NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY OF DRILLING OPERATIONS

U. S. NAVY

ATIGARU POINT NO. 1

HUSKY OIL NPR OPERATIONS, INC.
Prepared by: S. L. Hewitt
Edited by: R. G. Brockway

For the

U. S. GEOLOGICAL SURVEY
Office of the National Petroleum Reserve in Alaska
Department of the Interior
JUNE 1983

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ATIGARU POINT NO. 1

INTRODUCTION

The U. S. Navy-Atigaru Point No. 1 well is located in the National Petroleum Reserve in Alaska, formerly the Naval Petroleum Reserve No. 4 (Figure 1). The well is 1,422 feet from the north line and 1,926 feet from the east line of protracted Section 19, Township 14 North, Range 2 East, Umiat Meridian (Latitude: 70°33'22.03" North; Longitude: 151°43'01.85" West). Alaska State Plane Coordinates are: X = 290,644 and Y = 6,055,988, Zone 4. Elevations are: Kelly Bushing 27', Ground 7'. Drilling related operations commenced with rig-up on December 30, 1976, and the rig was released March 18, 1977.

The well was drilled to a total depth of 11,535 feet. The primary objectives of the well were the Kuparuk Sandstone, and the Sadlerochit and Lisburne Groups, with secondary interests in the Sag River Sandstone and the basal Torok sands. At the conclusion of the drilling and evaluation operations, the well was plugged and abandoned with cement and mechanical plugs set at selected intervals.

Husky Oil NPR Operations, Inc. supervised and directed the drilling and support operations as prime contractor for the Navy. Parco, Inc. was the drilling contractor; Parco Rig 95, a National 130, was used to drill the well.

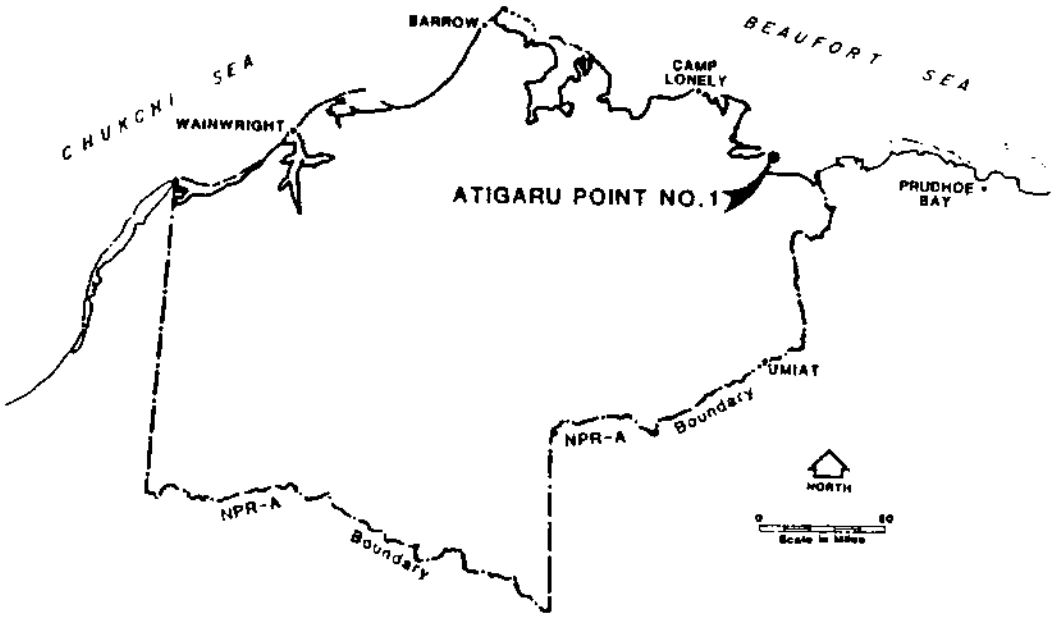


FIGURE 1 - WELL LOCATION MAP - ATIGARU POINT NO. 1

DRILLING SUMMARY

Field operations at the Atigaru Point No. 1 location started on December 2, 1976, with the mobilization of construction crews and equipment required to build the drilling pad and ice airstrip to accommodate C-130 Hercules aircraft. Construction work was completed on December 31, 1976, and the crews and equipment moved to another location.

Rig move-in operations began on December 18, 1976. The rig, Parco 95, had previously been used in the vicinity of Prudhoe Bay. The rig move was conducted using Hercules aircraft and completed in 11 days with a total of 99 loads. Rig-up operations began on December 30, 1976. Rig-up was completed in 14 days and the well spudded on January 12, 1977, at 4:00 p.m. Weather during rig move and rig-up was generally good with the exception of two days of winds from 30 to 40 knots with blowing snow.

During rig-up, a 30" conductor had been set at 99' and cemented with Permafrost II cement. A 17-1/2" pilot hole was drilled out below the 30" to 429'. The hole was opened to 26" to 429', and 26" hole was drilled to 525'. Problems with sloughing hole from 430' to 525' were encountered due to gravels being drilled. The mud was mixed with sufficient viscosity to handle gravel and the hole then drilled to 545'. During this period, a ground blizzard occurred which severely hampered the water haul. After conditioning the hole, 20" deep conductor was run and set at 447'. The 20" was cemented to surface with 2,600 sacks of Permafrost II cement with full returns.

A 20" casing head and 20" annular blowout preventer and diverter lines were installed on the 20" deep conductor. The 20" casing shoe was drilled out with a 17-1/2" bit. Drilling was suspended pending weather improvements for cement haul to the location. A 17-1/2" hole was drilled from the shoe of the 20" to 2520'. The hole was logged from 2520' (logger's total depth) to 447'. Three attempts were required to get the tools to bottom. The logs run were the DIL/SP and the BHC-Sonic/GR log. After logging, 13-3/8" surface casing was run to 2509' and cemented back to surface with 3,925 sacks of Permafrost II cement with full returns.

A 13-5/8", 5,000 psi blowout-preventer stack (SRRA arrangement) was installed on the 13-5/8" split unihead. The 5,000 psi choke manifold and kill line were also installed. The 13-3/8" casing was tested to 2,500 psi and the shoe and 10' of formation drilled. The formation below the shoe was tested with 400 psi (0.64 psi/ft. gradient). A 12-1/4" hole was drilled from 2520' to 8150' and logged from 8147' (logger's total depth) to the shoe of the 13-3/8" casing. The logging program was as follows: DIL/SP; BHC-Sonic/GR; FDC/CNL/CAL/GR; HDT-Dipmeter. Sidewall cores were shot. Intermediate 9-5/8" casing was run and landed at 8147'. Two FO cementers were run in the string and landed at 2352' and 2191' for use if Arctic Pack procedures became necessary. The 9-5/8" casing was cemented with 1,000 sacks of Class "G" cement containing friction reducer and retarder. The plug was bumped with 3,000 psi.

Blowout-preventer equipment was tested and the casing tested to 3,000 psi. The 9-5/8" casing shoe and 10' of formation were drilled out with an 8-1/2" bit and the formation below the shoe was tested to a 0.61 psi/ft. gradient. An 8-1/2" hole was drilled from 8147' to 8712'. Core No. 1 was cut from 8712' to 8742' with full recovery. Drilling continued from 8742' to 9123'. Approximately 200 barrels of mud were lost while drilling. Drilling continued to 10,041' with no further mud loss. While drilling to 10,262', approximately 150 barrels of mud were lost. Drilling continued to 10,731' with an additional loss of 70 barrels. After testing blowout-preventer equipment, drilling continued to 11,514'. The 8-1/2" hole was logged from 11,520' (logger's total depth) to the shoe of the 9-5/8" casing with the DIL/SP, BHC-Sonic/GR, FDC/CNL/CAL/GR, HDT-Dipmeter, and Velocity Survey. After logging, the hole was cleaned out to 11,520'. Core No. 2 was cut from 11,520' to 11,535', recovering 13'. Due to failure of Schlumberger equipment, it was necessary to relog the DIL/GR, FDC/CNL/CAL/GR. Sixty-nine sidewall cores were attempted. Thirty-eight were misfires, 17 were recovered empty, one cup was lost, and 13 cores were recovered.

All logs were recorded on magnetic tape and computer-log interpretations were prepared using Schlumberger's Synergetic Log Systems. A single-shot deviation survey was run while drilling. The hole was, for all practical purposes, "straight". In the 17-1/2" hole, the maximum deviation was 3/4° at 2490'. In the 12-1/4" hole, the maximum deviation of 1-1/4° occurred at 5124', and had reduced to 3/4° by the casing point. After casing in the 8-1/2" hole, the deviation increased gradually to 2° at 9406', decreased to 1-1/4° at 10,041', and increased again to 2° at 10,422'. The deviation decreased to 1-1/4° at 10,769' and increased again to 2° at 10,953'. At total depth, the deviation had decreased to 1°.

At the conclusion of the log evaluation, a decision was made to plug and abandon the well. Cement plugs were placed across selected intervals in the 8-1/2" hole as follows: Plug No. 1 from 9460' to 9260' with 115 sacks Class "G", Plug No. 2 from 8650' to 8450' with 95 sacks Class "G", Plug No. 3 from 8350-8100' with 125 sacks Class "G" covering the 9-5/8" casing shoe. Plug No. 4 consisted of a retainer set at 7900' with 25 sacks Class "G" spotted on top.

The 9-5/8" casing was cut at 2370', recovering both FO cementers. Plug No. 5 was set in the 13-3/8" casing from 2355' to 2255' with 100 sacks of Class "G". At 2155', the well was reversed from mud to water to diesel to allow the well to be used in the USGS North Slope geothermal measurement program. The abandonment well marker was installed, and the rotary rig released March 18, 1977, at 6:00 a.m.

The rig was rigged down and demobilized to the South Harrison Bay location, which had been prepared as a storage location for the rig. The rig was stacked out for the summer.

Detailed drilling information, in the form of bit records, mud summary, time analysis, and casing and cementing reports, is included in the body of the report.

Form 9-331 C
(May 1963)

REVISED 6/28/83

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER SINGLE ZONE [ ] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: x = 290,644. y = 6,055,988. Sec. 19, T14N, R2E.
At proposed prod. zone: Same - straight hole.

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 125 miles SE of Barrow.

5. LEASE DESIGNATION AND SERIAL NO.: N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: Naval Petroleum Reserve #4

9. WELL NO.: Atigaru Point #1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 19, T14N, R2E

12. COUNTY OR PARISH: No. Slope Borough 13. STATE: Alaska

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 5000'

16. NO. OF ACRES IN LEASE: 23,680,000

17. NO. OF ACRES ASSIGNED TO THIS WELL: N/A

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.: 47,500'

19. PROPOSED DEPTH: 10,880'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): G.L. = ± 7' (est.). K.B. = 25' (est.)

22. APPROX. DATE WORK WILL START*: January 1, 1977

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
36"	30"	-	80'	To surface.
26"	20"	133 (k-55)	500'	To surface w/Permafrost.
17½"	13 3/8"	72 (ss-95)	2500'	To surface w/Permafrost.
12¼"	9 5/8"	53.50 (ss-95)	7800'	± 250 sks or 500' fill.
8½"	7"	32 (N-80)	Liner	± 550 sks "G" as required to cement entire liner.

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum and Oil Shale Reserves, Serial #394, 27 August 1968.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED _____ TITLE Drilling Manager DATE October 19, 1976

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Accepted for the record.

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

Form 10 — 401
REV 1 - 1 - 71

SUBMIT IN TRIPLICATE
(Other instructions on reverse side)

REVISED 6/28/83

STATE OF ALASKA

OIL AND GAS CONSERVATION COMMITTEE

PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER SINGLE ZONE [ ] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL
At surface: x = 290,644. y = 6,055,988. Sec 19, T14N, R2E.
At proposed prod. zone: Same - straight hole.

13. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 125 miles SE of Barrow.

5. 6. LEASE DESIGNATION AND SERIAL NO.: N/A

7. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

8. UNIT, FARM OR LEASE NAME: Naval Petroleum Reserve #4

9. WELL NO.: Atigaru Point #1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., (BOTTOM HOLE OBJECTIVE): Sec 19, T14N, R2E

12. No. Slope Borough

14. BOND INFORMATION
TYPE N/A Surety and/or No. Amount

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT (Also to nearest drlg. unit, if any): 5,000'

16. NO. OF ACRES IN LEASE: 23,680,000

17. NO. ACRES ASSIGNED TO THIS WELL: N/A

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL DRILLING, COMPLETED, OR APPLIED FOR, FT: 47,500'

19. PROPOSED DEPTH: 10,880'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): G.L. = ± 7' (est.) K.B. = 25' (est.)

22. APPROX. DATE WORK WILL START*: January 1, 1977

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	GRADE	SETTING DEPTH	QUANTITY OF CEMENT
36"	30"	-	-	80'	To surface.
26"	20"	133	k-55	500	To surface w/Permafrost.
17½"	13 3/8"	72	ss-95	2500	To surface w/Permafrost.
12¼"	9 5/8"	53.50	ss-95	7800	± 250 sks or 500' fill.
8½"	7"	32	N-80	Liner	± 550 sks "G" as required to cement entire liner.

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum and Oil Shale Reserves, Serial #394, 27 August 1968.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program.

24. I hereby certify that the Foregoing is True and Correct

SIGNED _____ DATE October 19, 1976 TITLE Drilling Manager

(This space for State office use)

CONDITIONS OF APPROVAL, IF ANY

SAMPLES AND CORE CHIPS REQUIRED	MUD LOG	OTHER REQUIREMENTS
[ ] YES [ ] NO	[ ] YES [ ] NO	
DIRECTIONAL SURVEY REQUIRED	A.P.I. NUMERICAL CODE	
[ ] YES [ ] NO	50-103-20065	

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Form 9-330
(Rev. 5-63)

REVISED 6/28/83

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE*
(See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ DRY ☒ Other

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other ABANDONMENT

2. NAME OF OPERATOR: HUSKY OIL NPR OPERATIONS, INC.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface x = 290,644; y = 6,055,988
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: Naval Petroleum Reserve No.

