NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY
OF
DRILLING OPERATIONS

WALAKPA TEST WELL NO. 2

HUSKY OIL NPR OPERATIONS, INC.
Prepared by: Drilling Department
Edited by: S. L. Hewitt and C. C. Livingston

For the

U. S. GEOLOGICAL SURVEY
Office of the National Petroleum Reserve in Alaska
Department of the Interior
SEPTEMBER, 1982

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WALAKPA TEST WELL NO. 2

INTRODUCTION

Walakpa Test Well No. 2 is located in the National Petroleum Reserve in Alaska (Figure 1). The well is located 216 feet from the east line and 106 feet from the north line of protracted Section 31, Township 20 North, Range 19 West, Umiat Meridian (Latitude: 71°03'00.44" North; Longitude: 156°57'09.70" West). Alaska State Plane Coordinates are: X = 624,573.85 and Y = 6,234,924.32, Zone 6. Elevations: Pad 44 feet; Kelly Bushing 61 feet. Rig move began on December 20, 1980, and the well was spudded on January 3, 1981. The rig was released on February 14, 1981.

The well was drilled to a total depth of 4,360 feet. The primary objective of the well was to test a structural/stratigraphic trap(s) within the "Walakpa/Simpson" sandstone and Permo-Triassic Groups. At the conclusion of the drilling and evaluation operations, the well was left in a temporarily abandoned condition 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 Department of the Interior. Brinkerhoff Signal, Inc. was the drilling contractor; and Brinkerhoff Rig 31, a National T20, was used to drill the well.

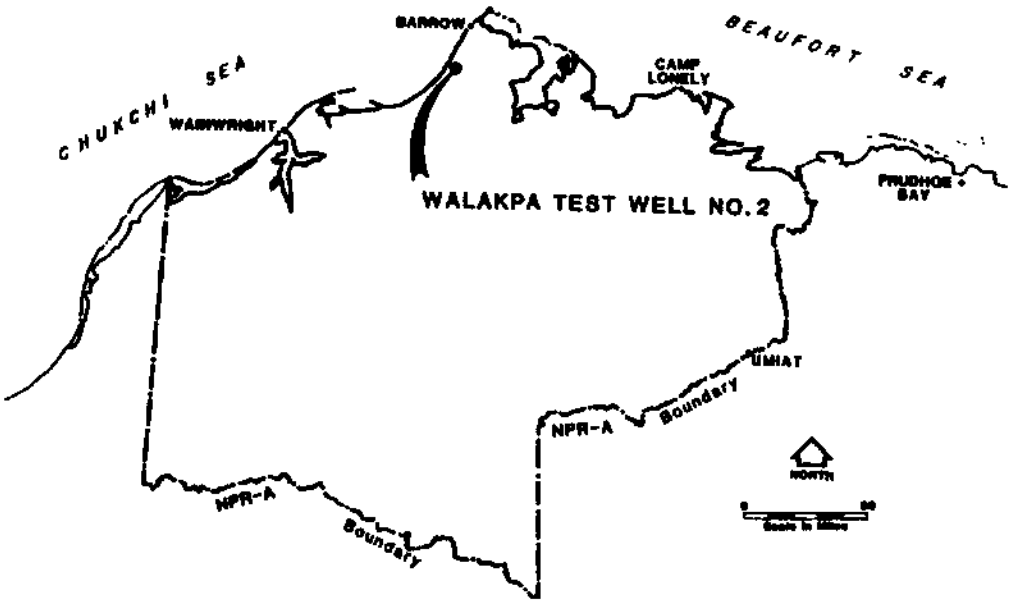


FIGURE 1 - WELL LOCATION MAP - WALAKPA NO. 2

DRILLING SUMMARY

Field operations at Walakpa Test Well No. 2 began on December 8, 1980, with the mobilization of construction crews and equipment required to build the drilling pad and an ice airstrip. Construction work was completed on December 23, 1980. Rig-up began on December 20, 1980, and the well was spudded January 3, 1981, at 7:00 p.m. A 20" conductor was set at 105' and cemented with 200 sacks of Permafrost cement.

Mud used the first 2,330 feet was a Gel Chemical system at 8.5 to 9.5 ppg weight. Beyond 2,330 feet, and after the 9-5/8" casing had been set, the mud system was converted to a calcium chloride mud with mud weights of 9.5 to 10.3 ppg and used to total depth, 4,360 feet.

A 12-1/4" hole was drilled from the base of the 20" conductor to 2330', and the following logs were run: DLL/GR; FDC/CNL/CAL/GR; BHC-Sonic/GR; and a HDT-Dipmeter.

The 9-5/8" casing was run to 2310' (54 joints, S-95, 53.5# BRC). The duplex float collar was set at 2263'. The casing was cemented to the surface with 1,750 sacks of 14.9 ppg Permafrost cement. The cement was in place January 12, 1981, at 12:48 p.m. The shoe was drilled out to 2340', and the formation tested to a 0.62 psi/ft. equivalent gradient with no leak off.

An 8-1/2" hole was drilled to 4360'. Cores were cut as follows: Core No. 1, 2611' to 2640', recovered 29'; Core No. 2, 2984' to 3021', recovered 37'; Core No. 3, 3690' to 3749', recovered 59'. The following logs were run from 4360' back into the 9-5/8" shoe at 2310'; HRT-Temperature Log (Run No. 1); DLL/GR/SP; FDC/CNL/CAL/GR; BHC-Sonic/GR; HRT-Temperature Log (Run No. 2). Shot 27 sidewall cores and recovered 25.

After log evaluation, a decision was made to plug the well back and test the interval 2606' to 2634'. A plug was set from 4010' to 3610' with 180 sacks of 15.8 ppg Class "G" cement. Next a 7" liner was run from 2800' to 1976' and was cemented in with 280 sacks of 15.8 ppg Class "G" cement (1% CFR-2, 2% $CaCl_2$). Returns were lost while pumping the last 20 barrels of slurry. An RTTS was set at 1931' and the liner lap squeezed with 100 sacks of 15.8 ppg Class "G" cement (1% CFR-2, 2% $CaCl_2$). The liner lap was then tested to 1,500 psi with no leak off.

In preparation for testing, the interval 2606' to 2636' was perforated at 2 shots per foot. A nitrogen cushion of 1,000 psi was used. The flow test was 37 hours, 54 minutes long and is summarized below:

> 1st Flow Period: (18 hours, 13 minutes) gas to surface in 41 minutes; maximum rate 2.293 MMCFGD on 24/64" choke; FBHP 770.4 psi; FWHP 580 psi.
>
> 1st Shut-In Period: (4 hours, 42 minutes) maximum BHSIP 1,061.6 psi.

2nd Flow Period: (3 hours, 23 minutes) maximum rate 0.909 MMCFGD on a 13/64" choke, FBHP 963.4 psi, FWHP 848 psi.

2nd Shut-In Period: (5 hours, 12 minutes) maximum BHSIP 1,044.1 psi.

3rd Flow Period: (1 hour, 15 minutes) maximum rate 1.385 MMCFGD on 18/64" choke, FBHP 917.6 psi, FWHP 790 psi.

3rd Shut-In Period: (5 hours, 09 minutes) maximum BHSIP 1,060.9 psi.

NOTE: Formation of hydrates downhole during all flow periods precluded obtaining stabilized rates on all attempted choke sizes.

After completing the test, a decision was made to temporarily abandon the well. A 9-5/8", Model N, Quick Retrievable Bridge Plug was set at 1948' and tested to 2,000 psi. A production string of 2-7/8" tubing was run and hung at 1944' (64 joints, 6.5#, N-80, 8rd).

Rigged up and circulated out 10.6 ppg calcium chloride water. The blowout preventer equipment was nippled down, and a 5,000 psi OCT tree nippled up and tested to 2,000 psi. Valve handles were removed and a house was placed over the well head. The rig was released February 14, 1981, at 12:00 midnight.

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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 National Petroleum Reserve in AK
9. WELL NO.
Walakpa Test Well No. 2
10. FIELD AND POOL, OR WILDCAT
N/A
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 31, T20N, R19W
12. COUNTY OR PARISH North Slope
13. STATE Alaska

NOTICE OF INTENT TO DRILL, DEEPEN, OR PLUG BACK

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

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

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface
216' FEL; 106' FNL
At proposed prod. zone
Same (straight hole)

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
19 Miles South of Barrow, Alaska

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drig. unit line, if any) 34,320'

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. 18,480

19. PROPOSED DEPTH 4100'

20. ROTARY OR CABLE TOOLS Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
Pad: 44'; KB: 61'

22. APPROX. DATE WORK WILL START*
December 30, 1980

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
28"	20"	133#	100'	200 ± Sks Permafrost to Surface
12 1/4"	9 5/8"	53.5# (S-95)	2400'	1500 ± Sks Permafrost to Surface

Blowout Preventer Program:
From 100' to 2400': 12", 3000 psi, SA Diverter Assembly

From 2400' to TD: 12", 3000 psi, SRRA BOP Assembly with 3000 psi Choke Manifold and Kill Line

RECEIVED
DEPUTY CONSERVATION MGR.
ONSHORE MINERALS

DEC 23 1980

CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

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 Max C. Brewer TITLE Chief of Operations, ONPRA DATE 22 December 80

(This space for Federal or State office use)

PERMIT NO. APPROVAL DATE

APPROVED BY [signature] TITLE DISTRICT SUPERVISOR DATE 12/24/80

CONDITIONS OF APPROVAL, IF ANY:

See attached conditions.

*See Instructions On Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9–331–C for such proposals.)

1. oil well ☒ gas well ☐ other

2. NAME OF OPERATOR: National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR: 2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE: N/A

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

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: National Petroleum Reserve in Alaska

9. WELL NO.: Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME: N/A

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 31, T20N, R19W

12. COUNTY OR PARISH: North Slope

13. STATE: Alaska

14. API NO.

15. ELEVATIONS (SHOW DF, KDB AND WD): Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐
(other) Subsequent Report of Spud			

RECEIVED
DEPUTY CONSERVATION FOR ONSHORE FIELD OPERATIONS
FEB 10 1981
(NOTE: Report results of multiple completion or zone change on Form 9–330.)
CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This well was spudded January 3, 1981, at 7:00 AM. Prior to spud, a 20" conductor was set into a 26" dry drilled hole. The conductor was cemented with 200 sacks Permafrost cement, 15 ppg, at a KB depth of 105'.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED [signature] TITLE Chief of Operations DATE 5 February 81

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

ACTING
TITLE DISTRICT SUPERVISOR DATE _____

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well ☒ gas well ☐ other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE
N/A

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

7. UNIT AGREEMENT NAME
N/A

8. FARM OR LEASE NAME National Petroleum Reserve in Alaska

9. WELL NO.
Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME
N/A

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 31, T20N, R19W

12. COUNTY OR PARISH North Slope 13. STATE Alaska

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐

(other) Subsequent Report of Running and Cementing 9 5/8" Casing

RECEIVED
DEPUTY CONSERVATION FOR
ON-SHORE FIELD OPERATIONS

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

FEB 10 1981

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Drilled 12 1/4" hole to 2330' and logged. Ran 54 joints of 9 5/8", S-95, 53.5 #/ft, BRC casing, with float shoe at 2310' KB and duplex float collar at 2263' KB. Tested 9 5/8" packoff to 3000 psi. Cemented 9 5/8" casing to surface with 1750 sacks of Permafrost cement at 14.9 ppg slurry weight. Full returns throughout job with 14.6 ppg slurry in returns. Cement in place at 12:48 PM, 1/12/81. Tested 10", 3000 psi dual Shaffer LWS BOP; choke line; choke manifold; and kelly cocks to 3000 psi. Tested 10", 3000 psi GK Hydril to 1500 psi. Tested 9 5/8" casing to 3000 psi. Drilled collar, shoe, and 10 feet of formation to 2340'. Tested formation to 0.62 psi/ft equivalent gradient (210 psi with 10.2 ppg mud) with no observed leak off.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED [signature] TITLE Chief of Operations DATE 5 February 81

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

ACTING
TITLE DISTRICT SUPERVISOR

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9–331–C for such proposals.)

1. oil well ☒ gas well ☐ other

2. NAME OF OPERATOR: National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR: 2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE: N/A

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

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: National Petroleum Reserve in Alaska

9. WELL NO.: Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME: N/A

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 31, T20N, R19W

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

14. API NO.: N/A

15. ELEVATIONS (SHOW DF, KDB AND WD): Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐
(other) Notice of Intent to Change Plans			

RECEIVED
DISTRICT ENGINEER, ALASKA
FEB 10 1981
CONSERVATION DIVISION

(NOTE: Report results of multiple completion or zone change on Form 9–330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

The Notice of Intent to Drill indicated the proposed TD to be 4100'. Due to thickened geologic sequences, the objective TD is expected to be deeper. The operator plans to continue drilling, and it is expected that final TD will be 4500'. Verbal notification was given to Harold Hedlund on January 28, 1981.

