to change bits.

Appendix A

APPENDIX A

S-89-5 DRILLING HISTORY

6-10-89		
	0800 - 1900	MIRU
6-11-89		
	0700 - 1200	Continue rig up.
	1200 - 1600	Spud 26" hole and DA to 25'KB, slow, hard.
	1600 - 1700	Run 20' casing and cement with Redi-Mix.
	1700 - 2000	WOC, continue rig up.
6-12-89		
	0700 - 1700	WOC, continue rig up.
	1700 - 1900	Drill cement, mud leaking around casing.
	1900 - 2000	Plan repairs, seal leak with LCM.
6-13-89		
	0800 - 0930	Safety course for all hands.
	0930 - 1230	DA to 45'KB with 17.5" bit.
	1230 - 1330	Repair flowline.
	1330 - 2400	DA 45-130'KB, circulate and condition hole.
6-14-89		
	0000 - 0030	Wait for Halliburton.
	0030 - 0230	POOH
	0230 - 0700	Run 130' of 13.375", 61#/Ft., K-55, BT&C casing.
	0700 - 0730	RU Halliburton.
	0730 - 0830	Cement with 95 sacks of geothermal mix, full returns.
	0830 - 2400	WOC, CO conductor, install wellhead, NU rotating head and flowline.
6-15-89		
	0000 - 0230	NU BOPE.
	0230 - 0730	Drill cement with 9.875" bit.
	0730 - 0800	Repair mudline.
	0800 - 2130	DA 130-413'KB; To=118F; ~40'/hr.
	2130 - 2400	Circulate, short trip, and recirculate; wait for Halliburton.

6-16-89

0000 - 0600	Circulate to condition hole.
0600 - 0900	POOH, LD collars.
0900 - 1145	Run 386 feet of 7", 26#/ft., K-55, BT&C casing.
1145 - 1330	RU Halliburton and cement with 110 sacks Premium Plus cement, 40% silica sand, and 1% $CaCl_2$.
1330 - 1940	WOC, clean up rig and location.
1940 - 2400	CO 13.375" and 7" casings, NU 7" BOPE.

6-17-89

0000 - 0300	Continue NU 7" BOPE stack.
0300 - 0700	MU and weld flowline.
0700 - 1500	Test BOPE. Sucessfully witnessed by J. Solum, Utah State Engineer at 1230 hrs.
1500 - 1720	Continue rig up.
1720 - 2130	RIH, tag cement at 373'KB, fix clutch adjust BOPE.
2130 - 2400	Drill cement slowly.

6-18-89

0000 - 0300	DA to 413'KB through hard cement.
0300 - 0730	DA 413-500'KB. Shut down to repair major damage to water swivel.

6-29-89

0000 - 1330	Service rig, RIH ream tight hole to 500'KB.
1330 - 1730	DA 500-656'KB with air and foam.
1730 - 2030	DA 656-781'KB.
2030 - 2045	Repair air pump.
2045 - 2400	DA 781-930'KB.

6-30-89

0000 - 0620	DA 930-1046'KB;steam entry at 960'KB, 1 ft. fracture at 967'KB.
0620 - 0830	Drill bit plugged, drilling slowly.
0830 - 1030	DA 1046-1085'KB
1030 - 1530	Flow well, clean up rig, wait for new bit.
1530 - 1930	PU hammer, clean out and RIH; unable to maintain air pressure.
1930 - 2230	POOH, Clean out plugged drill pipe.
2230 - 2400	RIH.

7-1-89

0000 - 0330	Ream to 1085'KB.
0330 - 0800	DA 1085-1118'KB, hard, slow.
0800 - 1000	POOH, progress stopped, bit worn out.
1000 - 1130	Replace bit.
1130 - 1440	RIH reaming tight spots.
1440 - 2000	DA 1118-1211'KB TD, fracture 1183-1191'KB.
2000	POOH, LDDP.

MEI DRILLING ACTIVITY LOG WELL # [589-5] DATE [6-10-89]

TIME	DEPTH	NAME	COMMENTS
12:00		Dale	Rigging up, Drag pump & All
7:00			Building's in place start to Hook
			up fuel lines Air lines & Rig
			up lights, level Rig Secure All
			Jack's Rig up Dog House -

Dale Hunt 7
Mark Weston 9
John Fullmer 7

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-10-89]

TIME	DEPTH	NAME	COMMENTS
8. AM		Allen	Rig up Drilling Rig Raising Derrick Moving Light Plant- to location, Fuel tank, Water tank,
12 pm Noon		Allen	Clean out mud pit. Set legs on Rig Sub-Structure. Run some mud lines.
1 pm		Allen	Fuel Lines Run to rig. Move Air Drill pump to location. Clean Dog House.
5 pm		Allen	Replace Hydraulic Lines #2 Run air lines from Air pump to rig
6 pm		Allen	Move Dog House to rig
7 pm		Allen	Move injector pump to location next to Air Drill pump Hook up.

Allen Bentum II
Stan Williams II

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-11-89]

TIME	DEPTH	NAME	COMMENTS
7:00		DALE	Rig up Rig To Spud in 26" Hole Hook up lines
12:00		DALE	Spud in 26" from 10' To 25' Hard formation Slow Drilling
4:00		DALE	Run Casing & Cement w/ Carling
5:00		DALE	W.O.C. Working on Rig, Stringing up Geolograph Line Restring CAT line.
8:00			

DALE HUNT 13
Mark Weston 13
John W. Falconer IV 13

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-11-89]

TIME	DEPTH	NAME	COMMENTS
7.00	—	Allen	Rig up Rig" to spud in 26" Hole
			Hook up lines
			Repair power plant, Electric lines to Rigs
12.00		Allen	Spud in 26" from 10' to 25'
			Hard formation slow Drilling
			take out Rotary table, so to Run 20" Casing down hole
1.00		Allen	Run Casing & Cement w/carling
500		Allen	W.O.C.
6.00		Allen	Set pipe Racks & level
			Clean & service 17" bite
7.00			pick up 6" Collars & subs place
			on Racks
800			

Allen Benham 13 hrs
Robert Green 8 1/2 hrs
Stan Williams 13 hrs

6-12-89

morning Report 10.00 HRS

Larry's welding is to cut conductor & weld on picture nipple - fab flow line & suction line To pump.
We Are gathering enough Hose to Get fresh water to Rig, from pond, need to put Rotary table Back in, mix mud & make up Drill Assembley ETA for Drilling 17½" is 20.00 HRS

Thank you Brent

MEI DRILLING ACTIVITY LOG WELL # [589-5] DATE: [6-12-89]

TIME	DEPTH	NAME	COMMENTS
0700	—	Allen	Service Rig & Fuel Warm up all motors Clean up floor
0800	—	Allen	Rig up pick up 8" line pipe, bring around to Rig to Welder-hook for flow line
10.00AM	—	Allen Brent	weld on flow line weld on Suction misc welding - Run water line from Pond Down to Rig About ¼ mile of 3" line or More Rig up Discharge line from pump - fill mud Tk.
8:00			

Allen Bentram
Robert Green
Stan Williams

Morning Report 0830 6-13-89

Started Drilling @ 0500 Drilled to About 20'. And Lost Circulation to out side of Conductor - what Seems to be Coming up throug An old Root Hole - the Hole is About 16" to 18" out from Conductor And About 1" to 2" in Diameter - we Are in pros. of Fixing Problem to Get Back to Drilling

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-13-89]

TIME	DEPTH	NAME	COMMENTS
8:00	8.60	GARY	Safety course H_2S
9:30	8.60	GARY	We condition Mud and circulated to a 40 vis
12:30	44.60	"	We Drilled Kelly Down.
1:30	44.60	"	Circulated to fix flow line
2:00	75.96	"	Drilled
3:00	75.96	"	worked on pump
3:30	109.06	"	Drilled
4:30		"	Circulate and work on pump
5:30	130	"	Drill
6:00			Wait on Cement & Condition mud. Circulate
			Gary Peterson 12

MEI DRILLING ACTIVITY LOG WELL # [58E-5] DATE [4-13-89]

TIME	DEPTH	NAME	COMMENTS
8:00		Dale	Build waterline to Rig.
			Fill Mud Tank, Install lights around
			Rig.
			Work on light plant.
			Put water line through 2" pipe across
			road.
			Work on light plant
			Break off 26" bit Bit sub to sub
			Pickup 17" Bit and make up same
			Light plant down
5:30		Dale	Drlg cement 2' fluid coming up around
			Conductor Pipe
6:30		Dale	Wait on orders Hook up to Air Compresser
7:00		Dale	Drlg with Air Dale Hunt 12
8:00		Dale	Wait on orders Mark Weston 12
			Tobi Fullmer 12

Morning Report 0830 6-14-89

Run 13 3/8 - 4 joint's Between 0100
0700 - Cemented with Halliburton @ 0800
Cement Come Around @ 0830 Good
Return - we will W.O.C for
8 To 10 HRS Depending on Cement, then
nipple up Rotating Head To Drill

Thank you Brent

203 .703 Jan 06.89 11:34 P.05

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-?-89]

Elapsed Time	TIME	DEPTH	NAME	COMMENTS
½	8:00/8:30	130	Gary/Pete	Cementing & Clean mud pits
8½	8:30/5:00	130	Gary/Pete	wait on cement to set up & cut [illegible]
2½	5:00/7:30	130	Gary	Cut conductor pipe & casing
½	7:30/8:00			weld well head on
		Total 12 hr		

Gary Peterson 12

[illegible] 12

Robert A. [illegible] 12

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-14-89]

TIME	DEPTH	NAME	COMMENTS
2000 6/13 6/14 8:00	120'	DALE	WAIT ON HALLIBURTON CLEAN UP AROUND RIG
12:30		DALE	TRIP OUT OF HOLE TO RUN 13⅜ BREAK OFF
+		~~DALE~~	17" BIT & BIT SUB AND XO SUB
2:30	7:00	DALE	RUN CASING 13⅜
7:00		DALE	RIG UP HALLIBURTON TO CEMENT
7:30		DALE	CEMENTING WITH HALLIBURTON
8:00		DALE	CEMENTING

DALE HUNT 12
JACK WESTON 2
JOHN FULLMER 12

0530 morning Report 6-15-89

Drilling 9 7/8 Hole, still in side Caseing on a rubber plug (we Have Drilled, one plug & aprox 60' of cement) Bit is about 16' off of Shoe. Every thing look's Good and good night

Thanks

MEI DRILLING ACTIVITY LOG WELL #: [589-S] DATE: [6-15-89]

TIME	DEPTH	NAME	COMMENTS
8:00		Dale	Finish Welding well head on
9:00		Dale	Nipple up Rotating head and Valve and Flow line
6/14 PM 1:00		Dale	Make up Bit and Bit Sub And Trip in Hole, Tag Cement
6/15 AM 7:30	8.00	Dale	Drlg Cement & Baffle Plate & Shoe — Could not Run muck wt.

Dale Hunt 12
Mack Weston 12
John Fullmen 12

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6-15-89]

TIME	DEPTH	NAME	COMMENTS
0800			Went To work Drilling 9 7/8 Hole -
0830			worked on light Plant -
			Started Drilling Again Cond - mud
			put Strip Rubber on Agust
11:00			Rotating Head 15 min Saftey Meeting
			with Tool pusher & Crew,
			Drilled till Shift was over
			Rig Serv -
2000			

MEI DRILLING ACTIVITY LOG WELL #: [ ] DATE: [6-15-87]

TIME	DEPTH	NAME	COMMENTS
8:00		Gary	Drill
9:00			work on light plant & charging pump
11.			Drill
12			Dump mud pit & coal mud Rig up orlon
1			Drill
3			Drill
6			work on mud pump
8			Drill

Gary Peterson 12
Robert G. Gerson 12
Stacy Williams 12

MEI DRILLING ACTIVITY LOG WELL # [5-89-5] DATE [6-16-89]

TIME	DEPTH	NAME	COMMENTS
8:00	414	Gary	Lay Down D.C.
9.00			Rig up for casing
9:30			Run casing
12:00			Rig up Halliburton
12:30			Pump Cement
1:30			Rig Halliburton DOWN
3:00			Clean mud pits & Cellar, and flow Line
6:00			Waiting on cement to Set
8:00			

GARY Peterson 12
Stan Williams 4
Shane Bullard 8

MEI DRILLING ACTIVITY LOG WELL #: [589-5] DATE: [6 29 89]

TIME	DEPTH	NAME	COMMENTS
8:00		Gary Peterson	Pick up kelly tighten Kelly & Kelly Sub. Work on Diesal lines Serv. Rig, work tight hole work on air pump
1:30			Depth on is 500 feet. 1st con Kelly Down 1:30 to 2:20 Depth of 531.
2:20			Depth 531 2nd con 562 2:30 to 305 Some Fract.
305			Depth 562 3rd con. 593 305 to 400
4:00			Depth 593 4th con 624
4:30		Gary	Depth 624 con. 656 4:30 to 5:30 Drilling Frac @ 635 5:30 off tool.
5:30	656		5th Con 656 Gary Peterson 9 Hr. Dave Peterson 9 Hr. Total Depth on 500 off 656

MEI DRILLING ACTIVITY LOG WELL #: [ ] DATE: [6/29 PM & 6/30 AM]

TIME	DEPTH	NAME	COMMENTS
5:30	656		CONN Drilling ahead Drilling Good
6:00	687		CONN " Drilling Good
6:30	719		CONN " FRAC's No Sock
7:20	750		CONN " Drilling Good
8:00	781		CONN " Drilling Good
8:30			AIR PUMP WENT DOWN Clean out Hole Drilling FAIR
8:45	812		CONN Drilling ahead FRAC's & Hole's
9:35	845		CONN " Drilling Good
10:12	874		CONN " Drilling Good
10:55	905		CONN " FRACs. & Hole's Drilling FAIR
12:30	936		CONN " clean out Hole FRACs Drilling FAIR
1:45	967	140°	CONN Drill work Hole STEAM ENTRY (960) FRACs Drilling 50-50
1:45			1:45 AM to 2:45 clean out Hole
2:55	967		CONN Drilling ahead 1 Free Fall FRAC
4:45	998		CONN Drilling ahead FRAC's
6:20	1028		CONN " FRAC's Drilling FAIR
			6:30 to 7:30 Plugged

MEI DRILLING ACTIVITY LOG WELL # [S 89-5] DATE: [6-30-89]

TIME	DEPTH	NAME	COMMENTS
8:00		GARY	Drill from 1046 to 1059 Kelly Down
8:15			1st con. 1059 to 1085 Drilling has slowed Down Drilling in frac. Stoped Drilling @ 10:30 @ a total depth of 1085 kelly 32 feet.
10:30			Trip out of hole
12:30			Flow well & wait on Bit. Rig Serv. fill all day tanks & clean up Rig & location
3:30	4:30		Pick up new Hammer Clean inside & out
4:30	7:00		Trip in hole
7:00	10:30		Trip out of Hole

GARY Peterson 15½
Dave Peterson 5½
Dale Hunt 1

6/29

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Dust Laster

SIGNATURE OF CONTRACTOR'S TOOL PUSHER

SIZE	WT./FT.	GRADE	TOOL JT O.D.	TYPE THREAD	STRING NO.
12					

PUMP NO.	PUMP MANUFACTURER	TYPE	STROKE LENGTH

LAST CASING TUBING OR LINER

SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

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

– OPERATION	MORN.	DAY	EVE.
UP AND R DOWN			
LL ACTUAL			
MING			
ING			
DITION MUD IRCULATE			
PS			
RICATE RIG			
AIR RIG			
OFF LLING LINE			
NATION SURVEY			
E LINE LOGS			
CASING EMENT			
T ON MENT			
PLE UP .P.			
ST B.O.P.			
LL STEM TEST			
UG BACK			
UEEZE CEMENT			
MING			
L WORK			
A. PERF'R'TN			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADDIT'N'L			
G.			
TALS			

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

CONTR. D.P.
OPR. D.P.
O/D.P.
TANDBY
DAY WORK
DAYS SPUD
ATIVE

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS.

DULL: CUT. STRUC. | I | O | D | L | B | G | O | R

GPM/PUMP-PSI

MUD RECORD

TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED: TYPE | AMT. | TYPE | AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SGL. PARTIAL COMPLETE

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

DRILLER

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT Hammer	3.95	FT.
	BS	2.38	
	STB RMR DC OD	3105	FT.
	D.C. ID DC OD	3001	FT.
	STB RMR DC OD	30.2	FT.
	D.C. ID DC OD	3071	FT.
	STB RMR OD		FT.
	Total BH	129.30	
	STANDS DP		FT.
	SINGLES DP	18	FT.
	KELLY DOWN	37	FT.
	TOTAL	556	FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS.

DULL: CUT. STRUC. | I | O | D | L | B | G | O | R

GPM/PUMP-PSI

MUD RECORD

TIME | WEIGHT | PRESSURE GRADIENT: Air | VISC.-SEC. | PV/YP | GELS | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED: TYPE | AMT. | TYPE | AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN: Air; SGL. PARTIAL COMPLETE
500	656			Air								

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
8:00	1:30	4 1/2	7	Rig Serv. Pick up kelly & work on Air pump work tight hole
1:30	5:30		2	Drill

DRILLER

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT Hammer	3.95	FT.
	BS	2.38	
	STB RMR DC OD	31.05	FT.
	D.C. ID DC OD	30.01	FT.
	STB RMR DC OD	30.20	FT.
	D.C. ID DC OD	30.71	FT.
	STB RMR OD		FT.
	Total BH	129.30	
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS.

DULL: CUT. STRUC. | I | O | D | L

MUD RECORD

TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED: TYPE | AMT. | TYPE | AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SGL. PARTIAL COMPLETE
656	1046											

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
4:00	5:30			Help other crew & H2S TRAINING
5:30				Drill
	8:30			Air pump went down
8:30				Drill
1:45				STEAM ENTREE 960
	2:45			Clean out Hole
2:45				Drill 1' Free Fall Fms

OPERATOR [redacted]

CONTRACTOR [redacted] 6/30 RIG NO. 2

SIGNATURE OF OPERATOR'S REPRESENTATIVE Brent Larsen

SIGNATURE OF CONTRACTOR'S TOOL PUSHER

D.P. SIZE	WT./FT.	GRADE	TOOL JT O.D.	TYPE THREAD	STRING NO.
3½		E			

PUMP NO.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	Air	Air	

FIELD OR DIST.

COUNTY Beaver

STATE Ut.

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

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			
7	LUBRICATE RIG			
8	REPAIR RIG			
9	CUT OFF DRILLING LINE			
10	DEVIATION SURVEY			
11	WIRE LINE LOGS			
12	RUN CASING & CEMENT			
13	WAIT ON CEMENT			
14	NIPPLE UP B.O.P.			
15	TEST B.O.P.			
16	DRILL STEM TEST			
17	PLUG BACK			
18	SQUEEZE CEMENT			
19	FISHING			
20	DIR. WORK			
Wait on Bit				
A	PERF'R'T'N			
B	TBG TRIPS			
C	TREATING			
D	SWABBING			
E	TESTING			
F	ADDIT'N'L			
G				
TOTALS				

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

W/CONTR. D.P.			
W/OPR. D.P.			
W/O D.P.			
STANDBY			
J. DAY WORK			

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC.	I O D L / B G O R
GPM/PUMP-PSI	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP			
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION

FROM	TO	DR. RM. 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 SCL. S PARE P COM'L C

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

DRILLER

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT Hammer	3.95	FT.
	B.S	2.38	
	STB RMR DC OD	31.05	FT.
	D.C. ID DC OD	30.01	FT.
	STB RMR DC OD	30.20	FT.
	D.C. ID DC OD	30.71	FT.
	STB RMR OD		FT.
	Total Bit ft: 129.30		
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC.	I O D L / B G O R
GPM/PUMP-PSI	

MUD RECORD

TIME	Air		
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP			
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION

FROM	TO	DR. RM. 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 SCL. S PARE P COM'L C
1046	1085			Drilling in Frac.			APR 300 lbs					Air

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
8:00	10:30	2 1/2	2	Drill
10:30	12:30	2	6	Trip out of Hole
12:30	3:30	3	21	Flow Well, & wait on Bit
				Rig Serv.
3:30	4:30	1		Clean Hammer inside & out
4:30	7:00	2 1/2		Trip in Hole & Pick up 2 DC
7:00	7:30	1/2		Ream to bottom / could not maintain Air pressure & formation to maintain
7:30	8:00	1/2		Lay down 5 Stands DP

DRILLER Sam Peterson

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	STANDS DP		FT.
	SINGLES DP		FT.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP			
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION

FROM	TO	DR. RM. 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 SCL. S PARE P COM'L C

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
8:00	10:00			Trip out
10:00				Brake out Hammer

DRILLER

EASE | WELL NO. | API WELL NUMBER | DATE 7/2

PERATOR | CONTRACTOR | RIG NO.

