Scout Report sent out	☑
Noted in the NID File	☑
Location map pinned	☑
Approval or Disapproval Letter	☑
Date Completed, P. & A. or operations suspended	11-26-57
Pin changed on location map	☐
Affidavit and Record of A & P	☐
Water Shut-Off Test	☐
Gas-Oil Ratio Test	☐
Well Log Filed	☑

CONVERTED TO Water Injection Well 5-7-65

FILE NOTATIONS

Entered in NID File	✓	Checked by Chief	✓
Card Indexed	✓	Copy NID to Field Office	✓
Location Map Pinned	✓	Approval Letter	✓
Card Indexed	✓	Disapproval Letter	
IWR for State or Fee Land			

COMPLETION DATA:

Date Well Completed 11-26-57 Location Inspected

OW ✓ WW PA Bond released

GW OS PA State of Fee Land

LOGS FILED

Driller's Log 1-27-58

Electric Logs (No.) 3

E I E-I ✓ GR GR-N Micro ✓

Lat Mi-L Sonic Others Radioactive

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R-359.3.
Approval expires 12-31-55.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal

Lease No. 14-20-603-353

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	X	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 REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING 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)

Denver, Colorado October 14, 1957

Desert "A"
Well No. 3 is located 660 ft. from {N} line and 1982 ft. from {W} line of sec. 18

NE/4 NW/4 Sec. 18 (¼ Sec. and Sec. No.) 41 South (Twp.) 24 East (Range) SLM (Meridian)

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

The elevation of the ~~derrick floor~~ ground above sea level is 5088 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)

Drill 17-1/4" hole to 150', set 13-3/8" conductor pipe and cement to surface. Drill 12-1/4" hole to 1875', set 8-5/8" casing and cement to surface. Drill 7-7/8" hole to 6075', run and cement 5-1/2" casing and complete in Paradox formation.

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

Company Phillips Petroleum Company

Address 1200 Denver Club Building
Denver 2, Colorado

By [signature]
Title Division Superintendent

Company PHILLIPS PETROLEUM COMPANY

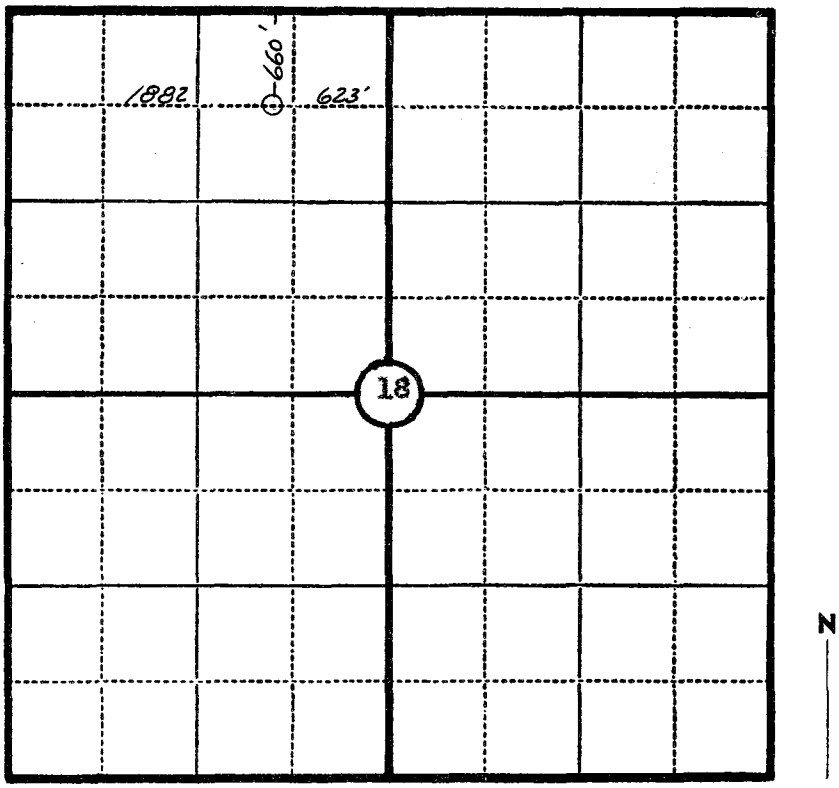
Lease ..... Well No. .....

Sec. 18, T. 41 SOUTH, R. 24 EAST, S.L.M.

Location 660' from the NORTH LINE and 1882' from the WEST LINE

Elevation 5088 UNGRADED

SAN JUAN COUNTY UTAH



Scale—4 inches equal 1 mile.

This is to certify that the above plat was prepared from field notes of actual surveys made by me or under my supervision and that the same are true and correct to the best of my knowledge and belief.

James P. Leese

Seal:

Registered Land Surveyor.
James P. Leese
Utah Reg. No. 1472

Surveyed 29 AUGUST, 1957

SAN JUAN ENGINEERING COMPANY, FARMINGTON, N. M.

October 15, 1957

Phillips Petroleum Company
1200 Denver Club Building
Denver 2, Colorado

Gentlemen:

This is to acknowledge receipt of your notice of intention to drill Well No. Desert A-3, which is to be located 660 feet from the north line and 1882 feet from the west line of Section 18, Township 41 South, Range 24 East, SLBM, 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

CLEON B. FEIGHT
SECRETARY

CBF:en

cc: Phil McGrath
USGS, Farmington,
New Mexico

DR-USGS

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R-359.3.
Approval expires 12-31-55.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal

Lease No. 14-20-603-353

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	X
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 REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING 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)

Denver, Colorado November 7, 1957

Desert "A"
Well No. 3 is located 660 ft. from [N] line and 1882 ft. from [E/W] line of sec. 18

NE/4 NW/4 Sec. 18 (¼ Sec. and Sec. No.) 41 South (Twp.) 24 East (Range) S.L.M. (Meridian)

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

The elevation of the derrick floor above sea level is 5111 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)

Spudded 5:00 a.m. 10-23-57. Drilled 12-1/4" hole to 191', reamed to 17-1/4" to 179'. Ran 13-3/8" Armco SW SJ 27.1# casing set at 175' RKB. Cemented with 175 sacks regular Portland cement, circulated 35 sacks. Job complete at 6:10 p.m. 10-24-57. WOC 24 hrs, tested casing with 500# for 30 minutes, held OK.

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

Company Phillips Petroleum Company

Address 1200 Denver Club Building
Denver 2, Colorado

By W. M. Schul

Title Division Superintendent

U. S. GOVERNMENT PRINTING OFFICE 16—8437b-7

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R-359.3.
Approval expires 12-31-55.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal

Lease No. 14-20-603-353

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	X
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 REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING 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)

Denver, Colorado November 8, 1957

Desert "A"

Well No. 3 is located 660 ft. from {N/S} line and 1882 ft. from {E/W} line of sec. 18

NE/4 NW/4 Sec. 18 (¼ Sec. and Sec. No.) 41 South (Twp.) 24 East (Range) S.L.M. (Meridian)

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

The elevation of the derrick floor above sea level is 5111 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)

Drilled 12-1/4" hole to 1879'. Ran 8-5/8" OD 24# 8rd STBC J-55 casing set at 1878' RKB. Cemented with 935 cu. ft. neat cement, 20 percent Diacel "D". Pumped plug to 1843'. Job complete 3:00 a.m. 10-29-57. WOC 24 hours. Tested casing and blowout preventer with 750# for 30 minutes, held OK. Drilled plug, tested with 750# for 30 minutes, held OK.

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

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By W. M. Schul

Title Division Superintendent

U. S. GOVERNMENT PRINTING OFFICE 16—8437b-7

PHILLIPS PETROLEUM COMPANY

1200 Denver Club Building
Denver 2, Colorado

November 25, 1957

Noted
H 12-5

Mr. Cleon B. Feight
Secretary
Utah Oil & Gas Conservation Commission
State Capitol Building
Salt Lake City, Utah

Dear Mr. Feight:

Attached you will find two copies of each of the following logs run on our Desert "A" #3, San Juan County, Utah:

1. Schlumberger Micro Log

2. Schlumberger Induction - Electrical Log

Very truly yours,

PHILLIPS PETROLEUM COMPANY

W. M. Schul
Division Superintendent

CCK/L

Attach.

It's Performance That Counts
FLITE FUEL — TROP-ARTIC

PHILLIPS PETROLEUM COMPANY

1200 Denver Club Building
Denver 2, Colorado

November 26, 1957

Mr. Cleon B. Feight, Secretary
Utah Oil & Gas Conservation Commission
State Capitol Building
Salt Lake City, Utah

Dear Mr. Feight:

Enclosed herewith you will find two copies of PGAC Radiation log run on Phillips Petroleum Company - Aztec Oil & Gas Company Desert "A" #3, San Juan County, Utah.

Very truly yours,

PHILLIPS PETROLEUM COMPANY

W. M. Schul
Division Superintendent

CCK/L

Attachment

It's Performance That Counts
FLITE FUEL — TROP-ARTIC

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R-359.3.
Approval expires 12-31-55.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal

Lease No. 14-20-603-353

Notify CA 12/13

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	X
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 REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING 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)

Denver, Colorado December 5, 19 57

Well No. Desert "A" 3 is located 660 ft. from {N} line and 1882 ft. from {W} line of sec. 18

NE/4 NW/4 Sec. 18 (¼ Sec. and Sec. No.) 41 South (Twp.) 24 East (Range) S.L.M. (Meridian)

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

The elevation of the derrick floor above sea level is 5111 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)

Drilled to 6085'. Ran 5½ OD 14# and 15.5# casing set at 6084'. Cemented with 610 cu.ft. cement, 40% Diacel "D", consisting of 146 sacks neat plus 110 sacks Diacel "D", plus 548# calcium chloride. Pumped plug to 6049'. Job completed at 1:30 a.m. 11-21-57. WOC 24 hours, tested casing with 500# for 30 minutes, held OK.

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

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By W. M. Schul

Title Division Superintendent

U. S. GOVERNMENT PRINTING OFFICE 16—84376-7

W

Form 9-330

get Bureau No. 42-R355.4.
Approval expires 12-31-60.

U. S. LAND OFFICE Navajo
SERIAL NUMBER 14-20-603-353
LEASE OR PERMIT TO PROSPECT

H
1-27-58

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

LOCATE WELL CORRECTLY

Company Phillips Petroleum Company - Aztec Oil & Gas Company Address 1200 Denver Club Building Denver 2, Colorado

Lessor or Tract Tribal Desert "A" Field Ratherford State Utah

Well No. 3 Sec. 18 T. 41S R. 24E Meridian S.L.M. County San Juan

Location 660 ft. {N. / S.} of N Line and 1882 ft. {E. / W.} of E Line of Sec. 18 Elevation 5111 (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 [signature]

Date January 23, 1958 Title Division Superintendent

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

Commenced drilling October 23, 19 57 Finished drilling November 26, 19 57

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 5885 to 6048 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 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 From—	Perforated To—	Purpose
13-3/8"	27.1#	SJ	Armco	160'	Halliburton				
8-5/8"	24#	8R	J-55	1520'	"				
5-1/2"	15.5#	8R	J-55				5885-94, 5908-19, 5982-89,		
5-1/2"	14#	8R	J-55	6085'	"		6004-22, 6029-37 and		
							6040-48		Oil Production

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
13-3/8"	175'	175	Halliburton		
8-5/8"	1875'	935 cu. ft.	"		
5-1/2"	6084'	610 cu. ft.	"		

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 6084 feet, and from ..... feet to ..... feet

Cable tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

DATES

January 23, 19 58 Put to producing November 26, 19 57

The production for the first 13 hours was 544 barrels of fluid of which 100 % 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

....., Driller ....., Driller

....., Driller ....., Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	1410	1410	Sand & shale
1410	1890	480	Wingate
1890	2700	810	Chinle
2700	2760	60	Shinarump
2760	2920	160	Moenkopi
2920	3000	80	Cutler
3000	3150	150	De Chelly
3150	4390	1240	Organ Rock
4390	4895	505	Rico
4895	5865	970	Upper Hermosa
5865	6084	219	Paradox

W

16—43094-4

16—43094-2 U. S. GOVERNMENT PRINTING OFFICE

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Spudded 5:00 a.m. 10-23-57. Drilled to 191', reamed hole to 17-1/4" to 179', ran 13-3/8" Armco SW SJ 27.1# casing set at 175' RKB and cemented with 175 sacks regular Portelnd cement, circulated 35 sacks. Job complete 6:10 p.m. 10-24-57. WOC 24 hours, tested casing with 500# for 30 minutes, held OK. Drilled 12-1/4" hole to 1879', ran 8-5/8" OD 24# SR ST&C J-55 casing set at 1878' RKB and cemented with 935 cu.ft. Neat cement, 20% Diacel "D". Pumped plug to 1843', job complete 9:00 a.m. 10-29-57. WOC 24 hours. Tested casing and BOP with 750# for 30 minutes, held OK. Drilled plug and tested again with 750# for 30 minutes, held OK. Drilled to 6085', ran 5-1/2" OD 14# and 15.5# J-55 casing set at 6084'. Cemented with 610 cu.ft. cement, 40% Diacel "D", consisting of 146 sacks neat plus 110 sacks Diacel "D", plus 548# calcium chloride. Pumped plug to 6049'. Job complete at 1:30 a.m. 11-21-57. WOC 24 hours, tested casing with 500# for 30 minutes, held OK. Ran logs. Displaced water with oil, drilled plug to 6054'. Perforated casing with 4 jet shots per foot 6049-48, 6028-27, 6004-22, 5982-89, 5908-19, 5885-94. Ran tubing, intake set 5979, packer set 5870. Acidized with 500 gallons mud acid and 950 gallons regular acid. Displaced acid and 42 bbls oil flush, maximum pressure 1600#, minimum 1300#, injection average rate 4.5 BPM. Swabbed well to 3500', kicked off and flowed to pits to clean up. Switched to tank at 3:25 p.m. 11-26-57. Flowed 544 barrels oil in 13 hours on 18/64" choke, grind out 2/10%, flowing pressure 400#. Shut in for tank room.

PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

November 30, 1964

Ratherford Unit, San Juan County,
Utah - Pressure Maintenance -
Expansion of Injection Program

Utah Oil & Gas Conservation Commission
310 Newhouse Building
Salt Lake City, Utah

Attention Mr. Cleon B. Feight

Gentlemen:

The Oil and Gas Conservation Commission of the State of Utah by its order entered in Cause 63 dated September 13, 1961, approved Phillips Petroleum Company's application for approval of a pressure maintenance program for the Ratherford Unit. Subsequent approvals have been given for modifications in the injection program as originally submitted, the last such approval was granted on April 13, 1964, relative to Phillips' submittal of April 2, 1964.

Pursuant to Item 3 of the Commission's letter of September 13, 1961, Phillips Petroleum Company respectfully requests that the Commission, or its designated representative, approve the following changes in the pressure maintenance program:

1. Convert to injection service wells Nos. 7-21, 7-43, 12-44, 18-21, 20-21, 29-41, 21-23, 16-41, and 15-41. (See attached plat.)

2. Attempt to inject 52,000 to 56,000 barrels of water per day to replace about 120% of reservoir voidage on a current basis.

All work for which you have given prior approval has been completed. Nevertheless, existing injection wells will not accept a sufficient volume of water to permit realization of the goal outlined above in Item 2. For this reason, conversion of additional wells to injection service is proposed. No need for other modification of the pressure maintenance program is indicated at this time.

A majority of the Working Interest Owners in the Ratherford Unit have approved this proposal. Your approval is solicited.

Respectfully submitted,

Earl Griffin, Manager
Production Division

JEC:emm
Attach.

December 8, 1964

Phillips Petroleum Company
Bartlesville,
Oklahoma

Attention: Mr. Earl Griffin, Manager Prod. Division

Dear Sir:

The following changes in your pressure maintenance program for the Ratherford Field are hereby approved as per your request.

1. Convert to injection service wells nos.7-21, 7-43, 12-44, 18-21, 20-21, 29-41, 21-23, 16-41, and 15-41.

2. Attempt to inject 52,000 to 56,000 barrels of water per day to replace about 120% of reservoir voidage on a current basis.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT
EXECUTIVE DIRECTOR

cbf;kgw

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Co.

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: Box 1150, Cortez, Colorado 81321

9. WELL NO.: 18-21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' from North line, 1882' from West Line NE NW Sec. 18

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 18-41S-24E SLM

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5111 DF

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			[ ]
(Other) Convert to Water Injection			[X]				

(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.) *

Pull pumping equipment, rerun tubing with Marlex liner, acidize perforations 5885-94', 5908-19', 5982-89', 6004-22', 6028-37', 6040-48' with approximately 3000 gallons acid and convert to water injection.

Present Production 12-9-64: 55 BOPD, 66 MCFGPD, 0 BWPD.

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

SIGNED C. M. Holes TITLE Area Superintendent DATE 1-11-65

(This space for Federal or State office use)

APPROVED BY _____ TITLE [signature] DATE 1-14-65

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL ☐ GAS WELL ☐ OTHER Water Injection Well

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: Drawer 1150, Cortez, Colorado 81321

9. WELL NO.: 18W21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' from North line, 1882' from West line
NE NW Sec. 18

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 18-41S-24E SLM

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5111 DF

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Convert to Water Injection			x
(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.)*

5-6-65 through 5-11-65: Pulled rods and tubing, reran tubing with Baker Model "A" Tension packer set at 5858.94' RKB. Hooked well up for water injection. Started injecting water 5-7-65. Changed well classification from oil well to Water Injection Well and number from 18-21 to 18W21 effective 5-7-65.

PREVIOUS PRODUCTION: 38 BOPD, 45 MCFGPD, 0 BWPD

PRESENT INJECTION RATE: 2150 BWPD on vacuum.
Injecting into Desert Creek zone, Paradox Formation of Greater Aneth Field.

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

SIGNED C. M. Boles TITLE District Superintendent DATE 6-14-65

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo Tribe

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injection Well

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: Drawer 1150, Cortez, Colorado

9. WELL NO.: 18-21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL; 1882' FWL; Sec. 18

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 18-41S-24E S.L.M.

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5111' DF

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☒	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(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.) *

In attempt to increase water injection rate, acidize well with 2000 gallons of 15% regular acid with 2 gallons of A-110 additive per 1000 gallons acid, 100# of J-145, and 2000 gallons of 15% regular acid with 2 gallons of A-110 additive per 1000 gallons of acid.

Present Injection Rate: 2470 BWPD at 225#.

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

SIGNED C. M. Boles TITLE District Superintendent DATE 10-13-65

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

December 15, 1965

Phillips Petroleum Company
Drawer 1150
Cortez, Colorado

Gentlemen:

Upon checking our files we note that we have not received subsequent reports for the following wells:

RATHERFORD UNIT #9W21, Sec. 9, T. 41 S., R. 24 E.	Shoot or Acidize
RATHERFORD UNIT #12-31, Sec. 12, T. 41 S., R. 23 E.	Perforate Lenny & Acidize
RATHERFORD UNIT #18W43, Sec. 18, T. 41 S., R. 24 E.	Shoot or acidize
RATHERFORD UNIT #18W21, Sec. 18, T. 41 S., R. 24 E.	Shoot or acidize
RATHERFORD UNIT #12W44, Sec. 12, T. 41 S., R. 23 E.	Shoot or acidize
RATHERFORD UNIT #21W41, Sec. 21, T. 41 S., R. 24 E.	Shoot or acidize
RATHERFORD UNIT #21W21, Sec. 21, T. 41 S., R. 24 E.	Shoot or acidize

Phillips Petroleum Company
Drawer 1150
Cortez, Colorado

(2)

RATHERFORD UNIT #15W23, Shoot or acidize
Sec. 15, T. 41 S., R. 24 E,

RATHERFORD UNIT #16WA3, Shoot or acidize
Sec. 16, T. 41 S., R. 24 E.

Your attention to this matter will be greatly appreciated.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

ARMENTA R. HANSEN
RECORDS CLERK

arh

Enclosures: OGCC-1b

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL [ ] GAS WELL [ ] OTHER Water Injection Well

2. NAME OF OPERATOR
Phillips Petroleum Company

3. ADDRESS OF OPERATOR
P. O. Drawer 1150, Cortez, Colorado 81321

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' FNL; 1982' FWL; Sec. 18

5. LEASE DESIGNATION AND SERIAL NO.
14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo

7. UNIT AGREEMENT NAME
SW-I-4192

8. FARM OR LEASE NAME
Rutherford Unit

9. WELL NO.
18W2

10. FIELD AND POOL, OR WILDCAT
Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
18-41S-24E S.L.M.

12. COUNTY OR PARISH
San Juan

13. STATE
Utah

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
5111 DF

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(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.)*

On February 24, 1966 acidized water injection well through 2⅞" bare tubing and packer with 2500 gallons 15% acid, 1000 gallons salt plug, followed with 2500 gallons 15% acid. Flushed with 70 barrels fresh water. Hooked back up and started water injection.

Present Injection Rate: 360 BWPD at 2450#.

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

SIGNED C. H. Boles TITLE District Superintendent DATE 3-10-66

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injection Well

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: Drawer 1150, Cortez, Colorado 81321

9. WELL NO.: 18-21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660 FNL 1882 FWL Sec. 18

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 18-41S-24E S.L.M.

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5111 DF

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF		PULL OR ALTER CASING		WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE	X	ABANDON*		SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(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.) *

Acidize with 5000 gallons 15% acid in two stages.

Present Injection Rate: Averaged 596 BWPD at 1494# during February 1969.

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

SIGNED C. M. Boles TITLE District Superintendent DATE 3-27-69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

Orig. & 2 cc: USGS, Farmington, NM
~~2 cc~~: Utah O&GCC, Salt Lake City
1 cc: B'ville
1 cc: Denver
1 cc: File

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injection Well

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: Drawer 1150, Cortez, Colorado 81321

9. WELL NO.: 18W21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface

660' FNL, 1882' FWL, Sec. 18

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 18-41S-24E S.L.M.

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5111' DF

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	X	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(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.) *

On April 17, 1969 acidized Desert Creek Zone I and II perforations 5885-94, 5908-19, 5982-89, 6004-22, 6028-37 and 6040-48' with 5000 gallons 15% acid in two equal 2500 gallon stages separated by 1000 gallons salt plug. Resumed injection.

PREVIOUS INJECTION RATE: 624 BWPD at 1535#.

PRESENT INJECTION RATE: 3500 BWPD on vacuum.

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

SIGNED C. M. Boles TITLE District Superintendent DATE 5-19-69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

Orig. & 2 cc: USGS, Farmington, NM
2cc: Utah O&GCC, Salt Lake City, Utah
[redacted]
1 cc: Denver
1 cc: Superior Oil Co., Cortez, Colo
1 cc: File

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL [ ] GAS WELL [x] OTHER Water Injection Well

2. NAME OF OPERATOR
Phillips Petroleum Company

3. ADDRESS OF OPERATOR
P O Box 2920 Casper, Wyoming 82601

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' FNL; 1882' FWL Sec 18

5. LEASE DESIGNATION AND SERIAL NO.
14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo

7. UNIT AGREEMENT NAME
SW-I-4192

8. FARM OR LEASE NAME
Ratherford Unit

9. WELL NO.
18W21

10. FIELD AND POOL, OR WILDCAT
Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
18-41S-24E SLBM

12. COUNTY OR PARISH
San Juan

13. STATE
Utah

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
5111' DF

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[x]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(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.)*

Acidize with 2500 gals. 15% HCL

Present Injection Rate: 868 BWPD at 1550# during January, 1971

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

SIGNED Original Signed By: J. P. DENNY TITLE Prod. Area Superintendent DATE Feb. 19, 1971

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL [ ] GAS WELL [X] OTHER Water Injection Well

2. NAME OF OPERATOR
Phillips Petroleum Company

3. ADDRESS OF OPERATOR
Box 2920, Casper, Wyoming 82601

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' FNL and 1882' FWL Sec. 18

5. LEASE DESIGNATION AND SERIAL NO.
14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo

7. UNIT AGREEMENT NAME
SW-I-4192

8. FARM OR LEASE NAME
Ratherford Unit

9. WELL NO.
18W21

10. FIELD AND POOL, OR WILDCAT
Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
18-41S-24E SLBM

12. COUNTY OR PARISH
San Juan

13. STATE
Utah

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
5111' RKB

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(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.) *

Dowell acidized with 2500 gals. 15% Regular Acid March 3, 1971.

Injection Rate Before: 868 BWPD at 1550#
Injection Rate After: 3160 BWPD at 75#

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

SIGNED Original Signed By: J. P. DENNY TITLE Prod. Superintendent DATE March 10, 1971

(This space for Federal or State office use)

APPROVED BY J. P. Denny TITLE DATE
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

STATE OF UTAH
DIVISION OF OIL, GAS, AND MINING
ROOM 4241 STATE OFFICE BUILDING
SALT LAKE CITY, UTAH 84114
(801) 533-5771
(RULE I-5 & RULE I-4)

FORM NO. DOGM-UIC-1
(Revised 1982)

IN THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY
ADDRESS P.O. BOX 2920
CASPER, WYOMING ZIP 82602
INDIVIDUAL ___ PARTNERSHIP X CORPORATION ___
FOR ADMINISTRATIVE APPROVAL TO DISPOSE OR INJECT FLUID INTO THE 18W21 WELL
SEC. 18 TWP. 41S RANGE 24E
SAN JUAN COUNTY, UTAH

CAUSE NO. C-3(B)

ENHANCED RECOVERY INJ. WELL	☒
DISPOSAL WELL	☐
LP GAS STORAGE	☐
EXISTING WELL (RULE I-4)	☒

APPLICATION

Comes now the applicant and shows the Corporation Commission the following:
1. That Rule I-5 (g) (iv) authorizes administrative approval of enhanced rcovery injections, disposal or LP Gas storage operations.
2. That the applicant submits the following information.

Lease Name: Ratherford Unit	Well No.: 18W21	Field: Greater Aneth	County: San Juan
Location of Enhanced Recovery Injection or Disposal Well: 18W21	Sec. 18	Twp. 41S	Rge. 24E
New Well To Be Drilled Yes ☐ No ☒	Old Well To Be Converted Yes ☐ No ☒	Casing Test Yes ☒ No ☐ Date 5-83	
Depth-Base Lowest Known Fresh Water Within ½ Mile: Wingate 1550'	Does Injection Zone Contain Oil-Gas-Fresh Water Within ½ Mile YES ☒ NO ☐	State What: Oil & Gas	
Location of Injection Source(s): Desert Creek Paradox I & II, San Juan River	Geologic Name(s) and Depth of Source(s): Desert Creek (5567'), San Juan River (Surface)		
Geologic Name of Injection Zone: Desert Creek I & II	Depth of Injection Interval 5885 to 6048		
a. Top of the Perforated Interval: 5885	b. Base of Fresh Water: 1550'	c. Intervening Thickness (a minus b): 4330	
Is the intervening thickness sufficient to show fresh water will be protected without additional data? YES NO	See Attachment #4		
Lithology of Intervening Zones: See Attachment #1			
Injection Rates and Pressures: SD 8-15-82	Maximum ___ B/D ___ PSI		

The Names and Addresses of Those to Whom Notice of Application Should be Sent.

Navajo Tribe, Minerals Dept., P.O. Box 146, Window Rock, AZ 86515
Superior Oil, P.O. Box 4530, The Woodlands, TX 77380
Texaco Inc., P.O. Box 2100, Denver, CO 80201
Southland Royalty, 1000 Fort Worth Club Tower, Fort Worth, TX 76102

State of Wyoming)
County of Natrona)

PHILLIPS PETROLEUM COMPANY
Applicant

Before me, the undersigned authority, on this day personally appeared A. E. Stuart known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Suscribed and sworn to before me this 21st day of Sept, 19 83

SEAL

DONALD L. HUDSON - Notary Public
County of Natrona
State of Wyoming
My Commission Expires Nov. 3, 1986

Donald L. Hudson

My commission expires Nov. 3, 1986 Notary Public in and for Natrona Co., Wyoming

(OVER)

INSTRUCTIONS

1. Attach qualitative and quantitative analysis of representative sample of water to be injected and a qualitative and quantitive analysis of the injection formation of water.

2. Attach plat showing subject well and all known oil and gas wells, abandoned, drilling and dry holes within one-half mile, together and with the name of the operator(s).

3. Attach Drillers Log (Form DOGM-UIC-2). (Appropriate Surety must be on file with Conservation Division or appropriate government agencies.)

4. Attach Electric or Radioactivity Log of Subject well (if released).

5. Attach schematic drawing of subsurface facilities including; Size, setting depth, amount of cement used measured or calculated tops of cement surface, intermediate (if any) and production casings; size and setting depth of tubing; type and setting depth of packer; geologic name of injection zone showing top and bottom of injection interval.

6. If the application is for a NEW well the original and six (6) copies of the application and three (3) complete sets of attachments shall be mailed to the Division. For EXISTING well applications (Rule I-4) only ONE copy of the application and ONE complete set of attachments are required to be mailed to the Division.

7. The Division is required to send notice of application to he surface owner of the land within one-half mile of the injection well and to each operator of a producing leasehole within one-half mile of the injection well. List all required names and addresses in the appropriate space provided on the front of this form.

8. Notice that an application has been filed shall be published by the Division in a newspaper of general circulation in the county of publication before the application is approved. The notice shall include the name and address of applicant, location of proposed injection or disposal well, injection zone, injection pressure and volume. If no written objection is received within 15 days from date of publication the application may be approved administratively.

9. A well shall not be used for injection or disposal unless completed machine accounting Form DOGM-UIC-3b is filed by January 31st each year.

10. Approval of this application, if granted, is valid only as long as there is no substantial change in the operations set forth in the application. A substantial operation change requires the approval of a new application.

11. If there is less intervening thickness required by Rule I-5 (b) 4, attach sworn evidence and data.

12. For enhanced recovery projects, information required by Rule I-4 which is common to more than one well, need be reported only once on the application.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Surface	13-3/8	175	205	Surface	Returns
Intermediate	8-5/8	1877.63	935 cu ft		
Production	5-1/2	6084	256+	4518	CALCULATED
Tubing	2-7/8	5860	Name - Type - Depth of Tubing Packer: Baker Model A Pkr		5858.94

PB Total Depth	Geologic Name - Inj. Zone	Depth - Top of Inj. Interval	Depth - Base of Inj. Interval
6054	Desert Creek I & II	5885	6048

FORM DOGM-UIC-2
(Rule I-5 (b) 2
(Revised 1982)

PLEASE TYPE OR USE BLACK INK ONLY

(To be filed within 30 days after drilling is completed)

14-20-603- 353
LEASE NO.

DEPARTMENT OF NATURAL RESOURCES AND ENERGY
DIVISION OF OIL, GAS, AND MINING
Room 4241 State Office Building
Salt Lake City, Utah 84114

API NO. 43-037- 16418

640 Acres
N
W E
S
Locate Well Correctly and Outline Lease

COUNTY San Juan SEC. 18 TWP. 41S RGE. 24E
COMPANY OPERATING Phillips Petroleum Company
OFFICE ADDRESS P.O. Box 2920
TOWN Casper STATE ZIP Wyoming 82602
FARM NAME -- WELL NO. 18W21
DRILLING STARTED 10/24 19 57 DRILLING FINISHED 11/16 19 57
DATE OF FIRST PRODUCTION 11/26/57 COMPLETED 11/26/57
WELL LOCATED NE ¼ NW ¼ ¼
660 FT. FROM NL OF ¼ SEC. & 1882 FT. FROM WL OF ¼ SEC.
RKB ELEVATION ~~BERRICK FLOOR~~ 5111 GROUND 5101

TYPE COMPLETION
Single Zone
Multiple Zone x
Comingled

LOCATION EXCEPTION

OIL OR GAS ZONES

Name	From	To	Name	From	To
Desert Creek I	5885	–			
Desert Creek II	–	6048			

CASING & CEMENT

Casing Set				Csg. Test	Cement		
Size	Wgt.	Grade	Feet	Psi	Sax	Fillup	Top
13-3/8	27.1	H-40	161.72	500	205		surface
8-5/8	24	J-55	1520	750	935 cu ft		
5-1/2	14	J-55	6085	1500	610 cu ft.	1573	4518
	15-1/2						

PBTD 6054
TOTAL DEPTH 6085
PACKERS SET DEPTH Baker Model A Pkr @ 5858.94

NOTE: THIS FORM MUST ALSO BE ATTACHED WHEN FILING PLUGGING FORM DOGM-UIC-6

COMPLETION & TEST DATA BY PRODUCING FORMATION

	1	2	3
FORMATION	Desert Creek I+II		
SPACING & SPACING ORDER NO.	40 acre Cause #C-3(B)		
CLASSIFICATION (DISPOSAL WELL, ENHANCED RECOVERY, LP GAS STORAGE)	Enhanced Recovery		
PERFORATED	5884-94	6028-37	
	5908-19	6040-48	
INTERVALS	5982-89		
	6004-22		
ACIDIZED?	3-3-71 2500 gal		
	15% reg. acid		
FRACTURE TREATED?	No		

INITIAL TEST DATA Converted to Injector 5-11-65

Date	5-11-65		
Oil, bbl./day	--		
Oil Gravity	--		
Gas, Cu. Ft./day	-- CF	CF	CF
Gas-Oil Ratio Cu. Ft./Bbl.	--		
Water-Bbl./day	2150		
Pumping or Flowing	flowing		
CHOKE SIZE	---		
FLOW TUBING PRESSURE	vacuum		

A record of the formations drilled through, and pertinent remarks are presented on the reverse. (use reverse side)

I, the undersigned, being first duly sworn upon oath, state that this well record is true, correct and complete according to the records of this office and to the best of my knowledge and belief.

Telephone 307-237-3791 A.E. Stuart, Area Manager
Name and title of representative of company

Subscribed and sworn before me this _____ day of SEP 22 '83 83

Casper

WELL: 18W27

LOCATION: NENW Sec 18 - T41S - R24E

FIELD: GREATER ANETH

RESERVOIR: Desert Creek I+II

I COMPLETION: 5.11.65

PRESENT STATUS: S.I.

