

**REFERENCES**

Entered in NID File  \_\_\_\_\_  
 Location Map Pinned  \_\_\_\_\_  
 Card Indexed  \_\_\_\_\_  
 C. Indexed  \_\_\_\_\_  
 IWR for State or Fee Land \_\_\_\_\_

Checked by Chief  \_\_\_\_\_  
 Copy NID to Field Office  \_\_\_\_\_  
 Approval Letter \_\_\_\_\_  
 Disapproval Letter \_\_\_\_\_

**COMPLETION DATA: 11-13-57**

Date Well Completed ~~11-18-57~~ \_\_\_\_\_ Location Inspected \_\_\_\_\_  
 OW \_\_\_\_\_ WW \_\_\_\_\_ TA \_\_\_\_\_ Bond released \_\_\_\_\_  
 GW \_\_\_\_\_ OS \_\_\_\_\_ PA  \_\_\_\_\_ State of Fee Land \_\_\_\_\_

**LOGS FILED**

Driller's Log 12-9-57  
 Electric Logs (No.) 5  
 E. \_\_\_\_\_ I. \_\_\_\_\_ EI  \_\_\_\_\_ GR \_\_\_\_\_ GR-N  \_\_\_\_\_ Micro  \_\_\_\_\_  
 Lat.  \_\_\_\_\_ MI-L  \_\_\_\_\_ Sonic \_\_\_\_\_ Others \_\_\_\_\_

**\* Re-entry April 6, '76**

**REFERENCES**

Entered in NID File .....  
 Location Map Pinned .....  
 Card Indexed .....  
 Checked by Chief .....  
 Approval Letter .....  
 Disapproval Letter .....

**COMPLETION DATA:**

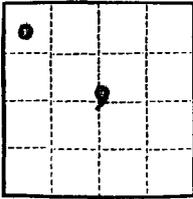
Date Well Completed 12-9-76 ..... Location Inspected .....  
 Date Well Completed ..... Bond released .....  
 OW ..... WW ..... TA ..... State or Fee Land .....  
 GW ..... OS ..... PA  .....

**LOGS FILED**

Driller's Log  .....  
 Electric Logs (No.) 5 .....  
 E. .... I. .... Dual I Lat. .... GR-N. .... Micro. ....  
 Sonic GR. .... Lat. .... MI-L. .... Sonic. ....  
 CCLog. .... CCLog. .... Others. ....

Burlington Northern, Inc assumed operations  
to re-enter service on April 6 1976 - ~~1975~~

10-9-76 - Plunged & abandoned



(SUBMIT IN TRIPPLICATE)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Land Office Utah  
Lease No. 015872  
Unit \_\_\_\_\_

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL.....	<input checked="" type="checkbox"/>	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....		SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....		SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....		SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....		SUPPLEMENTARY WELL HISTORY.....	
NOTICE OF INTENTION TO ABANDON WELL.....			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

..... July 26 ....., 1957

Well No. 1 is located 820 ft. from N line and 660 ft. from W line of sec. 9

NW/4 NW/4 of Section 9 3 1/2 South 21 East  
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)

Wildcat San Juan Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is ..... ft. (Will furnish later)

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Gulf Designation: Abajo-Federal No. 1

It is proposed to drill a wildcat well to test the Paradax formation to an approximate total depth of 6000'. Approximately 1300' of 10-3/4" OD surface casing will be run and cemented to surface. If commercial production is encountered, 5-1/2" OD production will be set at approximately 6000'. All possible producing formations will be adequately cored and/or tested.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Gulf Oil Corporation

Address Production Department

P. O. Box 2097

Denver, Colorado

ORIGINAL SIGNED BY  
W. D. MITCHELL

By \_\_\_\_\_

Title Zone Drilling Engineer

cc: Utah Oil and Gas Conservation Commission (2)

R. 21 E.

<i>N. Production</i>	<i>Sindair</i>	<i>Producers Uran.</i>	<i>CW Henderson</i>	<i>Capital Uranium</i>
31		Gulf 8-0064-00 10-30-65	8-0409-00 12-31-65 Gulf 50% Producers 25% Cataract 25%	G. C. Parker  36
5	<i>Sindair</i>	Gulf 8-0065-00 11-30-65	Gulf 8-0058-00-0 12-31-65	J. N. Papp  Superior
	<i>Atlantic</i>	LOCATION Gulf 50% Paradox Oil 50% 8-0406-00 11-30-65	8-0400-00 12-31-65 Gulf 50% Producers 25% Cataract 5%	Brewster & Bartel
		8-0408-00 Gulf 50% Paradox Oil 50% 11-30-65	8-0407-00 Gulf 50% Paradox Oil 50% 11-30-65	

T. 33 S.

T. 34 S.

WEST ABAJO	
SAN JUAN COUNTY, UTAH	
1 IN = 1 MILE	DATE .....
T. 33, 34 S	R. 21 E.

July 29, 1957

Gulf Oil Corporation  
P. O. Box 2097  
Denver, Colorado

Gentlemen:

This is to acknowledge receipt of your notice of intention to drill Well No. Abajo-Federal 1, which is to be located 820 feet from the north line and 660 feet from the west line of Section 9, Township 34 South, Range 21 East, S1EM, San Juan County, Utah.

Please be advised that insofar as this office is concerned, approval to drill said well is hereby granted.

Yours very truly,

OIL & GAS CONSERVATION COMMISSION

CLYDE B. FREIGHT  
SECRETARY

OBF:en

cc: Don Russell, Dist. Eng.  
USGS, Federal Bldg.  
Salt Lake City, Utah

STATE OF UTAH  
OIL & GAS CONSERVATION COMMISSION

State Capitol Building  
Salt Lake City 14, Utah

*Noted  
CMT  
9-23-57*

REPORT OF OPERATIONS AND WELL STATUS REPORT

State Utah County San Juan Field or Lease Abajo-Federal

The following is a correct report of operations and production (including drilling and producing wells) for Month of August, 1957.

Agent's address P. O. Box 2097 Company Gulf Oil Corporation

Denver, Colorado

Signed *Carl G. Richter*

Phone AMherst 6-1601

Agent's title Manager Accounting

State Lease No. \_\_\_\_\_ Federal Lease No. 015872 Indian Lease No. \_\_\_\_\_ Foo&Pat.

Sec. & 1/4 of 1/4	Twp.	Range	Well No.	*Status	Oil Bbls.	Water Bbls.	Gas MCF'S	REMARKS (If drilling, Depth; if shut down, Cause; Date & Results of Water Shut-Off Test; Contents of Gas; & Gas-Oil Ratio Test)
9-	34S	21E	1					Drilling depth 530'

NOTE: Report on this form as provided for in Rule C-22. (See back of form)

FILE IN DUPLICATE

\*STATUS: F-Flowing P-Pumping GL-Gas  
SI-Shut In D-Dead Lift  
GI-Gas Injection TA-Temp.  
WI-Water Injection Abandoned

**STATE OF UTAH**  
**OIL & GAS CONSERVATION COMMISSION**  
 State Capitol Building  
 Salt Lake City 14, Utah

**REPORT OF OPERATIONS AND WELL STATUS REPORT**

*2/10/57*  
*11/6*

State Utah County San Juan Field or Lease Abajo-Federal

The following is a correct report of operations and production (including drilling and producing wells) for  
 Month of September, 1957...

Agent's address P. O. Box 2097 Company Gulf Oil Corporation

Denver, Colorado Signed *Carl J. Richter*

Phone AMherst 6-1601 Agent's title Manager-Accounting

State Lease No. \_\_\_\_\_ Federal Lease No. 015872 Indian Lease No. \_\_\_\_\_ Fee & Pat.

Sec. & 1/4 of 1/4	Twp.	Range	Well No.	*Status	Oil Bbls.	Water Bbls.	Gas MCF's	REMARKS (If drilling, Depth; if shut down, Cause; Date & Results of Water Shut-Off Test; Contents of Gas; and Gas-Oil Ratio Test)
9	34S	21E	1					Drilling Depth 2626'

NOTE: Report on this form as provided for in Rule C-22. (See back of form.)

FILE IN DUPLICATE

\*STATUS: F-Flowing P-Pumping GL-Gas Lift  
 SI-Shut In D-Dead  
 GI-Gas Injection TA-Temp. Aban.  
 WI-Water Injection

*W*

**STATE OF UTAH**  
**OIL & GAS CONSERVATION COMMISSION**  
 State Capitol Building  
 Salt Lake City 14, Utah

10-20

**REPORT OF OPERATIONS AND WELL STATUS REPORT**

State Utah County San Juan Field or Lease Aba jo-Federal

The following is a correct report of operations and production (including drilling and producing wells) for  
 Month of October, 1957.

Agent's address P. O. Box 2097 Company Gulf Oil Corporation

Denver, Colorado Signed *Carl J. Lichta*

Phone AMherst 6-1601 Agent's title Manager-Accounting

State Lease No. \_\_\_\_\_ Federal Lease No. 015872 Indian Lease No. \_\_\_\_\_ Fee & Pat.

Sec. & 1/4 of 1/4	Twp.	Range	Well No.	*Status	Oil Bbls.	Water Bbls.	Gas MCF's	REMARKS (If drilling, Depth; if shut down, Cause; Date & Results of Water Shut-Off Test; Contents of Gas; and Gas-Oil Ratio Test)
9	34S	21E	1					Drilling Depth 4223'

NOTE: Report on this form as provided for in Rule C-22. (See back of form.)

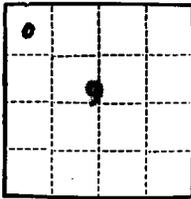
FILE IN DUPLICATE

\*STATUS: F-Flowing P-Pumping GL-Gas Lift  
 SI-Shut In D-Dead  
 GI-Gas Injection TA-Temp. Aban.  
 WI-Water Injection

3/

(SUBMIT IN TRIPLICATE)

Land Office **Utah**  
**015872**  
Lease No. \_\_\_\_\_  
Unit \_\_\_\_\_



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

*Notes*  
*H 12/5*

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR.....	<b>X</b>
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

11-15, 19<sup>57</sup>

Well No. 1 is located 820 ft. from N line and 660 ft. from E line of sec. 9

SW/4 NW/4 of Sec. 9 348 21E S1M  
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
Wildcat San Juan Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 8265 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Gulf Designation: **Abajo-Federal #1**

Drilled and cored to TD 4605' without encountering commercial production. Plugged well as follows: Spotted 55 sacks cement 4365'-4600'. Set CI bridging plug in 7 5/8" casing at 3461'. Spotted 10 sacks cement on top of bridging plug.

Will cap surface pipe and clean location when weather and road conditions permit. Supplemental report of abandonment will be filed at that time.

Verbal approval to plug, Mr. Long to Mr. Haller received 11-13-57.

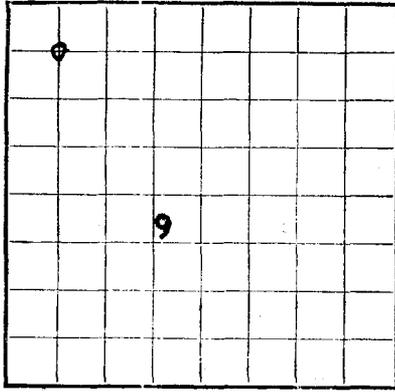
I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Gulf Oil Corporation  
Address Production Department  
P. O. Box 38  
Durango, Colorado  
By W. D. MERRITT  
Title Area Production Superintendent

cc: Utah Oil & Gas Conservation Comm. (2)

Utah

U. S. LAND OFFICE \_\_\_\_\_  
SERIAL NUMBER 015872  
LEASE OR PERMIT TO PROSPECT \_\_\_\_\_



LOCATE WELL CORRECTLY

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

P. O. Box 38  
Durango, Colorado

Company Gulf Oil Corporation Address \_\_\_\_\_  
Lessor or Tract Abajo Federal Field Wildcat State Utah  
Well No. 1 Sec. 9 T. 34S R. 21E Meridian SIM County San Juan  
Location 820 ft. IX of N Line and 660 ft. XV of W Line of Section \_\_\_\_\_ Elevation 8265'  
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed \_\_\_\_\_

Date 11 - 18 - 57 Title Area Production Superintendent

The summary on this page is for the condition of the well at above date.