GNATURE OF OPERATOR'S REPRESENTATIVE Brent Jansen | 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

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

CODE NO. – OPERATION	MORN.	DAY	EVE.
RIG UP AND TEAR DOWN			
DRILL ACTUAL			
REAMING			
CORING			
CONDITION MUD & CIRCULATE			
TRIPS			
LUBRICATE RIG			
REPAIR RIG			
CUT OFF DRILLING LINE			
DEVIATION SURVEY			
WIRE LINE LOGS			
RUN CASING & CEMENT			
WAIT ON CEMENT			
NIPPLE UP B.O.P.			
TEST B.O.P.			
DRILL STEM TEST			
PLUG BACK			
SQUEEZE CEMENT			
FISHING			
MISC. WORK			
A. PERF'RT'N			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADDIT'NL			
G.			
TOTALS			

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

D/CONTR. D.P.	
D/OPR. D.P.	
D/D.P.	
STANDBY	

MORNING TOUR

NO.	DRILLING ASSEMBLY (At end of tour)	FT.
	BIT	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	STANDS DP	FT.
	SINGLES DP	FT.
	KELLY DOWN	FT.
	TOTAL	FT.
	WT. OF STRING	LBS.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			
TOTAL FTG.			
TOTAL HRS.			
DULL CUT. STRUC.	I O D L		
	B G O R		
GPM/PUMP-PSI			

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	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

DRILLER

DAY TOUR

NO.	DRILLING ASSEMBLY (At end of tour)	FT.
	BIT	FT.
	Lay Down DP	
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	STANDS DP	FT.
	SINGLES DP	FT.
	KELLY DOWN	FT.
	TOTAL	FT.
	WT. OF STRING	LBS.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			
TOTAL FTG.			
TOTAL HRS.			
DULL CUT. STRUC.	I O D L		
	B G O R		
GPM/PUMP-PSI			

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	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
8:00				Lay Down D.P. & DC Rig down

DRILLER

EVENING TOUR

NO.	DRILLING ASSEMBLY (At end of tour)	FT.
	BIT	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S			
pH			
SOLIDS %			

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	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

OPERATION

CONTRACTOR

7/1 | 2

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Brent Larsen

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
3 1/2									

FIELD OR DIST. | COUNTY: BEAVER | STATE: UTAH

WIRE LINE RECORD — REEL NO.

LAST CASING TUBING OR LINER

SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

SIZE | NO. LINES | FT. SLIPPED

FT. CUT OFF | PRESENT LENGTH

TOH MI. OR TRIPS SINCE LAST CUT

CUMULATIVE TOH MI. OR TRIPS

TIME DISTRIBUTION — HOURS

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			
7.	LUBRICATE RIG			
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY			
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT			
13.	WAIT ON CEMENT			
14.	NIPPLE 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'R'T'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
TOTALS				

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.

HRS. W/OPR. D.P.

HRS. WO/D.P.

HRS. STANDBY

TOTAL DAY WORK

NO. OF DAYS

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

BIT			FT.
STB RMR	OD		FT.
D.C. ID	OD		FT.
STB RMR	OD		FT.
D.C. ID	OD		FT.
STB RMR	OD		FT.
STANDS DP			FT.
SINGLES DP			FT.
KELLY DOWN			FT.
TOTAL			FT.

WT. OF STRING ____ LBS.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS.

DULL: CUT. STRUC. I O D L / B G O R

GPM/PUMP-PSI

MUD RECORD

TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS. | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

DRILLER

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

BIT	Hamer	3.95	FT.
	B.S	2.38	
STB RMR	D.C OD	31.05	FT.
D.C. ID	D.C OD	30.01	FT.
STB RMR	D.C OD	30.20	FT.
D.C. ID	D.C OD	30.71	FT.
STB RMR	D.C OD	30.98	FT.
	D.C	3070	
	Total	189.98	
STANDS DP			FT.
SINGLES DP			FT.
KELLY DOWN			FT.
TOTAL			FT.

WT. OF STRING ____ LBS.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT 1118 | DEPTH IN | TOTAL FTG. | TOTAL HRS.

DULL: CUT. STRUC. I O D L / B G O R

GPM/PUMP-PSI

MUD RECORD

TIME | WEIGHT: AIR | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS. | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SURV.-S PART'L-P CORE-C
1085	1118						A.C					

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
8:00				Clean out Bit & D.C. Pluged 2"
10:30	11:30			Trip in
11:35	12:30			Kelly up Circulate
12:30	3:30			Reaming to Bottom
3:30	6:20			Drilling ahead Stoped Drilling
6:30	8:00			Trip out
8:00	8:40			work on tongs
8:40	10:00			Trip out D.C.

DRILLER

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

BIT	R.R.	.9	FT.
	B.S	2.38	
STB RMR	DC OD	31.05	FT.
D.C. ID	DC OD	30.61	FT.
STB RMR	DC OD	3020	FT.
D.C. ID	DC OD	30.71	FT.
STB RMR	DC OD	30.98	FT.
	DC	3070	
	Total	185.97	
STANDS DP			FT.
SINGLES DP		35	FT.

BIT RECORD

BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² OPEN | DEPTH OUT | DEPTH IN 1118 | TOTAL FTG. | TOTAL HRS.

MUD RECORD

TIME | WEIGHT: AIR | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS. | WL -CC'S. | pH | SOLIDS %

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SURV.-S PART'L-P CORE-C
1118	1121											

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
1800	1130	1 1/2	6	Chang out Bit
11:30	1:00	1 1/2	6	Trip in Hole
1:00	2:30	1 1/2	3	Ream and work tight hole Ream to Bottom
2:30	8:00	5 1/2	2	Drill @ 5.45 Depth of 1183 Drilling in frac 8 feet in 10 min

MEI DRILLING ACTIVITY LOG WELL #:[ ] DATE:[7-1-89]

TIME	DEPTH	NAME	COMMENTS
8:00	1085		Clean out Bit & D.C. Pluged 2'
1030			Trip in
6/30 11:35			Kelly up circulate
12:30	3:30		Ream to Bottom
3:30			Drill
7/1 3:40	6:20		conn Drilling ahead
6:30	8:00		Trip out
8:00	8:40		work on tongs
8:40			Trip out DC
	10:00		Bit wore out

FRAC's Drilling Hard Staped Drilling

Depth on 1118 Depth off 1211 TD

MEI DRILLING ACTIVITY LOG WELL #: [ ] DATE: [7-1- 89]

TIME	DEPTH	NAME	COMMENTS
		GARY	
10:00	1118		Chang ou Bit.
11:30	to 1:00		Trip in hole
1:00	to 240		Ream & work tight hole
2:40	to 4:00	CON.	Drill from 1118 to 1149
4:00	5:45	CON	Drill from 1149 to 1180
5:45		CON	Drill from 1180 to 1211 TD
			at 5:45 a Depth of 1183 we Drilled through fracture 8 feet in 10 min.

GARY Peterson 12
DAVE Peterson 12
Mike Bancroft 12

5-89-5   6/10

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.	COUNTY	STATE

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

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			
7. LUBRICATE RIG			
8. REPAIR RIG			
9. CUT OFF DRILLING LINE			
10. DEVIATION SURVEY			
11. WIRE LINE LOGS			
12. RUN CASING & CEMENT			
13. WAIT ON CEMENT			
14. NIPPLE 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'R'T'N			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADDIT'N'L			
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			
TOTAL DAY WORK			
NO. OF DAYS FROM SPUD			

MORNING TOUR

NO.	DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD	
	BIT	FT.	BIT NO.		TIME	
			SIZE		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.	JETS 1/32" /TFA in²		WL.–CC'S	
					pH	
			DEPTH OUT		SOLIDS %	
			DEPTH IN		MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.	
	STANDS DP	FT.	TOTAL FTG.			
	SINGLES DP	FT.	TOTAL HRS.			
	KELLY DOWN	FT.	DULL CUT. STRUC. I O D L			
	TOTAL	FT.	B G O R			
	WT. OF STRING	LBS.	GPM/PUMP-PSI			

FOOTAGE FROM	TO	DR.–D RM.–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 SGL.–S PAR'L–P COM'D–C

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
0730	0700			Rigging up

DRILLER [illegible signature]

DAY TOUR

NO.	DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD	
	BIT	FT.	BIT NO.		TIME	
			SIZE		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.	JETS 1/32" /TFA in²		WL.–CC'S	
					pH	
			DEPTH OUT		SOLIDS %	
			DEPTH IN		MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.	
	STANDS DP	FT.	TOTAL FTG.			
	SINGLES DP	FT.	TOTAL HRS.			
	KELLY DOWN	FT.	DULL CUT. STRUC. I O D L			
	TOTAL	FT.	B G O R			
	WT. OF STRING	LBS.	GPM/PUMP-PSI			

FOOTAGE FROM	TO	DR.–D RM.–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 SGL.–S PAR'L–P COM'D–C

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
12:00	7:00			RIGGING UP

DRILLER

EVENING TOUR

NO.	DRILLING ASSEMBLY (At end of tour)		BIT RECORD		MUD RECORD	
	BIT	FT.	BIT NO.		TIME	
			SIZE		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.	JETS 1/32" /TFA in²		WL.–CC'S	
					pH	
			DEPTH OUT		SOLIDS %	
			DEPTH IN		MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.	
	STANDS DP	FT.	TOTAL FTG.			
	SINGLES DP	FT.	TOTAL HRS.			
	KELLY DOWN	FT.	DULL CUT. STRUC.			

FOOTAGE FROM	TO	DR.–D RM.–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 SGL.–S PAR'L–P COM'D–C

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

16/11

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

LAST CASING TUBING OR LINER

SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

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			
7.	LUBRICATE RIG			
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY			
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT			
13.	WAIT ON CEMENT			
14.	NIPPLE 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'R'T'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	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	
TOTAL DAY WORK	
NO. OF DAYS FROM SPUD CUMULATIVE	

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC.	
DULL I O D L	
DULL B G O R	
GPM/PUMP-PSI	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S.			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION (SHOW CORE RECOVERY)

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SCHL DRLG'D COMP'D

DEVIATION RECORD

DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION

TIME LOG / DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
7:00	8:30			Rig up Drlg 26" Surface hole from 10' to 25'

DRILLER Tom Bowden

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC.	
DULL I O D L	
DULL B G O R	
GPM/PUMP-PSI	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S.			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION (SHOW CORE RECOVERY)

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SCHL DRLG'D COMP'D

DEVIATION RECORD

DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION

TIME LOG / DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
7:00	8:30			R/U & A Drlg 26" Surface hole from 25' To 215"

DRILLER Jake Hunt

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	D.C. ID OD		FT.
	STB RMR OD		FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC.	
DULL I O D L	
DULL B G O R	
GPM/PUMP-PSI	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS	/	/	/
WL -CC'S.			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION (SHOW CORE RECOVERY)

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SCHL DRLG'D COMP'D

DEVIATION RECORD

DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION	DEPTH	DEV.	DIRECTION

TIME LOG / DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

KATUK

6/12

SIGNATURE OF OPERATOR'S REPRESENTATIVE

SIGNATURE OF CONTRACTOR'S TOOL PUSHER

. 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.

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

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

– OPERATION	MORN.	DAY	EVE.
G UP AND EAR DOWN			
RILL ACTUAL			
EAMING			
ORING			
ONDITION MUD CIRCULATE			
RIPS			
UBRICATE RIG			
EPAIR RIG			
UT OFF RILLING LINE			
EVIATION SURVEY			
IRE LINE LOGS			
UN CASING CEMENT			
AIT ON EMENT			
IPPLE UP O.P.			
EST B.O.P.			
RILL STEM TEST			
LUG BACK			
QUEEZE CEMENT			
ISHING			
IR. WORK			
A. PERF'R'TN			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADD'T'NL			
G.			
OTALS			

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

/CONTR. D.P.			
/OPR. D.P.			
O/D.P.			
TANDBY			
L DAY WORK			
DAYS			

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
	WT. OF STRING		LBS.

BIT RECORD

BIT NO.				
SIZE				
IADC CODE				
MFG.				
TYPE				
SER. NO.				
JETS 1/32" /TFA in²				
DEPTH OUT				
DEPTH IN				
TOTAL FTG.				
TOTAL HRS.				
D/L	CUT. STRUC.			
	I	O	D	L
	B	G	O	R
GPM/PUMP-PSI				

MUD RECORD

TIME				
WEIGHT				
PRESSURE GRADIENT				
VISC.-SEC.				
PV/YP	/	/	/	/
GELS	/	/	/	/
WL -CC'S				
pH				
SOLIDS %				

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SOL.-1 PORTED-2 CONV.-3

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
3.700	9			Service Rig & Fuel
				Rig up

DRILLER

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT 1	1.50	FT.
	Bit Sub	2.00	
	STB RMR X0	OD 2.60	FT.
1	D.C. ID	OD 31.36	FT.
	STB RMR	OD	FT.
	D.C. ID	OD	FT.
	STB RMR	OD	FT.
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
	WT. OF STRING		LBS.

BIT RECORD

BIT NO.				
SIZE				
IADC CODE				
MFG.				
TYPE				
SER. NO.				
JETS 1/32" /TFA in²				
DEPTH OUT				
DEPTH IN				
TOTAL FTG.				
TOTAL HRS.				
D/L	CUT. STRUC.			
	I	O	D	L
	B	G	O	R
GPM/PUMP-PSI				

MUD RECORD

TIME				
WEIGHT				
PRESSURE GRADIENT				
VISC.-SEC.				
PV/YP	/	/	/	/
GELS	/	/	/	/
WL -CC'S				
pH				
SOLIDS %				

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE / FORMATION

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SOL.-1 PORTED-2 CONV.-3

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
6:00	5:30	9½	21	Build water line to Rig, Fill mud Tank
				Install Lights around Rig w/ Light Plant
				Put water line through 6" Pipe @ Cross Road
				Break off 26" Bit Bit Sub x0 Sub
				P/U 17" Bit and make up same, Light Plant down
5:00	6:30	1	22	Rig Cement & Fluid coming up Around
6:30	7:00			Conductor Pipe
7:00	6:00			W/O orders

DRILLER Dale Hunt

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT 1	1.50	FT.
	Bit Sub	2.00	
	STB RMR X0	OD 2.60	FT.
	D.C. ID X0	OD 1.00	FT.
	STB RMR Kelsub	OD 1.50	FT.
1	D.C. ID DC	OD 31.36	FT.
	STB RMR DC	OD 31.10	FT.
	DC	31.40	
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.

BIT RECORD

BIT NO.				
SIZE				
IADC CODE				
MFG.				
TYPE				
SER. NO.				
JETS 1/32" /TFA in²				
DEPTH OUT				
DEPTH IN				
TOTAL FTG.				
TOTAL HRS.				

MUD RECORD

TIME				
WEIGHT				
PRESSURE GRADIENT				
VISC.-SEC.				
PV/YP	/	/	/	/
GELS	/	/	/	/
WL -CC'S				
pH				
SOLIDS %				

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.
Gel	37		

FOOTAGE / FORMATION

FROM	TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN SOL.-1 PORTED-2 CONV.-3

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
8:00	9:30	1½		H2S Safety Course
9:30	12:30	3	5	Condition MUD & Circulate
12:30	1:30	1	2	Drill
1:30	2:00	½		Cut flow line
2:00	3:00	1	2	Drill
3:00	3:30	½		

6/13 AM

PERATOR

IGNATURE OF OPERATOR'S REPRESENTATIVE

CONTRACTOR

6/14

SIGNATURE OF CONTRACTOR'S TOOL PUSHER

RIG NO.

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

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

CODE NO.	OPERATION	MORN.	DAY	EVE.
	RIG UP AND TEAR DOWN			
	DRILL ACTUAL			
	REAMING			
	CORING			
	CONDITION MUD & CIRCULATE			
	TRIPS			
	LUBRICATE RIG			
	REPAIR RIG			
	CUT OFF DRILLING LINE			
	DEVIATION SURVEY			
	WIRE LINE LOGS			
	RUN CASING & CEMENT			
	WAIT ON CEMENT			
	NIPPLE UP B.O.P.			
	TEST B.O.P.			
	DRILL STEM TEST			
	PLUG BACK			
	SQUEEZE CEMENT			
	FISHING			
	DIR. WORK			
COMPLETION	A. PERF'R'T'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
	TOTALS			

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

W/CONTR. D.P.	
W/OPR. D.P.	
WO/D.P.	
STANDBY	
TAL DAY WORK	

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.		
	BIT	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	STANDS DP	FT.
	SINGLES DP	FT.
	KELLY DOWN	FT.
	TOTAL	FT.
	WT. OF STRING	LBS.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC. I O D L B G O R	
GPM/PUMP-PSI	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN

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

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
6:00	12:30	6½	21	Wait on Halliburton. Circ.
12:30	2:30	2	6	Trip out of Hole. To Cement 3rd Stg. Break off 12¼" Bit B. Tsub 4 x 5 sub
2:30	7:00	4½	12	Run Casing.
7:00	7:30	½	12	R.U. up Halliburton To Cement
7:30	8:00	½	12	Cementing 95 Sks

6/13 PM

DRILLER Dale Hurst

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.		
	BIT 1	1.50 FT.
	B.t sub	2.00
	STB RMR XO OD	2.60 FT.
	D.C. 6 XO OD	1.00 FT.
	STB RMR Kelly sub	1.50 FT.
	D.C. ID DC OD	31.36 FT.
	STB RMR DC OD	31.10 FT.
	DC	31.40
	STANDS DP	FT.
	SINGLES DP	FT.
	KELLY DOWN	FT.
	TOTAL	FT.
	WT. OF STRING	LBS.

BIT RECORD

BIT NO.	
SIZE	0
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	
DULL CUT. STRUC. I O D L B G O R	
GPM/PUMP-PSI	

MUD RECORD

TIME	Dumped S Hell Pit		
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN
130.	130.											

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

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
8:00	8:30	1/2	12	Cementing
8:30	5:00	8½	13	Wait on cement to set up. Rig Serv.
5:00	7:30	2½		Cut conductor pipe & Casing
7:30	8:00	1/2		Weld well head on

6/14 AM

DRILLER Gary Peterson

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.		
	BIT	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	D.C. ID OD	FT.
	STB RMR OD	FT.
	STANDS DP	FT.
	SINGLES DP	FT.

BIT RECORD

BIT NO.	
SIZE	
IADC CODE	
MFG.	
TYPE	
SER. NO.	
JETS 1/32" /TFA in²	
DEPTH OUT	
DEPTH IN	
TOTAL FTG.	
TOTAL HRS.	

MUD RECORD

TIME			
WEIGHT			
PRESSURE GRADIENT			
VISC.-SEC.			
PV/YP	/	/	/
GELS			
WL -CC'S			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT.	TYPE	AMT.