Subsurface Safety Valve: Manu. and Type _____ Set @: _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Max S. Brewer TITLE Chief of Operations DATE 4 February 81

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

ACTING DISTRICT SUPERVISOR

TITLE _____ DATE _____

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well ☒ gas well ☐ other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106'FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE
N/A

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

7. UNIT AGREEMENT NAME
N/A

8. FARM OR LEASE NAME National Petroleum Reserve in Alaska

9. WELL NO.
Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME
N/A

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 31, T20N, R19W

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

14. API NO.
N/A

15. ELEVATIONS (SHOW DF KDB AND WD)
Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐
(other) Subsequent Report of Hanging 7" Liner			

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Eight and one-half inch hole was drilled to 4360' KB and logged with HRT, DLL, FDC/CNL, Dipmeter, and Birdwell Velocity Survey. Twenty-seven sidewall cores were shot; 25 were recovered. Set plug with 180 sacks of 15.8 ppg Class "G" cement from 4010' to 3610'. Ran 21 joints of 7", 38#, S-95 liner with BOT liner hanger. Liner shoe set at 2800'. Pumped 280 sacks Class "G" cement with 1% CFR-2, 2% CaCl, 15.8 ppg slurry. No returns last 20 barrels. Cement in place 2/4/81 at 10:40 PM. Tested liner to 750 psi; would hold 400 psi. Set RTTS tool at 1931'; squeezed liner lap with 100 sacks 1% CFR-2, 2% CaCl, 15.8 ppg Class "G" cement. Tested liner lap to 1500 psi with no leak off. Nippled up BOP. Tested blind rams, pipe rams, choke manifold to 3000 psi; tested Hydril to 1800 psi.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Max Brewer TITLE Chief of Operations DATE 19 February 81

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

APPROVED James W. Wilson TITLE DISTRICT SUPERVISOR DATE 2/25/81

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well [X] gas well [ ] other

2. NAME OF OPERATOR: National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR: 2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE: N/A

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

7. UNIT AGREEMENT NAME: N/A

8. FARM OR LEASE NAME: National Petroleum Reserve in Alaska

9. WELL NO.: Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 31, T20N, R19W

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

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD): Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	[ ]		[ ]
FRACTURE TREAT	[ ]		[ ]
SHOOT OR ACIDIZE	[ ]		[ ]
REPAIR WELL	[ ]		[ ]
PULL OR ALTER CASING	[ ]		[ ]
MULTIPLE COMPLETE	[ ]		[ ]
CHANGE ZONES	[ ]		[ ]
ABANDON*	[ ]		[ ]

(other) Subsequent Report of Flow Test (Revised 7/82)

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Perforated interval 2606' to 2636' at 2 SPF. Opened well at 1406 hours 2/10/81. Test completed at 0400 hours 2/12/81 (total of 37 hours and 54 minutes).

1st Flow Period: (18 hours, 13 minutes) gas to surface in 41 minutes; maximum rate 2.293 MMCFGD on 24/64" choke; FBHP 770.4 psi; FWHP 580 psi.

1st Shut In Period: (4 hours, 42 minutes) maximum BHSIP 1061.6 psi.

2nd Flow Period: (3 hours, 23 minutes) maximum rate 0.909 MMCFGD on a 13/64" choke, FBHP 963.4 psi, FWHP 848 psi.

2nd Shut In Period: (5 hours, 12 minutes) maximum BHSIP 1044.1 psi.

Subsurface Safety Valve: Manu. and Type _____ Set @: _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Max Brewer TITLE Chief of Operations DATE 8 July 1982

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

_____ TITLE DISTRICT SUPERVISOR DATE JUL 12 1982

*See Instructions on Reverse Side

3rd Flow Period: (1 hour, 15 minutes) maximum rate 1.385 MMCFGD on 18/64" choke, FBHP 917.6 psi, FWHP 790 psi.

3rd Shut In Period: (5 hours, 09 minutes) maximum BHSIP 1060.9 psi.

NOTE: Formation of hydrates downhole during all flow periods precluded obtaining stabilized rates on all attempted choke sizes.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9–331–C for such proposals.)

1. oil well ☒ gas well ☐ other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 216' FEL; 106' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

5. LEASE
N/A

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

7. UNIT AGREEMENT NAME
N/A

8. FARM OR LEASE NAME National Petroleum Reserve in Alaska

9. WELL NO.
Walakpa Test Well No. 2

10. FIELD OR WILDCAT NAME
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 31, T20N, R19W

12. COUNTY OR PARISH 13. STATE
North Slope Borough, Alaska

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
Pad: 44'; KB: 61'

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐
(other) Notice of Intent to Temporarily Abandon			

(NOTE: Report results of multiple completion or zone change on Form 9–330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This is a confirming notice to temporarily abandon Walakpa Test Well No. 2. This well was drilled to a total depth of 4360', logged, and tested. The temporary abandonment procedure is attached.

Subsurface Safety Valve: Manu. and Type _____ Set @: _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Max S. Brewer TITLE Chief of Operations DATE 23 February 81

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

APPROVED BY [signature] TITLE DISTRICT SUPERVISOR DATE 2/25/81

*See Instructions on Reverse Side

Notified Joe Russell on February 11, 1981, of intent to temporarily abandon. Received verbal approval. Set 9 5/8" Model N Quick Retrievable Bridge Plug at 1948'. Tested same to 2500 psi. Ran 64 joints (1944 feet) of 2 7/8", 6.50#, N-80, 8rd tubing. Pumped 10.6 ppg CaCl in tubing and casing. Nipplad down BOPE. Set 5000 psi OCT tree. Tested same to 2000 psi. Removed OCT valve handles. Cleaned pits. Installed house over OCT. Released rig February 14, 1981, at 12:00 midnight.

Form 9-331
(Rev. 5-63)

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.

REVISED 7/82

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

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

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

2. NAME OF OPERATOR: National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR: 2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface: 216' FEL; 106' FNL
At top prod. interval reported below
At total depth: Same (straight hole)

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: National Petroleum Reserve in AK
9. WELL NO.: Walakpa Test Well No. 2
10. FIELD AND POOL, OR WILDCAT: N/A
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 31, T20N, R19W
12. COUNTY OR PARISH: North Slope Borough
13. STATE: AK

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

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
1/3/81	2/1/81	N/A	Pad: 44'; KB: 61'	N/A

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
4360'	1948'	N/A	→	All	N/A

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

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: DLL/CNL/FDC/BHCS/HDT-Dipmeter, HRT/DLL/FDC/CNL, CBL/VDL/GR/CCL

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"	119 (K-55)	105'	28"	200 Sx Permafrost	None
9 5/8"	53.5# (S-95)	2310'	12 1/4"	1750 Sx Permafrost	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
7"	1976'	2800'	280 "G"	N/A

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 7/8"	1944'	N/A

31. PERFORATION RECORD (Interval, size and number): 2606' - 2634' - 28 feet at 2 SPF; total of 56 shots.

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
	Did not stimulate perforated zone. Perforations were not cement squeezed.

33.* PRODUCTION

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

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
2/10/81	18 Hrs - 13 Mins	24/64					

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
580 psi	770.4 psi			2.293 MMCFGD		

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

TEST WITNESSED BY

35. LIST OF ATTACHMENTS: Wellbore Schematic

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

SIGNED Max Brewer TITLE Chief of Operations, ONPRA DATE 8 July 1982

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

INSTRUCTIONS

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.
SHOWS			
Basal Pebble Shale Sandstone	2606'	2632'	Ss. H-v lt gy, S&P, f-vf grn, SA-SR, sl sil, tr mica, occ glau, mod fr, approx 22% per (prelim log analysis), good cut & fluor, sl pet odor (gas sand).
CORES			
Pebble Shale SS/Kingak	2611'	2640'	Core No. 1 - See subsequent pages.
Kingak	2984'	3021'	Core No. 2 - See subsequent pages.
Kingak	3690'	3749'	Core No. 3 - See subsequent pages.
TEST DATA			
Basal Pebble Shale Sandstone	2606'	2634'	Production Test - See subsequent pages.

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH
Torok	1350'(?)	
GR/Pebble Shale	2201'	
Basal Pebble Shale Sandstone	2601'	
Kingak Sh	2639'	
Barrow SS	3703'	
Sag River Equiv?	3843'	
Argillite Basement	4301'	

U.S. GOVERNMENT PRINTING OFFICE: 1963 —O 683616

CORE NO.	INTERVAL	DESCRIPTION
1	2611-2640'	Cut 29 feet; rec 29 feet. 85° frac through, 5° dip contact 2638.6'.
	2611-2619'	Ss: v lt gy, S&P, f grn, sa-sr, w srtd, Qtzs, scat glau, tr wh Cly, sl sil, mod fri, fr-g por, bri lt blue yel fluor to pale lt yel fluor strks, dull yel fluor instant lt yel streaming cut, sl pet odor.
	2619-2625.5'	Ss: v lt gy, S&P, f-v f grn, sa, Qtzs, occ glau grns, incr Cly, sl sil, tr mica, sl alt wh grns (Fld?, Cht?), mod fri, p-fr por, lt yel-bri yel fluor, slow-instant ly yel cut, v sl pet odor.
	2625.5-2629'	Ss: lt gy, f-v f grn, ptly S&P, sa, mod srtd, Qtzs, wh Cly mtx, tr mica, sl sil, becoming carb, sl bnd, p por, nil-fnt dull yel fluor, slow lt yel crushed cut, bri yel-wh min fluor 2625-2626'.
	2629-2632.4'	Ss: v lt gy, sl S&P, sa, mod srtd, f-v f grn, slty, Cly, scat glau, tr wh alt grn, sl carb, p-fr por, lt yel fluor, m-fast lt yel cut, sl odor.
	2632.4-2637'	Ss: lt gy tn, f grn, occ m grn, sa, Qtzs, dol, v hd, tt, rr glau, no show.
	2637-2638'	Ss: lt brn, f grn, sa-sr, v clyey, sil, glau, tt, w/m grn cgl strks, lt and dk Cht pbls, Qtz grnls.
	2638-2838.6'	Ss: lt brn, v f grn, sid, tt and cgl, lt brn, sr-sa, trip Cht pbls and rd Qtz grnls, calc, sid cmt, hd, tt.
	2638.6-2640'	Sh: dk brn gy, fis, splty, w ind, f pyr, pel and incls, rr fish frags.

CORE NO.	INTERVAL	DESCRIPTION
2	2984-3021'	Cut 37 feet; rec 37 feet.
	2984-3021'	Sltst, gy brn-dk brn, shy, sh ptg & lam ptly mica, occ pyr, pyr repl plant remains, sid incl & nod, thn, intbd sh, dk brn, micromica, w/s, v f grn ss incl bds 2-3', sid strg & nod @ 2988-2989', 3001.5-3003', 3012-3015', lt gy, v f grn ss & slst, incl (within sltst) w/occ cht pbls below 3003'. 75% frac at 3002-3003'.
3	3690-3749'	Cut 59 feet; rec 59 feet. Sltst, m gy-brn gy argl, matrix, intbd w/ss str, lt gy, SA, v f grn, some cly, cal cmt, scat fos, frag, pyr & fe-st conc.
	3690-3699'	Sltst, m gy-brn gy, argl matrix, v f-f grn, Qtz ss lam. SA-A mica.
	3699-3708'	Sltst, m-lt gy, argl intbd w/ss str, lt gy, SA, v f grn, mica, clyey, matrix, scat fos frag, pyr, fe-st conc.
	3708-3722'	Sltst, m-gy, argl cal cmt, w/lenses & str SS lt gy, v f grn, SA, argl, & cal cmt, mica, increasing fe-st conc pyr str (?), worm trails. Fos frag cast & molds, tr glau.
	3722-3735'	Sltst, gy-brn gy, mica, argl, w/ss lenses, & str gy-lt gy, v f grn, SA, cly & cal cmt, mica, & shy lam.
	3735-3749'	Sltst, m gy-argl, sdy, pyr, abunt sh lam.