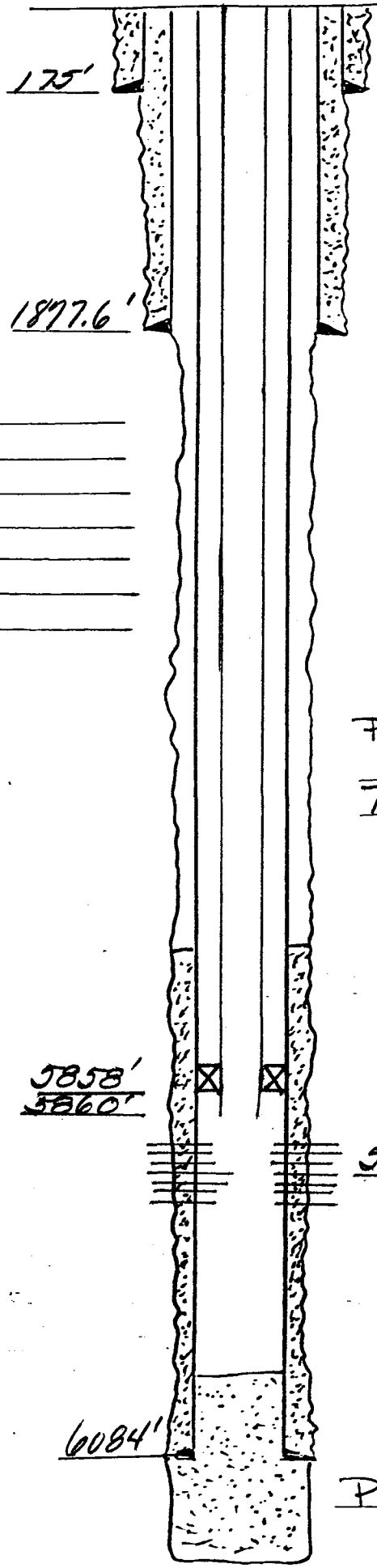
RKB 5111'

GL 5101'

SURFACE CASING: 13 3/8" 27.1# H-40

INTERMEDIATE CASING: 8 5/8" 24# J-55

PRODUCTION CASING: 5 1/2" : 14# J-55, 15.5# J-55



PERFORATIONS:

5884-5894

5908-19

5982-89

6004-22

6028-37

6040-6048

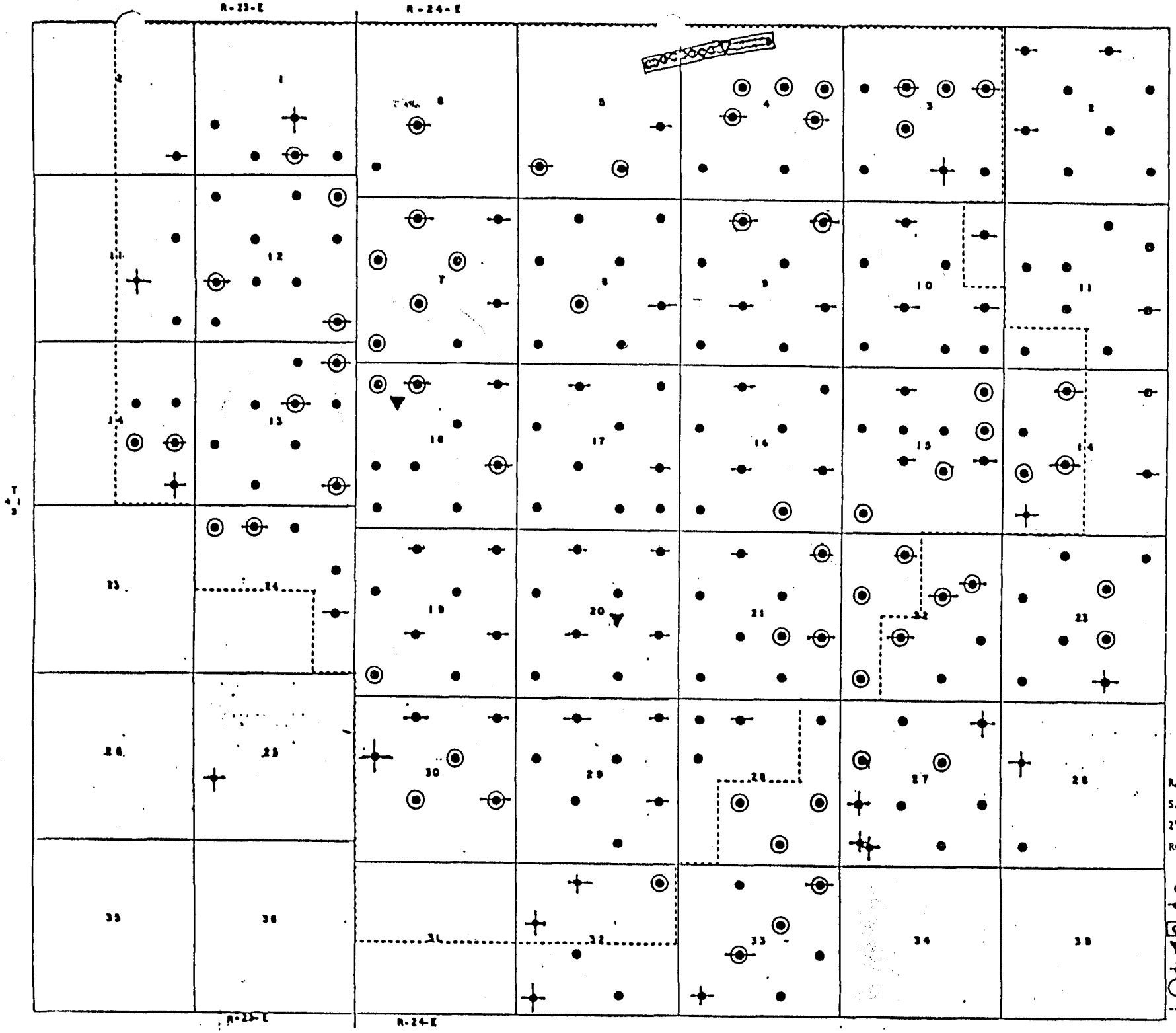
PACKER: Baker model "A" Pkr @ 5858.94'

Tubing: 2 7/8" @ 5860'

PBTD: 6054'

OTD: 6084'

Phillips Petroleum Company


R-23-E
R-24-E
T 41 S
RATHERFORD UNIT
SAN JUAN COUNTY, UTAH
2" = 1 mile
RCT 3-83
oil producer
water injector
water supply
domestic water
plugged & abandoned
shut in well
unit boundry

ATTACHMENT 3a:

Water Injection Well

CL1-12A (REV. 1964)

CHEMICAL & GEOLOGICAL LABORATORIES

P. O. Box 2794
Casper, Wyoming

WATER ANALYSIS REPORT

OPERATOR Phillips Petroleum Co. DATE 5-27-83 LAB NO. W30480
WELL NO. Rutherford Unit LOCATION
FIELD FORMATION
COUNTY San Juan INTERVAL
STATE Utah SAMPLE FROM

REMARKS & CONCLUSIONS:

Specific gravity @68°F	1.0646
Oil and grease, mg/l	2.5
Aluminum (Al), mg/l	0.90
Iron (Fe), mg/l	0.3
Total Sulfides, mg/l	ND(0.1)

Cations	mg/l	meq/l	Anions	mg/l	meq/l
Sodium	24574	1068.99	Sulfate	1190	24.75
Potassium	396	10.14	Chloride	52000	1466.40
Lithium	-	-	Carbonate	0	0.00
Calcium	5982	298.50	Bicarbonate	190	3.12
Magnesium	1419	116.64	Hydroxide	-	-
Iron	-	-	Hydrogen sulfide	-	-
Total Cations		1494.27	Total Anions		1494.27

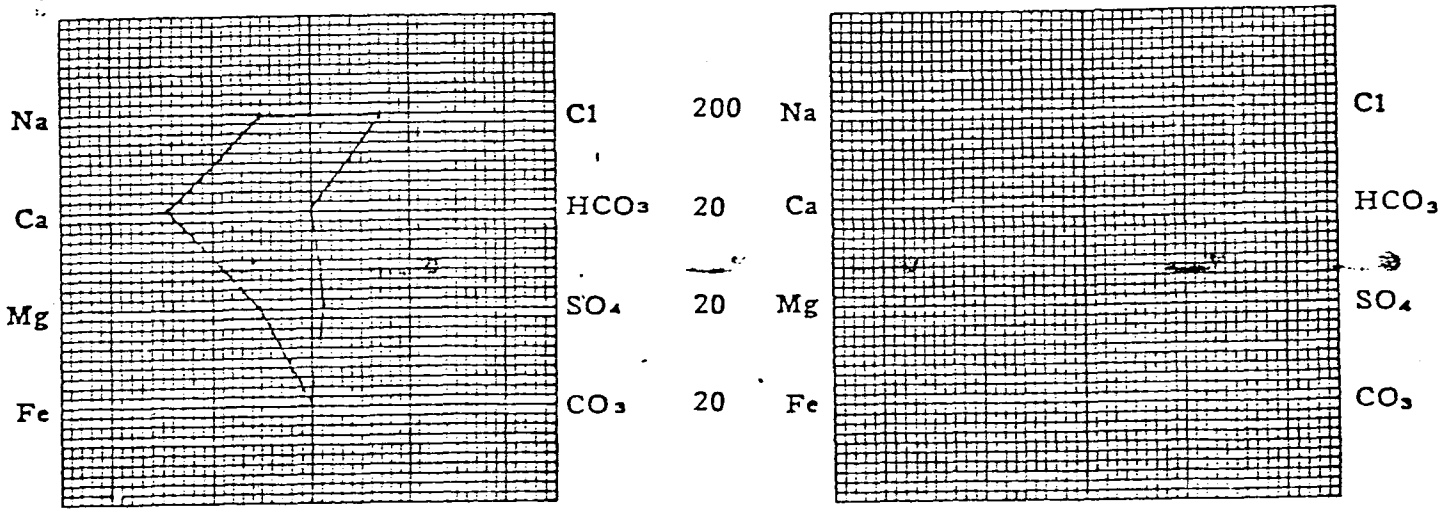
Total dissolved solids, mg/l 85655
NaCl equivalent, mg/l 86344
Observed pH 7.4

Specific resistance @ 68°F.:
Observed 0.095 ohm-meters
Calculated 0.086 ohm-meters

WATER ANALYSIS PATTERN

Sample above described

Scale
MEQ per Unit



(Na value in above graphs includes Na, K, and Li)
NOTE: Mg/l = Milligrams per liter Meq/l = Milligram equivalents per liter
Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

ATTACHMENT 3b:

Formation Water

CL1-12A (REV. 1964).

CHEMICAL & GEOLOGICAL LABORATORIES

P. O. Box 2794
Casper, Wyoming

WATER ANALYSIS REPORT

OPERATOR Phillips Petroleum Company
WELL NO. Ratherford Unit
FIELD
COUNTY San Juan
STATE Utah

DATE 7-22-83 LAB NO. W30636
LOCATION
FORMATION
INTERVAL
SAMPLE FROM Battery #1 Free water knockout (7-5-83) @ 10:35 S/N 28568

REMARKS & CONCLUSIONS:

Cations	mg/1	meq/1
Sodium	30147	1311.38
Potassium	429	10.98
Lithium	--	--
Calcium	6865	342.56
Magnesium	1738	124.86
Iron	--	--
Total Cations		1807.78

Anions	mg/1	meq/1
Sulfate	1380	28.70
Chloride	63000	1776.60
Carbonate	0	0.00
Bicarbonate	151	2.48
Hydroxide	--	--
Hydrogen sulfide	--	--
Total Anions		1807.78

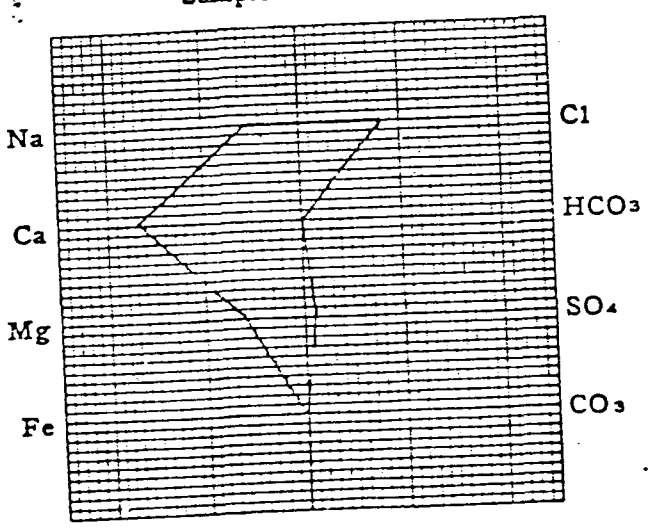
Total dissolved solids, mg/1	103633
NaCl equivalent, mg/1	104549
Observed pH	7.3

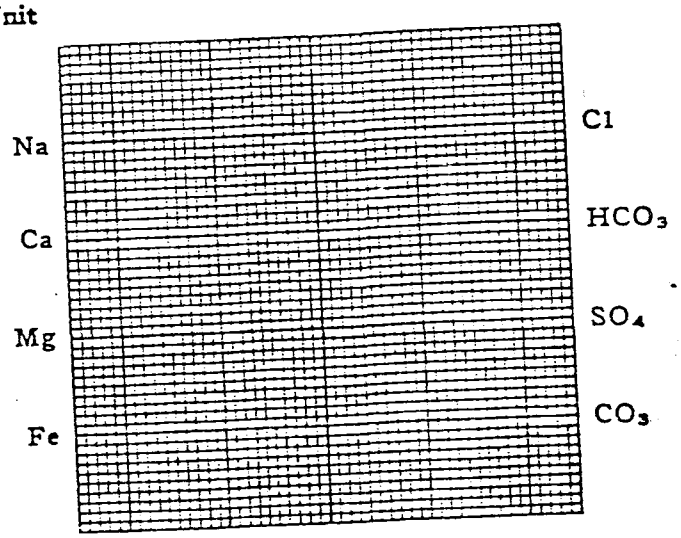
Specific resistance @ 68°F.:
Observed 0.087 ohm-meters
Calculated 0.078 ohm-meters

WATER ANALYSIS PATTERN

Sample above described

Scale
MEQ per Unit





(Na value in above graphs includes Na, K, and Li)
NOTE: Mg/1 = Milligrams per liter Meq/1 = Milligram equivalents per liter
Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

CHECKLIST FOR INJECTION WELL APPLICATION AND FILE REVIEW

Operator: Phillips Well No. Rathbone Unit 18W21

County: San Juan T 41S R 24E Sec. 18 API# 43-037-16418

New Well ___ Conversion ___ Disposal Well ___ Enhanced Recovery Well X

	YES	NO
UIC Forms Completed	✓	
Plat including Surface Owners, Leaseholders, and wells of available record	✓	
Schematic Diagram	✓	
Fracture Information		
Pressure and Rate Control	✓	
Adequate Geologic Information	✓	
Fluid Source	Desert Creek	
Analysis of Injection Fluid	Yes ✓	No ___ TDS 85655
Analysis of Water in Formation to be injected into	Yes ✓	No ___ TDS 103633
Known USDW in area	Wingate	Depth 1550
Number of wells in area of review	9	Prod. 6 P&A 0
		Water 1 Inj. 2
Aquifer Exemption	Yes ___	NA ✓
Mechanical Integrity Test	Yes ___	No ✓
	Date ___	Type ___

Comments: TOC 4578

Reviewed by: [signature]

UTAH DIVISION OF OIL, GAS AND MINING
CASING-BRADENHEAD TEST

OPERATOR: Phillips Petroleum

FIELD: Greater Aneth LEASE: Rutherford

WELL # 18W21 SEC. 18 TOWNSHIP 41S RANGE 24E

STATE (FED.) FEE DEPTH 6054 TYPE WELL INJW MAX. INJ. PRESS.

ST 8-15-82

TEST DATE 6/17/86

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE	13 3/8	175	205		SI	
INTERMEDIATE	8 5/8	1877	935			
PRODUCTION	5 1/2	6084	256			
TUBING	2 7/8	5860		Baker	Packer	

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE						
INTERMEDIATE						
PRODUCTION						
TUBING						

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE						
INTERMEDIATE						
PRODUCTION						
TUBING						

(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

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 "APPLICATION FOR PERMIT—" for such proposals.)

RECEIVED
JUN 10 1985
DIVISION OF OIL GAS & MINING

1. OIL WELL ☐ GAS WELL ☐ OTHER Water Injection Well
2. NAME OF OPERATOR: Phillips Oil Company
3. ADDRESS OF OPERATOR: P.O. Box 2920, Casper, WY 82602
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL, 1882' FEL, NENW
5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo
7. UNIT AGREEMENT NAME: SW-I-4192
8. FARM OR LEASE NAME: Ratherford Unit
9. WELL NO.: 18W21
10. FIELD AND POOL, OR WILDCAT: Greater Aneth
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 18-T41S-R24E
12. COUNTY OR PARISH: San Juan
13. STATE: Utah
14. PERMIT NO.: 43-037-16418
15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5113' RKB

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF		PULL OR ALTER CASING		WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE	X	ABANDON*		SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(Other)			
(Other) Plug back to Zone 1				(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.)*

It is proposed to convert Ratherford Unit #18W21 from Zone 1 & 2 to Zone 1 Water Injection. After plugging back to Zone 1, the well will be acidized with 5300 gallons of 28% HCL and returned to injection.

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 6/12/85
BY: [illegible]

A 10' x 8' x 6' fenced pit will be constructed on location in a previously disturbed area. Upon completion of the workover, the pit will be dried and recovered.

5-BLM, Farmington, NM
2-Utah O&G CC, Salt Lake City, Utah
1-P. J. Adamson
1-B. Conner, 318B-TRW
1-J. R. Weichbrodt
1-C. M. Anderson
1-File RC

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

SIGNED A. E. Stuart TITLE Area Manager DATE June 3, 1985

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Mobil Oil Corporation

P.O. BOX 5444
DENVER, COLORADO 80217-5444

May 14, 1986

RECEIVED
MAY 16 1986
DIVISION OF
OIL, GAS & MINING

Utah Board of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Attn: R. J. Firth
Associate Director

SUPERIOR OIL COMPANY MERGER

Dear Mr. Firth:
On September 20, 1984, The Superior Oil Company (Superior) became a wholly owned subsidiary of Mobil Corporation. Since January 1, 1985, Mobil Oil Corporation (MOC), another wholly owned subsidiary of Mobil Corporation, has acted as agent for Superior and has operated the Superior-owned properties.

On April 24, 1986, Superior was merged with Mobil Exploration and Producing North America Inc. (MEPNA), which is also a wholly owned subsidiary of Mobil Corporation. MEPNA is the surviving company of the merger.

This letter is to advise you that all properties held in the name of Superior will now be held in the name of MEPNA; and that these properties will continue to be operated by MOC as agent for MEPNA.

Attached is a listing of all wells and a separate listing of injection-disposal wells, Designation of Agent and an organization chart illustrating the relationships of the various companies. If you have any questions or require additional documentation of this merger, please feel free to contact me at the above address or (303) 298-2577.

Very truly yours,

R. D. Baker
Environmental Regulatory Manager

CNE/rd
CNE8661

orm 3160-5
(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injector

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: P. O. Box 2920, Casper, Wyoming 82602

9. WELL NO.: 18W21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL & 1882' FWL, NE NW

API #43-037-16418

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 18-T41S-R24E

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): RKB 5113'

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Plugback to Zone I			X
(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.)* April 4, 1986 through April 24, 1986 -

OLD PBTD 6084, NEW PBTD 5945.
MI WS Unit 4/4/86 to Sqz Zone II 6004-6022' & Zone III 6028-6048' OA and Acidize Zone I 5885-5989' OA. Run bit & scraper, tag fill at 6037', cleaned out to 6051'. Set pkr at 5955'. Check for communication between perfs, had communication. Set pkr at 5860'. Sqzd Zones I, II & III w/200 sx Class "B" Neat Cmt. Tested sqz, unsuccessful. Drld out cmt to 6050'. Set pkr at 5833'. Re-sqzd Zones I, II & III w/200 sx Class "B" Cmt. Cleaned out to New PBTD 5945'. Perforated Zone I 5882-5894' & 5908-5928', 4 SPF, total 128 holes. Acidized Zone I w/4800 gal 28% HCL in 3 stages. After 1st stage, pumped 1000 gal salt saturated formation wtr. After 2nd stage, pumped 1000 gal spacer. After 3rd stage, pumped over-flush of 2100 gal. Acid contained 4 gal/1000 W52.1 non-emulsifier, 2 gal/1000 A250 inhibitor, 4 gal/1000 F78 silt suspender and 6 gal/1000 U42 FE sequestering agent. Set 187 jts 2-7/8" tbg at 5832'. Released Rig 4/18/86. Hooked-up to Injection 4/24/86.

Injection Before (Zones I, II & III) - Shut-in 11/1/84.
Injection After (Zone I) - 24 BWPD at 1250 psi.

RECEIVED
JUL 17 1986
DIVISION OF
OIL, GAS & MINING

4-BLM, Farmington, NM
2-Utah O&G CC, SLC, UT
1-M. Williams. B'Ville
1-J. Landrum, Denver
1-J. Reno, Cortez
1-Chieftain
1-Mobil Oil
1-Texaco, Inc.
1-Chevron USA
1-File RC

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

SIGNED D. C. Gill TITLE Area Manager DATE July 15, 1986

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

DOWNHOLE SCHEMATIC

Date: 8/6/87

Rutherford Unit # 18W21

RKB Elev. 5113'

GL Elev. 5102'

RKB Above GL' 11'

Location NE NW sec. 18 T41S - R24E

Well Drld 11/26/57

Well Converted to injector 5/7/65

Conductor Csg 13 3/8 @ 175'

Surface Csg. 8 5/8 @ 1875'

TOC 5150' CALC.

Tubing 2 7/8 @ 5832' Duoline HT2

Packer Baker Lock-set PKR @ 5832

Perfs 5,882 - 94
5,908 - 28

PBTD 5,945'

Production Csg. 5 1/2 @ 6084'

All Perfs Zone I unless noted

Form 3160-5
(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
SW-I-4192

1. OIL WELL ☐ GAS WELL ☐ OTHER WATER INJECTION & WATER SUPPLY WELLS

7. UNIT AGREEMENT NAME
RATHERFORD UNIT #7960041920

2. NAME OF OPERATOR
PHILLIPS PETROLEUM COMPANY

8. FARM OR LEASE NAME

3. ADDRESS OF OPERATOR
152 N. DURBIN, 2ND FLOOR, CASPER, WYOMING 82601

9. WELL NO.
VARIOUS (see attached)

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
SEE ATTACHED

RECEIVED
MAR 20 1989
DIVISION OF OIL, GAS & MINING

10. FIELD AND POOL, OR WILDCAT
GREATER ANETH

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sections 1 thru 30
T41S - R23E & 24E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) CHANGE OF OWNERSHIP			XX
(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.)*

This is to advise all Water Injection and Water Supply Wells on the Ratherford Unit, listed on the attached sheet, were sold to Phillips Petroleum Company, effective August 1, 1985.

(former Operator - Phillips Oil Company)

3 - BLM, Farmington, NM
2 - ~~Utah~~ O&G CC, SLC, UT
1 - File

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

SIGNED S. H. Oden — TITLE District Superintendent — DATE March 17, 1989

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Form 3160-5
(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-01
Expires August 31, 1985

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 "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

1. OIL WELL ☐ GAS WELL ☐ OTHER Water Injection

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: P. O. Box 1150, Cortez, CO 81321

9. WELL NO.: #18W21

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL & 1882' FWL (NE NW)

RECEIVED MAY 01 1989 DIVISION OF OIL, GAS & MINING

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 18-T41S-R24E

14. PERMIT NO.: 43-037-16418

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 5113' RKB

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	X	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(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.)*

November 15, 1988 thru November 23, 1988

MI, RU Well Service unit 11/15/88. Release packer & POOH. Clean out w/bit & scraper to 5943' (PBTD). POOH. Run casing integrity log. RIH w/packer, set at 5848'. Acidize w/3500 gal. 28% HCl gelled acid. POOH. RIH w/injection packer & lined tubing. Set packer at 5635'. Tested annulus to 1000 psi for 15 min. Dropped 40 psi. Tested OK. Return well to injection. Release rig 11/23/88.

Injection Before: 22 BWPD @ 2350 psi
Injection After: 43 BWPD @ 2300 psi

5-BLM, Farmington, NM
2-Utah O&G, CC
1-M. Williams, Bartlesville
1-S. H. Oden, Casper
1-Chieftain
1-Mobil Oil
1-Texaco, Inc.
1-Chevron, USA
1-Cortez Office - RC

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

SIGNED M. L. Menghini TITLE DIST. SUPT. DATE 4/27/89

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

***See Instructions on Reverse Side**

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

NOV 15 1990

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: Navajo Tribal
7. If Unit or CA, Agreement Designation: SW-I-4192 Ratherford Unit
8. Well Name and No.: Ratherford Unit #18W21
9. API Well No.: 43-037-16418
10. Field and Pool, or Exploratory Area: Greater Aneth
11. County or Parish, State: San Juan County, Utah

1. Type of Well: ☐ Oil Well ☐ Gas Well ☒ Other Injector
2. Name of Operator: Phillips Petroleum Company
3. Address and Telephone No.: P. O. Box 1150, Cortez, CO 81321 (303) 565-3426
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL & 1882' FWL, NE NW, Sec. 18-T41S-R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
☐ Notice of Intent	☐ Abandonment	☐ Change of Plans
	☐ Recompletion	☐ New Construction
☒ Subsequent Report	☐ Plugging Back	☐ Non-Routine Fracturing
	☒ Casing Repair	☐ Water Shut-Off
☐ Final Abandonment Notice	☐ Altering Casing	☐ Conversion to Injection
	☐ Other _____	☐ Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

October 17, 1990 Through October 29, 1990

MI & RU well service 10/17/90. ND WH, NU BOP. Rel pkr & COOH w/Rice Duolined tbg. GIH w/bit & scraper & cleaned out well to PBTD 5945'. Ran new Baker Lok-set pkr & same inj tbg. Performed pressure test, failed. Determined csg leak. GIH w/5-1/2" RBP & pkr. Set RBP at 5590' & isolated leak between 3793-3854'. Set pkr at 3728'. Squeezed csg leak with a balanced 25 sx Class G w/2% calcium chloride plug. GIH w/blade bit & csg scraper & drld out hard cmt from 3633' to 3888'. COOH w/bit & scraper. TIH w/ retrieving tool & engaged RBP. COOH & LD workstring & RBP. Tested csg to 1000 psi, OK. GIH w/5-1/2" Baker Lok-set pkr w/on-off tool & 2-7/8" Rice lined inj tbg, changing barrier rings & drifting & pressure testing tbg. Set pkr at 5636'. Pressure tested annulus to 1000 psi. Circ inhibitor fluid (120 bbls wtr w/25 gals Wellchem WA-840). ND BOP, NU WH. Pressure tested annulus to 1020 psi for 45 min for UIC test. OK. RD & MO WSU & returned well to injection 10/29/90.

Injection Rate Prior to Work - 47 BWPD @ 2450 psi
Injection Rate After Work - 72 BWPD @ 2425 psi

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

Signed S. H. Oden S. H. Oden Title District Superintendent Date November 12, 1990

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: Navajo Tribal
7. If Unit or CA, Agreement Designation: Ratherford Unit SW-I-4192
8. Well Name and No.: Ratherford Unit #18W21
9. API Well No.: 43-037-16418
10. Field and Pool, or Exploratory Area: Greater Aneth
11. County or Parish, State: San Juan, Utah

1. Type of Well: ☐ Oil Well ☐ Gas Well ☒ Other Injection
2. Name of Operator: Phillips Petroleum Company
3. Address and Telephone No.: 5525 Hwy 64 NBU 3004, Farmington, NM 87401 (505) 599-3412
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): Unit C, 660' FNL & 1882' FWL, Sec. 18, T41S, R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
☐ Notice of Intent	☐ Abandonment	☐ Change of Plans
☐ Subsequent Report	☐ Recompletion	☐ New Construction
☐ Final Abandonment Notice	☐ Plugging Back	☐ Non-Routine Fracturing
	☐ Casing Repair	☐ Water Shut-Off
	☐ Altering Casing	☐ Conversion to Injection
	☐ Other _____	☐ Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

12-11-91 thru 12-12-91
MI & RU Halliburton and acidized w/5000 gals. of 20% HCl w/120,000 ft^3 of nitrogen. Flowed back well and returned well to injection.

RECEIVED
JAN 17 1992
DIVISION OF
OIL, GAS & MINING

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

Signed L. E. Robinson Title Sr. Drlg. & Prod. Engr. Date 1-9-92

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

FORM 10

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

MONTHLY OIL AND GAS PRODUCTION REPORT

RECEIVED
AUG 16 1993
DIVISION OF
OIL, GAS & MINING

OPERATOR NAME AND ADDRESS:

P J KONKEL
PHILLIPS PETROLEUM COMPANY
5525 HWY 64 NBU 3004
FARMINGTON NM 87401

UTAH ACCOUNT NUMBER: N0772

REPORT PERIOD (MONTH/YEAR): 6 / 93

AMENDED REPORT ☐ (Highlight Changes)

Well Name API Number	Entity	Location	Producing Zone	Well Status	Days Oper	Production Volumes OIL(BBL)	GAS(MCF)	WATER(BBL)
#21-23 4303713754	06280	41S 24E 21	DSCR	POW	29	1374	883	58
#3-44 4303715031	06280	41S 24E 3	DSCR	POW	30	111	94	2905
#3-14 4303715124	06280	41S 24E 3	DSCR	POW	30	67	23	302
#9-12 4303715126	06280	41S 24E 9	DSCR	POW	30	112	654	17363
#9-14 4303715127	06280	41S 24E 9	DSCR	POW	30	201	315	423
#28-12 4303715336	06280	41S 24E 28	PRDX	POW	29	112	47	2428
#29-12 4303715337	06280	41S 24E 29	PRDX	POW	29	56	0	672
#29-32 4303715339	06280	41S 24E 29	DSCR	POW	29	1402	287	2224
#29-34 4303715340	06280	41S 24E 29	DSCR	POW	29	757	48	0
#30-32 4303715342	06280	41S 24E 30	DSCR	POW	29	588	1049	3744
#3-12 4303715620	06280	41S 24E 3	DSCR	POW	30	268	11	363
#9-34 4303715711	06280	41S 24E 9	DSCR	POW	30	45	46	9800
#10-12 4303715712	06280	41S 24E 10	DSCR	POW	30	45	23	1088
					TOTALS	5138	3480	41370

USWA 8-18-93

COMMENTS: Effective July 1, 1993, Phillips Petroleum Company has sold its interest in the Ratherford Unit to Mobil Exploration and Producing U.S., Incorporated, P. O. Box 633, Midland, Texas 79702. Mobil assumed operations on July 1, 1993.

I hereby certify that this report is true and complete to the best of my knowledge. Date: 8/11/93

Name and Signature: PAT KONKEL Pat Konkel Telephone Number: 505 599-3452

(6/93)

FORM 11

STATE OF UTAH
/ISION OF OIL, GAS AND MINING

MONTHLY OIL AND GAS DISPOSITION REPORT

OPERATOR NAME AND ADDRESS:

L.B. Sheffield
~~BRIAN BERRY~~
~~M E P N A~~ MOBIL
~~POB 219031 1807A RENTWR~~ P.O. DRAWER G
DALLAS TX 75221-9031 CORTEZ, Co. 81321

UTAH ACCOUNT NUMBER: N7370

REPORT PERIOD (MONTH/YEAR): 7 / 93

AMENDED REPORT ☐ **(Highlight Changes)**

*931006 updated. fc

ENTITY NUMBER	PRODUCT	GRAVITY BTU	BEGINNING INVENTORY	VOLUME PRODUCED	DISPOSITIONS TRANSPORTED	USED ON SITE	FLARED/VENTED	OTHER	ENDING INVENTORY
05980	OIL			177609	177609	0			
	GAS			72101	66216	5885			
11174	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	TOTALS			249710	243825	5885			

RECEIVED
SEP 13 1993
DIVISION OF
OIL, GAS & MINING

COMMENTS: Please note address change. Mobil ~~ASSU~~ Production Reports will be compiled and sent from the Cortez, Co. office in the future.

I hereby certify that this report is true and complete to the best of my knowledge.

Date: 9/5/93

Name and Signature: Lowell B Sheffield

Telephone Number: 303 565 2212 ~~214 658 2528~~

(6/93)

FORM=NR0003.FRM 07/2

FORM 9

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION & SERIAL NO.

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 "APPLICATION FOR PERMIT—" for such proposals.)

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO TRIBAL

1. OIL WELL ☐ GAS WELL ☐ OTHER

7. UNIT AGREEMENT NAME: RATHERFORD UNIT

2. NAME OF OPERATOR: MOBIL OIL CORPORATION

8. FARM OR LEASE NAME

3. ADDRESS OF OPERATOR: P. O. BOX 633 MIDLAND, TX 79702

9. WELL NO.

RECEIVED SEP 13 1993

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.)
At surface
At proposed prod. zone

DIVISION OF OIL, GAS & MINING

10. FIELD AND POOL, OR WILDCAT: GREATER ANETH

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA

14. API NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

12. COUNTY: SAN JUAN

13. STATE: UTAH

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) CHANGE OF OPERATOR			
(Other)				(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

APPROX. DATE WORK WILL START _____

DATE OF COMPLETION _____

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.)

* Must be accompanied by a cement verification report.

AS OF JULY1, 1993, MOBIL OIL CORPORATION IS THE OPERATOR OF THE RATHERFORD UNIT. ATTACHED ARE THE INDIVIDUAL WELLS.

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

SIGNED Shirley Todd TITLE ENV. & REG TECHNICIAN DATE 9-8-93

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

See Instructions On Reverse Side

(3/89)

Sept 29, 1993

TO: Lisha Cordova - Utah Mining Oil & Gas

FROM: Janice Easley
BLM Farmington, NM
505 599-6355

Here is copy of Rutherford Unit Successor Operator.

4 pages including this one.

Ratherford Unit (GC)

RECEIVED
BLM
27 AM 11:44
070 FARMINGTON, NM

Navajo Area Office
P. O. Box 1060
Gallup, New Mexico 87305-1060

ARES/543

JUL 2 0 1993

Mr. G. D. Cox
Mobil Exploration and
Producing North America, Inc.
P. O. Box 633
Midland, Texas 79702

Dear Mr. Cox:

Enclosed for your information and use is the approved Designation of Operator between the Phillips Petroleum Company and Mobil Exploration and Producing North America, Inc. for the Ratherford Unit.

Please note that all other concerned parties will be furnished their copy of the approved document.

Sincerely,

ACTING Area Director

Enclosure

cc: Bureau of Land Management, Farmington District Office w/enc.
TNN, Director, Minerals Department w/enc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

RECEIVED
BLM
93 JUN 27 AM 11:44
070 FARMINGTON, NM

DESIGNATION OF OPERATOR

Phillips Petroleum Company is, on the records of the Bureau of Indian Affairs, operator of the Ratherford Unit,

AREA OFFICE: Window Rock, Arizona
LEASE NO: Attached hereto as Exhibit "A"

and, pursuant to the terms of the Ratherford Unit Agreement, is resigning as Unit Operator effective July 1, 1993, and hereby designates

NAME: Mobil Exploration and Producing North America Inc., duly elected pursuant to the terms of the Ratherford Unit Agreement,

ADDRESS: P. O. Box 633, Midland, Texas 79702
Attn: G. D. Cox

as Operator and local agent, with full authority to act on behalf of the Ratherford Unit lessees in complying with the terms of all leases and regulations applicable thereto and on whom the authorized officer may serve written or oral instructions in securing compliance with the Operating Regulations (43 CFR 3160 and 25 CFR 211 and 212) with respect to (described acreage to which this designation is applicable):

Attached hereto as Exhibit "A"

Bond coverage under 25 CFR 211, 212 or 225 for lease activities conducted by the above named designated operator is under Bond Number 05202782 (attach copy). Evidence of bonding is required prior to the commencement of operations.

It is understood that this designation of operator does not relieve any lessee of responsibility for compliance with the terms of the leases and the Operating Regulations. It is also understood that this designation of operator does not constitute an assignment of any interest in the leases.

In case of default on the part of the designated operator, the lessees will make full and prompt compliance with all regulations, lease terms, stipulations, or orders of the Secretary of the Interior or his representative.

Attached is the appropriate documentation relevant to this document.

The designated operator agrees to promptly notify the authorized officer of any change in the operatorship of said Ratherford Unit.

Phillips Petroleum Company

June 17, 1993 By: M. B. [illegible] J.
Attorney-in-Fact

Mobil Exploration and Producing
North America Inc.

June 11, 1993 By: B. D. Martiny
Attorney-in-Fact B.D. MARTINY

[illegible] ACTING AREA DIRECTOR 7/9/93
APPROVED BY TITLE DATE

APPROVED PURSUANT, TO SECRETARIAL REDELEGATION ORDER 209 DM 8 AND 230 DM 3.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

EXHIBIT "A"

ATTACHED TO AND MADE A PART OF DESIGNATION OF SUCCESSOR OPERATOR, RATHERFORD UNIT

EXHIBIT "C"

Revised as of September 29, 1992)
SCHEDULE OF TRACT PERCENTAGE PARTICIPATION

Tract Number	Description of Land	Serial Number and Effective Date of Lease	Tract Percentage Participation
1	S/2 Sec. 1, E/2 SE/4 Sec. 2, E/4 Sec. 11, and all of Sec. 12, T-41-S, R-23-E, S.L.M. San Juan County, Utah	14-20-603-246-A Oct. 5, 1953	11.0652565
2	SE/4 and W/2 SW/4 Sec. 5, the irregular SW/4 Sec. 6, and all of Sec. 7 and 8, T-41-S, R-24-E, San Juan County, Utah	14-20-603-368 Oct. 26, 1953	14.4159942
3	SW/4 of Sec. 4, T-41-S, R-24-E, San Juan County, Utah	14-20-603-5446 Sept. 1, 1959	.5763826
4	SE/4 Sec. 4, and NE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4035 March 3, 1958	1.2587779
5	SW/4 of Sec. 3, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5445 Sept. 3, 1959	.4667669
6	NW/4 of Sec. 9, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5045 Feb. 4, 1959	1.0187043
7	NW/4, W/2 NE/4, and SW/4 Sec. 10, SE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4043 Feb. 18, 1958	3.5097575
8	SW/4 Sec. 9, T-41-S, R-24-E, S.L.M. San Juan County, Utah	14-20-603-5046 Feb. 4, 1959	1.1141679
9	SE/4 Sec. 10 and S/2 SW/4 Sec. 11 T-41-S, R-24-E, San Juan County, Utah	14-20-603-4037 Feb. 14, 1958	2.6186804
10	All of Sec. 13, E/2 Sec. 14, and E/2 SE/4 and N/2 Sec. 24, T-41-S, R-23-E, S.L.M., San Juan County, Utah	14-20-603-247-A Oct. 5, 1953	10.3108861
11	Sections 17, 18, 19 and 20, T-41-S, R-24-E, San Juan County Utah	14-20-603-353 Oct. 27, 1953	27.3389265
12	Sections 15, 16, 21, and NW/4, and W/2 SW/4 Sec. 22, T-41-S, R-24-E, San Juan County, Utah	14-20-603-355 Oct. 27, 1953	14.2819339
13	W/2 Section 14, T-41-S, R-24-E, San Juan County, Utah	14-20-603-370 Oct. 26,1953	1.8500847
14	N/2 and SE/4, and E/2 SW/4 Sec. 29, NE/4 and E/2 SE/4 and E/2 W/2 irregular Sec. 30, and E/2 NE/4 Sec. 32, T-41-S, R-24-E, San Juan County, Utah	14-20-603-407 Dec. 10, 1953	6.9924969
15	NW/4 Sec. 28, T-41-S, R24-E San Juan County, Utah	14-20-603-409 Dec. 10, 1953	.9416393
16	SE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6504 July 11, 1961	.5750254
17	NE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6505 July 11, 1961	.5449292
18	NW/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6506 July 11, 1961	.5482788
19	NE/4 Sec. 4, T-41-S, R24-E San Juan County, Utah	14-20-0603-7171 June 11, 1962	.4720628
20	E/2 NW/4 Sec. 4, T-41-S, R-24-E San Juan County, Utah	14-20-0603-7172 June 11, 1962	.0992482
100% Indian Lands		TOTAL 12,909.74	100.0000000

Division of Oil, Gas and Mining

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

[] Well File _____

(Location) Sec___Twp___Rng___

(API No.) _____

[] Suspense

(Return Date) _____

(To - Initials) _____

XXX Other

OPERATOR CHANGE

1. Date of Phone Call: 10-6-93 Time: 9:30

2. DOGM Employee (name) L. CORDOVA (Initiated Call XXX)

Talked to:

Name GLEN COX (Initiated Call [])

Phone No. (915)688-2114

of (Company/Organization) MOBIL

3. Topic of Conversation: OPERATOR CHANGE FROM PHILLIPS TO MOBIL "RATHERFORD UNIT".

(NEED TO CONFIRM HOW OPERATOR WANTS THE WELLS SET UP - MEPNA AS PER BIA APPROVAL OR MOBIL OIL CORPORATION AS PER SUNDRY DATED 9-8-93?)