Commenced drilling 8-22-57, 19\_\_\_\_ Finished drilling 10-10, 19 57

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from None to \_\_\_\_\_ No. 4, from \_\_\_\_\_ to \_\_\_\_\_  
No. 2, from \_\_\_\_\_ to \_\_\_\_\_ No. 5, from \_\_\_\_\_ to \_\_\_\_\_  
No. 3, from \_\_\_\_\_ to \_\_\_\_\_ No. 6, from \_\_\_\_\_ to \_\_\_\_\_

IMPORTANT WATER SANDS

No. 1, from None to \_\_\_\_\_ No. 3, from \_\_\_\_\_ to \_\_\_\_\_  
No. 2, from \_\_\_\_\_ to \_\_\_\_\_ No. 4, from \_\_\_\_\_ to \_\_\_\_\_

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated		Purpose
							From-	To-	
10 3/4	33	8 RT	SS	1234'	Guide & Float			Surface	
7 5/8	26	8 RT	SS	950'	"			Intermediate	

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
10 3/4	1248'	500	HOWCO	-	-
7 5/8	3521	100	HOWCO	-	-

PLUGS AND ADAPTERS

Heaving plug—Material None Length \_\_\_\_\_ Depth set \_\_\_\_\_  
Adapters—Material \_\_\_\_\_ Size \_\_\_\_\_

FOLD MARK

**PLUGS AND ADAPTERS**

Heaving plug—Material None Length \_\_\_\_\_ Depth set \_\_\_\_\_  
 Adapters—Material \_\_\_\_\_ Size \_\_\_\_\_

**SHOOTING RECORD**

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
<u>None</u>						

**TOOLS USED**

Rotary tools were used from Surface feet to TD 4605 feet, and from \_\_\_\_\_ feet to \_\_\_\_\_ feet  
 Cable tools were used from \_\_\_\_\_ feet to \_\_\_\_\_ feet, and from \_\_\_\_\_ feet to \_\_\_\_\_ feet

**DATES**

Dry Hole-Plugged 11-13, 1957 Put to producing \_\_\_\_\_, 19\_\_\_\_

The production for the first 24 hours was \_\_\_\_\_ barrels of fluid of which \_\_\_\_\_% was oil; \_\_\_\_\_% emulsion; \_\_\_\_\_% water; and \_\_\_\_\_% sediment. Gravity, °Bé. \_\_\_\_\_

If gas well, cu. ft. per 24 hours \_\_\_\_\_ Gallons gasoline per 1,000 cu. ft. of gas \_\_\_\_\_

Rock pressure, lbs. per sq. in. \_\_\_\_\_

**EMPLOYEES**

Anschutz Oil Co., ET \_\_\_\_\_, Driller \_\_\_\_\_, Driller  
 \_\_\_\_\_, Driller \_\_\_\_\_, Driller

**FORMATION RECORD**

FROM—	TO—	TOTAL FEET	FORMATION
0	1575		Wingate & Chinle
1575	1680		Shinarump
1680	1720		Moenkopi
1720	2190		Cutler
2190	3523		Cedar Mesa
3523	4270		Hermosa
4270	4597		Paradox
4597	T.D.		Salt

[OVER]

FORMATION RECORD—Continued  
 DEC 9 1957

11 1970  
FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION
Core #1,	4470'-4470 1/2'	Recovered 3	1/2" Shale
Core #2,	4470 1/2'-4487'	Recovered 9'	Shale, 2 1/2' Siltstone, 6' Sand, no show.
Core #3,	4488'-4505'	Recovered 14'	Silt, 1 1/2' Dolomite, 1 1/2' Anhydrite.
Core #4,	4563'-4591'	Recovered 2'	Shale
			9' Dolomite
			4 1/2' Anhydrite
			6 1/2' Dolomite
			4' Anhydrite

TOTAL FEET

FORMATION

FORMATION RECORD

11 1970

11 1970

11 1970

11 1970

FORMATION RECORD

FORMATION

FORMATION RECORD

FORMATION RECORD

FORMATION RECORD

**STATE OF UTAH**  
**OIL & GAS CONSERVATION COMMISSION**  
 State Capitol Building  
 Salt Lake City 14, Utah

**REPORT OF OPERATIONS AND WELL STATUS REPORT**

State Utah County San Juan Field or Lease Abajo-Federal

The following is a correct report of operations and production (including drilling and producing wells) for  
 ..... Month of November ....., 19 57..

Agent's address P.O. Box 2097 Company Gulf Oil Corporation  
Denver, Colorado Signed *Carl Richter*

Phone AMherst 6-1601 Agent's title Manager-Accounting

State Lease No. .... Federal Lease No. 015872 Indian Lease No. .... Fee & Pat.

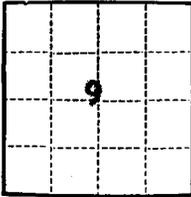
Sec. & 1/4 of 1/4	Twp.	Range	Well No.	*Status	Oil Bbls.	Water Bbls.	Gas MCF's	REMARKS (If drilling, Depth; if shut down, Cause; Date & Results of Water Shut-Off Test; Contents of Gas; and Gas-Oil Ratio Test)
9	34S	21E	1					Total Depth 4605' Plugged well 11-13-57 Drop from report.

NOTE: Report on this form as provided for in Rule C-22. (See back of form.)

FILE IN DUPLICATE

\*STATUS: F-Flowing P-Pumping GL-Gas Lift  
 SI-Shut In D-Dead  
 GI-Gas Injection TA-Temp. Aban.  
 WI-Water Injection

W/



(SUBMIT IN TRIPLICATE)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Land Office Utah  
Lease No. 015872  
Unit \_\_\_\_\_

*Notes*  
*1-7-58*  
*H*

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....
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NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....
NOTICE OF INTENTION TO ABANDON WELL.....	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Well No. 1 is located 820 ft. from N line and 660 ft. from W line of sec. 9  
NW/4 of Sec. 9 3/4S 21E S1M  
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
Wildcat San Juan Utah  
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 8265 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

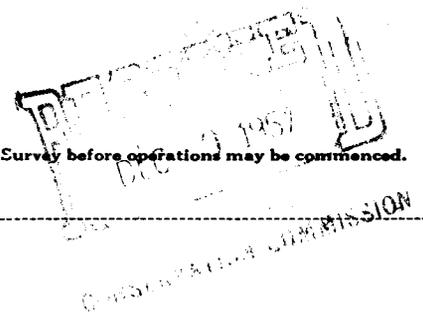
Gulf Designation: Abajo Federal #1

Drilled and cored to TD 4605' without encountering commercial production. Plugged well as follows: Spotted 55 sacks cement 4365'-4600'. Set CI bridging plug in 7 5/8" casing at 3461'. Spotted 10 sacks cement on top of bridging plug. Capped surface pipe with 10 sacks cement on 11-23-57.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Gulf Oil Corporation  
 Address Production Department  
P. O. Box 38  
Darango, Colorado

By \_\_\_\_\_  
 Title Area Production Superintendent





**BURLINGTON NORTHERN**

ENERGY AND MINERALS DEPARTMENT  
OIL AND GAS DIVISION

Midland Bank Building  
P. O. Box 1855  
Billings, Montana 59103  
Telephone (406) 259-4521

Utah Division of Oil and Gas Conservation  
1588 West North Temple  
Salt Lake City, Utah 84116

April 1, 1976

Gentlemen:

We enclose two copies of our application to re-enter and deepen a well in San Juan County.

As this well has previously been surveyed, we request waiver of the requirement of Rule C-4 for a plat, and as bonding has been required by the U. S., we request waiver of the requirement of Rule C-1. We attach copies of our Designation of Agent.

If there are any questions or if additional data is required, please call me collect at (406) 259-4521. All correspondence should be addressed to the P. O. Box as shown above.

Very truly yours,

Earl J. Whitaker  
Production Manager

EJW/meh  
Enclosures



**BURLINGTON NORTHERN**

ENERGY AND MINERALS DEPARTMENT  
OIL AND GAS DIVISION

Midland Bank Building  
P. O. Box 1855  
Billings, Montana 59103  
Telephone (406) 259-4521

District Engineer  
U. S. Geological Survey  
Box 1809  
Durango, Colorado 81301

April 1, 1976

Dear Sir:

We enclose our application to re-enter and deepen an existing well in San Juan County, Utah, with our drilling plan, pressure control plan, and surface use plan as attachments.

Amoco Production Company is the lessee of record on U-13785, and we have previously furnished your office with Designation of Operator. We assume Amoco's bond will cover this operation.

Our surface use plan is in a format we believe to be acceptable to the USFS, which we also believe will answer each question of your 12-point requirement. Mr. Jim Dailey, a geologist from our office, was on the prospect during the summer of 1974 with USFS personnel and much of the plan derives from his discussions of that period.

If there are any questions or if further data is required, please call me collect at (406) 259-4521.

Very truly yours,

Earl J. Whitaker  
Production Manager

EJW/meh  
Attachments

OP 737-ABJO  
Fed Lse No. U-13785  
Abajo, San Juan Co., UT

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK  
 DRILL       DEEPEN       PLUG BACK

b. TYPE OF WELL  
 OIL WELL       GAS WELL       OTHER       SINGLE ZONE       MULTIPLE ZONE

2. NAME OF OPERATOR  
 BURLINGTON NORTHERN INC.

3. ADDRESS OF OPERATOR  
 Box 1855, Billings, MT 59103

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*  
 At surface      NWNW 9-34S-21E (820 FNL - 660 FWL)  
 At proposed prod. zone      Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
 Approx 20 miles NW of Blanding

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drig. unit line, if any)      820

16. NO. OF ACRES IN LEASE      2560.00

17. NO. OF ACRES ASSIGNED TO THIS WELL      160.00

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.      NA

19. PROPOSED DEPTH      7000

20. ROTARY OR CABLE TOOLS      RT

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
 8266 KB

22. APPROX. DATE WORK WILL START\*  
 July, 1976

5. LEASE DESIGNATION AND SERIAL NO.  
 U-13785

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
 Abaje

9. WELL NO.  
 11-9

10. FIELD AND POOL, OR WILDCAT  
 WC

11. SEC. T., R., M., OR BLK. AND SURVEY OR AREA  
 9-34S-21E

12. COUNTY OR PARISH      18. STATE  
 San Juan      UT

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
Surface and intermediate strings already set.				

- For detail of present status and proposed work see attached Drilling Plan.
- Pressure control plan attached.
- Surface use plan attached.

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 *Earl W. Kitcher* TITLE Production Manager DATE March 31, 1976

(This space for Federal or State office use)  
 PERMIT NO. 43-034-10725 APPROVAL DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:

File in Duplicate

DIVISION OF OIL AND GAS CONSERVATION  
OF THE STATE OF UTAH

DESIGNATION OF AGENT  
\*\*\*\*\*

The undersigned producer, operator, transporter, refiner, gasoline or initial purchaser who is conducting oil and/or gas operations in the State of Utah, does, pursuant to the Rules and Regulations and Rules of Practice and Procedure of the Division of Oil and Gas Conservation of the State of Utah, hereby appoint Max D. Eliason, whose address is 418 Atlas Bldg., Salt Lake City, Utah 84101, ~~as~~ its designated agent to accept and to be served with notices from said Board, or from other persons authorized under the Oil and Gas Conservation Act of the State of Utah.

The undersigned further agrees to immediately report in writing, all changes of address of the agent, and any termination of the agent's authority, and in the latter case, the designation of a new agent or agents shall be immediately made. This designation of agent, however, shall remain in full force and effect until and unless a new designation of agent is filed in accordance with said statute and said regulations.

Effective date of designation April 1, 1976

Company BURLINGTON NORTHERN INC. Address Box 1855, Billings, MT 59103

By  Title Production Manager  
(signature)

NOTE: Agent must be a resident of the State of Utah

File in Duplicate

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OF THE STATE OF UTAH

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Effective date of designation April 1, 1976

Company BURLINGTON NORTHERN INC.

Address Box 1855, Billings, MT 59103

By   
(Signature)

Title Production Manager

NOTE: Agent must be a resident of the State of Utah

# DRILLING PLAN

PROSPECT / FIELD ABAJO COUNTY San Juan STATE Utah  
 OPERATOR Burlington Northern Inc.  
 WELL NO. 11-9 LEASE Abajo (former Gulf #1 Abajo-Federal)  
 LOCATION NW NW 9-34S-21E (820 FNL - 660 FWL)  
 EST. T.D. 7000 OR 50' below top of Aneth Fm. GROUND ELEV. 8266 KB

**PROGNOSIS:**

Marker	Depth	Remarks
<b>Present Status</b>		
16" @ 80 w/125 sx		
10-3/4" @ 1248 w/500 sx		
7-5/8" 26# @ 3521 w/100 sx (drift diam. 6.844)(6-3/4 hole to TD)		
Plugs: 10 sx @ surface		
10 sx 3420-3461		
CIBP @ 3461		
55 sx 4365-4600		
Old TD: 4605 (8' into Paradox Salt)		
<b>Projected Tops</b>		
Molas	6060	
Mississippian	6100	
Ouray	6600	
McCracken	6900	
Aneth	6950	
TD	7000	

**LOGS:**  
 DLL TD to 4500  
 FDC/CNL/GR TD to base of salt  
 BHC/GR/Cal TD to base of salt  
 (see below)

**DEVIATION:**  
 Max: 7 Max. change: 1 1/2 / 100  
 Surveys: each new bit

**DST'S:**  
 and/or as req'd by wellsite geologist

**CORES:** None

**MUD LOGGER:** Shoe to TD

**SAMPLES:**  
 Each 10 Ft. from 4600 to TD  
 Each Ft. from to  
 and/or as req'd by wellsite geologist

**BOP:**  
 10" Series 900 dbl ram.  
 Test 15 min. at 1000 psi before drlg. Opg. test req'd daily

**MUD:**

	TYPE	WT	VIS	WL	Remarks
(Clean out hole to old TD with fresh wtr, then convert to sat salt system).					
4600-6000	Salt sat	-	36-40	-	Starch & salt gel as req.
6000- TD	Salt sat	10-10.3	40-50	6-8	Ph 10-10.5, PV 12-16, YP 6-12

**CASING:**

	SIZE	HOLE	DEPTH	CEMENT	WOC	REMARKS
SURFACE	See above.					
PRODUCTION	5 1/2	6-3/4	*	See below		* 100' below lowest indicated