PRODUCTION TEST

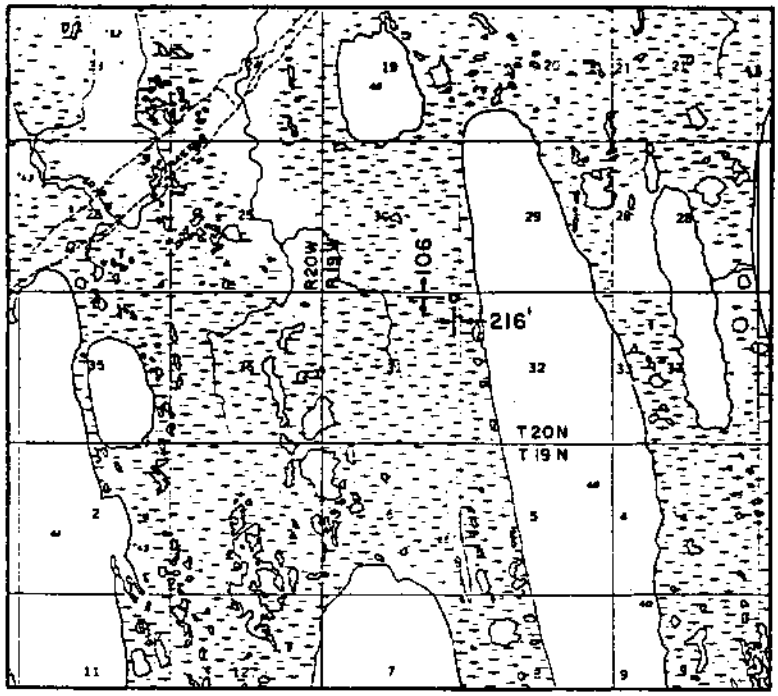
Interval Tested: 2606' to 2634'

Cushion Used: Nitrogen - 1000 psi

Recoveries: Flowed 2.293 MMCFD on 24/64" choke w/770 psig bottomhole flowing pressure and 580 psig flowing tubing pressure.

Shut-in Pressure: 1060.9 psi measured with Hewlett-Packard recorder during final shut in at 2315 hours, 2/11/81.

Production: Gas, 97.08 % methane, specific gravity of 0.57.



COMPUTED LOCATION BASED ON DATA FROM INTERNATIONAL TECHNOLOGY LIMITED TO HUSKY OIL NPR OPERATIONS, INC. DATED AUG. 14, 1980, A COPY OF WHICH IS ON FILE WITH NANA-BELL-HERRING, ANCHORAGE, ALASKA.

0 1/2 1 2
SCALE IN MILES

WALAKPA 2-81

Lat = 71°03'00.44"
Long. = 156°57'09.70"
Y = 6,234,924.32
X = 624,573.85
Zone 6

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.

DATE: DEC. 12, 1980

JOHN R. HERRING
No. 5638-S
REGISTERED PROFESSIONAL LAND SURVEYOR

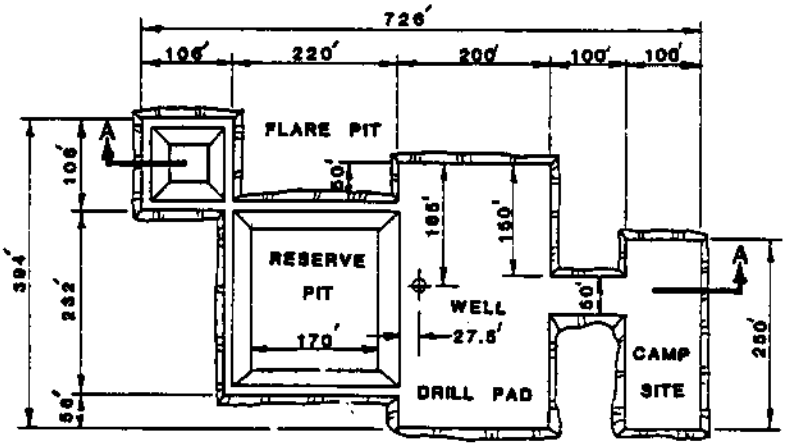
AS-BUILT LOCATION
FOR

WALAKPA No. 2

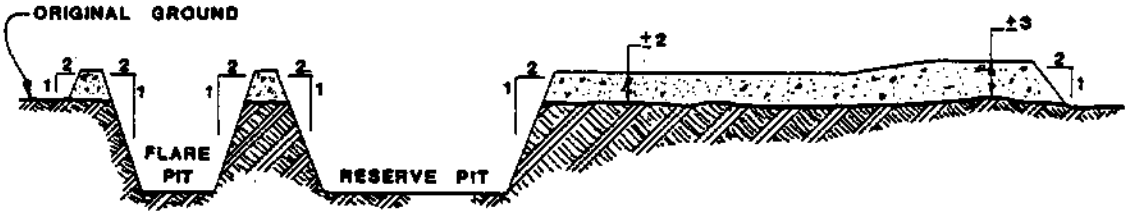
located in: NE 1/4 protracted Sec. 31, T. 20 N., R. 19 W., Umiat Meridian, Ak.

Surveyed for:
HUSKY OIL
NPR Operations Inc

Surveyed by: nana-bell-herring, inc.
engineers and land surveyors
3340 Arctic Blvd., Anchorage, Alaska, 99503



PLAN VIEW



SECTION A - A

WALAKPA NO.2 DRILL PAD

OPERATIONS HISTORY

DATE AND FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
12/21/80	Moved camp to location and set nine units. Worked on trail and cleaned location. Set 20" casing at 105'.
12/22/80	Started generator; continued setting camp units in place.
12/23/80	Hooked up sewage and water treatment plants. Began moving rig. Rigged up weather shack and started generator.
12/24/80	Continued with rig move. Rigged up matting boards and set two sides of subbase.
12/25/80	Continued with rig move. Finished setting subbase and draw works.
12/26/80	Completed rig move. Set pump house, mud tanks, generator house, boiler house, water tank, fuel tank, tool house, and shop building. Began stringing up derrick.
12/27/80	Laid fuel, water, steam, and electric lines. Put derrick on floor and raised A-frame.
12/28/80	Attempted to raise derrick but leg buckled on pit side about 14 feet from derrick shoe. Laid derrick down and set it off floor for repairs. Set Howco cement tank and unit.
12/29/80	Began repairing derrick. Set logging shack; hooked up cement tanks; hooked up lights; fired No. 1 boiler.
12/30/80	Continued with derrick repairs. Cut off 20" casing and installed 20" head; tested weld to 750 psi.
12/31/80	Nippled up 13-5/8" blowout preventer stack. Started Halliburton unit to cement 20" casing.
1/1/81	Completed repairs to derrick. Finished nippling up blowout preventer equipment; installed cement line.
1/2/81	Set derrick on rig floor; set board and hooked drilling line to drum. Raised derrick at 5:30 p.m. Set in catwalks, pipe rack, windwalls, and diverter lines. Cemented 20" conductor pipe with 200 sacks Permafrost cement at 15 ppg. Cement in place at 5:30 a.m.

1/3/81	Picked up kelly; set rat and mouse holes. Rigged up diverter lines. Mixed spud mud.
1/4/81 125'	Total Depth: 230'; Mud Weight: 8.9; Viscosity: 35. Filled and repaired accumulator lines; rigged up torque and weight indicator. Repaired mud lines and stand pipes; tightened all unions. Pressure tested Hydril and diverter system to 250 psi. Worked on pumps. Rigged up survey equipment and ran survey at 105'. Circulated. Spudded well January 3, 1981, at 7:00 p.m. Pulled out of hole; unplugged bit. Worked on pumps. Ran in hole; picked up kelly; drilled ahead.
1/5/81 455'	TD: 685'; MW: 9.8; Vis: 30. Pulled out of hole; unplugged bit; changed jets from 11 to 12. Drilled ahead. Tripped to unplug bit; drilled ahead. Changed out geolograph line; drilled ahead. Surveyed; drilled ahead.
1/6/81 630'	TD: 1315'; MW: 9.5; Vis: 28. Drilled to 1045'; surveyed. Drilled to 1077'; surveyed at 1067'. Drilled ahead.
1/7/81 375'	TD: 1690'; MW: 9.5; Vis: 28. Drilled to 1485'; swept hole with gel pill. Tripped for new bit. Drilled to 1611'; surveyed at 1591'. Drilled ahead.
1/8/81 377'	TD: 2067'; MW: 9.5; Vis: 29. Drilled to 2067'; repaired rotary chain.
1/9/81 263'	TD: 2330'; MW: 9.5; Vis: 43. Repaired rotary torque assembly. Drilled to 2330'. Circulated and conditioned mud; brought calcium level to specifications. Ran survey; wire line on spool balled up. Dropped survey. Attempted to pull out of hole; hole tight. Picked up kelly; mixed gel; circulated shale off bottom. Pulled out of hole; hole tight.
1/10/81 0'	TD: 2330'; MW: 9.5; Vis: 45. Made wiper trip; tight hole from 2330' to 1650'. Ran survey. Washed and reamed from 2140' to 2330'. Conditioned mud for logs. Made short trip to 1500'; hole OK. Circulated bottoms up; hole clean. Pulled out of hole; no drag. Rigged up Schlumberger unit; ran DLL but could not get below 1500'. Ran in hole with bit; tight hole from 1650' to 2300'. Circulated and conditioned mud to run log.
1/11/81 0'	TD: 2330'; MW: 9.5; Vis: 46. Continued conditioning mud for logs. Pulled out of hole and

	rigged up logging unit. Logged surface hole. Ran DLL, 109' to 2250'; CNL/FDC, 109' to 2310'; BHCS, 109' to 2308'; and HDT-Dipmeter, 109' to 2308'. Made up bit and ran in hole; had four feet of fill. Circulated and conditioned mud to run casing.
1/12/81 0'	TD: 2330'; MW: 9.5; Vis: 47. Conditioned mud to run 9-5/8" casing. Pulled out of hole and rigged up to run casing. Ran shoe, one joint, float collar, and 54 joints of 9-5/8", S-95, 53.5# casing. Shoe at 2310' and duplex float collar at 2263'. Circulated hole clean and conditioned mud. Hung 9-5/8" casing in hanger. Cleaned out cellar. Packed off 9-5/8" casing and tested packoff to 3,000 psi.
1/13/81 0'	TD: 2330'; MW: 9.5; Vis: 43. Ran in hole with 9-5/8" stab-in tool; stabbed float. Circulated before cementing. Pumped 20 barrels water ahead; mixed and pumped 1,750 sacks Permafrost cement; followed with 5 barrels water and 11-3/4 barrels mud. Final pump pressure: 250. Cement in place at 12:48 p.m. Pulled stinger out of float and circulated out while cleaning out diverter lines. Pulled out of hole with stab-in tool. Tested blowout preventer to specifications. Installed wear bushing in head. Washed mud pit and flushed manifold with diesel. Made up new bit.
1/14/81 75'	TD: 2405'; MW: 10.2; Vis: 40. Circulated and conditioned mud at 2255' while waiting on cement. Tested casing to 3,000 psi. Drilled float, cement, and shoe, 2260' to 2310'. Washed from 2310' to 2330'; drilled from 2330' to 2340'. Conditioned mud to 10.2 ppg. Drilled ahead.
1/15/81 180'	TD: 2585'; MW: 10.2; Vis: 41. Drilled to 2431'; pulled out of hole for new bit. Made up bit and boot basket; ran in hole. Strung up geolograph line. Attempted to pick up junk. Drilled ahead.
1/16/81 51'	TD: 2636'; MW: 10.2; Vis: 47. Drilled to 2611'; circulated samples. Surveyed. Pulled out of hole to core. Made up core barrel and ran in hole. Reamed from 2521' to 2611'. Began cutting Core No. 1 at 2611'.
1/17/81 70'	TD: 2706'; MW: 10.2; Vis: 47. Cut Core No. 1 to 2640'. Pulled out of hole with core barrel and laid down core; recovered 29 feet. Made up new bit and ran in hole. Reamed from 2610' to 2640'. Drilled to 2703'. Lost 400 pounds pump pressure. Pulled out of hole, checking for washout. Worked on pump. Ran in hole; changed out jar; drilled ahead.

1/18/81
234'

TD: 2940'; MW: 10.2; Vis: 40. Drilled ahead.

1/19/81
44'

TD: 2984'; MW: 10.2; Vis: 48. Drilled to 2960'; surveyed; pulled out of hole. Ran in hole to 2588'; reamed to 2960'. Drilled to 2984'; had drilling break, 2980' to 2984'. Circulated up samples. Pulled out of hole; tight at 2610'. Reamed from 2640' to 2984'. Circulated hole clean. Pulled out of hole for core barrel. Made up core barrel. Ran in hole to 2610' and reamed to 2660'.

1/20/81
0'

TD: 2984'; MW: 10.2; Vis: 42. Reamed with core barrel from 2660' to 2794'. Repaired draw works transfer case. Reamed with core barrel from 2794' to 2910'.