4. Highlights of Conversation:

MR. COX CONFIRMED THAT THE WELLS SHOULD BE SET UNDER ACCOUNT N7370/MEPNA AS PER BIA APPROVAL, ALSO CONFIRMED THAT PRODUCTION & DISPOSITION REPORTS WILL NOW BE HANDLED OUT OF THEIR CORTEZ OFFICE RATHER THAN DALLAS.

MEPNA-

PO DRAWER G

CORTEZ, CO 81321

(303)565-2212

*ADDRESS CHANGE AFFECTS ALL WELLS CURRENTLY OPERATORED BY MEPNA, CURRENTLY REPORTED OUT OF DALLAS (MCELMO CREEK).

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

OCT 25 1993

TRANSFER OF AUTHORITY TO INJECT - UIC FORM 5

Well name and number: _____

Field or Unit name: RATHERFORD UNIT API no. _____

Well location: QQ ____ section ___ township ___ range ___ county _____

Effective Date of Transfer: July 1, 1993

CURRENT OPERATOR

Transfer approved by:

Name Ed Hasely Company Phillips Petroleum Company

Signature Ed Hasely Address 5525 HWY. 64

Title Environmental Engineer Farmington, NM 87401

Date October 22, 1993 Phone (505) 599-3460

Comments:

NEW OPERATOR

Transfer approved by:

Name Shirley Todd Company Mobil Exploration & Producing North America

Signature Shirley Todd Address P O Box 633

Title Env. & Reg. Technician Midland, TX 79702

Date October 7, 1993 Phone (915) 688-2585

Comments:

(State use only)
Transfer approved by [signature] Title UIC Manager

Approval Date 10-27-93

Lisha Cordova (801) 538-5340

(3/89)

BEFORE THE OIL AND GAS CONSERVATION COMMISSION OF THE STATE OF UTAH

APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE APPROVAL OF THE UNIT OPERATIONS AND PRESSURE MAINTENANCE PROGRAM FOR THE RATHERFORD UNIT IN THE GREATER ANETH AREA, SAN JUAN COUNTY, UTAH	)	CAUSE NO. 63

O R D E R

This Cause came on for hearing before the Oil and Gas Conservation Commission of the State of Utah at 10 o'clock a. m. on Wednesday, September 13, 1961, in the Crystal Room, Hotel Newhouse, Fourth South at Main Street, Salt Lake City, Utah, pursuant to notice duly and regularly given. The entire Commission, except Walter G. Mann, was present, Edward W. Clyde presiding. Appearances were made as follows: Cecil C. Hamilton, attorney, on behalf of Phillips Petroleum Company; Clair M. Senior, attorney, on behalf of Texaco, Inc.; Gordon Mayberry, attorney, on behalf of Continental Oil Company; R. R. Robison on behalf of Shell Oil Company. Others present included Carl Trawick, on behalf of United States Geological Survey; and J. R. White, on behalf of Texaco, Inc.

Evidence in support of the application was introduced by Phillips Petroleum Company, the applicant and Unit Operator of the Ratherford Unit, which embraces as the unit area the following described land in San Juan County, State of Utah, to wit:

TOWNSHIP 41 SOUTH, RANGE 23 EAST, SLBM

Section 1:	All	Sections 12 and 13:	All
Section 2:	S/2	Section 14:	S/2
Section 11:	E/2	Section 24:	All

TOWNSHIP 41 SOUTH, RANGE 24 EAST, SLBM

Section 3:	SW/4	Sections 15 through 21:	All
Section 4:	S/2	Section 22:	NW/4 and W/2 of the SW/4
Sections 5 through 9:	All		
Section 10:	S/2 and NW/4 and W/2 of NE/4		
Section 11:	S/2 of SW/4	Section 23:	NW/4 and W/2 of NE/4 and W/2 of SW/4
Section 14:	W/2		
		Section 29 and 30:	All
		Section 31:	N/2
		Section 32:	W/2

R. R. Robison on behalf of Shell Oil Company stated that (as contemplated by paragraph No. 5 of the Commission's order of February 24, 1959, in Cause No. 17 authorizing the drilling of certain test wells) Shell would submit to the Commission, as arbiter, the question as between Shell and Superior Oil Company

of the monetary value, if any, to be attributed to three test wells drilled within the Ratherford Unit area pursuant to said order of February 24, 1959.

No objection to the granting of the application was filed or expressed. The Shell Oil Company, Texaco, Inc. and Continental Oil Company expressed their support of the application of Phillips Petroleum Company.

FINDINGS OF FACT

The Commission finds that:

1. The unitized operation of the Ratherford Unit Area will enable pressure maintenance operations to be initiated and permit such Area to be operated in a manner which will prevent waste, protect correlative rights and result in greater ultimate recovery of oil and gas.

2. The Ratherford Unit Agreement has been approved by the various signatory parties as fair, reasonable and acceptable.

3. The water injection pressure maintenance program proposed by the applicant appears to be proper and designed to result in the greatest economic recovery of oil and gas to the end that all concerned, including the general public, may realize and enjoy the greatest good from the oil and gas resources of the unitized lands.

O R D E R

THEREFORE, IT IS ORDERED BY THE COMMISSION, and subject to its continuing jurisdiction, that:

1. Unit operation of the Ratherford Unit Area under the Ratherford Unit Agreement is approved.

2. The plan and program of water injection pressure maintenance operations proposed by applicant in its application filed herein should be and the same is hereby approved and the unit operator is authorized to proceed with and under such plan and program as soon as the Ratherford Unit Agreement becomes effective and operative.

3. If, at any time or from time to time, it appears necessary or desirable to the unit operator to alter or modify the hereby approved plan of pressure maintenance, any such alteration or modification shall be submitted for

and shall be subject to approval by the Commission or its delegated representative, which approval may be given without notice or hearing, unless otherwise ordered or directed by the Commission.

Dated this 13th day of September, 1961.

THE OIL AND GAS CONSERVATION
COMMISSION OF THE STATE OF UTAH

Edward W. Clyde, Commissioner presiding

C. R. Henderson, Chairman

M. V. Hatch, Commissioner

C. S. Thomson, Commissioner

Walter G. Mann, Commissioner

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:
1-LEC/7-SJ
2-DTS/8-FILE
3-VLC
4-RJF
5-LEC
6-PL

Attach all documentation received by the division regarding this change.
Initial each listed item when completed. Write N/A if item is not applicable.

XX Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator ☐ Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 7-1-93)

TO (new operator) M E P N A
(address) PO DRAWER G
CORTEZ, CO 81321
GLEN COX (915)688-2114
phone (303) 565-2212
account no. N7370

FROM (former operator) PHILLIPS PETROLEUM COMPANY
(address) 5525 HWY 64 NBU 3004
FARMINGTON, NM 87401
PAT KONKEL
phone (505) 599-3452
account no. N0772(A)

Well(s) (attach additional page if needed): *RATHERFORD UNIT (NAVAJO)

Name	API	Entity	Sec	Twp	Rng	Lease Type
SEE ATTACHED	43037.16418					

OPERATOR CHANGE DOCUMENTATION

Lec 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). (Reg. 8-20-93) (6/93 Prod. Rpt. 8-16-93)

Lec 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). (Reg. 8-31-93) (Rec'd 9-14-93)

N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: _____.

Lec 4. **(For Indian and Federal Wells ONLY)** The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.

Lec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 6. Cardex file has been updated for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 7. Well file labels have been updated for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (10-6-93)

Lec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

- OVER -

PERATOR CHANGE WORKSHEET (CONTINUED) Initial each item when completed. Write N/A if item is not applicable.

ENTITY REVIEW

Yes 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) ____ (If entity assignments were changed, attach copies of Form 6, Entity Action Form).

N/A 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

Yes/N/A 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.

__ 2. A copy of this form has been placed in the new and former operators' bond files.

__ 3. The former operator has requested a release of liability from their bond (yes/no) ___. Today's date _____ 19___. If yes, division response was made by letter dated _____ 19___.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

N/A 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19___, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.

DTS 11-10-93

N/A 2. Copies of documents have been sent to State Lands for changes involving **State leases**.

FILMING

✓ 1. All attachments to this form have been microfilmed. Date: 11-17 19 93.

FILING

Yes 1. Copies of all attachments to this form have been filed in each well file.

Yes 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

931006 BIA/Blm Approved 7-9-93.

12W-44	43-037-16405	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 660 FSL; 660 FEL	PA'd
12W-44A	43-037-31543	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 807 FEL; 772 FSL	
13-11W	43-037-31152	14-20-603-247A	SEC. 13, T41S, R23E	NW/NW 500 FNL; 660 FWL	
13-12	43-037-31127	14-20-603-247A	SEC. 13, T41S, R23E	SW/NW 1705 FNL; 640 FWL	
13W-13	43-037-15851	14-20-603-247A	SEC. 13, T41S, R23E	NW/SW 1980 FSL; 4620 FEL	
13-14	43-037-31589	14-20-603-247A	SEC. 13, T41S, R23E	660 FSL; 660 FWL	
13-21	43-037-31128	14-20-603-247A	SEC. 13, T41S, R23E	NE/NW 660 FNL; 1920 FWL	
13W-22	43-037-15852	14-20-603-247A	SEC. 13, T41S, R23E	SE/NW 1988 FNL; 3300 FEL	
13-23	43-037-31129	14-20-603-247A	SEC. 13, T41S, R23E	NE/SW 1980 FSL; 1930 FWL	
~~13W-44~~	~~43-037-15853~~	~~14-20-603-247~~	~~SEC. 13, T41S, R23E~~	~~600 FSL; 3300 FEL~~	
13W-32	43-037-16406	14-20-603-247A	SEC. 13, T41S, R23E	1881 FNL; 1979 FEL	
13W-33	43-037-15855	14-20-603-247A	SEC. 13, T41S, R23E	NW/SE 1970 FSL; 1979 FEL	
13W-34	43-037-31130	14-20-603-247A	SEC. 13, T41S, R23E	SW/SE 660 FSL; 1980 FEL	
13-41	43-037-15856	14-20-603-247A	SEC. 13, T41S, R23E	NE/NE 660 FNL; 660 FEL	
13W-42	43-037-15857	14-20-603-247A	SEC. 13, T41S, R23E	SE/NE 2139; 585 FEL	
13-43	43-037-31131	14-20-603-247A	SEC. 13, T41S, R23E	NE/SE 1700 FSL; 960 FEL	
13W-44	43-037-16407	14-20-603-247A	SEC. 13, T41S, R23E	SE/SE 635 FSL; 659 FEL	
~~14-03~~	~~NA~~	~~14-20-603-4037~~	~~SEC. 11, T41S, R23E~~	~~SW/SW 660 FSL; 660 FEL~~	
14-32	43-037-15858	14-20-603-247A	SEC. 14, T41S, R23E	2130 FNL; 1830 FEL	
14-41	43-037-31623	14-20-603-247A	SEC. 14, T41S, R23E	NE/NE 521 FEL; 810 FNL	
14W-42	43-037-15860	14-20-603-247A	SEC. 14, T41S, R23E	SE/NE 1976 FNL; 653 FEL	
14W-43	43-037-16410	14-20-603-247A	SEC. 14, T41S, R23E	3300 FSL; 4770 FEL	
14-33	43-037-15859	14-20-603-247	SEC. 14, T41S, R23E	2130 FSL; 1830 FEL	
15-12	43-037-15715	14-20-603-355	SEC. 15, T41S, R24E	1820 FNL; 500 FWL	
15W-21	43-037-16411	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 1820 FWL	
15-22	43-037-30449	14-20-603-355	SEC. 15, T41S, R24E	SE/NW, 1980 FNL; 2050 FWL	
15-32	43-037-15717	14-20-603-355A	SEC. 15, T41S, R24E	1980 FNL; 1980 FEL	
15-33	43-037-15718	14-20-603-355	SEC. 15, T41S, R24E	NW/SE 1650 FSL; 1980 FEL	
15-41	43-037-15719	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 660' FEL	
15-42	43-037-30448	14-20-603-355	SEC. 15, T41S, R24E	SE/NE 2020 FNL; 820 FEL	
16W-12	43-037-15720	14-20-603-355	SEC. 16, T41S, R24E	SW/NW 1880 FNL; 660 FWL	
16-13	43-037-31168	14-20-603-355	SEC. 16, T41S, R24E	1980 FSL; 660 FWL	
16W-14	43-037-15721	14-20-603-355	SEC. 16, T41S, R24E	SW/SW 660 FSL; 660 FWL	
16W-21	43-037-16414	14-20-603-355	SEC. 16, T41S, R24E	NE/NW 660 FNL; 1880 FWL	
16W-23	43-037-15722	14-20-603-355	SEC. 16, T41S, R24E	NE/SW 1980 FSL; 1980 FWL	
16-32	43-037-15723	14-20-603-355	SEC. 16, T41S, R24E	1980 FNL; 1980' FEL	
16-34	43-037-15724	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 1980' FEL	
16-41	43-037-15725	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 660 FEL	
16W-43	43-037-16415	14-20-603-355	SEC. 16, T41S, R24E	NE/SE 2140 FSL; 820 FEL	
17-11	43-037-31169	14-20-603-353	SEC. 17, T41S, R24E	NW/NW 1075' FNL; 800' FWL	
17W-12	43-037-15726	14-20-603-353	SEC. 17, T41S, R24E	SW/NW 1980' FNL; 510' FWL	
17-13	43-037-31133	14-20-603-353	SEC. 17, T41S, R24E	NW/SW 2100' FSL; 660' FWL	
17W-14	43-037-15727	14-20-603-353	SEC. 17, T41S, R24E	SW/SW 660' FSL; 660' FWL	
17W-21	43-037-16416	14-20-603-353	SEC. 17, T41S, R24E	510' FNL; 1830' FWL	
17-22	43-037-31170	14-20-603-353	SEC. 17, T41S, R24E	1980' FNL; 1980' FWL	
17W-23	43-037-15728	14-20-603-353	SEC. 17, T41S, R24E	NE/SW 1980' FWL; 1880' FSL	
17-31	43-037-31178	14-20-603-353	SEC. 17, T41S, R24E	NW/NE 500' FNL; 1980' FEL	
17-32W	43-037-15729	14-20-603-353	SEC. 17, T41S, R24E	SW/NE 1830' FNL; 2030' FEL	
17-33	43-037-31134	14-20-603-353	SEC. 17, T41S, R24E	NW/SE 1980' FSL; 1845' FEL	
17-34W	43-037-15730	14-20-603-353	SEC. 17, T41S, R24E	SW/SE 560' FSL; 1880' FEL	
17W-41	43-037-15731	14-20-603-353	SEC. 17, T41S, R24E	610' FNL; 510' FEL	
17-42	43-037-31177	14-20-603-353	SEC. 17, T41S, R24E	SE/NE 1980; FNL, 660' FEL	
17-44	43-037-15732	14-20-603-353	SEC. 17, T41S, R24E	660 FSL; 660' FEL	
17W-43	43-037-16417	14-20-603-353	SEC. 17, T41S, R24E	NE/SE 1980' FSL; 660' FEL	
18-11	43-037-15733	14-20-603-353	SEC. 18, T41S, R24E	NW/NW 720' FNL; 730' FWL	
18-12W	43-037-31153	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 1980' FNL; 560' FWL	
18W-21	43-037-16418	14-20-603-353	SEC. 18, T41S, R24E	NE/NW 660' FNL; 1882' FWL	
18-22	43-037-31236	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 2200' FNL; 2210' FWL	
18W-23	43-037-30244	14-20-603-353	SEC. 18, T41S, R24E	NE/SW 2385' FSL; 2040' FWL	
18W-14	43-037-15735	14-20-603-353	SEC. 18, T41S, R24E	SW/SW 810' FSL; 600' FWL	
18-24	43-037-31079	14-20-603-353	SEC. 18, T41S, R24E	SE/SW 760' FSL; 1980' FWL	
18-31	43-037-31181	14-20-603-353	SEC. 18, T41S, R24E	NW/NE 795' FNL; 2090; FEL	
~~18W-32~~	~~43-037-15736~~	~~14-20-603-353~~	~~SEC. 18, T41S, R24E~~	~~SW/NE 2140' FNL; 1830' FEL~~	
18-33	43-037-31135	14-20-603-353	SEC. 18, T41S, R24E	NW/SE 1870' FSL; 1980' FEL	
18-34W	43-037-15737	14-20-603-353	SEC. 18, T41S, R24E	SW/SE 780' FSL; 1860 FEL	
18W-41	43-037-15738	14-20-603-353	SEC. 18, T41S, R24E	NE/NE 660' FNL; 660' FEL	
18-42	43-037-31182	14-20-603-353	SEC. 18, T41S, R24E	SE/NE 2120' FNL; 745' FEL	
18W-43	43-037-16419	14-20-603-353	SEC. 18, T41S, R24E	NE/SE 1980' FSL; 660' FEL	PA'd
18-44	43-037-31045	14-20-603-353	SEC. 18, T41S, R24E	SE/SE 660' FSL; 660' FEL	
19-11	43-037-31080	14-20-603-353	SEC. 19, T41S, R24E	NW/NW 660' FNL; 660' FWL	
19-12	43-037-15739	14-20-603-353	SEC. 19, T41S, R24E	600' FWL; 1980' FNL	
19-14	43-037-15740	14-20-603-353	SEC. 19, T41S, R24E	600' FSL; 660' FEL	

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APR 1 1 1994

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.
14-20-603-353

6. If Indian, Allottee or Tribe Name
NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation
RATHERFORD UNIT

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other

8. Well Name and No.
RATHERFORD UNIT 18-W-21

2. Name of Operator
MOBIL EXPLORATION & PRODUCING US, AS AGENT FOR MEPNA

9. API Well No.
43-037-16418

3. Address and Telephone No.
P. O. BOX 633, MIDLAND, TX 79702 **(915) 688-2585**

10. Field and Pool, or exploratory Area
GREATER ANETH

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
660' FNL, 1882' FWL Sec 18 T41S R24E

11. County or Parish, State
SAN JUAN, UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
☐ Notice of Intent	☐ Abandonment	☐ Change of Plans
	☐ Recompletion	☐ New Construction
☒ Subsequent Report	☐ Plugging Back	☐ Non-Routine Fracturing
	☐ Casing Repair	☐ Water Shut-Off
☐ Final Abandonment Notice	☐ Altering Casing	☐ Conversion to Injection
	☐ Other ACIDIZE	☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

03-07-94 MIRU; PRESS TEST COIL TBG & BOP TO 5000 PSI - TAG FILL @ 5943'. CLEAN ACROSS PERFS 5882-94',5908-28' W/40 BBLS FW. ACIDZE W/4600 GALS 15% HCL. TAG FILL @5943'. FLOW BACK LOAD. RDMO. RETURN WELL TO INJECTION.

14. I hereby certify that the foregoing is true and correct
Signed D. Irino for Shirley Todd Title **ENV. & REG. TECHNICIAN** Date **04/01/94**

(This space for Federal or State office use)

Approved by _____ Title _____ Date ~~04~~ Credit
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*** See Instruction on Reverse Side**

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.
14-20-603-353

6. If Indian, Allottee or Tribe Name
NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation
RATHERFORD UNIT

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other

8. Well Name and No.
RATHERFORD UNIT 18-W-21

2. Name of Operator
MOBIL EXPLORATION & PRODUCING US, AS AGENT FOR MEPNA

9. API Well No.
43-037-16418

3. Address and Telephone No.
P. O. BOX 633, MIDLAND, TX 79702 **(915) 688-2585**

10. Field and Pool, or exploratory Area
GREATER ANETH

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
660' FNL, 1882' FWL; SEC 18, T41S, R24

11. County or Parish, State
SAN JUAN, UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
☐ Notice of Intent	☐ Abandonment	☐ Change of Plans
☒ Subsequent Report	☐ Recompletion	☐ New Construction
☐ Final Abandonment Notice	☐ Plugging Back	☐ Non-Routine Fracturing
	☐ Casing Repair	☐ Water Shut-Off
	☐ Altering Casing	☐ Conversion to Injection
	☐ Other WORKOVER	☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

10/19/93 MIRU; BLED WELL DOWN. ND WELLHEAD. NU BOP. REL PKR. POOH W/TBG & PKR.

10/21/93 RIH W/BIT & SCRAPER. TAG FILL @ 5930. CLEAN OUT TO 5945' PBTD. CIRC HOLE CLEAN.

10/22/93 RIH W/PKR ON 180 JTS DUOLINE TBG. SET PKR @ 5602'. PRESS TEST TO 1000#/OK. RETURN TO INJ. RDMO.

14. I hereby certify that the foregoing is true and correct
Signed D Irvins for Shirley Todd Title ENV. & REG. TECHNICIAN Date 04/26/94

(This space for Federal or State office use)
Approved by _____ Title _____ Date Kay Credit
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

Division of Oil, Gas and Mining

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

[] Well File _____

(Location) Sec___Twp___Rng___

(API No.) _____

[] Suspense

(Return Date) _____

(To - Initials) _____

XXX Other

OPER NM CHG

1. Date of Phone Call: 8-3-95 Time: _____

2. DOGM Employee (name) L. CORDOVA (Initiated Call [])

Talked to:

Name R. J. FIRTH (Initiated Call XX) - Phone No. ( )

of (Company/Organization) _____

3. Topic of Conversation: M E P N A / N7370

4. Highlights of Conversation:

OPERATOR NAME IS BEING CHANGED FROM M E P N A (MOBIL EXPLORATION AND PRODUCING NORTH AMERICA INC) TO MOBIL EXPLOR & PROD. THE NAME CHANGE IS BEING DONE AT THIS TIME TO ALLEVIATE CONFUSION, BOTH IN HOUSE AND AMONGST THE GENERAL PUBLIC.

*SUPERIOR OIL COMPANY MERGED INTO M E P N A 4-24-86 (SEE ATTACHED).

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:

1-LEC	7-PL
2-LWP	8-SJ
3-~~DTS~~	9-FILE
4-VLC	
5-RJF	
6-LWP	

Attach all documentation received by the division regarding this change.
Initial each listed item when completed. Write N/A if item is not applicable.

☐ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator XXX Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: **8-2-95**)

TO (new operator) **MOBIL EXPLOR & PROD**
(address) **C/O MOBIL OIL CORP**
PO DRAWER G
CORTEZ CO 81321
phone **(303) 564-5212**
account no. **N7370**

FROM (former operator) **M E P N A**
(address) **C/O MOBIL OIL CORP**
PO DRAWER G
CORTEZ CO 81321
phone **(303)564-5212**
account no. **N7370**

Well(s) (attach additional page if needed):

Name	API	Entity	Sec	Twp	Rng	Lease Type
** SEE ATTACHED **	037-16418					

OPERATOR CHANGE DOCUMENTATION

N/A 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form).

N/A 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form).

N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: _____.

N/A 4. **(For Indian and Federal Wells ONLY)** The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.

Lec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (8-3-95)

LWP 6. Cardex file has been updated for each well listed above. 8-31-95

LWP 7. Well file labels have been updated for each well listed above. 9-28-95

Lec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (8-3-95)

Lec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

– OVER –

OPERATOR CHANGE WORKSHEET (CONTINUED) Initial each item when completed. Write N/A if item is not applicable.

ENTITY REVIEW

Lec 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) ____ (If entity assignments were changed, attach copies of Form 6, Entity Action Form).

N/A 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only) * No Fee Lease Wells at this time!

N/A/Lec 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.

___ 2. A copy of this form has been placed in the new and former operators' bond files.

___ 3. The former operator has requested a release of liability from their bond (yes/no) ___. Today's date _____ 19___. If yes, division response was made by letter dated _____ 19___.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

N/A 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19___, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.

UTS 8/5/95

N/A 2. Copies of documents have been sent to State Lands for changes involving **State leases**.

FILMING

✓ 1. All attachments to this form have been microfilmed. Date: October 4 19 95.

FILING

___ 1. Copies of all attachments to this form have been filed in each well file.

___ 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

950803 UIC F5/Not necessary!

WE71/34-35

STATE OF UTAH
INVENTORY OF INJECTION WELLS

OPERATOR	API NO.	WELL	TNS	RGE	SE	WELLTYPE	INDIAN COUNT
MEPNA (MOBIL	43-037-15722	16W23	41S	24E	16	INJW	Y
MEPNA (MOBIL	43-037-16414	16W21	41S	24E	16	INJW	Y
MEPNA (MOBIL	43-037-16416	17W21	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15726	17W12	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15731	17W41	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-16417	17W43	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15728	17W23	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15730	17W34	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15729	17W32	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-15727	17W14	41S	24E	17	INJW	Y
MEPNA (MOBIL	43-037-31153	18W12	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-15737	18W34	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-15736	18W32	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-30244	18W23	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-15735	18W14	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-16418	18W21	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-15738	18W41	41S	24E	18	INJW	Y
MEPNA (MOBIL	43-037-15741	19W21	41S	24E	19	INJW	Y
MEPNA (MOBIL	43-037-15742	19W23	41S	24E	19	INJW	Y
MEPNA (MOBIL	43-037-15745	19W41	41S	24E	19	INJW	Y
MEPNA (MOBIL	43-037-16420	19W43	41S	24E	19	INJW	Y
MEPNA (MOBIL	43-037-15748	20W23	41S	24E	20	INJW	Y
MEPNA (MOBIL	43-037-15751	20W41	41S	24E	20	INJW	Y
MEPNA (MOBIL	43-037-16423	20W21	41S	24E	20	INJW	Y
MEPNA (MOBIL	43-037-16424	20W43	41S	24E	20	INJW	Y
MEPNA (MOBIL	43-037-16427	21W43	41S	24E	21	INJW	Y
MEPNA (MOBIL	43-037-16425	21W21	41S	24E	21	INJW	Y
MEPNA (MOBIL	43-037-16431	28W21	41S	24E	28	INJI	Y
MEPNA (MOBIL	43-037-16433	29W41	41S	24E	29	INJW	Y
MEPNA (MOBIL	43-037-16432	29W21	41S	24E	29	INJW	Y
MEPNA (MOBIL	43-037-15338	29W23	41S	24E	29	INJI	Y
MEPNA (MOBIL	43-037-16434	29W43	41S	24E	29	INJW	Y
MEPNA (MOBIL	43-037-15343	30-41	41S	24E	30	INJW	Y
MEPNA (MOBIL	43-037-16435	30W21	41S	24E	30	INJI	--

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other SIDETRACT/INJECTOR
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL & 1882' FWL SEC.18, T41S, R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other SIDETRACT	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BOTTOM HOLE LOCATION:

LATERAL #1 2571' (984) NORTH & 3064' (933) WEST F/SURFACE SPOT (ZONE 1b/1d)
LATERAL #2 2000' (600) NORTH & 3464' (1056) WEST F/SURFACE SPOT (ZONE 1a/1b)

SEE ATTACHED PROCEDURE.

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14. I hereby certify that the foregoing is true and correct
Signed Shirley Houchins Title ENV. & REG. TECHNICIAN Date 04-14-97

(This space for Federal or State office use)
Approved by John R. Bay Title Petroleum Engineer Date 5/7/97
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

Ratherford Unit Well #18-21
Multilateral Horizontal Drilling Procedure

The objective of this procedure is to prepare this wellbore for sidetracking, sidetrack the subject well and drill multiple medium radius horizontal laterals (4000 ft).

1. Prepare location and dig working pit.

2. MIRU WSU, reverse unit, and H_2S equipment. Bullhead kill weight fluid down tubing.

3. Release packer, and pick up on wellhead to remove. ND wellhead and NU BOP's. Pressure test BOP's.

4. Continue to POH with tubing.

5. TIH with full gauge bit and casing scraper to PBTD. TOH with bit and scraper.

6. Ensure well will circulate, and set RTBP above perfs. **Pressure test casing to 1000 psi.**

7. RDMO WSU.

8. MIRU 24 hr WSU.

9. PU tubing, drill collars, and drill pipe in derrick and run in hole. Then POH and stand back.

10. RU wireline company and run gauge ring for casing down to packer setting depth.

11. Run packer on wireline and set using GR/CCL log to correlate with. RD wireline.

12. PU drillpipe with UBHO sub and latch assembly.

13. Latch into packer. Run gyro and obtain orientation of keyway on packer.

14. POH w/ gyro. POH w/ drill pipe and RIH w/ whipstock oriented on the surface for window azimuth desired.

15. Shear pilot mill bolt and start milling window.

16. POH and PU window mill and watermelon mill to finish window and drill 3 ft of formation.

17. POH w/ mills and RBIH w/ new mills to clean up window.

18. PU drill pipe and directional motors to drill curve. Use the gyro to drill until the inclination dictates that the gyro must be pulled.

19. Pull five stands of drill pipe and run steering tool to finish drilling the curve.

20. POH once curve is finished and PU lateral motor to drill the lateral using MWD.

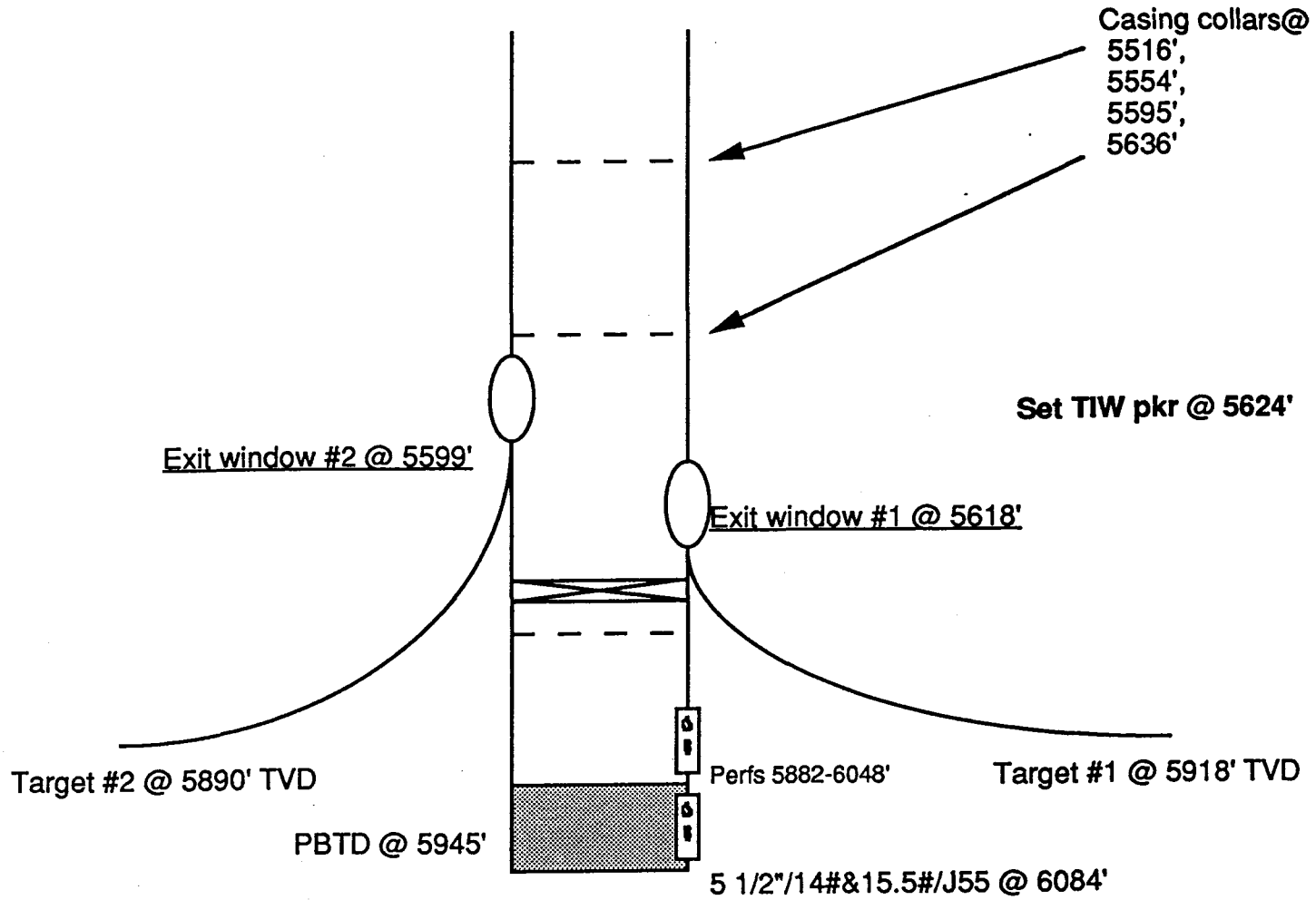
21. Once lateral TD is reached, POH w/ directional equipment.