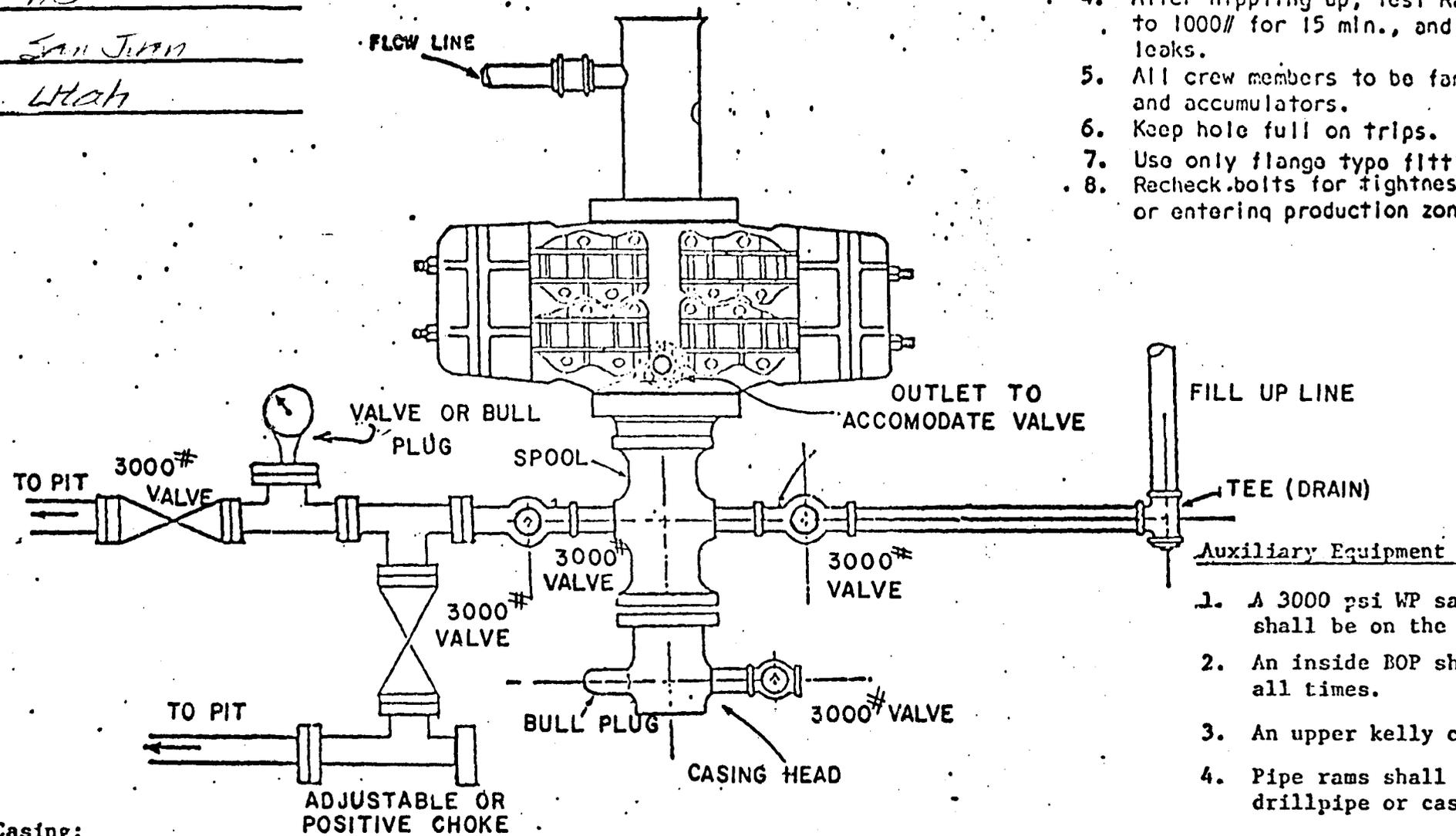
**PROBABLE PLUGS, IF REQ'D** 25 sx TD-6900, 35 sx 6240-6100, 25 sx 4600-4500, 25 sx 3550-3450, 10 sx surface. prod.

**OTHER:** Cmtg 5 1/2: 200 sx 13.5# salt sat Lite fol by 75 sx 50/50 Poz, salt sat.  
 Logs: BHC-por curve @23,000 w/F-log  
 CNL-limestone por curve w/F-log  
 Prod csg: 5 1/2" 15.5# above & below salt, 5 1/2" 23# P110 thru salt.  
 Csg hd: 8-5/8" x 10" Ser. 900, w/ 8-5/8 x 7-5/8 swage welded to 7-5/8" csg in hole.

Well Name 11-9 ABAJO  
 Field WC  
 County SAN JUAN  
 State Utah

NOTES

1. B.O.P., valves and all working fittings should be in good working condition.
2. All bolts to be installed and tight.
3. All valves to be 3000# W.P. or better.
4. After nipping up, test Rams and pressure up to 1000# for 15 min., and check for possible leaks.
5. All crew members to be familiar with B.O.P. and accumulators.
6. Keep hole full on trips.
7. Use only flange type fittings.
8. Recheck bolts for tightness before 5000 feet or entering production zones.



Auxiliary Equipment

1. A 3000 psi WP safety valve, properly subed, shall be on the floor at all times.
2. An inside BOP shall be on the floor at all times.
3. An upper kelly cock to be used at all times.
4. Pipe rams shall be sized to match the drillpipe or casing being run in the hole.

Surface Casing:

Size	Weight	Grade	Connection	Length	Condition
16				80	Cemented in place
10 3/4	40.50	K	STC	1248	Cemented in place

Intermediate Casing:

Sec. No.	Size	Weight	Grade	Connection	Length	Condition
	7 5/8	26#	K		3521	Cemented in place

Max. Anticipated BHP: 3150 psi @ 7000 ft.

Drilling Fluid: Salt saturated gel



## Surface Use and Operating Plan

Well #11-19 Abajo  
Federal Lease No. U-13785  
San Juan County, Utah

The following plan is prepared to comply with USDA Stipulations and environmental analysis of the project:

### 1. Lessee:

Amoco Production Company  
Security Life Building  
Denver, CO 80202

### Designated Operator:

Burlington Northern Inc.  
Oil and Gas Division  
P. O. Box 1855  
Billings, MT 59103

### Operator's Representative:

To be designated prior to start of operation.  
Representative will establish and maintain close liaison with the District Ranger and will have full authority to implement all requirements.

### 2. Location:

NWNW 9-T34S-R21E (820 FWL - 660 FWL).  
Site is indicated on attached map of area.

### 3. Time of Operation:

Project time on location is estimated to be 25 days, and is planned for the summer of 1976. District Ranger will designate earliest entry date.

### 4. Operation:

Operator will re-enter a dry hole (abandoned in 1957), clean out to original depth of 4605', and deepen to approximately 7000' to test Mississippian and Devonian formations for oil and/or gas production. Operation will include dirt work and the old drillsite (primarily re-opening old reserve mud pit), moving in drilling rig, drilling, completion, moving out rig, and rehabilitation of drillsite. All drilling operations will be conducted in accordance with regulations of the USGS and the State of Utah.

5. Access Roads:

Existing USFS Roads 079 and 095 will be used to reach the drillsite, with about 100 yards of location access to be re-opened. This route is indicated on the attached map. Operator will be responsible for maintenance occasioned by his usage, to be performed to the satisfaction of the District Ranger.

6. Drillsite Construction and Maintenance:

The site will be cleared and the old reserve pit re-opened. Rig and site layout will be essentially as shown on the attached plat. All topsoil from the site will be stockpiled for rehabilitation. No new cuts or fills will be required.

7. Slash:

There will be no slash created by this operation.

8. Sanitary Precautions:

A portable chemical toilet will be used at the site.

9. Trash, Garbage, and Pollutants:

All trash and garbage will be contained, and will be disposed of in a trash pit at the end of the operation, covered with four feet of soil. Liquid wastes in the reserve pit will be evaporated and drill cuttings and sludge will be covered with soil. In event of a dry hole, the maximum practical amount of liquid wastes will be injected down the well bore prior to plugging.

10. Fire:

No burning is authorized under this plan. Fire extinguishers, shovels, and buckets will be readily available for fire protection.

11. Water Supply:

Water will be taken from a creek along the USFS road in Section 9 and hauled to the drillsite.

12. Protection of Humans, Livestock, and Wildlife:

All chemicals, salts, and other toxic materials will be stored in suitable, clearly marked containers.

The reserve pit will be adequately fenced after use, prior to closing. The fence will be removed when the pit is closed.

13. Rehabilitation:

Upon completion of drilling the drillsite will be cleaned up and topsoil replaced. The reserve pit will be closed as soon as practicable and topsoil will be replaced. Water bars will be installed as required. All disturbed areas will be reseeded as directed by the District Ranger, and, as required by the District Ranger, small seedling pine trees from the surrounding area may be transplanted to the site.

14. Development and Production:

If the well is completed as a producer, the development of the natural resource reservoir and installation of production facilities will be subject to further environmental and operational analyses, and a supplemental Operating Plan will be prepared.

SUBMITTED BY:

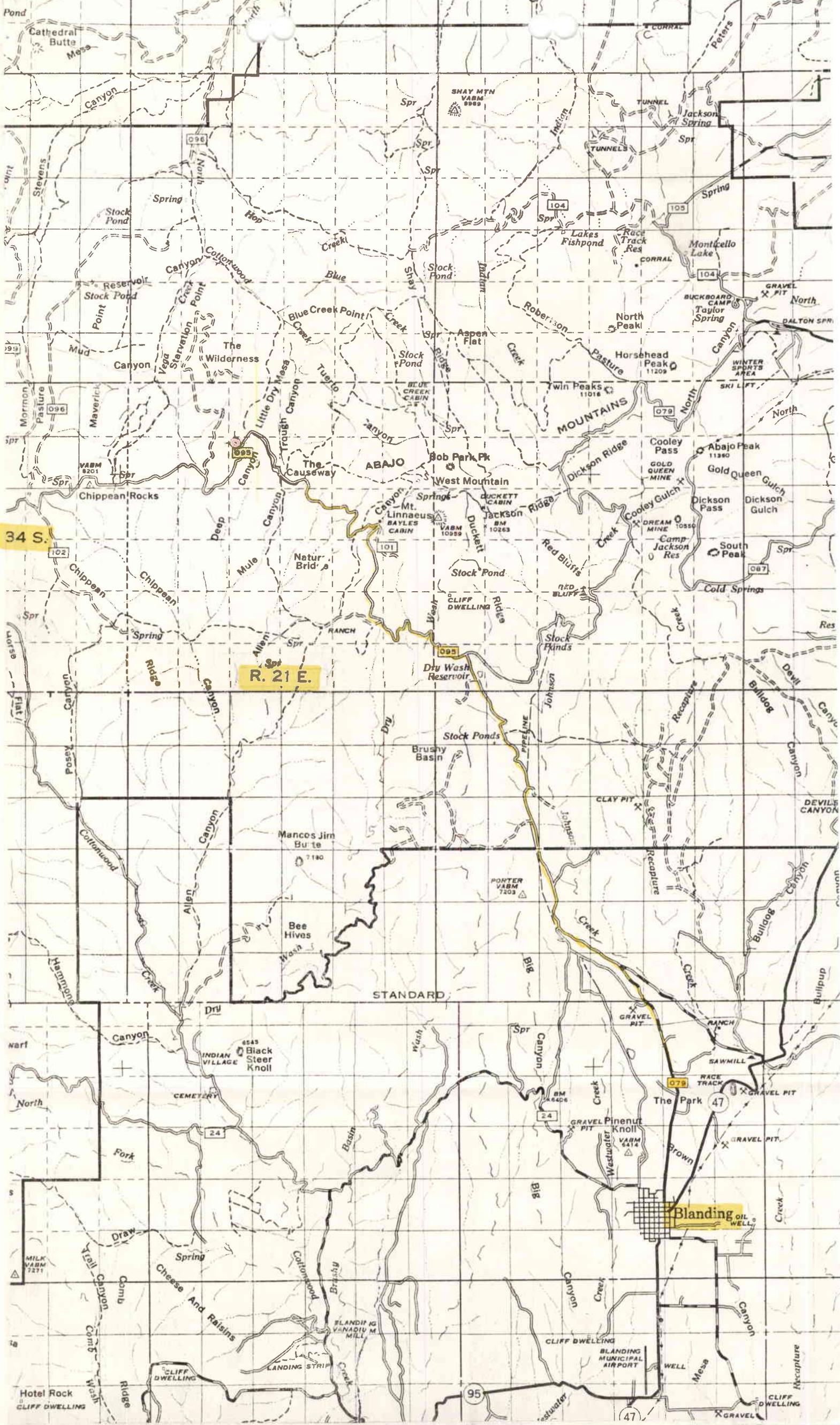
BURLINGTON NORTHERN INC.



Earl J. Whitaker, Production Manager

EJW/meh  
Attachments

March 30, 1976

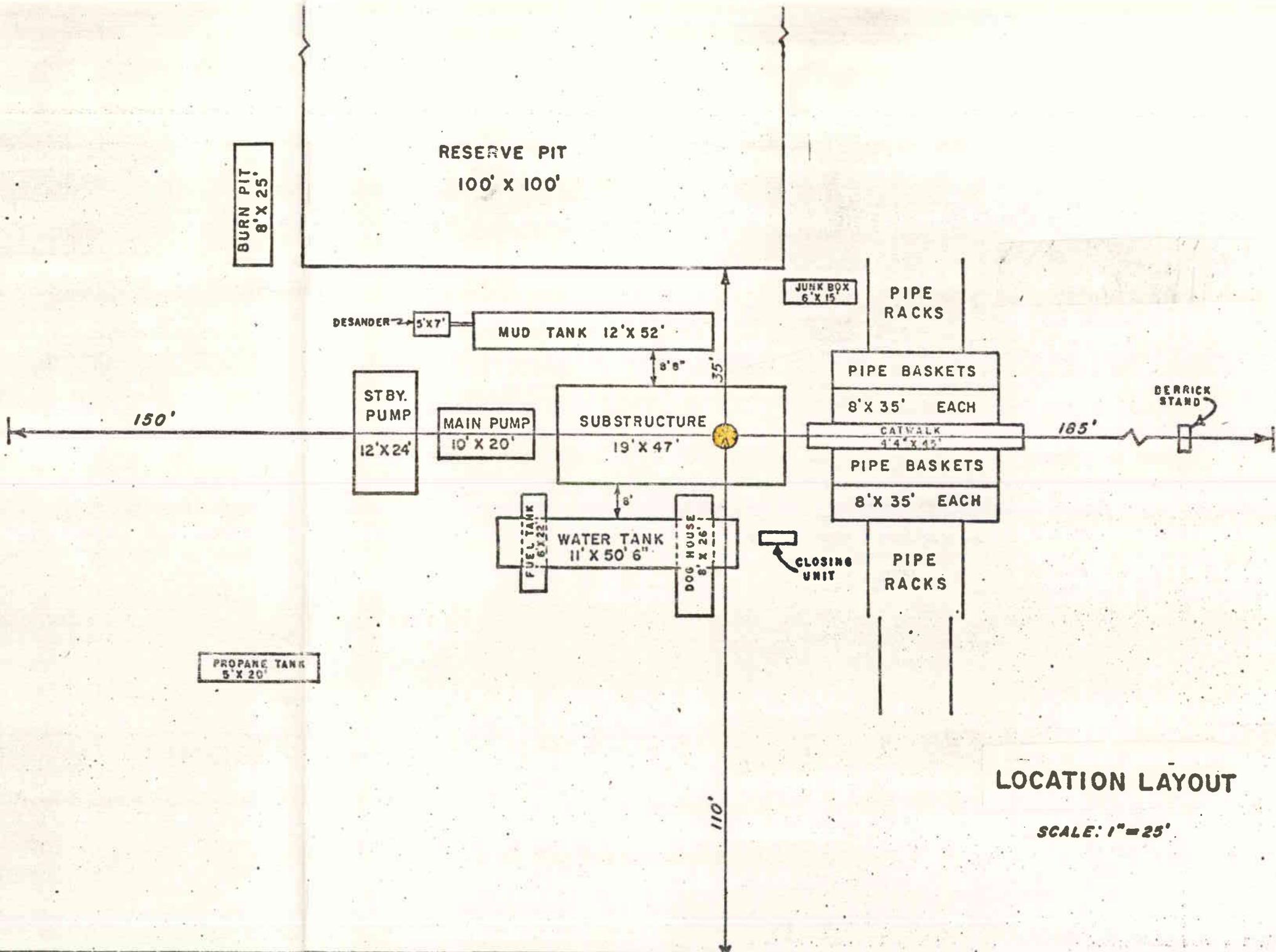


34 S.

R. 21 E.

STANDARD

Blanding



**LOCATION LAYOUT**

SCALE: 1" = 25'



April 6, 1976

Burlington-Northern Inc.  
Box 1855  
Billings, Montana 59103

Re: Well No. Abajo Federal 11-9  
Sec. 9, T. 34 S, R. 21 E,  
San Juan County, Utah

Gentlemen:

Insofar as this office is concerned, approval to re-enter and deepen the above referred to well is hereby granted in accordance with the General Rules and Regulations and Rules of Practice and Procedure.