1/21/81
37'

TD: 3021'; MW: 10.2; Vis: 43. Reamed with core barrel from 2910' to 2984'. Cut Core No. 2, 2984' to 3021'. Circulated hole clean. Pulled out of hole and laid down core; recovered 37 feet. Tested blowout preventer, pipe, blind rams, and choke manifold to 3,000 psi; tested Hydril to 1,500 psi.

1/22/81
102'

TD: 3123'; MW: 10.2; Vis: 40. Ran in hole with bit; reamed from 2968' to 3021'. Drilled to 3041'. Repacked swivel. Drilled to 3056'; had drilling break from 3050' to 3056'. Circulated samples. Drilled to 3123'.

1/23/81
152'

TD: 3275'; MW: 10.2; Vis: 43. Drilled to 3136'; tripped for new bit. Reamed from 3076' to 3136'. Drilled to 3260'; repaired geolograph line. Drilled to 3265'; repaired lights to mud logging unit. Drilled to 3275'.

1/24/81
228'

TD: 3503'; MW: 10.3; Vis: 45. Drilled to 3462'; replaced union in stand pipe. Drilled to 3503'; circulated up samples. Had drilling break from 3498' to 3503'.

1/25/81
182'

TD: 3685'; MW: 10.3; Vis: 48. Drilled to 3507'; surveyed. Tripped for bit. Reamed from 3475' to 3507'. Drilled to 3562'; circulated up samples. Restrung geolograph line. Drilled to 3577'; worked on pump. Drilled to 3632'; serviced swivel. Drilled to 3675'; repaired mud lines. Drilled ahead.

1/26/81
64'

TD: 3749'; MW: 10.2; Vis: 40. Drilled to 3690'; circulated samples. Surveyed. Pulled out of hole; made up core barrel. Ran in hole to 3749'. Reamed

	from 3449' to 3480'. Finished tripping in hole. Circulated and dropped ball. Cut Core No. 3, 3690' to 3749'.
1/27/81 126'	TD: 3875'; MW: 10.2; Vis: 41. Circulated for trip. Pulled out of hole with core. Laid down core; recovered 59 feet. Made up new bit; ran in hole to 3690'. Washed from 3690' to 3749'. Drilled ahead.
1/28/81 125'	TD: 4000'; MW: 10.3; Vis: 49. Drilled to 3960'; circulated samples; surveyed. Pulled out of hole for new bit. Made up bit; ran in hole to 3900'. Washed from 3900' to 3960'. Drilled to 4000'.
1/29/81 67'	TD: 4067'; MW: 10.3; Vis: 51. Drilled to 4041'; surveyed. Pulled out of hole for bit. Repaired cellar pump. Made up bit; ran in hole to 2050'. Cut 80 feet off drilling line. Tripped into hole and reamed 60 feet to bottom. Drilled to 4067'.
1/30/81 130'	TD: 4197'; MW: 10.3; Vis: 52. Drilled from 4067' to 4161'. Circulated samples. Had drilling break from 4157' to 4161'. Drilled to 4197'; surveyed. Pulled out of hole for new bit. Thawed out air lines and fuel lines. Restarted draw works motors.
1/31/81 45'	TD: 4242'; MW: 10.3; Vis: 47. Tripped out of hole for bit; pulled wet string. Tested pipe, blind rams, choke manifold, and all valves to 3,100 psi. Tested Hydril to 1,500 psi; tested actuator. Made up bit; checked out jars. Ran in hole; drilled to 4242'.
2/1/81 49'	TD: 4291'; MW: 10.3; Vis: 46. Drilled to 4255'; slugged pipe and pulled out of hole. Made up bit and ran in hole. Drilled to 4291'.
2/2/81 69'	TD: 4360'; MW: 10.3; Vis: 46. Drilled to 4360'; circulated samples. Short tripped 10 stands; wet string. Circulated for logs. Dropped survey; slugged pipe. Pulled out of hole to log.
2/3/81 0'	TD: 4360'; MW: 10.3; Vis: 45. Finished tripping out of hole for logs, steel line measuring; no correction. Began logging. Ran HRT-Temperature 4348' to 2306'; DLL, 4354' to 2306'; and FDC/CNL, 4360' to 2200'. Began running Dipmeter; tool failed.
2/4/81 0'	TD: 4360'; MW: 10.3; Vis: 52. Ran Velocity Survey, Dipmeter and final Temperature Survey. Shot 27 sidewall cores; recovered 25. Ran in hole with bit and drill pipe to 4010'; circulated. Set 400 foot plug with 180 sacks Class "G" cement; displaced with 26 barrels mud. Pulled out of hole with 17 stands. Circulated at 2585'. Laid down drill pipe.

2/5/81 TD: 4360'; PBTD: 3610'; MW: 10.4; Vis: 43. Laid down excess drill pipe and drill collars. Rigged up to run 7" liner. Ran 21 joints of 38#, S-95, 7" liner (a total of 798.20 feet). Ran in hole to 2250' with 3-1/2" drill pipe. Filled every six stands. Circulated at 2250'; made up cement head. Tripped in hole with liner to 2800'. Circulated to cement. Cemented liner with 20 barrels clear water flush; mixed and pumped 280 sacks Class "G" with 1% CFR-2 and 2% $CaCl_2$; displaced with 39.5 barrels mud. Pump pressure: 200 to 500 psi. Liner wiper went through sleeve. Pressure increased from 750 to 850 psi. Bumped plug in latch collar with 3,000 psi; held OK. Hung liner; released shut-in tool; pulled 10 stands of drill pipe; reversed out. Tripped out of hole. Picked up six 4-3/4" drill collars and 18 joints of drill pipe. Waited on cement.

2/6/81 TD: 4360'; PBTD: 3610'; MW: 10.3; Vis: 44. Waited on cement; tripped in hole; tagged top liner at 1974'. Tested liner; pumped in at 750 psi; would hold only 400 psi. Circulated; pulled out of hole. Made up Halliburton RTTS tool; tripped in hole with tool to 1900'. Waited on cement to squeeze liner lap.

2/7/81 TD: 4360'; PBTD: 3610'; MW: 10.3; Vis: 42. Waited on cement. Set RTTS at 1931'; cemented liner lap with 100 sacks Class "G" cement with 1% CFR-2 and 2% $CaCl_2$, 15.8 slurry. Pumped to top of tool at 2 BPM, 150 to 200 psi. Reduced rate to 1 BPM, 200 psi, to bottom of liner lap. Reduced rate to 1/2 BPM, 200 psi. Displaced 13.5 barrels, with no increase in pressure. Stopped for two minutes; pressure at 150 psi. Pumped 1/2 barrel at 225 psi; stopped for two minutes; pressure held at 175 psi. Pumped 1/2 barrel; pressure 250 psi. Stopped for two minutes; pressure held at 175 psi. Pumped 1/2 barrel at 250 psi. Bled back 1/2 barrel; pumped 1/2 barrel at 300 psi. Stopped for four minutes; pressure held at 200 psi. Bled back 1/2 barrel, pumped 1/2 barrel at 400 psi. Shut down for two minutes; pressure held at 250 psi. Bled back 3/8 barrel; pumped 3/8 barrel at 700 psi. Waited for five minutes; held at 500 psi. Bled pressure off; released tool. Pulled four stands; reversed out. Waited on cement. Pulled out of hole; laid down RTTS tools. Ran in hole with six stands of drill collars and one stand of drill pipe. Waited on cement.

2/8/81 TD: 4360'; PBTD: 3610'; MW: 8.3; Vis: 28. Waited on cement. Tripped in hole to 1937'. Drilled cement from 1937' to 1976', top of liner lap.

Circulated at 1976'. Pressure tested liner lap to 1,500 psi for seven minutes; no leak off. Pulled out of hole with bit and casing scraper. Tested blowout preventer equipment; tested blind and pipe rams; tested choke manifold to 3,000 psi; tested Hydril to 1,800 psi. Repaired Hydril leak. Ran in hole with 7" casing scraper and 5-5/8" bit. Drilled cement inside liner from 1976' to 2000'. Tripped in hole to 2721', top of latch collar. Circulated at 2721'. Cleaned mud pits; filled with water in preparation for mixing $CaCl_2$.

2/9/81 — TD: 4360'; PBTD: 2721'; MW: 9.6. Mixed $CaCl_2$ water to 9.6 ppg. Circulated, displaced mud with 154 barrels $CaCl_2$ water; preceded with 80 barrels fresh water. Pulled out of hole for bond log and perforations. Rigged up logging unit. Ran CBL/VDL/CCL/GR from 2702' to 2210'. Top of cement at 2606'. Ran in hole with 37 foot perforating gun; two misruns. Began repairs to gun.

2/10/81 — TD: 4360'; PBTD: 2721'; MW: 9.6. Finished repairs to perforating gun. Ran in hole with 4" OD perforating gun; perforated from 2606' to 2636'; total of 56 shots. Tripped in hole with RHS to 2565'. Made up Halliburton unitest tree and manifold. Hooked up Otis and NOWSCO units; attempted to pressure-up drill pipe with NOWSCO. Observed leak at 270 psi. Pulled out of hole to 1635'. Broke and checked drill pipe connection. Laid down two joints of drill pipe. Pressured up drill pipe with NOWSCO; leaked at 400 psi. Pulled out of hole; checked drill pipe; laid down two joints. Reset Halliburton tool and timer. Ran in hole to 2565'. Pressured up to 700 psi; observed leak in annulus. Pressured up to 1,050 psi; pressure dropped 13 psi every five minutes. Tested Otis equipment to 1,150 psi. Pressured up drill pipe to 1,020 psi.

2/11/81 — TD: 4360'; PBTD: 2721'. Pressured annulus to 340 psi. NOWSCO pressured 3-1/2" drill pipe to 1,150 psi with N_2. Had decrease of 2 psi per minute for one hour on annulus; had decrease of 1.5 psi per minute for one hour on drill pipe. Pressured annulus to 1,000 psi with water on annulus and 1,150 psi on drill pipe. Casing pressure after 1-1/2 hours: 800 psi. Drill pipe pressure after 1-1/2 hours: 940 psi. Rigged up lubricator on unitest tree. Ran temperature and pressure recorder to 2600'. Flow tested perforations, 2606' to 2634', through test separator. Opened well at 2:06 p.m. on 6/64" choke. Initial BHP: 1001 psi; BHT: 75.8°F. Gas to surface at

2:48 p.m. Gradually increased choke size from 6/64" to 24/64" to keep BHP between 800 and 900 psi. Rate increased from 1.1 MMCFD to 2.2 MMCFD. Rate at 6:00 a.m.: 2.2 MMCFD, with 882 psi BHP and 64.2°F BHT. Flow line began to freeze up at 5:30 a.m. Started methanol injection into unitest tree.

2/12/81 TD: 4360'; PBTD: 2721'. Flow tested perforations through test separator on 24/64" choke. Rate at 6:00 a.m.: 2.2 MMCFD with 882 psi FBHP and 64.2°F FBHT. Shut in well at 8:19 a.m. Rate immediately before shut in on 8/64" choke was 369 MCFD with FBHP of 1,025 psi, FDPP of 930 psi, and FBHT of 70.2°F. Reopened well at 1:01 p.m. on 8/64" choke. Last SIBHP before reopening well at 1:01 p.m. was 1,042 psi, with last SIDPP of 960 psi and SIBHT of 72.6°F. Immediately increased choke opening to 12/64" and then to 13/64". Low rate on 12/64" choke was 540 MCFD, with FBHP 987 psi, FDPP 840 psi, and FBHT 72.6°F. High rate on 13/64" choke was 919 MCFD with FBHP of 948 psi, FDPP 835 psi, FBHT 72.6°F. Shut in well at 4:24 p.m. Reopened well at 9:30 p.m. on 17/64" choke, SIBHP 1,042 psi, SIDPP 960 psi, SIBHT 72.5°F immediately before reopening well. Flowed on 17/64" choke for 13 minutes, then increased to 18/64" for remainder of flow period. At 9:30 p.m., SICP of 1,100 psi. Low rate on 17/64" choke was 1,267 MCFD with FBHP of 935 psi, FDPP of 800 psi, and FBHT of 68.4°F. Shut in well at 10:51 p.m. SIBHP increased to 1,060 psi and then decreased to 1,040 psi by 4:00 a.m., while SIDPP increased to 940 psi and remained. SIBHT increased to 72°F by 4:00 a.m. Pulled out of hole with temperature and pressure recorder. Shut in unitest tree. Bled off lubricator pressure and began rigging down Schlumberger unit.