22. RIH w/ hook and retrieve whipstock.

23. PU new whipstock with extension in body for next window and orient on surface to desired azimuth.

24. Repeat steps 15-23, for each successive planned lateral.

Whipstock plan for Ratherford #18-21



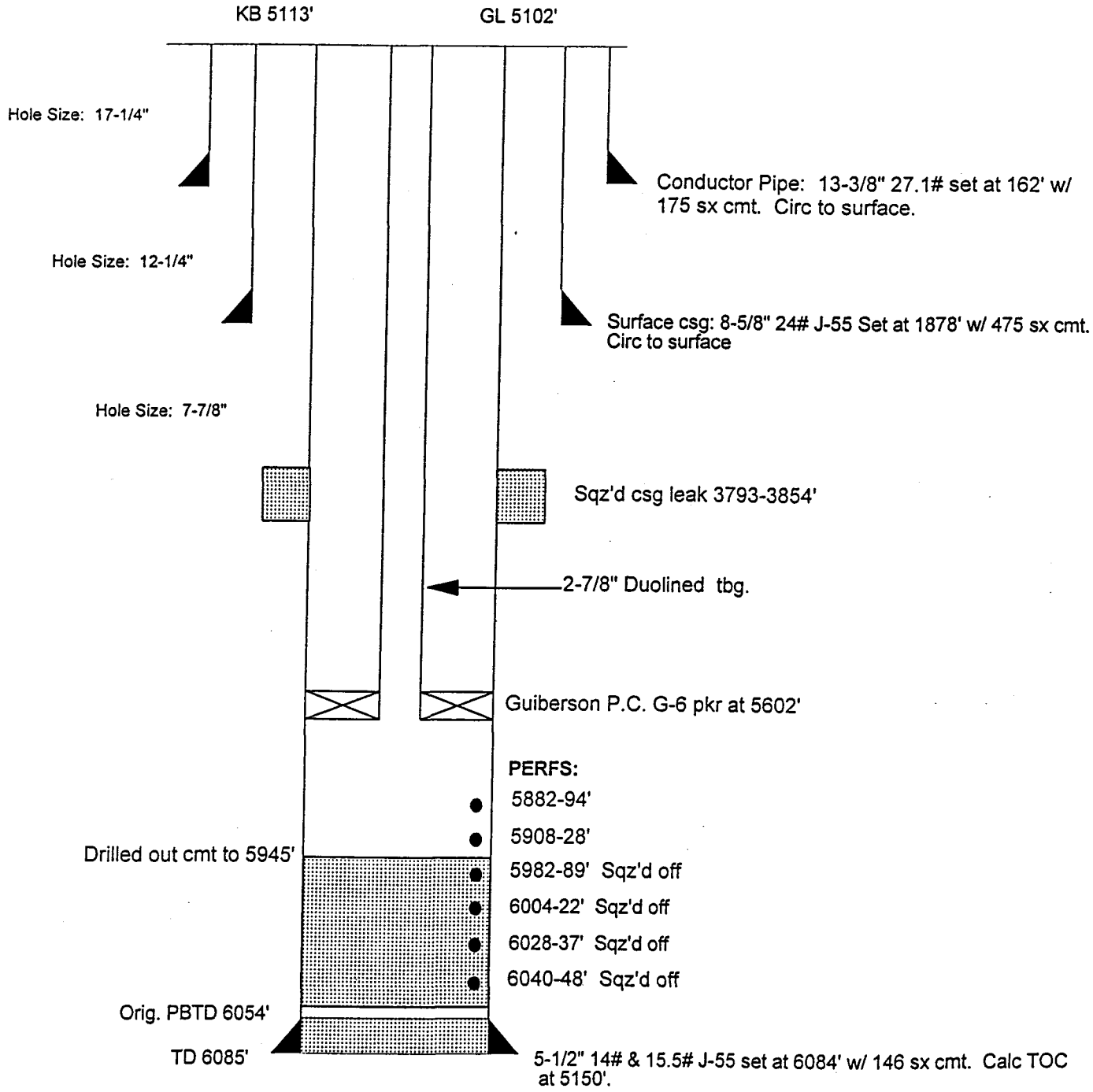
Window	Btm-Top of window	Extension length	Curve radius	Bearing	Horix Displ
1	5618-09	-	300	310	4000
2	5599-90	19	291	300	4000

RATHERFORD UNIT # 18W-21

INJECTOR

GREATER ANETH FIELD
660' FNL & 1882' FWL
SEC 18-T41S-R24E
SAN JUAN COUNTY, UTAH
API 43-037-16418
PRISM 0043064

Capacities:	bbl/ft	gal/ft	cuft/ft
2-7/8" 6.5#	.00579	.2431	.0325
5-1/2" 14#	.0244	1.0249	.1370
5-1/2" 15.5#	.0238	.9997	.1336
2-7/8x5.5"14# .0919	.0164	.6877	
2-7/8x5.5"15.5# .0886	.0158	.6625	



L. A. TUCKER 6-20-96 R.U. # 18-W-21

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MOBIL

RATHERFORD UNIT #18-21
NW HORIZONTAL LATERAL LEG #2
UPPER 1-A & 1-B POROSITY BENCHES
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 18, T41S, ~~R23E~~ R24E
SAN JUAN, UTAH

GEOLOGY REPORT
by

DAVE MEADE & MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #18-21 NW HORIZONTAL LATERAL LEG #2 IN 1-A/1-B UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 18, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4595' GL:4607'
SPUD DATE:	6/16/97
COMPLETION DATE:	6/26/97
DRILLING ENGINEER:	LEWIS SIMMONS
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING ENGINEERS:	DAVE MEADE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES /D. SIPE
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5592' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	RON WESTENBERG/ DANNE BEASON
MUD TYPE:	FRESH WATER & BRINE WATER W/ POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPERRY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	9115 ' MEASURED DEPTH TVD-5849'
STATUS:	TOH & LAY DOWN TOOLS - PREPARE TO MOVE RIG

DRILLING CHRONOLOGY
RATHERFORD UNIT #18-21
1-A/1-B NW HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	ACTIVITY
6/16/97	9145'	6'	LAY DOWN 30 JTS PH6 DP-TOH-LAY DOWN LATERAL ASSEMBLY-P.U. RETRIEVING HOOK-TIH-RETRIEVE WHIPSTOCK-TOH-CHANGE OUT WHIPSTOCK & ORIENT-TIH-SET WHIPSTOCK-BREAK CIR. & MILL W/STARTER MILL-25ppm H_2S-CIR. & SWITCH TO GAS BUSTER-MILL W/STARTER MILL-PUMP SWEEP & SPOT 10bbls 10# BRINE-TOH-L.D. STARTER MILL-P.U. WINDOW MILL & WATERMELON MILL-TIH-BREAK CIR.-28ppm H_2S-MILL WINDOW-5583'-5589'
6/17/97	5589'	45'	MILLWINDOW 5589'-5592'-PUMP SWEEPS & PUMP 109 BBLS 10# BRINE-TOH-L.D. MILLS-P.U. CURVE ASSEMBLY & TEST MTR-TIH-BREAK CIR.-20ppm H_2S-TIH-RIG UP WIRELINE & SET GYRO-TIME DRLG 5592'-5634'
6/18/97	5634'	272'	DIR DRLG 5634'-5645'-PULL GYRO-DIR DRLG & SURVEYS
6/19/97	5906'	188'	DIR DRLG & SURVEYS- PUMP TWO 10 BBL SWEEPS & CIR BTMS UP @ 6094'-HANG SWIVEL & L.D. 52 JNTS D.P.-DISPLACE HOLE WITH BRINE WATER
6/20/97	6094'	598'	TOOH-BREAK & LAY DOWN CURVE ASSEMBLY-PICK UP LATERAL BHA & BIT #2-PICK UP 1 JNT PH6 DRLG PIPE-TIH-DIR DRLG & SURVEYS
6/21/97	6692'	821'	DIR DRLG & SURVEYS
6/22/97	7513'	371'	DIR DRLG & SURVEYS- PUMP 8 BBL SWEEP & CIR BTMS UP @ 7884'-HANG SWIVEL & L.D. 74 JNTS D.P.-DISPLACE HOLE WITH BRINE WATER
6/23/97	7884'	564'	WORK ON TRANSMISION-TOH-PICK UP NEW MWD, MUD MOTOR & BIT-ORIENT & TEST-PICK UP 60 JNTS PH6-TIH-CIR-DIR DRLG & SURVEYS-PUMP REPAIR-DIR DRLG & SURVEYS
6/24/97	8448'	364'	DIR DRLG & SURVEYS-CIR. BTMS UP @ 8765'-SHORT TRIP 16 STDS (WIPER TRIP)-DIR DRLG & SURVEYS
6/25/97	8812'	292'	DIR DRLG & SURVEYS
6/26/97	9104'	11'	DIR DRLG & SURVEYS- TERMINATE LATERAL #2 @ 9115'-PUMP 125 BBL BRINE WATER SWEEP-TOH & LAY DOWN 60 JTS PH6 DRL PIPE-PREPARE TO MOVE RIG

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
6/16/97	9145'	6'			
6/17/97	5589'	45'			
6/18/97	5634'	272'			
6/19/97	5906'	188'			
6/20/97	6094'	598'			
6/21/97	6692'	821'			
6/22/97	7513'	371'			
6/23/97	7884'	564'			
6/24/97	8448'	364'			
6/25/97	8812'	292'			
6/26/97	9104'	11'			
TD	9115'				

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL LEG #2

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1	4 3/4"	STC	MF-3P	5592'/ 6094'	502'	50.5	9.9
#2	4 3/4"	HTC	STR-30	6094'/ 7884'	1790'	59.0	30.3
#3	4 3/4"	HTC	STR-30	7884'/ 9115'	1231'	61.0	20.2

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5400.00	0.35	279.02	5399.78	3.48 S	30.49 W	24.67	0.00
5583.00	0.44	300.64	5582.78	3.10 S	31.67 W	25.87	0.00
5589.00	2.70	307.10	5588.78	3.01 S	31.80 W	26.03	37.72
5592.00	3.70	306.67	5591.77	2.91 S	31.93 W	26.20	33.34
5612.00	7.90	303.87	5611.67	1.75 S	33.59 W	28.21	21.04
5632.00	11.50	301.07	5631.38	0.04 N	36.44 W	31.58	18.15
5652.00	15.20	298.27	5650.83	2.31 N	40.46 W	36.20	18.77
5672.00	18.50	295.47	5669.97	4.92 N	45.64 W	41.98	16.99
5692.00	21.70	292.68	5688.75	7.71 N	51.91 W	48.81	16.70
5712.00	24.30	289.88	5707.16	10.54 N	59.20 W	56.53	14.10
5732.00	29.10	287.08	5725.02	13.37 N	67.72 W	65.33	24.80
5752.00	33.40	284.28	5742.12	16.15 N	77.71 W	75.37	22.69
5772.00	37.50	281.48	5758.41	18.72 N	89.02 W	86.45	22.04
5792.00	42.50	278.67	5773.73	20.96 N	101.67 W	98.53	26.58
5812.00	46.90	275.80	5787.94	22.71 N	115.62 W	111.49	24.20
5832.00	50.20	277.79	5801.18	24.49 N	130.50 W	125.26	18.11
5852.00	53.40	279.78	5813.55	26.90 N	146.03 W	139.91	17.81
5872.00	57.40	281.77	5824.90	29.98 N	162.20 W	155.46	21.61
5892.00	61.60	283.76	5835.05	33.79 N	179.00 W	171.91	22.68
5912.00	65.20	285.75	5844.00	38.35 N	196.28 W	189.16	20.08
5932.00	68.30	287.74	5851.90	43.65 N	213.88 W	207.05	17.99
5952.00	72.20	289.73	5858.66	49.70 N	231.70 W	225.50	21.63
5972.00	76.10	291.72	5864.12	56.51 N	249.69 W	244.49	21.72
5992.00	77.10	293.71	5868.75	64.02 N	267.63 W	263.79	10.89
6012.00	79.60	295.70	5872.79	72.21 N	285.42 W	283.29	15.85
6032.00	81.70	297.69	5876.04	81.07 N	303.05 W	302.99	14.37
6052.00	84.40	299.68	5878.46	90.60 N	320.47 W	322.83	16.73
6067.00	86.00	301.20	5879.72	98.17 N	333.35 W	337.78	14.69
6094.00	90.20	299.90	5880.61	111.89 N	356.59 W	364.76	16.28
6106.94	90.00	299.80	5880.59	118.33 N	367.81 W	377.70	1.73
6138.54	87.20	298.60	5881.36	133.74 N	395.38 W	409.28	9.64
6170.33	87.40	297.70	5882.86	148.72 N	423.38 W	441.02	2.90
6202.15	88.60	296.50	5883.97	163.21 N	451.69 W	472.78	5.33
6234.04	91.10	296.70	5884.05	177.48 N	480.20 W	504.61	7.86
6265.89	92.70	297.20	5883.00	191.91 N	508.57 W	536.39	5.26
6297.71	89.40	298.50	5882.41	206.77 N	536.70 W	568.18	11.15
6329.63	88.20	298.50	5883.08	222.00 N	564.74 W	600.08	3.76
6361.49	91.10	298.80	5883.28	237.27 N	592.70 W	631.93	9.15

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6393.25	91.80	299.70	5882.47	252.78 N	620.40 W	663.68	3.59
6425.07	91.10	300.00	5881.67	268.62 N	647.99 W	695.48	2.39
6456.92	91.00	299.70	5881.09	284.47 N	675.61 W	727.33	0.99
6488.77	91.20	300.00	5880.47	300.32 N	703.23 W	759.17	1.13
6520.59	90.90	300.40	5879.89	316.32 N	730.73 W	790.99	1.57
6552.23	91.10	300.40	5879.34	332.33 N	758.01 W	822.62	0.63
6583.41	89.60	299.30	5879.15	347.85 N	785.05 W	853.80	5.97
6615.19	90.80	299.20	5879.04	363.37 N	812.78 W	885.58	3.79
6646.95	90.10	299.00	5878.79	378.82 N	840.53 W	917.33	2.29
6678.63	88.50	298.60	5879.17	394.08 N	868.29 W	949.00	5.21
6710.36	90.00	299.30	5879.59	409.44 N	896.05 W	980.72	5.22
6742.18	92.30	300.70	5878.95	425.34 N	923.60 W	1012.53	8.46
6774.03	91.10	300.60	5878.01	441.57 N	950.99 W	1044.37	3.78
6805.86	91.10	300.20	5877.40	457.68 N	978.44 W	1076.19	1.26
6837.72	90.80	300.40	5876.87	473.75 N	1005.94 W	1108.04	1.13
6869.41	90.40	300.20	5876.54	489.74 N	1033.30 W	1139.73	1.41
6901.23	88.70	299.20	5876.79	505.50 N	1060.94 W	1171.55	6.20
6933.03	87.50	299.00	5877.84	520.96 N	1088.71 W	1203.33	3.83
6964.87	89.60	298.50	5878.65	536.27 N	1116.61 W	1235.15	6.78
6996.70	91.10	299.00	5878.45	551.57 N	1144.52 W	1266.97	4.97
7028.53	92.00	299.90	5877.59	567.22 N	1172.22 W	1298.78	4.00
7060.39	90.90	299.70	5876.78	583.05 N	1199.86 W	1330.63	3.51
7092.15	91.40	299.00	5876.15	598.61 N	1227.54 W	1362.38	2.71
7123.99	90.50	298.80	5875.62	614.00 N	1255.41 W	1394.21	2.90
7155.79	86.40	297.70	5876.48	629.04 N	1283.41 W	1425.98	13.35
7187.56	86.80	297.00	5878.36	643.61 N	1311.57 W	1457.66	2.53
7219.49	88.30	297.20	5879.73	658.14 N	1339.97 W	1489.52	4.74
7251.25	92.30	298.80	5879.56	673.05 N	1368.01 W	1521.25	13.56
7283.03	93.00	300.40	5878.09	688.73 N	1395.61 W	1553.00	5.49
7314.78	91.10	300.70	5876.96	704.85 N	1422.93 W	1584.72	6.06
7345.86	90.00	300.70	5876.66	720.72 N	1449.66 W	1615.80	3.54
7377.73	90.40	300.20	5876.55	736.87 N	1477.13 W	1647.67	2.01
7408.90	90.20	300.40	5876.38	752.60 N	1504.04 W	1678.84	0.91
7440.74	91.10	300.20	5876.02	768.66 N	1531.53 W	1710.67	2.90
7471.81	92.20	299.20	5875.13	784.05 N	1558.51 W	1741.73	4.78
7503.67	94.10	299.50	5873.38	799.64 N	1586.23 W	1773.54	6.04
7535.41	92.40	299.90	5871.58	815.34 N	1613.76 W	1805.23	5.50
7567.18	90.60	299.90	5870.75	831.17 N	1641.29 W	1836.98	5.67

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
7599.07	90.10	299.50	5870.55	846.97 N	1668.99 W	1868.87	2.01
7630.13	89.60	299.70	5870.63	862.31 N	1696.00 W	1899.93	1.73
7662.04	89.40	300.20	5870.91	878.24 N	1723.64 W	1931.84	1.69
7693.78	86.40	299.50	5872.07	894.03 N	1751.15 W	1963.55	9.71
7724.89	88.20	299.90	5873.54	909.42 N	1778.14 W	1994.63	5.93
7756.67	91.30	300.90	5873.68	925.50 N	1805.55 W	2026.40	10.25
7788.44	93.40	302.10	5872.38	942.09 N	1832.61 W	2058.13	7.61
7820.23	93.90	302.70	5870.35	959.09 N	1859.40 W	2089.83	2.45
7851.96	93.80	303.90	5868.22	976.47 N	1885.86 W	2121.44	3.79
7900.46	90.80	305.50	5866.27	1004.05 N	1925.69 W	2169.73	7.01
7962.54	91.70	304.60	5864.92	1039.69 N	1976.50 W	2231.55	2.05
7994.34	91.60	303.70	5864.00	1057.54 N	2002.81 W	2263.25	2.85
8026.24	90.40	303.20	5863.45	1075.12 N	2029.42 W	2295.09	4.08
8057.22	89.10	302.70	5863.58	1091.97 N	2055.42 W	2326.03	4.50
8088.34	89.60	302.30	5863.94	1108.69 N	2081.66 W	2357.12	2.06
8120.13	90.20	302.70	5863.99	1125.77 N	2108.47 W	2388.87	2.27
8151.67	89.70	301.40	5864.02	1142.51 N	2135.20 W	2420.39	4.42
8183.45	90.20	300.90	5864.05	1158.94 N	2162.40 W	2452.17	2.22
8214.43	90.40	300.60	5863.88	1174.78 N	2189.03 W	2483.14	1.16
8246.38	89.60	300.20	5863.88	1190.95 N	2216.58 W	2515.09	2.80
8278.27	90.30	300.00	5863.91	1206.94 N	2244.17 W	2546.98	2.28
8310.02	89.80	299.50	5863.88	1222.70 N	2271.74 W	2578.73	2.23
8341.74	90.00	299.00	5863.94	1238.20 N	2299.41 W	2610.45	1.70
8373.58	91.20	299.20	5863.61	1253.68 N	2327.23 W	2642.28	3.82
8405.39	91.80	299.20	5862.77	1269.20 N	2354.99 W	2674.08	1.89
8437.19	89.40	298.50	5862.44	1284.54 N	2382.84 W	2705.87	7.86
8469.01	88.90	297.90	5862.91	1299.57 N	2410.88 W	2737.67	2.45
8500.78	90.40	298.60	5863.11	1314.61 N	2438.86 W	2769.42	5.21
8532.63	89.10	298.80	5863.25	1329.90 N	2466.80 W	2801.26	4.13
8564.51	89.30	299.00	5863.69	1345.31 N	2494.71 W	2833.13	0.89
8596.35	92.10	299.50	5863.30	1360.86 N	2522.48 W	2864.97	8.93
8628.20	90.80	299.70	5862.50	1376.59 N	2550.17 W	2896.80	4.13
8659.96	92.60	300.90	5861.55	1392.61 N	2577.57 W	2928.55	6.81
8691.77	93.50	300.90	5859.86	1408.92 N	2604.83 W	2960.31	2.83
8723.66	94.70	301.60	5857.58	1425.42 N	2632.02 W	2992.11	4.35
8755.51	93.00	302.00	5855.44	1442.16 N	2659.03 W	3023.87	5.48
8787.36	91.00	302.10	5854.33	1459.06 N	2686.01 W	3055.68	6.29
8819.16	90.90	303.00	5853.80	1476.16 N	2712.81 W	3087.44	2.85

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
8850.78	90.50	303.70	5853.42	1493.54 N	2739.22 W	3119.01	2.55
8881.96	89.10	304.40	5853.53	1511.00 N	2765.05 W	3150.11	5.02
8913.74	89.30	306.00	5853.97	1529.32 N	2791.02 W	3181.75	5.07
8945.49	89.00	306.70	5854.44	1548.13 N	2816.59 W	3213.30	2.40
8977.33	91.00	306.70	5854.44	1567.16 N	2842.11 W	3244.92	6.28
9009.14	91.30	306.70	5853.80	1586.17 N	2867.61 W	3276.51	0.94
9040.86	91.10	306.00	5853.14	1604.97 N	2893.16 W	3308.03	2.29
9072.52	93.50	306.90	5851.87	1623.76 N	2918.60 W	3339.46	8.10
9083.00	93.70	307.40	5851.21	1630.07 N	2926.94 W	3349.84	5.13
9115.00	93.70	307.40	5849.15	1649.47 N	2952.30 W	3381.51	0.00

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL SYSTEM REFERENCE POINT.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS WELL HEAD.
THE VERTICAL SECTION WAS COMPUTED ALONG 300.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

5400 TIE-IN; 5583 INTERPOLATED GYRO; 5589 GYRO AT
CASING WINDOW; 5592-9083 MWD SURVEYS; 5592-6052
HAVE INTERPOLATED AZIMUTHS; 9115 PROJECTED TO BIT

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
6/16/97	9145'	9.0	28	2	1	0/0	11.6	16.2	<1/32	82000	380	–	4%	96%
6/17/97	5592'	9.5	26	–	–	0/0	10.9	NC	NC	136000	600	–	0%	100%
6/18/97	5731'	9.6	26	–	–	0/0	11.6	NC	NC	140000	600	–	TR	100%
6/19/97	5986'	9.5	27	–	–	0/0	11.6	NC	NC	130000	4820	–	TR	100%
6/20/97	6094'	9.8	27	–	–	0/0	11.6	NC	NC	166 K	720	–	0%	100%
6/21/97	6984'	9.2	26	–	–	0/0	11.8	NC	NC	102 K	560	–	1%	99%
6/22/97	7599'	9.2	27	1	1	0/0	11.8	NC	NC	106 K	500	–	2%	98%
6/2397	7884'	9.2	29	1	2	0/0	11.8	NC	NC	102 K	680	–	2%	98%
6/24/97	8731'	9.0	29	1	2	0/0	11.6	NC	NC	76000	600	–	4%	96%
6/25/97	8853'	8.9	29	1	2	0/0	11.0	NC	NC	71000	600	–	6%	94%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL

DEPTH	LITHOLOGY
5590.00 5600.00	"LS crm-wh,ltgy-ltgybrn,crpxl,occ micxl,chk,v sl plty,arg ip,cln-dns,sl anhy,tt,NFSOC"
5600.00 5610.00	"DOL tan,m-ltgybrn,crpxl-micxl,vfxl,rthy-dns,sl chky,tr pp LS-frag incl,sl arg ip,rr-tr trnsl xln ANHY incl,tt-vrr intxl POR,n-v dull orng mnrl FLOR,NSOC"
5610.00 5620.00	"LS crm-wh,ltgy-ltgybrn,crpxl,occ micxl,chk,v sl plty,arg ip,cln-dns,tr pp DOL incl,occ grdg to lmy DOL,tr trnsl-bf CHT frag,v sl anhy,tt,NFSOC"
5620.00 5630.00	"SH lt-mgy,occ dkgy-gybrn,plty-sbplty-sbblky,sft-mfrm,slty-arg,occ sl sdy ip,calc-sl lmy"
5630.00 5640.00	"LS wh,crm,ltgy-ltgybrn,crpxl,occ micxl,v chky-arg,sl plty-v sl shy ip,occ sl slty,cln-dns,tr trnsl-bf CHT frag,v sl anhy,tt,NFSOC,w/ DOL AA,NFSOC"
5640.00 5650.00	"DOL m-ltgy,micxl-vfxl,occ crpxl,rthy,slty-sl sdy/tr lmy cmt,v-sl chky,tr pp LS-frag incl,grdg to dol LS,v sl arg ip,rr-tr trnsl xln ANHY incl,tt-vrr intx/tr lmy cmt fl POR,tr spty dull yel FLOR,rr brn STN,n-tr slow strmg CUT"
5650.00 5660.00	"LS wh-tan,ltgy,crpxl-micxl,slty-vslty ip,chty,dns,sl anhy,tt,NFSOC,w/DOL mbrn,micxl,rthy,lmy,AA"
5660.00 5669.00	"LS AA,tt,NFSOC,w/trnsl-bf CHT frag & DOL bri-dkbrn,micxl,rthy,sl slty,lmy,tt,NFSOC"
5670.00 5690.00	"LS crm-tan,ltgy,crpxl,occ micxl,rthy-chk,chty-scat trnsl-bf CHT frag,sl anhy,slty ip,occ dol,tt,NFSOC,w/tr DOL brn-dkbrn,micxl,rthy,arg-sl slty,lmy,tt-v rr intxl POR,NFSOC"
5690.00 5700.00	"LS AA,w/scat CHT frag,v rr thn lmy DOL incl AA,n-v rr intxl POR,NFSOC"
5700.00 5720.00	"LS crm-tan,ltgy,crpxl,occ micxl,rthy-chk,chty-scat trnsl-bf CHT frag,sl anhy,v sl slty,occ dol,rr mic fos,mrly ip,tt,NFSOC,w/tr DOL brn-dkbrn,micxl,rthy,arg-sl slty,lmy,tt-v rr intxl POR,NFSOC"
5720.00 5730.00	"LS AA,tt,NFSOC,CHT AA,w/thn DOL AA,bcmg mrly,grdg to dkgy-blk sbblky calc-sl dol occ carb mica SH"
5730.00 5740.00	"SH dkgy-brnblk,plty-sbplty-sbblky,frm-mhd,sl dol,intbd/plty DOL,occ sl slty,w/crm-tan,crpxl LS AA,NFSOC"
5740.00 5750.00	"LS crm-wh-ltgy,crpxl-micxl,rthy-v slty,chk,occ dns,sl anhy,grdg to v lmy SLTST ip,tt-v rr intxl POR,NFSOC,w/v thn DOL AA,rr CHT frag & dkgy SH lams"
5750.00 5770.00	"LS AA,v slty ip,bcmg v arg,incr cln-dns w/depth,v rr intxl POR,v rr spty fnt dull yel FLOR,n vis STN,n-v p v slow resid ring CUT,rr scat trnsl-bf CHT,v rr dkgy-blk SH lams,thn intbd DOL tan-brn,micxl,rthy,v rr intxl POR,n-v rr FLOR,n vis STN,v p ring CUT"

DEPTH	LITHOLOGY

5770.00 5780.00 "LS crm-tan-wh,crpxl,occ micxl,cln-dns,occ rthy-chk,sl slty,v thn DOL incl AA,scat v rr CHT frag,sl anhy,v rr mic fos,v rr frac,tt-v rr intxl-frac POR,n-v rr dull yel FLOR,n-v rr spty STN,v p resid CUT"

5780.00 5790.00 "LS AA,pred cln-dn,occ arg,anhy ip,tt,NFSOC,scat CHT frag,v thn brn-mbrn micxl arg lmy DOL v sl mrly tt,v rr mnrl FLOR,NSOC"

5790.00 5800.00 "LS AA,pred tan-brn,occ ltgy-wh,v chty-scat dkbrn-blk occ smky gy CHT frag,rr brn-gybrn micxl mrly DOL,v thn dkgy-blk SH lam,NFSOC"

5800.00 5810.00 "SH dkgy-brnblk,plty-sbplty-sbblky,frm-mhd,sl dol,intbd/plty DOL,occ sl slty,w/crm-tan,crpxl LS AA,NFSOC"

5810.00 5820.00 "DOL dkbrn-dkbrnblk,dkgybrn,micxl-crpxl,rthy,occ intbd/blk-dk brn arg-sl slty lmy SH,occ grdg to dol LS,tr blk-dkbrn CHT frag,tt-v rr intxl POR,NFSOC"

5820.00 5830.00 "LS lt-m-dkgybrn,wh-crm-tan,occ brn,ltgy,micxl-vfxl,crpxl,pred mot/blk-dkbrnblk arg-shy incl-strk,rthy-slty,chky,tr trnsl xln ANHY incl,sl dol ip,tt-tr intxl POR,NFSOC"

5830.00 5840.00 "LS crm-tan-wh,ltgybrn,micxl-vfxl,occ crpxl,rthy-chk,occ sl mot/dkbrn-brnblk shy DOL incl,v slty-arg,scat CHT frag,sl anhy,v rr mic fos,tt-v rr intxl POR,n-v rr dull yel FLOR,n-v rr spty STN,v p resid CUT"

5840.00 5860.00 "LS crm-tan-wh,ltgybrn,occ brn,crpxl,micxl-vfxl,dns,chky,occ mot AA,tr tnsl ANHY incl,tr scat CHT frag,tt-rr intxl POR,n-rr v dull yel FLOR,n-vrr spty brn STN,CUT AA"

5860.00 5870.00 "DOL dkbrn-brnblk,crpxl,occ micxl,dns,occ intbd/lt-mgybrn crpxl LS AA,shy/occ mot/arg strk,tr intbd trnsl xln ANHY,tr scat brn-dkbrn CHT frag,tt,NFSOC"

5880.00 5890.00 "LS lt-mgybrn,crm-wh,tan-ltbrn-brn,dkbrn-brnblk,crpxl-micxl,occ vfxl-micsuc,pred dns-rthy,occ cln-chky,sl arg,tr scat wh-trnsl sdy-slty strk/lmy cmt,tr ANHY,rr GAST fos,rr CHT,tt-tr intxl POR,tr scat spty dull yel FLOR,tr dif/v slow strmg CUT"

5890.00 5910.00 "SS ltgy,wh-trnsl,ltgybrn-ltbrn,vf-f gr,w srt,rd-sbrd,cln,v slty-sl sdy ip/calc-sil arg cmt-fl,occ dns,chky-sl anhy,tr pp LS incl/occ frag,tr mic fos,grdg to sil vf gr LS GRNST ip,tr v dull yel FLOR,n vis STN,v p res ring CUT"

5910.00 5920.00 "LS crm-wh-tan,ltbrn-brn,occ ltgy,crpxl,occ micxl-vfxl,pred cln/occ blk lam,chk-occ v chk,tr scat CHT & ANHY frag AA,pred dns tt LS PCKST/intbd lmy SS AA,tt-vrr frac POR,tr v dull yel FLOR,n-tr ltbrn STN,v p res ring CUT"

5920.00 5930.00 "LS ltbrn-ltgy-ltgybrn,ooc crm,mbrn,crpxl-micxl,dns,sl chk-arg,scat trnsl-mlky CHT,tr trnsl ANHY incl,rr GAST fos,tt-rr intxl POR,n-v fnt dull yel FLOR,tr brn/rr blk STN,n CUT"

5930.00 5950.00 "LS wh,ltgy,lt-mgybrn,tan,occ brn,crpxl,micxl-occ vfxl,dns,cln,chky,shy-occ sl slty,sl arg ip,tr scat trnsl-mlky CHT,rr ANHY incl,POR-FLOR-STN-CUT AA"

5940.00 5950.00 "LS wh-ltgy-tan,crpxl,occ micxl,anhy,v rr frac-ANHY fl frac,sl dol,v rr mic fos,tt,NFSOC,w/v rr thn ltbrn micxl DOL,tt,NFSOC,incr trnsl-clr-bf CHT frag"

DEPTH	LITHOLOGY

5950.00 5960.00 "LS AA,v sl arg-v sl mrly,DOL AA,occ sl mrly,tr trnsl-bf CHT frag,v rr thn blk-dkgy carb sbblky calc-dol SH lams"

5960.00 5980.00 "SH dkgy-blk,sbblky-blky,sft-mfrm,rthy,mica,sl slty,calc-dol,carb-sooty,w/wh-crm-ltbrn,crpxl,occ micxl,dns,sl anhy,arg,tt LS & v thn ltbrn-gybrn-gy,micxl,rthy,sl mrly DOL,NFSOC"

5980.00 5990.00 "SH AA,slty-v slty,v arg,v sft,w/scat trnsl-bf CHT frag,occ ltbrn micxl arg sl lmy tt DOL & crm-tan-wh crpxl-micxl rthy-chk dns-cln sl dol tt LS"

5990.00 6010.00 "SH blk,sbblky-blky,sft-mfrm,mica,v arg,slty-v slty,calc-dol,carb,sooty,w/intbd brn-tan-ltgybrn,crpxl-micxl,rthy-v sl slty,sl mrly DOL,occ grdg to dol SH,v rr intxl POR,NFSOC & crm-tan-ltgy,crpxl,occ micxl,slty-v slty,sl dol tt LS,NFSOC,v rr trnsl-bf CHT "

6010.00 6030.00 "LS crm-tan-wh,occ ltgy,crpxl,rr micxl,occ slty-v slty,arg ip,sl chty-trnsl-vf CHT frag incr w/depth,sl anhy,tt,NFSOC,w/intbd lt-mbrn micxl rthy lmy sl arg DOL,tt-v rr intxl POR,NFSOC & v thn SH AA,"

6030.00 6040.00 "LS brn-ltbrn,occ crm-wh,crpxl-micxl,rthy-arg ip,cln-dns,occ anhy,slty-v slty ip,sl dol,tt,NFSOC,w/intbd ltbrn-dkbrn,crpxl-micxl,rthy-cln,lmy DOL tt,NFSOC,v thn blk carb SH lams,scat trnsl CHT frag"

6040.00 6050.00 "DOL m-ltgybrn,occ ltgy,micxl-micsuc,DOL GRNST/tr lmy cmt ip,sl slty/occ sdy strk,tr dk SH-mica incl,tt-rr intxl POR/chky arg fl,NFSOC"

6050.00 6060.00 "LS tan-crm-wh,ltgybrn-ltgy,occ brn-dkbrngy,crpxl-micxl,vfxl-sl micsuc,pred cln PCKST/scat v chky-arg mot frag,occ slty-sl sdy/lmy cmt,tr xln ANHY,sl chty,tt-rr intxl POR,tr scat v dull orng mnrl FLOR,rr brn STN,n CUT"

6060.00 6080.00 "LS tan-crm-wh,occ brn,crpxl-micxl,occ vfxl-gran,PCKST/tr plty chky prtgs,cln,v sl slty,sl anhy,tr xln calc & bf-tan CHT incl,tr trnsl sil-qtz incl-frag,tt-rr intxl-frac POR,n-rr scat v dull yel FLOR,n-vrr ltbrn STN/vrr blk STN,v fnt res ring CUT,w/DOL AA"

6080.00 6090.00 "LS AA,incr scat trnsl xln calc & CHT,tt-tr intxl-frac POR,n-tr scat mod bri-dull yel FLOR,tr ltbrn-rr brn STN,vrr pp blk dd o STN,v fnt res ring CUT,w/DOL AA"

6094.00 6100.00 " ABNT SH CVGS AFTER TRIP
LS pred wh-crm-tan,occ brn LS PKST,occ rthy-chk,cln-dns,v rr frac-ANHY fl,v rr POR,n-v rr v spty dull yel FLOR,n vis STN-CUT"

6100.00 6110.00 "LS AA,pred crm-tan-brn LS PKST AA,v rr p frac POR,v p FLOR-STN-CUT,w/v rr ltbrn-brn,micxl,rthy,lmy DOL PKST,tr trnsl-brn CHT frag,tr blk carb SH CVGS"

6110.00 6120.00 "LS AA,sl dol-v rr DOL cmt,POR-FLOR-STN-CUT AA,scat CHT frag,tr SH CVGS"

6120.00 6140.00 "LS crm-tan,occ ltbrn,v rr brn,crpxl-micxl,anhy,dns,chk ip,LS PKST,bcmg v sl ooc LS GRNST w/depth,rr trnsl-bf CHT frag,fr-g intxl-scat tr ool POR,occ ANHY fl POR,tr-fr dull-bri yel FLOR,rr-tr ltbrn-brn STN,tr of fr slow-fast stmg CUT"

6140.00 6160.00 "LS tan-ltbrn,occ crm-wh,crpxl-vfxl,gran-micsuc ip,occ rthy-chk,pred cln,sl anhy,dol-tr DOL rich cmt,scat trnsl-bf CHT frag,tr-fr intxl-tr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn STN,fr-g mod fast-fast stmg mlky CUT"

DEPTH	LITHOLOGY

6160.00 6190.00 "LS AA,w/scat crpxl,dns,tt,sl anhy LS PKST,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

6190.00 6220.00 "LS tan,occ ltbrn-crm,crpxl-vfxl,gran-micsuc ip,pred oolicastic LS GRNST,w/scat LS PKST,anhy ip-occ ANHY fl POR,v rr scat trnsl CHT frag,occ dol-rr DOL rich cmt,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-ltbrn STN,rr blk dd o STN,g mod fast-fast CUT"

6220.00 6240.00 "LS AA,pred oolicastic LS GRNST,rr LS PKST,POR-FLOR-STN-CUT AA"

6240.00 6260.00 "LS tan-ltbrn,rr crm,crpxl-vfxl,occ gran-micsuc,pred oolicastic LS GRNST,sl anhy-v rr ANHY fl POR,tr DOL rich cmt,scat dns,tan LS PKST,pred g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g ltbrn-brn STN,v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6261.00 6270.00 "LS AA,sl incr CHT frag,POR-FLOR-STN-CUT AA"

6270.00 6290.00 "LS tan-ltbrn,rr brn,crpxl-vfxl,gran-micsuc ip,oolicastic,pred LS GRNST,sl incr dns anhy LS PKST,occ DOL rich cmt,tr trnsl CHT frag,occ ANHY xl-incl-tr POR fl,fr intxl-ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,fr-g mod fast-fast stmg CUT"

6290.00 6300.00 "LS AA,incr ool POR,FLOR-STN-CUT AA"

6300.00 6330.00 "LS tan-ltbrn,occ brn,crpxl-vfxl,occ gran,micsuc ip,oolicastic,intbd LS GRNST & PKST,scat ANHY xl-incl,tr DOL rich cmt,rr trnsl-bf CHT frag,fr ool-tr intxl POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6330.00 6340.00 "LS tan-ltbrn,occ crm-wh,crpxl-gran-vfxl,occ micsuc ip,oolicastic,intbd LS GRNST/incr scat PKST,tr ANHY xl-incl,tr trnsl-bf CHT frag,rr dol cmt,tr intxl/scat ool POR,g even scat mod bri-bri yel FLOR,STN-STN-CUT AA"

6340.00 6361.00 "LS tan-ltbrn,occ brn,crpxl-vfxl,occ gran-oolicastic,pred ool LS GRNST/intbd PKST,scat ANHY xl-incl,rr-tr DOL rich cmt,rr trnsl-bf CHT frag,fr-g ool/tr intxl POR,g-fr dull-bri yel FLOR,tr-fr ltbrn-brn/rr pp blk dd o STN,g mod fast-fast stmg CUT"

6360.00 6380.00 "LS tan-ltbrn,occ brn,crpxl-vfxl-ooliclastic,occ gran-micxl,pred ool LS GRNST/intbd PKST,scat ANHY xl-incl,rr-tr DOL rich cmt,trnsl-bf CHT incl,g ool/tr intxl POR,g-fr scat dull-bri yel FLOR,tr-fr ltbrn-brn/rr pp blk dd o STN,g dif/mod fast-fast stmg CUT"

6380.00 6400.00 "LS tan-ltbrn,occ brn,crpxl-vfxl-oolicastic,occ micxl-gran,pred ool LS GRNST/intbd PKST,tr scat ANHY xl-incl,rr-tr DOL rich cmt,tr trnsl-bf CHT frag,fr-g ool/tr intxl POR,g-fr dull-bri yel FLOR,tr-fr ltbrn-brn/rr pp blk dd o STN,g dif/mod fast stmg CUT"

6400.00 6410.00 "LS AA,ool LS GRNST/tr intbd PCKST,g-fr ool-intxl POR,g bri-mod bri yel FLOR,g-fr ltbrn-brn/tr blk dd o STN,g dif-mod fast strmg CUT"

6410.00 6430.00 "LS tan-ltbrn,occ brn,crpxl-vfxl,gran-oolicastic,pred ool LS GRNST/intbd PKST,tr ool-mic fos incl,rr scat ANHY xl-incl,rr-tr trnsl-bf CHT frag,g-fr ool/tr intxl POR,g-fr dull-bri yel FLOR,tr-fr ltbrn-brn/blk dd o STN,g fast stmg mlky-blooming CUT"

DEPTH	LITHOLOGY

6430.00 6450.00 "LS tan-ltbrn,occ brn,vfxl-oolicastic-gran,occ crpxl,pred ool LS GRNST/intbd PKST,tr scat xln ANHY-rr incl,tr-rr DOL rich cmt,rr trnsl-bf CHT incl,fr-g ool/tr intxl POR,g even mod bri-bri yel FLOR,fr-g ltbrn-brn/tr blk dd o STN,g mod fast stmg mlky CUT"

6450.00 6470.00 "LS tan-ltbrn,occ brn,vfxl-crpxl-gran,oolicastic,pred ool LS GRNST/tr intbd PKST,tr ool-mic fos incl,rr scat ANHY xl-incl,tr trnsl-bf CHT incl-frag,g ool/tr intxl POR,g-fr dull-bri yel FLOR,tr-fr ltbrn-brn/blk dd o STN,g dif/slow blooming mlky CUT"

6470.00 6490.00 "LS tan-ltbrn,occ brn,vfxl-oolicastic-gran,occ crpxl,pred ool LS GRNST/intbd PKST,tr bf-trnsl CHT incl,tr-rr DOL rich cmt,rr trnsl xln ANHY,fr-g ool/tr intxl POR,g mod bri-bri yel FLOR,fr-g ltbrn-brn/tr blk dd o STN,g mod fast stmg mlky CUT"

6490.00 6500.00 "LS AA,ool LS GRNST/tr scat-intbd PCKST,tr DOL cmt,tr CHT incl,rr trnsl xln ANHY frag,g-fr ooc-intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn-brn/scat blk dd o STN,g mod fast-fast stmg mlky CUT"