9. WELL NO.: Atigaru Point No. 1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 19, T14N, R2E

14. PERMIT NO.: N/A
DATE ISSUED: N/A

12. COUNTY OR PARISH: North Slope
13. STATE: Alaska

15. DATE SPUDDED: 1/12/77
16. DATE T.D. REACHED: 3/13/77
17. DATE COMPL. (Ready to prod.): Abandoned 3/15/77
18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*: 7' GL (est); 27' KB (est)
19. ELEV. CASINGHEAD: 7' (est)

20. TOTAL DEPTH, MD & TVD: 11,535' MD
21. PLUG, BACK T.D., MD & TVD: 2255' MD
22. IF MULTIPLE COMPL., HOW MANY*: N/A
23. INTERVALS DRILLED BY: →
ROTARY TOOLS: 0-11,535
CABLE TOOLS: None

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: N/A

25. WAS DIRECTIONAL SURVEY MADE: No

26. TYPE ELECTRIC AND OTHER LOGS RUN: DIL, BHC-Sonic/GR, FDC/CNL/GR, HRD, Velocity Survey

27. WAS WELL CORED: Yes

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	133#	447'	26"	2600 sx Permafrost II	None
13 3/8"	72#	2509'	17 1/2"	3925 sx Permafrost II	None
9 5/8"	53.5#	8147'	12 1/4"	1000 sx Class "G"	2370'

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

31. PERFORATION RECORD (Interval, size and number): N/A

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED

33.* PRODUCTION

DATE FIRST PRODUCTION: N/A
PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump): N/A
WELL STATUS (Producing or shut-in): P and A

DATE OF TEST | HOURS TESTED | CHOKE SIZE | PROD'N FOR TEST PERIOD → | OIL—BBL. | GAS—MCF | WATER—BBL. | GAS-OIL RATIO

FLOW. TUBING PRESS. | CASING PRESSURE | CALCULATED 24-HOUR RATE → | OIL—BBL. | GAS—MCF | WATER—BBL. | OIL GRAVITY-API (CORR.)

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)

TEST WITNESSED BY

35. LIST OF ATTACHMENTS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

SIGNED _____ TITLE Drilling Manager DATE _____

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTRUCTIONS

REVISED 6/28/83

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: "Sacks Cement": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

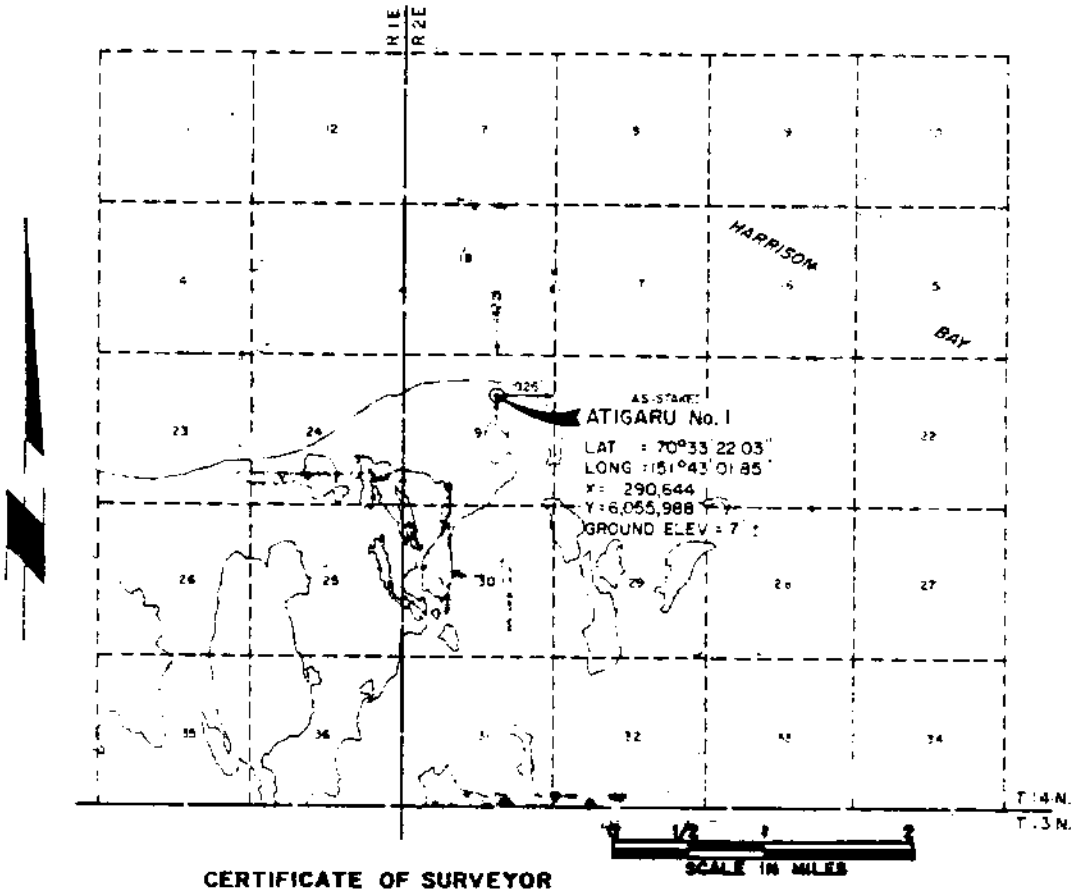
37. SUMMARY OF POROUS ZONES:
SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH
Tertiary - Late Cretaceous undivided	545'	
Nanushuk Group	3410'	
Torok Formation	5520'	
"Pebble Shale"	7275'	
Kingak Formation	7317'	
Sag River Sandstone	8190'	
Shublik Formation	8348'	
Sadlerochit Group		
Ivishak Formation	8595'	
Kavik Shale Member	9242'	
Echooka Formation	9412'	
Lisburne Group	9494'	
Endicott Group	10,890'	
Argillite	11,328'	

U.S. GOVERNMENT PRINTING OFFICE 1983 O-680616



CERTIFICATE OF SURVEYOR

I hereby certify that I am properly registered and licensed to practice land surveying in the State of Alaska and that this plat represents a location survey made by me or under my supervision, and that all dimensions and other details are correct.

STATE OF ALASKA
49TH
Andrew F. Potts

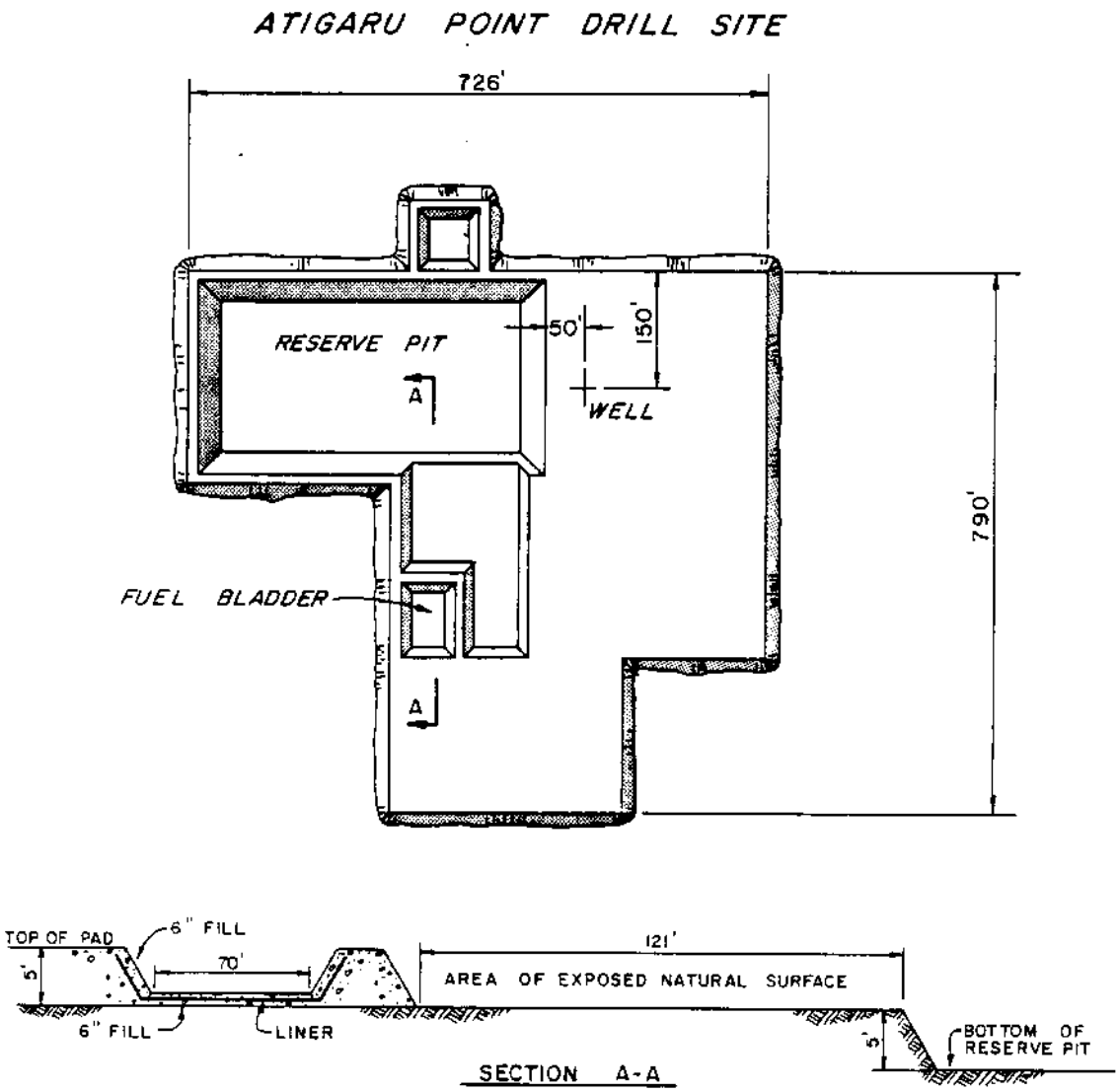
7-22-76
Date

Andrew F. Potts
SURVEYOR

AS-STAKED
ATIGARU No. 1
Located in
[illegible]

Surveyed for
HUSKY OIL
N.P.R. OPERATIONS INC.

Surveyed by
F. M. LINDSEY & ASSOC.
LAND & HYDROGRAPHIC SURVEYORS
2502 West Northern Lights Boulevard Box [illegible]
Anchorage



DRILL PAD DRAWING

OPERATIONS HISTORY

DATE AND FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
12/31/76	Began rigging up (total Herc loads: 99). Rigged up matting boards, substructure, draw works, cat works, and one motor section. Six percent rigged up.
1/1/77	Set two motors and two mud pumps. Set suction tank and dog house. Set derrick on floor and raised A frame. Twelve percent rigged up.
1/2/77	Set two mud tanks; hooked up same. Hooked up shale shaker, desander, and gas buster. Set shop building. Received 10,000-gallon tanker, 26" hole opener. Eighteen percent rigged up.
1/3/77	Set hot-air heater and ducts. Installed pit liner; set bladder tank. Began setting up wind walls. Twenty-four percent rigged up.
1/4/77	Rigged up wind walls around pumps, motors, and pits. Set two water tanks, one light plant, parts house, two boilers. Set fuel tank on parts house. Thirty percent rigged up.
1/5/77	Started rig generator and No. 2 hot-air heater. Rigged up pump suctions and miscellaneous lines. Strung lights. Set suitcases and hooked up same. Thirty-six percent rigged up.
1/6/77	Hooked up fuel, water, steam, electrical lines. Rigged up mixing pumps, set floor sheds, started No. 2 hot-air heater. Fifty percent rigged up.
1/7/77	Finished floor sheds, hooked up miscellaneous lines, put board on derrick, set catwalk and blocks, strung up derrick. Hooked up compound and draw-works chains. Fired boilers. Set Howco house and tanks. Fifty-eight percent rigged up.
1/8/77	Dressed deck; hooked desander and desilter lines; hooked up right-angle drive on draw works. Hooked up steam heaters, repaired steam lines. Prepared to offload cement (set tanks on low boy). Sixty-five percent rigged up.

1/9/77	Hooked up miscellaneous lines, finished dressing derrick, repaired steam heaters and hooked up. Raised derrick. Rigged up floor. Seventy-five percent rigged up.
1/10/77	Rigging up floor, worked on mud pumps, rigged up miscellaneous parts. Received two loads of cement. Eighty-one percent rigged up.
1/11/77	Rigging up floor (rotary chain, chain guard). Nippled up on 30" conductor and flow line. Welded on 4" nipples. Cemented 30" conductor. Cemented "U" tube. Used 300 sacks Permafrost II. Need about 250 (estimated) sacks more to complete job. Rigged up shale shaker, desander, desilter. Ninety percent rigged up.
1/12/77	Rigged up rotary tools, kelly cock, swivel; worked on mixing pumps. Filled mud tanks with water. Recemented 30" conductor with 200 sacks Permafrost II. Ninety-eight percent rigged up.
1/13/77 330'	TD: 429'. Completed rig up. Spudded well at 4:00 p.m. Drilled out cement at 50'. Drilled to 429', plugged bit. Pulled out of hole. Picked up 26" hole opener. Mixed mud and revamped mud hopper.
1/14/77 96'	TD: 525'; MW: 9.3; Vis: 46. Rebuilt mud hopper, opened 26" hole from 50' to 430'. Drilled 26" hole to 525'. Pulled out of hole. Prepared to mud up.
1/15/77 0'	TD: 525'; MW: 9.2; Vis: 150. Waited on water. Mixed and conditioned mud.
1/16/77 20'	TD: 545'; MW: 10.2; Vis: 190. Mixed and conditioned mud. Going in hole. Drilled to 545', circulated and conditioned hole. Pulled out of hole. Rigged up and ran eleven joints 20", 133#, K-55, Buttress. Set at 447'. Circulated cement, pumped 40 barrels water, 2,600 sacks Permafrost II at 14.6-14.8 ppg. Displaced with 6-1/2 barrels mud. Full returns to surface at 14.5 ppg. Cement in place at 3:35 a.m., 1/16/77. Centralizers at 437' plus first 3 collars.
1/17/77 0'	TD: 545'. Waited on cement. Nippled down. Installing 20" head.
1/18/77 0'	TD: 545'. Welded on 20" head and tested to 750 psi. OK. Set in drilling spool and preventer. Set in 4" blowdowns. Tested blowout preventer to 1,000 psi. Nippled up flow line and drill nipple.