Should you determine that it will be necessary to plug and abandon this well once again, it will be necessary that you immediately contact the following:

PATRICK L. DRISCOLL - Petroleum Engineer  
HOME: 582-7247  
OFFICE: 533-5771

Enclosed please find Form OGC-8-X, which is to be completed whether or not water sands (aquifers) are encountered during drilling.

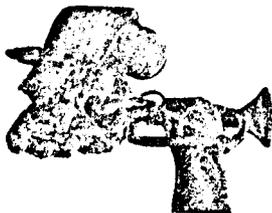
The API number assigned to this well is 43-037-10725.

Very truly yours,

DIVISION OF OIL, GAS, AND MINING

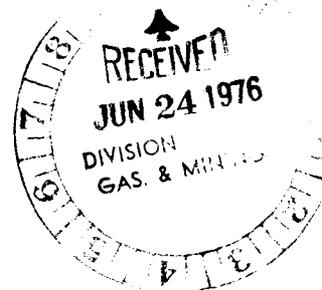
CLEON B. FEIGHT  
DIRECTOR

CBF:sw  
cc: U.S. Geological Survey



K

MINERALS MANAGEMENT INCORPORATED  
A Division of SCIENTIFIC SOFTWARE CORPORATION



June 22, 1976

Mr. Jerry Long  
U.S. Geological Survey  
P.O. Box 1809  
Durango, Colorado 81301

Dear Jerry:

As requested, we are enclosing 4 copies of the re-survey plat for the Burlington Northern Abajo 11-9 (formerly Gulf #1 Abajo) located in Section 9, T34N, R21E, San Juan County, Utah.

Please advise if any additional information is required.

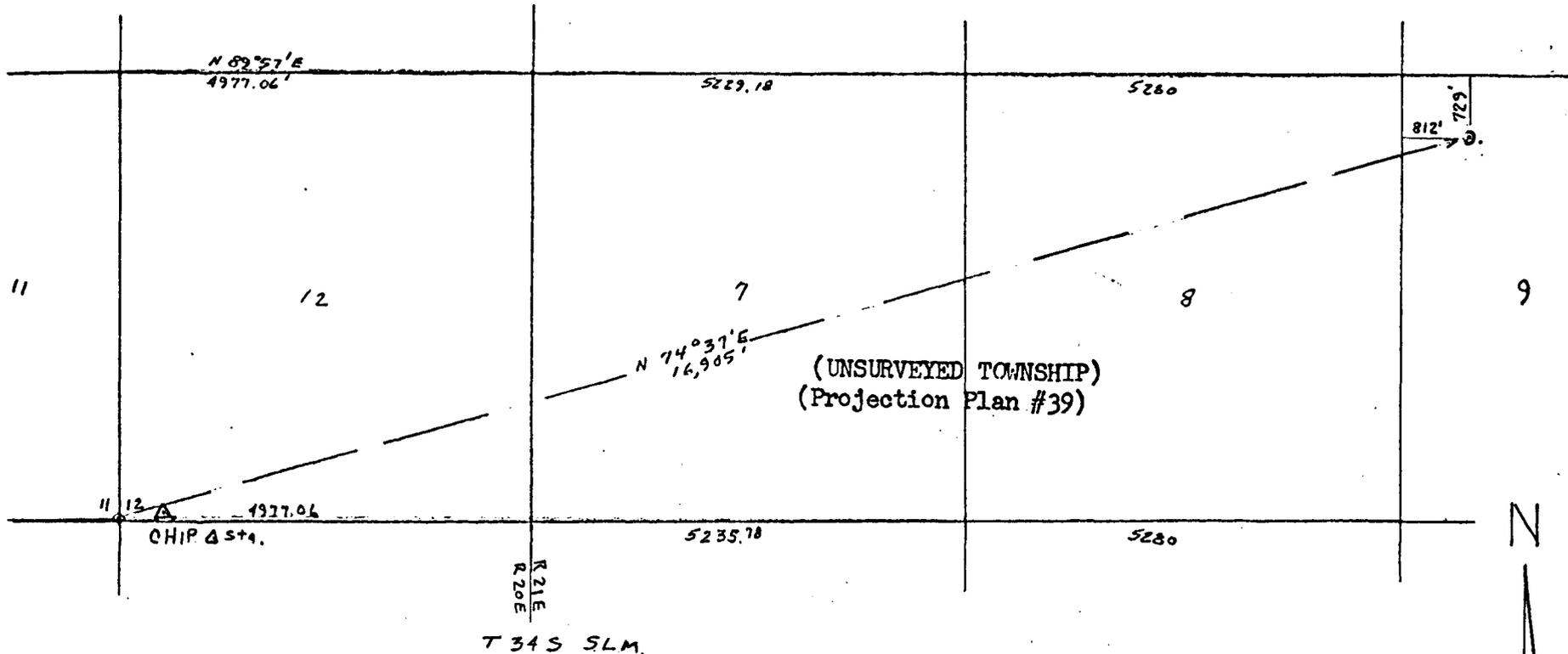
Yours very truly,

J. Arnold Snell  
Area Manager

JAS/vf

Attachments

cc: Mr. Cleon B. Feight-Utah Oil Commission  
Mr. Earl Whitaker



I hereby certify that the well location shown on this plat was plotted from field surveys made by me or under my supervision, and that the same are true and correct to the best of knowledge and belief.

*Fred B. Kerr Jr.*  
 Fred B. Kerr Jr.  
 Reg. #3950

Laughlin-Simmons & Co.

Re-survey of Gulf #1 Abajo  
 for  
 BURLINGTON NORTHERN INC.  
 Original location report:  
 820' FNL 660' FWL Sec 9-T34N-R21E S.L.M.  
 Found:  
 729' FNL 812' FWL Sec 9-T34N-R21E S.L.M.  
 San Juan County, Utah June 15, 1976

COMPANY Burlington Northwestern Inc.

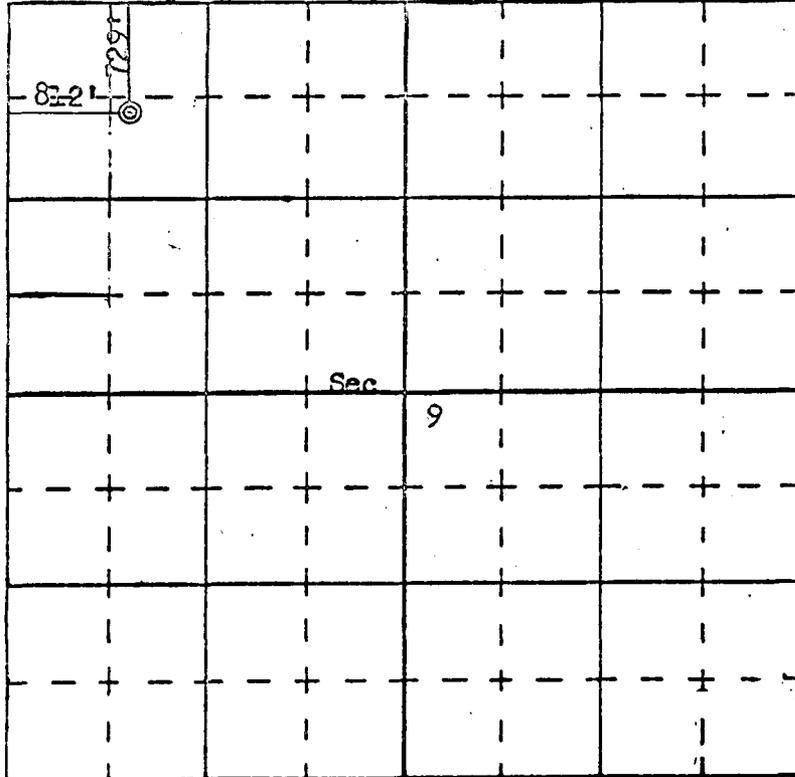
LEASE \_\_\_\_\_ WELL NO. \_\_\_\_\_

SEC. 9, T. 34S, R. 21E SLM  
SAN JUAN COUNTY, UTAH

LOCATION 729'FNL 812'FWL

ELEVATION 8255 Gr.

Unsurveyed Township(Projection Plan #39)



SCALE—4 INCHES EQUALS 1 MILE

THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM FIELD NOTE OF ACTUAL SURVEYS MADE BY ME UNDER MY SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

*Fred B. Kerr Jr.*  
Fred B. Kerr Jr.  
Registered Land Surveyor

SEAL:

#3950

Re- SURVEYED June 15 1976

RESIDENCE PHONE:  
505/325-2188

OFFICE PHONE:  
505/325-4900

K.O.

**HAROLD H. BROWN**

*Consultant in Petroleum Geology*

POST OFFICE BOX NO. 94 • PETROLEUM PLAZA BLDG.  
FARMINGTON, NEW MEXICO 87401

October 11, 1976



Attn: ✓  
State of Utah  
Div. of Oil, Gas & Mining  
1588 W. No. Temple  
Salt Lake City, Utah 84116

Re: Geological Wellsite  
Report.  
Burlington Northern  
Abajo 11-9  
Sec. 9, T34S - R21E  
San Juan Co., Utah.

Mr. James Dailey  
District Geologist  
Burlington Northern, Inc.  
P. O. Box 1855  
Billings, Montana 59103

Dear Mr. Dailey:

(2COPIES)

Attached is a copy of the geological report for the subject well location.

Copies are also being sent to Amoco in Denver, the State of Utah and the U. S. G. S.

Very truly yours,

A handwritten signature in cursive script that reads "Harold H. Brown".

Harold H. Brown

HHB/sj



CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

COMPANY BURLINGTON NORTHERN INC. FIELD WILDCAT FILE RP-3-2776  
 WELL ABATO-FEDERAL NO. 11-9 COUNTY SAN JUAN DATE 9-28-76  
 LOCATION SEC. 9-T34S-R21E STATE UTAH ELEV. 8266' KB

# CORE-GAMMA CORRELATION

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted) but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

VERTICAL SCALE: 5" = 100'

## CORE-GAMMA SURFACE LOG

(PATENT APPLIED FOR)