6500.00 6520.00 "LS tan-ltbrn,occ crm,brn,vfxl-oolicastic-crpxl,gran-micxl-micsuc,ooc LS GRNST/scat-intbd PCKST,cln-sl chky,tr ool & rr mic fos,tr bf-tan/occ trnsl CHT incl-frag,sl dol ip,g ool-intxl POR,g even mod bri-bri yel FLOR,g ltbrn/occ brn & blk DD o STN,CUT AA"

6520.00 6540.00 "LS tan-ltbrn,occ brn,vfxl-oolicastic-gran,occ crpxl,pred ool LS GRNST/intbd PKST,tr scat xln ANHY-rr incl,tr-rr DOL rich cmt,rr trnsl-bf CHT incl,fr-g ool/tr intxl POR,g even mod bri-bri yel FLOR,fr-g ltbrn-brn/tr blk dd o STN,g mod fast stmg mlky CUT"

6540.00 6550.00 "LS AA,ool LS GRNST/scat-intbd PCKST,incr bf-tan-occ trnsl CHT incl-rr frag,sl dol ip,POR-FLOR-STN-CUT AA"

6550.00 6570.00 "LS AA,ool LS GRNST/tr scat-intbd PCKST,tr bf-tan-occ trnsl CHT incl-rr frag,rr trnsl xln ANHY frag,occ sl dol ip,g-fr ooc-intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn-brn/scat blk dd o STN,g slow-mod fast stmg mlky CUT"

6570.00 6590.00 "LS tan-ltbrn,occ crm-wh,brn,crpxl-vfxl-micxl,crpxl-ooliclastic,pred LS GRNST/incr scat-intbd PCKST,dns,cln-sl chk,sl dol-occ grdg to lmy DOL,tr tan-bf CHT incl-frag,rr-tr xln ANHY,fr intxl-occ ooc POR,rr mod bri-bri yel FLOR,STN-CUT AA"

6590.00 6600.00 "LS AA,pred scat LS PCKST-occ intbd/GRNST,dns,cln-sl chk,sl dol-occ grdg to lmy DOL,tr tan-bf CHT incl-frag,rr-tr xln ANHY,tt-fr intxl-occ ooc POR,FLOR-STN-CUT AA"

6600.00 6610.00 "LS AA,vfxl-ooc-crpxl,gran-micxl-micsuc,ooc LS GRNST/scat-intbd PCKST,tr ool & rr mic fos,tr bf-tan/occ trnsl CHT incl-frag,sl dol ip,g ool-intxl POR,g even mod bri-bri yel FLOR,g ltbrn/occ brn & blk dd o STN,g mod fast strmg CUT"

6610.00 6630.00 "LS AA,ooc LS GRNST/scat-intbd PCKST,cln-sl chky,tr ool fos,bf-tan/occ trnsl CHT incl-frag,v sl dol ip,g ool-intxl POR,g mod bri-bri yel FLOR,g ltbrn/occ brn & blk DD o STN,fr-g dif/tr slow strmg CUT"

6630.00 6650.00 "LS AA,ool LS GRNST/tr scat-intbd PCKST,tr bf-tan-occ trnsl CHT incl-rr frag,rr trnsl xln ANHY frag,occ sl dol ip,g-fr ooc-intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn-brn/scat blk dd o STN,g slow-mod fast stmg mlky CUT"

DEPTH	LITHOLOGY

6650.00 6660.00 "LS AA,pred ooc LS GRNST/incr scat PCKST frag-incl,incr CHT AA,tr xln ANHY,tr plty chky prtgs,sl dol,fr-g ooc-intxl POR,g scat bri yel FLOR,g ltbrn-occ brn/tr scat pp blk dd o STN,g mod slow-fast strmg CUT"

6660.00 6680.00 "LS AA,vfxl-ooc-crpxl,gran-micxl-micsuc,ooc LS GRNST/scat-intbd PCKST,tr bf-tan/occ trnsl CHT incl-frag,tr scat xln ANHY,g ool-intxl POR,g scat mod bri-bri yel FLOR,g ltbrn-occ brn/tr scat blk dd o STN,g mod slow-fast strmg mlky CUT"

6680.00 6700.00 "LS AA,vfxl-ooc-crpxl,gran-micxl-micsuc,ooc LS GRNST/scat-intbd PCKST,tr ool & rr mic fos,tr bf-tan/occ trnsl CHT incl-frag,sl dol ip,g ool-intxl POR,g even mod bri-bri yel FLOR,g ltbrn/occ brn & blk DD o STN,g mod fast strmg CUT"

6700.00 6730.00 "LS tan-ltbrn,occ crm-wh,brn,vfxl-crpxl-ooliclastic,gran-micxl,pred ooc LS GRNST/scat-intbd PCKST,cln-sl chk,tr sl dol cmt,rr CHT incl-frag AA,tr xln ANHY,fr ooc-intxl POR,g mod bri-bri yel FLOR,g-fr ltbrn-brn/scat blk dd o STN,g dif/slow strmg mlky CUT"

6730.00 6750.00 "LS tan-ltbrn,occ crm-wh,brn,crpxl-vfxl-micxl,crpxl-ooliclastic,pred LS GRNST/scat-intbd PCKST,dns,cln-sl chk,v sl dol,tr tan-bf-trnsl CHT incl-frag,rr-tr xln ANHY,fr-g ooc-intxl POR,g mod bri-bri yel FLOR,STN-CUT AA"

6750.00 6760.00 "LS AA/incr PCKST,bcmg incr dol-occ grdg to lmy DOL ip,dns,cln,tt,GRNST g-fr ool-intxl POR,FLOR-STN-CUT AA"

6760.00 6780.00 "LS tan-ltbrn,occ crm-wh,brn,vfxl-crpxl-ooliclastic,gran-micxl,pred ooc LS GRNST/scat-intbd PCKST,cln-sl chk,tr sl dol cmt,tr CHT incl-frag AA,rr xln ANHY,g ooc-intxl POR,g mod bri-bri yel FLOR,g-fr ltbrn-brn/scat blk dd o STN,g dif/slow strmg mlky CUT"

6780.00 6800.00 "LS AA,vfxl-crpxl-ooliclastic,gran-micxl,pred ooc LS GRNST/scat-intbd PCKST,cln-sl chk,tr sl dol cmt,tr scat chky prtgs,rr CHT AA,tr xln ANHY,rr CHT AA,POR-FLOR-STN-CUT AA"

6800.00 6810.00 "LS AA,sl incr v sl ool tt LS PKST,sl decr POR,FLOR-STN-CUT AA"

6810.00 6830.00 "LS tan-crm,occ brn,crpxl-vfxl,occ gran,v sl micsuc,pred oolicastic LS GRNST,occ tt ool LS PKST,anhy ip-rr ANHY xl-incl,v rr Crin fos,sl DOL cmt,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6830.00 6840.00 "LS AA,decr ool LS GRNST,pred tt ool sl anhy LS PKST,tr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,scat tr-fr brn STN,fr-g mod fast stmg CUT"

6840.00 6870.00 "LS tan-crm,occ brn,crpxl-vfxl,gran ip,sl micsuc,pred oolicastic LS GRNST,tt anhy ool LS PKST ip,scat ANHY xl-incl,sl DOL cmt,rr trnsl-bf CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,n-v rr blk dd o STN,fr-g mod fast-fast CUT"

6870.00 6880.00 "LS AA,sl incr v sl ool tt LS PKST w/tr ANHY fl POR,sl decr POR,FLOR-STN-CUT AA"

6880.00 6900.00 "LS crm-tan,ltbrn-brn,crpxl-micxl,occ vfxl-gran,sl micsuc,tr DOL cmt,sl ool LS PKST w/decr LS GRNST AA,tt-fr intxl-tr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn STN,tr-fr mod fast-fast stmg CUT,occ QTZ xl in ool POR"

DEPTH	LITHOLOGY

6900.00 6910.00 "LS AA,pred ool LS GRNST w/rr ANHY fl POR,incr ool-intxl POR,fr-g FLOR-STN-CUT AA"

6910.00 6940.00 "LS tan-crm,occ brn,crpxl-vfxl,gran ip,sl micsuc,pred oolicastic LS GRNST,w/intbd tt ool LS PKST ip,scat ANHY xl-incl,sl DOL cmt,rr trnsl-bf CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,n-v rr blk dd o STN,fr-g mod fast-fast CUT"

6940.00 6970.00 "LS tan-brn,crm,crpxl-vfxl,occ gran-micsuc,oolicastic,DOL rich cmt ip,scat ANHY xl-incl-v rr POR fl,occ tt ool LS PKST,scat CHT frag,tr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,tr-fr g mod fast-fast stmg CUT"

6970.00 6980.00 "LS AA,incr tt LS PKST,incr ANHY xl-incl,sl decr POR,FLOR-STN-CUT AA"

6980.00 7000.00 "LS intbd oolicastic,sl dol,anhy LS GRNST & tt,chty,LS PKST w/ANHY fl POR,decr POR-FLOR-STN-CUT"

7000.00 7020.00 "LS tan-ltbrn,occ crm,crpxl-vfxl,occ gran-micsuc,occ ANHY xl-incl,sl dol,pred LS GRNST,scat intbd tt ool LS PKST,v rr CHT frag,tr-g intxl-tr ool POR,tr-g dull-bri yel FLOR,tr-fr ltbrn STN,fr g mod fast-fast stmg mlky CUT"

7020.00 7030.00 "LS AA,incr tt ool anhy LS PKST,w/incr trnsl-clr CHT frag,POR-FLOR-STN-CUT"

7030.00 7050.00 "LS pred anhy dol oolicastic LS GRNST,w/thn tt LS PKST,fr-g POR-FLOR-STN-CUT AA"

7070.00 7090.00 "LS tan-ltbrn,occ crm,crpxl-vfxl,occ gran-micsuc,tr ANHY xl-incl,sl dol,pred LS GRNST,scat intbd tt ool LS PKST,tr CHT frag,tr-g intxl-tr ool POR,tr-g dull-bri yel FLOR,tr-fr ltbrn STN,fr g mod fast-fast stmg mlky CUT"

7090.00 7100.00 "LS tan-brn,wh ip,crpxl-micxl,anhy ip,dns,tt,v sl dol,tt-anhy fl oolicasts,occ plty,pred PKST,w/intbd thn ool LS GRNST,tt-fr intxl-ool POR,fr dull-bri yel FLOR,tr ltbrn STN,tr g mod fast stmg CUT"

7100.00 7120.00 "LS tan-ltbrn,occ crm,crpxl-vfxl,occ gran-micsuc,tr ANHY xl-incl,sl dol,pred LS GRNST,scat intbd tt ool LS PKST,tr CHT frag,tr-g intxl-tr ool POR,tr-g dull-bri yel FLOR,tr-fr ltbrn STN,fr g mod fast-fast stmg mlky CUT"

7110.00 7130.00 "LS pred intbd oolicastic LS GRNST,sl anhy,dol,chty ip,w/intbd tt-occ plty,ool ip,crm-wh-tan LS PKST,fr intxl-tr ool POR,tr-fr bri-occ dull yel FLOR,tr-fr ltbrn STN,occ spty blk dd o STN,fr g mod fast-fast stmg CUT"

7130.00 7140.00 "LS AA,pred sl ool LS PKST,anhy-sl dol,w/thn intbd oolicastic LS GRNST,POR-FLOR-STN-CUT AA"

7140.00 7170.00 "LS tan-ltbrn,occ crm,crpxl-vfxl,occ gran-micsuc,tr ANHY xl-incl,sl dol,pred LS GRNST,scat intbd tt ool LS PKST,tr trnsl-bf CHT frag,tr-g intxl-tr ool POR,tr-g dull-bri yel FLOR,tr-fr ltbrn STN,v rr blk dd o STN,fr g mod fast-fast stmg mlky CUT"

7170.00 7190.00 "LS AA,pred sl dol,oolicastic LS GRNST,w/incr ANHY xl-incl w/depth,scat LS PKST,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

7190.00 7220.00 "LS tan-brn,crm ip,crpxl-vfxl,gran-micsuc ip,rr wh-plty LS PKST,pred oolicastic LS GRNST,scat ANHY xl-incl,dol ip,rr-tr scat trnsl-bf CHT frag,fr-g intxl-tr-fr ool POR,fr-g dull-bri yel FLOR,fr ltbrn STN,v rr spty blk dd o STN,fr-g mod fast-fast CUT"

7220.00 7230.00 "LS AA,incr tt-sl anhy-tt LS PKST,incr CHT-ANHY,decr intxl POR,FLOR-STN-CUT AA"

7230.00 7250.00 "LS tan-ltbrn,occ crm,brn,crpxl-vfxl,micxl-gran,tr ooc,pred PCKST/scat ooc GRNST frag,cln,dns,occ sl dol ip,tr bf-tan-occ mlky CHT frag-incl,rr-tr plty chky prtgs,rr xln ANHY,tt-tr intxl/rr ooc POR,g-fr scta mod bri-bri yel FLOR,STN & CUT AA"

7250.00 7270.00 "LS AA,vfxl-ooc-micxl,crpxl-gran,ooc LS GRNST/scat PCKST frag-incl,dns,occ v sl dol ip,incr bf-tan-occ mlky CHT incl-frag,rr ool,rr-vrr plty chky prtgs,rr xln ANHY,fr-g ooc-intxl POR,g-fr scat mod bri-bri yel FLOR,g ltbrn-tr brn/scat blk dd o STN,CUT AA"

7270.00 7290.00 "LS AA,ooclastic LS GRNST/tr dol cmt,tr tan-bf-occ mlky CHT frag-incl,rr-tr trnsl xln ANHY,rr ool,w/ scat PCKST frag-rr incl,dns,sl chky,g ooc/fr-tr intxl POR,fr-g even-occ spty mod bri-bri yel FLOR,g ltbrn-brn/occ blk dd o STN,g mod fast-fast strmg CUT"

7290.00 7300.00 "LS AA,incr oolclastic LS GRNST,tr scat PCKST,CHT & ANHY AA,incr ooc POR,g even bri yel FLOR,g ltbrn-brn STN/incr blk dd o STN,g fast strmg-bloomig CUT"

7300.00 7320.00 "LS tan-ltbrn,occ crm,ltgytan,vfxl-ooc-crpxl,micxl-gran,ooc GRNST/tr scat PCKST frag,cln-sl mot,v sl chky,occ sl dol-dol cmt,tr bf-tan CHT incl-rr frag,vrr xln ANHY,g ooc-tr intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn/occ scat blk dd o STN,CUT AA"

7320.00 7340.00 "LS AA,vfxl-ooc-crpxl,micxl-gran,ooc GRNST/tr scat PCKST frag,cln-sl mot,v sl chky,occ dol cmt,tr bf-tan CHT incl-rr frag,vrr xln ANHY,rr ool & mic fos,g ooc-tr intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn-occ brn STN,scat blk dd o STN,g fast strmg CUT "

7340.00 7360.00 "LS AA,ooc GRNST/tr scat PCKST frag,cln,v sl chky,occ dol cmt,rr bf-tan CHT incl-frag,vrr xln ANHY,rr ool & mic fos,g ooc-tr intxl POR,g-fr mod bri-bri yel FLOR,g ltbrn-occ brn STN,scat blk dd o STN,g fast strmg mlky-blooming CUT "

7360.00 7390.00 "LS AA,ooc GRNST/decr scat PCKST frag,cln,v sl chky,occ dol cmt,rr bf-tan CHT incl,vrr xln ANHY,rr ool & mic fos,g ooc-fr intxl POR,g-fr bri-mod bri yel FLOR,g ltbrn-occ brn STN,scat blk dd o STN,g fast strmg mlky-blooming CUT "

7390.00 7400.00 "LS AA,ooc LS GRNST/rr-tr scat PCKST,tr dol cmt,rr ool-mic fos incl,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g ltbrn-tr brn STN,fr-g scat blk dd o STN,g mod fast-fast strmg mlky CUT"

7400.00 7430.00 "LS AA,ooc GRNST/rr scat PCKST frag,v sl chky,tr dol cmt-occ v sl dol ip,vrr-rr bf-tan CHT incl,ANHY AA,rr ool & mic fos,g ooc-tr intxl POR,g-fr even bri-mod bri yel FLOR,g ltbrn-occ brn STN,incr scat blk dd o STN,g slow blooming-mod fast strmg mlky CUT "

7430.00 7450.00 "LS tan-ltbrn,occ brn,crm,vfxl-ooc-crpxl,micxl-gran,ooc GRNST/rr PCKST frag,v sl chky,tr dol cmt-v sl dol,rr bf-tan CHT incl-frag,rr ool incl,vrr xln ANHY,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g ltbrn-brn/scat blk dd o STN,CUT AA"

DEPTH	LITHOLOGY

7450.00 7470.00 "LS AA,ooc LS GRNST/rr-tr scat PCKST,v sl chky,tr dol cmt,rr ool-mic fos incl,rr bf-tan CHT incl,vrr trnsl xln calc incl,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g ltbrn-tr brn STN,fr-g scat blk dd o STN,g slow blooming-mod fast strmg mlky CUT"

7470.00 7490.00 "LS AA,ooc GRNST/rr scat PCKST frag,v sl chky,tr dol cmt-occ v sl dol ip,rr ool & mic fos,vrr bf-tan CHT incl,vrr ANHY AA,g ooc-tr intxl POR,g-fr even bri-mod bri yel FLOR,g ltbrn-occ brn STN,occ scat blk dd o STN,g slow-mod fast strmg mlky CUT "

7490.00 7500.00 "LS AA,ooc LS GRNST/rr-tr scat PKST,rr ool-mic fos incl,CHT & ANHY AA,POR-FLOR-STN AA,g blooming-mod fast strmg CUT"

7500.00 7520.00 "LS AA,ooc LS GRNST/tr scat-intbd PCKST,tan-bf-occ trnsl CHT incl,tr dol cmt,rr ool-mic fos incl,vrr chky plty frag,rr scat trnxl xln ANHY,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g ltbrn-brn STN,fr scat blk dd o STN,g blooming-mod fast strmg CUT"

7520.00 7530.00 "LS AA,ooc LS GRNST/incr chky plty frag,tr crpxl dns-tt scat PKST frag-incl,incr CHT incl,ANHY AA,POR-FLOR-STN AA,g blooming-mod fast strmg CUT"

7530.00 7550.00 "LS tan-ltbrn,occ crm-wh,vfxl-crpxl-ooc,ooc GRNST intbd/dns-tt PCKST,incr scat chky plty prtgs,occ sl dol,tr tan-bf CHT incl-frag,rr xln ANHY,fr-g ooc/tr intxl POR,g mod bri-bri yel FLOR,g ltbrn/occ brn & scat blk dd o STN,g-fr slow-mod fast strmg CUT"

7550.00 7570.00 "LS wh-tan-brn,occ crm,crpxl-micxl,v sl vfxl-oolicastic,pred dns-tt LS PKST,v sl dol,occ v rr ooc LS GRNST,v rr CHT frag,tt-v rr intxl-ool POR,n-tr dull-bri yel FLOR,tr spty ltbrn STN,n-v rr spty blk STN,rr g mod fast-fast stmg CUT"

7570.00 7580.00 "LS pred brn-tan,occ wh,crpxl-micxl,plty PKST,v rr vfxl-gran,ooclicastic,sl anhy LS GRNST,v sl dol,v rr trnsl CHT frag,tt-tr intxl-rr ool POR,tr-fr dull-rr bri yel FLOR,tr ltbrn-v rr blk dd o STN,tr of g mod fast CUT"

7580.00 7600.00 "LS wh-tan-brn,occ crm,crpxl-micxl,tr vfxl-oolicastic,pred dns-tt LS PKST,v sl dol,occ v rr ooc LS GRNST,anhy ip-rr ANHY xl-incl,rr CHT frag,tt-fr intxl-ool POR,tr-fr dull-bri yel FLOR,tr spty ltbrn STN,rr spty blk STN,tr of g mod fast-fast stmg CUT"

7600.00 7610.00 "LS AA,pred wh-crm,crpxl,sl anhy,plty,occ v sl slty LS PKST,w/thn intbd sl oolicastic LS GRNST AA,POR-FLOR-STN-CUT AA"
7610.00 7620.00 7613.15 0 "LS AA,sl incr oolicastic LS GRNST,sl incr POR-FLOR-STN-CUT"

7620.00 7630.00 "LS tan-brn,wh-crm,crpxl-micxl,rr vfxl-gran,v rr oolicastic,pred LS PKST,occ slty-v sl sdy,w/v rr intbd ool LS GRNST,v sl anhy,tt-rr intxl-v rr ool POR,tr-fr dull-bri yel FLOR,n-v rr ltbrn STN,n-rr mod fast CUT"

7630.00 7650.00 "LS pred tan-wh,crpxl-micxl,plty,occ sl slty-v sl sdy,dns,sl anhy LS PKST,w/v thn intbd sl oolicastic LS GRNST,tt-v rr intxl-ool POR,tr spty dull-bri yel FLOR,rr ltbrn STN,n-v rr blk dd o STN,rr g mod fast stmg CUT"

7650.00 7670.00 "LS AA,v sl incr oolcastic LS GRNST,v rr-tr scat trnsl-clr CHT frag,POR-FLOR-STN-CUT AA"

7670.00 7680.00 "LS AA,incr oolicastic LS GRNST,scat CHT frag AA,anhy ip,sl incr POR-FLOR-STN-CUT

DEPTH	LITHOLOGY

7890.00 7920.00 "LS crm-tan-brn,crplx-vfxl,gran-micsuc ip,occ oolicastic,v sl anhy ip,v rr scat CHT frag,pred ool LS GRNST w/thn intbd wh plty LS PKST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN,v rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

7920.00 7950.00 "LS crm-tan-brn,crplx-vfxl,gran-micsuc ip,occ oolicastic,v sl anhy ip,rr-tr scat CHT frag,pred ool LS GRNST w/thn intbd wh plty LS PKST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN,v rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

7950.00 7970.00 "LS AA,occ incr LS PKST,w/sl incr trnsl-bf CHT frag,POR-FLOR-STN-CUT AA"

7970.00 8000.00 "LS crm-tan-brn,crplx-vfxl,gran-micsuc ip,occ oolicastic,v sl anhy ip,rr-tr scat CHT frag,pred ool LS GRNST w/v rr intbd wh plty LS PKST,fr-g intxl-ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,v rr spty blk dd o STN,fr mod fast-fast stmg CUT"

8000.00 8020.00 "LS AA,incr tt plty sl anhy LS PKST,sl decr POR-FLOR-STN-CUT"

8020.00 8050.00 "LS tan-brn,occ crm,rr wh,crpxl-vfxl,gran-micsuc,rr suc,pred sl oolicastic LS GRNST,w/rr thn intbd occ plty LS PKST,sl anhy,v sl dol ip,scat trnsl CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-rr blk STN,g mod fast-fast stmg CUT"

8050.00 8070.00 "LS tan-crm-ltbrn,occ brn,crplx-vfxl,gran-oolicastic,sl dol,v sl anhy ip,tr scat bf-tan CHT frag,pred ool LS GRNST/rr-tr intbd wh plty LS PKST,fr-g intxl-ool POR,fr even dull-bri yel FLOR,fr ltbrn-rr brn/v rr pp blk dd o STN,fr dif/slow stmg mlky CUT"

8070.00 8100.00 "LS AA,vfxl-crpxl-gran,occ oolicastic-micsuc,GRNST/tr scat PCKST frag,occ v sl dol,rr-tr intbd CHT AA,rr xl trnsl ANHY frag,rr scat plty chky frag,fr-g intxl-ooc POR,g-fr even-scat mod bri-dull yel FLOR,g-fr ltbrn-tr brn/vrr blk pp STN,g CUT AA"

8100.00 8120.00 "LS AA,vfxl-crpxl-gran,oolicastic-micsuc,GRNST/tr scat PCKST frag,occ sl dol,tr intbd bf-tan CHT incl,tr xl trnsl ANHY frag,rr scat plty chky frag,g intxl-ooc POR,g-fr even-scat mod bri-dull yel FLOR,g-fr ltbrn-brn/tr blk pp STN,g mod fast-fast strmg CUT"

8120.00 8130.00 "LS AA,LS GRNST/incr bf-tan CHT incl-tr frag,rr trnsl xl ANHY,g ooc-intxl POR,g even mod bri-dull yel FLOR,g-fr ltbrn-occ brn/tr blk pp STN,g dif/slow strmg mlky CUT"

8130.00 8150.00 "LS tan-crm-ltbrn,occ brn,crplx-vfxl,gran-oolicastic,sl dol,tr scat bf-tan CHT frag,pred ool LS GRNST/tr intbd crpxl dns LS PKST,vrr plty chk prtgs,g ooc-intxl POR,g even mod bri-bri yel FLOR,fr ltbrn-tr brn/rr-tr pp blk dd o STN,fr dif/slow stmg mlky CUT"

8150.00 8170.00 "LS AA,crpxl-vfxl-gran,occ oolicastic-micsuc,GRNST/tr scat PCKST frag AA,occ v sl dol,tr intbd CHT AA,rr xl trnsl ANHY frag,rr scat plty chky frag,fr-g intxl-ooc POR,g-fr even-scat mod bri-dull yel FLOR,g-fr ltbrn-tr brn/vrr blk pp STN,g CUT AA"

8170.00 8190.00 "LS AA,pred oolicastic LS GRNST/incr tan-bf-occ trnsl CHT incl-frag,tr scat tt dns crpxl PCKST,rr trnsl xl ANHY frag,g ooc-intxl POR,g even mod bri-bri yel FLOR,g-fr ltbrn/incr brn STN,occ scat pp blk dd o STN,g mod fast strmg-slow blooming CUT"

8190.00 8210.00 "LS AA,oolicastic LS GRNST,occ v sl-sl dol ip,tr CHT incl AA,vrr plty chky prtgs,tr scat PCKST,g ooc-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-tr scat brn/rr pp blk STN,g fast-mod fast strmg CUT"

DEPTH	LITHOLOGY
8210.00 8230.00	"LS tan-crm-ltbrn,incr brn,vfxl-gran-crpxl,oolicastic,sl dol,rr bf-tan CHT frag-incl,pred ool LS GRNST/tr crpxl dns LS PKST,rr-tr plty chk prtgs,g ooc-intxl POR,g even bri yel FLOR,fr ltbrn-incr brn/tr pp blk dd o STN,g blooming-fast stmg mlky CUT"
8230.00 8250.00	"LS AA/decr brn,pred oolicastic LS GRNST/incr tan-bf-occ trnsl CHT incl-frag,tr scat tt dns crpxl PCKST,rr trnsl xl ANHY frag,g ooc-intxl POR,g even mod bri-bri yel FLOR,g-fr ltbrn/incr brn STN,occ scat pp blk dd o STN,g mod fast-fast strmg CUT"
8250.00 8280.00	"LS tan-crm-ltbrn,occ brn,vfxl-crpxl,micxl-oolicastic-gran,sl dol,rr-tr bf-tan CHT incl,pred ool LS GRNST/tr crpxl dns LS PKST,rr plty chk prtgs,g ooc-intxl POR,g even bri yel FLOR,fr ltbrn-rr brn/rr pp blk dd o STN,g mod fast-fast stmg mlky CUT"
8280.00 8300.00	"LS AA,ooliclastic GRNST/tr scat PCKST,decr chky plty prtgs,tr tan-bf CHT incl,vrr trnsl xln ANHY frag,g-fr ooc-intxl POR,gmod bri-bri yel FLOR,g-fr ltbrn-tr brn/rr scat blk dd o STN,g dif/tr slow strmg mlky CUT"
8300.00 8320.00	"LS AA,vfxl-crpxl-oolicastic,micxl-gran,occ micsuc,ooc LS GRNST,v sl dol,tr CHT incl AA,rr plty chky prtgs,tr scat dns PCKSTfrag,g ooc-intxl POR,g even mod bri-bri yel FLOR,g ltbrn-tr scat brn/vrr blk STN,g slow-mod fast strmg mlky CUT"
8320.00 8350.00	"LS tan-crm-ltbrn,occ brn,vfxl-crpxl-oolicastic,occ micxl-crpxl,v sl dol,tr CHT frag-incl AA,pred ool LS GRNST/tr crpxl dns LS PKST,tr plty chk prtgs,vrr scat trnsl xln ANHY,POR-FLOR AA,fr ltbrn-occ brn/tr pp blk dd o STN,g slow-mod fast stmg mlky CUT"
8350.00 8360.00	"LS AA.vfxl-crpxl-oolicastic,gran-micxl,pred GRNST/tr scat dns PCKST,occ sl dol,tr intbd tan-bf-occ trnsl CHT,rr scat xl ANHY,tr chky plty frag,g even mod bri-dull yel FLOR,g ooc-intxl POR,fr ltbrn-tr brn STN,rr-tr scat blk STN,g mod fast-fast strmg CUT"
8360.00 8380.00	"LS tan-crm-ltbrn,occ wh,brn,vfxl-crpxl,gran-ooliclastic,ooc GRNST/sl incr plty chky prtgs & dns PCKST,tr CHT incl,vrr xln ANHY,g-fr ooc-intxl POR,g mod bri-bri yel FLOR,fr ltbrn-tr scat brn STN,tr-rr blk dd o STN,g dif/slow strmg mlky CUT"
8380.00 8400.00	"LS AA,pred ooc GRNST/incr wh plty chky prtgs,tr dns tt PCKST,tr CHT incl,vrr xln ANHY,g-fr ooc-intxl POR,g mod bri-bri yel FLOR,fr ltbrn-tr scat brn STN,rr blk dd o STN,g-fr dif/slow strmg mlky CUT"
8400.00 8430.00	"LS tan-crn-ltbrn,occ brn,crpxl-vfxl-micxl,ooc-gran,pred ooc GRNST/wh plty chky prtgs,tr dns tt PCKST,tr CHT incl,tr-rr xln ANHY,g-fr ooc-intxl POR,g mod bri-dull yel FLOR,fr ltbrn/tr scat brn STN,rr blk dd o STN,g-fr dif/slow strmg mlky CUT"
8430.00 8450.00	"LS AA,incr crpxl,pred ooc GRNST/scat wh plty chky-arg prtgs,tr dns tt PCKST,tr CHT incl,tr xln ANHY,fr-g ooc-intxl POR,g mod bri-bri yel FLOR,fr ltbrn-decr scat brn STN,rr-vrr blk dd o STN,fr dif/v-n slow strmg mlky CUT"
8450.00 8470.00	"LS tan-crm-ltbrn,occ wh,brn,crpxl,vfxl-gran-ooliclastic,pred cln tt dns-chky plty PCKST,tr scat ooc GRNST,tan-bf CHT incl & frag/vrr ool incl,rr xl ANHY,fr intxl-ooc POR,fr scat dull-mod bri yel FLOR,fr ltbrn-tr brn/vrr pp blk STN,fr dif/v fnt ring CUT"
8470.00 8490.00	"LS tan,lbrn,occ crm-wh,crpxl,vfxl-gran,ooliclastic-micxl,pred PCKST AA/incr ooc GRNST,occ v sl dol,incr tan-bf-occ trnsl scat CHT/vrr ool incl,vrr xl ANHY,POR-FLOR-STN AA,fr slow dif/v fnt res ring CUT"

DEPTH	LITHOLOGY

8490.00 8510.00 "LS crm-tan-brn,crpxl-vfxl,gran-suc ip,occ oolicastic,sl anhy,v sl dol,pred ooc LS GRNST,w/thn intbd dns tt LS PKST,scat trnsl-bf CHT frag,tr-g intxl-fr ool POR,tr-fr dull-bri yel FLOR,scat fr ltbrn-v rr blk STN,tr of g mod fast stmg CUT"

8510.00 8520.00 "LS AA,incr POR-FLOR-STN-CUT"

8520.00 8530.00 "LS AA,sl incr tan-bf crpxl LS PKST,v rr scat CHT frag,sl anhy,sl decr intxl POR-FLOR,decr ltbrn-incr blk dd o STN,fr CUT AA"

8530.00 8550.00 "LS tan-brn,occ crm,wh ip,crpxl-vfxl,occ gran-micsuc,intbd sl ool LS GRNST & dns,occ wh-plty LS PKST,anhy ip-v rr ANHY xl,rr-tr scat CHT frag,v sl dol,tt-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn STN,v rr spty blk dd o stn,tr-fr g mod fast CUT"

8550.00 8560.00 "LS AA,incr & bcmg crpxl-micxl,v sl ool LS PKST,w/LS GRNST AA,tr-fr intxl-tr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,tr-fr g mod fast-fast CUT"

8560.00 8580.00 "LS tan-brn,occ crm,wh ip,crpxl-vfxl,occ gran-micsuc,intbd sl ool LS GRNST & dns,occ wh-plty LS PKST,anhy ip-v rr ANHY xl,rr-tr scat CHT frag,v sl dol,tt-g intxl-tr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn STN,v rr spty blk dd o stn,tr-fr g mod fast CUT"

8580.00 8590.00 "LS pred oolicastic LS GRNST AA,w/thn intbd LS PKST,fr-g intxl-fr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn STN,tr spty blk dd o STN,tr-fr g mod fast-fast stmg CUT"

8590.00 8600.00 "LS AA,incr & bcmg crpxl-micxl,v sl ool LS PKST,w/LS GRNST AA,tr-fr intxl-tr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,tr-fr g mod fast-fast CUT"

8600.00 8630.00 "LS tan-brn,occ crm-wh,crpxl-vfxl,gran-micsuc ip,rr suc,oolicastic ip,pred LS GRNST,thn intbd LS PKSTN,v sl anhy,occ chty-scat trnsl-clr CHT frag,v sl dol,fr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn STN,rr-tr blk dd o STN,g mod fast-fast CUT"

8630.00 8650.00 "LS AA,incr crpxl-micxl,occ plty-wh,v sl ool LS PKST,w/LS GRNST AA,sl DOL rich cmt,fr intxl-tr ool POR,fr-tr dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,fr-tr g mod fast-fast CUT"

8650.00 8680.00 "LS wh-crm-tan-brn,crpxl-vfxl,occ gran-micsuc,oolicastic ip,rr tr DOL rich cmt,scat ANHY xl,intbd LS GRNST & LS PKST,tr-fr intxl-rr-tr ool POR,tr-g dull-bri yel FLOR,tr-fr lt-mbrn STN,rr blk dd o STN,tr of g mod fast-fast stmg CUT"

8680.00 8700.00 "LS tan-brn,occ crm-wh,crpxl-vfxl,gran-micsuc ip,rr suc,oolicastic ip,pred LS GRNST,thn intbd LS PKSTN,v sl anhy,occ chty-scat trnsl-clr CHT frag,v sl dol,fr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn STN,rr-tr blk dd o STN,g mod fast-fast CUT"

8700.00 8720.00 "LS AA,incr & bcmg crpxl-micxl,v sl ool LS PKST,w/LS GRNST AA,tr-fr intxl-tr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,tr-fr g mod fast-fast CUT"

8720.00 8730.00 "LS AA,incr crpxl-micxl,occ plty-wh,v sl ool LS PKST,w/LS GRNST AA,sl DOL rich cmt,fr intxl-tr ool POR,fr-tr dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,fr-tr g mod fast-fast CUT"

8730.00 8750.00 "LS tan-brn,occ crm,crpxl-micxl,dns,sl anhy,v sl dol,pred LS PKST,w/thn intbd ool LS GRNST AA,tr intxl-rr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn-v rr blk STN,tr of g mod fast-fast CUT"