1/19/77 0'	TD: 545'; MW: 8.7; Vis: 70. Nippled up flow line, picked up bottom-hole assembly, tested casing to 650 psi; leaked off to 250 psi. Drilled out shoe at 447'. Drilled out cement. Pulled up in casing. Circulated and conditioned mud. Waited on cement haul. Received two loads of cement.
1/20/77 1143'	TD: 1688'; MW: 9.5; Vis: 90. Conditioned mud; waited on cement haul. Drilled to 1688'.
1/21/77 822'	TD: 2510'; MW: 9.3; Vis: 47. Ran survey at 1712'. Drilled to 2510'. No fill on connections.
1/22/77 10'	TD: 2520'; MW: 9.6; Vis: 65. Drilled to 2520'. Tripped out and rigged up Schlumberger. Ran DIL and tool stopped at 1140'. Made second attempt and tool stopped at 760'. Tripped in with no tight spots. Conditioned hole and tripped out. Ran DIL and tool stopped at 1135'. Tripped in with tight spots between 1200' and 2000'. Circulated and conditioned mud.
1/23/77 0'	TD: 2520'. Made short trip. Tripped out and rigged up Schlumberger. Ran DIL from 2520' to 447'. Ran BHC-Sonic from 2520' to 447'. Tripped in to condition hole. Tripped out and rigged up to run casing. Running 13-3/8" casing (23 joints in at 6:00 a.m.).
1/24/77 0'	TD: 2520'; MW: 9.5; Vis: 55. Ran 75 joints 13-3/8", 72#, S-95, Buttress casing. Set at 2509.63' KB. Duplex collar at 2429.92'. Circulated and pumped 20 barrels water spacer. Mixed and pumped 3,925 sacks Permafrost II cement (14.4 to 14.8 ppg). Full returns. Returned 55 barrels cement with maximum density of 14.7 ppg. Displaced with 35 barrels mud. Float held OK. Cement in place at 6:30 p.m., 1/23/77. Set 13-3/8" casing slips (string weight 105,000 pounds).
1/25/77 0'	TD: 2520'. Set back 20" Hydril and spool. Installed 20", 2,000 x 13-5/8", 5,000 OCT unihead. Tested 20" flange and packoff to 2,000 psi. OK. Installed and nippled up 13-5/8", 5,000 psi, blowout-preventer stack and hooked up choke and kill lines. Velocity survey holes complete and loaded.
1/26/77 0'	TD: 2520'. Built choke and manifold lines. Installed Cameron choke. Connected choke and flare lines. Prepared to test preventers.
1/27/77 10'	TD: 2530'; MW: 9.2; Vis: 42. Completed nipple up, tested Hydril to 3,000 psi, blowout preventer and

	manifold to 5,000 psi. Tripped in hole and laid down 18 joints of drill pipe. Tested casing to 2,500 psi. OK. Drilled float collar and 60' of cement. Tested shoe to 2,500 psi. Drilled 10' of formation. Tested formation with 400 psi. OK.
1/28/77 631'	TD: 3161'; MW: 8.9; Vis: 38. Repaired Totco line and mud line. Unplugged flow line. Fished stripper rubber out of blowout preventer. Checked blowout preventer. Drilled to 3161'.
1/29/77 929'	TD: 4090'; MW: 9.2; Vis: 40. Steel-line measure correction 3161' to 3114'. Drilled ahead.
1/30/77 757'	TD: 4847'; MW: 9.4; Vis: 38. Drilling.
1/31/77 561'	TD: 5408'; MW: 9.5; Vis: 45. Drilled to 5124'. Tripped for bit. Slipped drilling line.
2/1/77 657'	TD: 6065'; MW: 9.5; Vis: 43. Drilled to 6065'. Dropped survey. Tripped for Bit No. 9.
2/2/77 629'	TD: 6694'; MW: 9.5; Vis: 43. Drilling.
2/3/77 349'	TD: 7043'; MW: 9.5; Vis: 42. Drilled to 6911'. Dropped survey. Tripped for Bit No. 10.
2/4/77 487	TD: 7530'; MW: 9.5; Vis: 45. Drilled to 7530' and tripped for bit. Dropped survey. Began adding 2 to 2-1/2 lb./bbl. Soltex to mud system at about 7250'. Kingak sample top: 7360'.
2/5/77 447'	TD: 7977'; MW: 9.8; Vis: 42. Slipped drilling line. Completed trip in. Drilled to 7977'. Dropped survey. Tripped out for bit (steel-line measure out of hole).
2/6/77 173'	TD: 8150'; MW: 10.5; Vis: 43. Tripped in. Washed and reamed 120' to bottom at 7977'. Drilled and increased mud weight. Drilled to 8150' and made short trip. Tight hole at 7820'. Built weight and conditioned mud.
2/7/77 0'	TD: 8150'; MW: 10.6; Vis: 43. Ran DIL, FDC/CNL, BHC-Sonic, and HDT from 8147' to 2507'. Ran 30-shot sidewall core gun. Running second sidewall core gun.
2/8/77 0'	TD: 8150'; MW: 10.7; Vis: 48. Ran 90 sidewall cores. Recovered 66 cores and all cups. Tripped in. Thirty-nine feet of fill. Made two short trips. Spotted 20-barrel pill on bottom for shale control.

2/9/77 0'	TD: 8150'; MW: 10.7; Vis: 46. Ran 206 joints 9-5/8", 53.5#, S-95, Buttress R3 casing. Set at 8147.36' KB. Float collar at 8065.71'. Ran 11 centralizers on bottom 17 joints; FOs at 2351.58' and 2191.39' with centralizers above and below each. Hooked up circulating head; circulated and prepared to cement.
2/10/77 0'	TD: 8150'. Cemented 9-5/8" casing. Pumped 50 barrels water, bottom plug, 1,000 sacks Class "G" with 1% CFR-2 + 0.2% HR-7 (15.8 to 16.1 ppg slurry), top plug, and displaced with 587 barrels mud. Bumped plug at 3,000 psi. Cement in place at 8:27 a.m., 2/9/77. Installed 9-5/8" pack-off and tested to 5,000 psi. Laid down 8" drill collars. Changed rams and tested stack to 5,000 psi and Hydril to 3,000 psi. OK. Picked up bottom-hole assembly.
2/11/77 118'	TD: 8268'; MW: 10.6; Vis: 42. Picked up bottom-hole assembly and ran in to plug at 8053'. Tested casing to 3,000 psi. OK. Drilled cement to 8142' and retested casing to 3,000 psi. OK. Drilled out ±10' of formation and tested to 0.61 psi/ft. gradient. OK.
2/12/77 62'	TD: 8330'; MW: 10.7; Vis: 44. Drilled ahead to 8268'. Pulled out of hole. Left two cones in hole. Ran in hole with Bit No. 14. Drilled on junk and drilled ahead. Pulled out of hole. Recovered iron in junk basket. Ran in hole with Bit No. 15. Drilling ahead.
2/13/77 220'	TD: 8550'; MW: 10.7; Vis: 47. Drilling ahead.
2/14/77 115'	TD: 8665'; MW: 10.5; Vis: 42. Drilled ahead to 8600'. Tripped for bit. Drilling ahead.
2/15/77 77'	TD: 8742'; MW: 10.5; Vis: 50. Drilled ahead to 8712'. Pulled out of hole to cut Core No. 1. Picked up core barrel. Cut Core No. 1: 8712-8742'.
2/16/77 163'	TD: 8905'; MW: 10.4; Vis: 45. Core No. 1: 8712-8742'. 100% recovery. Picked up Bit No. 17. Drilling ahead.
2/17/77 201'	TD: 9106'. Drilled ahead to 9054'. Pulled out of hole with Bit No. 17. Going in hole with Bit No. 18. Reamed to bottom. Drilling ahead.
2/18/77 157'	TD: 9263'; MW: 10.4; Vis: 44. Drilled to 9123' and tripped for bit. Tested blowout preventers. Tripped in. Lost 200 barrels mud while drilling and tripping. Added lost-circulation material to system.

2/19/77 143'	TD: 9406'; MW: 10.4; Vis: 46. Drilled ahead to 9406'. Dropped survey. Pulled out of hole. Picked up new bit. Going in hole. Full returns. No lost circulation on trip.
2/20/77 190'	TD: 9596'; MW: 10.4; Vis: 40. Drilling ahead. No mud loss. Lisburne: 9495'.
2/21/77 132'	TD: 9728'; MW: 10.4 Vis: 47. Pulled out of hole with Bit No. 20. Jars washed out at piston bowl. Picked up new jars. Drilled ahead.
2/22/77 127'	TD: 9855'; MW: 10.5; Vis: 44. Drilled ahead to 9855'. Pulled out of hole for new bit. Going in hole.
2/23/77 180'	TD: 10,035'; MW: 10.5; Vis: 43. Drilling ahead.
2/24/77 130'	TD: 10,165'; MW: 10.4; Vis: 42. Drilled ahead to 10,041'. Tripped for new bit. Drilling ahead.
2/25/77 97'	TD: 10,262'; MW: 10.4; Vis: 50. Lost 150 barrels mud while drilling; seepage type loss.
2/26/77 160'	TD: 10,422'; MW: 10.3; Vis: 54. Increased pit volume by 270 barrels.
2/27/77 98'	TD: 10,520'; MW: 10.4; Vis: 43. Changed out shock sub. Laid down No. 31992; picked up No. 32165.
2/28/77 135'	TD: 10,655'; MW: 10.4; Vis: 44. Drilling ahead.
3/1/77 76'	TD: 10,731'; MW: 10.4; Vis: 45. Lost 70 barrels mud due to seepage. Tested blind and pipe rams, choke, kelly cock to 5,000 psi. OK. Tested Hydril to 3,000 psi. OK.
3/2/77 27'	TD: 10,758'; MW: 10.4; Vis: 43. Drilled ahead to 10,731'. Pulled out of hole for new bit. Drilling ahead.
3/3/77 51'	TD: 10,809'; MW: 10.5; Vis: 44. Lost 400 pound pump pressure. Pulled out of hole. Shock-sub mandrel washed out (Serial No. 32165) at 57-1/4 hours.
3/4/77 74'	TD: 10,883'; MW: 10.4; Vis: 43 (Kayak Shale sample top: 10,825'). Drilling ahead.
3/5/77 70'	TD: 10,953'; MW: 10.4; Vis: 44. Drilled ahead; tripped for bit.

3/6/77 124'	TD: 11,077'; MW: 10.4; Vis: 46. Drilling ahead.
3/7/77 152'	TD: 11,229'; MW: 10.4; Vis: 43. Drilling ahead.
3/8/77 145'	TD: 11,374'; MW: 10.4; Vis: 41. Drilling ahead.
3/9/77 65'	TD: 11,439'; MW: 10.4; Vis: 47. Hole OK on trip. Drilling ahead.
3/10/77 75'	TD: 11,514'; MW: 10.4; Vis: 46. Top of Argillite: 11,375'. Survey misrun. Rigging up to log.
3/11/77 0'	TD: 11,514'. Ran DIL, BHC-Sonic, FDC/CNL, HRD from their total depth of 11,520'. Running Velocity Survey. Short in line. Attempting to find short.
3/12/77 6'	TD: 11,520'; MW: 10.4; Vis: 46. Ran Velocity Survey. Going in hole with bit and circulating and conditioning mud. Drilled 5' of new hole. Pulled out of hole for core barrel.
3/13/77 15'	TD: 11,535'; MW: 10.5; Vis: 48. Picked up core barrel. Cut Core No. 2: 11,520-11,535'. Recovered 13'. Rigged up Schlumberger, ran DIL (misran), ran FDC/CNL.
3/14/77 0'	TD: 11,535'; MW: 10.5; Vis: 48. Finished FDC/CNL/GR log. Ran HDT-Dipmeter, Velocity Survey and CCL. Attempted 69 sidewall cores (38 misfires, 17 empties, 1 lost, 13 recovered). Laid down 6-1/2" drill collars and drill pipe.
3/15/77 0'	TD: 11,535'; PBTD: 7837'; MW: 10.5; Vis: 40. Set Plug No. 1: 9460-9260'; 115 sacks "G" (3/14/77). Set Plug No. 2: 8650-8450'; 95 sacks "G" (3/14/77). Set Plug No. 3, 8350-8100'; 125 sacks "G". Set Plug No. 4. Retainer at 7900'. Tested to 2,500 psi. OK. Set 25 sacks "G" plug on retainer 3/15/77. Laid down drill pipe.
3/16/77 0'	PBTD: 2255'; MW: 10.4; Vis: 37. Laid down drill pipe. Cut 9-5/8" at 2370'. Pulled out of hole. Rigged up casing tools; pulled 59 joints of 9-5/8" casing plus cut off plus FOs. Set 100 sacks "G" plug at 2355-2255', 3/16/77. Pulled up to 2155'. Reversed out mud.
3/17/77	PBTD: 2255'. Reversed out mud with 330 barrels water. Reversed out water with 326 barrels diesel.

	Laid down 90 joints of 4-1/2" drill pipe. Broke and laid down kelly. Set out rig floor. Nippled down blowout-preventer equipment.
3/18/77	Cleaned mud pits. Installed well marker. Released rotary rig at 6:00 a.m., 3/18/77. Rigging down.