2/13/81 TD: 4360'; PBTD: 2721'. Laid down Howco tools; rigged up to kill well. Unseated packer; reversed out gas. Finished laying down Howco bridge plug. Picked up 9-5/8" bridge plug and ran in hole to 1950'. Set packer at 1950'; attempted to pressure with no success. Pulled out of hole; laid down bridge plug. Ran in hole open ended. Waited on Howco bridge plug. Lost 35 barrels of water while killing well.

2/14/81 TD: 4360'; PBTD: 3650'. Waited on bridge plug. Pulled out of hole; made up bridge plug. Ran in hole. Set plug at 1948' and tested to 2,000 psi. Repaired leak. Laid down drill pipe and drill collars. Pulled wear bushing; picked up kelly and broke same. Rigged up to run 2-7/8" tubing. Ran 64 joints (1,944

feet) of tubing. Rigged up; circulated out 10.6 ppg $CaCl_2$. Drained blowout preventer stack; made up tubing spool and landed same. Nippled down blowout preventers.

2/15/81 TD: 4360'; PBTD: 3650'. Finished nippling down and set OCT head and tested to 2,000 psi; held OK. Cleaned mud pits and moved rental tools off floor. Released rig February 14, 1981, at 12:00 midnight. Began rigging down.

DRILLING TIME ANALYSIS

WALAKPA TEST WELL NO. 2

BRINKERHOFF SIGNAL, INC., RIG 31

Spudded 1/3/81, Rig released 2/14/81

Total Depth: 4,360 Feet

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. WALAKPA TEST WELL NO. 2 Page 1 of 5

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
1980 12-11																							12	Setting Out Camp	Began Setting Out
12-12																							12	Setting Out Camp	Camp Units In
12-13																							12	Setting Out Camp	Preparation for Move to Rig Site
12-14																							12	Setting Out Camp	
12-15																							12	Setting Out Camp	
12-16																							12	Setting Out Camp	
12-17																							12	Setting Out Camp	
12-18																							12	Setting Out Camp	
12-19																							24	Setting Out Camp	
12-20	12																						12	Setting In Camp	Crew Arrived Walakpa
12-21	12																				-		12	Setting In Camp	Set 20" at 105'
12-22	24																							Hooking Up Sewer Line	Began Rigging Up
12-23	24																							Laying Matting Boards	
12-24	24																							Setting Substructure	
12-25	24																							Setting Pump Houses	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. WALAKPA TEST WELL NO. 2 Page 2 of 5

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
12-26	24																							Setting Mast on Floor	
12-27	24																							Began Raising Mast	A-Leg Buckled
12-28	24																							Hooking Up Mud Line	
12-29	24																							Repairing Derrick Leg	
12-30												24												Repairing Steam Heater	
12-31												24												Nippling Up on 20"	
1981 1-1	12											12												Setting Derrick	Finished Repairing Derrick
1-2	3									2½	18½													Waiting On Cement	
1-3	4	1		4	1½		3	3½															7	Making up Accumulator Lines	Spudded Well at 7:00 p. m.
1-4	15½			7¼	¾																		¾	Working Drill Collars	
1-5		22			2																			Drilling	
1-6		17		6½				½																Drilling	
1-7		22			2																			Drilling	
1-8		18			1		2	3																Repairing Rotary Torque Wheel	
1-9				15½				5	2½														1	Tripping Out of Hole	Running Schlumberger Wireline Logs

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. WALAKPA TEST WELL NO. 2 Page 3 of 5

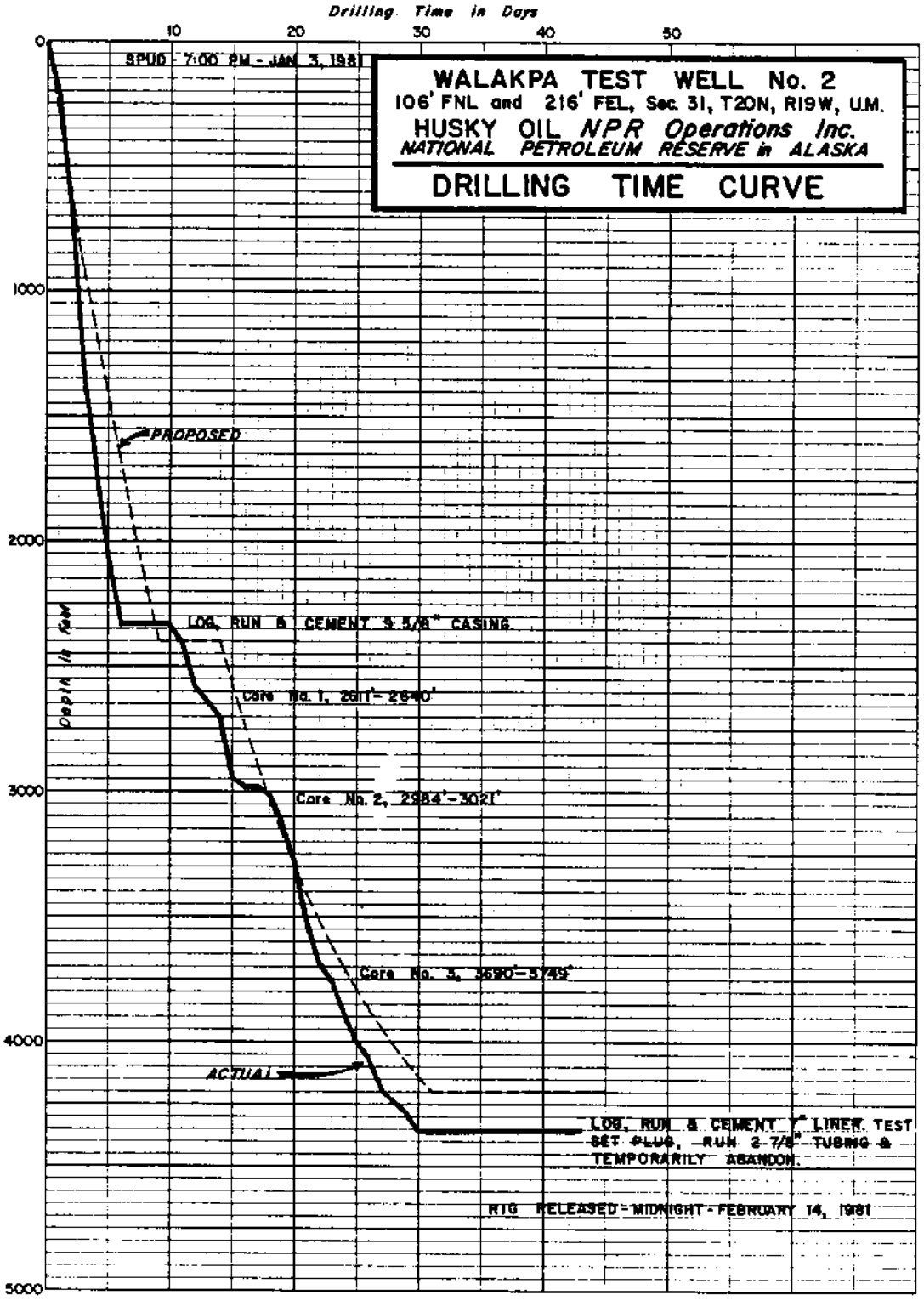
DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1-10				5½				3½	14½														½	Conditioning Hole	
1-11				6½				5½	½	10½													1	Conditioning Hole	Set 9 5/8" at 2310'
1-12				1½				3½		11			7										1	Setting Packoff	
1-13		9						1½			12½		½										½	Circulating & Conditioning	
1-14		16½		6½																			1	Drilling	
1-15		8	2½	5½	½			1½									3½						2½	Drilling	
1-16		5½	1	7													8						2½	Coring	Core No. 1: 2611' - 2640'
1-17		18½		4½																			1	Drilling	
1-18		9	6½	6½	½			1½																Drilling	
1-19			5	4½			14	½																Reaming	
1-20			8	½			3	1½									11							Washing & Reaming	Core No. 2: 2984' - 3021'
1-21		12½	1	4			1½	½					3										1½	Tripping in Hole	
1-22		17	½	6½																				Drilling	
1-23		22					½																1½	Drilling	
1-24		15	½	4½	½		½	1½															1½	Circulating Samples	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. WALAKPA TEST WELL NO.2 Page 4 of 5

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
1-25		5½	1	6	½	½	½	2									8							Drilling	
1-26		9	½	7½													6						1	Coring	Core No. 3: 3690' - 3749'
1-27		17		6				1																Drilling	
1-28		14½	½	5½	½		2																1	Drilling	
1-29		21½	½	1				1																Drilling	
1-30		9½		8	½		1½						4½											Working on Air Lines	
1-31		17		7																				Drilling	
2-1		23						1																Drilling	
2-2				5½	½			3	14														1	Pulling Out of Hole	Running Schlumberger Wireline Logs
2-3				3				3	18															Logging	
2-4				1				3½		13½										½			5½	Laying Down Drill Pipe	Ran 7" Liner 1976' - 2800'
2-5				1							23													Waiting on Cement	
2-6				3				1½			12									2			5½	Waiting on Cement Delivery	
2-7		3	½	3½				1			11½		2										2½	Waiting on Cement	
2-8				1½				2	5½														15	Cleaning Mud Pits	Ran CBL Log

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. WALAKPA TEST WELL NO. 2 Page 5 of 5

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
2-9																							24	Perforating	
2-10				3																			21	Drill Stem Testing	
2-11																							24	Testing	
2-12				1¾				2															20¼	Rigging Up to Kill Well	
2-13				6¾																			17¼	Waiting on Bridge Plug	
2-14	5							2½				15											1½	Nippling Down BOPs	Rig Released at 12:00 Midnight
2-15	24																							Rigging Down	
2-16	24																							Rigging Down	
2-17	24																							Rigging Down	
		333		167¾		50		56½		37½		75	-0-		-0-		-0-		2½		-0-				
TOTAL HOURS	327¼		28		10¾		28½		55		77½		17		-0-		36½		-0-		-0-		306¾		


Drilling Time in Days
10
20
30
40
50
0
1000
2000
3000
4000
5000
Depth in Feet
SPUD - 7:00 PM - JAN. 3, 1981
WALAKPA TEST WELL No. 2
106' FNL and 216' FEL, Sec. 31, T20N, R19W, U.M.
HUSKY OIL NPR Operations Inc.
NATIONAL PETROLEUM RESERVE in ALASKA
DRILLING TIME CURVE
PROPOSED
LOG, RUN & CEMENT 9 5/8" CASING
Core No. 1, 2611'-2640'
Core No. 2, 2984'-3021'
Core No. 3, 3690'-3749'
ACTUAL
LOG, RUN & CEMENT 7" LINER. TEST
SET PLUG, RUN 2 7/8" TUBING &
TEMPORARILY ABANDON.
RIG RELEASED - MIDNIGHT - FEBRUARY 14, 1981

ARCTIC DRILLING SERVICES

DRILLING MUD RECORD

COMPANY Husky Oil Company STATE Alaska CASING PROGRAM: 20 inch at 105 ft.

WELL Walakpa Test Well No. 2 COUNTY North Slope Borough 9 5/8 inch at 2310 ft.

CONTRACTOR Brinkerhoff Signal LOCATION NPRA SEC 31 TWP 20N RNG 19W 7 inch at 2800 ft.

STOCKPOINT DATE TOTAL DEPTH 4360 ft.