FOOTAGE FROM	FOOTAGE TO	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.	PUMP NO. LINER SIZE	PUMP NO. S.P.M.	METHOD RUN

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

TIME LOG FROM	TIME LOG TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

6/15

…ESENTATIVE | SIGNATURE OF CON…

GRADE	TOOL JT O.D.	TYPE THREAD	STRING NO.	PUMP NO.	PUMP …

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

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

CODE NO. – OPERATION	MORN.	DAY	EVE.
RIG UP AND TEAR DOWN			
DRILL ACTUAL			
REAMING			
CORING			
CONDITION MUD & CIRCULATE			
TRIPS			
LUBRICATE RIG			
REPAIR RIG			
CUT OFF DRILLING LINE			
DEVIATION SURVEY			
WIRE LINE LOGS			
RUN CASING & CEMENT			
WAIT ON CEMENT			
NIPPLE UP B.O.P.			
TEST B.O.P.			
DRILL STEM TEST			
PLUG BACK			
SQUEEZE CEMENT			
FISHING			
DIR. WORK			
COMPLETION: A. PERF'R'T'N			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADDIT'N'L			
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
TOTAL DAY WORK
NO. OF DAYS FROM SPUD
CUMULATIVE

MORNING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.	ITEM	FT.
1	BIT	.70
1	BitSub	2.40
	STB RMR OD	
4	D.C. ID OD	125.24
	STB RMR OD	
	D.C. ID OD	
	STB RMR OD	
1	X O	2.70
	KellySub	1.50
	B.H.A.	133.24
	STANDS DP	
	SINGLES DP	
	KELLY DOWN	
	TOTAL	
	WT. OF STRING (LBS.)	

BIT RECORD: BIT NO. / SIZE / IADC CODE / MFG. / TYPE / SER. NO. / JETS 1/32" /TFA in² / DEPTH OUT / DEPTH IN / TOTAL FTG. / TOTAL HRS. / DULL CUT. STRUC. I O D L B G O R / GPM/PUMP-PSI

MUD RECORD: TIME / WEIGHT / PRESSURE GRADIENT / VISC.–SEC. / PV/YP / GELS / WL–CC'S / pH / SOLIDS %

MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.

FOOTAGE FROM / TO | DR.–D RM–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

DEVIATION RECORD: DEPTH / DEV. / DIRECTION

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
8:00	9:00	1		Finish welding on well head
9:00	1:00	4	14	Nipple up Rotateing head & flowline
1:00	2:30	1½	4	make up Bit Bit sub T.I.H.
2:30	7:30	5		Myrs accident
7:30	8:00	½		Conn Tighten mudline

DRILLER Dale Shunt

DAY TOUR

DRILLING ASSEMBLY (At end of tour)

NO.	ITEM	FT.
1	BIT RR	.70
1	Bit Sub	2.60
	STB RMR OD	
1	D.C. ID XO OD	2.70
3	STB RMR Kelly OD	3.40
4	D.C. ID OD	125.24
	STB RMR OD	
	BHA	134.64
	STANDS DP	
	SINGLES DP	
	KELLY DOWN	26
	TOTAL	3535
	WT. OF STRING (LBS.)	

BIT RECORD: BIT NO. / SIZE / IADC CODE / MFG. / TYPE / SER. NO. / JETS 1/32" /TFA in² / DEPTH OUT / DEPTH IN / TOTAL FTG. / TOTAL HRS. / DULL CUT. STRUC. I O D L B G O R / GPM/PUMP-PSI

MUD RECORD: TIME / WEIGHT / PRESSURE GRADIENT / VISC.–SEC. / PV/YP / GELS / WL–CC'S / pH / SOLIDS %

MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.

FOOTAGE FROM / TO | DR.–D RM–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

DEVIATION RECORD: DEPTH / DEV. / DIRECTION

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
8:00	8:30	1/2	2	Drill
8:30	11:30	3		Worked on light Plant & Charging Pump
10:00	12:30	1 1/2		Drill
12:30	1:00	1/2	5	Condition mud
1:00	1:30	1/2	2	Drill — 4:00/8:00 Drill
1:30	2:30	1		Work on Kelly
2:30	3:30	1	2	Drill
3:30	4:00	1/2		Work on Blocks

DRILLER Gary Peterson

EVENING TOUR

DRILLING ASSEMBLY (At end of tour)

NO.	ITEM	FT.
	BIT	
	STB RMR OD	
	D.C. ID OD	
	STB RMR OD	
	D.C. ID OD	
	STB RMR OD	
	STANDS DP	
	SINGLES DP	
	KELLY DOWN	

BIT RECORD: BIT NO. / SIZE / IADC CODE / MFG. / TYPE / SER. NO. / JETS 1/32" /TFA in² / DEPTH OUT / DEPTH IN / TOTAL FTG. / TOTAL HRS. / DULL CUT. STRUC. I O D L

MUD RECORD: TIME / WEIGHT / PRESSURE GRADIENT / VISC.–SEC. / PV/YP / GELS / WL–CC'S / pH / SOLIDS %

MUD & CHEMICALS ADDED: TYPE / AMT. / TYPE / AMT.

FOOTAGE FROM / TO | DR.–D RM–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

DEVIATION RECORD: DEPTH / DEV. / DIRECTION

TIME LOG FROM / TO | ELAPSED TIME | CODE NO. | DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS

4.96
3.20
1.5
[illegible]

6/16

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. | COUNTY | STATE

WIRE LINE RECORD REEL NO.

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD: 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

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			
7 LUBRICATE RIG			
8 REPAIR RIG			
9 CUT OFF DRILLING LINE			
10 DEVIATION SURVEY			
11 WIRE LINE LOGS			
12 RUN CASING & CEMENT			
13 WAIT ON CEMENT			
14 NIPPLE UP B.O.P.			
15 TEST B.O.P.			
16 DRILL STEM TEST			
17 PLUG BACK			
18 SQUEEZE CEMENT			
19 FISHING			
20 REPAIR WORK			
21			
22			
23			
A. PERF'R'T'N			
B. TBG TRIPS			
C. TREATING			
D. SWABBING			
E. TESTING			
F. ADDIT'N'L			
G.			
TOTALS			

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

CONTR. D.P.
OPR. D.P.
D.P.
STDBY
DAY WORK
DAYS
TO
TIVE HRS

MORNING TOUR

NO. DRILLING ASSEMBLY (At end of tour)

BIT FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
STANDS DP FT.
SINGLES DP FT.
KELLY DOWN FT.
TOTAL FT.
WT. OF STRING LBS.

BIT RECORD: BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS. | DULL CUT. STRUC. 1 0 D L B G O R | GPM/PUMP-PSI

MUD RECORD: TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS | WL.-CC'S. | pH | SOLIDS % | MUD & CHEMICALS ADDED TYPE AMT. TYPE AMT.

FOOTAGE FROM TO | DR.-D RM.-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 SURF'S INTER'D COMP'L

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
2:00	9:30	1½	2	Drlg 4113 TD 2½
9:30	11:00	1½	5	Circ
11:00	11:30	½	4	Short Trip
11:30	5:00	4½	5	Circ To Run 7" Casing
5:00	8:00			Trip out - Hole Lay Down Drill Collars

DRILLER

DAY TOUR

NO. DRILLING ASSEMBLY (At end of tour)

BIT FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
STANDS DP FT.
SINGLES DP FT.
KELLY DOWN FT.
TOTAL FT.
WT. OF STRING LBS.

BIT RECORD: BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS. | DULL CUT. STRUC. 1 0 D L B G O R | GPM/PUMP-PSI

MUD RECORD: TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS | WL.-CC'S. | pH | SOLIDS % | MUD & CHEMICALS ADDED TYPE AMT. TYPE AMT.

FOOTAGE FROM TO | DR.-D RM.-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 SURF'S INTER'D COMP'L

FROM	TO
414	414

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
8:00	9:00	1		Lay Down D.C.
9:00	9:30	½		Rig up for casing
9:30	12:00	2½		Run Casing
12:00	12:30	½		Rig up Halliburton
12:30	1:30	1		pump cement
1:30	8:00	6½		Wait for cement to set

DRILLER Gary Peterson

EVENING TOUR

NO. DRILLING ASSEMBLY (At end of tour)

BIT FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
D.C. ID OD FT.
STB RMR OD FT.
STANDS DP FT.
SINGLES DP FT.
KELLY DOWN FT.
DULL CUT. STRUC.

BIT RECORD: BIT NO. | SIZE | IADC CODE | MFG. | TYPE | SER. NO. | JETS 1/32" /TFA in² | DEPTH OUT | DEPTH IN | TOTAL FTG. | TOTAL HRS.

MUD RECORD: TIME | WEIGHT | PRESSURE GRADIENT | VISC.-SEC. | PV/YP | GELS | WL.-CC'S. | pH | SOLIDS % | MUD & CHEMICALS ADDED TYPE AMT. TYPE AMT.

FOOTAGE FROM TO | DR.-D RM.-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 SURF'S INTER'D COMP'L

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
3:00	3:00			Nipal up
3:00	7:00			Welder unit flow line
7:00	8:00			Test B.O.P.

6/17

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

LAST CASING TUBING OR LINER	SIZE	MAKE	WT. & GR.	NO. JOINTS	FEET	RKB. TO CSG. HD.	SET AT

WIRE LINE RECORD REEL NO.

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

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			
7.	LUBRICATE RIG			
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY			
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT			
13.	WAIT ON CEMENT			
14.	NIPPLE 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'R'T'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADD'T'N'L			
	G.			
TOTALS				

DAY WORK TIME SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.

HRS. W/OPR. D.P.

HRS. WO/D.P.

HRS. STANDBY

TOTAL DAY WORK

NO. OF DAYS FROM SPUD

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT 6¼		FT.
	B.S.	2.38	
	STB RMR OD		FT.
L	D.C. ID DC OD	31.05	FT.
2	STB RMR DC OD	31.01	FT.
3	D.C. ID DC OD	30.20	FT.
4	STB RMR DC OD	30.71	FT.
	Total BHA	129.97	
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN		FT.
	TOTAL		FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			
TOTAL FTG.			
TOTAL HRS.			
DULL CUT. STRUC. I O D L B G O R			
GPM/PUMP-PSI			

MUD RECORD

TIME				
WEIGHT	Trip IN			
PRESSURE GRADIENT	to tag			
VISC.-SEC	Cement			
PV/YP	/	/	/	
GELS	/	/	/	
WL -CC'S				
pH				
SOLIDS %				
MUD & CHEMICALS ADDED	TYPE	AMT.	TYPE	AMT.

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT		FT.
	B.S.	2.38	
	STB RMR Hammer OD	3.95	FT.
	D.C. ID DC OD	31.05	FT.
	STB RMR DC OD	30.01	FT.
	D.C. ID DC OD	30.20	FT.
	STB RMR DC OD	30.71	FT.
	Total	129.30	
	STANDS DP/2	371.38	FT.
	SINGLES DP	5.00.68	FT.
	KELLY DOWN	36	FT.
	TOTAL	536.68	FT.
WT. OF STRING			LBS.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			
TOTAL FTG.			
TOTAL HRS.			
DULL CUT. STRUC. I O D L B G O R			
GPM/PUMP-PSI			

MUD RECORD

TIME				
WEIGHT				
PRESSURE GRADIENT				
VISC.-SEC				
PV/YP	/	/	/	
GELS	/	/	/	
WL -CC'S				
pH				
SOLIDS %				
MUD & CHEMICALS ADDED	TYPE	AMT.	TYPE	AMT.

DRILLING ASSEMBLY (At end of tour)

NO.			
	BIT Hammer	3.95	FT.
	B.S.	2.38	
	STB RMR DC OD	31.05	FT.
	D.C. ID DC OD	30.01	FT.
	STB RMR DC OD	30.20	FT.
	D.C. ID DC OD	30.71	FT.
	STB RMR OD		FT.
	Total BHA	129.30	
	STANDS DP		FT.
	SINGLES DP		FT.
	KELLY DOWN	36	FT.

BIT RECORD

BIT NO.			
SIZE			
IADC CODE			
MFG.			
TYPE			
SER. NO.			
JETS 1/32" /TFA in²			
DEPTH OUT			
DEPTH IN			
TOTAL FTG.			
TOTAL HRS.			
DULL CUT. STRUC.			

MUD RECORD

TIME				
WEIGHT				
PRESSURE GRADIENT				
VISC.-SEC				
PV/YP	/	/	/	
GELS	/	/	/	
WL -CC'S				
pH				
SOLIDS %				
MUD & CHEMICALS ADDED	TYPE	AMT.	TYPE	AMT.

MORNING TOUR

FOOTAGE FROM | TO | 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. | PUMP NO. LINER SIZE | PUMP NO. S.P.M. | METHOD RUN SCHL'S PARFL-P COMP'C

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
8:00AM	10:30	2½		Rig up Kommey
10:30	12:30	2		Test BoP & fix all leaKS
12:30	1:00	½		Test BoP Dio not Pass fixed all leaks Passed
1:00	3:00	2		Pick up Pipe to fill Pipe Rack Witnessed BOP test Start 700 psi
3:00	5:00	2		Rig up flow LINE end 635 psi. John Salmon State Engineer
				Center BoP & Boomdown
5:00	5:30	½		Chang out Rotating Rubber Strap DP & DK
5:30	7:00	1½		Trip IN Hole to tag cement.
7:00	8:00	1		Work on mudpump clutch

DRILLER GARY Peterson

DAY TOUR

FOOTAGE FROM | TO | 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. | PUMP NO. LINER SIZE | PUMP NO. S.P.M. | METHOD RUN SCHL'S PARFL-P COMP'C

FROM	TO
?	536.68

DEVIATION RECORD: DEPTH 414 | DEV. ¾ | DIRECTION | DEPTH | DEV. | DIRECTION | DEPTH | DEV. | DIRECTION

TIME LOG FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
8:20	9:30			Ajust B.O.P.
9:30	11:30			DRlg cement
11:30	12:00			Circulate TRIP out
12:00	4:00			TRIP out 2NR TRIP IN 2 NR
4:00	7:00			Drlg
7:00	8:00			TRIP 5 STANDS OUT

DRILLER

EVENING TOUR

FOOTAGE FROM | TO | 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. | PUMP NO. LINER SIZE | PUMP NO. S.P.M. | METHOD RUN SCHL'S PARFL-P COMP'C

FROM	TO
536.68	

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
8:00	8:30	1/2		Rig Serv
8:30				

Appendix B

"Slim Hole" Drilling Program

Objective: Drill/Complete exploratory hole to ±1500' TD and evaluate formation. Conductor casing 13 3/8" set at ±40-120', surface casing set at ±250'-400', 6 1/4" open hole to 1500' or producing formation.

Prepared by: Jay C. Hauth, July 1988
Version 2: October, 1988
Version 3: April, 1989

Sequence of Operations

1. Construct location and sump per rig requirements.

2. MIRU rotary drilling rig.

3. Mix spud mud per attached drilling fluids program
3a Drill 26¼" hole for 20" Conductor Casing.
4. Spud well with 17 1/2" bit and drill to ±40-120'. Run and cement 13 3/8" conductor per attached cementing program. Optionally, run 12" OD X .375" wall ASTM A53 gr B, seamless or ERW pipe, w/butt weld ends. Optionally, install master valve and rotating head w/ 6" flowline per attached drawing, per supervision/geology direction. Note requirement for ±50' handwheel extension with optional master valve.

5. Visually inspect and note on Tour Sheet whether all drill pipe is white banded, specifying that it meets AAODC API Class II inspection as to the following:

1. Electromagnetic inspection of tubes (Sconoscope or Scanalog)
2. Wall thickness and cross-sectional area (Ultrasonic or gamma ray)
3. Tool jt inspection (electronic or mag particle)

Also check to see that all drill collar connections have been mag particle inspected and that all bottom hole assemblies have been magnafluxed prior to delivery. Note condition on Tour Sheet. Ensure that 7" casing is on location and in position to run. Ensure all casing accessories, wellhead equipment, and circulating head are on hand.

6. RIH with 9 7/8" bit and drill with mud to ±250'-400, depending on geology. Remove thread protectors, clean threads, drift and measure casing while drilling surface hole. Measure KB height and log on Tour Sheet. After casing point has been selected, drill any additional hole that might be required so that casing can be landed within 1' of bottom, and still space out correctly on surface. Maintain hole as straight as possible while drilling. Take drift shots every 100-200'. Run maximum reading thermometer on each survey. Maximum angle at TD 4 degrees or less. Maximum rate of change 1 degree per 100'. Monitor and record flow line temperatures every hour. Catch 2 sets of formation samples every 10'.

7. Upon reaching desired depth, circulate and condition mud until shaker screen is clean and viscosity is less than 45 sec/qt. Make wiper trip. Check for fill. If hole is in good condition, circulate bottoms up, POOH, and laydown 9 7/8" drilling assembly. If tight hole was encountered on wiper

trip, then make another wiper trip. It may also be necessary to further condition mud.

8. Rig up and run 7" casing to TD, per attached casing program. Run in hole slowly to avoid breaking down formation and losing circulation. Circulate past any bridges encountered. Use proper makeup torque on casing, and geothermal casing dope on threads.

9. Once casing has been run to TD, circulate hole clean, while reciprocating casing, with at least two full circulations. Circulate until hole is clean, mud is in good shape, and viscosity is less than 45 sec/qt. Check bottoms up time to be sure mud is not channeling.

10. When mud is in good shape, cement casing as per attached cement program. Monitor and record cement data to assure adherence to cmt. program. Catch cement samples. If possible, reciprocate casing while pumping cement. Land casing approximately 1' off bottom. Center casing in rotary table.

11. WOC 8 hrs. (check samples to determine if additional time is req'd) Monitor cement in annulus. If it falls back, bring it back to surface with 1" pipe.

12. Land and cut off 7" casing. Weld on 7" x 300 SR Starter flange. Test between welds. Check with level to be sure flange is on correctly. Callout surveyors to survey casing head location.

13. Make sure that BOP equipment has been inspected by the manufacturer or an authorized agent prior to arrival and that all equipment is proper and in good shape on delivery. Nipple up BOP equipment per attachment. Test 7" casing and BOP equipment to 500 psi with BLM representative present to witness. Log test data and request BLM witness to sign name and successful test completion on Tour Sheet.

14. Trip in hole with 6 1/4" mill tooth bit and tag cement. Log top of cement on Tour Sheet. Drill out baffle plate, cement and float shoe from 7" csg with spud mud. Drill 10' of formation and then trip to pick up button bit or hammer/hammer bit. If the decision is made to air drill, run float in bit sub and unload mud out of hole with air on the trip back in. If the decision is made to drill with mud, then displace the spud mud out of the hole with the gel/water/polymer system when you reach bottom with bit. See attached mud system details.

15. Drill 6 1/4" hole with air, foam, or mud to 1500', or until producing formation is encountered. Test formations per engineer's direction, log per permit and engineer/geologist requirements. Operate BOP on each trip out of hole and log on Tour Sheet. Ensure accumulator is holding pressure.

16. Upon reaching TD, circulate hole clean, laydown drill string, ND BOPs, clean location and release rig.

17. Submit all reports as required by regulatory agencies.

Drilling Fluids Program

17 1/2" and 9 7/8" surface hole, 0- ±250'-400'

Mud System: Gel, lime, water, LCM (Spud Mud)
Mix 15-20 Lb/Bbl bentonite in fresh water. Flocculate with lime.

Weight: As low as possible with mechanical solids control equipment

Viscosity: 45-55 sec/qt or as needed to clean hole

Water loss: No control

Total hardness: No control

pH: Mix lime through chemical barrel to maintain 9.5-10.5 pH

Comments: Lost circulation through this interval is possible. No formation pressures are anticipated. Keep plastic viscosity down and yield point up. Run solids control equipment continuously. Break circulation slowly and trip slowly. Use Desco to thin mud if necessary.

6 1/4" Hole, ±250'/400' - TD

Mud system: Polymer, gel, soda ash, Desco, high temp thinner. Drill out cement with Spud Mud and then dump Spud Mud. Build new system. Mud up in clean steel pits by mixing, with fresh water, 1/2 lb/bbl caustic soda and a ratio of 8 bentonite to 1 Drispac regular. Mix bentonite first and then slowly add (30 min/sk) Drispac. (Substitute a high molecular weight anionic liquid polymer such as Magcobar Rapid Mud for Drispac if so desired)

Weight: As low as practical with water and mechanical solids control equipment.