DRILLING TIME ANALYSIS

ATIGARU POINT NO. 1

PARCO, INC., RIG 95

Spudded 1/12/77; Rig released 3/18/77

Total Depth: 11,535 Feet

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1976 12-18																							24		Preparing to Fly Rig
12-19																							24		Flying Rig
12-20																							24		Flying Rig
12-21																							24		Flying Rig
12-22																							24		Flying Rig
12-23																							24		Flying Rig
12-24																							24		Flying Rig
12-25																							24		Flying Rig
12-26																							24		Flying Rig
12-27																							24		Working On Camp
12-28																							24		Working On Camp
12-29																							24		Working On Camp
12-30	24																							Rigging Up	
12-31	24																							Rigging Up	
1977 1-1	24																							Rigging Up	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1-2	24																							Rigging Up	
1-3	24																							Rigging Up	
1-4	24																							Rigging Up	
1-5	24																							Rigging Up	
1-6	24																							Rigging Up	
1-7	24																							Rigging Up	
1-8	24																							Rigging Up	
1-9	24																							Rigging Up	
1-10	24																							Rigging Up	
1-11	24																							Rigging Up	
1-12	16	7½		½																				Rigging Up	Well Spudded 4:00 p. m.
1-13			17½																				6½	Laying Down D. C.	Reamed 17½" Hole
1-14				½				14½															9	Waiting on Water & Weather	
1-15		1½	2	5				7½		8														Circulate & Condition Mud	Ran 20" Casing
1-16				½				1		2	9½	8½											2½	W.O.C.	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1-17												24												Nipple Up BOP	Welded on 20" Casing Head
1-18			2½	6				3				11½	½										½	Nipple Up BOP	Drilled Out Cement
1-19		11		½			1	11½																Circulate & Condition Mud	
1-20		12½		4½	½	½	1	4															1	Drilling	
1-21		5¼		9¼	½			3	5½															Condition Mud & Circulate	
1-22			5½	10				4	4½															Condition Mud & Circulate	
1-23				3				1¾		19¼														Rig Up & Run Casing	Ran 13 3/8" Casing
1-24				1½								22½												Nipple Up, Test Casing Hanger W/2000 PSI	
1-25												24												Nipple Up	
1-26				6¼								13	4¾											Nipple Up	
1-27		7¾		1½			4½			5													5¼	Drilling	
1-28		11¾		6½			2½																3¼	Changed Bits Worked BOP	
1-29		15¼	½	5			¼	1½															1½	Drilling	P.O.H. For Bit No. 7
1-30		14¼		6¼		½		1½															1½	Drilling	
1-31		23¾				¼																		Drilling	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ARIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
2-1		12		8	½	½		1															2	Trip	
2-2		15		6½		½		2																Drilling	
2-3		20½		½				3																Drilling	P. O. H. For Bit No. 11
2-4		16		5¼																			2¼	Cut & Slip Drilling Line	
2-5		5	2¾	10				6¼																P.O.H.,S. L. M. Out	
2-6				5				5½	13½															Building Mud Weight	Ran Schlumberger Wireline Logs
2-7			1¾	10½				4¼	7½															Logging	
2-8										24														Running Casing	Ran 9 5/8" Casing
2-9									3	15		3											3	Circulating	Ran 9 5/8" Casing
2-10		6¼								7¼		3	3										4½	Making Up Bit, Bit Sub and Shock Tool	Ran 9 5/8" Casing
2-11		4		13¼	½			2½															3¾	P.O.H.	Tested 9 5/8" Casing
2-12		19¾	¼	2																			1½	Drilling	R.I.H. W/Bit No. 15
2-13		13½	½	9	½		½																	Drilling	Tripped For Bit No. 16
2-14		10		7¼	½		½	3½									2¼							Drilling	Tripped for Core No. 1
2-15		9¾	½	5¾			½										5						2½	P.O.H.	R.I.H. W/Bit No. 17

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

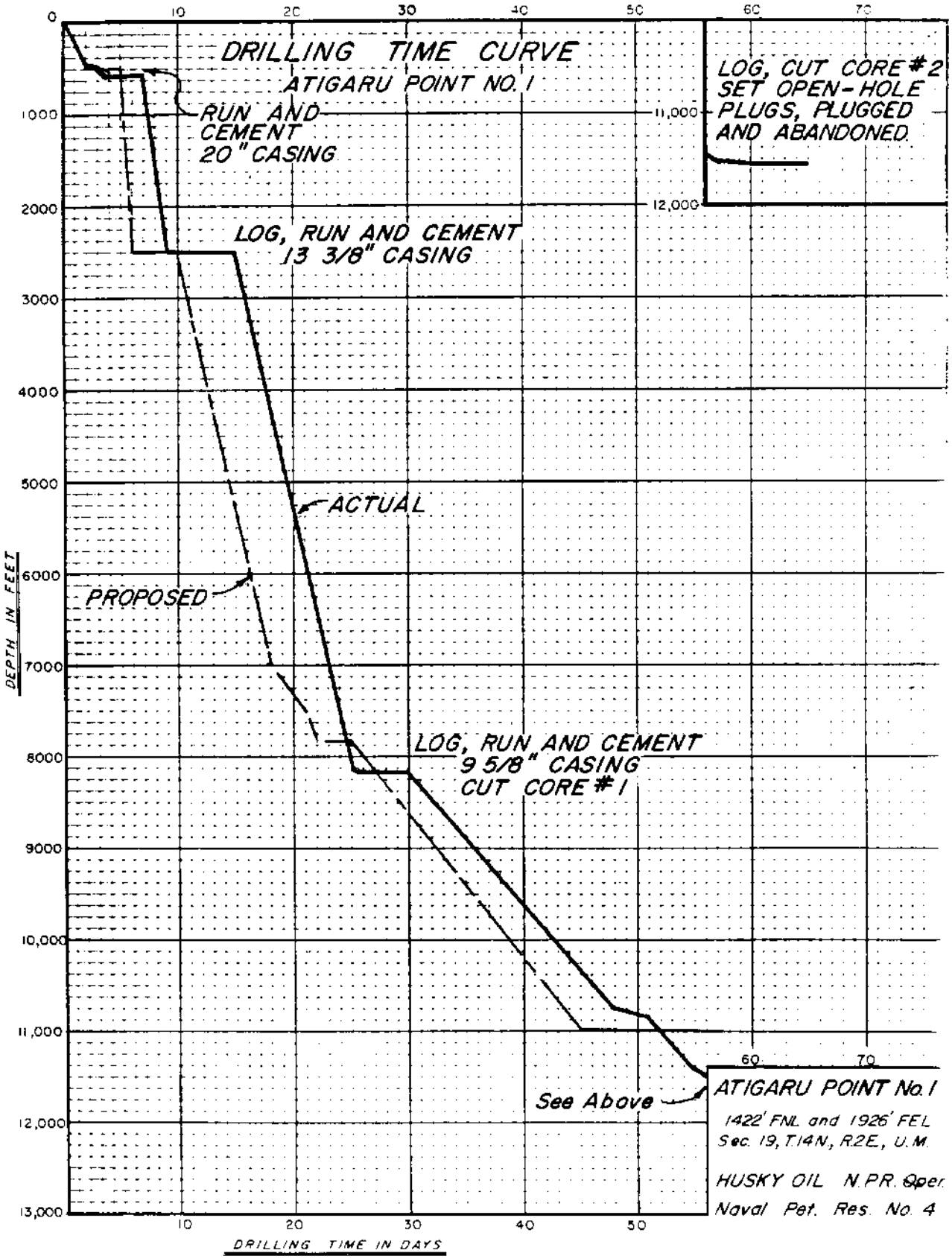
DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
2-16		16½		4	½		½	1½															1¼	Drilling	Tripped For Bit No. 18
2-17		11	¼	8¼	½			1½					2											Drilling	R.I.H. W/Bit No. 19
2-18		19		2¼	½		2¼																	Drilling	Tripped Out For Bit No. 20
2-19		17½	¼	5¼			½	½																Wash 60' To Bottom	
2-20		15	¼	6¼	½		¼																1¾	Drilling	R.I.H. W/Bit No. 21
2-21		22¼		½	½		½																¼	Drilling	
2-22		17	¼	6¼			¼																¼	Trip For Bit	
2-23		15	½	7	½																		1	Drilling	R.I.H. W/Bit No. 23
2-24		16¼	¼	7	½																			Drilling	Tripped For Bit No. 24
2-25		24																						Drilling	
2-26		14	½	8	½																		1	Trip Out	R.I.H. W/Bit No. 25
2-27		24																						Drilling	
2-28		16½		5½	½								1½											Drilling	P.O.H. For Bit No. 26
3-1		8¾	½	11			3																¾	Drilling	R.I.H. W/Bit No. 27
3-2		15		8																			1	Drilling	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
3-3		19¼					4¾																	Drilling	
3-4		22¼		1¼	½																			Drilling	Tripped For Bit No. 29
3-5		16½	½	5½				1½																Reaming	
3-6		24																						Drilling	
3-7		24																						Drilling	
3-8		12¼	½	9¾	½																		1	Drilling	R.I.H. W/Bit No. 30
3-9		18		1½	½			4																Drilling	
3-10				4			2		18															Logging	Ran Schlumberger Wireline Logs
3-11		1¼	½	4¾				3½	14															Logging	Circulated For Core No. 2
3-12			1¾	13¼													5					3½		Trip For Core Barrel	Cut Core No. 2
3-13				3½					20½															Logging	
3-14				12¼				3		3¼													5½	Strap In Hole To Set First Plug	
3-15				6½				½															17	Laying Down Drill Pipe	
3-16				5				8¾		1		6											3¼	Circulating Mud	
3-17	18																						6	Cleaning Mud Pits	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. ATIGARU POINT NO. 1

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
3-18	24																							Laying Down Derrick	Released Rig at 6:00 a. m.
3-19	24																							Rigging Down	
3-20	24																							Rigging Down	
3-21	24																							Rigging Down Shop	
3-22	24																							Stacking Out Rig	
3-23	24																							Stacking Out Rig	
TOTAL HOURS	490	631¼	40¼	298¼	9	2¼	24¾	106	86½	84¾	9½	115½	11¾	-0-	-0-	-0-	12¼	-0-	-0-	-0-	-0-	3½	378½		


DRILLING TIME CURVE
ATIGARU POINT NO. 1
RUN AND CEMENT 20" CASING
LOG, RUN AND CEMENT 13 3/8" CASING
ACTUAL
PROPOSED
LOG, RUN AND CEMENT 9 5/8" CASING CUT CORE #1
LOG, CUT CORE #2 SET OPEN-HOLE PLUGS, PLUGGED AND ABANDONED
See Above
ATIGARU POINT No. 1
1422' FNL and 1926' FEL
Sec. 19, T.14N., R.2E., U.M.
HUSKY OIL N.P.R. Oper.
Naval Pet. Res. No. 4
DEPTH IN FEET
DRILLING TIME IN DAYS
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
11,000
12,000
13,000
10
20
30
40
50
60
70

Milchem® Drilling Fluids Division

MILCHEM INCORPORATED / P. O. BOX 22111 / HOUSTON, TEXAS 77027

DRILLING MUD RECAP

Contractor PARCO OPERATOR HUSKY OIL COMPANY NPR OPERATIONS LEGAL DESCRIPTION

Rig No. 95 Well Name And No. ATIGARU POINT #1 Field NPR #4 COUNTY NORTH SLOPE STATE ALASKA

Milchem Well No. Milchem Warehouse Spud Date 1/12/77 No. Drilling Days To T.D. DATE T.D. REACHED 3/11/77 TOTAL DEPTH 11535 TOTAL COST $

CASING PROGRAM Depth (ft)	Size (in)	BITS No.	Size (in)	TYPE MUD SYSTEM Type	Depth Interval (ft)	SOLIDS CONTROL EQUIPMENT Type	Depth Interval (ft)
99	30	1	26	SPUD	0- 1260	DESANDER	0- TD
447	20	3	17 ½	LIGNOSULFONATE	1260- TD	DESILTER	0-8000
2,509	13 3/8	9	12 ¼				
8,147	9 5/8	18	8 ½				

ADDITIONAL INFORMATION

Pump Specifications

D.P. and D.C.

Other

DATE (1977)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (sec/qt) API	°F	PLASTIC VISCOSITY cp @	°F	YIELD POINT (lb/100ft²)	GELS (lb/100ft²) 0/10	pH	FILTRATE (ml/30 min) API	HT-HP	°F	Cake (32nd in)	Alkalinity P_m	P_f / M_f	Chloride (ppm)	Calcium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	Oil (% by Vol.)	Water (% by Vol.)	Methy. Blue (me/ml mud)				Circ. Volume (bbl)	REMARKS
1/13	2:30A	490	9.3	46		13		12	10/14	8.5	20+			3		.1/.3	1200	240	5	9	0	91					390	Lost vol to hole & across shaker. Out of water due to storm.
1/14	12:00P	530	9.2	150+		-		-	-	8.0	N/C			-		.1/.2	800	40	2	13	0	87						Build vol w/150+ vis
1/16	3:20A	545	10.2	190+		-		-	-	8.0	N/C			-		.1/.3	900	60	1.5	14	0	86						Rap 20" csg-woc-VG readings off scale
1/18																												Nipple up 20"
1/19	12:00P		8.7	70		-		-	-	-	-			-		-	-	-	-	-	-	-						Building vol w/150+ vis
1/20	12:00A	600	8.9	200		-		-	-	-	-			-		-	-	-	-	-	-	-						" " " "
1/20	12:00P	1200	8.8	80		-		-	-	8.5	N/C			-		.1/.4	850	180	3/4	-	-	-						Drlg out of gravel into clay lowered vis to 80
1/20	5:00A	1623	9.5	90		40		32	3/20	8.5	18			4		.1/.4	850	180	1	9	0	91					976	Loosing mud at shaker
1/21	5:00A	2495	9.3	47		22		14	1/7	8.0	14.6			2		.1/.4	700	125	3/4	9	0	91					824	Plugged flow line-build vol w/low vis
1/22	5:00A	2510	9.6	65		36		20	4/10	8.0	8.4			2		.1/.5	700	125	3/4	9	0	91					1328	Cond hole to log
1/23	10:30P	2510	9.5	55		26		16	3/8	8.0	9.8			2		.1/.4	700	120	1	9	0	91					1328	Cond mud to run csg
1/24	12:00P	2510	9.5	55		26		16	3/8	8.0	9.8			2		.1/.4	700	120	1	9	0	91					973	WOC
1/25	12:00P	2510	9.5	51		26		16	2/6	8.0	9.8			2		.1/.3	700	120	1	9	0	91					973	Testing BOP
1/26	4:00A	2517	9.2	42		13		7	3/15	8.0	16.0			2		.2/.7	1600	160	1	6.5	0	93.5					947	Drlg out 13 3/8 csg
1/27	4:00A	3152	8.9	38		8		4	3/8	8.0	9.8			2		.2/.5	1300	80	tr	5	0	95					1140	
1/28	4:00A	3921	9.2	40		12		6	2/3	12.0	8.0			2		2.0/4.0	1300	60	tr	6	0	94					1189	Raised Ph
1/29	3:00A	4725	9.4	38		9		6	1/3	9.0	9.0			2		.2/.5	1300	60	tr	8	0	92					1240	
1/30	4:00A	5345	9.5	45		10		8	1/4	8.5	9.0			2		.2/.6	1300	60	tr	8	0	92					1350	
1/31	12:00P	6065	9.4	40		9		8	1/3	9.0	8.5			2		.2/.7	1300	35	tr	8	0	92					1452	

Date

Milchem Technical Representative JIM LARY & BILL HUBBARD District ALASKA Region CANADA

TSD- DMR (1) - 1/71

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Milchem® Drilling Fluids Division