DATE	DEPTH	WEIGHT	VISCOSITY		Yp	GELS	pH	FILTRATION			FILTRATE ANALYSIS				SAND	RETORT			CEC	REMARKS AND TREATMENT
1981	feet	lb/gal	Sec API @ °F	PV @ °F		10 sec/10 min	Strip Ø Meter Ø	ml API	@THP & °F	Cake 32nds	Pm	Pf/Mf	Cl ppm	Ca ppm	%	Solids %	Oil %	Water %	Mud, me/ml	
1/3	105	8.5	37	3	9	0/1	7.5	15		3			300	60	0	2	0	98		
1/4	230	8.9	35	3	6	0/1	7.5	30		3			1800	280	Tr	4	0	6		
1/5	655	9.8	30	5	7	3/7	7.5	25		4			1300	100	1.5	10	0	90		
1/6	1315	9.5	28	2	1	0/0	7.5	25		3			600	80	1.5	8	0	92		
1/7	1632	9.5	28	4	1	0/0	7.5	20		3			500	30	.25	9	0	91		
1/8	2067	9.5	29	5	1	0/0	7.5	20		3			400	30	.25	9	0	91		
1/9	2322	9.5	43	11	21	16/19	7.0	9		3			46,000	25,000	Tr	6	0	94		Changed mud to $CaCl_2$
1/10	2330	9.5	45	13	25	15/17	7.0	11		3			46,000	25,000	.5	6	0	94		
1/11	2330	9.5	46	12	25	14/17	7.0	12		3			46,000	25,000	.5	6	0	94		
1/12	2330	9.5	47	12	24	14/21	7.0	10.5		3			44,000	24,600	.5	6	0	94		
1/13	2330	9.5	43	11	21	14/17	7.5	12		3			41,000	22,000	.5	6	0	94		
1/14	2400	10.2	40	11	13	4/12	7	11		3			46,000	25,000	.25	8	0	92		
1/15	2555	10.2	41	13	15	10/15	7.5	11		3			48,000	26,800	.25	8	0	92		
1/16	2635	10.2	47	15	20	10/18	7	9		3			36,000	20,000	.25	8	0	92		
1/17	2703	10.2	47	16	18	10/19	7	6.4		3			46,000	25,700	.25	9	0	91		
1/18	2930	10.2	40	12	13	9/21	7	7.5		3			41,000	22,900	.5	9	0	91		
1/19	2985	10.2	48	12	20	11/24	7	8.4		3			39,000	21,800	.25	9	0	91		
1/20	2985	10.2	42	14	24	10/19	7	6.2		3			44,000	24,600	.25	9	0	91		
1/21	3021	10.2	43	10	20	9/18	7	6.6		3			44,000	24,600	.25	9	0	91		
1/22	3120	10.2	40	10	24	11/17	7	8.0		3			37,000	20,700	.25	9	0	91		
1/23	3265	10.2	43	12	26	10/21	7	8.0		3			41,000	22,960	.5	9	0	91		
1/24	3500	10.3	45	13	29	12/21	7	8.4		3			46,000	25,200	.5	10	0	90		
1/25	3677	10.3	48	15	30	12/23	7	6.0		3			38,000	21,280	.5	10	0	90		
1/26	3745	10.2	40	10	25	8/18	7	8.2		3			39,000	21,840	.5	10	0	90		
1/27	3868	10.2	41	10	15	9/18	7	8.8		3			40,000	22,400	.25	10	0	90		
1/28	3995	10.3	49	12	31	12/19	7	9.8		3			41,000	22,960	.25	11	0	89		
1/29	4060	10.3	51	14	28	12/22	7	10.2		3			40,000	22,400	.25	11	0	89		
1/30	4197	10.3	52	12	25	12/28	7	9.8		3			41,000	22,960	.25	11	0	89		
1/31	4231	10.3	47	12	27	17/30	7	11.2		3			38,000	21,280	.25	11	0	89		
2/1	4284	10.3	46	12	24	13/27	7	10.8		3			38,000	21,280	Tr	11	0	89		
2/2	4360	10.3	46	12	26	12/27	7	8.6		3			41,000	22,960	Tr	11	0	89		
2/3	4360	10.3	45	11	24	11/25	7	8.7		3			41,000	22,960	0	11	0	89		
2/4	4360	10.3	52	14	27	12/33	8.5	11.5		3			40,000	24,000	Tr	11	0	89		
2/5	4360	10.3	43	9	19	3/7	9.0	11.6		3			39,000	22,000	Tr	11	0	89		Ran 7" liner to 2800'
2/6	2800	10.3	44	10	17	3/11	9.0	12.		3			39,000	22,000	Tr	11	0	89		

ARCTIC DRILLING SERVICES

DRILLING MUD RECORD

COMPANY Husky Oil Company STATE Alaska CASING PROGRAM: 20 inch at 105 ft.

WELL Walakpa Test Well No. 2 COUNTY North Slope 9 5/8 inch at 2310 ft.

CONTRACTOR Brinkerhoff Signal LOCATION NPRA SEC 31 TWP 20N RNG 19W 7 inch at 2800 ft.

STOCKPOINT _____ DATE _____ BAROID ENGINEER _____ TOTAL DEPTH 4360 ft.

DATE	DEPTH	WEIGHT	VISCOSITY		Yp	GELS	pH	FILTRATION			FILTRATE ANALYSIS				SAND	RETORT			CEC	REMARKS AND TREATMENT
	feet	lb/gal	Sec API @ °F	PV @ °F		10 sec/10 min	Strip ☐ Meter ☐	ml API	HTHP @ °F	Cake 32nds	Pm	Pf/Mf	Cl ppm	Ca ppm	%	Solids %	Oil %	Water %	Mud, me/ml	
2/7	2800	10.3	42	10	14	3/8	8.5	12.5		3		39,000	22,000	Tr	11	0	89		Squeezed liner lap
2/8	2800	10.3	55	14	31	14/40	9.0	14.0		3		38,000	23,000	.25	11	0	89		Dumped and cleaned pits
2/9	2800	9.6		$CaCl_2$ Solution															Mixed $CaCl_2$ solution for testing and completion
2/10	2800	9.6		$CaCl_2$ Solution															Flow tested well
2/11	2800	9.6		$CaCl_2$ Solution															Flow tested well
2/12	2800	9.6		$CaCl_2$ Solution															Killed well; lost 45 bbls fluid
2/13	2800	9.6		$CaCl_2$ Solution															Set bridge plug; displaced hole with $CaCl_2$ solution
2/14	2800	10.6		$CaCl_2$ Solution															

BIT RECORD

COMPANY	CONTRACTOR	COUNTY	STATE
Husky Oil Company	Brinkerhoff Signal Drilling Company	North Slope Borough	Alaska

LEASE	WELL NO	SEC	TOWNSHIP	RANGE	BLOCK	FIELD
National Petroleum Reserve	Walakpa Test Well No 2	31	20N	19W		

TOOL PUSHER	DRILL PIPE	DRAW WORKS	
DAY DRILLER	TOOL JOINT MAKE / SIZE / TYPE	POWER H P	UNDER SURF
EVENING DRILLER	DRILL COLLAR NO / O D / I D / LENGTH	PUMP NO 1 MAKE / MODEL / STROKE	HT DATE
MORNING DRILLER	DRILL COLLAR NO / O D / I D / LENGTH	PUMP NO 2 MAKE / MODEL / STROKE	I D DATE

BIT NO	BIT SIZE	BIT MFGR	BIT TYPE	SERIAL NO OF BIT	JET SIZE 1	2	3	DEPTH OUT	FTGE	HOURS RUN	ACC HOURS	FT/HR	WEIGHT 1000 LBS	ROTARY R P M	VERT DEV	PUMP PRESS	PUMPS No	Liner	SPM	MUD WT	Vis	DULL CODE T	B	G	REMARKS FORMATION, CIRC. FLUID, ETC.	OJ
1	12¼	Sec	S33S	207324	12	12	12	1485	1380	50¼	50¼	27.46	25	150	3/4	1100	1	5½	72	9.5	28	4	5	1		
2	12¼	STC	SDS	AK8808	11	11	11	2330	845	46	96¼	18.3	25	150	3/4	1500	2	5½	72	9.6	30	3	3	1		
3	8½	STC	SDS	AL9039	11	11	11	2431	101	16½	112 3/4	6.1	15/20	100		1000			100	10.2	40	4	3	1		
4	8½	STC	SDS	AJ4368	10	10	10	2611	180	18½	123½	9.7	20/25	120	1½	900	2	5½	93	10.2	40	4	6	1		
CH	8½	Chr	MC201	OW3449				2640	29	11½	135															
5	8½	STC	SDS	AJ4380	9	9	10	2960	320	32	167	10	20/25	100	1	900	2	5½	84	10.2	40	6	6	0		
6	8½	HTC	X3A	AV178	10	10	10	2984	24	1	168	24	25/30	100		1800	½	5½	106	10.2	40					
CH	8½	Chr	MC201	OW3449				3021	37	11	179	3.7	20	60		1350		5½	118	10.2	42					
RR6	8½	HTC	X3A	AV178	10	10	10	3136	115	23½	202½	4.9	25/30	100		1700		5½	100	10.3	43					
7	8½	STC	SDS	AJ6991	9	9	10	3507	371	35½	238	10.5	25/30	100		1700		5½	99	10.3	48					
8	8½	STC	SDS	AE6236	9	9	10	3690	183	15	253	12.2	25	120		1700		5½	99	10.3	46	2	2	1		
9	8½	STC	SDGH	AX1231	9	9	10	3960	211	26	293	8.1	30	110		1700		5½	96	10.3	49	7	4	1		
10	8½	STC	SD6H	BD3379	9	9	10	4041	81	15	308	5.4	30	90		1700		5½	96	10.3	51	6	5	1		
11	8½	STC	SVH	AT1624	9	9	10	4197	156	25	333	6.2	30	90/96		1700		5½	101	10.3	47	1	31	81		
12	8½	Sec	M44N	636933	9	9	10	4255	58	20		2.9	32	60		1700		5½	101	10.3	46	5	4	1		
13	8½	HTC	J-33	2W749	10	10	10	4360	105	26		4.4	32/35	60/68		1600		5½	99	10.3	46	2	2	1		
14	5 5/8	STC	D6	68425				2721	Drilling		cement out		of 7"	liner												

Compliments of SMITH TOOL

P.O. BOX C19511 • IRVINE, CALIF. 92713
DIVISION OF SMITH INTERNATIONAL, INC.

SMITH REPRESENTATIVE _____ PHONE _____

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.

The casing programmed for Walakpa Test Well No. 2 was as follows: 20" conductor at ±100'; 9-5/8" at ±2400'. Actual casing run was 20" at 105', and 9-5/8" at 2310'. A 7" liner was run from 1976' to 2800' to test the interval 2606' to 2636'. A 2-7/8" string of production tubing was run and hung at 1944' when completing the hole as a temporary abandoned gas well. The 9-5/8" annulus and 2-7/8" tubing were left full of 10.6 ppg calcium chloride water from 1948' to the surface.

CASING TALLY
SUMMARY SHEET

DATE: January 12, 1981

FIELD National Petroleum Reserve in AK LEASE & WELL NO Walakpa Test Well No. 2 TALLY FOR 9 5/8" CASING

SUMMARY OF PAGE MEASUREMENTS

	NO. OF JOINTS	FEET	00'S
PAGE 1	60	2550	00
PAGE 2	4	170	48
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	64	2720	48

SUMMARY OF DEPTH CALCULATIONS

		NO. OF JOINTS	FOOTAGE FEET	FOOTAGE .00'S
1	TOTAL CASING ON RACKS	64	2720	48
2	LESS CASING OUT (JTS NOS. 9, 53, 55, 56, 57, 59, 60, 61, 62, & 64)	10	437	06
3	TOTAL (1 - 2)		2283	42
4	SHOE LENGTH		2	00
5	FLOAT LENGTH		1	77
6	MISCELLANEOUS EQUIPMENT LENGTH OCT Hanger		2	85
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		2290	04
8	LESS WELL DEPTH (KB REFERENCE) Plus Elevation*		20	00
9	~~"UP" ON LANDING JOINT~~ – Set at		2310	04

Weight indicator before cementing: N/A ; after slack-off: N/A ; inches slacked off N/A .

*Casing was hung on OCT fluted hanger before cementing.

SUMMARY OF STRING AS RUN

WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW ~~USED~~	LOCATION IN STRING	NO. OF JOINTS	FOOTAGE	INTERVAL
53.50	S-95	Buttress			JT NO. 1 THRU NO. 54	54	2283.42	' - '
					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 6, 1981

FIELD NPRA LEASE & WELL NO. Walakpa Test Well No. 2 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	43	18			
2	38	83			
3	33	68			
4	40	90			
5	40	86			
6	40	63			
7	40	10			
8	46	04			
9	46	36			
0	43	67			
TOTAL A	414	25			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	41	10			
2	42	26			
3	44	00			
4	45	76			
5	42	23			
6	45	20			
7	42	42			
8	38	93			
9	40	66			
0	45	01			
TOTAL D	427	57			

1	46	60			
2	42	61			
3	43	23			
4	40	85			
5	41	30			
6	39	60			
7	46	25			
8	36	45			
9	39	30			
0	40	69			
TOTAL B	416	88			

1	46	26			
2	40	74			
3	46	40			
4	44	68			
5	44	26			
6	42	05			
7	45	45			
8	46	77			
9	42	10			
0	38	00			
TOTAL E	436	71			

1	36	69			
2	41	40			
3	43	45			
4	42	15			
5	42	88			
6	45	83			
7	46	84			
8	46	10			
9	44	48			
0	44	51			
TOTAL C	434	33			

TOTAL A	414	25		
TOTAL B	427	57		
TOTAL C	416	88		
TOTAL D	436	71		
TOTAL E	434	33		
TOTAL PAGE	2129	74		

PAGE 2 OF 2

CASING TALLY

DATE: January 6, 1981

FIELD NPRA LEASE & WELL NO. Walakpa Test Well No. 2 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	42	32			
2	42	42			
3	46	06			
4	41	62			
5	42	53			
6	42	66			
7	41	72			
8	37	68			
9	41	30			
0	41	95			
TOTAL A	420	26			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	45	08			
2	44	28			
3	36	00			
4	45	12			
5					
6					
7					
8					
9					
0					
TOTAL D	170	48			

1					
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	420	26		
TOTAL B	170	48		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	590	74		

Shoe	2	00
Float	1	77
Hanger	2	85
	6	62

CASING AND CEMENTING REPORT

WELL NAME Walakpa Test Well No. 2

LOCATION National Petroleum Reserve in Alaska

RAN CASING AS FOLLOWS:

54	Jts	53.5#	S-95	9 5/8"	Casing	
	Jts					
	Jts					

Shoe @ 2310' Float @ _____ DV @ _____

Centralizers 10 feet above shoe, on top of joints 2, 4, 6, 8, 10, 51, 52, and 53.