DEPTH	LITHOLOGY
8750.00 8760.00	"LS AA,pred LS PKST,w/thn intbd ool LS GRNST AA,tr intxl-rr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn-v rr blk STN,fr dif/fnt res ring CUT"
8760.00 8790.00	"LS tan-crm-ltbrn,occ brn,wh,crpxl-micxl,occ ooc-vfxl,dns,sl anhy,v sl dol,pred LS PKST,w/thn intbd ool LS GRNST AA,scat chky-arg plty prtgs,tr tan-bf CHT incl,tr intxl-rr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn-v rr blk STN,fr dif/tr slow strmg CUT"
8790.00 8800.00	"LS AA,pred LS PKST,w/thn intbd ool LS GRNST AA,incr scat chky-arg plty prtgs,tr tan-bf CHT incl,POR-FLOR-STN-CUT AA"
8800.00 8820.00	"LS tan-crm-ltbrn,occ brn,wh,crpxl-micxl,occ ooc-vfxl,dns,sl anhy,v sl dol,pred LS PKST,w/thn intbd ool LS GRNST AA,scat chky-arg plty prtgs,tr tan-bf CHT incl,tr intxl-rr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn-v rr blk STN,fr dif/tr slow strmg CUT"
8820.00 8830.00	"LS AA,crpxl,incr micxl-vfxl-gran,occ ooc,dns,sl anhy,v sl dol,pred LS PKST/incr chky-arg plty prtgs,tr scat intbd ool LS GRNST,tr tan-bf CHT incl,tr intxl-rr ool POR,tr-fr scat dull-bri yel FLOR,STN-CUT AA"
8830.00 8850.00	"LS tan-brn,wh-crm ip,crpxl-micxl,occ vfxl-gran,v sl oolicastic,anhy,sl dol,pred dns sl slty occ plty LS PKST,w/v thn ooc LS GRNST,rr scat CHT frag,tt-tr intxl-v rr ool POR,tr spty dull-bri yel FLOR,rr-tr spty ltbrn-v rr blk STN,rr-tr g mod fast stmg CUT"
8850.00 8870.00	"LS AA,pred dns,tt,occ plty LS PKST,sl chty,w/v thn intbd occ ool LS GRNST,POR-FLOR-STN-CUT AA"
8870.00 8880.00	"LS AA,pred LS PKST,sl slty,tr intxl-v rr ool POR,FLOR-STN-CUT AA"
8880.00 8900.00	"LS crm-tan-brn,occ wh,crpxl-micxl,vfxl-misuc ip,occ dns,plty ip,v sl slty,occ anhy,pred LS PKST w/sl incr LS GRNST-sl ool,scat trnsl CHT frag,tt-tr intxl-ool POR,tr dull-bri yel FLOR,rr-tr ltbrn STN,v rr spty blk dd o STN,rr-tr g mod fast-fast stmg CUT"
8900.00 8920.00	"LS tan-crm-brn,crpxl-vfxl,gran-micsuc,occ dns-plty,incr v sl oolicastic LS GRNST,thn intbd LS PKST,v sl anhy,scat trnsl-clr CHT frag,v rr vf qtz grns,tt-fr intxl-rr ool POR,tr-fr dull-bri yel FLOR,n-v rr brn-blk STN,tr mod fast-fast stmg CUT"
8920.00 8930.00	"LS AA,intbd LS GRNST & LS PKST AA,decr FLOR-STN-CUT"
8930.00 8950.00	"LS tan-crm-brn,crpxl-vfxl,gran-micsuc,occ dns-plty,scat v sl oolicastic LS GRNST,thn intbd LS PKST,v sl anhy,scat trnsl-clr CHT frag,v rr vf qtz grns,tt-fr intxl-rr ool POR,tr-fr scat dull-bri yel FLOR,n-v rr brn-blk STN,fr dif/tr slow strmg CUT"
8950.00 8970.00	"LS tan-crm,wh,occ ltbrn,vfxl-crpxl,gran-micsuc,ooc,GRNST/ooc-sl slty strk,tr PCKST pred chky plty-occ dns frag-intbd in GRNST,tr xl ANHY,tr bf-trnsl CHT-sil incl,fr-g intxl-ooc POR,fr-g even mod bri-bri yel FLOR,tr ltbrn-rr brn/vrr scat pp blk STN,CUT AA"
8970.00 8990.00	"LS AA,scat ooc GRNST/incr chky-arg plty PCKST prtgs,PCKST pred dns,cln,tr scat CHT & ANHY AA,sl anhy,POR-FLOR-STN-CUT AA"
8990.00 9010.00	"LS tan-crm-ltbrn,occ wh-trnsl,micxl-vfxl-crpxl,gran-ooc,GRNST/decr chky plty-arg prtgs,cln,sl slty ip,scat PCKST frag-tr incl,sl anhy,tr CHT incl AA,fr-g ooc-intxl POR,fr dull-scat mod bri yel FLOR,tr ltbrn-brn STN/rr pp blk STN,fr dif/tr slow strmg CUT"

DEPTH	LITHOLOGY

9010.00 9030.00 "LS AA,incr crm-wh-occ trnsl,pred LS GRNST bcmg incr ooliclastic,scat chky-arg plty PCKST/occ dns frag,tr trnsl xln ANHY,tr bf-tan-occ trnsl CHT incl-frag,POR-FLOR-STN-CUT AA "

9030.00 9050.00 "LS tan,crm-wh-trnsl,occ ltbrn,vfxl-crpxl-gran,micsuc-ooc,pred GRNST/ooc-sl slty strk,incr chky plty PCKST/occ dns frag,tr xl ANHY,tr bf-trnsl CHT incl-frag,fr-g ooc-intxl POR,fr-g even dull-scat mod bri yel FLOR,STN AA,fr dif/tr slow strmg mlky CUT "

9050.00 9070.00 "LS AA,vfxl-crpxl-gran,ooliclastic-micsuc,cln,sl slty,v sl dol,pred ooc LS GRNST/decr intbd chky-arg plty PCKST,tr scat dns PCKST frag,tr bf-tan CHT incl,fr-g ooc-intxl POR,g even dull/scat mod bri yel FLOR,fr-g ltbrn/tr brn & vrr pp blk dd o STN,CUT AA"

9070.00 9090.00 "LS tan-crm,occ wh-trnsl,ltbrn-brn,vfxl-gran-micsuc,crpxl,LS GRNST/incr chky plty-arg prtgs,occ slty,tr scat dns LS PKST,v sl anhy,scat bf-trnsl-mlky CHT,tr-rr xl ANHY,tr-fr intxl-rr ool POR,tr dull-rr bri yel FLOR,n-tr ltbrn-vrr blk STN,tr slow dif CUT"

9090.00 9110.00 "LS AA,vfxl-gran-micsuc,crpxl,LS GRNST/abnt chky plty-arg PCKST prtgs,occ slty,scat dns LS PKST,incr scat CHT incl-frag AA,tr-rr xl ANHY,tr-fr intxl-rr ool POR,tr scat dull-rr bri yel FLOR,n-tr ltbrn-vrr blk STN,fr slow dif/tr slow strmg mlky CUT"

9110.00 9115.00 "LS AA,incr ltbrn-brn,vfxl-crpxl,micxl-gran.occ ooliclastic,GRNST/decr chky-arg plty frag,scat dns PCKST,tr CHT & ANHY AA,g-fr intxl-ooc POR,fr scat dull-tr mod bri yel FLOR,fr ltbrn/incr brn & pp blk STN,fr dif/tr slow strmg CUT"

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #18-21 Horizontal Lateral Leg 1 was a re-entry of the Mobil Ratherford Unit #18-21 located in Section 18, T41S, R23E, and was sidetracked in a southeasterly direction from a 5583' measured depth, 5583' true vertical depth, on June 16, 1997. The lateral reached a measured depth of 9115', true vertical depth of 5849' at total depth, with a horizontal displacement of 3381.5' and true vertical plane 307.4 degrees, on June 26, 1997, in the upper Desert Creek transition zone above the 1-A porosity zone, where the decision to terminate the lateral was made. The lateral was drilled with no problems. which were minor traces of H_2S gas, noted while milling the window, which was due to the well having been used for injection prior to the lateral being drilled. This lateral used fresh water and then brine water with polymer sweeps as the drilling fluid. Also a trip was made at a measured depth of 7884' to change the mud motor and the bit, as well as to add more drill pipe below the collars. A very minor amount of oil was noted while drilling the lateral through the 1-A porosity zone. The background gases noted on the accompanying mud log showed only moderately increases while drilling the 1-A porosity, and gradually decreased from a measured depth of 8300' to termination. The samples showed a fair amount of oil shows through out the drilling of the lateral in the 1-A section.

The primary objectives of the Ratherford Unit #18-21 Leg 1 horizontal lateral were the upper 1-A and 1-B porosity benches of the Desert Creek to identify and define the porosity benches, the effective porosity, staining and reservoir properties in both 1-A and 1-B zones of the Desert Creek Member of the Upper Paradox Formation. After drilling out the top of the 1-A porosity zone at approximately 8732' measured depth, a true vertical depth of 5857', and after turning the well bore down to reacquire the porosity, it was decided to reacquire the porosity and rotate the well out as far as possible in the 1-A zone.

The Upper Ismay, Lower Ismay, Gothic Shale, and the transition zone at the top of the Desert Creek were encountered while drilling the curve section of the lateral. Kick off point for this lateral was 5583', measured and true vertical depth, just above the top of the Upper Ismay in the basal carbonates of the Honaker Trail.

The base of the Honaker Trail Formation of the Upper Hermosa Group was predominately a cream to tan, brown to light gray brown, cryptocrystalline to microcrystalline, tight and dense, an very slightly anhydritic limestones, with very thin interbedded gray to gray brown, cryptocrystalline to microcrystalline, dense, slightly argillaceous dolomites. The limestones were occasionally slightly silty to very slightly sandy. Scattered buff to dark brown cherts were noted through out the basal Honaker Trail section. There was no to very rare visible porosity noted in the lower Honaker Trail, with no sample shows or gas increases. The dolomites at the base of the Honaker Trail graded into the medium gray to dark graybrown, carbonaceous, dolomitic, micaceous shale at the base, locally referred to as the Paradox Shale.

The Upper Ismay was picked at a measured depth of 5732' (5725' TVD) at the base of the Honaker Trail. The Upper Ismay was predominately light gray to cream to tan, occasionally brown, microcrystalline to cryptocrystalline, chalky, cherty, and occasionally fossiliferous limestone. There were very thin interbedded argillaceous, brown to gray brown, microcrystalline to microsucrosic

dolomite were present as well as minor amounts of very thin black, carbonaceous, slightly calcareous to dolomitic shale, and scattered brown to black to translucent chert fragments noted through out the Upper Ismay. Near the base of the Upper Ismay were significant amounts of silty limestone grading to very limy siltstone and very fine to fine grained, light gray to translucent, very limy sandstone, which graded to very sandy limestone. These sands and silts may indicate a possible slump feature in the basal Upper Ismay. There was very rare, scattered visible porosity noted in the Upper Ismay, with only a few zones of poor intercrystalline porosity with very rare visible stain, fluorescence and cut and no associated gas increases. The dolomites at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5909' measured depth, 5842' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was predominately a cream to white, light gray to medium brown limestone, microcrystalline to cryptocrystalline, very rarely granular, slightly silty to clean, cherty with a trace of scattered micro fossils and slightly silty to slightly sandy. Very little to no intercrystalline and very poor fractured porosity, with only very poor visible fluorescence, stain or cut was present in the limestone. Interbedded in the limestones were scattered light to dark brown, thin dolomites which were cryptocrystalline to microcrystalline, earthy to clean, with poor intercrystalline porosity, faint dull yellow fluorescence, rare spotty brown stain and a very poor diffuse to residual ring cut and very thin limy siltstones and calcareous sands were also noted. The limestones in the base of the Lower Ismay were very thin mottled gray to gray brown, cryptocrystalline to microcrystalline, and clean to argillaceous. The basal limestones and dolomites became very marly and graded into the Gothic Shale.

The top of the Gothic Shale was at 5965' measured depth, 5862' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and a distinct increase in the percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this leg occurred at a measured depth of 6026' and a true vertical depth of 5875'. In this well the zone was interbedded a very silty, dolomitic limestone, brown, limy, argillaceous dolomites and very thin carbonaceous shales. The limestones were cream to tan, some gray to white to brown to dark brown, cryptocrystalline to microcrystalline, argillaceous, with very rare intercrystalline porosity, but only very rare, spotty, dull fluorescence, with no visible stain, and a very poor slow ring cut. The interbedded dolomites were microcrystalline to granular, slightly silty and had no to very rare intercrystalline porosity, with a very poor sample show. The limestones graded into the oolicastic porosity of the 1-A zone.

The curve was landed in the transition zone just above upper most porosity bench of the 1-A zone. The limestones in this upper bench became increasingly granular and oolicastic with an increase in stain, fluorescence and cut. At a measured depth of 6110', 5911' true vertical depth , with a horizontal displacement of 366.4' a trip was made to change the bottom hole assemblies and bits. Upon resumption of drilling in the lateral section, the well bore was drilled at a very slight downward angle to try to acquire the porosity zone of the 1-A.

The top of the Desert Creek 1-A porosity zone was picked at 6125' measured depth, 5881' true vertical depth, with a horizontal displacement of 396', after drilling was resumed in the lateral. The pick was based on sample identification as well as a significant increase in the penetration rate. Of note is that the top of the porosity zone was flat with the top of the 1-A at the well bore. The top in this lateral was in a very oolicastic, clean to very slightly dolomitic, slightly anhydritic limestone

grainstone. Noted in the limestone were thinly interbedded slightly silty and limy dolomite grainstones near the top. The limestone was cream to tan, light brown to occasionally brown, with intercrystalline to oolitic and some very rare algal porosity and had very rare scattered chert fragments. It appears that the 1-A porosity bench is possibly defined by the interval 5881' true vertical depth to 5890' true vertical depth. The top of the porosity bench was marked by a slightly gradational to sharp facies change as the drill rate increased rather rapidly. The base of the porosity zone was not encountered until drilling the lateral section.

The oolicastic limestone porosity of the upper 1-A interval was continuous from a measured depth of 6125', 5881' true vertical depth, to a measured depth of 7512', 5872' true vertical depth, with 1781' of horizontal displacement, as the well bore penetrated the tight limestones at top of the 1-A zone porosity zone for the first time. Previously the top had been bumped at measured depths of 6880' and 7060',true vertical depths of 5876' and 5875',and had horizontal displacements of 1150' and 1330' respectively. The bas of the best porosity was encountered only once through this interval at a measured depth of 7220', 5879' true vertical depth and a horizontal displacement of 1489'. In each case a slight decrease in the background gas was noted along with an increase in tight, tan to cream, cryptocrystalline limestone packstone, with a slight increase in scattered chert fragments, and decreasing porosity, stain, fluorescence and cut. The 1-A porosity zone had an apparent dip angle of approximately 90.4 degrees.

As the well bore was turned downward to regain the porosity zone of the 1-A, from a measured depth of 7512', to a measured depth of 7686', 5871' true vertical depth, with a horizontal displacement 1956', the lateral encountered very tight, very dense, cherty, occasionally argillaceous limestone packstone, with very thin interbedded oolicastic limestone grainstone. The thin oolicastic limestone grainstones had very streaky fair porosity, fluorescence, stain and cut, with the packstones having little or no sample show. At 7686' measured depth the lateral reacquired the good oolicastic limestone porosity of the 1-A.

From a measured depth of 7686' to 8440' measured depth, 5862' true vertical depth, with 2708' of horizontal displacement, as the well bore was continued upward at a very shallow angle that averaged 90.8 degrees, the very good porosity of the 1-A was drilled. The lithology was predominately a light brown to tan, cream to white, microcrystalline to very finely crystalline, with rare scattered cryptocrystalline to platy, limestone grainstone, with very thin interbedded tight limestone packstone. The limestone was dolomitic to having dolomite rich cement, slightly anhydritic. There rare scattered translucent to clear chert fragments and translucent to light gray, anhydrite crystals and inclusions noted in the limestones, which increased as the well continued upward and encountered the top of the 1-A porosity. The limestone grainstones had fair to good intercrystalline to oolicastic porosity, with fair to good fluorescence, stain and cut. The platy limestone packstones as the well bumped the top of the porosity zone were very tight and had no visible fluorescence, stain or cut. The background gases showed increases which were associated with the best drilling and very good porosity. Also during this interval at a measured depth of 7884', 5866' true vertical depth, with a horizontal displacement of 2156', a trip was made to change the bit, check and change the mud motor and pick up more tubing.

At a measured depth of 8440' to a measured depth of 8480', 5863' true vertical depth, and a horizontal displacement of 2749', the top of the porosity in the 1-A zone was again encountered. The lithology through this interval was predominately the tan to light brown, microcrystalline to very finely crystalline, microsucrosic to sucrosic, oolicastic and very slightly algal limestone grainstone. This oolcastic limestone had thin, tight, interbedded limestone packstones, slightly cherty, some anhydrite crystals and porosity filling, and a good sample show. As the well bore turned away from the top of the porosity zone the lithology returned to the very good oolicastic limestone grainstones, with very good sample shows. Of note was just prior to bumping the top of the porosity was a gradual decrease in the background gases.

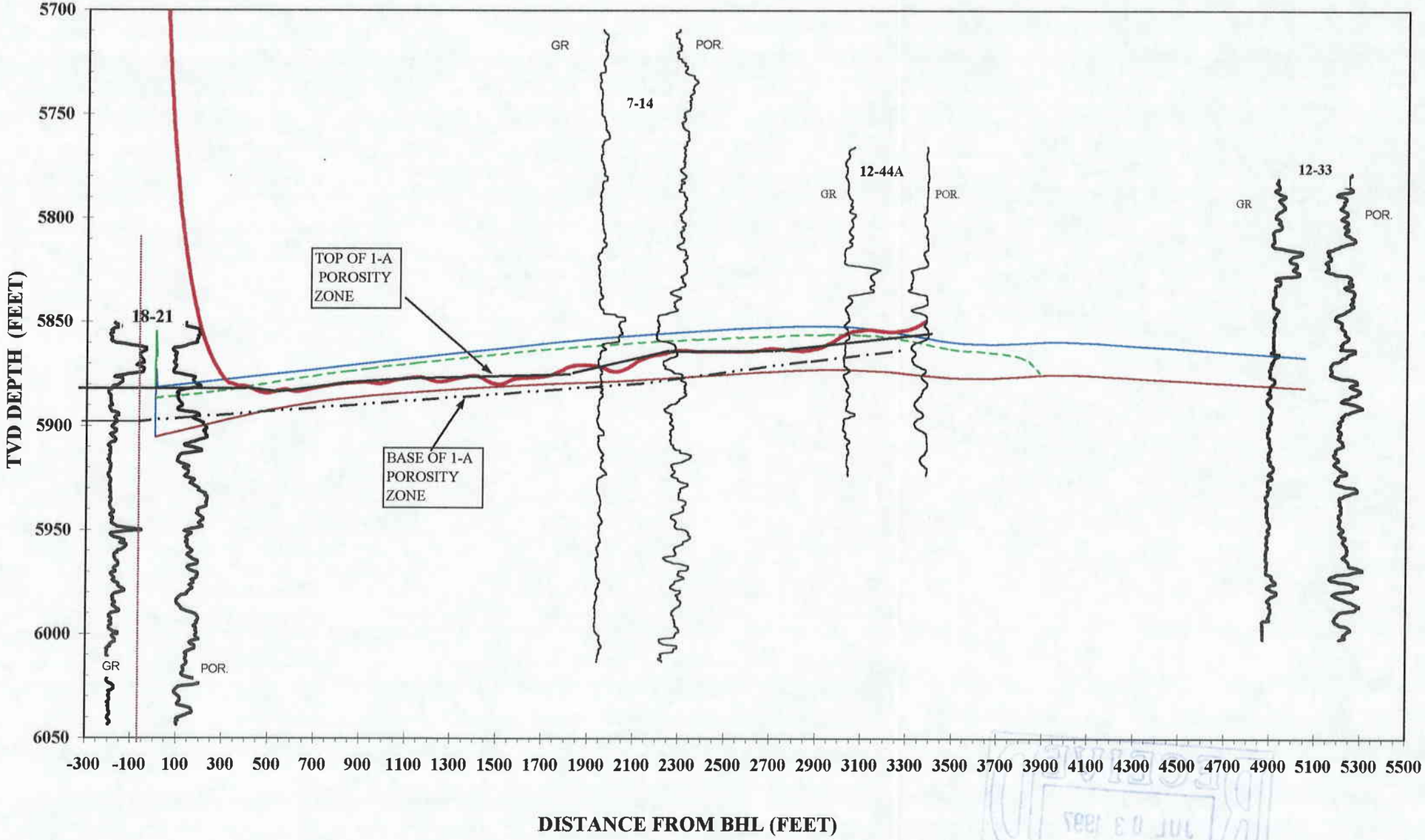
From the top of the 1-A porosity bench to a measured depth of 9115', the limestone lithology was consistent, ranging from light brown to medium brown, cryptocrystalline to very finely crystalline, occasionally microsucrosic to granular, with thin platy limestone packstone and scattered chert fragments, with increases in chert and the limestone packstones as the well bore penetrated top of the 1-A, and approached the 1-A to 1-B transition zone below the 1-A porosity. The limestones had fair to good intercrystalline to oolicastic and a slight trace of algal porosity, predominately fair to good dull to bright yellow fluorescence, with noticeable decreases when at the top and of the zone, as well over the last 200' of the lateral. The staining in the limestones ranged from a trace to good light brown to dark brown, and scattered traces of black dead oil stain and the associated cuts being a predominately fair to good moderately fast to fast streaming cuts. The very thin platy limestones at the top and the base of the 1-A porosity in this lateral had no visible porosity, fluorescence, staining, or cut. The samples shows were affected in part due to the oil & water emulsion used as the drilling fluid beginning at about 7000' in the lateral section and the oil added to system midway through the lateral.

The conclusion drawn from the northwesterly lateral in the 1-A zone is that in this area the limestone porosities were consistent through the zone. Also having an effect on the porosity, was the minor amounts of anhydrite filled porosity and the very thin, platy limestone packstones near the top and base of the 1-A zone. Staining was good to fair and there were sections where staining was poor to none, with some black dead oil staining trapped in the intercrystalline porosity. The lateral used the proposed target line as a reference point through the 1-A bench, with the well bore planing to following the line of best porosity after entering the 1-A porosity bench and then attempting to turn downward into the 1-B after approximately 3100' of the lateral had been drilled.

While drilling the lateral, the background gas was due impart to the minor amounts of oil encountered while drilling the lateral as well as the minor amounts of oil added to the mud system. A slow drop in the background gases was noted in the 1-A zone beginning at measured depth of 8395'. This lateral can be interpreted to having very good reservoir qualities through out. It appears that the porosities are well enough developed, in this northwesterly direction to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

MOBIL, Ratherford #18-21, Northwest Lateral Leg #2



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MOBIL

RATHERFORD UNIT #18-21
NW HORIZONTAL LATERAL LEG #1
UPPER 1-B & 1-D POROSITY BENCHES
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 18, T41S, ~~R23E~~ R24E
SAN JUAN, UTAH

GEOLOGY REPORT
by

DAVE MEADE & MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #18-21 NW HORIZONTAL LATERAL LEG #1 IN 1-B/1-D UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 18, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4595' GL:4607'
SPUD DATE:	6/04/97
COMPLETION DATE:	6/15/97
DRILLING ENGINEER:	BENNY BRIGGS & LEWIS SIMMONS
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING:	
ENGINEERS	DAVE MEADE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES /D. SIPE
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5600' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	RON WESTENBERG/ DANNE BEASON
MUD TYPE:	FRESH WATER & BRINE WATER W/ POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPERRY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	9145' MEASURED DEPTH TVD- 5873.9'
STATUS:	TOH & LAY DOWN TOOLS - PREPARE TO SET WHIPSTOCK FOR LEG #2

DRILLING CHRONOLOGY
RATHERFORD UNIT #18-21
1-B/1-D NW HORIZONTAL LATERAL

DATE	DEPTH	DAILY	ACTIVITY
6/04/97	5600'	0'	MOVE RIG & RIG UP-TIH-W/ PACKER ASSEMLBY-CIR.
6/05/97	5600'	4'	CIR BTMS UP-STRING IN PACKER-RUN WIRE LINE-TOH-PICK UP WHIPSTOCK ASSEMBLY-ORIENT WHIPSTOCK-TIH W/ WHIPSTOCK ASSEMBLY & STARTER MILL-BREAK CIR.-MILL-CIR BTMS UP-TOH-REPAIR DRIVE CHAIN-TOH-CHANGE OUT MILLS & TIH-W/D.C.-SLIP & CUT 65' OF DLRG LINE-TIH W/ D.P.-P.U. SWIVEL-BREAK CIR-MILLWINDOWS 5600'-5604'
6/06/97	5604'	74'	MILL 5604'-5607'-PUMP SWEEPS & CIR OUT-TOH W/MILLS-L.D. MILLS-PU CURVE ASSEMBLY-ORIENT & TEST MOTOR-TIH-RIG UP WIRE LINE & SET GYRO-TIME DRLG 5607' TO 5620' -DRLG 5620'-5642'-PULL & CHANGE OUT GYRO-RUN IN W/GYRO-DRLG 5642'-5673'-PULL GYRO-DIR DRLG & SURVEYS 5673'-5678'
6/07/97	5678'	356'	DIR DRLG & SURVEYS
6/08/97	6034'	284'	DIR DRLG & SURVEYS- PUMP 10 BBL HIGH VIS SWEEP & CIR BTMS UP @ 6110'-DISPLACE HOLE W/BRINE WATER-TOH-LAY DOWN CURVE ASSEMBLY-PICK UP LATERAL BHA & BIT #2-TIH-DIR DRLG & SURVEYS
6/09/97	6318'	366'	DIR DRLG & SURVEYS
6/10/97	6684'	375'	DIR DRLG & SURVEYS-NO DETECTION ON SURVEY PROBE-CIR OUT SPLS-TOH
6/11/97	7059'	425'	REPLACE SURVEY PROBE-CHANGE OUT MUD MOTOR & BIT-ORIENT & TEST-MWD & MOTOR-PICK UP 5 JNTS PH6-TIH-CIR OUT GAS (30ppm H_2S)-DIR DRLG & SURVEYS
6/12/97	7484'	637'	SURVEY & CHANGE SURVEY MODES-DIR DRLG & SURVEYS
6/13/97	8121'	518'	DIR DRLG & SURVEYS
6/14/97	8639'	230'	DIR DRLG & SURVEYS-15 JT SHORT TRIP W/SWIVEL-DIR DRLG & SURVEYS
6/15/97	8869'	276'	DIR DRLG & SURVEYS-CIR & TRY TO REGAIN MWD SIGNAL @ 9145'-TERMINATE LATERAL #1-PUMP SWEEP-TOH & LAY DOWN 60 JTS PH6 DRL PIPE

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #18-21 NW 1-B/1-D HORIZONTAL LATERAL

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
6/04/97	5600'	0'			
6/05/97	5600'	4'			
6/06/97	5604'	74'			
6/07/97	5678'	356'			
6/08/97	6034'	284'			
6/09/97	6318'	366'			
6/10/97	6684'	375'			
6/11/97	7059'	425'			
6/12/97	7484'	637'			
6/13/97	8121'	518'			
6/14/97	8639'	230'			
6/15/97	8869'	276'			
TD	9145'	0'			

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-B/1-D HORIZONTAL LATERAL

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1	4 3/4"	STC	MF-3P	5607'/ 6110'	503'	38.0	13.2
#2	4 3/4"	HTC	STR-30	6110'/ 7059'	949'	49.5	19.4
#3	4 3/4"	HTC	STR-30	7059'/ 9145'	2086'	97.0	21.5

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5500.00	0.39	285.20	5499.78	3.35 S	31.12 W	21.69	0.00
5598.00	0.46	302.99	5597.78	3.05 S	31.77 W	22.38	0.15
5606.00	3.40	307.10	5605.77	2.89 S	31.99 W	22.65	36.77
5626.00	9.00	307.20	5625.65	1.58 S	33.71 W	24.81	28.00
5646.00	15.10	307.30	5645.20	0.95 N	37.03 W	28.97	30.50
5666.00	21.90	309.60	5664.15	4.91 N	41.98 W	35.31	34.19
5686.00	26.20	310.00	5682.41	10.12 N	48.24 W	43.46	21.52
5706.00	29.00	310.20	5700.13	16.09 N	55.33 W	52.73	14.01
5726.00	28.90	308.50	5717.64	22.23 N	62.81 W	62.41	4.14
5746.00	28.80	308.00	5735.15	28.21 N	70.39 W	72.05	1.31
5766.00	29.90	314.90	5752.59	34.69 N	77.72 W	81.84	17.77
5786.00	31.80	316.80	5769.76	42.05 N	84.86 W	92.04	10.68
5806.00	36.50	320.10	5786.31	50.46 N	92.29 W	103.13	25.25
5826.00	40.40	320.70	5801.97	60.05 N	100.21 W	115.36	19.59
5846.00	43.20	321.00	5816.88	70.38 N	108.63 W	128.45	14.04
5866.00	47.50	321.20	5830.93	81.45 N	117.56 W	142.41	21.51
5886.00	51.50	318.50	5843.92	93.07 N	127.37 W	157.39	22.48
5906.00	55.50	313.70	5855.82	104.63 N	138.52 W	173.37	27.78
5926.00	58.80	311.00	5866.66	115.94 N	150.94 W	190.15	20.02
5946.00	62.60	310.30	5876.45	127.30 N	164.17 W	207.59	19.24
5966.00	67.40	307.30	5884.90	138.64 N	178.30 W	225.70	27.58
5986.00	73.70	306.60	5891.56	149.97 N	193.36 W	244.53	31.67
6006.00	78.60	307.10	5896.34	161.62 N	208.90 W	263.91	24.62
6026.00	79.40	306.50	5900.16	173.38 N	224.62 W	283.51	4.97
6046.00	79.70	306.20	5903.79	185.03 N	240.46 W	303.14	2.10
6066.00	79.70	305.80	5907.36	196.60 N	256.38 W	322.77	1.97
6087.00	85.00	305.80	5910.16	208.77 N	273.25 W	343.52	25.24
6110.00	89.50	306.70	5911.26	222.35 N	291.77 W	366.44	19.95
6138.82	89.70	307.20	5911.46	239.68 N	314.80 W	395.21	1.87
6170.67	87.60	306.20	5912.21	258.70 N	340.33 W	427.00	7.30
6202.42	88.10	306.00	5913.40	277.40 N	365.97 W	458.65	1.70
6233.27	90.30	305.80	5913.84	295.48 N	390.95 W	489.42	7.16
6265.07	88.40	304.80	5914.20	313.86 N	416.90 W	521.11	6.75
6296.83	88.20	304.10	5915.14	331.82 N	443.08 W	552.71	2.29
6328.71	87.30	305.50	5916.39	350.00 N	469.24 W	584.43	5.22
6360.62	86.60	306.90	5918.09	368.81 N	494.95 W	616.22	4.90
6392.26	85.30	306.70	5920.32	387.72 N	520.22 W	647.73	4.16
6424.13	85.30	309.20	5922.93	407.25 N	545.27 W	679.47	7.82

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6455.95	85.30	309.70	5925.54	427.40 N	569.76 W	711.19	1.57
6487.63	85.80	311.30	5928.00	447.91 N	593.77 W	742.77	5.28
6519.46	87.10	313.40	5929.97	469.31 N	617.25 W	774.51	7.75
6551.27	90.00	314.30	5930.78	491.34 N	640.18 W	806.23	9.55
6583.03	92.80	315.30	5930.00	513.71 N	662.70 W	837.87	9.36
6614.82	93.40	315.30	5928.28	536.27 N	685.03 W	869.48	1.89
6646.01	94.40	315.50	5926.16	558.43 N	706.88 W	900.45	3.27
6677.84	94.90	315.70	5923.58	581.10 N	729.08 W	932.03	1.69
6709.65	94.60	314.80	5920.94	603.61 N	751.40 W	963.60	2.97
6741.51	94.10	314.40	5918.53	625.92 N	774.02 W	995.26	2.01
6773.37	95.40	314.80	5915.89	648.21 N	796.62 W	1026.91	4.27
6805.22	97.00	314.80	5912.45	670.52 N	819.09 W	1058.46	5.02
6837.08	91.60	315.00	5910.06	692.94 N	841.59 W	1090.10	16.96
6868.88	89.20	315.00	5909.84	715.42 N	864.07 W	1121.78	7.55
6900.58	92.00	315.90	5909.51	738.01 N	886.30 W	1153.33	9.28
6932.42	92.60	316.20	5908.23	760.91 N	908.38 W	1184.97	2.11
6964.17	91.10	314.40	5907.21	783.47 N	930.70 W	1216.56	7.38
6996.01	90.10	311.10	5906.87	805.08 N	954.08 W	1248.36	10.83
7027.00	88.90	310.20	5907.14	825.26 N	977.59 W	1279.35	4.84
7046.15	90.20	310.40	5907.29	837.65 N	992.19 W	1298.49	6.87
7077.97	92.40	310.20	5906.57	858.22 N	1016.46 W	1330.30	6.94
7109.85	92.50	310.20	5905.21	878.78 N	1040.78 W	1362.16	0.31
7141.55	92.40	309.20	5903.85	899.01 N	1065.15 W	1393.83	3.17
7173.34	90.60	308.60	5903.02	918.97 N	1089.88 W	1425.60	5.97
7205.10	90.40	308.10	5902.74	938.67 N	1114.79 W	1457.34	1.70
7236.94	90.60	307.60	5902.47	958.21 N	1139.93 W	1489.16	1.69
7268.60	93.00	308.50	5901.47	977.71 N	1164.84 W	1520.78	8.10
7300.30	91.80	307.60	5900.14	997.23 N	1189.78 W	1552.44	4.73
7331.30	92.80	307.60	5898.90	1016.13 N	1214.33 W	1583.38	3.23
7363.13	93.40	308.10	5897.18	1035.63 N	1239.42 W	1615.14	2.45
7394.90	89.60	305.80	5896.35	1054.72 N	1264.80 W	1646.85	13.98
7426.65	89.60	305.10	5896.57	1073.13 N	1290.66 W	1678.50	2.20
7457.28	90.30	306.50	5896.60	1091.05 N	1315.50 W	1709.05	5.11
7489.01	91.20	307.20	5896.18	1110.07 N	1340.89 W	1740.72	3.59
7520.82	92.20	308.60	5895.24	1129.61 N	1365.98 W	1772.50	5.41
7552.59	93.70	309.40	5893.60	1149.57 N	1390.64 W	1804.22	5.35
7584.42	90.90	309.70	5892.32	1169.82 N	1415.16 W	1836.02	8.85
7616.18	90.40	309.40	5891.96	1190.04 N	1439.64 W	1867.78	1.84

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
7648.03	90.50	310.90	5891.71	1210.58 N	1463.99 W	1899.62	4.72
7679.12	90.40	312.70	5891.47	1231.30 N	1487.16 W	1930.70	5.80
7710.98	90.90	312.30	5891.11	1252.82 N	1510.65 W	1962.52	2.01
7741.96	90.10	310.60	5890.84	1273.33 N	1533.87 W	1993.49	6.06
7773.70	90.90	310.60	5890.56	1293.98 N	1557.97 W	2025.23	2.52
7804.70	91.10	312.20	5890.02	1314.48 N	1581.22 W	2056.21	5.20
7836.46	92.80	312.50	5888.94	1335.86 N	1604.67 W	2087.93	5.44
7868.23	93.30	312.50	5887.25	1357.30 N	1628.06 W	2119.62	1.57
7899.19	89.30	310.40	5886.55	1377.78 N	1651.26 W	2150.56	14.59
7931.06	89.40	309.90	5886.91	1398.33 N	1675.62 W	2182.42	1.60
7962.86	88.40	309.50	5887.52	1418.64 N	1700.08 W	2214.22	3.39
7994.75	88.70	309.70	5888.33	1438.96 N	1724.64 W	2246.10	1.13
8026.50	88.30	310.10	5889.16	1459.32 N	1748.99 W	2277.84	1.78
8058.38	88.50	309.70	5890.05	1479.76 N	1773.44 W	2309.70	1.40
8089.34	89.00	310.20	5890.72	1499.63 N	1797.17 W	2340.65	2.28
8120.45	89.90	310.10	5891.02	1519.69 N	1820.95 W	2371.76	2.91
8152.19	89.80	309.90	5891.10	1540.09 N	1845.26 W	2403.50	0.70
8183.81	90.10	310.10	5891.13	1560.42 N	1869.48 W	2435.12	1.14
8215.53	90.70	310.90	5890.91	1581.02 N	1893.60 W	2466.84	3.15
8247.49	93.00	310.80	5889.88	1601.91 N	1917.76 W	2498.78	7.20
8279.33	93.30	310.80	5888.13	1622.68 N	1941.83 W	2530.57	0.94
8311.24	93.50	310.90	5886.24	1643.52 N	1965.92 W	2562.42	0.70
8342.99	93.30	310.60	5884.35	1664.21 N	1989.93 W	2594.11	1.13
8374.71	89.50	310.20	5883.58	1684.75 N	2014.08 W	2625.81	12.05
8406.48	89.20	310.20	5883.94	1705.26 N	2038.34 W	2657.58	0.94
8438.27	89.20	309.90	5884.38	1725.71 N	2062.67 W	2689.37	0.94
8470.09	90.30	309.90	5884.52	1746.12 N	2087.08 W	2721.19	3.46
8501.83	90.20	309.40	5884.38	1766.38 N	2111.52 W	2752.93	1.61
8533.67	90.80	309.00	5884.10	1786.50 N	2136.20 W	2784.76	2.26
8565.53	89.10	307.80	5884.13	1806.29 N	2161.16 W	2816.61	6.53
8596.36	88.70	307.80	5884.72	1825.18 N	2185.52 W	2847.41	1.30
8628.20	88.60	308.10	5885.47	1844.76 N	2210.62 W	2879.22	0.99
8660.04	91.20	309.20	5885.53	1864.64 N	2235.48 W	2911.05	8.87
8691.95	91.60	310.80	5884.75	1885.14 N	2259.92 W	2942.95	5.17
8723.76	91.10	312.90	5884.00	1906.36 N	2283.61 W	2974.73	6.78
8755.39	92.00	313.90	5883.15	1928.08 N	2306.58 W	3006.29	4.25
8787.06	90.90	314.80	5882.34	1950.21 N	2329.22 W	3037.86	4.49
8818.88	90.20	314.40	5882.04	1972.56 N	2351.87 W	3069.57	2.53

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFORD UNIT
Slot/Well .. : BA25/18-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
8850.67	90.40	314.80	5881.87	1994.88 N	2374.51 W	3101.26	1.41
8882.43	89.60	315.30	5881.87	2017.35 N	2396.95 W	3132.90	2.97
8914.19	90.50	316.70	5881.84	2040.20 N	2419.01 W	3164.48	5.24
8946.04	90.90	317.40	5881.46	2063.51 N	2440.71 W	3196.09	2.53
8977.24	90.20	318.00	5881.16	2086.59 N	2461.70 W	3227.01	2.95
9009.10	91.80	319.00	5880.60	2110.44 N	2482.81 W	3258.51	5.92
9040.92	92.90	320.20	5879.29	2134.65 N	2503.42 W	3289.86	5.11
9072.74	93.00	320.20	5877.66	2159.07 N	2523.76 W	3321.13	0.31
9145.00	93.00	320.20	5873.88	2214.51 N	2569.95 W	3392.15	0.00

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL SYSTEM REFERENCE POINT.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS WELL HEAD.
THE VERTICAL SECTION WAS COMPUTED ALONG 310.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