MILCHEM INCORPORATED / P. O. BOX 22111 / HOUSTON, TEXAS 77027

DRILLING MUD RECAP

Contractor: PARCO OPERATOR: HUSKY OIL COMPANY NPR OPERATIONS LEGAL DESCRIPTION:

Rig No.: 95 Well Name And No.: ATIGARU POINT #1 Field: NPR #4 COUNTY: NORTH SLOPE STATE: ALASKA

Milchem Well No.: Milchem Warehouse: Spud Date: 1/12/77 No. Drilling Days To T.D.: DATE T.D. REACHED: 3/11/77 TOTAL DEPTH: 11535 TOTAL COST $:

CASING PROGRAM Depth (ft)	Size (in)	BITS No.	Size (in)	TYPE MUD SYSTEM Type	Depth Interval (ft)	SOLIDS CONTROL EQUIPMENT Type	Depth Interval (ft)
99	30	1	26	SPUD	0- 1260	DESANDER	0- TD
447	20	3	17 ½	LIGNOSULFONATE	1260- TD	DESILTER	0- 8000
2,509	13 3/8	9	12 ¼				
8,147	9 5/8	18	8 ½				

ADDITIONAL INFORMATION
Pump Specifications:
D.P. and D.C.:
Other:

DATE (1977)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY API@	°F	PLASTIC VISCOSITY cp @	°F	YIELD POINT (lb/100ft²)	GELS (lb/100ft²) 0/10	pH	FILTRATE API	HT-HP	°F	Cake (32nd in)	Alkalinity P_m	P_f/M_f	Chloride (ppm)	Calcium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	Oil (% by Vol.)	Water (% by Vol.)	Methy. Blue (lbs/bbl mud)				Circ. Volume (bbl)	REMARKS
2/1	5:00A	6550	9.5	43		11		9	1/4	9.5	9.2			2		.1/.5	1250	70	tr	9	0	91					1455	drlg ahead no problems
2/2	4:00A	7025	9.5	42		14		9	1/4	9.8	8.0			2		.1/.5	1250	75	tr	9	0	91					1569	" " " "
2/3	3:00A	7580	9.5	45		14		14	2/6	10.0	7.7			2		.2/.5	1250	75	½	10	0	90					1637	" " " "
2/4	3:00A	7977	9.8	42		10		10	2/8	10.0	5.5			2		.3/.6	1250	80	tr	11	0	89					1681	inc mud wt to 9.8 -lower FL to approx 5cc
2/5	5:00A	8150	10.5	43		14		8	2/8	9.5	5.2			2		.2/.5	1250	80	tr	14	0	86					1642	inc mud wt to 10.6 prior to logging
2/6	2:00A	8150	10.6	43		14		8	2/8	9.5	5.2			2		.2/.5	1250	80	tr	14	0	86					1642	
2/7	2:30A	8150	10.7	48		15		8	2/7	9.5	5.0			2		.2/.4	1250	80	tr	14	0	86					1642	Spotted hi-vis pill on bottom-POH to run 9 5/8
2/8	2:00A	8150	10.7	46		15		7	2/8	9.5	5.3			2		.2/.5	1250	80	tr	14	0	86					-	Run 9 5/8 csg
2/9	12:00P	8150	10.6	44		14		6	1/4	9.0	5.4			2		.1/.3	1250	80	tr	13	0	87						WOC
2/10	1:00A	8268	10.6	42		14		6	1/4	11.0	5.8			2		1.1/2.6	1250	tr	tr	15	0	85					1135	Drlg 80' cement
2/11	4:00A	8300	10.7	46		15		7	1/3	10.5	5.4			2		.8/1.8	1250	40	½	16	0	84					1137	
2/12	12:00P	8499	10.7	47		15		6	1/4	10.5	4.2			2		.7/1.5	1250	40	½	16	0	84					1200	
2/13	3:00A	8644	10.5	42		14		7	1/4	10.0	4.4			2		.7/1.6	1250	60	½	16	0	84					1260	
2/14	10:00P	8714	10.5	50		18		10	2/5	10.0	5.1			2		.7/1.4	1250	50	½	16	0	84					1215	
2/15	12:00P	8800	10.4	45		16		9	2/5	10.0	5.0			2		.6/1.4	1250	50	½	15	0	85					1213	
2/16	5:00A	9100	10.4	52		19		12	2/5	9.5	5.1			2		.5/1.2	1300	50	3/4	16	0	84					1211	
2/17	3:00A	9235	10.4	44		16		8	2/6	10.0	5.2			2		.5/1.4	1300	50	3/4	16	0	84					998	
2/18	4:00A	9406	10.4	46		18		10	2/6	10.0	4.8			2		.6/1.6	1300	50	½	16	0	84					1105	
2/19	3:00A	9600	10.4	40		16		6	1/4	10.0	5.1			2		.6/1.6	1275	50	½	16	0	84					1158	
2/20	4:00A	9700	10.4	47		18		10	2/6	10.0	4.9			2		.6/1.7	1275	50	3/4	16	0	84					1224	

Date Milchem Technical Representative: JIM LARY & BILL HUBBARD District: ALASKA Region: CANADA

TSD DMR (1) 1/71

Milchem® Drilling Fluids Division

MILCHEM INCORPORATED / P. O. BOX 22111 / HOUSTON, TEXAS 77027

DRILLING MUD RECAP

Contractor PARCO OPERATOR IRISKY OIL COMPANY NPR OPERATIONS LEGAL DESCRIPTION

Rig No. 95 Well Name And No. ATIGARU POINT #1 Field NPR #4 COUNTY NORTH SLOPE STATE ALASKA

DATE (1977)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (sec/qt) API	FUNNEL VISCOSITY (sec/qt) °F	PLASTIC VISCOSITY cp @	PLASTIC VISCOSITY °F	YIELD POINT (lb/100ft²)	GELS (lb/100ft²) 0/10	pH	FILTRATE (ml/30 min) API	FILTRATE HT-HP	FILTRATE °F	Cake (32nd in)	Alkalinity P_m	Alkalinity P_f/M_f	Chloride (ppm)	Calcium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	Oil (% by Vol.)	Water (% by Vol.)	Methy. Blue (me/ml mud)				Circ. Volume (bbl)	REMARKS
2/21	4:00A	9855	10.5	44		16		8	1/4	10.5	4.6			2		.6/1.8	1250	40	3/4	18	0	82					1284	
2/22	3:00A	10025	10.5	43		16		7	1/5	10.5	4.5			2		.7/1.8	1250	40	½	17	0	83					1294	
2/23	12:00P	10115	10.4	42		15		6	1/2	10.5	4.6			2		.6/1.4	1250	40	-½	16	0	84					1300	
2/24	12:30A	10225	10.4	50		16		8	2/4	10.0	4.8			2		.5/1.3	1250	40	-½	16	0	84					1157	Partial loss (seepage)
2/25	4:00A	10420	10.3	54		18		14	2/15	11.5	4.4			2		1.2/2.6	1250	40	½	17	0	83					1440	Built 400bbls mud
2/26	3:00A	10500	10.4	43		22		9	2/4	11.0	4.2			2		1.0/2.1	1450	40	- ½	16	0	84					1425	Desander & desilter down
2/27	4:00A	10644	10.4	44		22		7	1/3	11.0	4.3			2		1.0/2.3	1250	40	½	15	0	85					1434	Drlg ahead no problems
2/28	11:00P	10714	10.4	45		21		8	1/3	11.0	4.0			2		1.0/2.2	1250	40	½	15	0	85					1413	lost 70bbls to formation
3/1	12:00P	10739	10.4	43		18		9	2/6	10.5	4.2			2		.9/1.8	1250	50	tr	15	0	85					1390	
3/2	12:00P	10791	10.5	44		20		12	2/6	10.5	4.3			2		.9/1.6	1250	50	½	16	0	84					1344	
3/3	12:00P	10859	10.4	43		18		10	1/6	10.5	4.2			2		.9/1.7	1250	50	½	15	0	85					1373	
3/4	12:00P	10953	10.4	44		20		9	1/6	10.5	4.1			2		.9/1.5	1250	50	tr	15	0	85					1404	lost 20bbls to formation
3/5	5:00A	11045	10.4	46		22		12	2/7	10.0	4.2			2		.8/1.4	1250	50	½	15	0	85					1434	Cont losses w/ mica
3/6	3:00A	11210	10.4	43		20		10	1/6	10.5	4.0			2		1.0/1.5	1225	50	½	15	0	85					1470	
3/7	3:00A	11364	10.4	41		18		10	1/5	10.5	3.9			2		1.0/1.7	1225	50	tr	15	0	85					1476	
3/8	12:00P	11405	10.4	47		18		9	1/4	10.5	4.1			2		1.1/1.9	1200	40	tr	15	0	85					1478	
3/9	2:00A	11514	10.4	46		18		10	2/4	9.5	3.8			2		.5/1.2	1200	40	tr	15	0	85					1480	POH to run logs
3/11	12:00P	11520	10.4	46		18		11	2/5	9.5	3.8			2		.4/.9	1300	40	tr	15	0	85					1486	Drlg 5' prep to core
3/13	12:00P	11520	10.5	48		20		10	2/5	9.0	4.0			2		.4/.9	1200	40	tr	15	0	85					-	Prep to P&A
3/14	12:00P	11520	10.5	40		19		14	2/18	11.0	12			2		.8/1.9	1300	120	tr	16	0	84					-	Setting cement plugs
3/15	2:00A	11520	10.4	37		17		4	1/3	9.0	14			2		.3/.7	1250	60	tr	15	0	85						Cut 2370' 9 5/8"csg - pull csg- set plug- clean & jet pits

Date

Milchem Technical Representative JIM LARY & BILL HUBBARD District ALASKA Region CANADA

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TSO OMR (2) - 1/71

BIT RECORD

HUSKY OIL NPR OPERATIONS, INC.
Atigaru Point No. 1, NE 1/4, Sec. 19, T14N, R2E, Umiat Meridian, North Slope, Alaska

BIT NO.	BIT SIZE	BIT MFGR.	BIT TYPE	SER. NO. OF BIT	JET SIZE 1	2	3	DEPTH OUT	FTGE.	HRS. RUN	ACC. HRS.	FT. PER. HR.	WEIGHT 1000 LBS	ROTARY R.P.M.	VERT DEV.	PUMP PRESS	PUMPS LINER	SPM.	MUD WT.	VIS	DULL CODE T	B	G
1	17½	Reed	Y11J	618225				425	336	7½		44.8	10/20	150	0	800	6½	60		150	6	1	I
2	12¼	HTC	OSC-3	HT416				545	120	19	31	6.3	10/20	150	0	500	6½	60		200	1	1	I
3	17½	Reed	Y11J	100780	16	16	18	1731	1186	17½	48½	67.8	25/30	120	1/4	1400	6½	53	9.5	75	3	1	I
4	17½	Reed	Y11J	100296	14	14	14	2510	779	11½	60½	69.2	30/40	120		1900	6½	42	9.5	45	1	1	I
5	12¼	HTC	OSC3J	HZ715	12	12	13	3114	604	9½	70	63.6	45/50	110		2300	6½	50	9.5	52	1	5	I
6	12¼	HTC	OSC3J	HX300	12	12	12	4279	1165	22	92	53.0	45/50	120		3000	6½	56	9.7	39	5	3	I
7	12¼	HTC	OSC3J	HW936	12	12	12	5124	845	18½	110½	45.7	45/50	140		2800	6½	48	9.7	39	3	2	I
8	12¼	Smith	DSJ	084EK	12	12	12	6065	941	23½	134½	40.5	45/50	140		2800	6½	48	9.5	40	3	2	I
9	12¼	Smith	DSJ	086EK	12	12	12	6911	846	26½	161½	31.9	45/50	140		2800	6½	49	9.5	40	4	2	I
10	12¼	Smith	DSJ	062EK	12	12	12	7530	625	21	182½	29.8	55	140		2800	6½	49	9.5	40	3	2	I
11	12¼	Smith	DSJ	068EK	12	12	12	7977	447	16½	199	27.1	55	140		2800	6½	50			2	2	I
12	12¼	Smith	DSJ	570EJ	12	12	12	8150	173	4½	203½	38.4	55	140		2800	6½	50			2	2	I
13	8½	Reed	S11J	303525	10	10	10	8268	118	6½	209½	18.9	45	120		2800	6½	50			Lost 2 cones		
14	8½	HTC	J-7	HS-252	14	14	14	8299	31	3½	213	8.9	35	50		2200	6½	45			6	2	I
15	8½	Smith	F2	833CJ	9	9	9	8600	301	31	244	9.7	45	45		2800	6½	38	10.7	40	6	3	I
16	8½	Smith	F3	BB531	9	9	9	8712	112	12½	256½	9.0	55	40		2800	6½		10.5		8	3	I
Core #1		ACC	Dimond					8742	30	7½	263	4.1	55	40		1400	6½	46	10.0		Core Head		
17	8½	Smith	F2	343DX	9	9	9	9054	312	25 3/4	289½	12.1	55	40	1 3/4	2800	6½	38	10.0		8	3	1/8
18	8½	HTC	X1G	WE351	9	9	9	9123	69	7½	297	9.5	55	90		2800	6½	42	10.0		8	8	1/8
19	8½	Smith	F2	652DD	9	9	9	9406	383	22 3/4	299	16.8	55	40		2750	6½	40	10.0		2	2	I
20	8½	Smith	F2	342DX	9	9	9	9606	200	26 3/4	326	7.5	55	40		2700	6½	40	10.0		8	3	I
21	8½	Smith	F3	586CE	9	9	9	9855	249	27 3/4	354	9.0	55	40		2700	6½	40	10.0		8	3	I
22	8½	Smith	F3	CV793	9	9	9	10041	186	24	378	7.8	55	40		2600	6½	40	10.3		8	3	I
23	8½	Smith	F3	867CL	9	9	9	10214	173	22	400	7.9	55	40		2600	6½	40	10.5		8	3	I
24	8½	Smith	F3	AC283	9	9	9	10422	208	30 3/4	431	6.8	35	40		2600	6½	40	10.5	50	4	3	I
25	8½	Smith	F3	TN452	9	9	9	10716	294	50	481	5.9	35	40		2600	6½	40	10.5	45	8	4	I
26	8½	Smith	F3	442CE	9	9	9	10731	15	5½	486	2.7	35	40		2600	6½	40	10.5	46	2	1	I
27	8½	HTC	J44	EM167	10	10	10	10769	38	12½	498	3.1	40/45	40		2500	6½	46	10.3	43	3	1	I
28	8½	HTC	J44	FR636	9	9	9	10953	184	47	545	3.9	35/40	40		2600	6½	40	10.3	44	4	3	I
29	8½	Smith	F3	AH935	9	9	9	11138	428	71½	617	6.0	35/45	40		2600	6½	41	10.4	43	6	3	I
30	8½	Smith	F2	338DX	9	9	9	11514	133	23½	640½	5.7	40/45	40		2600	6½	41	10.4	[illegible]	2	2	I

INTRODUCTION

After the 1976 drilling season, casing requirements were reviewed and design of casing strings standardized. Every effort was made to minimize weight and grade changes for simplicity, cost effectiveness, and to reduce chances of error during handling and running operations. Casing sizes were selected to accommodate designs for wells from 2,000' to 20,000'. Steel grade selection was the controlling factor on design with low hardness (Rockwell C24-28) steel being selected for Arctic application and possible H_2S environment. Below is listed casing sizes and design criteria required by Husky:

		YIELD STRENGTH (PSI)		MINIMUM PRESSURE REQUIREMENT (PSI)		
SIZE(1)	WEIGHT	MIN.	MAX.	COLLAPSE	BURST	CONNECTION
20"	133#/ft.	55,000	80,000	1,500	3,050	STC
13-3/8"(2)	72#/ft.	95,000	110,000	3,450	5,350	BTC
9-5/8"(3)	53.5#/ft.	95,000	110,000	8,850	7,900	BTC
9-3/4"(3)	59.2#/ft.	95,000	110,000	9,750	8,540	BTC
7"	38#/ft.	95,000	110,000	12,600	9,200	BTC

(1) OD tolerance to be within API requirements unless adjustment absolutely necessary to meet ID requirements.