Viscosity: 38-45 sec/qt with bentonite and Drispac (8:1 ratio of bentonite:Drispac) Stay on this ratio to maintain viscosity after Mud-up.

Water Loss: No control

Total Hardness: Below 300 ppm with soda ash.

pH: 9.5-10.5

Rheology: Control flow properties at reasonable levels with Desco thinner. If downhole temperatures increase to where Desco is not effective, then use high temp thinner

Torque, Drag, Hole Stability, and high temp lubricant: Add 2 ppb Soltex additive as necesary.

Lost Circulation (surface to TD): Methods to be used as follows:
1. Lost circulation materials such as nut plug, cotton seed hulls, saw dust, medium Kwik-Seal, etc.
2. Gunk Squeezes
3. Cement
4. Lighter-than-water drilling fluids

Abnormal Presure: Weight material (barite) should be on location at all times.

Corrosion: Add corrosion inhibitors such as oxygen scavengers or scaling amines to control corrosion.

Stable Foam Make-up:
Mix 1/2 - 2 ppb Drispac in water
1-2 ppb soda ash
5-10% foamer <u>just before use</u> (use alpha olefin sulfonate for high temp foamer)
Air-Mud ratio required = 100:1 to 300:1

Special considerations:
1. Drilling recorder to monitor rate of penetration
2. Catch drill cutting samples (2 sets) every 10', cleaned, sacked, and labeled in accordance with geologist direction. Collect samples every 5' on conductor.
3. All lost circulation zones encountered shall be recorded in Tour book, recording both the depth at which the loss occurred, as well as amount and rate of fluid lost.
4. In and Out temperatures, both mud and air, shall be recorded in Tour book every hour.
5. Temperatures should be taken with every directional survey by running a maximum registering thermometer in the survey instrument.

Casing Program

Conductor casing: ±40-120' 13 3/8" 61 ppf J-55 BT&C in 17 1/2" hole
Optional: ±40-120' 12" OD X .375" wall ASTM A53 gr B, seamless or ERW pipe, w/butt weld ends, in 17 1/2" hole.

Surface Casing: ±250'-400' x 7" J-55 20 ppf ST&C Range 2 Casing

Torque: 3200 ft-lbs

Drift ID: 6.331"

Strength ratings:
- Yield - 2992 psi
- Collapse - 1816 psi
- Tension - 187,200 lb

Accessories:

Float equipment: flapper type conventional float shoe on bottom of string and baffle plate installed one jt up from bottom

Centralizers: 2 centralizers installed in the middle of the bottom 2 jts (7" x 9 7/8" bow type)

Wellhead equipment: 7" x 300 SR SOW starter flange for wellhead. 300 SR gate valve for master valve.

Notes:

- Tack weld shoe, also top and bottom of couplings on bottom three jts
- Lower casing in hole slowly to avoid formation breakdown and lost circ.
- Use geothermal grade thread dope on casing threads

Cementing program

±250'-400 x 9 7/8" hole x 7" casing surface job

Slurry description: API Class "G" or "H" cement mixed with 5.0 gal/sk water

Requires: .2301 sk/linear ft in 9 7/8" annulus

Slurry wt: 15.8 lbs/gal or 118 lbs/cu. ft.

Yield: 1.15 cu.ft./sk

Water requirement: 5.0 gal/sk or 0.67 cu.ft./sk

Pump time: 1-2 hrs

24 compressive strength: 2915 psi

7" J-55 20 ppf ST&C casing displacement= .0404 bbl/linear ft or .2273 cu.ft./linear ft.

Note: calculate cement job with 100% excess in open hole; 50% in cased hole is OK.

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 no later than drilling out the production casing.

In all matters of safety, the H2S safety man has the FINAL WORD on procedures. NO DRILLING OPERATIONS SHALL BE CONDUCTED CONTRARY TO THE H2S SAFETY MAN'S DIRECTION. NO EXCEPTIONS.

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.

Windsocks 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

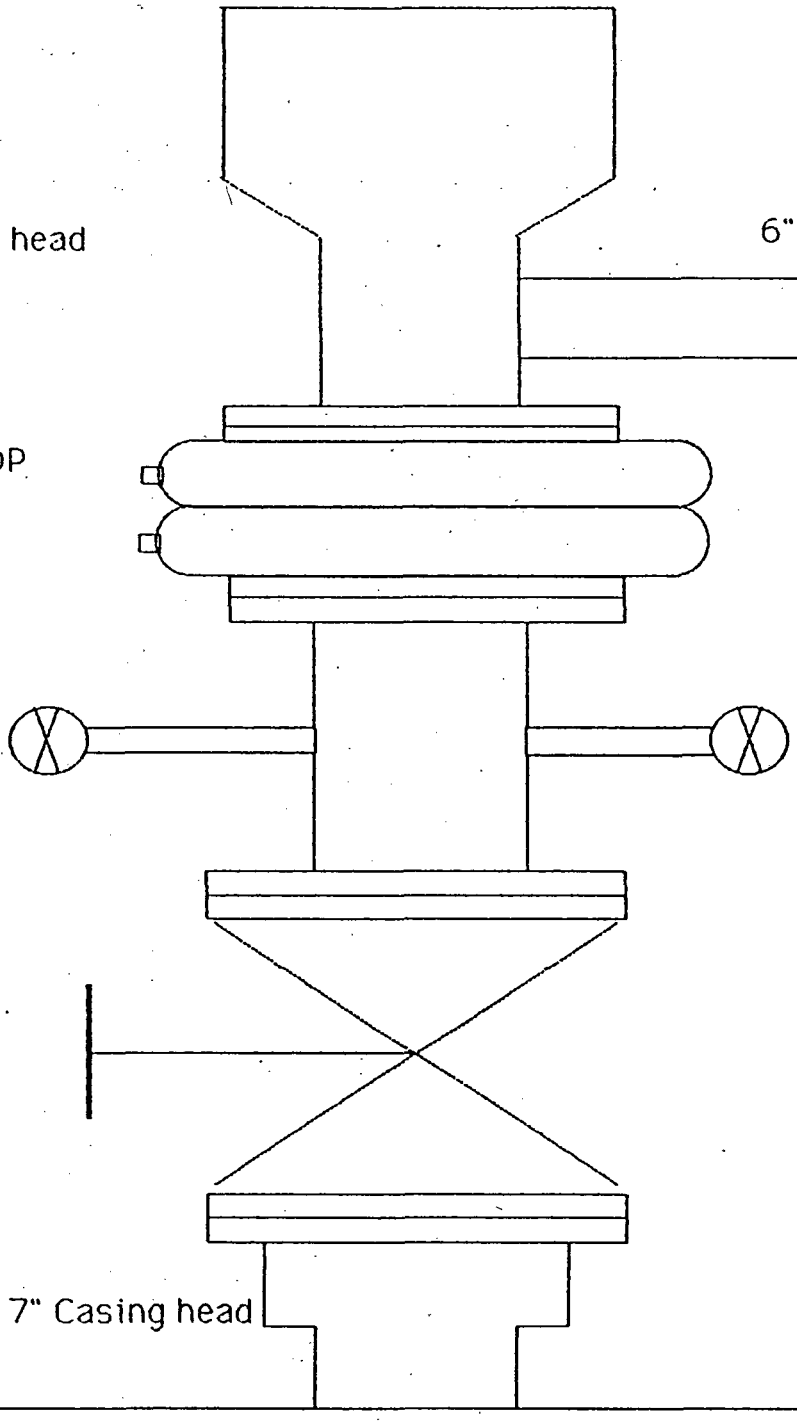
IN CASE OF H2S ALARM:

1. MASK UP WITH ESCAPE UNIT

2. GO IMMEDIATELY TO THE UPWIND BRIEFING AREA

NO EXCEPTIONS UNLESS DIRECTED BY H2S SAFETY MAN ON LOCATION

Blowout Preventer Details; 7" casing



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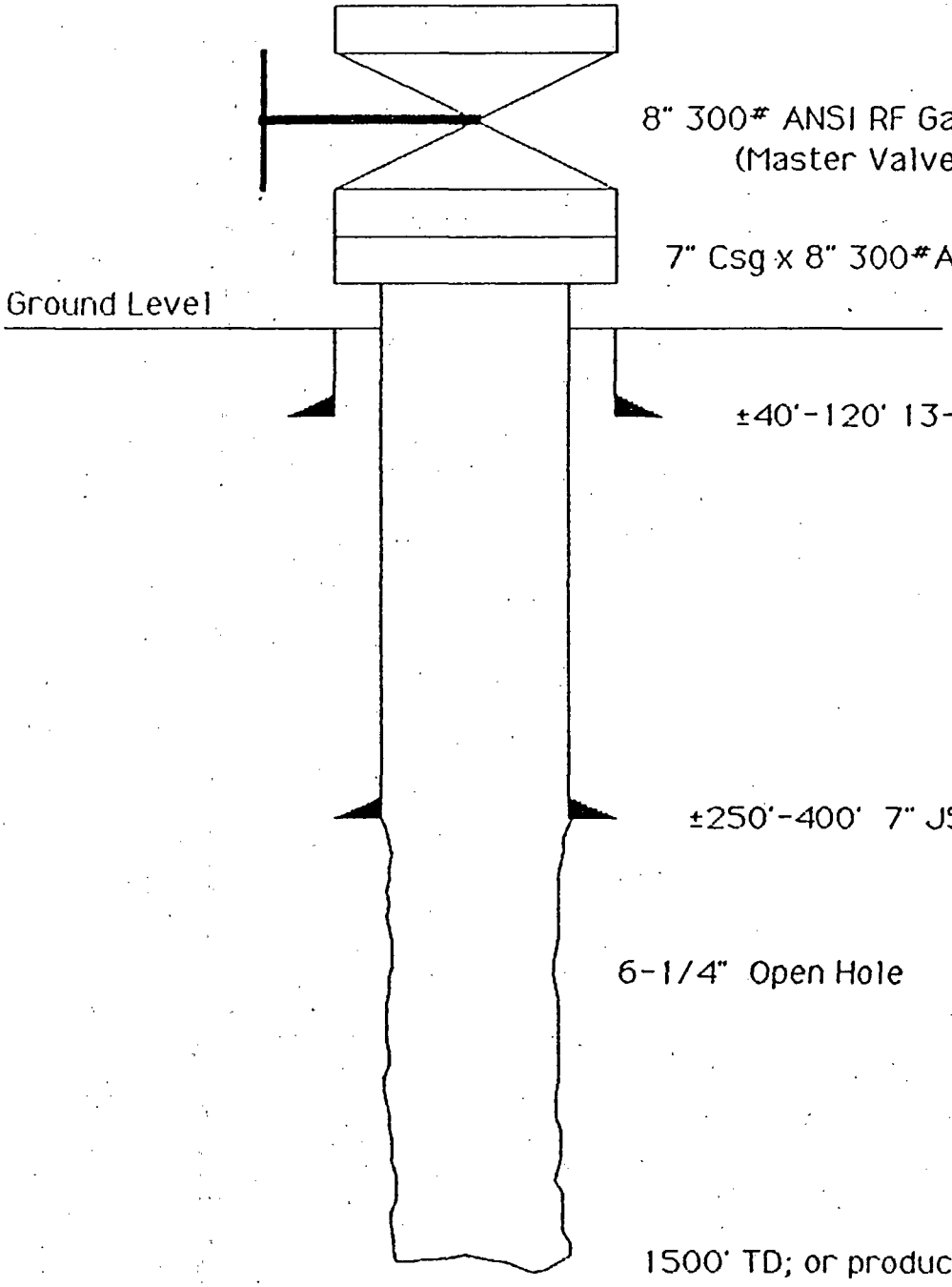
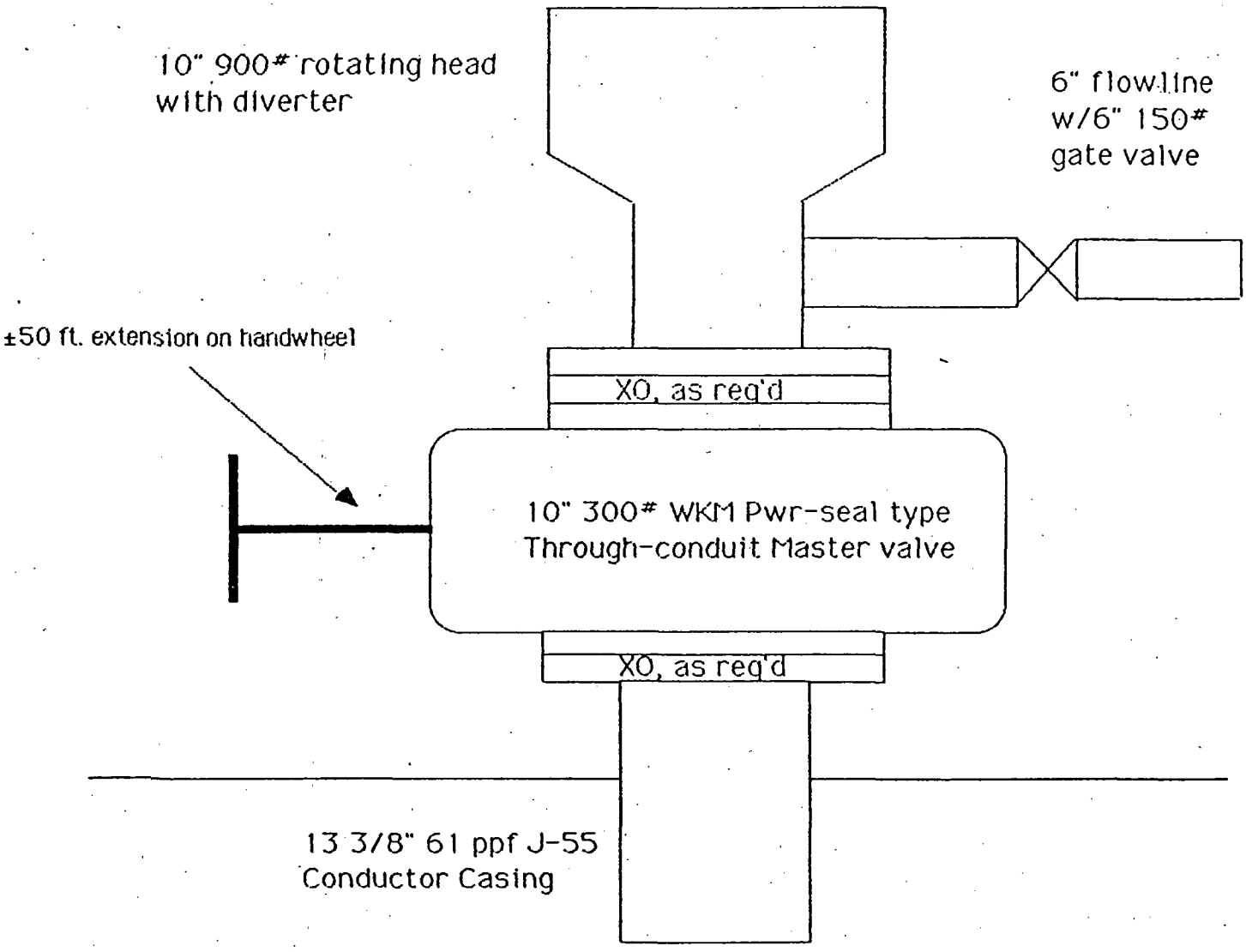
Slim Hole Completion Details



Not to Scale

Blowout Preventer Details; 13 3/8" casing (optional, as req'd on slim hole program)



JCH 10/5/88

Appendix C

LITHOLOGIC LOG OF MEI WELL S-89-5

Prepared for
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7350 E. Evans Road, Suite B
Scottsdale, Arizona 85260

By
Joseph N. Moore
Salt Lake City, Utah

October, 1989

MEI well S-89-5 was sampled to a depth of 1210 feet. This report describes the rock types and alteration encountered in the well. The report is based on a binocular logging of the chips supplemented by petrographic examination of thin sections from 13 selected intervals. The results of this work are summarized in the accompanying lithologic log.

Lithologic Relationships

The rocks encountered in S-89-5 are similar to those found in other MEI wells with several notable exceptions. From the surface to a depth of 120 feet, the cuttings consist of variably altered alluvium that contains abundant aggregates of iron sulfides. A thin section from a depth of 80-90 feet shows that the alluvium contains fragments of Three Creeks Tuff, poorly welded rhyolitic ash-flow tuffs, and latite porphyry. Chips of white, acid altered fragments occur throughout the alluvium but are particularly well represented in cuttings from 80 to 100 feet.

Between 120 and 230 feet, the cuttings contain abundant coarse-grained crystals of feldspar and dipyramidal quartz, fragments of argillically altered rocks, aggregates of sulfides similar to those found in the alluvium and chips of latite porphyry. The coarse grain size of the crystals and the habit of the quartz indicate that the crystals were derived from the Three Creeks Tuff (see below for a description of this ash-flow tuff). The chips from this interval may in part represent material sluffed from shallower depths as well as lithologies encountered below the alluvial deposits.

Latite porphyry is present between 230 and 440 feet. The latite porphyry is fine-grained and brown to pink in color. Thin sections of samples from 290-300 and 430-440 feet show that the latite porphyry consists of phenocrysts of zoned plagioclase, and

altered biotite. The matrix of the latite consists of quartz and potassium feldspar that in places, contains numerous oriented microlites of plagioclase. The textures of the chips suggest that they are part of a sequence of latite flows. Some of the latite porphyry in the sample from 290-300 feet has been strongly silicified.

The chips from 370-380 feet (refer to Appendix A) consist of latite porphyry and a fragments of latite porphyry and Three Creeks Tuff in a matrix of clays. Many of the fragments of latite porphyry within the breccia are rounded. The fragmental nature of this rock suggests that it is part of a pyroclastic deposit (lapilli tuff) erupted around the vent of the dome that produced the latite flows. Thinner pyroclastic deposits were encountered in S-88-1A. The increased thickness of the latite in S-89-5 suggests that this well was drilled closer to the vent.

The age of the latite eruptions with respect to the Three Creeks Tuff cannot be determined directly from the lithologic relationships. Geologic relationships mapped by Moore and Samberg (1979) indicate that intermediate composition dikes and flows exposed near Sulphurdale were emplaced after deposition of the Three Creeks Tuff at 27 my but prior to the Osiris Tuff at 22 my. The dikes that were studied in thin section were found to contain phenocrysts of plagioclase and pyroxene in a groundmass of quartz and feldspar. Because the latite in S-89-5 lacks pyroxene, it cannot be correlated directly with these dikes.

In both S-89-5 and S-88-1A, the lapilli tuff appears to be overlain by Three Creeks Tuff. In S-88-1A, the ash-flow tuff overlying the lapilli tuff is densely welded. A decrease in the degree of welding of the ash-flow tuffs overlying the lapilli tuff in S-88-1A would be expected since the presence of the lapilli tuff implies a hiatus of at least a short duration. The lack of any change in welding suggests that the Three Creeks Tuff is part of a gravitational glide block and that the latite postdates this ash-flow sheet.

The latite porphyry is underlain by Three Creeks Tuff between 450 and 730 feet. The Three Creeks Tuff is characterized by approximately 50% phenocrysts of quartz, biotite, potassium feldspar, plagioclase, and hornblende. Quartz phenocrysts, which commonly are dipyramidal in form and biotite crystals up to several millimeters across are diagnostic of this unit.

S-89-5 encountered the Wales Canyon Tuff between depths of 730 and 930 feet. This ash-flow tuff is also crystal-rich but is much finer grained than the overlying Three Creeks Tuff. The Wales Canyon Tuff is densely welded and where fresh, contains approximately 40% phenocrysts of plagioclase, hornblende, and minor quartz. Both the matrix and phenocrysts of the Wales Canyon Tuff in S-89-5 have been strongly altered to mixtures of sheet silicates, quartz, and calcite.