FIRST STAGE

Sx of Cement 1750 Type Pmfst Additives None % Excess _____

Preflush 20 barrels water Initial Pressure _____

Displacement 16.75 bbls. Final Pressure 250

Plug Down 1:38 ~~AM~~ PM

SECOND STAGE - Stage Collar @ _____

Sx of Cement _____ Type _____ Additives _____ % Excess _____

Preflush _____ Initial Pressure _____

Displacement _____ bbls. Final Pressure _____

Plug Down _____ AM PM

Well Depth _____ Overall Casing Tally _____

KB to Top of Cut Off Casing _____ Length of Landing Jt Removed _____

Weight Indicator Before Cementing _____ lbs.

Weight Indicator After Slacking Off _____ lbs.

Inches Slacked Off _____

Remarks: Water temperature for mixing cement: 85°. Cement slurry: 14.9# in; 14.6# out. Circulated out 18 barrels.

TUBING TALLY SUMMARY SHEET

DATE: February 5, 1981

FIELD National Petroleum Reserve in AK LEASE & WELL NO. Walakpa Test Well No. 2 TALLY FOR 7 " TUBING

SUMMARY OF PAGE MEASUREMENTS			
	NO. OF JOINTS	FEET	.00'S
PAGE 1	21	798	20
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	21	798	20

SUMMARY OF DEPTH CALCULATIONS				
		NO. OF JOINTS	FOOTAGE	
			FEET	.00'S
1	TOTAL CASING ON RACKS	21	798	20
2	LESS CASING OUT (JTS NOS.			
3	TOTAL (1 – 2)			
4	SHOE LENGTH		1	85
5	FLOAT LENGTH			95
6	MISCELLANEOUS EQUIPMENT LENGTH Setting Sleeve, Seal Nipple, Hanger, XO, Landing Collar		23	45
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)			
8	LESS WELL DEPTH (KB REFERENCE)		16	00
9	"UP" ON LANDING JOINT			

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
38	S-95	Buttress		New	JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '
					JT NO. THRU NO.			' _ '

TUBING TALLY

PAGE 1 OF 1 DATE: February 5, 1981

FIELD NPRA LEASE & WELL NO. Walakpa Test Well No. 2 TALLY FOR 7" TUBING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	36	12			
2	38	30			
3	36	77			
4	41	50			
5	35	01			
6	39	92			
7	35	90			
8	40	02			
9	40	10			
0	41	68			
TOTAL A	385	32			

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	40	34			
2	34	10			
3	34	61			
4	37	76			
5	38	94			
6	35	47			
7	37	75			
8	35	99			
9	41	29			
0	36	77			
TOTAL B	373	02			

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

1	39	86			
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C	39	86			

TOTAL A	385	32		
TOTAL B	373	02		
TOTAL C	39	86		
TOTAL D				
TOTAL E				
TOTAL PAGE	798	20		

TUBING AND CEMENTING REPORT

WELL NAME Walakpa Test Well No. 2

LOCATION National Petroleum Reserve No. 2

RAN TUBING AS FOLLOWS:

21	Jts	38#	S-95	7"	Liner	
	Jts					
	Jts					

Shoe @ 2800.85 Float @ _____ DV @ _____

Centralizers 10 feet above shoe, between 2d, 4th, 6th, 8th, 13th, 14th, 16th, and 18th joints.

FIRST STAGE

Sx of Cement 280 Type "G" Additives 1% CFR-2, 2% $CaCl_2$ % Excess _____

Preflush 20 barrels water Initial Pressure _____

Displacement 39.5 bbls. Final Pressure 3000

Plug Down 10:40 ~~AM~~ PM

SECOND STAGE - Stage Collar @ _____

Sx of Cement _____ Type _____ Additives _____ % Excess _____

Preflush _____ Initial Pressure _____

Displacement _____ bbls. Final Pressure _____

Plug Down _____ AM PM

Well Depth _____ Overall Casing Tally _____

KB to Top of Cut Off Casing _____ Length of Landing Jt Removed _____

Weight Indicator Before Cementing _____ lbs.

Weight Indicator After Slacking Off _____ lbs.

Inches Slacked Off _____

Remarks: Water temperature: 86°F. Liner became stuck after pumping 46 barrels cement. Lost returns after releasing plug. No returns during rest of cement job.

TUBING TALLY SUMMARY SHEET

DATE: February 14, 1981

FIELD National Petroleum Reserve in AK LEASE & WELL NO. Walakpa Test Well No. 2 TALLY FOR 2 7/8" TUBING

SUMMARY OF PAGE MEASUREMENTS			
	NO. OF JOINTS	FEET	.00'S
PAGE 1	50	1502	80
PAGE 2	20	610	42
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL			

SUMMARY OF DEPTH CALCULATIONS				
		NO. OF JOINTS	FOOTAGE FEET	.00'S
1	TOTAL CASING ON RACKS	70	2113	22
2	LESS CASING OUT (JTS NOS.	6	185	47
3	TOTAL (1 – 2)	64	1927	75
4	SHOE LENGTH			
5	FLOAT LENGTH			
6	MISCELLANEOUS EQUIPMENT LENGTH			
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		1944	75
8	LESS WELL DEPTH (KB REFERENCE) (+ 17' KB)			
9	"UP" ON LANDING JOINT			

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
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '
					JT NO. THRU NO.			' – '

TUBING TALLY

PAGE 1 OF 2

DATE: February 14, 1981

FIELD NPRA LEASE & WELL NO. Walakpa Test Well No. 2 TALLY FOR 2 7/8 " TUBING

JOINT NO.	FIRST MEASUREMENT FEET	.00'S	CHECK MEASUREMENT FEET	.00'S	WT GR.
1	31	49			
2	31	03			
3	31	19			
4	28	59			
5	29	71			
6	30	52			
7	29	00			
8	29	59			
9	31	43			
0	28	60			
TOTAL A	301	15			

JOINT NO.	FIRST MEASUREMENT FEET	.00'S	CHECK MEASUREMENT FEET	.00'S	WT GR.
1	29	46			
2	28	52			
3	31	51			
4	29	92			
5	30	91			
6	30	20			
7	29	58			
8	30	70			
9	31	44			
0	30	47			
TOTAL D	302	71			

1	31	42			
2	31	19			
3	29	65			
4	28	88			
5	29	51			
6	28	12			
7	30	05			
8	28	78			
9	30	77			
0	29	41			
TOTAL B	297	78			

1	29	58			
2	29	63			
3	30	84			
4	30	75			
5	30	55			
6	31	84			
7	28	59			
8	29	65			
9	28	80			
0	30	62			
TOTAL E	300	35			

1	29	74			
2	30	68			
3	30	98			
4	30	55			
5	29	50			
6	29	25			
7	30	65			
8	28	88			
9	28	96			
0	30	82			
TOTAL C	300	01			

TOTAL A	301	15		
TOTAL B	297	78		
TOTAL C	300	01		
TOTAL D	302	71		
TOTAL E	300	35		
TOTAL PAGE	1502	00		

TUBING TALLY

PAGE 2 OF 2 DATE: February 14, 1981

FIELD NPRA LEASE & WELL NO. Walakpa Test Well No. 2 TALLY FOR 2 7/8 " TUBING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	28	60			
2	29	72			
3	30	30			
4	29	43			
5	31	50			
6	30	75			
7	29	57			
8	29	82			
9	31	24			
0	30	75			
TOTAL A	301	68			

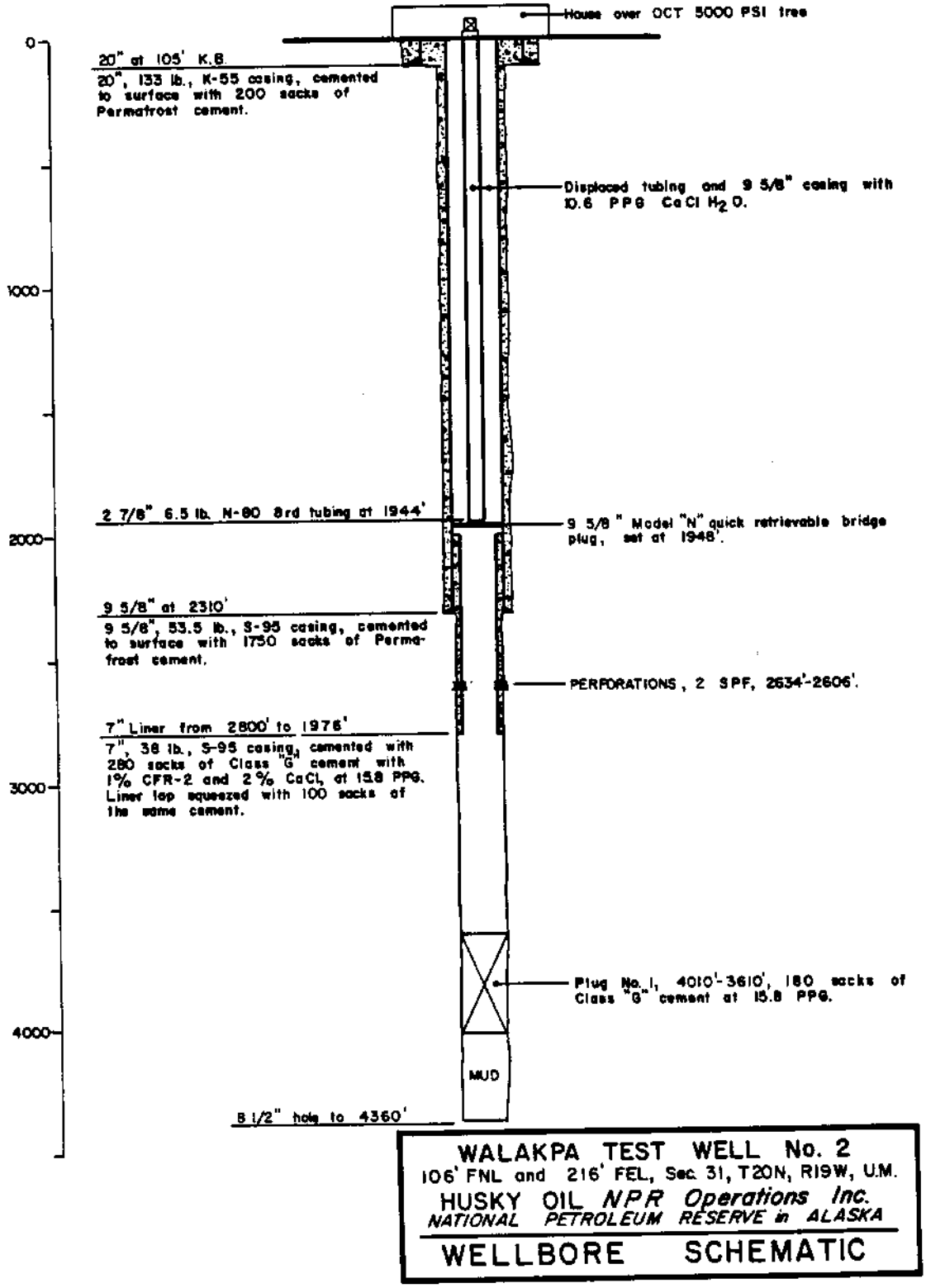
JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1	30	20			
2	30	87			
3	31	50			
4	30	70			
5	31	62			
6	30	37			
7	29	44			
8	31	52			
9	30	96			
0	31	56			
TOTAL B	308	74			