(2) Special drift to 12.25".

(3) Special drift to 8.50".

The following are additional requirements primarily to assure that the steel exhibits the metallurgical properties for Arctic applications and resistance to hydrogen embrittlement.

1. All pipe that is 13-3/8" OD and smaller to be quenched and tempered.

2. Run Charpy "V" notch tests on two random samples per 50 tons per heat. Minimum acceptance of 15 ft.-lb.@-50°F. Furnish test reports with order.

3. Perform all testing normally required for API approved pipe.

4. Furnish test reports for ladle analysis, quantitative analysis, and all check tests as per API requirements.

In addition, the following handling requirements were made:

1. Collars must be of same steel grade as pipe body.

2. Apply an API modified thread compound on mill-installed collar before bucking on.

3. Inspect at mill using Tuboscope's Amalog IV or equivalent on 9-3/4" and smaller, and at least magnetic particle on 13-3/8" and 20". All pipe to have special and area inspection together with full length API drifting. (Note special drifting requirements.)

4. Apply Arctic grade grease on all connections before installing thread protectors.

5. Install closed-end type thread protectors. Plastic plugs can be used to secure wrench openings in protectors.

6. Buck up thread protectors with impact wrench. Both mill and third party inspection personnel should observe the installation of thread protectors.

7. Palletize or containerize the tubulars, if possible, prior to shipment from mill. Do not haul pipe like cordwood in gondola railroad cars.

8. All pipe to be Range 3.

9. No "V" notching or metal stenciling on pipe body or collars.

Casing programmed for Atigaru Point No. 1 was as follows: 30" conductor at ±80'; 20" at 500'; 13-3/8" at 2500'; 9-5/8" at 7800'; and a 7" liner to a total depth of 10,880' if needed for evaluation purposes. Actual casing run was 30" at 99', 20" at 447', 13-3/8" at 2509', 9-5/8" at 8147'. The 7" liner was not required.

After total depth had been reached, the 9-5/8" casing was cut off at 2370' and recovered back to surface. The 13-3/8" annulus from 2155' to surface was left full of diesel. This was to allow future temperature measurements by U. S. Geological Survey personnel.

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No. 4 Well Atigaru Point No. 1 Date January 11, 1977

Size Casing 30" Setting Depth 99' Top (liner hanger) _____

Hole Size 36" Mud Gradient Dry Viscosity _____

Casing Equipment

_____ shoe. _____ float located _____ feet

above shoe. _____ (DV, FO) collars located at _____ feet

and _____ feet

_____ centralizers located _____

_____ scratchers located _____

Liner hanger and pack off (describe) _____

Miscellaneous (baskets, etc.) _____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	500	Howco	Permafrost II			
(2)						

Cement through (DV, FO) Collar at _____ feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

CASING TALLY
SUMMARY SHEET

DATE: January 17, 1977

FIELD Naval Petroleum Reserve No. 4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 20 " CASING

SUMMARY OF PAGE MEASUREMENTS

	NO OF JOINTS	FEET	.00'S
PAGE 1	11	449	64
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	11	449	64

SUMMARY OF DEPTH CALCULATIONS

		NO. OF JOINTS	FOOTAGE FEET	FOOTAGE .00'S
1	TOTAL CASING ON RACKS	11	449	64
2	LESS CASING OUT JTS NOS.		-	-
3	TOTAL (1 – 2)		449	64
4	SHOE LENGTH			
5	FLOAT LENGTH			
6	MISCELLANEOUS EQUIPMENT LENGTH			
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		449	64
8	LESS WELL DEPTH (KB REFERENCE)			
9	"UP" ON LANDING JOINT		2	92

Weight indicator before cementing: _____ ; after slack-off: _____ ; inches slacked off _____ .

SUMMARY OF STRING AS RUN

WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW-USED	LOCATION IN STRING		NO OF JOINTS	FOOTAGE	INTERVAL
133	K-55	Buttress		New	JT NO 1	THRU NO 11	11	449.64	0 - 449.64
					JT NO.	THRU NO.			
					JT NO.	THRU NO			
					JT NO	THRU NO.			
					JT NO	THRU NO.			
					JT NO	THRU NO.			
					JT NO	THRU NO			

PAGE 1 OF 1

CASING TALLY

DATE: January 15, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 20" CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	44	43	w/Shoe		
2	42	52			
3	41	59			
4	35	85			
5	39	12			
6	38	02			
7	43	52			
8	40	84			
9	39	73			
0	40	97			
TOTAL A	406	59			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1	43	05			
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL B	43	05			

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C					

TOTAL A	406	59		
TOTAL B	43	05		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	449	64		

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No.4 Well Atigaru Point No. 1 Date January 16, 1977

Size Casing 20" Setting Depth 446.72 Top (liner hanger) _____

Hole Size 26 " Mud Gradient 10.2 ppg Viscosity 150

Casing Equipment

Howco Duplex _____ shoe, _____ float located ten _____ feet

above shoe, _____ (DV, FO) collars located at _____ feet

and _____ feet.

One _____ centralizer located ten joints above shoe, and three located

on each of the first three collars above the shoe.

_____ scratchers located _____

_____

Liner hanger and pack off (describe) _____

_____

Miscellaneous (baskets, etc.) _____

_____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	2600	Howco	Permafrost II	None	14.6/14.8 ppg	
(2)						

Cement through (DV, FO) Collar at _____ feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

CASING TALLY
SUMMARY SHEET

DATE: January 23, 1977

FIELD Naval Petroleum Reserve No. 4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 13 3/8" CASING

SUMMARY OF PAGE MEASUREMENTS	NO OF JOINTS	FEET	.00'S
PAGE 1			
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL			

SUMMARY OF DEPTH CALCULATIONS		NO OF JOINTS	FOOTAGE FEET	FOOTAGE 00'S
1	TOTAL CASING ON RACKS	65	2508	88
2	LESS CASING OUT (JTS NOS.			
3	TOTAL (1 2)			
4	SHOE LENGTH		2	00
5	FLOAT LENGTH		1	75
6	MISCELLANEOUS EQUIPMENT LENGTH			
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		2512	63
8	LESS WELL DEPTH (KB REFERENCE)		2509	63
9	"UP" ON LANDING JOINT		3	00

Weight indicator before cementing: 105,000 ; after slack-off: Set 40,000 inches slacked off _____ .
on OCT 13 3/8" slips

SUMMARY OF STRING AS RUN								
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW-USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL
72	S-95	Buttress		New	JT NO. 0 THRU NO. 65	65	2512.63	KB 2509.63
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			

PAGE 1 OF 2

CASING TALLY

DATE: January 23, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 13 3/8" CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR
1	2	00			
2	36	13			
3	39	83			
4	1	75			
5	37	37			
6	44	42			
7	41	02			
8	37	35			
9	41	67			
0	35	16			
TOTAL A	316	70			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	40	42			
2	33	88			
3	40	94			
4	38	84			
5	42	32			
6	37	58			
7	37	61			
8	37	72			
9	37	57			
0	41	27			
TOTAL D	388	15			

1	37	20			
2	36	91			
3	36	47			
4	40	65			
5	37	50			
6	39	68			
7	36	10			
8	36	92			
9	42	74			
0	37	84			
TOTAL B	382	01			

1	41	00			
2	38	33			
3	40	10			
4	39	08			
5	37	10			
6	40	50			
7	38	84			
8	39	87			
9	40	68			
0	39	05			
TOTAL E	394	46			

1	41	10			
2	40	42			
3	38	90			
4	38	76			
5	36	20			
6	41	37			
7	37	50			
8	37	92			
9	39	57			
0	38	40			
TOTAL C	390	14			

TOTAL A	316	70		
TOTAL B	382	01		
TOTAL C	390	14		
TOTAL D	388	15		
TOTAL E	394	46		
TOTAL PAGE	1871	46		

PAGE 2 OF 2 CASING TALLY DATE: January 23, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 13 3/8 " CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	34	71			
2	40	45			
3	37	54			
4	38	88			
5	35	72			
6	39	30			
7	38	78			
8	38	02			
9	40	13			
0	40	84			
TOTAL A	384	37			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1	36	69			
2	37	08			
3	35	79			
4	36	40			
5	34	68			
6	40	79			
7	35	37			
8					
9					
0					
TOTAL B	256	80			

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C					

TOTAL A	384	37		
TOTAL B	256	80		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	641	17		

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No.4 Well Atigaru Point No. 1 Date January 23, 1977

Size Casing 13 3/8" Setting Depth 2509.63 Top (liner hanger) _____

Hole Size 17 1/2" Mud Gradient 9.5 ppg Viscosity 55

Casing Equipment

Howco Float _____ shoe, duplex float (Howco) float located 79.71 feet

above shoe _____ (DV, FO) collars located at _____ feet

and _____ feet

One _____ centralizer located 10' above shoe (3); one each on next three collars and (6) one each on every other collar for next 12 joints. Ten total.

_____ scratchers located _____

Liner hanger and pack off (describe) _____

Miscellaneous (baskets, etc.) _____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	3925	Howco	Permafrost II		14.4/14.8	ppg
(2)						

Cement through (DV, FO) Collar at _____ feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated two hours, pumped in 40 ~~(cu. ft.)~~ (barrels) water _____ prewash, used bottom plug ~~(yes~~ no), mixed cement (1) above _____ minutes, cement (2) above _____ minutes, top plug (yes, no) displaced with _____ (cu. ft.), (barrels) in 570 minutes at rate of 6.5 BPM, ~~CFM~~, ~~(Bumped plug)~~ ~~(Did not bump plug)~~. ~~Final Pressure~~ Used duplex equipment. Reciprocated pipe _____ feet while (mixing) and (displacing) cement. Displacing time _____ minutes. Had full _____ circulation (full, partial, none, etc.). Completed job at 6:30 ~~a.m.~~, p.m.

Cementing Procedure (through (DV, FO) at _____ feet) (cross out where necessary)

Opened (DV, FO) at _____ a.m., p.m., circulated _____ bbls @ _____ BPM, pumped in _____ (cu. ft.), (barrels) _____ prewash, mixed cement (3) above _____ minutes, cement (4) above _____ minutes, dropped closing plug, displaced with _____ (cu. ft.), (barrels) in _____ minutes at rate of _____ _____ BPM, CFM. (Bumped plug) (Did not bump plug). Final Pressure _____ Displacing time _____ minutes. Had _____ circulation (full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

_____

_____

_____

_____

_____

s/Billy L. Clanton
Foreman

CASING TALLY
SUMMARY SHEET

DATE: February 9, 1977

FIELD Naval Petroleum Reserve No. 4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8" CASING

SUMMARY OF PAGE MEASUREMENTS

	NO OF JOINTS	FEET	00'S
PAGE 1	50	1970	75
PAGE 2		1897	62
PAGE 3		1981	41
PAGE 4		1959	91
PAGE 5		337	67
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL		8147	36

SUMMARY OF DEPTH CALCULATIONS

		NO. OF JOINTS	FOOTAGE FEET	FOOTAGE 00'S
1	TOTAL CASING ON RACKS	207	8171	18
2	LESS CASING OUT (JTS NOS			
3	TOTAL (1 - 2)		78	15
4	SHOE LENGTH		2	05
5	FLOAT LENGTH		1	45
6	MISCELLANEOUS EQUIPMENT LENGTH Two FO Collars		7	81
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6) OCT Hanger		3	85
8	LESS WELL DEPTH (KB REFERENCE)		19	28
9	"UP" ON LANDING JOINT		23	32

Weight indicator before cementing: Hung on OCT fluted hanger. ; after slack-off: ; inches slacked off

SUMMARY OF STRING AS RUN

WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW USED	LOCATION IN STRING	NO. OF JOINTS	FOOTAGE	INTERVAL
53	S-95	Buttress	Lone Star	New	JT NO. 1 THRU NO. 207	207	8171.18'	
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			
					JT NO. THRU NO.			