The volcanic rocks are underlain by sandstones and limestones. Fine-grained sandstone assigned to the Coconino Sandstone in adjacent wells was encountered between depths of 930 and 1120 feet. Thin sections show that the sandstone consists dominantly of quartz cemented by quartz overgrowths and minor sericite or calcite. Limestones were penetrated between 1130 and 1210 feet. The limestones are fine- to medium-grained and typically reddish brown in color. Their stratigraphic position beneath the sandstone suggests that the limestones are correlative with the thick carbonate sequence encountered in Union Oil well 42-7.

Hydrothermal Alteration

The hydrothermal alteration of the rocks in S-89-5 in most samples can be classified as either intense acid alteration or argillic alteration. Less commonly, such as at a depth of 290-300 feet, the rocks have been strongly silicified. A detailed description of the alteration minerals occurring in the thin sections studied is presented as Appendix 1. Acid alteration

characterizes the alluvial deposits that occur in the upper 120 feet of the well. These rocks are characterized by kaolin, a green clay, and iron sulfides. Aggregates of iron sulfides locally comprise up to approximately one third of the cuttings. An X-ray analysis of the sulfides from a depth of 80-90 feet indicate that both marcasite and pyrite are present.

The clay minerals present in altered alluvium suggests that they were produced by highly acidic fluids. Acid fluids can form when hydrogen sulfide released from a boiling water table reacts with oxygenated water to produce sulfuric acid. The reaction of hydrogen sulfide with the host rocks under reducing conditions can lead to the formation of iron sulfides. The abundance of sulfide minerals in this well is unusual and suggests that conditions were more reducing here than in other areas around the Sulphurdale pit. Such reducing conditions may have been associated with a concentration of organic debris in the alluvial deposits.

The rocks below the alluvium have been argillically altered to sheet silicates, quartz, pyrite, and calcite. These minerals are common as alteration products of the phenocrysts and matrix of the volcanic rocks throughout the well. This alteration assemblage is typical of rocks where temperatures are less than about 200°C. Traces of epidote, which is indicative of temperatures in excess of 225°C, were found only as an alteration product of plagioclase phenocrysts in the latite porphyry from 430-440 feet. The restricted occurrence of this mineral suggests that it represents alteration related to the emplacement of the latite porphyry. No other high temperature minerals were observed.

Veins containing various proportions of chalcedony, quartz, calcite, barite, and pyrite are common in the altered rocks. Veins of chalcedony and calcite + barite or quartz + barite occur in the upper 400 feet of the well. The presence of chalcedony suggests that these veins formed at temperatures consistent with

those indicated by the alteration minerals present in the rocks. As shown by Fournier (1985), chalcedony is indicative of temperatures less than 200°C. These veins appear to be restricted to the latite porphyry. At 290-300 feet, the chalcedony is associated with euhedral quartz crystals. In this sample, the chalcedony appears to have been deposited on the quartz.

Textural evidence suggests that the veins of calcite + barite may postdate much of the argillic alteration present in the volcanic rocks. This conclusion is based on the textural relationships observed at 370-380 feet. In this sample, the clasts of lapilli tuff are cemented by fine-grained sericite and quartz. The veins of calcite + barite crosscut the breccia and appear to be the last event to have affected these rocks.

Crosscutting relationships among the calcite and quartz veins are not common and were observed only in samples from a depth of 290-300 and 730-740 feet. At 290-300 feet, calcite veins cut silicfied latite porphyry. The porphyry can be identified on the basis of ghost outlines of plagioclase phenocrysts. The sample from 730-740 feet consists of argillically altered Wales Canyon Tuff. Here, the ash-flow tuffs have been cut by veins of quartz + calcite + pyrite which are in turn cut by calcite + pyrite veins.

Structural Relationships

The stratigraphic and textural relationships in S-89-5 suggest that this well was drilled adjacent to several faults. The upper 400 feet of the well appears to have followed a steeply dipping fault or fracture zone. Rocks in this interval are strongly altered and veined. Between 300 and 340 feet the chips are extremely fine-grained and appear to display intense argillic alteration. This interval probably represents a gouge zone along the fault. However, it is not possible to determine the

orientation of this fault from the cuttings.

The differences in the depth to the Coconino Sandstone between S-89-1, S-89-4, and S-89-5 suggest that S-89-5 is in a downdropped fault block relative to the other wells. The Coconino sandstone in S-89-5 is approximately 80 feet deeper than it is in S-89-1 and more than 300 feet deeper than in S-89-4. The most likely orientation of a fault between these three wells is northerly with a dip to the west. This direction is parallel to the major Basin and Range faults mapped by Moore and Samberg (1979).

References

Fournier, R. O., 1985, The behavior of silica in hydrothermal systems: Reviews in Economic Geology, v. 2, p. 45-61.

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

Appendix 1
Thin Section Descriptions

80-90 feet: Alluvium

Variably altered fragments of a poorly welded ash-flow tuff latite porphyry, and aggregates of sulfides. The ash-flow tuff contains a few percent phenocrysts of quartz, plagioclase, and potassium feldspar. The ash-flow tuff has been altered to kaolin. Some of the fragments of latite porphyry contain pyroxene and a mafic phase altered to a green clay.

200-210 feet: Three Creeks Tuff

The sample contains crystals of quartz, plagioclase, and potassium feldspar derived from the Three Creeks Tuff, argillically altered Three Creeks Tuff, latite porphyry, and cement. The matrix of the ash-flow tuff has been altered to sericite and quartz. Pyrite is disseminated throughout the matrix. The latite porphyry contains phenocrysts and microlites of plagioclase. Veins of calcite + barite, calcite, and quartz + barite, are present in fragments of Three Creeks Tuff. Botryoidal textures indicative of chalcedony are present in a highly silicified sample of unknown origin.

290-300 feet: Latite porphyry

The chips consist dominantly of latite porphyry containing phenocrysts of plagioclase, and biotite, opaques or calcite and a brown, pleochroic smectite. The latite porphyry locally contains vugs filled with euhedral quartz crystals. Fragments of silicified latite porphyry containing ghost phenocrysts of feldspar are present in the cuttings. Approximately 10% of the chips consist of Three Creeks Tuff that has been intensely altered to calcite, quartz and clays or has been silicified. Veins of chalcedony + quartz, sericite, calcite + smectite, and

calcite + quartz (open space fillings) are present. Disseminated pyrite is common.

370-380 feet: Lapilli Tuff

The majority of the cuttings consist of variably rounded fragments of latite porphyry and Three Creeks Tuff in a matrix of sericite. In places, the matrix has been replaced by calcite. The remainder of the chips consist of latite porphyry. Secondary phases within the chips include sericite after biotite and plagioclase and disseminated pyrite. Veins of calcite + barite and calcite + pyrite cut the lapilli tuff.

430-440 feet: Latite porphyry

The latite porphyry contains phenocrysts of plagioclase and biotite. The plagioclase has been moderately altered to sericite, carbonate, and traces of epidote. The biotite has been altered to sericite and carbonate. Veins of pyrite + calcite and disseminated pyrite are present.

450-460 feet: Three Creeks Tuff

The cuttings consist of fragments of Three Creeks Tuff and cement. The mafic minerals have been altered to sericite and quartz, whereas the feldspars have been altered to calcite and sericite. The matrix of the ash-flow tuff has been altered to sericite and quartz. In places, the matrix has been partially replaced by calcite. Disseminated pyrite and veins of calcite + pyrite are present.

560-570 feet: Three Creeks Tuff

Alteration and lithologies as above.

730-740 feet: Wales Canyon Tuff

The Wales Canyon Tuff in this sample has been intensely altered. The phenocrysts have been altered to mixtures of

sericite and calcite whereas the matrix has been altered to fine-grained mixtures of quartz + sericite. Veins of quartz + calcite + pyrite are cut by veins of calcite + pyrite. Minor silicification is associated with the quartz veins. Disseminated pyrite is also present.

850-860 feet: Wales Canyon Tuff

Alteration and lithologies as above.

920-930 feet: Wales Canyon Tuff

Alteration and lithologies as above. Veins of quartz + calcite + sericite, calcite + quartz, and calcite + pyrite are present.

950-960 feet: Coconino Sandstone

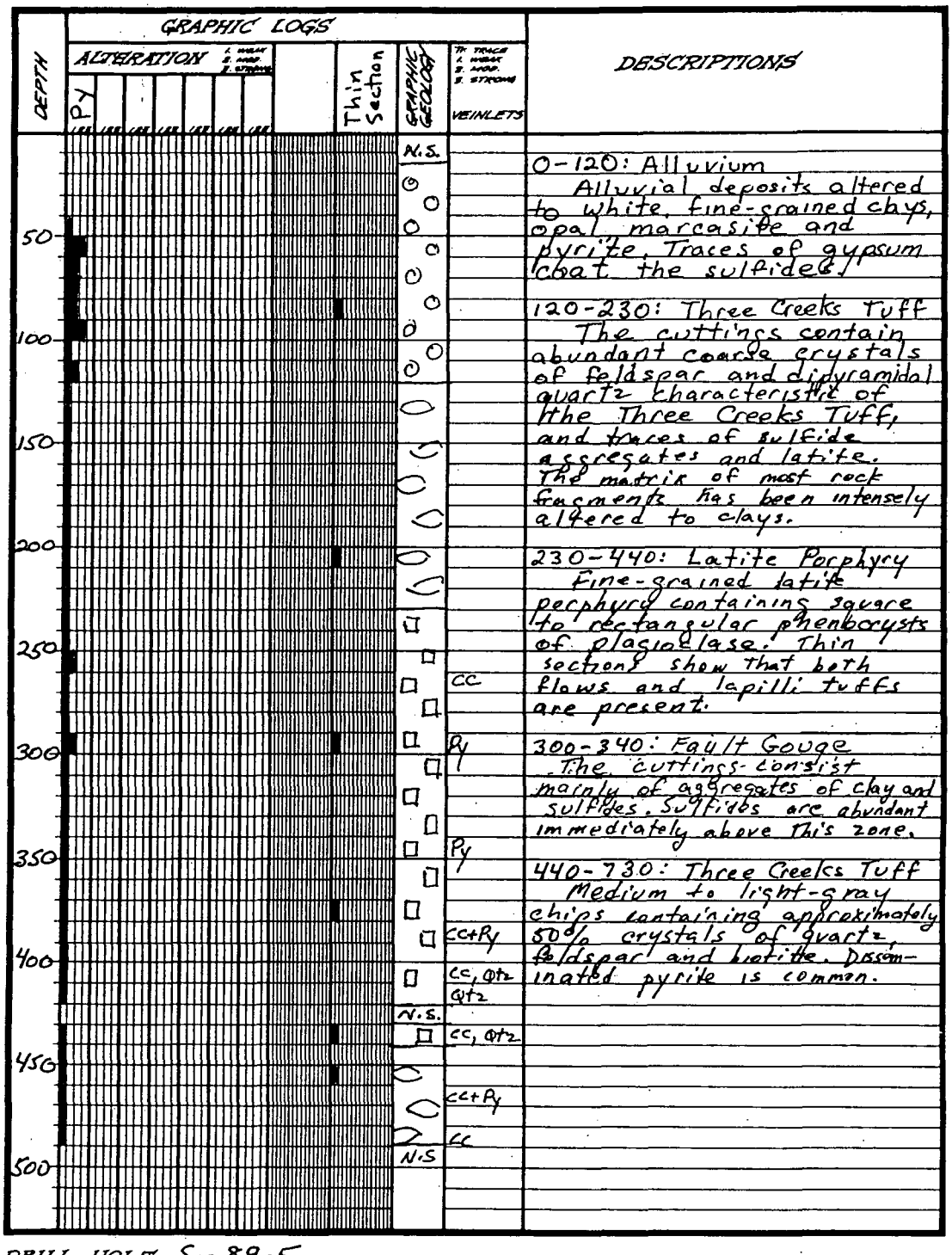
The cuttings consist of a fine-grained quartz sandstone cemented by quartz overgrowths and sericite or calcite. Fragments of highly altered Wales Canyon Tuff (as above) are also present. Veins of quartz and calcite + pyrite + sericite + quartz are present. Disseminated pyrite is present.

1050-1060 feet: Coconino Sandstone

Alteration and lithologies as above.

1140-1150 feet: Limestone

The cuttings consist of fine- to medium-grained limestone, limestone breccia, and minor (sluffed) latite, ash-flow tuff, and calcite cemented sandstone. Veins of quartz + pyrite and calcite + quartz are present.



DESCRIPTIONS

0-120: Alluvium
Alluvial deposits altered to white, fine-grained clays, opal, marcasite and pyrite. Traces of gypsum coat the sulfides.

120-230: Three Creeks Tuff
The cuttings contain abundant coarse crystals of feldspar and dipyramidal quartz characteristic of the Three Creeks Tuff, and traces of sulfide aggregates and latite. The matrix of most rock fragments has been intensely altered to clays.

230-440: Latite Porphyry
Fine-grained latite porphyry containing square to rectangular phenocrysts of plagioclase. Thin sections show that both flows and lapilli tuffs are present.

300-340: Fault Gouge
The cuttings consist mainly of aggregates of clay and sulfides. Sulfides are abundant immediately above this zone.

440-730: Three Creeks Tuff
Medium to light-gray chips containing approximately 50% crystals of quartz, feldspar and biotite. Disseminated pyrite is common.

DRILL HOLE S-89-5
LOCATION Sulphurdale

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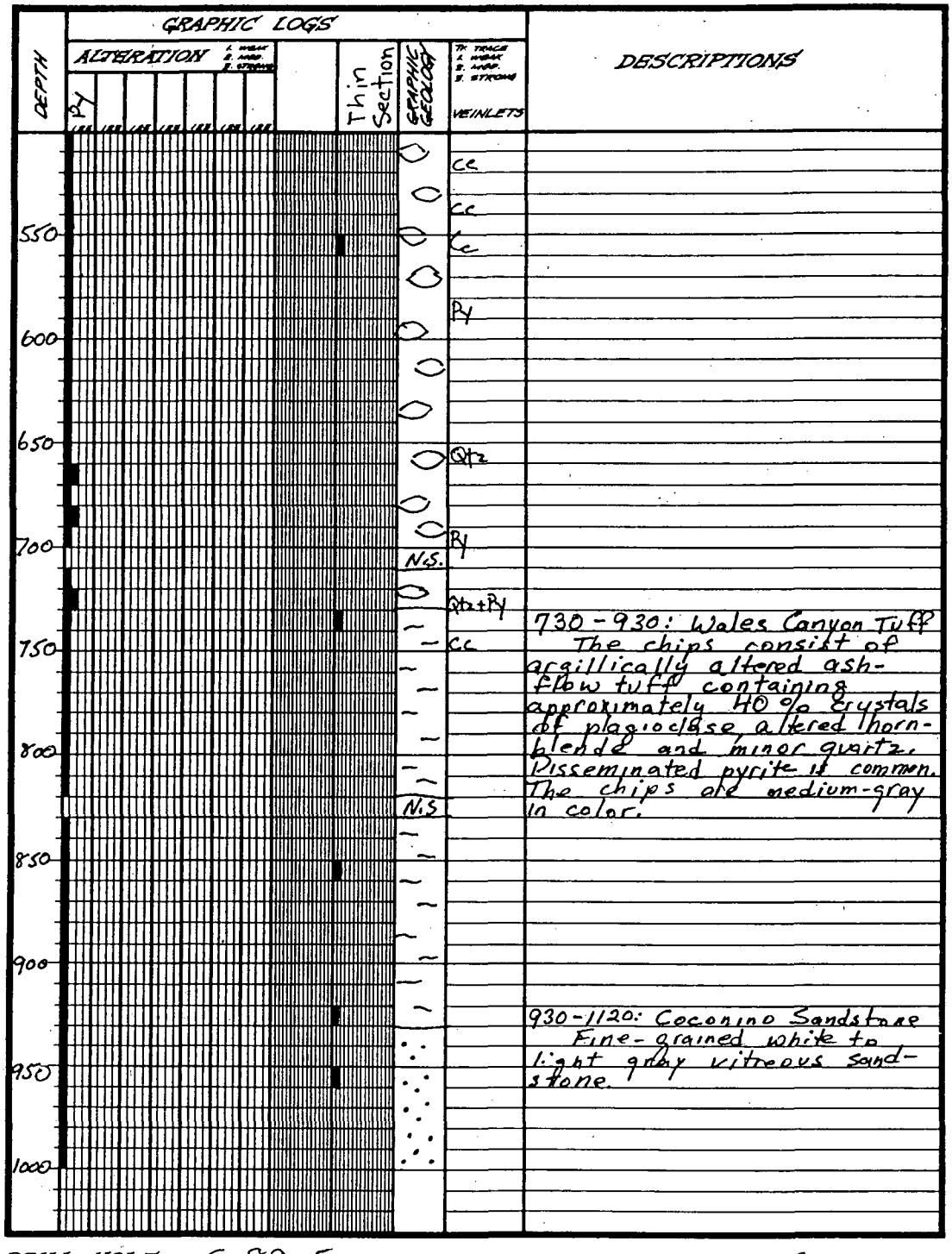

DRILL HOLE S-89-5

LOCATION Sulphurdale

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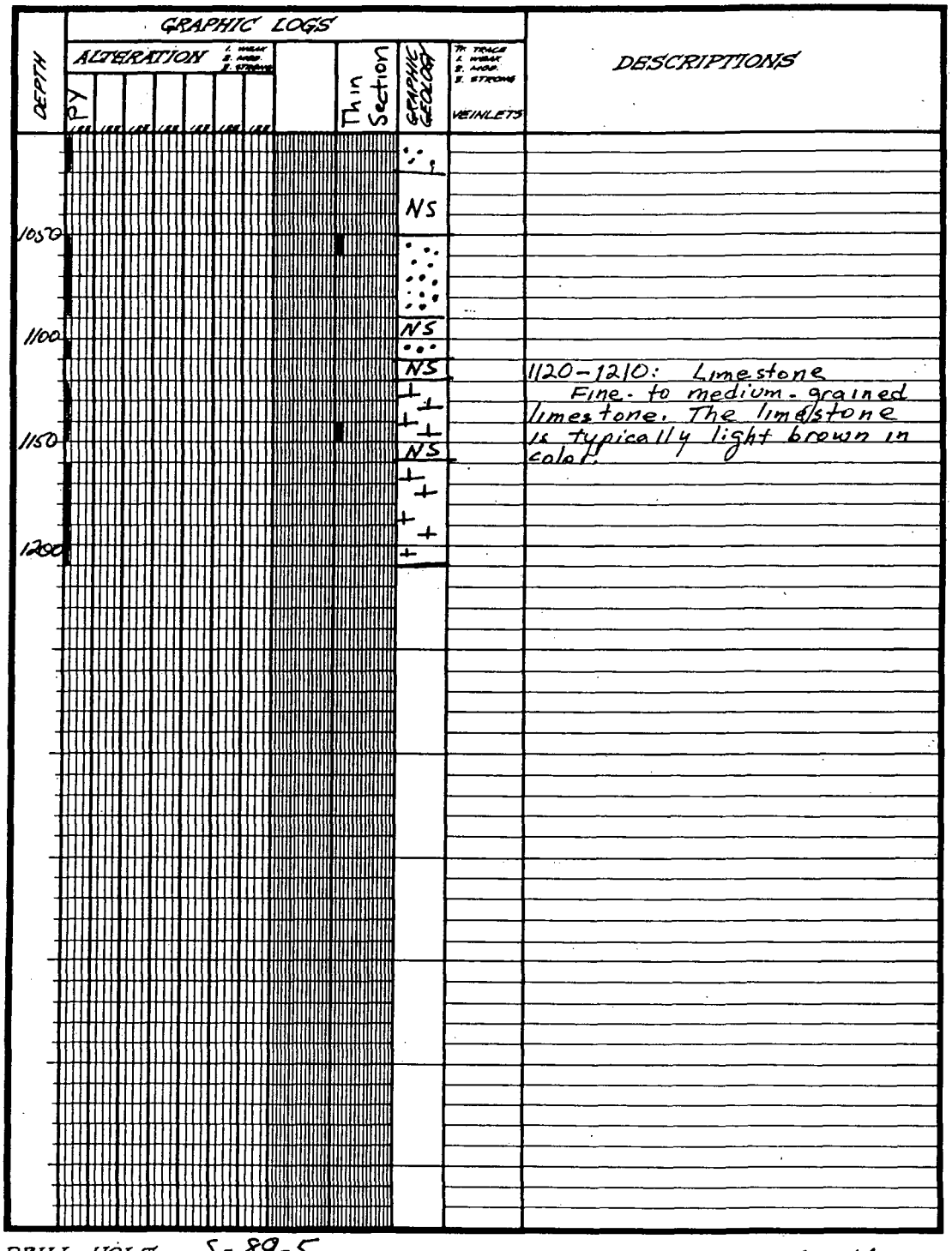

DRILL HOLE S-89-5

LOCATION Sulphurdale

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Appendix D

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

Norman H. Bangerter
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

April 14, 1989

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 Slim Holes S89-1 through S89-7
Expiration Date: October 14, 1989

Dear Mr. Hauth:

Reference is made to your request of April 5, 1989, to drill seven "slim hole" geothermal wells as part of MEI's continued field development program at the Cove Fort/Sulfurdale KGRA. The location of the wells is to be:

S89-1 South 3211 feet and East 609 feet from the NW Corner of Section 7, T26S, R6W, SLB&M;

S89-2 South 2853 feet and East 578 feet from the NW Corner of Section 7, T26S, R6W, SLB&M;

S89-3 South 3597 feet and East 1108 feet from the NW Corner of Section 7, T26S, R6W, SLB&M;

S89-4 South 3456 feet and East 354 feet from the NW Corner of Section 7, T26S, R6W, SLB&M;

S89-5 South 3684 feet and West 225 feet from the NE Corner of Section 12, T26S, R7W, SLB&M;

S89-6 South 3369 feet and West 465 feet from the NE Corner of Section 12, T26S, R7W, SLB&M;

S89-7 South 3129 feet and West 915 feet from the NE Corner of Section 12, T26S, R7W, SLB&M.