GAMMA RAY

RADIATION INCREASE →

## COREGRAPH

TOTAL WATER

PERCENT TOTAL WATER

80 60 40 20 0

PERMEABILITY

MILLIDARCVS

100 50 10 5 1

POROSITY

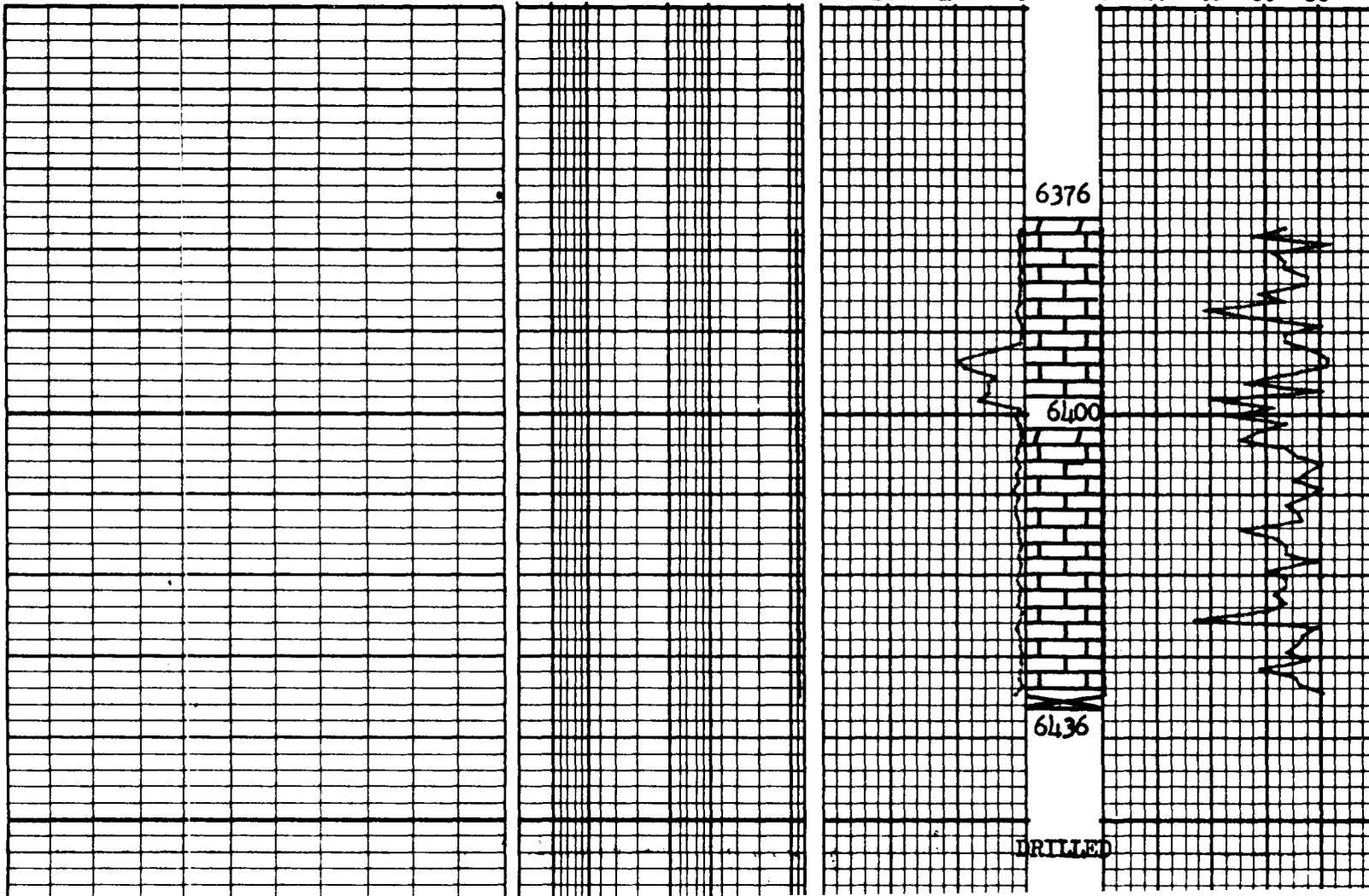
PERCENT

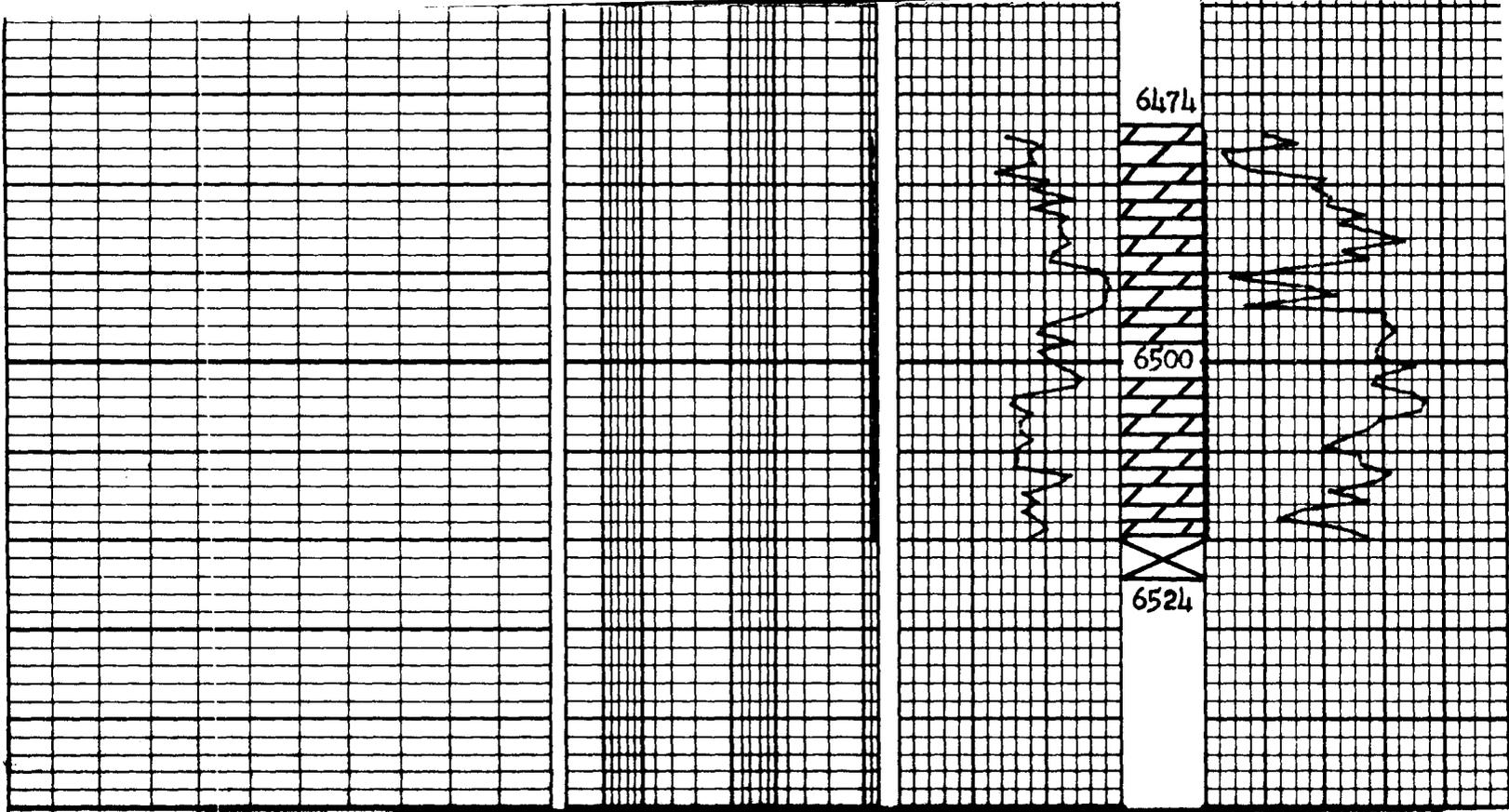
20 10 0

OIL SATURATION

PERCENT PORE SPACE

0 20 40 60 80





**INTERPRETATION OF DATA**

6377.0-6435.0 Feet - Non-productive due to low permeability and porosity.

6474.0-6520.0 Feet -Believed to be water productive, although low permeability may limit production.

*These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.*

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc., and its officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

RESIDENCE PHONE:  
505/325-2188

OFFICE PHONE:  
505/325-4900



## HAROLD H. BROWN

*Consultant in Petroleum Geology*

POST OFFICE BOX NO. 94 • PETROLEUM PLAZA BLDG.  
FARMINGTON, NEW MEXICO 87401

### WELLSITE GEOLOGICAL REPORT

Burlington Northern, Inc.  
Abajo 11-9  
San Juan Co., Utah

LOCATION: 820'NL & 660' WL, Sec. 9, T34S-R21E.

ELEVATIONS: 8255' Gr. 8269' Kb.

DRILLING CONTRACTOR: Loffland Brothers, Farmington, N. M. Rig 231.

DRILLING ENGINEER: Minerals Management, Farmington, N. M.

GEOLOGIST: Harold H. Brown, Farmington, N. M.

MUD LOGGING: Underwood Logging, Farmington, N. M.

MUD COMPANY: Basin Mud, Farmington, N. M.

WATER HAULING: Bowen, Farmington, N. M.

LOCATION: Perry McDonald, Cortez, Colorado.

CEMENTING: Halliburton, Farmington & Cortez, Colorado.

ELECTRIC LOGGING: Schlumberger, Farmington, N. M.

CASING: 7 5/8" @ 3521', 10 3/4" @ 1248', 16" @ 80'.

CORES: Two in Mississippian.

DSTS: None.

SPUD DATE: August 30, 1976.

DATE DRILLING COMPLETED: September 29, 1976.

TOTAL DEPTH: 6987' - Driller. Top Fish - 6519'.

The location is on the west side of the Abajo Mountains, an uplift of stocks and laccliths, about twenty-two miles northwest of the town of Blanding, Utah. The hole was originally drilled by Gulf Oil Company in the 1950s, to a total depth of 4605 feet. The wireline log indicated the hole was bottomed about fifty-five feet below the base of the Pennsylvanian Desert Creek Zone. Extreme lost circulation was encountered from under surface casing to total depth with no cuttings returns.

Minerals Management, consulting engineers, cleaned out the old hole, encountering much junk and lost circulation that could not

be sealed off. The lost circulation was possibly due to the hole being positioned in a zone of near vertical fracturing. This condition can be seen in the canyon walls in the vicinity of the location where highly fractured zones are spaced intermittently with non-fractured or slightly fractured intervals. Lost circulation below the casing point was in the Pennsylvanian Hermosa formation, a sequence of hard, cherty limestones, siltstones and shales.

Fresh water for drilling down to 4605' was obtained from a stream at Allen's Canyon, along the road, about six miles southeast of the location. Salt water was used to drill below 4605' through the Paradox formation of salt beds, and brine was trucked from Moab, approximately one hundred miles by road. The water level in the hole remained at about 1950' throughout the drilling period. Occasionally the hole was slugged with a salt gel mud to clean out cuttings but drill pipe became stuck at 6987' when the bit plugged and circulation off bottom could not be maintained. Ten drill collars remain in the hole when it was plugged with the top of the fish at 6519'.

The wellsite geologist was on location from 4600 feet to total depth. A drilling time log was prepared on a scale of 2" = 100'. Two cores taken in the Mississippian are described and plotted on this log and samples obtained from the junk basket are also described and plotted on the log. Core descriptions are found on attached pages to this report.

Underwood Logging engineer monitored for gas shows by a line into the end of the flow line. Fifteen to twenty units of methane were recorded at 6290' and ten units were logged at 6460' - 6470'. No gas was indicated on the Neutron log in these intervals. Underwood Logging will submit a separate report of their work.

Schlumberger logged the hole and ran Gamma Ray Sonic and Neutron Density logs. No zones were observed to have gas of any note. The deepest point logged was 6510' as the drill collars prevented logging to the drilled depth of 6987'.

Two cores were cut in the Mississippian by Christensen Diamond Bit Company. Core No. 1 was taken from 6376 feet to 6436 feet and one foot of orange-brown siltstone and fifty-nine feet of tight, dense limestone was recovered. Some oolitic limestone with some black, dead oil residue was described. In Core No 2, from 6474' to 6524', about forty seven feet was recovered in the fifty foot interval. The three foot loss was probably

distributed throughout the length of the core. The entire core was a crystalline dolomite, with intercrystalline porosity and much dead, black oil residue. No live oil shows were seen in either core. A core analysis of Core No. 2 was made during the drilling operations which showed a range of porosity up to 15.5% but permeability is low, with a maximum millidarcy of 0.14. It was decided to have an analysis of Core No. 1 after drilling was completed and the results are not available at this time. Copies of each analysis is being distributed by Core Laboratory.

Cores will be sent to Amoco's warehouse in Denver, and a cut of the cores, and samples obtained from the junk basket will be sent to Am Strat in Denver.

#### FORMATIONS OF INTEREST

Mississippian Age. Mississippian rocks range from 6342' to 6770' in this well and are considered the primary objective for this area. The first core was cut at the top of the section in hopes of finding porosity to observe in a rock sample. None was encountered. Upon drilling ahead a drilling break held up for fourteen feet from 6460' to 6474' and ten units of methane gas was also noted for this interval. In the junk basket, when the bit was pulled, was a dolomite with excellent porosity, and black, dead oil residue. As noted above, no live oil was present in the core. Fast drilling was maintained below Core No. 2 suggesting that drilling was taking place in the massive porous interval of the Mississippian. No gas shows were recorded to the base of the Mississippian.

Devonian Ouray. This formation is estimated to be between 6770' and 6850'. In the junk basket at 6812' was a light grey dolomite with tight to fair intercrystalline porosity, and traces of black, dead oil residue. It is not sure if this dolomite is from the Ouray formation. No gas shows were noted.

Devonian Elbert. The top of this formation is estimated to be at 6850' and at the depth of 6987' drilling was probably still in this formation when the collars were stuck. No gas was recorded within this interval.

Devonian McCracken. This formation was the secondary objective but was not reached in this operation. The top of the McCracken is estimated to be at 7035'.

#### FORMATION TOPS

Upper Hermosa - 3523' (Gulf)	Top Fish - 6519'
Ismay - 4280' (Gulf)	Devonian Ouray - 6770' est.
Desert Creek - 4482' (Gulf).	Devonian Elbert - 6850' est.
First Salt - 4711'	Devonian McCracken - 7035' est.
Base Salt (Lower Hermosa) - 6018'	TD Driller - 6987'
Molas - 6307'	
Mississippian - 6342'	

## CONCLUSIONS

The dead oil residue suggests that oil had been trapped at this location but has since been removed. The uplift caused by igneous intrusives may have been the reason for hydrocarbon flushing, or large scale structural movement within the Colorado Plateau may have been the cause of migration. From the amount of section with dead oil in Core No. 2, plus the fourteen foot drilling break above the core, it is estimated that an oil column of fifty or sixty feet was present. This would suggest a structure of fair magnitude if the trap was structural. A further indication that the trap could have been structural is the thickness of the Molas formation. It is thirty five feet thick, which is about half the thickness as occurs in nearby wells.



Harold H. Brown

CORE DESCRIPTIONS

Core No. 1. 6376' - 6436'. Cut and recovered 60'.