5500,TIEIN; 5598,INTERPOLATED GYRO; 5606,CSG WINDOW
5606,GYRO SURVEY; 5626 HAS INTERPOLATED AZIMUTH
5626-9072 MWD SURVEYS; 9145 EXTRAPOLATED TO BIT

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-B/1-D HORIZONTAL LATERAL

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	pH	WL	CK	CHL	CA	SD	OIL	WTR
6/05/97	5615'	8.5	26	–	–	0/0	8.0	NC	NC	24000	3800	–	0%	100%
6/06/97	5609'	8.5	26	1	1	0/0	10.0	NC	NC	22000	2000	–	0%	100%
6/07/97	5775'	8.6	26	1	1	0/0	9.5	NC	NC	28000	2600	–	0%	100%
6/08/97	6110'	9.8	27	1	1	0/0	8.0	NC	NC	163 K	720	–	0%	100%
6/09/97	6456'	9.8	27	1	1	0/0	11.6	NC	NC	166 K	720	–	0%	100%
6/10/97	6826'	9.4	27	1	1	0/0	11.6	NC	NC	120 K	420	–	0%	100%
6/11/97	7170'	9.4	27	1	1	0/0	11.6	NC	NC	123 K	480	–	0%	100%
6/12/97	7650'	8.8	27	1	1	0/0	11.8	NC	NC	108 K	380	–	0%	100%
6/13/97	8272'	9.0	27	1	1	0/0	11.7	NC	NC	83000	400	–	0%	100%
6/14/97	8700'	9.0	27	1	1	0/0	11.7	NC	NC	81000	480	–	0%	100%
6/15/97	8950'	9.0	28	2	1	0/0	11.6	18.2	<1/32	78000	400	–	4%	96%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 SE 1-B/1-D HORIZONTAL LATERAL

DEPTH	LITHOLOGY

5607.00 5610.00 "LS wh-crm,tan,crpxl-micxl,rthy-arg,v slty,grdg to ltgy mica sl glau v lmy SLTST,w/scat brn CHT frag,tt-v rr intxl POR,n-v rr spty dull orng mnrl FLOR,n vis STN,n vis CUT,tr ltbrn-brn,slty,micxl,lmy DOL,tt,NFSOC"

5610.00 5620.00 "LS AA,w/intbd SLTST & CHT AA,v thn arg DOL AA,POR-FLOR-STN-CUT AA"

5620.00 5630.00 "LS crm-tan,occ ltbrn-ltgy,crpxl-micxl,rthy-arg,slty-v slty,scat CHT frag,rr micfos,tt,rr dull orng mnrl FLOR,NSOC,tr ltbrn-brn,tt,micxl,arg DOL,thn intbd ltgy-gybrnv lmy sl sdy SLTST"

5630.00 5640.00 "LS AA,w/intbd SLTST & CHT AA,v thn arg DOL AA,POR-FLOR-STN-CUT AA"

5640.00 5650.00 "DOL brngy-gy,crpxl,occ micxl,dns,lmy/occ LS incl,occ sl slty ip/tr lmy cmt,grdg to dol LS,tr trnsl & dkbrn CHT frag,NFSOC"

5650.00 5660.00 "LS crm-tan-off wh,occ ltbrn-ltgy,crpxl-micxl,rthy-arg,slty-v slty,occ sl sdy-rr vf gr QTZ,scat CHT AA,tt-tr intxl POR/occ lmy cmt fl,tr v dull orng mnrl FLOR,NSOC,DOL AA"

5660.00 5670.00 "DOL m-ltgybrn,ltbrngy,occ ltgy,crpxl-micxl,micsuc-vfxl,intbd/lt tan-crm-off wh LS,rthy-occ sl chky,occ sl slty,grdg to dol LS ip,tt-tr intxl POR,NSOC"

5670.00 5680.00 "DOL AA/intbd dol LS,tr scat bf-trnsl CHT frag,NFSOC"

5680.00 5690.00 "LS crm-tan,lt brn,occ off-ltgy,crpxl-micxl,rthy-arg,dns,cln,scat trnsl CHT,grdg to lmy DOL,tt-tr intxl POR,NFSOC"

5690.00 5700.00 "DOL m-ltgybrn,ltbrngy-ltgy,occ tan-brn,crpxl-micxl,occ vfxl,intbd/lt tan-crm-off wh LS,rthy-occ sl chky,sl-occ v slty,grdg to dol LS ip,tr bf CHT frag,tt-tr intxl POR,NFSOC"

5700.00 5710.00 "LS brn-tan,dkbrngy,occ lt brn,crm-off wh-ltgy,crpxl-micxl,rthy-occ sl arg,dns,cln-occ sl chky,scat bf CHT,grdg to lmy DOL ip,tt-tr intxl POR,no-sl tr v dull orng FLOR,NSOC"

5710.00 5720.00 "SH dkgy-gyblk,sbblky-blky-sbplty,frm-hd,v sl dol-calc ip,sl slty,tr pp mica,v sl carb/rr frag,occ grdg to shy DOL"

5720.00 5730.00 "LS wh-crm-tan,ltgy,crpxl-micxl,rthy-cln,arg,chty-scat brn CHT frag,mrly ip,tt,NFSOC,w/intbd brn-gybrn,micxl,arg,lmy,mrly DOL,tt,NFSOC,grdg to v lmy-dol dkgy-gybrn plty mica sl slty v sl carb SH"

5730.00 5740.00 "SH AA,grdg to v thn dol MRLST,tan-brn micxl rthy lmy arg tt DOL,bcmg pred LS tan-crm-ltbrn,occ gybrn,micxl-crpxl,tt,sl arg,chty,v sl anhy,tt,NFSOC"

5740.00 5750.00 "LS AA,incr cln,sl slty,occ grdg to lmy SLTST,w/v thn intbd ltgybrn-ltbrn,crpxl-micxl,tt DOL & ltgy-ltgybrn plty-sbplty SH,scat lt-mbrn CHT frag,NFSOC"

DEPTH	LITHOLOGY

5750.00 5770.00 "LS crm-wh,tan-ltgy,crpxl,occ micxl,rthy-cln,scat Form fos,chty-scat tan-brn CHT frag,occ chk-sl anhy,tt-v rr intxl POR,NFSOC,w/thn ltgybrn-ltbrn, micxl-crpxl,rthy,arg,v sl slty,lmy DOL,tt,NFSOC"

5770.00 5780.00 "LS pred tan,crpxl,sl dol,AA,slty-grdg to v lmy SLTST,tt,NFSOC,w/scat tan CHT frag,ltgybrn-gy,crpxl-micxl,rthy,lmy,arg,tt DOL,NFSOC"

5780.00 5790.00 "LS AA,DOL AA,CHT AA,w/v thn ltgy,lmy,v sl sdy,mica SLTST incl"

5790.00 5800.00 "LS AA incr slty,DOL AA,SLTST AA,scat brn-tan-blk CHT frag,n vis POR,NFSOC"

5800.00 5810.00 "LS crm-tan,brn,crpxl,occ micxl,rthy-cln,occ arg-v sl slty,mrly,sl dol,tt,NFSOC,w/DOL brn-gybrn,micxl,arg-sl slty,rthy,lmy,occ mrly,tt,NFSOC,thn dkgy-blk dol plty sl carb SH,& dkbrn-dkgybrn,occ blk CHT"

5810.00 5820.00 "LS pred ltbrn-brn,AA,chty,v rr intxl-anhy fl frag POR,n vis FLOR,n-v rr blk carb STN,n-v slow dif CUT,thn intbd DOL brn-dkbrn,micxl,AA,tt-v rr micsuc POR,NFSOC,scat dkbrn-brn CHT frag,SH AA"

5820.00 5830.00 "LS pred tan,crpxl,AA,anhy,rr mic fos,tt,NFSOC,w/intbd DOL brn-gybrn-dkgy,micxl,rthy,sl slty,v arg-shy,mrly,tt,NFSOC,scat lt-dkbrn CHT frag,thn blk-dkgy plty rthy SH"

5830.00 5840.00 "LS tan-crm,crpxl,occ micxl,cln-rthy,chk,chty-scat ltbrn CHT frag,rr mic fos,anhy-occ ANHY fl frac,tt,NFSOC,w/decr DOL-CHT-SH AA"

5840.00 5850.00 "LS AA,incr brn-gybrn-mgybrn,micxl,rthy,mrly DOL AA,SH-CHT AA"

5850.00 5860.00 "LS tan-crm,ltbrn-gy,crpxl-micxl,rthy,occ cln,sl dol,arg,anhy,rr mic fos,slty,tt,NFSOC,DOL AA,lt-dkbrn-occ blk CHT frag,thn dkgy-blk carb plty mica dol-calc SH"

5860.00 5880.00 "LS crm-tan,occ ltbrn-ltgy,crpxl-micxl,plty ip,rthy-slty,chk,occ cln,grdg to v lmy SLTST,occ dol,v rr mic fos,tt,NFSOC,thn DOL lt-mbrn-gybrn,micxl,rthy-arg,lmy,mrly ip,tt-v rr intxl POR,NFSOC,scat ltbrn-brn CHT frag,rr-tr ltgy SLTST rthy,sl sdy,mica,SH AA"

5880.00 5890.00 "LS AA,occ grdg to v lmy SLTST,tt,NFSOC,scta CHT frag AA,w/intbd DOL ltbrn-gybrn,micxl,rthy,sl slty,arg,tt-v rr intxl POR,n-v rr spty dull FLOR,n vis STN,n-v p slow dif CUT"

5890.00 5900.00 "LS AA,pred crm-tan,anhy ip,v sl slty,tt-v rr intxl POR,NFSOC,v rr SLTST stmg AA,rr CHT frag,thn intbd DOL AA,POR-FLOR-STN-CUT AA"

5900.00 5910.00 "LS wh-crm-tan,occ ltgy,crpxl-micxl,rthy-chk,occ cln,chty,sl slty,v rr mic fos,sl anhy,tt,NFSOC,v thn gybrn micxl DOL tt-v rr intxl POR,n vis STN,n-v p slow dif CUT,rr trnsl-bf CHT frag"

5910.00 5940.00 "SH dkgy-blk,sbblky-plty,frm,sl slty,mica,dol-v sl calc,carb-sooty,w/thn LS crm-wh-tan,crpxl,cln-dns,occ rthy-chk,tt,NFSOC & DOL ltbrn-gybrn,crpxl-micxl,rthy,v arg,occ grdg to dol SH,tt,NFSOC"

5940.00 5950.00 "SH AA,bcmg DOL ltbrn-brn,occ gybrn,crpxl-micxl,rthy ip,v sl slty,lmy,occ mrly,sl anhy,tt,NFSOC w/ LS crm-tan,occ wh,crpxl-micxl,sl slty,chty,dol ip,v rr mic fos,tt,NFSOC"

5950.00 5960.00 "DOL brn-gybrn,occ ltbrn,crpxl-micxl,gran ip,rthy-sl slty,chty,lmy,tt-tr intxl POR,n-v rr dull FLOR,n vis STN,n-p slow dif CUT,w/SH & LS tan,crpxl-vfxl,ool ip,AA,v rr POR-FLOR-STN CUT,tr lt-dkbrn CHT frag"

DEPTH	LITHOLOGY

5960.00 5980.00 "LS tan-crm,ltbrn,crpxl-vfxl,sl micsuc,oolicastic,dol ip,sl chty,v rr frag,scat ANHY incl,tt-fr ool-tr intxl POR,fr dull-bri yel FLOR,tr ltbrn-brn STN,rr blk dd o STN,fr slow-mod stmg CUT,w/v thn DOL AA,ltbrn CHT frag,tr SH cvgs"

5980.00 5990.00 "LS tan,ltbrn,occ brn,lt-mgybrn,off wh,micsuc-ooliclastic,occ crpxl-micxl,sl chky,rr bf CHT frag,occ v sl dol,vrr ANHY incl,g ool/fr-tr intxl POR,g scat mod bri-bri yel FLOR,fr-g ltbrn-brn STN,g dif/tr slow strmg CUT"

5990.00 6000.00 "LS wh-crm-tan,occ brn,ltgybrn,crpxl-micxl,occ oolclastic-micsuc,pred dns/chky plty prtgs,sl arg,tr trnsl xln ANHY,tt-tr intxl/occ ool POR,tr-fr scat spty mod bri-bri yel FLOR,tr ltbrn-brn STN,g dif/tr slow strmg CUT"

6000.00 6020.00 "LS tan-crm-off wh,occ ltgybrn,brn,crpxl-micxl,occ scat ooliclastic-micsuc,dns,cln,sl chky-arg,rr ANHY AA,tr trnsl CHT frag,tt-tr intxl/occ ool POR,tr scat spty mod bri-bri yel FLOR,tr ltbrn/rr brn & blk STN,fr-tr slow-mod fast strmg CUT"

6020.00 6030.00 "LS AA,incr ooliclastic,POR-FLOR-STN-CUT AA"

6030.00 6040.00 "LS tan-crm-off wh,occ ltbrn-brn,crpxl-micxl,occ micsuc-oolicastic,dol ip,sl chty/tr frag,rr ANHY incl,tt-tr ool-intxl POR,tr scat mod bri-bri yel FLOR,tr ltbrn-brn /rr blk dd o STN,fr v slow stmg CUT"

6040.00 6050.00 "LS AA/sl incr micsuc-ooliclastic,POR AA/incr scat FLOR AA,STN-CUT AA"

6050.00 6060.00 "LS AA,crpxl-micxl,occ micsuc-oolicastic,dol ip,sl chty,rr ANHY frag,POR AA,decr scat dull-mod bri spty yel FLOR/STN AA,mod fast strmg CUT "

6060.00 6070.00 "LS tan-crm-wh,occ brn,lt-mbrngy,crpxl-micxl,occ vfxl-micsuc,rr ooliclastic,dns,cln-chky,occ mot-arg,dol ip,tr xln ANHY incl,tt-tr intxl POR,tr scat dull-mod bri yel FLOR,slow strmg CUT"

6070.00 6090.00 "DOL lt-mgybrn,brn,occ ltbrn-tan,micxl-crpxl,occ gran/tr lmy cmt,rthy,intbd/LS AA,v sl chky,grdg to dol LS,tt-tr intxl POR,fr scat mod bri-dull spty yel FLOR,fr-g brn-ltbrn/scat pp blk dd o STN,g mod fast strmg CUT"

6090.00 6100.00 "LS tan-crm-wh,occ brn,lt-mbrngy,crpxl-micxl,occ vfxl-micsuc,rr ooliclastic,dns,chky,occ mot-arg,grdg to lmy DOL ip,tt-tr intxl POR,tr scat dull-mod bri yel FLOR,slow strmg CUT"

6100.00 6110.00 "DOL AA,incr ooliclastic-micsuc,grdg to dol LS,fr-g ool-intxl POR,g-fr scat mod bri-dull yel FLOR,g ltbrn-brn/scat blk dd o STN,g mod fast-fast strmg CUT"

6110.00 6130.00 "LS crm-tan,occ brn,crpxl-vfxl,gran-micsuc ip,ooc ip,DOL rich cmt,sl chty,tr-fr intxl-ool POR,fr dull yel FLOR,fr ltbrn-rr blk STN,fr-g mod fast-fast stmg CUT,w/thn DOL AA,scat CHT AA,tr SH cvgs"

6130.00 6140.00 "LS AA,pred ool LS GRNST w/v thn plty LS PKST,incr POR,FLOR-STN-CUT AA,w/v thn ltbrn-brn micxl DOL incl,scat CHT frag,tr SH cvgs"

6140.00 6150.00 "LS AA,incr wh plty LS PKST,thn DOL incl in LS,tr ltbrn-brn mot ool CHT frag,rr ANHY xl-incl,decr oolicastic POR,FLOR-STN-CUT AA"

6150.00 6160.00 "LS AA,decr DOL PKST incl,scat ltbrn-brn CHT frag,rr ANHY xl-incl,fr-g intxl-ool POR,fr dull yel FLOR,tr-fr ltbrn-brn STN,tr blk dd o STN,fr slow-mod fast stmg CUT"

DEPTH	LITHOLOGY

6160.00 6180.00 "LS lt brn-brn,tan,crpxl-vfxl,gran-ooc,tr DOL rich cmt-v rr DOL PKST incl,scat ltbrn-brn mot CHT frag,rr ANHY xl-incl,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,occ blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6180.00 6190.00 "LS AA,v rr DOL PKST incl,scat CHT frag,rr LS PKST,pred ooc LS GRNST,POR-FLOR-STN-CUT"

6190.00 6200.00 "LS lt brn-brn,tan,crpxl-vfxl,gran-ooc,LS GRSTN,v rr LS PKST,tr DOL rich cmt,rr ltbrn-brn mot CHT frag,rr ANHY xl-incl,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,occ blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6200.00 6220.00 "LS ltbrn,occ tan,brn-dkbrn/blk dd o STN,micsuc-ooliclastic,occ gran-micxl-vfxl,GRNST/tr scat PCKST,tr ltgybrn-crm plty crpxl prtgs,tr CHT incl-rr frag,occ sl dol AA,g ool/tr intxl POR,g even mod bri-dull yel FLOR,g brn/blk dd o STN,CUT AA"

6220.00 6240.00 "LS AA,micsuc-ooc,gran-vfxl-crpxl,LS GRNST/rr dol cmt,tr tan-crm chky plty prtgs,tr ltbrn-brn mot CHT incl,fr-g ooc-ool-intxl POR,fr-g even mod bri yel FLOR,fr-g lt-dkbrn/incr blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6240.00 6250.00 "LS tan,ltbrn,occ brn-dkbrn,micsuc-ooc,occ gran-crpxl,vfxl,LS GRNST/incr scat PCKST,incr chky plty LS prtgs,tr bf-tan-trnsl CHT incl/vrr ool incl,POR-FLOR AA,g brn-ltbrn/decr blk dd o STN,g mod slow strmg mlky CUT"

6250.00 6260.00 "LS AA,pred ooc GRNST/tr scat PACKST,POR_FLOR-STN-CUT AA"

6260.00 6280.00 "LS ltbrn-tan-crm,ltgy-ltgybrn,occ brn,micsuc-vfxl-micxl,crpxl,occ ooc-gran,pred GRNST/ltgy-gybrn plty chky prtgs,incr scat PCKST,intbd-scat bf CHT/vrr ool,sl dol ip,fr-g intxl-ool POR,tr scat mod bri-dull yel FLOR,g-fr slow strmg CUT"

6280.00 6300.00 "LS ltbrn-tan,occ brn-dkbrn,ltgy-gybrn,micsuc-vfxl,occ gran-crpxl-ooc,LS GRNST/chky plty-arg LS prtgs,tr scat PCKST,tr bf-tan-trnsl CHT incl/vrr ool incl,POR-FLOR AA,g-fr ltbrn-brn/tr scat blk dd o STN,g-fr mod slow-slow strmg mlky CUT"

6300.00 6310.00 "LS AA,micsuc-vfxl,gran-crpxl,ooc,LS GRNST/rr dol cmt,incr ltgy-gybrn chky plty prtgs,tr CHT incl,fr ooc-ool-intxl POR,fr-g scat mod bri yel FLOR,fr-g lt-dkbrn/incr blk dd o STN,g dif/mod fast stmg mlky CUT"

6310.00 6320.00 "LS AA,LS GRNST/prtgs AA,tr sact PCKST,tr CHT incl,fr-g intxl-ooc-ool POR,decr scat mod bri yel FLOR,fr-g lt-dkbrn/occ blk dd o STN,fr-g dif/mod fast stmg mlky CUT"

6320.00 6340.00 "LS lt brn-brn,tan,micsuc-vfxl,gran-ooc,tr DOL rich cmt/rr DOL PKST incl,scat ltbrn-brn mot CHT frag-incl & LS prtgs AA,rr ANHY xln-incl,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN/blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6340.00 6350.00 "LS AA,micsuc-ool-vfxl,occ gran-crpxl,GRNST/tr scat PCKST,scat ltgy-gybrn plty prtgs,tr CHT incl-rr frag,occ sl dol/tr dol cmt,POR-FLOR-STN-CUT AA"

6350.00 6370.00 "LS ltbrn-tan-crm,ltgy-ltgybrn,occ brn,micxl-vfxl-crpxl,micsuc,occ ooc-gran,pred GRNST/decr plty chky prtgs,tr scat PCKST,intbd-scat CHT/vrr ool,tr dol cmt-sl dol,fr intxl- tr ool POR,fr scat mod bri-dull yel FLOR,g-fr ltbrn-brn/occ blk dd o STN,CUT AA"

DEPTH	LITHOLOGY

6370.00 6380.00 "LS brn-ltbrn-tan,occ ltgybrn,crpxl-vfxl-gran,occ ooc,pred LS GRNST/tr dol cmt,incr PCKST,tr intbd-scat bf CHT frag/rr ool incl,rr scat plty LS prtgs,fr intxl/occ ooc POR,g even mod bri-dull yel FLOR,g brn-ltbrn/occ blk dd o STN,g mod fast strmg mlky CUT"

6380.00 6400.00 "LS brn-ltbrn,occ tan,ltgybrn,crpxl-gran-ooc,pred ooc LS GRNST/tr dol cmt,tr PCKST,tr CHT AA,rr LS prtgs,vrr scat xln ANHY,g-fr ooc-ool-intxl POR,g even mod bri-dull yel FLOR,g brn-ltbrn/incr blk dd o STN,g fast strmg mlky CUT"

6400.00 6420.00 "LS AA,gran-crpxl-vfxl,ooc,pred LS GRNST/tr dol cmt,tr PCKST,tr CHT frag/rr ool incl,rr plty LS prtgs,fr-g intxl/occ ooc POR,g even mod bri-dull yel FLOR,g brn-ltbrn/scat blk dd o STN,g mod fast strmg mlky CUT"

6420.00 6430.00 "LS tan-brn,mbrn,micxl-vfxl,gran-ooc,rr wh plty crpxl LS PKST,pred ooc LS GRNST,scat CHT frag,rr ANHY xl-incl,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g ltbrn-brn STN,rr blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6430.00 6440.00 "LS AA,sl incr LS GRNST,decr ooc mat,scat CHT frag,DOL cmt,incr intxl POR,FLOR-STN-CUT AA"

6440.00 6450.00 "LS tan-brn,occ mbrn,crpxl-vfxl,gran,occ ooc,scat tr wh-crm crpxl plty LS PKST,occ bf-brn CHT frag,tr DOL cmt,occ ANHY xl-incl,tr-fr intxl-fr ool POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr slow-mod fast stmg CUT"

6450.00 6460.00 "LS AA,decr LS PKST,incr ooc mat,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,STN AA,fr-g mod fast-fast CUT"

6460.00 6470.00 "LS AA,incr wh plty crpxl LS PKST,scat ooc mat,occ bf-brn CHT frag,tr-fr intxl-fr ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,rr blk dd o STN,fr slow-mod fast CUT"

6470.00 6480.00 "LS pred tan-ltbrn LS PKST,scat ooc LS GRNST,decr POR-FLOR-STN-CUT"

6480.00 6490.00 "LS crm-tan-brn,crpxl-micxl,rr vfxl,occ gran,occ DOL cmt,rr ooc mat,tr ANHY xl-incl,tt-tr intxl-rr ool POR,tr-fr dull yel FLOR,tr dull-bri yel FLOR,tr ltbrn-brn STN,tr-fr slow-mod fast stmg CUT"

6490.00 6500.00 "LS AA,incr LS GRNST,pred wh-crm-tan occ plty LS,occ dol LS,scat CHT frag,v rr ooc mat,tt-tr occ fr intxl-v rr ool POR,n-tr dull yel FLOR,n-rr spty lt-dkbrn STN,v rr blk dd o STN,n-tr slw-rr mod fast cut "

6500.00 6520.00 "LS ltbrn-brn,occ ltgybrn,crpxl-micxl,v rr gran,pred intbd tt LS PKST-WKST,n-v rr dol LS,v rr CHT frag,v sl anhy,tt-v rr intxl POR,n-v rr dull yel FLOR,n-v rr spty brn-v rr blk STN,n-v p slow CUT"

6520.00 6540.00 "LS crm-wh,lt-mbrn,crpxl-micxl,v rr gran,pred LS PKST-WKST,occ LS GRNST,sl DOL cmt-v rr brn micxl DOL incl,rr ltbrn CHT frag,occ anhy,v rr mic fos,tt-v rr intxl POR,n-v rr v spty dull yel FLOR,n vis STN-CUT"

6540.00 6550.00 "LS AA,sl incr ltbrn-gybrn micxl tt dol LS GRNST & incr wh-crm crpxl-micxl plty LS,occ ltbrn CHT frag,rr mic fos,tt-v rr intxl POR,n-v rr spty dull yel FLOR,n vis STN-CUT"

6550.00 6570.00 "LS crm-tan-brn-mbrn,crpxl-micxl,rr vfxl,dol,tr ltbrn-brn mot CHT frag w/scat fos incl,pred LS PKST-WKST,v rr blk carb SH lams,occ thn v sl ool LS GRNST,tt-rr intxl-v rr ool POR,n vis FLOR,n-v rr v spty blk STN,n vis CUT"

DEPTH	LITHOLOGY

6570.00 6580.00 "LS m-ltgybrn,ltgy,occ dkgybrn,brn-ltbrn,vfxl-micxl-crpxl,LS PCKST-WKST/abnt chky plty ptrgs-occ dns,sl dol,tr CHT AA,rr trnsl xln ANHY incl-rr frag,tt-rr intxl POR,FLOR-STN-CUT AA"

6580.00 6590.00 "LS AA,/incr ltgy-gybrn chky plty prtgs,v sl dol,NFSOC"

6590.00 6600.00 "LS m-ltbrngy,brn/occ ltgy strk,crpxl,tr micxl-vfxl,LS PCKST/tr WKST,rthy-occ sl chk,rr plty chky prtgs,dns,mot/dk brn arg incl,sl dol,tt-rr intxl POR,NFSOC"

6600.00 6610.00 "LS m-ltbrngy,brn/occ ltgy strk,crpxl,tr micxl-vfxl,rthy,occ sl chk-v sl slty ip,pred dns,mot/dk brn arg incl,sl dol,tt-vrr intxl POR,NFSOC"

6610.00 6620.00 "LS m-ltgybrn,ltgy,occ dkgybrn,brn-ltbrn,vfxl-micxl-crpxl,LS PCKST-WKST/abnt chky plty prtgs,sl dol,occ sl slty,tr bf CHT,tt-rr intxl POR,NFSOC"

6620.00 6630.00 "LS m-ltgybrn,brn,occ ltgy,crpxl-micxl,occ vfxl,LS PCKST-WKST/tr chky plty prtgs,sl dol,tr blk SH lam-strk,tr bf CHT/rr ool incl,tt-rr intxl POR,no-vrr scat mod bri yel-orng FLOR,tr brn STN,fr dif CUT"

6630.00 6640.00 "LS AA/abnt ltgybrn-gy chky-sl slty plty prtgs,tr CHT AA,POR-FLOR-STN CUT AA"

6640.00 6650.00 "LS AA,LS PCKST-WKST/scat chky plty prtgs,,tr bf CHT frag-incl,tt-rr intxl POR,FLOR-STN-CUT AA"

6650.00 6660.00 "LS AA,PCKST/incr WCKST,incr amt plty ltgybrn-ltgy chky plty prtgs,tr intbd bf CHT,occ arg-mot,tr blk SH lam,rr-tr mic fos,tt-rr intxl POR,NFSOC"

6660.00 6680.00 "LS tan-ltgybrn-crm,ltbrn,occ brn,vfxl-micxl,gran-micsuc,crpxl,LS PCKST/scat GRNST,tr WCKST,cln,slty-v slty,occ sl sdy ip,scat ltgy-gybrn chky plty prtgs,tr bf CHT frag & trnsl xln ANHY,g intxl POR,tr scat dull yel FLOR,fr ltbrn/tr brn STN,p res ring CUT"

6680.00 6690.00 "LS lt-mbrngy,brn/occ ltgy strk,crpxl,tr micxl-vfxl,rthy,chky-arg,incr ltgybrn chky plty frag,v sl slty,tr bf-brn-trnsl CHT incl-frag,v sl dol,tt-vrr intxl POR,no-rr scat dull yel FLOR,NSOC"

6690.00 6710.00 "LS m-ltbrn-brn/tr ltgybrn-gy strk,occ dkbrn,crm,crpxl,micx-vfxl,pred dns LS PKST-WKST,tr ltgybrn-gy chky plty frag,sl dol-occ grdg to dol LS,tr CHT AA,v rr anhy,tt-tr intxl POR,n-v rr dull orng-orng yel FLOR,tr-rr spty brn-v rr blk STN,n-v p slow CUT"

6710.00 6720.00 "LS AA,crpxl,micx-vfxl,pred dns LS PKST-WKST,tr ltgybrn-gy chky plty frag,rr blk SH lam,sl dol-occ grdg to dol LS,tr CHT AA,v rr anhy,tt-tr intxl POR,n-v rr dull orng-orng yel FLOR,STN-CUT AA"

6720.00 6740.00 "LS m-ltbrn-brn/tr ltgybrn-gy strk,occ dkbrn,crm,crpxl,micx-vfxl,pred dns LS PKST-WKST,tr-incr/depth chky plty frag,sl dol-occ grdg to dol LS,tr CHT AA,v rr anhy,tt-tr intxl POR,n-v rr dull orng-orng yel FLOR,tr-rr spty brn/v rr blk STN,n CUT"

6740.00 6750.00 "LS AA.LS PCKST/tr scat WCKST,tr scat chky plty sl arg frag,rr ool GRNST/fr ooc POR,no FLOR,fr ltbrn-brn/rr blk dd o STN,no CUT"

6750.00 6770.00 "LS ltgybrn-lt-dkbrn,crpxl-micxl,v rr gran,v rr ool,pred tt LS PKST,w/thn intbd ool LS GRNST,DOL rich cmt,v rr blk carb SH lams,scat brn CHT frag,anhy ip,tt-rr intxl POR,n-v rr spty dull yel FLOR,n vis STN,n-v p slow ring CUT"

DEPTH	LITHOLOGY

6770.00 6780.00 "LS AA,incr v sl ooc LS GRNST,sl anhy-rr ANHY xl,scat brn-ltgybrn CHT frag,tt-tr intxl-rr ool POR,n-v rr spty dull yel FLOR,v rr spty brn-dkbrn STN,rr fr slow stmg CUT"

6780.00 6790.00 "LS pred ltbrn-ltgybrn,incr micxl-gran,AA,scat ooc,pred v sl ool LS GRNST,scat CHT frag,dol ip,fr intxl-rr ool POR,rr p dull yel FLOR,rr spty brn STN,v rr spty blk dd o STN,rr slow-mod fast stmg-tr dif-ring CUT"

6790.00 6810.00 " LS lt-mbrn,crpxl-vfxl,gran-suc,occ ooc,pred sl ool LS GRNST,scat thn wh-crm plty LS PKST,v sl anhy,rr mic fos,occ DOL rich cmt,tt-g intxl-tr ool POR,fr-g dull-bri yel flor,fr-g lt-dkbrn STN,rr spty blk dd o STN,tr-g slow-fast stmg CUT"

6810.00 6820.00 "LS AA,sl incr wh-brn,plty-blky LS PKST,POR-FLOR-STN-CUT AA"

6820.00 6830.00 "LS AA,abnt ool-intxl POR,FLOR-STN-CUT AA"

6830.00 6840.00 "LS ltbrn-brn,crm-tan ip,crpxl-vfxl,gran-micsuc ip,incr plty LS PKST,pred ooc LS GRNST,sl anhy,DOL rich cmt,v rr mic fos,rr scat ltbrn-trnsl CHT frag,tr-fr intxl-ool POR,tr dull-bri yel FLOR,tr lt-mbrn STN,v rr blk dd o STN,tr-g slow-fast stmg CUT"

6840.00 6850.00 "LS AA,incr wh-crm plty crpxl LS PKST,decr intxl-ool POR,tr-fr dull-bri yel FLOR,tr-fr lt-mbrn STN,rr spty blk dd o STN,tr-fr slow-mod fast stmg CUT"

6850.00 6870.00 "LS lt-mbrn,dkbrn,occ wh-crm,crpxl-vfxl,gran-ooc,occ micsuc,scat dns-plty crpxl LS PKST,pred ooc LS GRNST,DOL rich cmt,sl anhy,scat tan-ltbrn CHT frag,tt-g intxl-ool POR,tr-g dull-bri yel FLOR,p-g lt-dkbrn STN,spty blk dd o STN,n-v g mod fast-fast stmg CU"

6870.00 6890.00 "LS tan-mbrn,dkbrn-wh ip,micxl-vfxl,gran-ooc,occ micsuc,tr dns-plty crpxl LS PKST,pred ooc LS GRNST,sl dol cmt,rr DOL incl,anhy,tr trnsl-bf CHT frag,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6890.00 6900.00 "LS AA,incr tt crm-wh-ltbrn,crpxl,occ plty LS PKST w/v rr mic fos,decr intxl-ool POR,sl decr FLOR-STN-CUT"

6900.00 6910.00 "LS AA,pred ltbrn-crm-tan cprxl anhy sl dol LS PKST,tr intxl-ool POR,tr dull-bri yel FLOR,fr ltbrn-rr blk STN,tr-fr slow-fast stmg CUT"

6910.00 6930.00 "LS lt-mbrn,occ crm-tan,micxl-vfxl,gran-micsuc,oolicastic,pred ooc sl dol LS GRNST,rr-tr tan CHT frag w/ool fos,rr LS PKST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr lt-dkbrn STN,rr spty blk dd o STN,fr-g slow-fast stmg CUT"

6930.00 6940.00 "LS AA,sl incr POR,fr dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,CUT AA"

6940.00 6960.00 "LS crm-tan,ltbrn-brn,occ wh,crpxl-vfxl,occ gran-micsuc-suc,ooc ip,pred dns plty LS PKST,w/thn intbd & bcmg ool LS GRNST,v rr mic fos,anhy-rr ANHY xl-incl,scat ool CHT frag,tt-fr intxl-ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn-rr blk STN,tr g fast CUT "

6960.00 6970.00 "LS pred ltbrn-brn,vfxl-gran,micsuc-suc,ooc,sl dol LS GRNST,w/rr ANHY xl,v sl chty,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g brn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT,w/LS PKST AA"

DEPTH	LITHOLOGY

6970.00 6990.00 "LS AA,incr ltbrn-crm-wh crpxl dns plty LS PKST,pred ooc LS GRNST,sl anhy,chty,v sl dol,tr-g intxl-ool POR,tr-fr dull-bri yel FLOR,tr-fr ltbrn-brn STN,v rr blk dd o STN,tr-g mod fast-fast stmg CUT"

6990.00 7010.00 "LS ltbrn-brn,tan,occ crm-ltgybrn,micsuc-vfxl-gran,occ suc-ooc,crpxl,LS GRNST/scat chky prtgs,chty,tr-rr xln ANHY frag,occ sl dol-dol,g-fr intxl-ool POR,fr-g scat dull-bri yel FLOR,fr-g brn/rr-tr spty blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

7010.00 7020.00 "LS AA,pred LS GRNST AA/incr m-ltbrn PCKST,occ dkbrn,tr ltgy-crm strk,dns,sl chky,tr scat bf-tan CHT/rr ool incl & rr trnsl xln ANHY,tt-tr intxl POR,no-rr mod bri yel FLOR,g brn/tr blk dd o STN,fr slow strmg CUT"

7020.00 7040.00 "LS ltbrn-tan,brn,occ crm-ltgybrn,micsuc-vfxl-gran,occ suc-ooc,crpxl,LS GRNST/scat plty chky prtgs,tr scat PCKST AA,chty,tr xln ANHY frag,rr blk SH lam,occ sl dol,g intxl-ool POR,g scat bri-mod bri yel FLOR,STN AA,fr-g mod fast-fast stmg mlky CUT"

7040.00 7050.00 "LS AA,LS GRNST/decr plty prtgs,tr scat PCKST,tr dol cmt-occ grdg to dol LS,scat CHT frag-occ incl,rr ANHY,POR-FLOR-STN-CUT AA"

7050.00 7060.00 "LS AA,LS GRNST/incr plty prtgs,tr scat PCKST,tr dol cmt-occ grdg to dol LS,incr scat CHT frag-occ incl,g intxl-ooc POR,g scat bri yel FLOR,g ltbrn-brn/tr scat blk dd o STN,g fast strmg CUT "

7059.00 7080.00 "TR BLK CARB SH CVGS"
"LS crm-brn-mbrn,crpxl-vfxl,gran,ooc,pred ool LS PKST,tr ANHY xl,occ DOL rich cmt-tr brn-gybrn DOL GRNST incl,rr scat brn CHT frag w/ool fos,fr-g intxl-ool POR,fr dull-bri yel FLOR,g brn-rr blk STN,fr-g mod fast-fast CUT"

7080.00 7100.00 "LS pred lt-mbrn,vfxl,gran-suc,AA,rr wh plty LS PKST,sl DOL rich cmt,scat CHT frag,g intxl-ool POR,fr-g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

7100.00 7110.00 "LS AA,rr ANHY xl,POR-FLOR-STN-CUT AA"

7110.00 7120.00 "LS AA,pred wh-ltbrn-gybrn dol crpxl-micxl LS PKST,anhy ip,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr lt-mbrn STN,rr blk dd o STN,tr-fr mod fast-fast stmg CUT"

7120.00 7140.00 "LS ltbrn-brn,occ mbrn-crm,micxl-vfxl,occ crpxl,gran-suc,pred ooc LS GRNST,sl DOL rich cmt,scat plty LS PKST,rr ANHY xl,scat trnsl-ltbrn CHT frag,fr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,g mbrn STN,rr spty blk dd o STN,fr-g mod fast-fast CUT"