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.

2. The driller must be bonded and have a current well driller's permit from the Division of Water Rights. A federal bond covering the well will satisfy the bonding requirement.

3. These wells may be drilled to a maximum of 1500 feet. The applicant must obtain written permission from the State Engineer prior to drilling to a depth significantly beyond 1500 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 rig equipment and/or the structural integrity of the well.

4. 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.

5. 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 (13-3/8 inch) shall be installed to a depth of 40-120 feet and the annular space shall be cemented back solid to the surface.

   B. The surface casing (7 inch) shall be set to a depth of 250-400 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. This approval is conditioned upon the proper easements and trespass agreements being obtained from Provo City, the fee hold of the land where the proposed well S89-3 will reside. A copy of such agreements shall be provided the Division of Water Rights before the approval of S89-3 is considered final.

This is permission for the licensed driller to begin drilling the geothermal test well. Note that the expiration date of this letter is October 14, 1989.

Please notify Gerald Stoker, the Area Engineer, at 586-4231 or John Solum, at 538-7406 prior to the commencement of drilling operations.

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,

Robert L. Morgan

For Kent Jones, P.E.
Directing Appropriations Engineer

KLJ:JS:rc

cc: Gerald W. Stoker
Jerry Bronicel
Delano Development Company

Appendix E

S89-5 Field Cost Estimate Date:				
Item	**6/17/89**	**6/29/89**	**6/30/89**	**Totals**
Mob/rigup				2000
Construct Pad				250
Drill 28 1/2" hole 15' @ $56/ft				840
Run/Cmt 20" Conductor				500
Drill 17 1/2" hole 105'@$31/ft				3255
Run 13 3/8" Conductor				450
Cement conductor, WOC 6 hrs				1400
Drill 9 7/8" hole 280' @ $18/ft ($20?)				5600
NU 11" Rotating head				500
Run 7" casing x 300' (4 hrs)				400
Cement 7" casing, WOC (16 hrs)				1600
NU/Test BOPE (16 hrs)	1600			1600
Drill 6 1/4" hole 400'-500' @$12.50/ft	1250			1250
Drill 6 1/4" hole 500'-1000' @$15/ft		7500		7500
Drill 6 1/4" hole 1000'-1200 @$17.50/ft			3500	3500
GDI Subtotal:				
BOP and drlg tool rentals (Land & Marine)	307	307	632	1650
Drilex Rentals (est does not incl 11" unit)	1350			2838
Compressor rental (1/2 mo) (act. 3/4 mo)				3600
Casing 120' 13 3/8 @ $19.00/ft				2280
Casing 411 ft 7" @ $7.00/ft				2779
Single shot/geolograph (Eastman)	56	28	28	224
Mud/chemicals				0
Fuel/lubricants		1000		1228
Cement Conductor (Carling)				314
Cement 7" (Dowell est-act. by Halliburton)				5007
Cement 13 3/8" (Dowell est-act. by Hallibur				4214
H2S Safety		600	600	2905
Geologist (Huttrer)	640			1806
Geologist (Moore)		500	400	900
Wellhead equip	1630			1630
9 7/8" bit				200
Welder				1100
Mechanic, repairs				0
Generator rental (est 1 wk) (act. 2 wks)				1400
Estimate Total:				
Daily Total:				
Cum Total:				**$64,720**

Eastman Christensen

★ A STAR RECORDING ★

12 HOUR CHART

TIME ON

COMPANY

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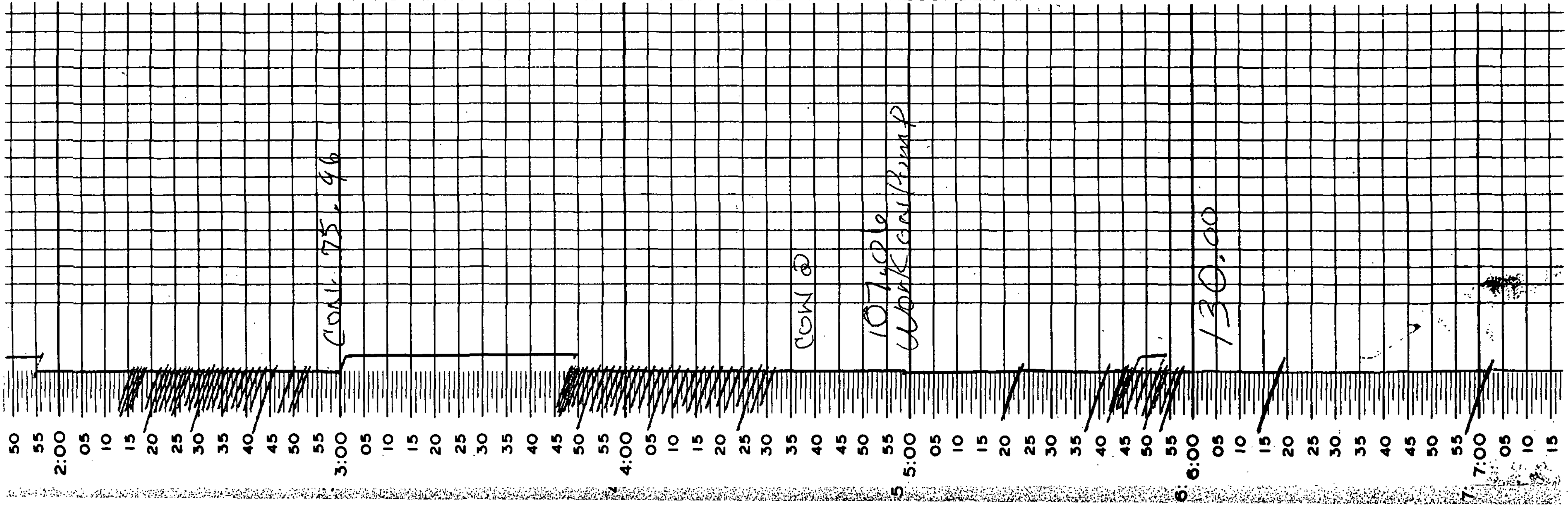

Eastman Christensen

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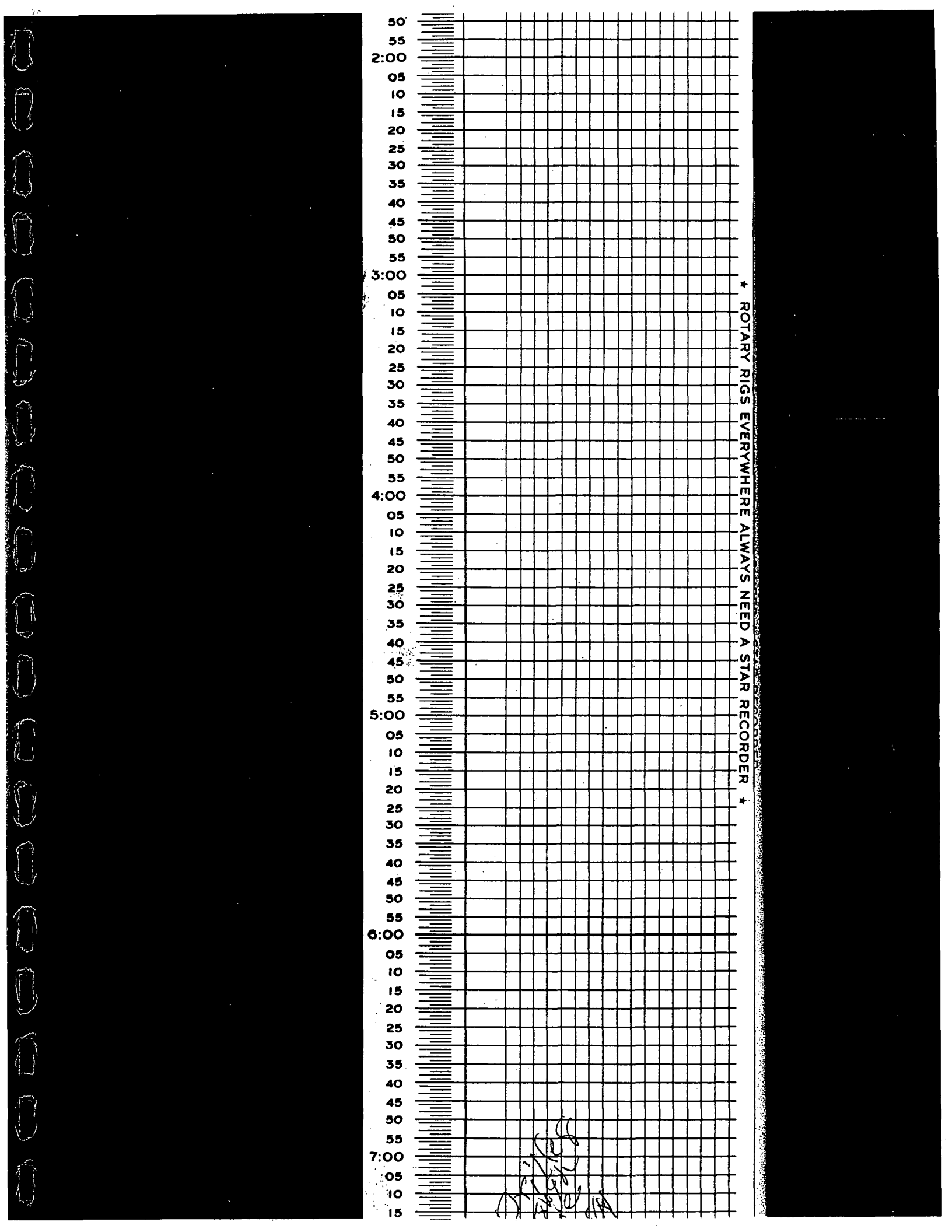
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Eastman Christensen

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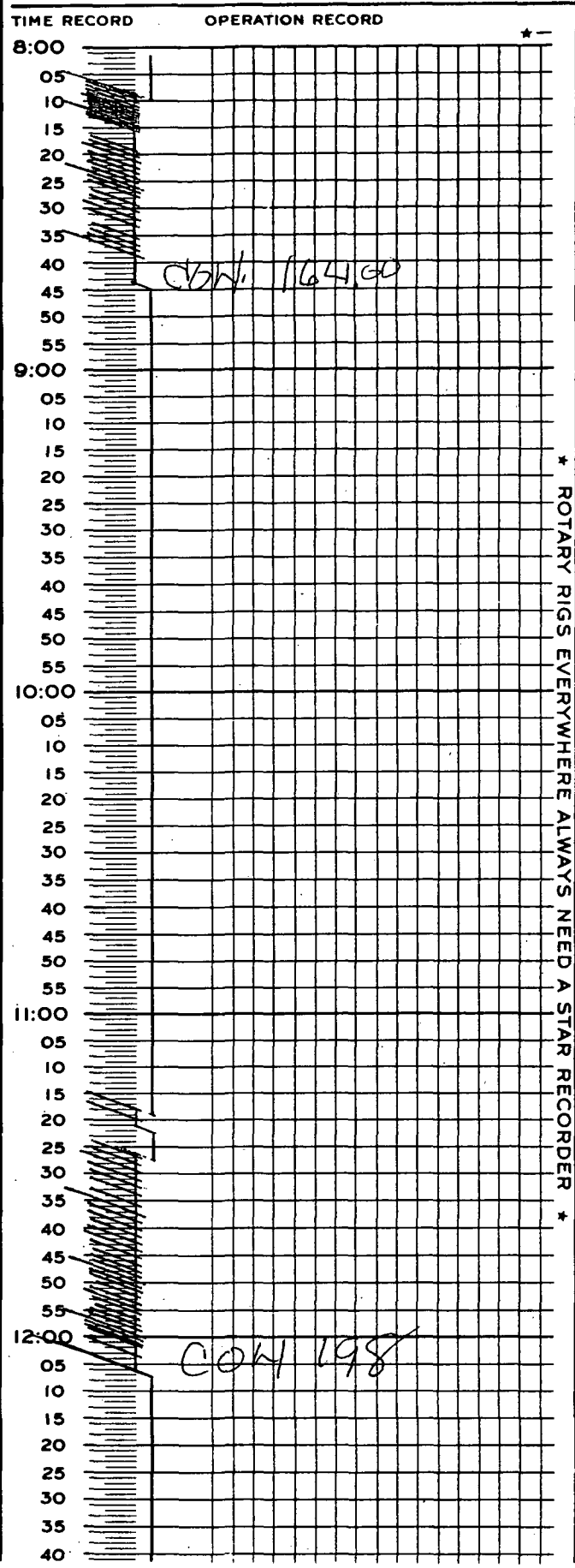

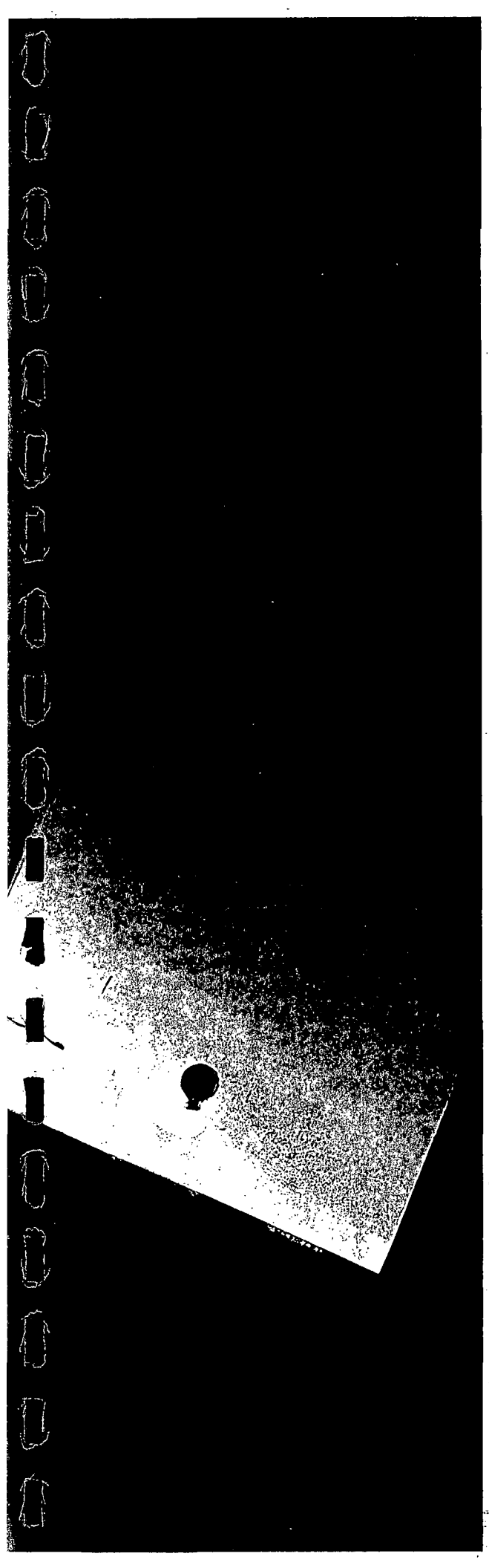

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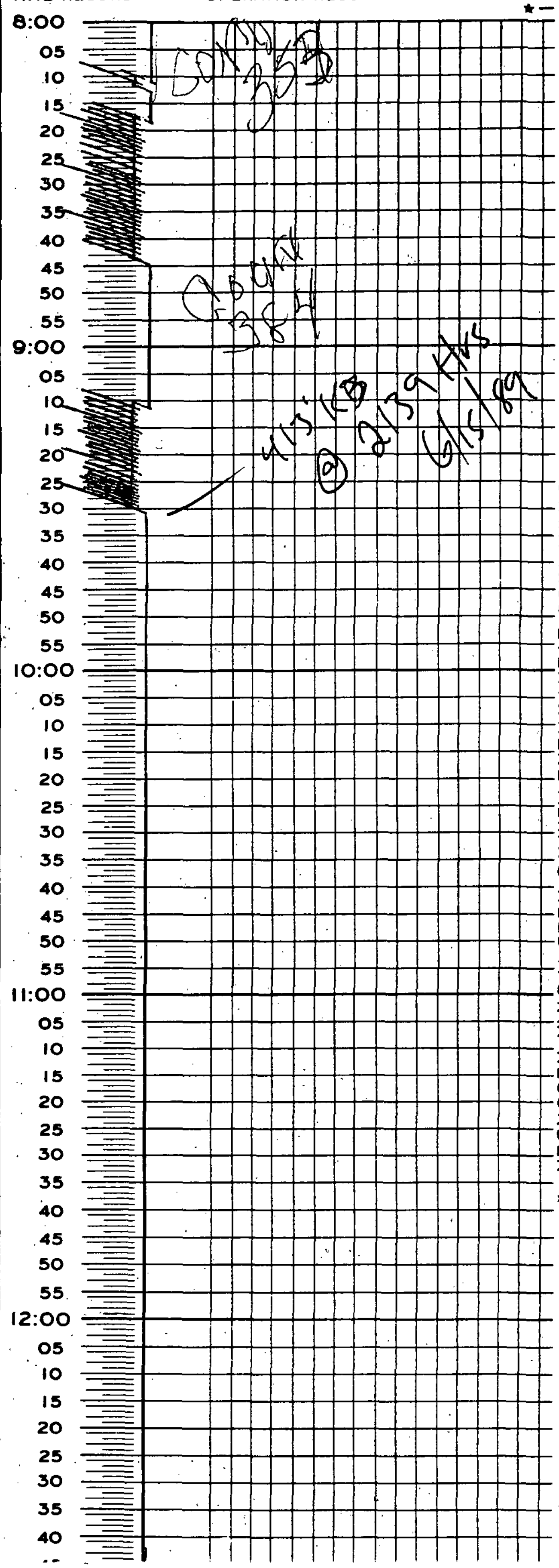