PAGE 1 OF 5 **CASING TALLY** DATE: February 9, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1	41	62			
2	37	59			
3	37	88			
4	38	25			
5	39	81			
6	40	28			
7	40	70			
8	41	60			
9	38	63			
0	37	34			
TOTAL A	393	70			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1	38	65			
2	39	10			
3	40	00			
4	38	45			
5	40	90			
6	40	70			
7	40	60			
8	37	35			
9	39	15			
0	37	45			
TOTAL D	392	35			

1	37	22			
2	39	67			
3	40	56			
4	39	58			
5	41	10			
6	41	29			
7	40	43			
8	40	81			
9	40	12			
0	40	27			
TOTAL B	401	05			

1	38	80			
2	37	88			
3	36	78			
4	41	12			
5	40	87			
6	38	63			
7	40	44			
8	38	02			
9	41	16			
0	38	93			
TOTAL E	392	63			

1	39	84			
2	40	73			
3	40	40			
4	38	41			
5	39	20			
6	37	71			
7	38	15			
8	40	32			
9	38	26			
0	38	00			
TOTAL C	391	02			

TOTAL A	383	70		
TOTAL B	401	05		
TOTAL C	391	02		
TOTAL D	392	35		
TOTAL E	392	63		
TOTAL PAGE	1970	75		

PAGE 2 OF 5

CASING TALLY

DATE: February 9, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8" CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	38	50			
2	39	10			
3	39	25			
4	40	00			
5	39	44			
6	03	90			
7	40	12			
8	40	94			
9	36	75			
0	38	48			
TOTAL A	356	48			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	37	48			
2	40	73			
3	37	03			
4	38	80			
5	40	95			
6	41	28			
7	39	31			
8	39	52			
9	41	28			
0	37	43			
TOTAL D	393	81			

1	03	91			
2	37	57			
3	36	60			
4	39	57			
5	37	87			
6	39	88			
7	38	60			
8	36	71			
9	37	78			
0	41	01			
TOTAL B	349	50			

1	40	95			
2	40	88			
3	37	78			
4	41	62			
5	39	16			
6	40	38			
7	39	10			
8	38	41			
9	39	33			
0	39	35			
TOTAL E	396	96			

1	41	22			
2	40	10			
3	39	40			
4	40	80			
5	41	44			
6	38	52			
7	41	18			
8	35	97			
9	41	30			
0	40	94			
TOTAL C	400	87			

TOTAL A	356	48			
TOTAL B	349	50			
TOTAL C	400	87			
TOTAL D	393	81			
TOTAL E	396	96			
TOTAL PAGE	1897	62			

PAGE 3 OF 5

CASING TALLY

DATE: February 9, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1	38	20			
2	39	04			
3	40	18			
4	37	50			
5	39	60			
6	40	83			
7	41	11			
8	39	43			
9	39	50			
0	37	68			
TOTAL A	393	07			

1	38	65			
2	38	76			
3	39	54			
4	42	59			
5	41	78			
6	38	03			
7	39	02			
8	39	02			
9	38	30			
0	41	08			
TOTAL B	396	77			

1	40	10			
2	38	13			
3	37	10			
4	40	84			
5	40	94			
6	38	33			
7	38	57			
8	40	83			
9	41	15			
0	40	80			
TOTAL C	396	79			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	41	31			
2	40	19			
3	41	18			
4	39	01			
5	41	16			
6	39	13			
7	39	70			
8	41	46			
9	37	36			
0	39	93			
TOTAL D	400	43			

1	38	75			
2	41	00			
3	34	70			
4	39	22			
5	40	40			
6	41	13			
7	37	76			
8	40	31			
9	39	78			
0	41	30			
TOTAL E	394	35			

TOTAL A	393	07		
TOTAL B	396	77		
TOTAL C	396	79		
TOTAL D	400	43		
TOTAL E	394	35		
TOTAL PAGE	1981	41		

PAGE 4 OF 5 CASING TALLY DATE: February 9, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	34	88			
2	41	67			
3	39	83			
4	39	94			
5	41	05			
6	36	03			
7	41	24			
8	38	82			
9	40	68			
0	40	34			
TOTAL A	394	48			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR
1	37	46			
2	41	13			
3	38	08			
4	37	60			
5	40	20			
6	40	62			
7	39	71			
8	38	25			
9	40	82			
0	35	90			
TOTAL D	389	77			

1	37	77			
2	41	04			
3	33	45			
4	38	21			
5	41	30			
6	39	45			
7	40	25			
8	39	48			
9	41	08			
0	40	82			
TOTAL B	392	85			

1	39	51			
2	40	20			
3	40	92			
4	39	97			
5	39	32			
6	39	38			
7	40	67			
8	36	03			
9	38	86			
0	39	85			
TOTAL E	394	71			

1	40	78			
2	40	80			
3	36	95			
4	34	35			
5	39	08			
6	38	43			
7	40	60			
8	40	43			
9	37	86			
0	38	82			
TOTAL C	388	10			

TOTAL A	394	48		
TOTAL B	392	85		
TOTAL C	388	10		
TOTAL D	389	77		
TOTAL E	394	71		
TOTAL PAGE	1959	91		

PAGE 5 OF 5 **CASING TALLY** DATE: February 9, 1977

FIELD NPR-4 LEASE & WELL NO. Atigaru Point No. 1 TALLY FOR 9 5/8" CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1	39	21			
2	41	00			
3	40	92			
4	38	22			
5	40	34			
6	37	05			
7	39	17			
8	38	98			
9	01	45	Float Collar		
0	02	05	Shoe		
TOTAL A	318	39			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1	19	28	KB		
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL B					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C					

TOTAL A	318	39		
TOTAL B	19	28		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	337	67		

CASING OR LINER CEMENT JOB

Lease Naval Petroleum Reserve No.4 Well Atigaru Point No. 1 Date February 9, 1977

Size Casing 9 5/8" Setting Depth 8147.36 KB Top (liner hanger) _____

Hole Size 12 1/4 " Mud Gradient 10.7 ppg Viscosity 48

Casing Equipment

Howco Float Shoe shoe, Howco float located 81.65 feet

above shoe, two Howco [redacted] FO) collars located at 2351.58 feet

and 2191.39 feet.

Fifteen centralizers located one 10' above shoe, one each on next three collars, next seven on every other collar, one each on collars above and below each FO collar. scratchers located _____

Liner hanger and back off (describe) _____

Miscellaneous (baskets, etc.) _____

Cement (around shoe)

	No Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	1000	Howco	Class "G"	& 1% CFR-2 & .2% HR-7	15.8/16.0 ppg	1.15
(2)						

Cement through (DV, FO) Collar at _____ feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated three hours, pumped in 50 ~~(cu. ft.)~~, (barrels) water _____ prewash, used bottom plug (yes, ~~no~~), mixed cement (1) above 32 minutes, cement (2) above _____ minutes, top plug (yes, no) displaced with 585 ~~(cu. ft.)~~ (barrels) in 50 minutes at rate of 11.6 BPM, ~~CFM~~, (Bumped plug) ~~(Did not bump plug)~~. Final Pressure 3,000. Reciprocated pipe _____ feet while (mixing) and (displacing) cement. Displacing time _____ minutes. Had full circulation (full, partial, none, etc.). Completed job at 8:27 a.m., ~~p.m.~~

Cementing Procedure (through (DV, FO) at _____ feet) (cross out where necessary)

Opened (DV, FO) at _____ a.m., p.m., circulated _____ bbls @ _____ BPM, pumped in _____ (cu. ft.), (barrels) _____ prewash, mixed cement (3) above _____ minutes, cement (4) above _____ minutes, dropped closing plug, displaced with _____ (cu. ft.), (barrels) in _____ minutes at rate of _____ _____ BPM, CFM. (Bumped plug) (Did not bump plug). Final Pressure _____ Displacing time _____ minutes. Had _____ circulation (full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

_____

_____

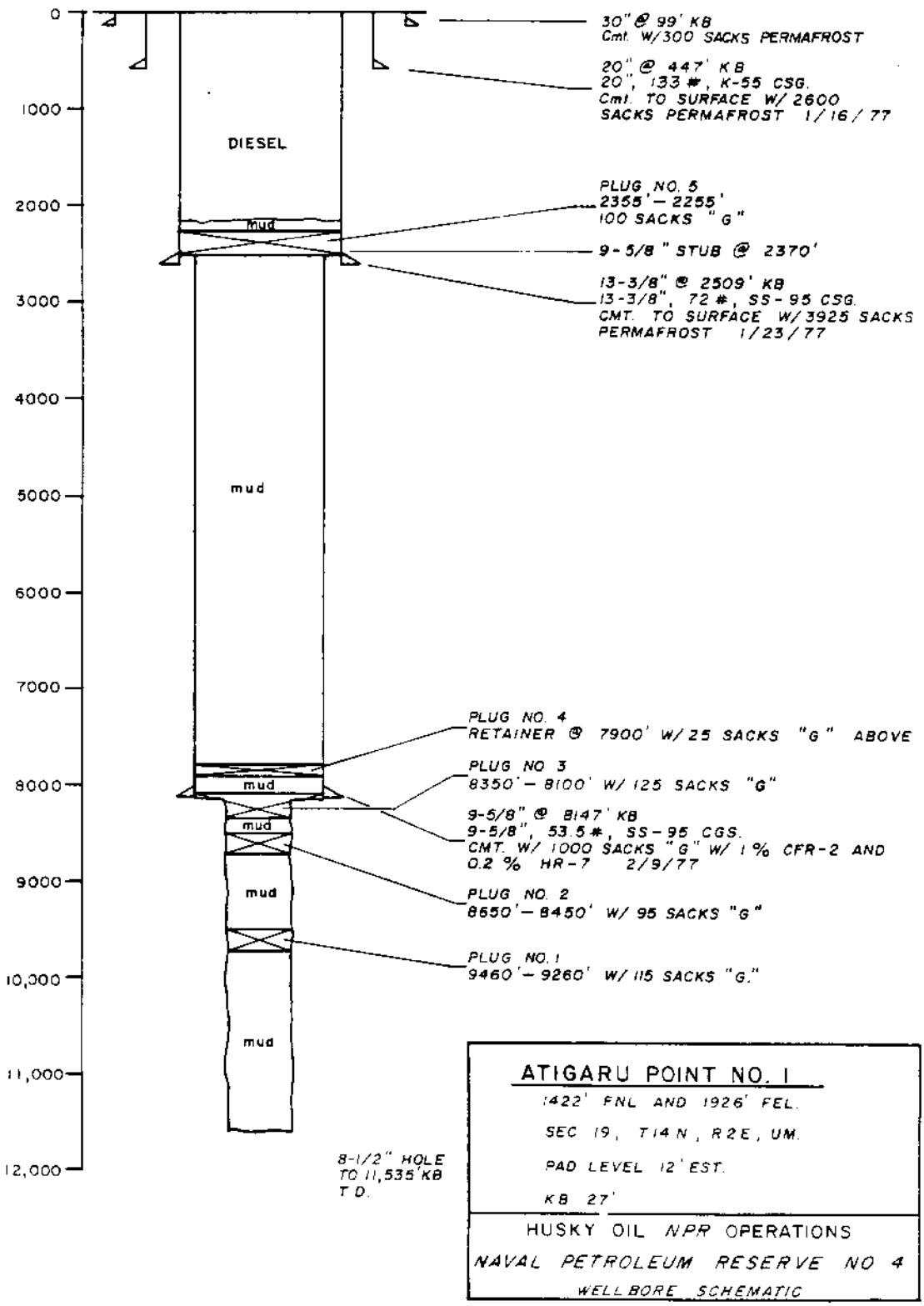
_____

_____

_____

_____
Foreman

WELLBORE SCHEMATIC



ATIGARU POINT NO. 1

1422' FNL AND 1926' FEL.

SEC 19, T14N, R2E, UM.

PAD LEVEL 12' EST.

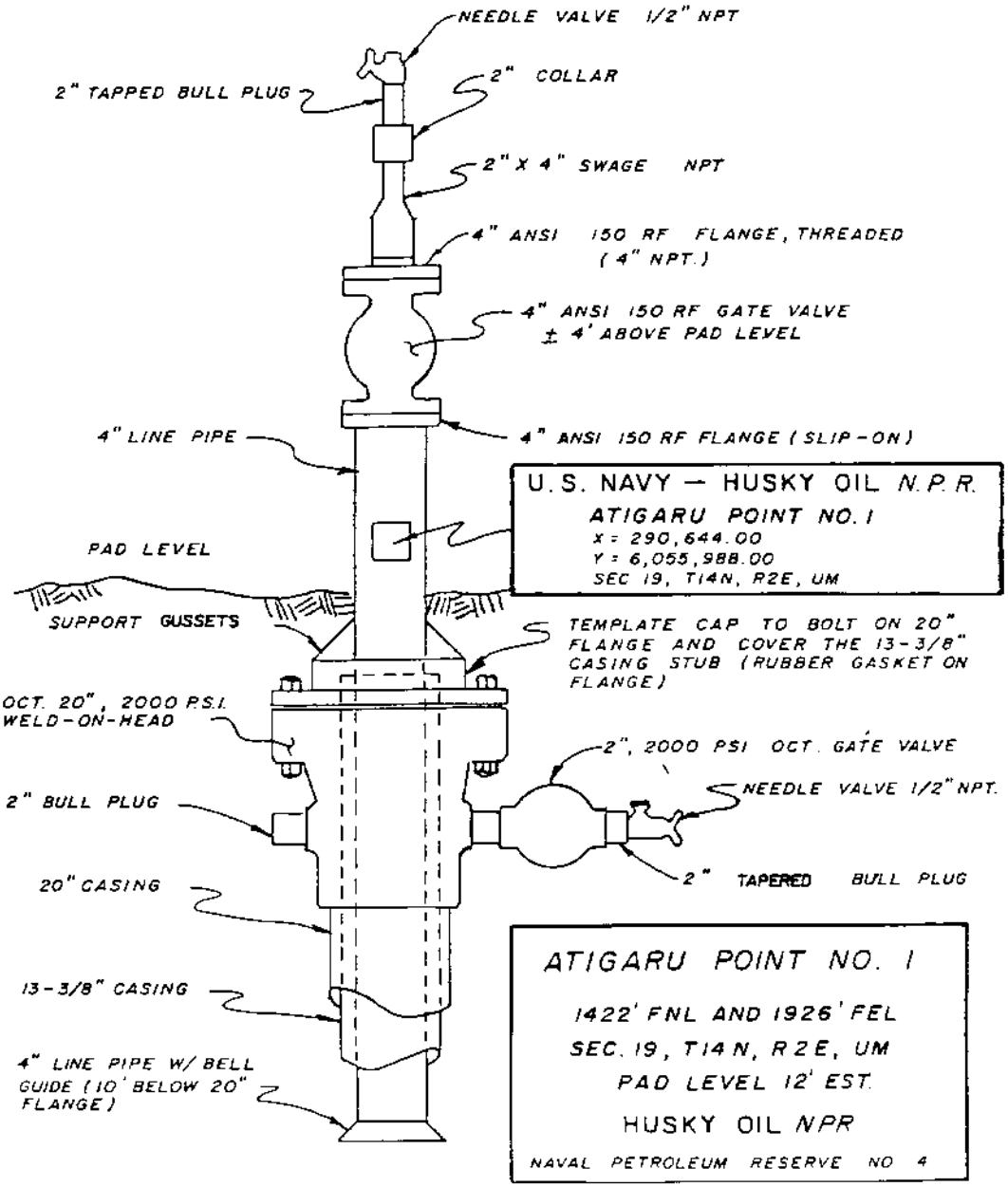
KB 27'

HUSKY OIL NPR OPERATIONS

NAVAL PETROLEUM RESERVE NO 4

WELLBORE SCHEMATIC

ABANDONMENT HEAD



RIG INVENTORY

Draw Works

National 130, 25,000 pound, Serial No. 615648.