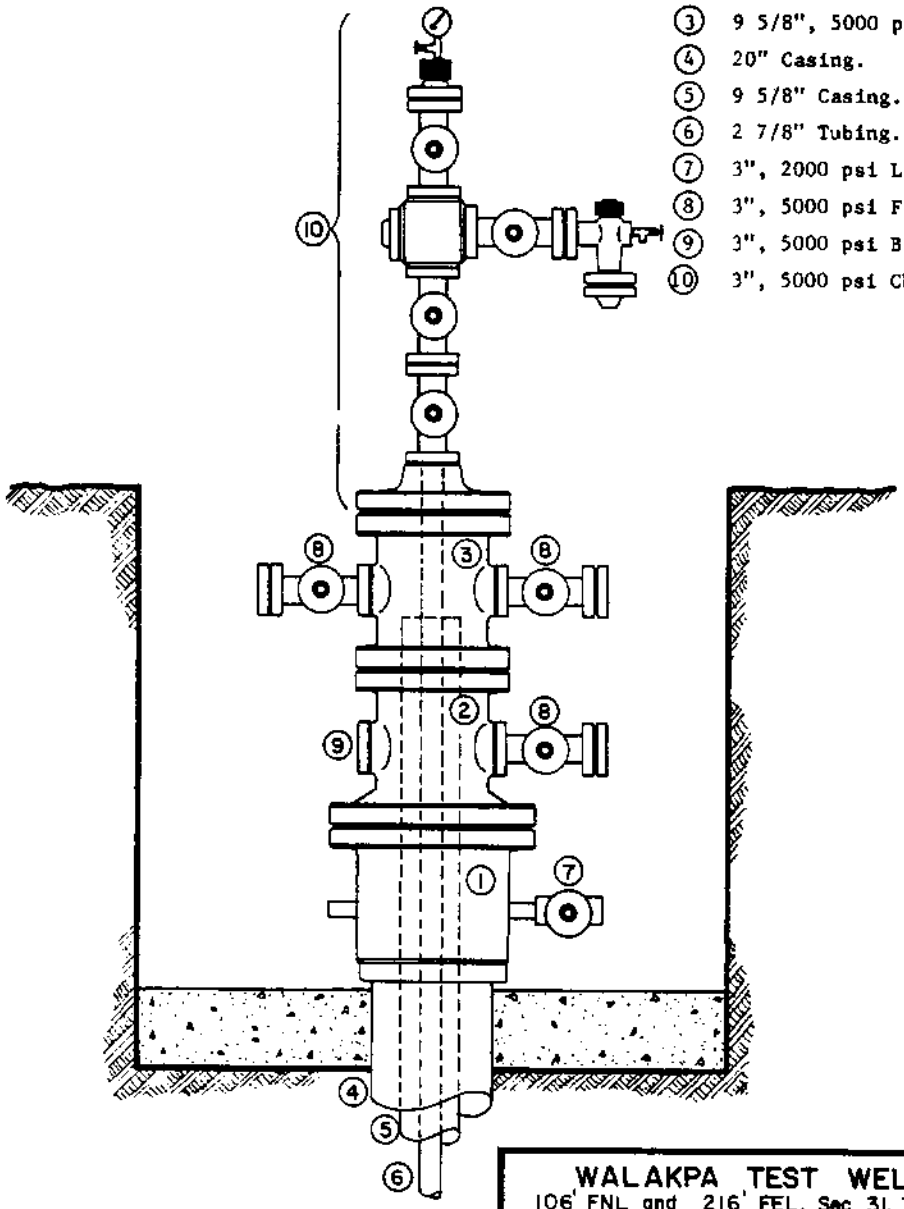
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

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

TOTAL A	301	68		
TOTAL B	308	74		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	610	42		


House over OCT 5000 PSI tree
0
20" at 105' K.B.
20", 133 lb., K-55 casing, cemented to surface with 200 sacks of Permafrost cement.
Displaced tubing and 9 5/8" casing with 10.6 PPG CaCl H2O.
1000
2 7/8" 6.5 lb. N-80 8rd tubing at 1944'
9 5/8" Model "N" quick retrievable bridge plug, set at 1948'.
2000
9 5/8" at 2310'
9 5/8", 53.5 lb., S-95 casing, cemented to surface with 1750 sacks of Permafrost cement.
PERFORATIONS, 2 SPF, 2634'-2606'.
7" Liner from 2800' to 1976'
7", 38 lb., S-95 casing, cemented with 280 sacks of Class "G" cement with 1% CFR-2 and 2% CaCl, at 15.8 PPG. Liner lap squeezed with 100 sacks of the same cement.
3000
Plug No. 1, 4010'-3610', 180 sacks of Class "G" cement at 15.8 PPG.
4000
MUD
8 1/2" hole to 4360'
WALAKPA TEST WELL No. 2
106' FNL and 216' FEL, Sec. 31, T20N, R19W, U.M.
HUSKY OIL NPR Operations Inc.
NATIONAL PETROLEUM RESERVE in ALASKA
WELLBORE SCHEMATIC

Part No.	EQUIPMENT LIST
1	20", 2000 psi slip-on Head, OCT.
2	13 3/8", 5000 psi Casing Head, OCT.
3	9 5/8", 5000 psi Casing Head, OCT.
4	20" Casing.
5	9 5/8" Casing.
6	2 7/8" Tubing.
7	3", 2000 psi L.P. Gate Valve.
8	3", 5000 psi F.E. Gate Valve.
9	3", 5000 psi Blank Flange.
10	3", 5000 psi Christmas Tree.



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SURFACE EQUIPMENT

RIG INVENTORY

Draw Works

National T-20, single drum grooved for 1" wireline with 15" double hydromatic brake, automatic breakout and make up catheads, driven by one set of FMC diesel twin 671 engines, 300 HP, through Allison torque converter, all mounted on single skid. One Westinghouse 3YC air compressor driven by main PTO.

Mast

Lee C. Moore, 95' high with 9 foot wide front by spread cantilever. Gross nominal capacity 290,000 lbs. with racking board capacity of 130 stands of 4-1/2" drill pipe (doubles). Mast crown block capable of stringing eight 1" wire lines.

Subbase

Three box sections, two at ground level 8 feet high, 9 feet wide, 37 feet long; center section 8 feet 5 inches high, 9 feet wide and 37 feet long. Clear working space from bottom of rotary beam to bottom of subbase is 14 feet 7 inches. Rotary table to bottom of subbase is 17 feet (add four inches for rig matts).

Rig Matts

Ten 4" x 16' long x 8' wide; fifteen 4" x 24' long x 8' wide.

Traveling Blocks

IDECO, 160 ton, four 1" sheave combination block and hook.

Swivel

EMSCO L-140, 6-5/8" left hand API regular pin, 140 ton capacity.

Bails

Byron Jackson, 2-1/4" x 108', links 250 ton capacity.

Rotary Table

Oilwell 17-1/2" split square drive master bushing 275 ton static load capacity.

Mud Tank

Three section, insulated tank. Capacity shale tank: 75 barrels; capacity middle tank: 100 barrels; capacity suction tank: 112 barrels. Shale tank equipped with shale jet and 16 barrel trip tank. Total capacity: 303 barrels.

Shaker

Single Brandt tandem separator driven by 3 HP, three-phase, 440 volt, 1,750 RPM explosion proof electric motor.

Degasser

Drilco, see-flo, driven by 7-1/2 HP, three-phase, 440 volt, explosion proof motor with 1/2 HP, three-phase, 440 volt explosion proof blower.

Desander

Pioneer Model S2-12; capacity: 500 GPM.

Desilter

Pioneer Model T8-6; capacity: 500 GPM.

Mud Mixer

One Dreco, driven by 5 HP, three-phase, 440 volt, 1,725 RPM explosion proof motor.

Hopper

One low pressure mud mixing hopper.

Generators

One Caterpillar Model 3406, 210 KW; one Caterpillar, skid mounted in Hercable house, 8' 5" high x 8' 2" wide x 29' 5" long; one Caterpillar Model D-333, 100 KW standby.

Boilers

Two Continental, 40 HP, 120 psi diesel fired skid mounted in Hercable house, 8' 4" high x 8' wide x 35' long.

Steam Heaters

Seven Model 90H Trane steam heaters; three Model 96H Trane steam heaters.

Tongs

Byron Jackson, Type "C", short lever, with heads.

Indicator

(Weight) Cameron, Type "C", up to 400,000 lbs.

Indicator

(Rotary Torque) Martin Decker hydraulic piston wheel type with remote gauge at driller's position.

Indicator

(Tong Torque) Martin Decker, hydraulic piston type with remote gauge.

Mud Box

OKE mud box with 3-1/2" and 4-1/2" rubbers.

Slips

One set for 3-1/2" drill pipe. One set for 4-1/2" drill pipe.

Elevators

One set for 3-1/2" drill pipe, 18 degrees taper.
One set for 4-1/2" drill pipe, 18 degrees taper.

Kelly

One square 4-1/4" drive, 4" FH pin, 6-5/8" API regular left-hand box.
One square, 3-1/2" drive, 3-1/2" IF pin, 6-5/8" API regular left-hand box.

Kelly Bushing

VARCO, square drive, 3-1/2" rollers.

Pumps

(Drilling and Cementing) Two Halliburton, HT-400D, single acting piston pumps with Gist Oil Tool API fluid ends, each driven by GMC diesel 8V-71N, 300 HP engines through an Allis-Chalmers torque converter, Model 8FW1801-1 and a twin-disc power shift transmission, Model No. T-A-51-2003. Continuous duty with 5-1/2" API pistons at maximum of 75 SPM will produce 185 GPM for each pump with maximum pressure up to 3,000 psi. Both pumps can be run simultaneously if desired. The discharge mud lines furnished by contractor from pumps to swivel connection is designed for 3,000 psi working pressure. Each pump unit mounted on 8' 4" high x 10' wide x 40' long covered skid.

Air Compressors

One LeRoi 34C mounted on draw works compound. One Ingersoll Rand Model 71-T2-T3011 TM, driven by 10 HP, 440 volt, 1,725 RPM explosion proof electric motor.

Water Tanks

One 7' high x 9' wide x 20' long, insulated water tank, mounted in the subbase; capacity: 225 barrels. One 17' 4" long x 6' 4" wide; capacity: 120 barrels.

Fuel Tanks

One 20' long x 8' 6" wide; capacity: 6,000 gallons.

Blowout Preventer Equipment

One 10-inch, 900 dual Shaffer gate LWS with three-inch flanged side outlet one side.
One 10-inch 900 GK Hydril.
One 10-inch 900 drill spool with two-inch flanged outlets both sides.
One set 4-1/2" pipe rams.
One set 3-1/2" pipe rams.
One set blind rams.
One upper kelly cock T1W 6-5/8" regular LH box to pin.
Two T1W 10,000 psi lower kelly cocks, 4-1/2" XH joints.
Two T1W 10,000 psi lower kelly cocks, 3-1/2" IF joints.
One inside preventor, 10,000 lb. Hydril, 4-1/2" XH.
One inside preventor, 10,000 lb. Hydril, 3-1/2" IF.

Choke Manifold

Three-inch, 3,000 lb., with one two-inch OCT adjustable choke; one two-inch OCT positive choke and space for automatic choke.

Closing Unit

One 80-gallon Hydril closing unit with four nitrogen bottle backup. Four-station Koomey control manifold with four-station air operated remote stations.

Drill Pipe

5,000 feet, 4-1/2", 16.6 lb., Grade E, 4-1/2" XH joints;
5,000 feet, 3-1/2", 15.5 lb., Grade E, 3-1/2" IF joints.

Drill Collars

Nineteen 6-1/4" x 2-1/4" x 30' four-inch H90 tool joints.
One 6-1/4" x 2-1/4" x 30' four-inch H90 x 4-1/2" regular bottom collar.
Nineteen 4-3/4" x 1-3/4" x 30' x 3-1/2" IF x 3-1/2" regular bottom collar.
One 4-3/4" x 1-3/4" x 30' x 3-1/2" IF x 3-1/2" regular bottom collar.

Subs

Two 4-1/2" XH kelly savor subs.
Two 3-1/2" IF kelly savor subs.
Two 4-1/2" XH box to 4" H90 pin (DC crossover).
Two 4" H90 box to 4-1/2" regular box (bit sub).
Two 3-1/2" IF box to 2-7/8" API regular box (bit sub).

Forklift

One 966 Caterpillar, equipped with 60-inch forks.

Pipe Racks

One V door ramp with stairs.
One tail walk section, 6' 1" wide x 43" high x 42' long.
Four pipe rack sections, 43" high x 4' wide x 28' long.