- 6376 - 6377. Siltstone org-brn, shaly.
- 77 - 78 Ls gry, dns, f xln, crinoid frags ?
- 78 - 79 Ls gry, tan, dns, filled frac, styolites, strk gry sh.
- 79 - 80 Ls lt gry, m xln, styolites.
- 80 - 81 Ls lt gry, dns/vfxln, sty.
- 81 - 82 Ls lt gry, dns, shell frag, sty, calc in frac.
- 82 - 83 Ls as ab, f xln.
- 83 - 84 Ls lt gry, dns.
- 84 - 86 Ls lt gry, f xln, sty, calc in frac.
- 86 - 90 Ls lt gry, dns/mxln, foss frags, sty.
- 90 - 92 Ls dns, styolites.
- 92 - 93 Ls dns and as below.
- 93 - 96 Dol blk, vfxln, highly frac w/calc in frac.
- 96 - 97 Ls gry, dns, frac.
- 97 - 98 Ls gry, tan, dns/vfxln, highly fracd, grn sh strks.
- 98 - 99 Dol gry, dns, brecciated(?).
- 99 - 6401 Ls gry, v dns, sty, some grn sh strks.
- 01 - 03 Ls lt gry, dns/vfxln, sty.
- 03 - 04 Ls lt gry, dns, w/grn sh strks.
- 04 - 05 Ls lt gry, m xln.
- 05 - 06 Ls lt gry, dns/m xln, sty.
- 06 - 08 Ls lt gry, tan, dns, foss frags, sty.
- 08 - 10 Ls tan, dns, oolitic, blk dead oil residue.
- 10 - 16 Ls gry, tan, dns/fxln, styolites, some frac.
- 16 - 17 Ls tan, dns, v oolitic.
- 17 - 18 Ls tan, dns/vfxln.
- 18 - 19 Ls tan, dns/vfxln, slty oolitic.
- 19 - 20 Ls tan, dns/vfxln, vert frac, oolitic, dead oil res.
- 20 - 25 Ls tan, v dns, styolites.
- 25 - 29 Ls tan, v dns, styolites, dk brn cht.
- 29 - 35 Ls tan, dns/vfxln, styolites.
- 35 - 36 Ls tan, dns/vfxln, w/cht dk gry, blk.

No live oil shows observed and no porosity other than fracture porosity.

CORE DESCRIPTIONS CONTINUED.

Core No. 2. 6474' - 6524'. Cut 50'. Recovered 47'. Lost interval probably distributed throughout core.

6474 - 6480. Dol lt gry, fxltn, good interxltn por, much blk dead oil residue.

80 - 82 Dol lt gry, fxltn, tight/poor intxltn por, dead oil res.

82 - 83 Dol lt gry, dns/fxltn, tight/poor intxltn por, dead oil residue.

83 - 84 Dol lt gry, fxltn, p/f por, dead oil res.

84 - 85 Dol lt gry, dns/fxltn, tight w/dead oil res.

85 - 86 Dol lt gry, dns/vfxln, good vug por, dead oil res.

86 - 89 Dol lt gry, dns/vfxln, some poor vug por, dead oil res.

89 - 90 Dol tan, dns, ti/poor intxltn por, dead oil res.

90 - 92 Dol tan, dns. frac, tight.

92 - 93 Dol tan, vdns, tight.

93 - 94 Dol tan, dns/vfxln, tight.

94 - 6500 Dol lt gry, dns/fxltn, some poor intxltn por and poor vug porosity, blk dead oil residue.

00 - 01 Dol lt gry, dns/fxltn, tight, blk dead oil res.

01 - 02 Dol lt gry, dns/fxltn, vugs, tight, blk deadoil res.

02 - 03 Dol lt gry, fxltn, poor intxltn por, poor vug por, blk dead oil res.

03 - 04 Dol lt gry, dns/fxltn, tight, blk dead oil res.

04 - 05 Dol lt gry, vfxln, p/f intxltn por, tight vug por, blk dead oil res.

06 - 08 Dol lt gry, vfxln, tight vug por, dead oil res.

08 - 13 Dol tan, vfxln, p/f intxltn por, poor vug por, dead oil res.

13 - 14 Dol gry, vfxln, tight vug por, blk dead oil res.

14 - 17 Dol lt gry, vfxln, poor intxltn por, filled fracs, blk dead oil res.

17 - 18 Dol brn, vfxln, tight, blk dead oil res.

18 - 19 Dol brn, vfxln, tight, vugs.

19 - 21 Dol brn, vfxln, tight.

No live oil shows observed.

## HAROLD H. BROWN

*Consultant in Petroleum Geology*

POST OFFICE BOX NO. 94 • PETROLEUM PLAZA BLDG.  
FARMINGTON, NEW MEXICO 87401

### WELLSITE GEOLOGICAL REPORT

Burlington Northern, Inc.  
Abajo 11-9  
San Juan Co., Utah

LOCATION: 820'NL & 660' WL, Sec. 9, T34S-R21E.

ELEVATIONS: 8255' Gr. 8269' Kb.

DRILLING CONTRACTOR: Loffland Brothers, Farmington, N. M. Rig 231.

DRILLING ENGINEER: Minerals Management, Farmington, N. M.

GEOLOGIST: Harold H. Brown, Farmington, N. M.

MUD LOGGING: Underwood Logging, Farmington, N. M.

MUD COMPANY: Basin Mud, Farmington, N. M.

WATER HAULING: Bowen, Farmington, N. M.

LOCATION: Perry McDonald, Cortez, Colorado.

CEMENTING: Halliburton, Farmington & Cortez, Colorado.

ELECTRIC LOGGING: Schlumberger, Farmington, N. M.

CASING: 7 5/8" @ 3521', 10 3/4" @ 1248', 16" @ 80'.

CORES: Two in Mississippian.

DSTS: None.

SPUD DATE: August 30, 1976.

\*DATE DRILLING COMPLETED: September 29, 1976.

TOTAL DEPTH: 6987' - Driller. Top Fish - 6519'.

The location is on the west side of the Abajo Mountains, an uplift of stocks and laccliths, about twenty-two miles northwest of the town of Blanding, Utah. The hole was originally drilled by Gulf Oil Company in the 1950s, to a total depth of 4605 feet. The wireline log indicated the hole was bottomed about fifty-five feet below the base of the Pennsylvanian Desert Creek Zone. Extreme lost circulation was encountered from under surface casing to total depth with no cuttings returns.

Minerals Management, consulting engineers, cleaned out the old hole, encountering much junk and lost circulation that could not

be sealed off. The lost circulation was possibly due to the hole being positioned in a zone of near vertical fracturing. This condition can be seen in the canyon walls in the vicinity of the location where highly fractured zones are spaced intermittently with non-fractured or slightly fractured intervals. Lost circulation below the casing point was in the Pennsylvanian Hermosa formation, a sequence of hard, cherty limestones, siltstones and shales.

Fresh water for drilling down to 4605' was obtained from a stream at Allen's Canyon, along the road, about six miles southeast of the location. Salt water was used to drill below 4605' through the Paradox formation of salt beds, and brine was trucked from Moab, approximately one hundred miles by road. The water level in the hole remained at about 1950' throughout the drilling period. Occasionally the hole was slugged with a salt gel mud to clean out cuttings but drill pipe became stuck at 6987' when the bit plugged and circulation off bottom could not be maintained. Ten drill collars remain in the hole when it was plugged with the top of the fish at 6519'.

The wellsite geologist was on location from 4600 feet to total depth. A drilling time log was prepared on a scale of 2" = 100'. Two cores taken in the Mississippian are described and plotted on this log and samples obtained from the junk basket are also described and plotted on the log. Core descriptions are found on attached pages to this report.

Underwood Logging engineer monitored for gas shows by a line into the end of the flow line. Fifteen to twenty units of methane were recorded at 6290' and ten units were logged at 6460' - 6470'. No gas was indicated on the Neutron log in these intervals. Underwood Logging will submit a separate report of their work.

Schlumberger logged the hole and ran Gamma Ray Sonic and Neutron Density logs. No zones were observed to have gas of any note. The deepest point logged was 6510' as the drill collars prevented logging to the drilled depth of 6987'.

Two cores were cut in the Mississippian by Christensen Diamond Bit Company. Core No. 1 was taken from 6376 feet to 6436 feet and one foot of orange-brown siltstone and fifty-nine feet of tight, dense limestone was recovered. Some oolitic limestone with some black, dead oil residue was described. In Core No 2, from 6474' to 6524', about forty seven feet was recovered in the fifty foot interval. The three foot loss was probably

distributed throughout the length of the core. The entire core was a crystalline dolomite, with intercrystalline porosity and much dead, black oil residue. No live oil shows were seen in either core. A core analysis of Core No. 2 was made during the drilling operations which showed a range of porosity up to 15.5% but permeability is low, with a maximum millidarcy of 0.14. It was decided to have an analysis of Core No. 1 after drilling was completed and the results are not available at this time. Copies of each analysis is being distributed by Core Laboratory.

Cores will be sent to Amoco's warehouse in Denver, and a cut of the cores, and samples obtained from the junk basket will be sent to Am Strat in Denver.

#### FORMATIONS OF INTEREST

Mississippian Age. Mississippian rocks range from 6342' to 6770' in this well and are considered the primary objective for this area. The first core was cut at the top of the section in hopes of finding porosity to observe in a rock sample. None was encountered. Upon drilling ahead a drilling break held up for fourteen feet from 6460' to 6474' and ten units of methane gas was also noted for this interval. In the junk basket, when the bit was pulled, was a dolomite with excellent porosity, and black, dead oil residue. As noted above, no live oil was present in the core. Fast drilling was maintained below Core No. 2 suggesting that drilling was taking place in the massive porous interval of the Mississippian. No gas shows were recorded to the base of the Mississippian.

Devonian Ouray. This formation is estimated to be between 6770' and 6850'. In the junk basket at 6812' was a light grey dolomite with tight to fair intercrystalline porosity, and traces of black, dead oil residue. It is not sure if this dolomite is from the Ouray formation. No gas shows were noted.

Devonian Elbert. The top of this formation is estimated to be at 6850' and at the depth of 6987' drilling was probably still in this formation when the collars were stuck. No gas was recorded within this interval.

Devonian McCracken. This formation was the secondary objective but was not reached in this operation. The top of the McCracken is estimated to be at 7035'.

#### FORMATION TOPS

Upper Hermosa - 3523' (Gulf)	Top Fish - 6519'
Ismay - 4280' (Gulf)	Devonian Ouray - 6770' est.
Desert Creek - 4482' (Gulf).	Devonian Elbert - 6850' est.
First Salt - 4711'	Devonian McCracken - 7035' est.
Base Salt (Lower Hermosa) - 6018'	TD Driller - 6987'
Molas - 6307'	
Mississippian - 6342'	

## CONCLUSIONS

The dead oil residue suggests that oil had been trapped at this location but has since been removed. The uplift caused by igneous intrusives may have been the reason for hydrocarbon flushing, or large scale structural movement within the Colorado Plateau may have been the cause of migration. From the amount of section with dead oil in Core No. 2, plus the fourteen foot drilling break above the core, it is estimated that an oil column of fifty or sixty feet was present. This would suggest a structure of fair magnitude if the trap was structural. A further indication that the trap could have been structural is the thickness of the Molas formation. It is thirty five feet thick, which is about half the thickness as occurs in nearby wells.

*Harold H. Brown*

Harold H. Brown

CORE DESCRIPTIONS

Core No. 1. 6376' - 6436'. Cut and recovered 60'.

- 6376 - 6377. Siltstone org-brn, shaly.
- 77 - 78 Ls gry, dns, f xln, crinoid frags ?
- 78 - 79 Ls gry, tan, dns, filled frac, styolites, strk gry sh.
- 79 - 80 Ls lt gry, m xln, styolites.
- 80 - 81 Ls lt gry, dns/vfxln, sty.
- 81 - 82 Ls lt gry, dns, shell frag, sty, calc in frac.
- 82 - 83 Ls as ab, f xln.
- 83 - 84 Ls lt gry, dns.
- 84 - 86 Ls lt gry, f xln, sty, calc in frac.
- 86 - 90 Ls lt gry, dns/mxln, foss frags, sty.
- 90 - 92 Ls dns, styolites.
- 92 - 93 Ls dns and as below.
- 93 - 96 Dol blk, vfxln, highly frac w/calc in frac.
- 96 - 97 Ls gry, dns, frac.
- 97 - 98 Ls gry, tan, dns/vfxln, highly fracd, grn sh strks.
- 98 - 99 Dol gry, dns, brecciated(?).
- 99 - 6401 Ls gry, v dns, sty, some grn sh strks.
- 01 - 03 Ls lt gry, dns/vfxln, sty.
- 03 - 04 Ls lt gry, dns, w/grn sh strks.
- 04 - 05 Ls lt gry, m xln.
- 05 - 06 Ls lt gry, dns/m xln, sty.
- 06 - 08 Ls lt gry, tan, dns, foss frags, sty.
- 08 - 10 Ls tan, dns, oolitic, blk dead oil residue.
- 10 - 16 Ls gry, tan, dns/fxln, styolites, some frac.
- 16 - 17 Ls tan, dns, v oolitic.
- 17 - 18 Ls tan, dns/vfxln.
- 18 - 19 Ls tan, dns/vfxln, slty oolitic.
- 19 - 20 Ls tan, dns/vfxln, vert frac, oolitic, dead oil res.
- 20 - 25 Ls tan, v dns, styolites.
- 25 - 29 Ls tan, v dns, styolites, dk brn cht.
- 29 - 35 Ls tan, dns/vfxln, styolites.
- 35 - 36 Ls tan, dns/vfxln, w/cht dk gry, blk.

No live oil shows observed and no porosity other than fracture porosity.

CORE DESCRIPTIONS CONTINUED.

Core No. 2. 6474' - 6524'. Cut 50'. Recovered 47'. Lost interval probably distributed throughout core.

6474 - 6480. Dol lt gry, fxln, good interxln por, much blk dead oil residue.

80 - 82 Dol lt gry, fxln, tight/poor intxln por, dead oil res.

82 - 83 Dol lt gry, dns/fxln, tight/poor intxln por, dead oil residue.

83 - 84 Dol lt gry, fxln, p/f por, dead oil res.

84 - 85 Dol lt gry, dns/fxln, tight w/dead oil res.

85 - 86 Dol lt gry, dns/vfxln, good vug por, dead oil res.

86 - 89 Dol lt gry, dns/vfxln, some poor vug por, dead oil res.

89 - 90 Dol tan, dns, ti/poor intxln por, dead oil res.

90 - 92 Dol tan, dns. frac, tight.

92 - 93 Dol tan, vdns, tight.

93 - 94 Dol tan, dns/vfxln, tight.

94 - 6500 Dol lt gry, dns/fxln, some poor intxln por and poor vug porosity, blk dead oil residue.

00 - 01 Dol lt gry, dns/fxln, tight, blk dead oil res.

01 - 02 Dol lt gry, dns/fxln, vugs, tight, blk deadoil res.