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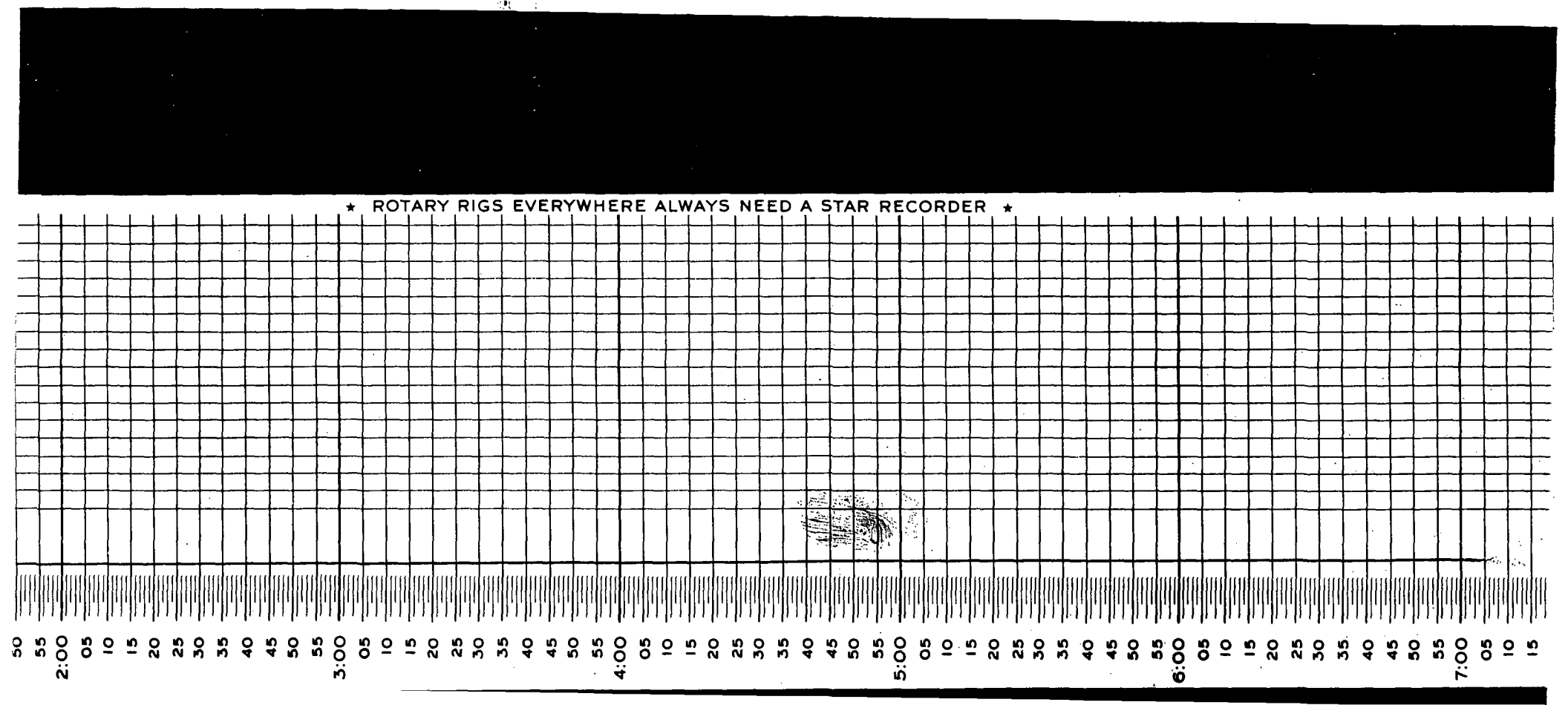
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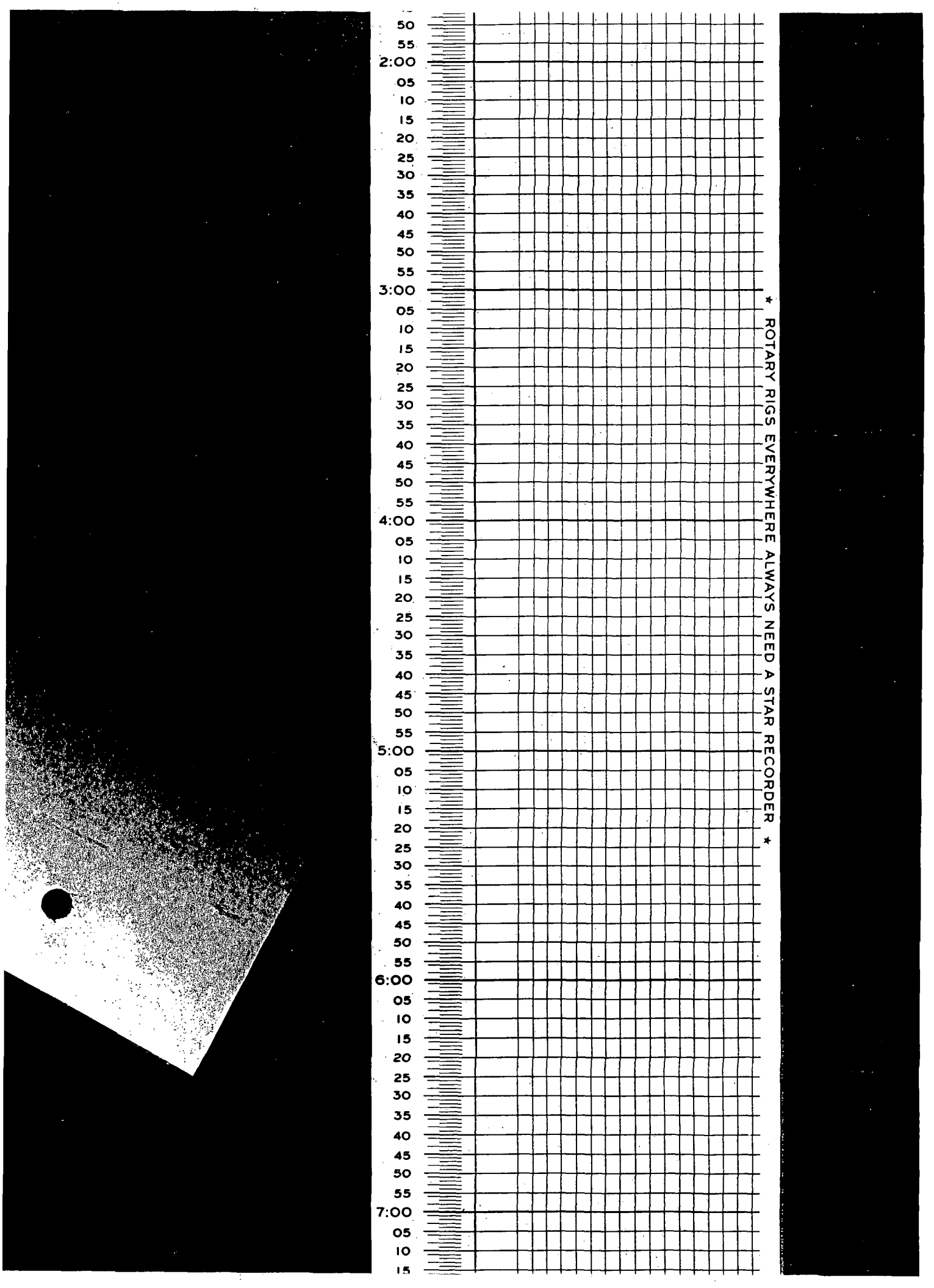
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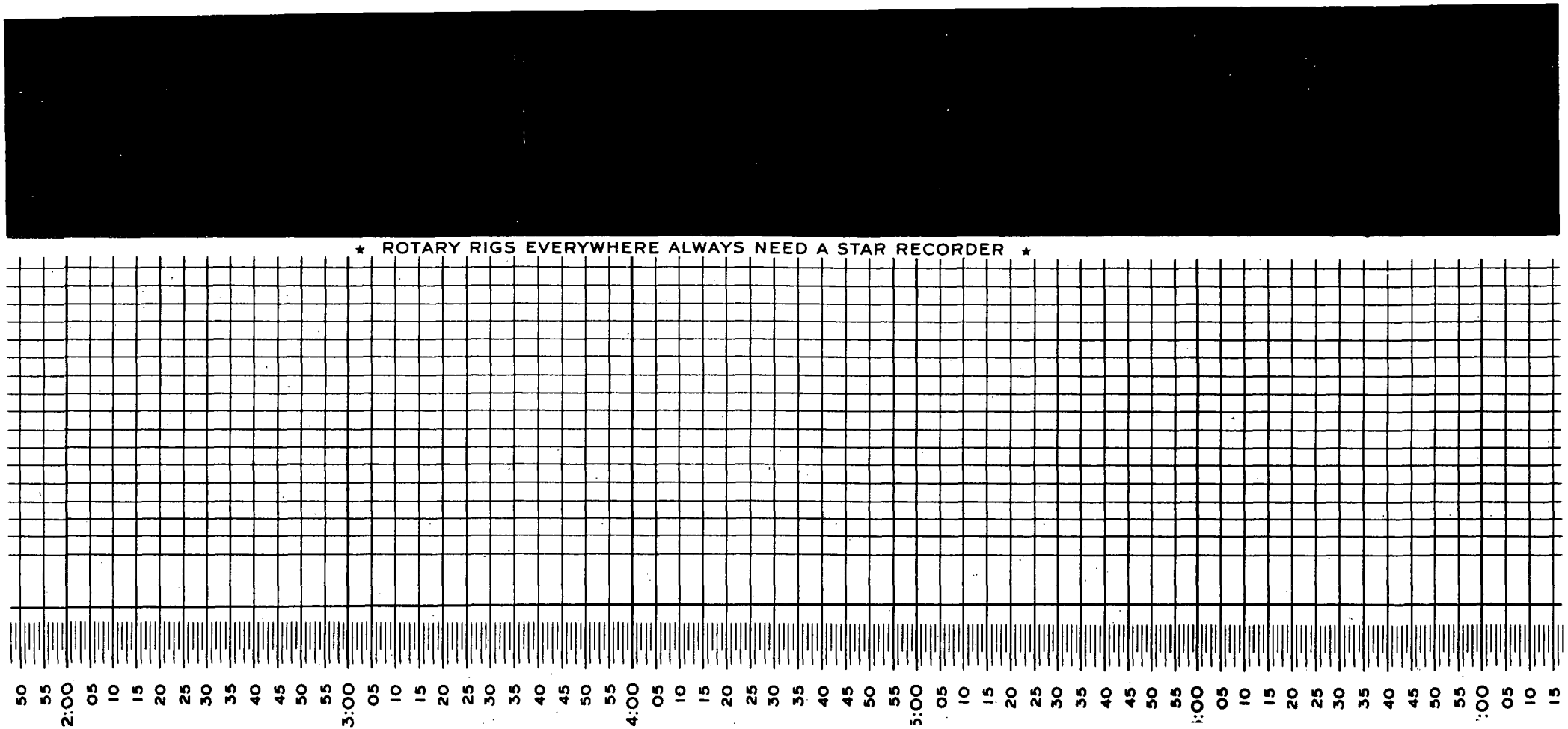
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Eastman Christensen

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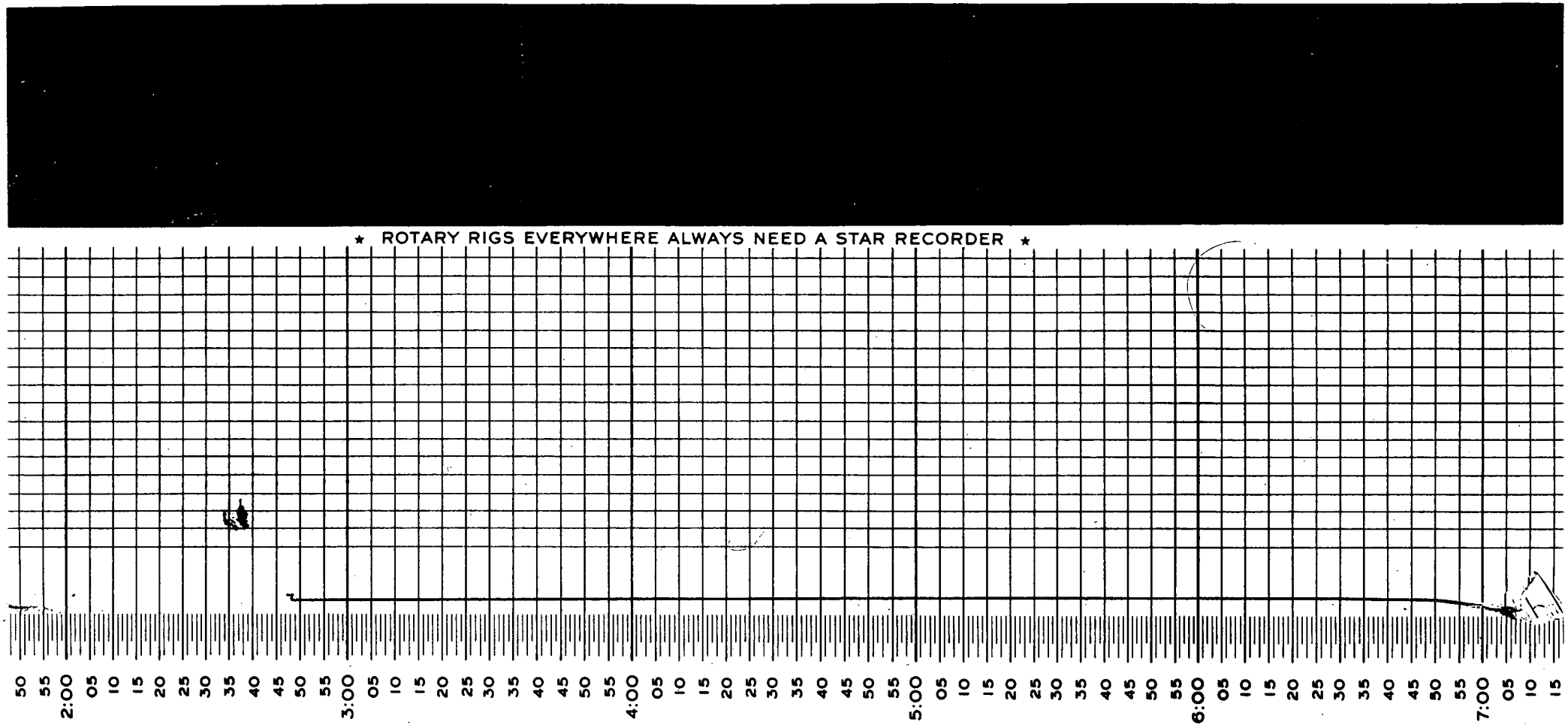
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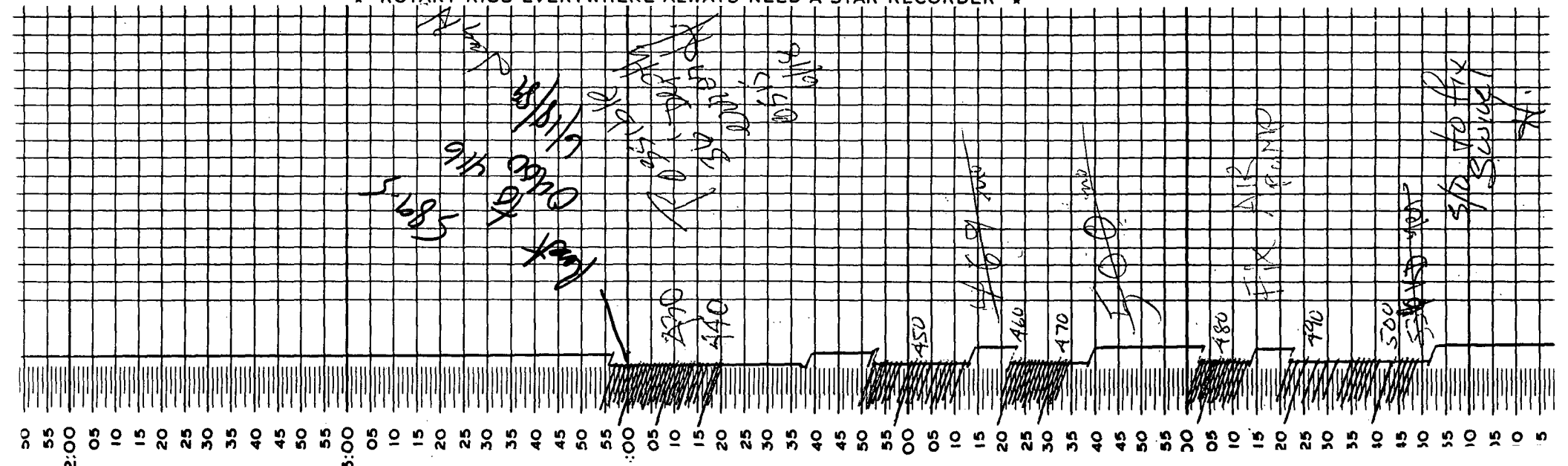

Eastman Christensen

★ A STAR CORDING ★

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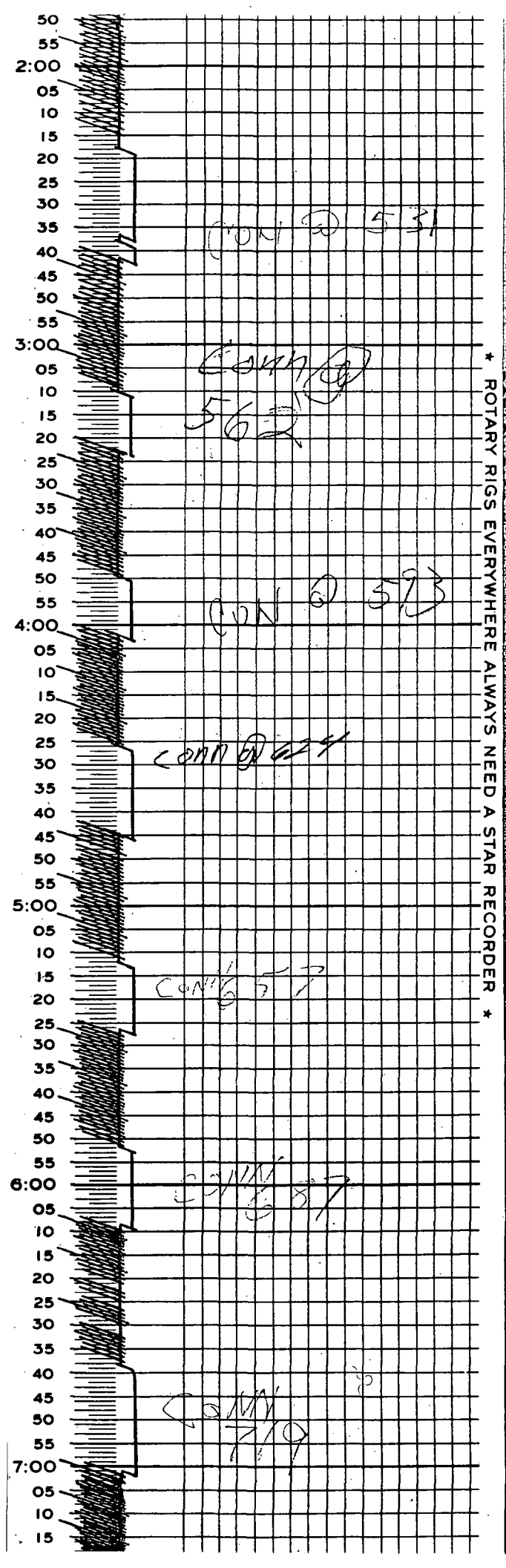
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* ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER *

Eastman Christensen

★ A STAR RECORDING ★

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REMARKS

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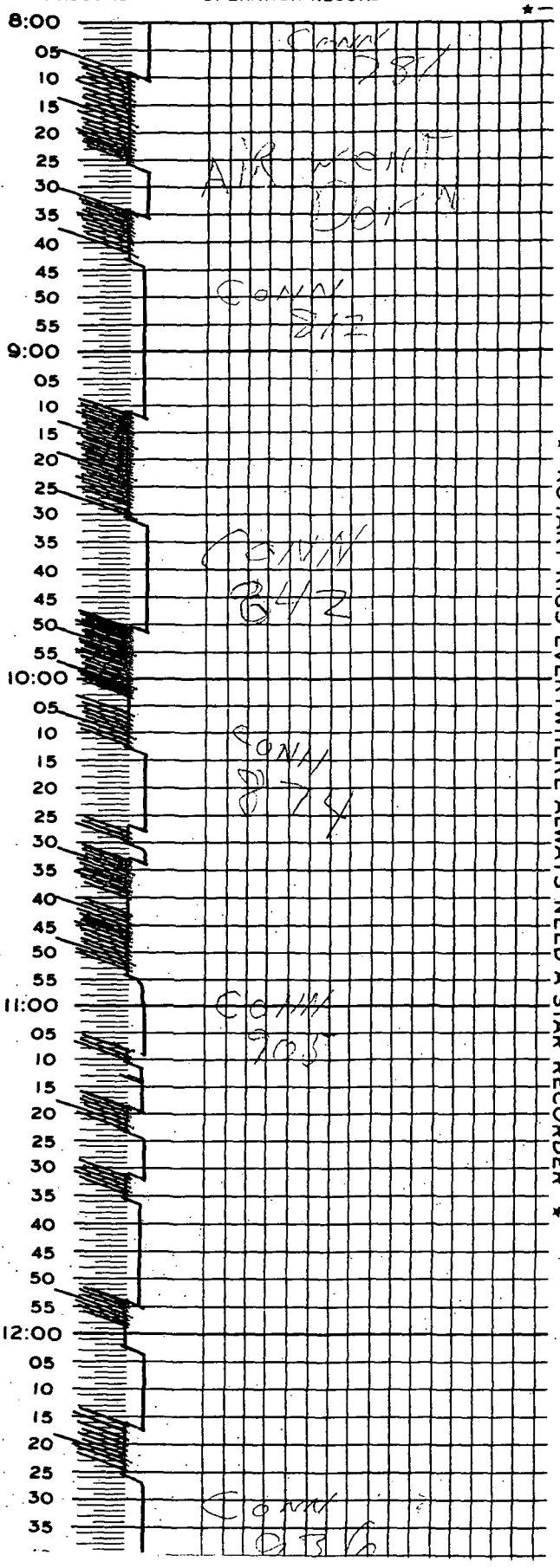

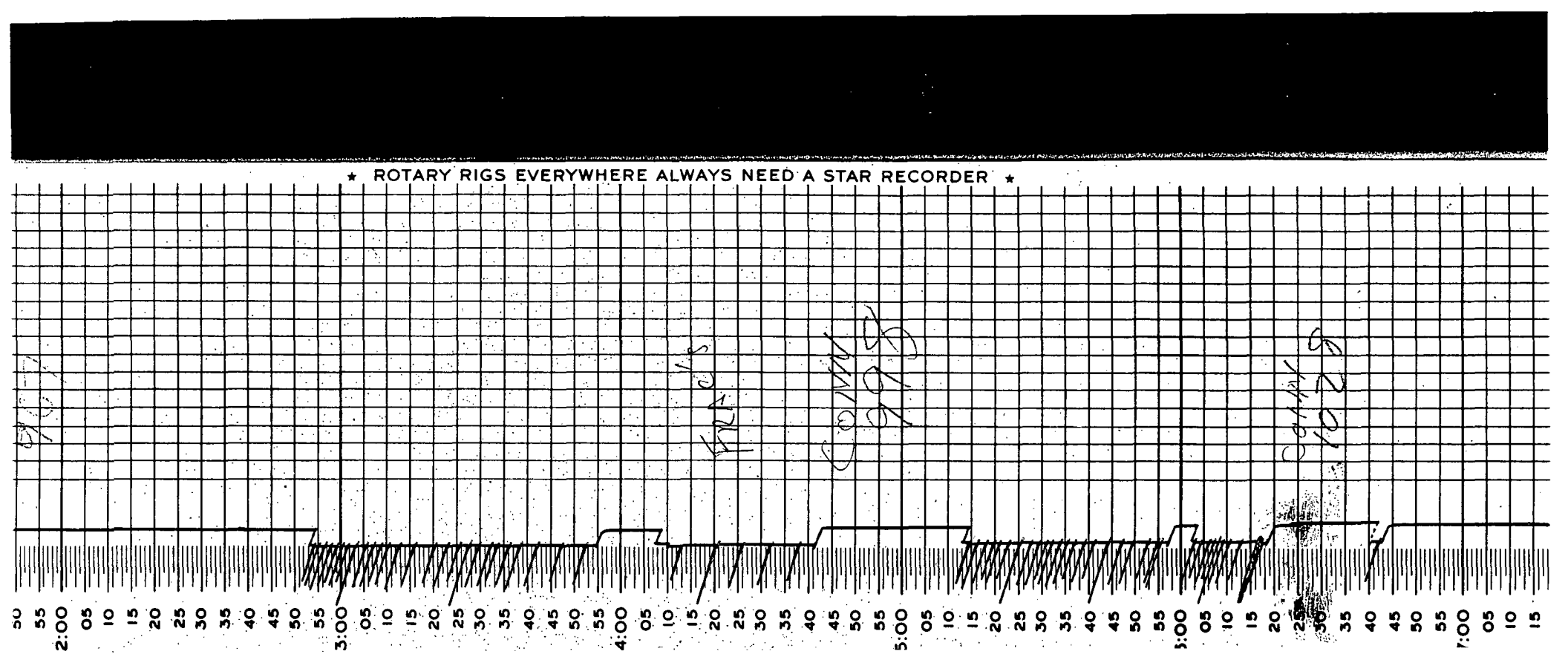
★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★
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Eastman Christensen

★ A STAR CORDING ★

12 HOUR CHART

COMPANY _____

WELL _____

TOTAL DEPTH ON 1055

TIME ON 9 AM

DATE 6/3

WELL NUMBER _____

TOTAL DEPTH OFF _____

REMARKS

LITHO IN U.S.A.

TIME RECORD | OPERATION RECORD

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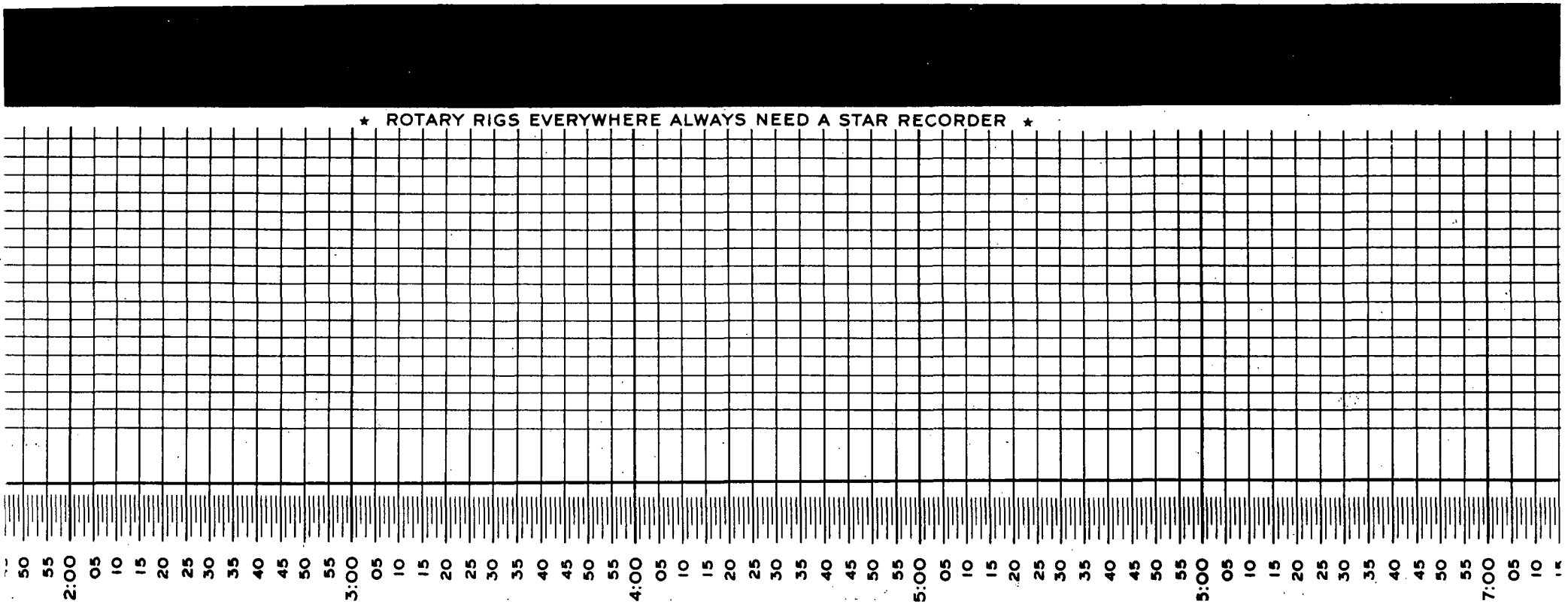
★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★


★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★
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★ A STAR RECORDING ★

12 HOUR CHART

TIME ON 3:00

COMPANY

DATE 7-1-89

WELL S-89-3

WELL NUMBER

TOTAL DEPTH ON 1085

TOTAL DEPTH OFF

REMARKS

LITHO IN U.S.A.

TIME RECORD

OPERATION RECORD

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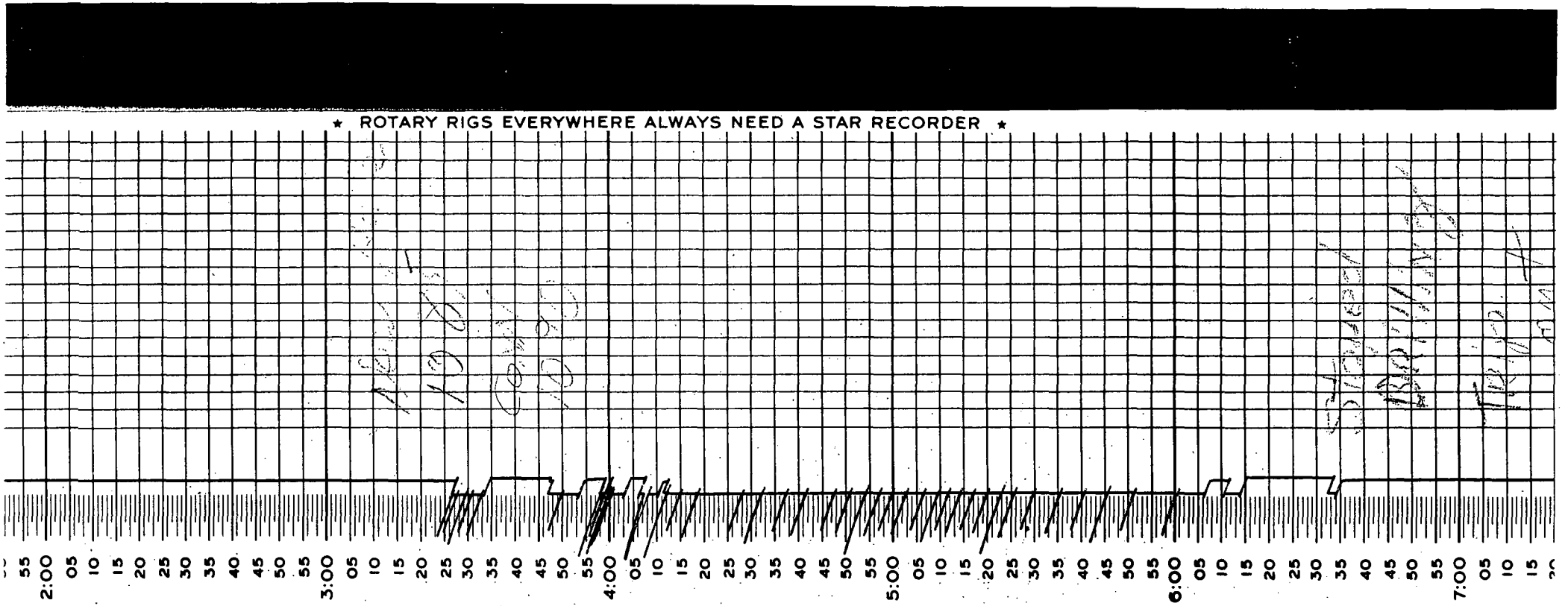
★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★


★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★
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Eastman Christensen

★ A STAR RECORDING ★

12 HOUR CHART — TIME ON

COMPANY — DATE 2-1-54

WELL — WELL NUMBER

TOTAL DEPTH ON 1115 — TOTAL DEPTH OFF 1202

REMARKS T.D.

TIME RECORD — OPERATION RECORD

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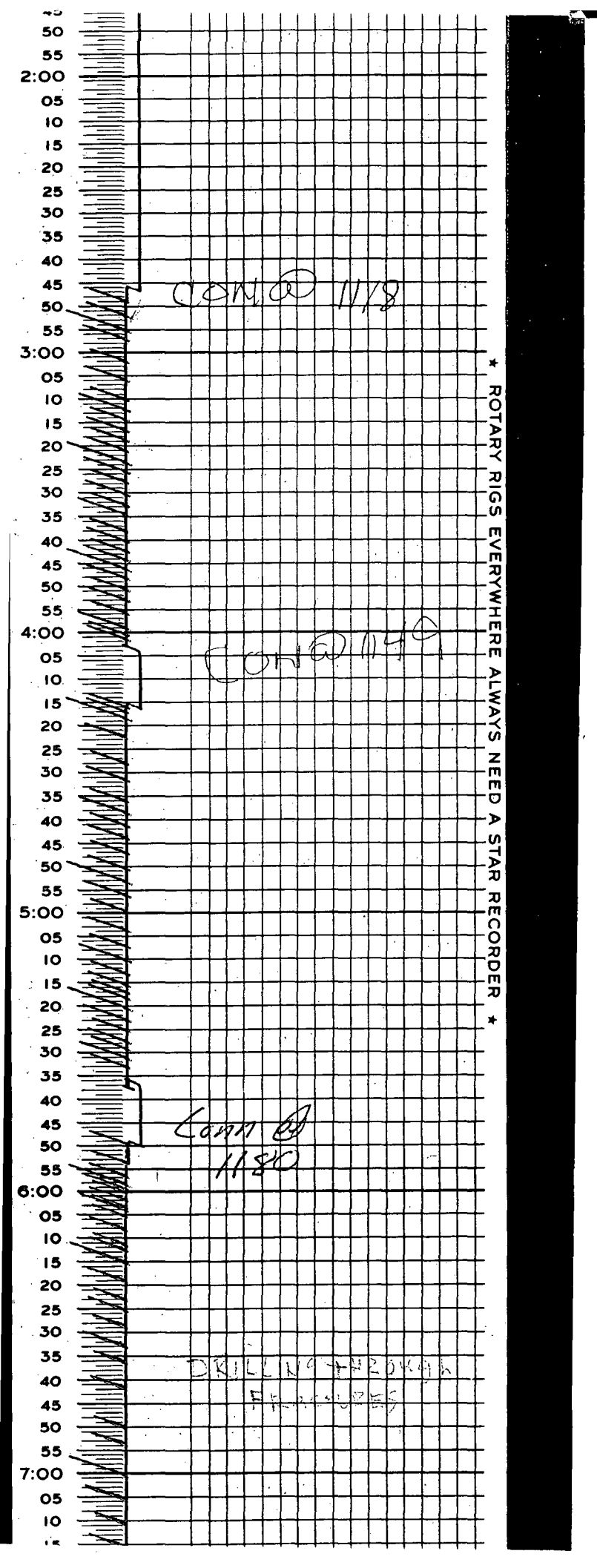
★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★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* ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER *

Eastman Christensen

★ A STAR CORDING ★

12 HOUR CHART — TIME ON

COMPANY — DATE

WELL — WELL NUMBER

TOTAL DEPTH ON — TOTAL DEPTH OFF ~~4150~~ 414

REMARKS 414

PRINTED IN U.S.A.

TIME RECORD — OPERATION RECORD

8:00 05 10 15 20 25 30 35 40 45 50 55
9:00 05 10 15 20 25 30 35 40 45 50 55
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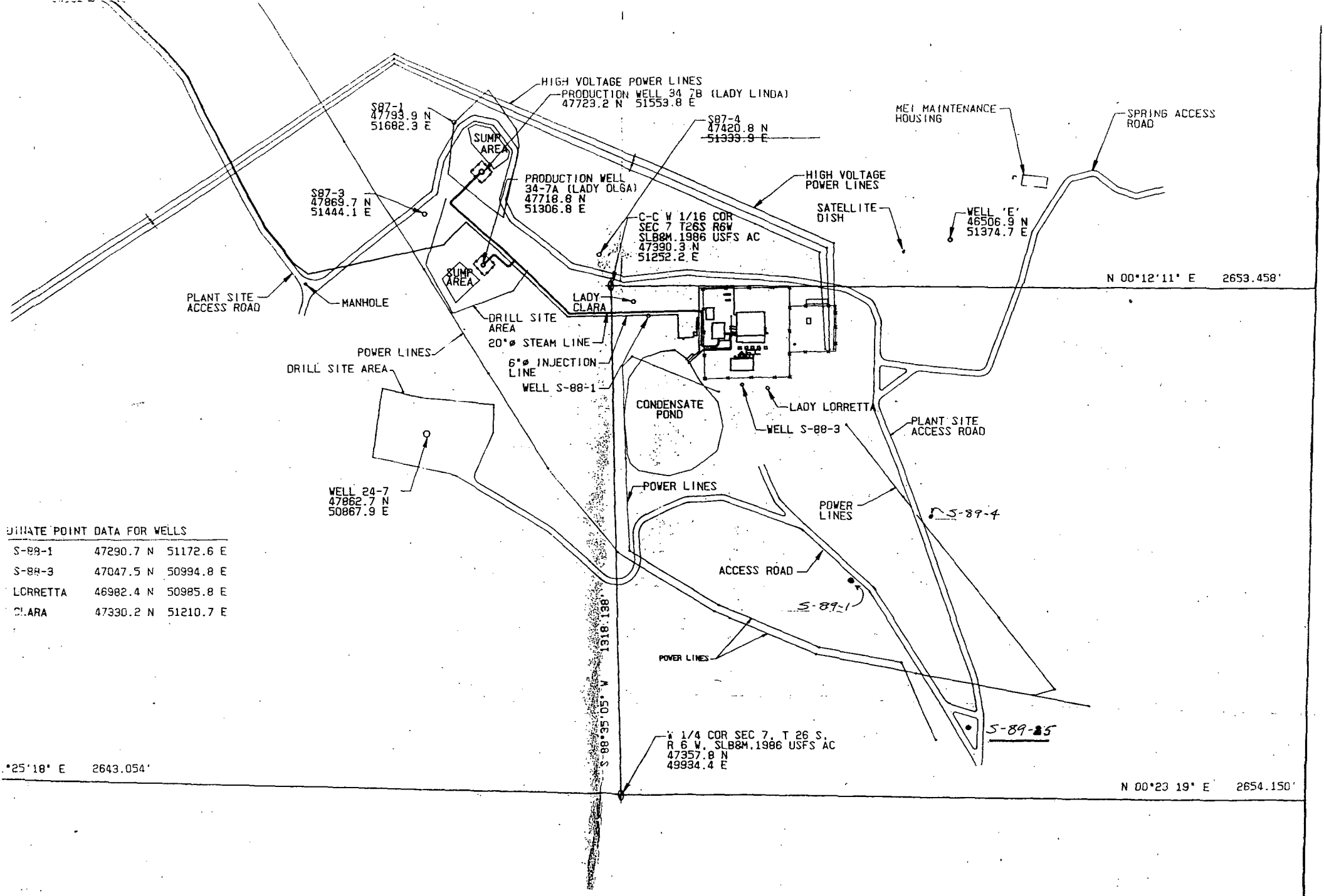
11:00 05 10 15 20 25 30 35 40 45 50 55
12:00 05 10 15 20 25 30

★ ROTARY RIGS EVERYWHERE ALWAYS NEED A STAR RECORDER ★



DINATE 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

Plate 1