Hydromatic Brakes

Parkersburg, hydromatic, 60", Serial No. 48173.

Catworks Unit

National 130, Serial No. 438-3.

Compound and Rig Drive

National, B Section, three engine, 2,000 H.P. with gyro drive.

Drilling Engines

Caterpillar, diesel turbo, D-398, 750 H.P., Serial No. 66B2440.
Caterpillar, diesel turbo, D-398, 750 H.P., Serial No. 66B2436.
Caterpillar, diesel turbo, D-298, 750 H.P., Serial No. 66B2439.
Starting Engines: Three Switzer, air, 40 H.P.
Sheds: Parker, steel, 8' x 30'.
Skids.

Transmissions

Torque Converters.

Rig Lights

GE, vapor proof, 500 WT to 1,500 WT.

No. 1 Light Plant

Caterpillar, diesel turbo AC, 250 KW.
No. 1 Engine: Caterpillar, diesel turbo, D-353, 450 H.P., AC power plant, Serial No. 46B2997.
No. 1 AC Generator: Caterpillar, AC electric, 250 KW, AC power plant, Serial No. 250TH1550.

No. 2 Light Plant

Caterpillar, turbo diesel, 250 KW.
No. 2 Engine: Caterpillar, turbo diesel, D-353, 450 H.P., Serial No. 46B2999.
No. 2 AC Generator: Caterpillar/GE, AC electric, 250 KW, Serial No. 250TH1549.

No. 3 Light Plant

Caterpillar/GE
No. 3 Engine: Caterpillar, turbo diesel, D-353, 450 H.P.
No. 3 AC Generator: Caterpillar/GE, AC electric, 250 KW.

Mast and Substructure

L. C. Moore, jackknife, 142' x 1,025M, Serial No. T-2560.
L. C. Moore, box type, 18' x 34' x 32' with engine sub 8' x 32' draw works and engine sub.
Crown: L. C. Moore, 7' x 54", 1" x 60" fast line, 500 ton.

Wire Line Anchor

National, 500 ton, 1-3/8", substructure.

Windwalls

Parker, steel, 25' x 8'.

Catwalks

Parker, steel, 6' x 54'.
Pipe Racks: Parker, drill pipe triangular, 4' x 20'.

Pumps

No. 1 Pump: EMSCO, D-1000 duplex, 1,000 H.P.
Power End: EMSCO, steel, 1,000 H.P.
Fluid End: EMSCO, steel, 7" x 18", 1,000 H.P.
Pulsation Damper: EMSCO, PD2, 20 gallon.
No. 2 Pump: EMSCO, DB700 duplex, 700 H.P.
Power End: EMSCO, steel, 700 H.P., 7" x 16".
Pulsation Dampener: EMSCO, PD2, 20 gallon.

Mud Mixing Equipment

Mud Mixing Unit: Mission/Caterpillar/Parker.
Engine: Caterpillar, diesel turbo, D-330, 130 H.P.
Pump: ASH, B-65, centrifugal, 6" x 8".
Mud Mixing Unit: Caterpillar, diesel turbo.
Pump: ASH, B-65, centrifugal, 6" x 8".
Lightening Mixers: Lightning, 73Q80, 7.5' x 32".

Utility Skid

Shale Shaker

Milchem, single decks, 6' x 8'.
Motor: U.S. electric, 10 H.P.

Desander

Dorcone, 12".
Pump: Harrisburg, centrifugal, 5" x 6".
Motor: Newman, electric, 60 H.P., with #5 starter and switch gear.

Desilter

DEMCO, 4", 8 cone.
Pump: Harrisburg, centrifugal, 5" x 6".
Motor: Pacemaker, CJ48, electric, 60 H.P., with #5 starter and switch gear.

Degasser

Oliver Door, FAC, 6' x 6'.
Pump: Gorman Rupp, Model #1682B, centrifugal, 6" x 6".

Traveling Block

IDECO, UTB Big Shorty, 525 ton.

Hook

IDECO, Big Shorty, 525 ton.

Swivel

National, N-815, 400 ton.

Tongs-Nonpower

BJ, 2-3/8" x 13-5/8".

Elevators

BJ, MGG, 5", 500 ton.
BJ, MG, 4-1/2", 350 ton.
BJ, side door, A, 6-1/2".
BJ, side door, A, 8-5/8".

Casing Tools-Nonpower

Tubing Tools-Nonpower

Elevator Bails

BJ, forged steel, 106", 350 ton.
BJ, forged steel, 96", 350 ton.

Rotary Table

National, roller bearing, 350 ton, 27-1/2".
National, roller bearing, 20.5.

Master Bushings

Varco, forged steel, 27:5 WI.
Kelly Drive Bushings: Baash Ross, IRH 56, 2' x 5' Hex.

Kelly

Drilco, Hex, 4-1/2" IF x 6-5/8 Reg., 5-1/4" x 45'.

Kelly Cock

Shaffer, ball, 6-5/8" x 10,000 psi.

Air Compressor

Quincy, piston, 390.
Quincy, piston, 350.
Motor: U.S. Electric, 10 H.P.

Air Hoist

Ingersoll Rand, air.
Ingersoll Rand, hoist, K6U.

Drilling Lines

U.S. Steel, Tiger brand WRC, 1-3/8" x 6,000'.
Oilwell, WRC, 1-3/8" x 7,500'.

Steam Heater

Modene, steam, HL 1250, V-419.
Stove.
Hot Air Blower.
Safety Heater.

Boilers

Cleaver Brooks, steam, 100 H.P.
Hot Air Heaters: Arctic Air, diesel, C-240-0-F, 2,400,000 BTU.
Hot Air Heaters: T109A, IDF 600,000, BTU 600,000.
Motors.
Boiler House: Parker, steel, 7.5' x 34'.

Rotary Hose

Hewett Robbins, rubber steel, 55' x 7,500 psi.

Vibrator Hose

Hewett Robbins, rubber steel, 12' x 7,500 psi.

Tool House

Parker, wood and steel, 8' x 40'.

Dog House

Parker, steel.

Sanitary Facility House

Parker, steel insulated, 16' x 40'.
Sewage Unit: MetPro, 1 PC 140,000, 7,000 GPD.

Clothes House

Light Plant House

Parker, steel, 8' x 34'.

Mud House

Mud Sample House

Parts Storage House

Blowout Preventers

Shaffer, hubbed LWS, 13-5/8" - 5,000 psi.
Shaffer, LS, 13-5/8" - 5,000 psi.
Annular Spherical Preventer: Shaffer, hubbed, LW, 13-5/8" - 5,000 psi.
Choke Manifold: Cameron, 2" - 5,000 psi.
Cameron, 4" - 5,000 psi.
Tees: Cameron, 4" with 2" outlets.
Cameron, 4 way T with one 4" outlet and two 2" outlets.
Cameron, positive choke.
Cameron, adjustable choke.
Two spacer spools.
One spool, 2" - 10,000 psi to 2" - 5,000 psi.
Flanges: Shaffer, 2" - 5,000 psi.
Drilling Spools: Cameron, 13-5/8" - 5,000 psi.
Shaffer, clamp to hub, 13-5/8" - 5,000 psi.
Shaffer, hub to hub.

Double studded 13-5/8" to 12".
Shaffer double, 10" - 1,500 psi to 13-5/8" - 5,000 psi.
Shaffer, 13-5/8" - 5,000 psi x 13-5/8" - 5,000 psi.
Adapters.
Rams: Shaffer, 70, 4-1/2" rams.
Shaffer, 70, blind rams.
Shaffer, 70, 9-5/8" rams.
Shaffer, 70, 7" rams.
Kill Line: Steel, 4-1/2" drill pipe.
Gate Valves: Demco, 4" - 5,000 psi.
Demco, 2" - 5,000 psi.

Accumulator

Koomey, T315-15-3, 160 gallon.

Water Tanks

PDC, steel, 17,500 gallon.

Tong Torque Gauge

Martin Decker.

Rotary Torque Gauge

Martin Decker.

Mud Pressure Gauge

Cameron.

Drilling Recorder

Totco, 61-A, 4 Pen.

Weight Indicator

Cameron C.
Martin Decker, E, with Type E sensator.

Welding Machine

Lincoln, diesel, 300 AMP.
Motor: GMC, diesel, 2/53.

Wire Line Unit

Halliburton, XLD, 18,000 with Ramsey gear box.

Drill Pipe Slips

Varco, SDL, 4-1/2".

Drill Collar Slips

Baash/Ross.
Clamps: Baash/Ross.

Subs

2 - 6-5/8" Reg. x 6-5/8" Reg.
1 - 5" H90 x 6-5/8" Reg.
2 - 4-1/2" IF x 4" H90.
2 - 4" H90 x 4-1/2" IF.
1 - 4-1/2" IF x 4-1/2" IF.
1 - 4-1/2" IF x 4-1/2" Reg.
2 - 6-5/8" Reg. x 4-1/2" IF.
2 - 4-1/2" IF x 6-5/8" Reg.
1 - 5" H90 x 4-1/2" Reg.
2 - 6-5/8" Reg. x 7-5/8" Reg.
2 - 4-1/2" IF x 7-5/8" Reg.
2 - Junk Baskets 4-1/2" Reg. x 4-1/2" Reg.
2 - Junk Baskets 6-5/8" Reg. x 6-5/8" Reg.
1 - 6-5/8" x 7-5/8" Reg.
1 - 4-1/2" Reg. x 4-1/2" Reg.
1 - 4-1/2" Reg. x 6-5/8" Reg.

Fishing Tools

Overshots: Top Subs.
Grapples.
Jars.
Basket Subs.
Bumper Subs.

Rat Hole

Parker, 9-5/8" x 30'.
Mouse Hole: Parker, 7" x 30'.

Wire Line Guides

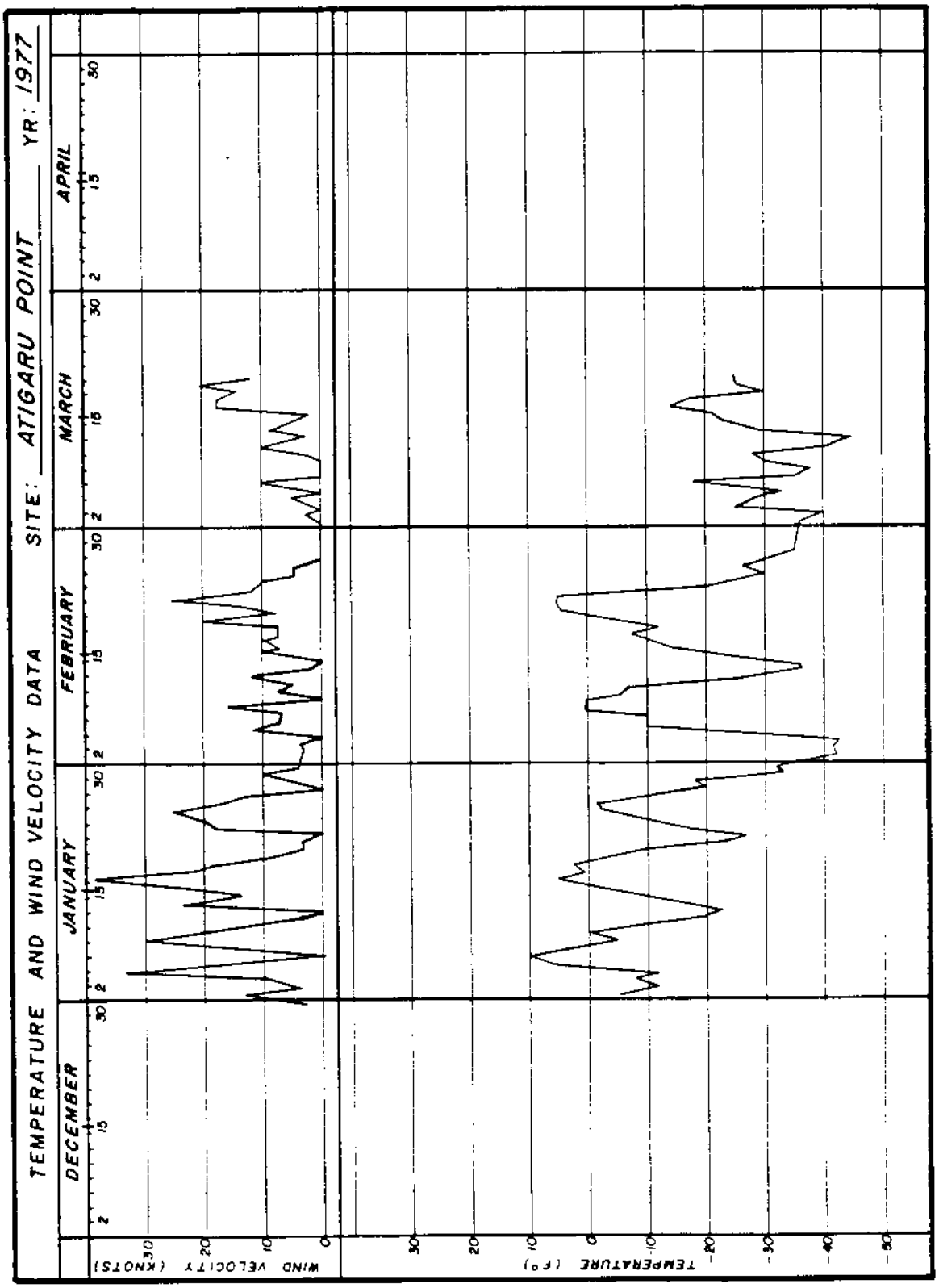
Oteco, roller.

Crown-o-matics

Stewart Stevenson, TCB.

Fire Extinguishers

General, powder, 30#.


TEMPERATURE AND WIND VELOCITY DATA
SITE: ATIGARU POINT
YR: 1977
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
WIND VELOCITY (KNOTS)
TEMPERATURE (F°)

70