02 - 03 Dol lt gry, fxln, poor intxln por, poor vug por, blk dead oil res.

03 - 04 Dol lt gry, dns/fxln, tight, blk dead oil res.

04 - 05 Dol lt gry, vfxln, p/f intxln por, tight vug por, blk dead oil res.

06 - 08 Dol lt gry, vfxln, tight vug por, dead oil res.

08 - 13 Dol tan, vfxln, p/f intxln por, poor vug por, dead oil res.

13 - 14 Dol gry, vfxln, tight vug por, blk dead oil res.

14 - 17 Dol lt gry, vfxln, poor intxln por, filled fracs, blk dead oil res.

17 - 18 Dol brn, vfxln, tight, blk dead oil res.

18 - 19 Dol brn, vfxln, tight, vugs.

19 - 21 Dol brn, vfxln, tight.

No live oil shows observed.

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY**

SUBMIT IN TRIPlicate\*  
(Other instructions on re-  
verse side)

Form approved.  
Budget Bureau No. 42-R1424

<b>SUNDRY NOTICES AND REPORTS ON WELLS</b> (Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)		
1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>	7. UNIT AGREEMENT NAME --	5. LEASE DESIGNATION AND SERIAL NO. U-13785
2. NAME OF OPERATOR BURLINGTON NORTHEPN INC.	8. FARM OR LEASE NAME Abajo	6. IF INDIAN, ALLOTTEE OR TRIBE NAME --
3. ADDRESS OF OPERATOR Box 1855, Billings, MT 59103	9. WELL NO. 77-0	7. UNIT AGREEMENT NAME --
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface NW NW 9-34S-21E <sup>660 820</sup> (729 - 812 FWL)	10. FIELD AND POOL, OR WILDCAT WC	11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 9-34S-21E
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.) 8266 KB	12. COUNTY OR PARISH San Juan
		13. STATE UT

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input checked="" type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) _____	
(Other) _____		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

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.)\*

Verbal approval to P&A was given to Mr. J. A. Snell by Mr. Jerry Long-USGS on October 7, 1976 to plug as follows:

Plug #	Depth	Cmt
1	6118-5918	110 sx Class B 187 salt +2% CaCl
2	4810-4610	75 sx Ditto
3	2435-3370	CIBP + 15 sx Ditto
4	0- 65	Wooden plug + 15 sx Ditto
5	Pump 15 sx of cmt down annulus of 7-5/8" 10-3/4" csg.	

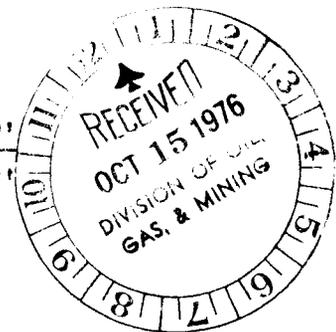
Junk left in hole from 6519-6819

1 6-3/4 S-88 Drill Bit	=	0.5'
1 Bit Sub	=	3.8'
1 Junk Basket	=	2.7'
10 4-3/4" OD Drill Collars	=	293.09'
		Total Fish 300.09'

APPROVED BY THE DIVISION OF OIL, GAS, AND MINING

DATE: Oct. 15, 1976

BY: P. A. Snell



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

SIGNED: [Signature] TITLE: Production Manager DATE: 10-11-76

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:

**PRELIMINARY COPY**

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

P

Company BURLINGTON NORTHERN Formation MISSISSIPPIAN Page 1 of 4  
 Well ABACO-FEDERAL NO. 11-9 Cores DIAMOND 3.5" File RP-3-2776  
 Field WILDCAT Drilling Fluid WATER BASE MUD Date Report 9-28-76  
 County SAN JUAN State UTAH Elevation 8266' KB Analysts ET  
 Location SEC. 9-T34S-R21E Remarks WHOLE CORE ANALYSIS

**CORE ANALYSIS RESULTS**

(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME	TOTAL WATER % PORE		
								(K <sub>A</sub> )
	6376-77							Salt - No Analysis
1A	6377-78	<0.01	<0.01	0.6	0.0	33.3	Lm Gy VFX	
2A	78-79	<0.01	<0.01	0.9	0.0	44.4	Lm Gy VFX	
3A	79-80	<0.01	<0.01	0.7	0.0	16.6	Lm Gy VFX	
4A	80-81	<0.01	<0.01	0.8	0.0	37.5	Lm Gy VFX	
5A	81-82	<0.01	<0.01	0.8	0.0	33.3	Lm Gy VFX	
6A	82-83	<0.01	<0.01	0.6	0.0	33.3	Lm Gy VFX	
7A	83-84	<0.01	<0.01	0.8	0.0	25.0	Lm Gy VFX	
8A	84-85	0.09	<0.01	0.7	0.0	25.0	Lm Gy VFX	
9A	85-86	<0.01	<0.01	0.8	0.0	42.8	Lm Gy VFX	
10A	86-87	<0.01	<0.01	0.7	0.0	33.3	Lm Gy VFX	
11A	87-88	<0.01	<0.01	1.2	0.0	62.5	Lm Gy VFX	
12A	88-89	<0.01	*	1.0	0.0	44.4	Lm Gy VFX	
13A	89-90	<0.01	<0.01	0.5	0.0	20.0	Lm Gy VFX	
14A	90-91	<0.01	<0.01	0.6	0.0	33.3	Lm Gy VFX	
15A	91-92	<0.01	*	0.7	0.0	33.3	Lm Gy VFX	
16A	92-93	<0.01	<0.01	5.1	0.0	23.3	Dolo Drk Gy VFX Lmy	
17A	93-94	<0.01	<0.01	10.0	0.0	17.5	Dolo Drk Gy VFX Lmy	
18A	94-95	<0.01	*	9.1	0.0	18.1	Dolo Drk Gy VFX Lmy	
19A	95-96	<0.01	*	4.5	0.0	33.3	Dolo Drk Gy VFX Lmy	
20A	96-97	<0.01	*	5.5	0.0	47.7	Dolo Drk Gy VFX Lmy	
21A	97-98	<0.01	*	5.4	0.0	19.4	Lm Gy VFX	
22A	98-99	<0.01	<0.01	6.9	0.0	59.6	Lm Gy VFX	
23A	99-00	<0.01	<0.01	0.9	0.0	37.5	Lm Gy VFX	
24A	6400-01	<0.01	*	1.5	0.0	53.8	Lm Gy VFX	
25A	01-02	<0.01	<0.01	0.9	0.0	33.3	Lm Gy VFX	
26A	02-03	<0.01	<0.01	0.7	0.0	42.9	Lm Gy VFX	
27A	03-04	<0.01	<0.01	0.8	0.0	50.0	Lm Gy VFX	
28A	04-05	<0.01	<0.01	1.2	0.0	33.3	Lm Gy VFX	
29A	05-06	<0.01	<0.01	1.5	0.0	28.6	Lm Gy VFX	
30A	06-07	<0.01	<0.01	1.0	0.0	20.0	Lm Gy VFX	
31A	07-08	<0.01	<0.01	1.4	0.0	25.0	Lm Gy VFX	
32A	08-09	<0.01	<0.01	1.0	0.0	30.0	Lm Gy VFX	
33A	09-10	<0.01	<0.01	2.0	0.0	20.0	Lm Gy VFX	
34A	10-11	<0.01	<0.01	1.1	0.0	25.0	Lm Gy VFX	



\*Unsuitable for Whole Core Permeability

NOTE: (1) REFER TO ATTACHED LETTER. (2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS.  
 (1) INCOMPLETE CORE RECOVERY—INTERPRETATION RESERVED.

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**CORE LABORATORIES, INC.**

Petroleum Reservoir Engineering

DALLAS, TEXAS

Company BURLINGTON NORTHERN Formation MISSISSIPPIAN Page 2 of 4  
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**CORE ANALYSIS RESULTS**

*(Figures in parentheses refer to footnote remarks)*

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		HORIZONTAL	VERTICAL		OIL % VOLUME	TOTAL WATER % PORE		
		(K <sub>A</sub> )						
35A	6411-12	<0.01	*	1.6	0.0	33.3	Lm Gy VFX	
36A	12-13	<0.01	*	1.6	0.0	28.5	Lm Gy VFX	
37A	13-14	<0.01	<0.01	1.1	0.0	27.3	Lm Gy VFX	
38A	14-15	<0.01	*	1.1	0.0	50.0	Lm Gy VFX	
39A	15-16	<0.01	<0.01	1.0	0.0	37.5	Lm Gy VFX	
40A	16-17	<0.01	<0.01	0.8	0.0	33.3	Lm Gy VFX	
41A	17-18	<0.01	*	1.1	0.0	33.3	Lm Gy VFX	
42A	18-19	<0.01	<0.01	0.9	0.0	22.2	Lm Gy VFX	
43A	19-20	<0.01	*	1.0	0.0	40.0	Lm Gy VFX	
44A	20-21	<0.01	*	1.3	0.0	33.3	Lm Gy VFX	
45A	21-22	<0.01	<0.01	0.9	0.0	33.3	Lm Gy VFX	
46A	22-23	<0.01	*	1.1	0.0	37.5	Lm Gy VFX	
47A	23-24	<0.01	*	1.3	0.0	33.3	Lm Gy VFX	
48A	24-25	<0.01	*	0.7	0.0	40.0	Lm Gy VFX	
49A	25-26	<0.01	*	1.0	0.0	66.6	Lm Gy VFX	
50A	26-27	<0.01	*	1.4	0.0	22.2	Lm Gy VFX	
51A	27-28	<0.01	*	1.0	0.0	27.3	Lm Gy VFX	
52A	28-29	<0.01	*	1.0	0.0	28.5	Lm Gy VFX	
53A	29-30	<0.01	*	0.8	0.0	33.3	Lm Gy VFX	
54A	30-31	<0.01	*	0.9	0.0	25.0	Lm Gy VFX	
55A	31-32	<0.01	<0.01	1.0	0.0	42.8	Lm Gy VFX	
56A	32-33	<0.01	<0.01	1.1	0.0	30.0	Lm Gy VFX	
57A	33-34	<0.01	<0.01	0.7	0.0	28.5	Lm Gy VFX	
58A	34-35	<0.01	*	1.7	0.2	20.0	Lm Gy VFX	

**\*Unsuitable for Whole Core Permeability**

NOTE:

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 (1) INCOMPLETE CORE RECOVERY—INTERPRETATION RESERVED.

(2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS.

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**CORE LABORATORIES, INC.**

*Petroleum Reservoir Engineering*

DALLAS, TEXAS

Company BURLINGTON NORTHERN Formation MISSISSIPPIAN Page 3 of 4  
 Well ABA 10-FEDERAL NO. 11-9 Cores DIAMOND 3.5" File RP-3-2776  
 Field WILDCAT Drilling Fluid WATER BASE MUD Date Report 9-28-76  
 County SAN JUAN State UTAH Elevation 8266' KB Analysts ET:RG  
 Location SEC. 9-T34S-R21E Remarks WHOLE CORE ANALYSIS

**CORE ANALYSIS RESULTS**

*(Figures in parentheses refer to footnote remarks)*

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PERCENT	RESIDUAL SATURATION			PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME	% PORE	TOTAL WATER % PORE		
			(K <sub>A</sub> )						
1	6474-75	0.14	0.03	15.5	0.0	79.4	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
2	75-76	0.02	0.02	10.7	0.0	68.8	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
3	76-77	0.04	*	12.6	0.0	94.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
4	77-78	0.03	*	11.7	0.0	91.8	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
5	78-79	0.13	*	17.1	0.0	84.4	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
6	79-80	0.01	0.01	10.0	0.0	60.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
7	80-81	0.03	0.01	12.0	0.0	63.9	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
8	81-82	0.01	0.01	6.4	0.0	57.9	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
9	82-83	0.02	0.01	12.4	0.0	59.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
10	83-84	0.01	0.01	7.4	0.0	46.7	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
11	84-85	0.01	0.01	8.4	0.0	55.2	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
12	85-86	0.01	0.01	8.1	0.0	42.8	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
13	86-87	0.01	*	7.0	0.0	33.3	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
14	87-88	0.01	0.01	9.2	0.0	54.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
15	88-89	0.01	0.01	9.6	0.0	45.5	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
16	89-90	0.01	*	3.3	0.0	72.9	Dolo	Drk Gy FX Anhy	
17	90-91	0.01	*	2.1	0.0	91.8	Dolo	Drk Gy FX Anhy	
18	91-92	0.01	0.01	1.7	0.0	66.5	Dolo	Drk Gy FX Anhy	
19	92-93	0.01	0.01	2.2	0.0	55.9	Dolo	Drk Gy FX Anhy	
20	93-94	0.01	0.01	2.5	0.0	87.0	Dolo	Drk Gy FX Anhy	
21	94-95	0.01	0.01	5.3	0.0	40.1	Dolo	Drk Gy FX Anhy	
22	95-96	0.01	*	10.3	0.0	40.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
23	96-97	0.05	*	11.5	0.0	36.8	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
24	97-98	0.01	*	6.6	0.0	40.5	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
25	98-99	0.01	*	11.4	0.0	43.0	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
26	99-00	0.02	*	10.0	0.0	43.1	Dolo	Drk Gy FX Anhy Sl/F Sl/Vgy	
27	6500-01	0.02	*	7.9	0.0	30.3	Dolo	Gy FX Anhy Sl/F Sl/Vgy	
28	01-02	0.01	0.01	5.6	0.0	42.9	Dolo	Gy FX Anhy Sl/Vgy	
29	02-03	0.01	0.01	6.3	0.0	44.3	Dolo	Gy FX Anhy Sl/Vgy	
30	03-04	0.01	0.01	14.3	0.0	31.3	Dolo	Gy FX Anhy Sl/Vgy	

\*Unsuitable for Whole Core Permeability

NOTE: (1) REFER TO ATTACHED LETTER. (2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS.  
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*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

Company BURLINGTON NORTHERN Formation MISSISSIPPIAN Page 4 of 4  
 Well ABAND-FEDERAL NO. 11-9 Cores DIAMOND 3.5" File RP-3-2776  
 Field WILDCAT Drilling Fluid WATER BASE MUD Date Report 9-28-76  
 County SAN JUAN State UTAH Elevation 8266' KB Analysts ET:RG  
 Location SEC. 9-T34S-R21E Remarks WHOLE CORE ANALYSIS

**CORE ANALYSIS RESULTS**

*(Figures in parentheses refer to footnote remarks)*

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME	TOTAL WATER % PORE		
								(K <sub>A</sub> )
31	6504-05	0.01	0.01	15.2	0.0	26.8	Dolo Gy FX Anhy Sl/Vgy	
32	05-06	0.01	0.01	12.5	0.0	28.3	Dolo Gy FX Anhy Sl/Vgy	
33	06-07	0.03	0.01	13.9	0.0	42.0	Dolo Gy FX Anhy Sl/Vgy	
34	07-08	0.02	0.01	13.9	0.0	45.8	Dolo Gy FX Anhy Sl/Vgy	
35	08-09	0.01	0.01	12.4	0.0	53.6	Dolo Gy FX Anhy Sl/Vgy	
36	09-10	0.01	0.01	14.5	0.0	60.5	Dolo Gy FX Anhy Sl/Vgy	
37	10-11	0.01	0.01	14.5	0.0	48.9	Dolo Gy FX Anhy Sl/Vgy	
38	11-12	0.01	0.01	14.7	0.0	48.1	Dolo Gy FX Anhy Sl/Vgy	
39	12-13	0.01	0.01	7.2	0.0	38.5	Dolo Gy FX Anhy Sl/Vgy	
40	13-14	0.20	0.01	8.8	0.0	43.8	Dolo Drk Gy FX Anhy Sl/Vgy	
41	14-15	0.01	0.01	13.5	0.0	58.7	Dolo Drk Gy FX Anhy Sl/Vgy	
42	15-16	0.01	0.01	11.7	0.0	46.0	Dolo Drk Gy FX Anhy Sl/Vgy	
43	16-17	0.01	0.01	13.7	0.0	67.6	Dolo Drk Gy FX Anhy Sl/Vgy	
44	17-18	0.01	0.01	11.5	0.0	76.2	Dolo Drk Gy FX Anhy Sl/Vgy	
45	18-19	0.01	*	10.4	0.0	56.3	Dolo Drk Gy FX Anhy Sl/F Sl/Vgy	
46	19-20	0.01	*	12.9	0.0	46.9	Dolo Drk Gy FX Anhy Sl/F Sl/Vgy	

\*Unsuitable for Whole Core Permeability

NOTE:

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(2) OFF LOCATION ANALYSES-NO INTERPRETATION OF RESULTS.

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CORE ANALYSIS RESULTS  
BURLINGTON NORTHERN, INC.  
ABATO-FEDERAL NO. 11-9  
WILDCAT  
SAN JUAN COUNTY, UTAH

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

Company BURLINGTON NORTHERN INC. Formation MISSISSIPPIAN Page 1 of 4  
 Well ABATO-FEDERAL NO. 11-9 Cores DIAMOND 3.5" File RP-3-2776  
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**CORE ANALYSIS RESULTS**  
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME % PORE	TOTAL WATER % PORE		
			(K <sub>A</sub> )					
	6376-77							Salt - No Analysis
1A	6377-78	<0.01	<0.01	0.6	0.0	33.3		Lm Gy VFX
2A	78-79	<0.01	<0.01	0.9	0.0	44.4		Lm Gy VFX
3A	79-80	<0.01	<0.01	0.7	0.0	16.6		Lm Gy VFX
4A	80-81	<0.01	<0.01	0.8	0.0	37.5		Lm Gy VFX
5A	81-82	<0.01	<0.01	0.8	0.0	33.3		Lm Gy VFX
6A	82-83	<0.01	<0.01	0.6	0.0	33.3		Lm Gy VFX
7A	83-84	<0.01	<0.01	0.8	0.0	25.0		Lm Gy VFX
8A	84-85	0.09	<0.01	0.7	0.0	25.0		Lm Gy VFX
9A	85-86	<0.01	<0.01	0.8	0.0	42.8		Lm Gy VFX
10A	86-87	<0.01	<0.01	0.7	0.0	33.3		Lm Gy VFX
11A	87-88	<0.01	<0.01	1.2	0.0	62.5		Lm Gy VFX
12A	88-89	<0.01	*	1.0	0.0	44.4		Lm Gy VFX
13A	89-90	<0.01	<0.01	0.5	0.0	20.0		Lm Gy VFX
14A	90-91	<0.01	<0.01	0.6	0.0	33.3		Lm Gy VFX
15A	91-92	<0.01	*	0.7	0.0	33.3		Lm Gy VFX
16A	92-93	<0.01	<0.01	5.1	0.0	23.3		Dolo Drk Gy VFX Lmy
17A	93-94	<0.01	<0.01	10.0	0.0	17.5		Dolo Drk Gy VFX Lmy
18A	94-95	<0.01	*	9.1	0.0	18.1		Dolo Drk Gy VFX Lmy
19A	95-96	<0.01	*	4.5	0.0	33.3		Dolo Drk Gy VFX Lmy
20A	96-97	<0.01	*	5.5	0.0	47.7		Dolo Drk Gy VFX Lmy
21A	97-98	<0.01	*	5.4	0.0	19.4		Lm Gy VFX
22A	98-99	<0.01	<0.01	6.9	0.0	59.6		Lm Gy VFX
23A	99-00	<0.01	<0.01	0.9	0.0	37.5		Lm Gy VFX
24A	6400-01	<0.01	*	1.5	0.0	53.8		Lm Gy VFX
25A	01-02	<0.01	<0.01	0.9	0.0	33.3		Lm Gy VFX
26A	02-03	<0.01	<0.01	0.7	0.0	42.9		Lm Gy VFX
27A	03-04	<0.01	<0.01	0.8	0.0	50.0		Lm Gy VFX
28A	04-05	<0.01	<0.01	1.2	0.0	33.3		Lm Gy VFX
29A	05-06	<0.01	<0.01	1.5	0.0	28.6		Lm Gy VFX
30A	06-07	<0.01	<0.01	1.0	0.0	20.0		Lm Gy VFX
31A	07-08	<0.01	<0.01	1.4	0.0	25.0		Lm Gy VFX
32A	08-09	<0.01	<0.01	1.0	0.0	30.0		Lm Gy VFX
33A	09-10	<0.01	<0.01	2.0	0.0	20.0		Lm Gy VFX
34A	10-11	<0.01	<0.01	1.1	0.0	25.0		Lm Gy VFX

\*Unsuitable for Whole Core Permeability

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Petroleum Reservoir Engineering

DALLAS, TEXAS

Company BURLINGTON NORTHERN INC. Formation MISSISSIPPIAN Page 2 of 4  
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## CORE ANALYSIS RESULTS

(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		HORIZONTAL	VERTICAL		OIL % VOLUME % PORE	TOTAL WATER % PORE		
		(K <sub>A</sub> )						
35A	6411-12	<0.01	*	1.6	0.0	33.3	Lm Gy VFX	
36A	12-13	<0.01	*	1.6	0.0	28.5	Lm Gy VFX	
37A	13-14	<0.01	<0.01	1.1	0.0	27.3	Lm Gy VFX	
38A	14-15	<0.01	*	1.1	0.0	50.0	Lm Gy VFX	
39A	15-16	<0.01	<0.01	1.0	0.0	37.5	Lm Gy VFX	
40A	16-17	<0.01	<0.01	0.8	0.0	33.3	Lm Gy VFX	
41A	17-18	<0.01	*	1.1	0.0	33.3	Lm Gy VFX	
42A	18-19	<0.01	<0.01	0.9	0.0	22.2	Lm Gy VFX	
43A	19-20	<0.01	*	1.0	0.0	40.0	Lm Gy VFX	
44A	20-21	<0.01	*	1.3	0.0	33.3	Lm Gy VFX	
45A	21-22	<0.01	<0.01	0.9	0.0	33.3	Lm Gy VFX	
46A	22-23	<0.01	*	1.1	0.0	37.5	Lm Gy VFX	
47A	23-24	<0.01	*	1.3	0.0	33.3	Lm Gy VFX	
48A	24-25	<0.01	*	0.7	0.0	40.0	Lm Gy VFX	
49A	25-26	<0.01	*	1.0	0.0	66.6	Lm Gy VFX	
50A	26-27	<0.01	*	1.4	0.0	22.2	Lm Gy VFX	
51A	27-28	<0.01	*	1.0	0.0	27.3	Lm Gy VFX	
52A	28-29	<0.01	*	1.0	0.0	28.5	Lm Gy VFX	
53A	29-30	<0.01	*	0.8	0.0	33.3	Lm Gy VFX	
54A	30-31	<0.01	*	0.9	0.0	25.0	Lm Gy VFX	
55A	31-32	<0.01	<0.01	1.0	0.0	42.8	Lm Gy VFX	
56A	32-33	<0.01	<0.01	1.1	0.0	30.0	Lm Gy VFX	
57A	33-34	<0.01	<0.01	0.7	0.0	28.5	Lm Gy VFX	
58A	34-35	<0.01	*	1.7	0.2	20.0	Lm Gy VFX	

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## CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

Company BURLINGTON NORTHERN INC. Formation MISSISSIPPIAN Page 3 of 4  
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME	TOTAL WATER % PORE		
			(K <sub>A</sub> )					
1	6474-75	0.14	0.03	15.5	0.0	79.4		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
2	75-76	0.02	0.02	10.7	0.0	68.8		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
3	76-77	0.04	*	12.6	0.0	94.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
4	77-78	0.03	*	11.7	0.0	91.8		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
5	78-79	0.13	*	17.1	0.0	84.4		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
6	79-80	0.01	0.01	10.0	0.0	60.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
7	80-81	0.03	0.01	12.0	0.0	63.9		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
8	81-82	0.01	0.01	6.4	0.0	57.9		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
9	82-83	0.02	0.01	12.4	0.0	59.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
10	83-84	0.01	0.01	7.4	0.0	46.7		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
11	84-85	0.01	0.01	8.4	0.0	55.2		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
12	85-86	0.01	0.01	8.1	0.0	42.8		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
13	86-87	0.01	*	7.0	0.0	33.3		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
14	87-88	0.01	0.01	9.2	0.0	54.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
15	88-89	0.01	0.01	9.6	0.0	45.5		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
16	89-90	0.01	*	3.3	0.0	72.9		Dolo Drk Gy FX Anhy
17	90-91	0.01	*	2.1	0.0	91.8		Dolo Drk Gy FX Anhy
18	91-92	0.01	0.01	1.7	0.0	66.5		Dolo Drk Gy FX Anhy
19	92-93	0.01	0.01	2.2	0.0	55.9		Dolo Drk Gy FX Anhy
20	93-94	0.01	0.01	2.5	0.0	87.0		Dolo Drk Gy FX Anhy
21	94-95	0.01	0.01	5.3	0.0	40.1		Dolo Drk Gy FX Anhy
22	95-96	0.01	*	10.3	0.0	40.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
23	96-97	0.05	*	11.5	0.0	36.8		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
24	97-98	0.01	*	6.6	0.0	40.5		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
25	98-99	0.01	*	11.4	0.0	43.0		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
26	99-00	0.02	*	10.0	0.0	43.1		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
27	6500-01	0.02	*	7.9	0.0	30.3		Dolo Gy FX Anhy Sl/F Sl/Vgy
28	01-02	0.01	0.01	5.6	0.0	42.9		Dolo Gy FX Anhy Sl/Vgy
29	02-03	0.01	0.01	6.3	0.0	44.3		Dolo Gy FX Anhy Sl/Vgy
30	03-04	0.01	0.01	14.3	0.0	31.3		Dolo Gy FX Anhy Sl/Vgy

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Petroleum Reservoir Engineering

DALLAS, TEXAS

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(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		MAX.	90°		OIL % VOLUME % PORE	TOTAL WATER % PORE		
			(K <sub>A</sub> )					
31	6504-05	0.01	0.01	15.2	0.0	26.8		Dolo Gy FX Anhy Sl/Vgy
32	05-06	0.01	0.01	12.5	0.0	28.3		Dolo Gy FX Anhy Sl/Vgy
33	06-07	0.03	0.01	13.9	0.0	42.0		Dolo Gy FX Anhy Sl/Vgy
34	07-08	0.02	0.01	13.9	0.0	45.8		Dolo Gy FX Anhy Sl/Vgy
35	08-09	0.01	0.01	12.4	0.0	53.6		Dolo Gy FX Anhy Sl/Vgy
36	09-10	0.01	0.01	14.5	0.0	60.5		Dolo Gy FX Anhy Sl/Vgy
37	10-11	0.01	0.01	14.5	0.0	48.9		Dolo Gy FX Anhy Sl/Vgy
38	11-12	0.01	0.01	14.7	0.0	48.1		Dolo Gy FX Anhy Sl/Vgy
39	12-13	0.01	0.01	7.2	0.0	38.5		Dolo Gy FX Anhy Sl/Vgy
40	13-14	0.20	0.01	8.8	0.0	43.8		Dolo Drk Gy FX Anhy Sl/Vgy
41	14-15	0.01	0.01	13.5	0.0	58.7		Dolo Drk Gy FX Anhy Sl/Vgy
42	15-16	0.01	0.01	11.7	0.0	46.0		Dolo Drk Gy FX Anhy Sl/Vgy
43	16-17	0.01	0.01	13.7	0.0	67.6		Dolo Drk Gy FX Anhy Sl/Vgy
44	17-18	0.01	0.01	11.5	0.0	76.2		Dolo Drk Gy FX Anhy Sl/Vgy
45	18-19	0.01	*	10.4	0.0	56.3		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy
46	19-20	0.01	*	12.9	0.0	46.9		Dolo Drk Gy FX Anhy Sl/F Sl/Vgy

\*Unsuitable for Whole Core Permeability

## NOTE:

(\*) REFER TO ATTACHED LETTER.

(1) INCOMPLETE CORE RECOVERY—INTERPRETATION RESERVED.

(2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS.

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