7140.00 7160.00 "LS ltbrn-brn,occ mbrn-crm,micxl-vfxl,occ crpxl,gran-suc,pred ooc LS GRNST,sl DOL rich cmt,scat plty LS PKST,rr ANHY xl,scat trnsl-ltbrn CHT frag,fr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,g mbrn STN,rr spty blk dd o STN,fr-g mod fast-fast CUT"

7160.00 7170.00 "LS AA,pred wh-ltbrn-gybrn dol crpxl-micxl LS PKST,anhy ip,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr lt-mbrn STN,rr blk dd o STN,tr-fr mod fast-fast stmg CUT"

7170.00 7180.00 "LS AA,pred wh-ltbrn-gybrn dol crpxl-micxl LS PKST,anhy ip,abnt bf-tan CHT frag,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr lt-mbrn STN,rr blk dd o STN,tr-fr mod fast-fast stmg CUT"

7180.00 7200.00 "LS tan-ltbrn,occ brn,micsuc-micxl-gran,occ suc-vfxl,crpxl,ooc LS GRNST/intbd bf-trnsl CHT incl-frag,rr wh-crm sl dol PCKST,g ooc-intxl POR,g even bri yel FLOR,g-fr ltbrn-brn/occ blk dd o STN,g mod fast-fast strmg CUT"

DEPTH	LITHOLOGY

7200.00 7210.00 "LS AA,pred GRNST/intbd strks of PCKST & bf-tan-occ trnsl CHT incl-frag,occ sl dol ip,occ scat wh-ltgy chky frag,g ooc-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/scat blk dd o STN,g dif/slwo strmg CUT"

7210.00 7220.00 "LS AA,incr CHT AA,sl incr wh-ltgy chky frag,POR-FLOR-STN-CUT AA"

7220.00 7240.00 "LS tan-ltbrn,occ brn,vfxl-micxl-gran,ooc,crpxl,ooc LS GRNST,tr scat PCKST,pred cln/tr scat wh-ltgy chky frag,g ooc-intxl POR,g even bri yel FLOR,g ltbrn/tr brn & blk dd o STN,g fast blooming-fast strmg CUT"

7240.00 7260.00 "LS tan-ltbrn,brn,micsuc-vfxl-crpxl,gran,LS GRNST,tr scat tan-wh-crm PCKST frag,tr bf-tan CHT incl-frag/rr ool,tr blk SH lam-styl,sl dol,sl chky,rr trnsl xln ANHY frag,g intxl-ooc POR,g scat bri yel FLOR,g ltbrn-tr brn/occ blk dd o STN,fr slow difCUT"

7260.00 7270.00 "LS AA,pred GRNST,decr blk SH,occ scat wh-ltgy chky prtgs,tr scat dns PCKST,g intxl-ooc POR,incr scat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,fr-g dif/tr slow strmg CUT"

7270.00 7280.00 "LS ltbrn-tan-brn,occ wh-ltgy,crpxl-micxl,vfxl-gran,LS GRNST/scat chky sl plty prtgs,incr bf-tan CHT frag-incl,tr scat PCKST,rr blk SH lam-strk,fr-g intxl-tr ooc POR,FLOR-STN-CUT AA"

7280.00 7290.00 "LS AA,vfxl-micsuc-micxl,crpxl-gran,GRNST/sact PCKST,tr scat chky frag,tr CHT AA,rr trnsl xln ANHY,POR-FLOR-STN-CUT AA"

7290.00 7300.00 "LS AA,pred GRNST,tr blk SH cvgs,occ scat prtgs AA,tr scat PCKST,rr CHT AA,g intxl-ooc POR,incr scat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,fr-g dif/tr slow strmg CUT"

7300.00 7320.00 "LS ltbrn-tan-brn,occ wh-ltgy,vfxl-micxl-gran,crpxl,LS GRNST,tr-rr scat PCKST,pred cln/rr blk SH lam,scat chky frag,g intxl-ooc POR,g incr scat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g-fr mod fast-fast strmg CUT"

7320.00 7330.00 "LS AA,pred GRNST,occ scat wh-ltgy chky prtgs,tr scat dns PCKST,g intxl-ooc POR,g-fr scat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,fr-g dif/tr slow strmg CUT"

7330.00 7350.00 "LS ltbrn-tan-brn,occ wh-ltgy,vfxl-micxl-gran,crpxl,LS GRNST,tr-rr scat PCKST,scat chky frag,scat bf-trnsl-tan CHT incl-frag,g intxl-ooc POR,g incr scat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g-fr mod fast-fast strmg CUT"

7350.00 7370.00 "LS ltbrn-tan,brn,micsuc-vfxl-crpxl,gran,LS GRNST/scat tan-wh-crm PCKST frag,tr bf-tan CHT incl-frag,,sl dol,sl chky,rr trnsl xln ANHY frag,g intxl-ooc POR,fr-tr scat bri yel FLOR,g ltbrn-brn/occ blk dd o STN,g mod fast-slow strmg CUT"

7370.00 7380.00 "LS ltbrn-tan-brn,occ wh-ltgy,micsuc-vfxl-gran,micxl-crpxl,LS GRNST/scat chky sl plty prtgs,incr bf-tan CHT frag-incl,tr scat PCKST,g intxl/tr ooc POR,FLOR-STN-CUT AA"

7380.00 7400.00 "LS ltbrn-tan,brn,occ wh-ltgy,micsuc-vfxl-gran-micxl,occ crpxl-ooc,pred GRNST,occ scat chky prtgs,tr scat PCKST,tr bf-tan CHT,tr xln ANHY frag,g intxl-ooc POR,g incrscat bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g mod fast-fast strmg CUT"

7400.00 7410.00 "LS AA,LS GRNST/tr PCKST,tr scat chky prtgs,tr scat bf-tan CHT frag-incl,tr trnsl xln ANHY,g intxl-occ ooc POR,g even mod bri-bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g dif/mod fast strmg CUT"

DEPTH	LITHOLOGY

7410.00 7430.00 "LS ltbrn,tan,occ brn,micsuc-ooc-gran,vfxl-crpxl,LS GRNST/incr ooc POR,tr scat ltgy-crm chky PCKST,tr CHT AA,rr xln trnsl ANHY,g ooc-intxl/tr alg POR,g even mod bri-spty bri yel FLOR,g dif/slow-mod fast strmg CUT"

7430.00 7440.00 "LS AA,pred GRNST/incr tan-bf CHT incl-frag,tr scat PCKST,tr trnsl xln ANHY,g ooc-agl-intxl POR,g even mod bri-bri yel FLOR,g ltbrn-brn/tr-rr blk dd o STN,g dif/fast strmg CUT"

7440.00 7450.00 "LS AA,pred GRNST/decr CHT,incr scat PCKST,tr ANHY AA,g ooc-intxl/rr agl POR,g-fr scat mod bri-bri yel FLOR,g ltbrn-brn/tr-rr blk dd o STN,g dif/fast strmg CUT"

7450.00 7470.00 "LS tan-ltbrn,micsuc-gran-ooc,vfxl-crpxl,LS GRNST-incr ooc/depth,tr PCKST prtgs,cln-sl chky,rr bf-tan CHT frag,rr trnsl xln ANHY frag,g intxl-ooc/tr alg POR,g even bri-mod bri yel FLOR,g ltbrn-brn/scat blk dd o STN,g blooming-fast strmg CUT"

7470.00 7490.00 "LS ltbrn,tan,occ brn,ooc-micsuc,gran-micxl-vfxl,pred ooc LS GRNST/tr ool incl,tr-rr PCKST frag,v sl chky,vrr bf-tan CHT incl,sl tr dol cmt ip,g ooc-alg-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr blk dd o stn,g fast strmg mlky CUT"

7490.00 7500.00 "LS ltbrn,tan,ooc,micsuc-gran,micxl-vfxl,ooc LS GRNST,tr ool incl,v sl chky,vrr bf-tan CHT incl,sl tr dol cmt ip,g ooc-alg-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr blk dd o stn,g fast strmg-blooming CUT"

7500.00 7510.00 "LS AA,ooc LS GRNST/incr dol rich cmt,occ grdg to lmy DOL ip,tr tan-bf CHT incl-frag,rr ool incl,POR-FLOR-STN-CUT AA"

7510.00 7530.00 "LS ltbrn,tan,ooc,micsuc-agl,gran,micxl-vfxl,ooc LS GRNST/dol rich cmt,occ grdg to lmy DOL ip,rr ool incl,v sl chky,rr bf-tan CHT/rr ool incl,g ooc-alg-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr blk dd o stn,g blooming-fast strmg mlky CUT"

7530.00 7550.00 "LS ltbrn,tan,ooc,micsuc-agl,gran,micxl-vfxl,ooc LS GRNST/dol rich cmt,occ grdg to lmy DOL ip,rr ool incl,v sl chky,rr bf-tan CHT/rr ool incl,g ooc-alg-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr blk dd o stn,g fast strmg mlky-sl blooming CUT"

7550.00 7560.00 "LS AA,occ GRNST/dol rich cmt,occ grdg to lmy DOL ip,sl tr CHT,rr ool incl,vrr ANHY AA,g ooc-agl-intxl POR,g even bri yel FLOR,g ltbrn-brn/tr pp blk dd o STN,g fast strmg mlky CUT"

7560.00 7580.00 "LS ltbrn,tan,occ brn,ooc,micsuc-agl,gran,micxl-vfxl,ooc LS GRNST/dol rich cmt,occ grdg to lmy DOL,tr ool incl,tr xln ANHY,rr bf-tan CHT incl,g ooc-alg-intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr-rr blk dd o stn,g blooming-fast strmg mlky CUT"

7580.00 7590.00 "LS ltbrn-brn,occ tan,ooc-agl-micsuc,vfxl-gran,ooc LS GRNST/dol rich cmt,occ grdg to lmy DOL ip,rr scat PCKST,rr bf-trnsl CHT incl,vrr xln ANHY,g ooc-intxl POR,g even bri yel FLOR,STN-CUT AA"

7590.00 7600.00 "LS AA,ooc LS GRNST,vrr scat ool,POR-FLOR-STN-CUT AA"

7600.00 7630.00 "LS lt-mbrn,rr tan,micxl-vfxl,gran-suc,rr crpxl LS PKST,v sl DOL cmt-v rr DOL PKST incl,oolicatic-v sl alg,v rr scat trnsl CHT frag,fr-g intxl-ool-sl alg POR,fr-g dull-bri yel FLOR,fr-g lt-mbrn-rr blk STN,fr-g mod fast-fast stmg CUT"

DEPTH	LITHOLOGY

7630.00 7640.00 "LS AA,incr CHT-DOL frag,sl incr tt crpxl sl dol LS PKST,fr POR AA,fr-g FLOR AA,STN-CUT AA"

7641.00 7650.00 "LS AA,rr-tr dkbrn micxl lmy DOL PKST-v rr DOL GRNST,fr intxl-tr-fr ool-alg POR,fr dull-bri yel FLOR,fr lt-dkbrn STN,rr spty blk dd o STN,fr g mod fast-fast stmg CUT"

7650.00 7670.00 "LS brn-mbrn,occ ltbrn-tan,dkbrn ip,micxl-vfxl,gran-suc,crpxl ip,scat tr lt-dkbrn dol LS PKST,pred ooc-alg LS GRNST,occ DOL rich cmt-v rr scat gybrn DOL PKST,rr tnsl-tan CHT frag,v sl anhy,tt-g intxl-ool-alg POR,fr-g dull-bri yel FLOR,g brn STN,g fast CUT"

7670.00 7680.00 "LS AA,incr trnsl CHT frag,scat ltgybrn lmy crpxl DOL PKST,incr LS PKST,tr-fr intxl-ool POR,v rr alg POR,fr dull-bri yel FLOR,fr brn STN,v rr spty blk dd o STN,tr-fr mod fast-fast stmg CUT"

7680.00 7700.00 "LS lt-dkbrn,micxl-vfxl,gran-suc,oolicastic-sl alg,pred LS GRNST,sl DOL rich cmt,v rr scat CHT frag,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,lt-dkbrn STN-v rr blk dd o STN,g mod fast-fast CUT"

7700.00 7720.00 "LS AA,sl incr LS PKST,occ DOL cmt-v rr DOL frag,CHT AA,POR-FLOR-STN-CUT AA"

7720.00 7770.00 "LS brn-mbrn,occ ltbrn-gybrn-dkbrn,micxl-vfxl,gran-suc,oolicastic,sl alg,pred LS GRNST,v sl anhy,occ DOL rich cmt,scat trnsl-bf CHT frag,v rr mic-Cor fos,tr crpxl LS PKST,fr-g intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,g lt-dkbrn-rr blk STN,fr-g fast CUT"

7770.00 7780.00 "LS AA,incr dol crpxl brn-gybrn-crm LS PKST,tt-g intxl-g ool-tr alg POR,fr-g dull-yel FLOR,fr lt-dkbrn STN,spty blk dd o STN,fr-g mod fast-fast stmg CUT"

7780.00 7800.00 "LS pred brn,micxl-vfxl,gran-micsuc,ooc-alg,sl DOL rich cmt LS GRNST,thn tan-gybrn crpxl LS PKST,v rr mic fos,scat trnsl-bf CHT frag,rr gybrn-dkbrn crpxl-micxl DOL PKST,fr intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr lt-dkbrn-rr blk STN,fr mod fast CUT"

7800.00 7810.00 "LS AA,decr LS PKST,incr oolicastic-alg,fr-g intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr brn-dkbrn STN,rr spty blk dd o STN,fr mod fast-fast stmg CUT"

7810.00 7831.00 "LS brn-mbrn,occ ltbrn-gybrn-dkbrn,micxl-vfxl,gran-suc,oolicastic,sl alg,pred LS GRNST,v sl anhy,occ DOL rich cmt,scat trnsl-bf CHT frag,v rr mic-Cor fos,tr crpxl LS PKST,fr-g intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,g lt-
dkbrn-rr blk STN,fr-g fast CUT"

7830.00 7850.00 "LS AA,sl incr tan-crm crpxl-micxl v sl dol LS PKST,v rr gybrn-crm crpxl lmy DOL PKST,POR-FLOR-STN-CUT AA"

7850.00 7880.00 "LS pred brn,micxl-vfxl,gran-micsuc,ooc-alg,sl DOL rich cmt LS GRNST,thn tan-gybrn crpxl LS PKST,rr trnsl-bf CHT frag,rr gybrn-dkbrn crpxl-micxl DOL PKST,fr intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr lt-dkbrn-rr blk STN,fr mod fast CUT"

7880.00 7900.00 "LS AA,pred ooc-v sl alg LS GRNST,incr crm-ltbrn,occ gybrn,crpxl,dol,anhy LS GRNST,w/v rr brn crpxl-micxl DOL PKSTN,fr-g intxl-ool-rr alg POR,fr-g bri-dull yel FLOR,g brn STN,v rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

DEPTH	LITHOLOGY

7900.00 7920.00 "LS pred brn,micxl-vfxl,gran-micsuc,ooc-alg,sl DOL rich cmt LS GRNST,thn tan-gybrn crpxl LS PKST,,rr trnsl-bf CHT frag,rr gybrn-dkbrn-tan crpxl-micxl DOL PKST incl,fr intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr lt-dkbrn-rr blk STN,fr mod fast CUT"

7920.00 7930.00 "LS ltbrn-tan,brn,micsuc-gran-ooc,occ vfxl-crpxl,LS GRNST,tr tan chty incl-frag,rr trnsl xln ANHY,g intxl-occ-rr agl POR,g even bri yel FLOR,g ltbrn-brn/tr scat pp blk dd o STN,g mod fast strmg mlky CUT"

7930.00 7940.00 "LS AA,incr brn,LS GRNST,POR AA,g brn-occ ltbrn/tr scat pp blk dd o STN,g blooming-fast strmg CUT"

7940.00 7960.00 "LS ltbrn-tan,brn,micsuc-gran-ooc,occ vfxl-crpxl,LS GRNST,tr dol cmt-DOL PCKST frag,tr tan-trnsl CHT incl-frag,rr trnsl xln ANHY,g intxl-occ rr agl POR,g even bri yel FLOR,g ltbrn-brn/tr scat pp blk dd o STN,g fast strmg mlky CUT"

7960.00 7970.00 "LS brn-ltbrn,occ tan,micsuc-gran-vfxl,crpxl-sl agl,LS GRNST/dol cmt,tr scat PCKST,tr CHT incl-frag,rr xln ANHY,occ grdg to lmy DOL,o intxl-ooc/tr agl POR,FLOR-STN-CUT AA"

7970.00 7990.00 "LS brn,ltbrn-tan,occ crm-trnsl-ltgy,vfxl-micsuc-micxl,crpxl-ooc-sl agl,LS GRNST/tr scat PCKST frag,tr dol cmt-rr lmy DOL frag,tr bf-tan-trnsl CHT incl-frag,rr xln ANHY,g intxl-ooc/rr agl POR,g even bri yel FLOR,g blooming mlky CUT"

7990.00 8000.00 "LS AA,pred GRNST/sl incr scat crpxl PCKST,rr-tr xln ANHY frag,tr-rr CHT incl AA,POR-FLOR-STN-CUT AA"

8000.00 8020.00 "LS brn,ltbrn-tan,occ crm-lygy,vfxl-micsuc,vfxl-gran,occ crpxl,GRNST/tr scat crpxl PCKST,incr trnsl-off wh-tan CHT incl-frag/tr-rr ool incl,tr-rr trnsl xln ANHY,sl tr dol cmt,g intxl-fr ooc POR,g even bri yel FLOR,g brn-ltbrn/tr pp dd o STN,g blooming CUT"

8020.00 8030.00 "LS AA,GRNST/scat wh chky arg & brn-tan sl dol crpxl PCKST,tr CHT AA,tr-rr trnsl xln ANHY,tr dol cmt,g intxl-fr ooc POR,g even bri yel FLOR,g brn-ltbrn/tr pp dd o STN,g fast strmg mlky CUT"

8030.00 8040.00 "LS AA,pred GRNST/incr scat wh chky arg plty-tan crpxl sl dol PCKST,tr tan-bf CHT frag-incl,rr xln ANHY,POR-FLOR-STN-CUT AA"

8040.00 8060.00 "LS brn,ltbrn,occ tan,crm-ltgy,micsu-vfxl-gran,ooc-crpxl,LS GRNST intbd/chky plty-occ dns crpxl PCKST,tr scat trnsl-mlky-tan CHT frag-incl,rr trnsl xln ANHY frag,g intxl-ooc/rr agl POR,g bri yel FLOR,g brn-ltbrn/scat pp blk dd o STN,g mod fast strmg CUT"

8060.00 8080.00 "LS ltbrn,brn,tan,occ crm-ltgy,vfxl-micsuc-micxl,gran-crpxl,occ ooc,LS GRNST/scat chky plty-fl,tr dns sl dol PCKST,tr trnsl-tan CHT frag/rr wh ool incl,tr xln ANHY frag,POR-FLOR AA,g ltbrn/scat brn-dkbrn/spty blk dd o STN,g mod fast-fast strng mlky CUT"

8080.00 8090.00 "LS AA,pred GRNST/incr scat wh chky arg plty prtgs,tr scat sl dol PCKST,tr tan-tnsl-occ wh CHT frag-incl,tr xln ANHY,POR-FLOR-STN-CUT AA"

8090.00 8100.00 "LS AA,pred GRNST/scat wh chky arg plty-tan crpxl sl dol PCKST,tr tan-bf CHT frag-incl,rr xln ANHY,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

8100.00 8120.00 "LS ltbrn,tan,brn,crm-off wh-wh,crpxl-gran,micxl-vfxl,LS GRNST/scat chky plty prtgs,tr scat CHT frag-occ incl AA,rr ltgybrn arg sl dol frag/vrr blk SH strk,g intxl/tr ooc-vrr agl POR,g scat bri-spty mod bri yel FLOR,g ltbrn-tr brn/occ blk dd o STN,CUT AA"

8120.00 8140.00 "LS tan-ltbrn,occ crm-wh,ltgybrn,crpxl-micxl,vfxl,occ ooc-micsuc,GRNST/tr scat PCKST,occ scat chky-arg prtgs,tr CHT & ANHY AA,g intxl-tr ooc POR,g scat bri-spty dull yel FLOR,g ltbrn-brn/scat blk dd o STN,g dif/tr fast strmg CUT"

8140.00 8150.00 "LS AA,scat DOL rich LS PKST,v rr tt brn micxl lmy DOL PKST,POR-FLOR-STN-CUT AA"

8150.00 8160.00 "LS pred brn-mbrn gran ooc-sl alg LS GRNST,w/tr crm-tan crpxl LS PKST,v rr DOL PKST,tr-g intxl-ooc-rr alg POR,fr-g dull-bri yel FLOR,fr mbrn-brn STN,rr blk dd o STN,fr-g mod fast-fast stmg CUT"

8160.00 8190.00 "LS brn-mbrn,occ crm-tan-ltbrn,micxl-vfxl,crpxl ip,gran-suc,ooc-sl alg,pred LS GRNST,rr tt LS PKST,occ DOL rich cmt w/v rr brn crpxl-micxl DOL PKST,scat trnsl CHT frag,fr-g intxl-ooc-v rr alg POR,occ tt,fr-g dull-bri yel FLOR,fr brn-rr blk STN,fr fast CUT"

8190.00 8200.00 "LS AA,scat ANHY xl-incl,POR-FLOR-STN-CUT"

8200.00 8220.00 "LS ltbrn-brn,mbrn,occ crm-tan,crpxl-vfxl,gran-micsuc,occ suc,scat mic fos,pred ool-sl alg LS GRNST w/thn intbd sl fos LS PKST,DOL rich cmt-v rr-v thn DOL PKST,tt-g intxl-tr ool-sl alg POR,fr-g dull-bri yel FLOR,fr brn STN-rr blk dd o STN,fr mod fast CUT"

8220.00 8250.00 "LS pred lt-dkbrn,micxl-vfxl,gran-suc,oolicastic-v sl alg LS GRNST,w/scat tan crpxl-micxl sl dol anhy ip LS PKST,rr mic fos,DOL rich cmt ip,rr ANHY xl-incl,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr-g brn-rr blk STN,fr-g mod fast-fast CUT"

8250.00 8260.00 "LS AA,incr DOL cmt-ANHY xl,tr trnsl-bf CHT frag,incr LS PKST,tr-fr intxl-tr ool-rr alg POR,fr-g dull-bri yel FLOR,tr-fr brn-v rr blk STN,tr of g mod fast-fast stmg CUT"

8260.00 8280.00 "LS pred intbd ooc-alg LS GRNST-dol LS PKST AA,POR-FLOR-STN-CUT AA"

8280.00 8290.00 "LS pred ltbrn-mbrn-brn,micxl-vfxl,gran-suc,oolcastic-sl alg LS GRNST,scat tt LS PKST,sl dol,scat trnsl-bf CHT frag,rr mic fos,fr-g intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr-g brn-mbrn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

8290.00 8300.00 "LS pred intbd ooc-alg LS GRNST-dol LS PKST AA,POR-FLOR-STN-CUT AA"

8300.00 8330.00 "LS pred lt-dkbrn,micxl-vfxl,gran-suc,oolicastic-v sl alg LS GRNST,w/scat tan crpxl-micxl sl dol anhy ip LS PKST,rr mic fos,DOL rich cmt ip,rr ANHY xl-incl,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr-g brn-rr blk STN,fr-g mod fast-fast CUT"

8330.00 8350.00 "LS tan-crm-brn-mbrn,crpxl-vfxl,gran-suc,occ micsuc,occ ool-sl alg,pred LS GRNST,scat LS PKST incl,DOL rich cmt-v rr spty DOL PKST,v rr mic fos,sl anhy,tr-g intxl-fr ool-v rr alg POR,fr-g dull-bri yel FLOR,tr-g brn-rr blk STN,fr-g mod fast-fast stmg CUT"

8350.00 8360.00 "LS AA,incr & bcmg tan-crm crpxl,occ plty LSPKST,incr CHT frag,decr POR,FLOR-STN-CUT AA"

8360.00 8370.00 "LS pred ooc-alg LS GRNST-decr dol LS PKST AA,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

8370.00 8400.00 "LS pred ltbrn-mbrn-brn,micxl-vfxl,gran-suc,oolcastic-sl alg LS GRNST,scat tt LS PKST,sl dol,scat trnsl-bf CHT frag,rr mic fos,fr-g intxl-ool-tr alg POR,fr-g dull-bri yel FLOR,fr-g brn-mbrn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

8400.00 8410.00 "LS AA,scat tan-brn,occ crm LS PKST,v rr mic fos,sl dol,POR-FLOR-STN-CUT AA"

8410.00 8430.00 "LS ltbrn-tan,mbrn-brn,occ crm,vfxl-micsuc-gran,ooc-crpxl,tr agl,GRNST/scat tt LS PKST,sl dol,scat trnsl-bf CHT frag,tr xln ANHY,rr mic fos,fr-g intxl-ool-tr alg POR,g even bri-mod bri yel FLOR,g ltbrn-brn STN/rr pp blk dd o STN,g mod fast-fast stmg CUT"

8430.00 8440.00 "LS AA,pred LS GRNST/incr scat PCKST,incr bf-tan CHT incl-frag,tr trnsl xln ANHY,g scat dull-bri yel FLOR,g ltbrn/occ brn-tr scat blk dd o STN,g mod fast strmg CUT"

8440.00 8460.00 "LS ltbrn-mbrn-brn,micxl-vfxl,gran-micsuc,ooc ooc-sl alg,GRNST,rr scat crm-ltgy chky PKST,v sl dol,tr scat trnsl-bf CHT frag,rr xln ANHY,g intxl-ool-rr alg POR,g even bri yel FLOR,g brn-mbrn/rr pp blk dd o STN,g blooming-fast stmg mlky CUT"

8460.00 8470.00 "LS ltbrn-tan,mbrn-brn,occ crm,vfxl-micsuc-gran,ooc-crpxl,GRNST/incr tt LS PKST,sl dol,CHT AA,tr xln ANHY,fr-g intxl POR,fr-g scat dull-mod bri yel FLOR,g ltbrn-brn STN/rr pp blk dd o STN,CUT AA"

8470.00 8500.00 "LS ltbrn-mbrn-brn,occ crm-ltgy,micxl-vfxl,gran-micsuc,ooc ooc-sl alg,GRNST,tr scat sl plty chky PKST,v sl dol,tr scat trnsl-bf CHT frag,tr xln ANHY,g intxl-ool-rr alg POR,g even bri yel FLOR,g brn-mbrn/rr pp blk dd o STN,g blooming-fast stmg mlky CUT"

8500.00 8530.00 "LS ltbrn-mbrn-brn,micxl-vfxl,gran-micsuc,ooc ooc-sl alg,GRNST,rr scat crm-ltgy chky PKST,v sl dol,tr-rr scat trnsl-bf CHT incl-frag,rr xln ANHY,g intxl-ool-rr alg POR,g even bri yel FLOR,g brn-mbrn/rr pp blk dd o STN,g blooming-fast stmg mlky CUT"

8530.00 8540.00 "LS mbrn-brn,ltbrn-tan,occ crm,vfxl-micsuc-gran,ooc-crpxl,GRNST/tr LS PKST,v sl dol,tr CHT AA,tr xln ANHY,rr ool incl,g-fr intxl POR,g even bri yel FLOR,g ltbrn-brn STN/rr pp blk dd o STN,CUT AA"

8550.00 8570.00 "LS ltbrn-tan,mbrn-brn,occ crm,vfxl-micsuc-gran,ooc-crpxl,rr agl,GRNST/rr tt LS PKST,sl dol,scat trnsl-bf CHT incl-frag,tr xln ANHY,rr ool,g intxl-ool-tr alg POR,g even bri-mod bri yel FLOR,g ltbrn-brn STN/rr pp blk dd o STN,g blooming-fast stmg mlky CUT "

8570.00 8590.00 "LS lt-mbrn,brn,occ tan,crm-ltgy,micxl-vfxl-micsuc,ooc-gran,crpxl,GRNST,occ v sl dol,cln/tr scat chky frag prtgs,tr-rr trnsl xln ANHY,rr-tr tan-bf CHT incl,rr scat PCKST,rr ool,g intxl-ooc/rr agl POR,g brn-ltbrn/rr scat pp blk dd o STN,g blooming mlky CUT"

8590.00 8600.00 "LS AA,GRNST/incr scat chky PCKST frag-prtgs,incr tan-bf CHT incl-frag,POR-FLOR-STN AA,g blooming-fast strmg mlky CUT"

8600.00 8610.00 "LS AA,tr-rr crm-ltgy LS PKST prts,v sl dol ip,tr-rr CHT incl AA, rr xln ANHY,sl dol,POR-FLOR-STN-CUT AA"

8610.00 8630.00 "LS lt-mbrn,brn,occ tan,crm-ltgy,micxl-vfxl-micsuc,ooc-gran,crpxl,GRNST,occ v sl dol,cln/tr scat chky frag prtgs,tr-rr trnsl xln ANHY,rr-tr tan-bf CHT incl,rr scat PCKST,rr ool,g intxl-ooc/rr agl POR,g brn-ltbrn/rr scat pp blk dd o STN,g blooming mlky CUT"

DEPTH	LITHOLOGY

8630.00 8650.00 "LS lt-mbrn,tan,occ brn,crm-ltgy,micxl-micsuc,gran,ooc-crpxl,LS GRNST v ooc ip,v sl dol,tr scat chky prtgs,tr scat tt dns PCKST,tr trnsl-bf CHT incl-frag,rr xln ANHY,rr ool,g ooc-intxl POR,g even bri yel FLOR,g brn-ltbrn/rr pp blk dd o STN,g blooming CUT"

8650.00 8670.00 "LS AA,pred micxl-vfxl,gran-micsuc,occ ooc-v sl alg LS GRNST,w/rr scat wh-cr LS PKST,sl dol,scat trnsl-bf CHT frag,v rr ANHY xl,fr intxl-rr ool-alg POR,fr-g dull-bri yel FLOR,tr-fr brn-v rr blk STN,fr amnt g mod fast-fast CUT"

8670.00 8690.00 "LS intbd lt-mbrn LS GRNST AA,w/fr amnt crm-wh crm-micxl plty sl anhy LS PKST,tr-fr intxl-rr ool-v sl alg POR,fr dul-bri yel FLOR,fr ltbrn-brn-v rr blk STN,tr-fr amnt g mod fast-fast CUT"

8690.00 8700.00 "LS brn,occ tan-crm,crpxl-vfxl,gran-micsuc ip,occ ool-v sl alg,intdb LS GRNST & LS PKST,sl dol,v sl anhy,tr-fr intxl-rr ool POR,tr-fr dull-bri yel FLOR,tr scat brn-v rr blk STN,n-g slow-fast CUT"

8700.00 8720.00 "LS ltbrn-brn,occ crm-tan-ltgy,micxl-vfxl,occ crpxl,gran-micsuc,sl ooc-rr alg,pred LS GRNST,w/v sl anhy LS PKST incr w/depth,dolip,scat trnsl-bf CHT frag,fr-g intxl-tr ool POR,fr dull-bri yel FLOR,fr lt-mbrn STN,v rr blk dd o STN,fr-g mod fast stmg CUT"

8720.00 8730.00 "LS pred intbd ltbrn-brn,micxl-vfxl,gran-micsuc,oolcatic LS GRNST & wh-crm-tan,occ ltgy,crpxl,plty LS PKST,n-fr intxl-rr ool POR,n-fr brn-v rr blk STN,n-g fast stmg CUT"

8730.00 8740.00 "LS AA,intbd LS GRNST-PKST AA,incr trnsl-bf CHT frag,decr POR-FLOR-STN-CUT"

8740.00 8750.00 "LS AA,tr ANHY fl POR,v rr alg POR,tr POR-FLOR-STN-CUT AA,w/tt m-dkbrn,crpxl-micxl,lmy DOL PKST NFSOC"

8750.00 8760.00 "DOL dkbrn-brn,crpxl,occ micxl,dns DOL PCKST,sl lmy-grdg to dol LS,intbd/LS AA,tr mot dkbrnblk arg strk,pred tt-rr intxl POR,n-vrr dull orng-orngyel FLOR,fr brn/vrr blk STN,no CUT"

8770.00 8780.00 "LS ltbrn-tan,occ brn-dkbrn,crpxl-micxl-vfxl,gran,occ micsuc-oolcatic,LS GRNSTintbd w/DOL PCKST AA,vrr wh-crm-tan,occ ltgy,crpxl,plty LS PKST,n-tr intxl-vrr ool POR,n-fr ltbrn-brn/v rr blk STN,n-fr dif/fnt res ring CUT"

8780.00 8800.00 "DOL dkbrn-brn,crpxl,occ micxl,dns DOL PCKST,sl lmy-grdg to dol LS,intbd/LS AA,tr lt-ltbrn LS incl,occ mot dkbrnblk arg strk,pred tt-rr intxl POR,n-vrr dull orng-orngyel FLOR,fr brn/vrr blk STN,no CUT"

8800.00 8820.00 "LS tan,lt-mbrn,occ ltgybr-crm,vfxl-micsuc-gran,crpxl-ooc,pred dns LS GRNST/LS PKST,occ intbd in DOL AA-occ grdg to lmy DOL,sl chky,rr CHT & ANHY AA,fr-g intxl-rr ooc POR,fr scat dull-mod bri yel FLOR,fr lt-mbrn/v rr blk dd o STN,fr dif/v fnt res ring CUT"

8820.00 8830.00 "LS AA/ltgy-ltgybr-wh-crm plty-chky scat PCKST frag-prtgs,occ mot/dkbrn-brnblk arg strk,rr xln ANHY,POR-FLOR-STN-CUT AA"

8830.00 8840.00 "DOL dkbrn-brn-tan,crpxl,occ micxl,dns DOL PCKST,sl lmy-grdg to dol LS,intbd/LS AA,tr lt-ltbrn LS incl,occ mot dkbrnblk arg strk,pred tt-rr intxl POR,n-vrr dull orng-orngyel FLOR,fr brn/vrr blk STN,no CUT"

8840.00 8850.00 "LS AA,tr scat chky plty-arg frag,tr xln ANHY/vrr POR fl,fr-g in xlt/v rr ooc-alg POR,FLOR-STN-CUT AA,w/tt m-dkbrn,crpxl-micxl,scat lmy DOL PKST NFSOC"

DEPTH	LITHOLOGY

8860.00 8870.00 "DOL dkbrn-brn-tan,crpxl,occ micxl-sl gran,pred dns DOL PCKST,occ grdg to dol LS,scat LS AA,tr LS incl/occ lmy strk,occ mot dkbrnblk arg strk,rr-tr mic fos incl,tt-rr intxl POR,n-vrr dull orng-orngyel FLOR,fr brn/tr blk STN,v fnt res ring CUT"

8870.00 8890.00 "DOL ltbrn,tan,occ m-dkbrn,crpxl,occ sl micxl,dns DOL PCKST/lmy-LS pp-frag incl,rr lmy POR fl,rr scat bf-trnsl CHT frag/vrr ool incl,occ grdg to dol LS,scat LS PCKST AA,tt-rr intxl POR,n-tr scat v dull orng mnrl FLOR,fr brn-occ dk brn/tr blk STN,n vis CUT"

8890.00 8900.00 "DOL AA,tt-v rr v p intxl POR,NFSOC,incr LS GRNST,v sl ool,tr-fr intxl-tr ool POR,fr dull-bri yel FLOR,rr-tr dkbrn-blk STN,fr mod fast CUT"

8900.00 8920.00 "LS tan-brn,mbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,oolicastic ip,pred LS GRNST w/thn intbd LS PKST-tr tt mbrn DOL PKST,occ ANHY fl POR,tr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr lt-mbrn STN,fr-g mod fast-fast stmg CUT"

8920.00 8930.00 "LS AA,pred ool LS GRNST,dol ip,scat v dol LS PKST,w/v rr DOL PKST frag,tr ANHY fl POR,FLOR-STN-CUT AA"

8930.00 8950.00 "LS tan-brn,mbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,oolicastic ip,pred LS GRNST w/tr thn intbd wh crpxl plty LS PKST-v rr tt mbrn DOL PKST,occ ANHY fl POR,tr-g intxl-tr ool POR,fr-g dull-bri yel FLOR,tr-fr lt-mbrn
STN,fr-g mod fast-fast stmg CUT"

8950.00 8970.00 "LS AA,scat brn lmy micxl DOL PKST incl,v rr styl,pred oolcastic-gran LS GRNST AA,POR-FLOR-STN-CUT AA"

8970.00 8990.00 "LS crm-tan,brn-mbrn,micxl-vfxl,gran-suc,rr plty LS PKST frag,occ dol,oolicastic ip,pred LS GRNS,rr ANHY fl POR,fr-g intxl-ool POR,g bri-dull yel FLOR,tr-fr lt-mbrn STN,v rr v spty blk dd o STN,g fast CUT"

8990.00 9000.00 "LS AA,pred oolicastic LS GRNST AA,POR-FLOR-STN-CUT AA"

9000.00 9040.00 "LS ltbrn-brn,occ crm-tan-ltgy,micxl-vfxl,gran-suc,v rr crpxl-plty,pred sl oolicastic LS GRNST,v rr LS PKST,v sl dol,v rr ANHY xl,scat trnsl CHT frag,g intxl-tr ool POR,g dull-bri yel FLOR,fr mbrn STN-rr blk spty dd o STN,g mod fast-fast stmg CUT"

9040.00 9050.00 "LS AA,POR-FLOR-STN-CUT AA"

9050.00 9080.00 "LS ltbrn-brn,occ crm-tan-ltgy,micxl-vfxl,gran-suc,v rr crpxl-plty,pred sl oolicastic LS GRNST,v rr LS PKST,v sl dol,v rr ANHY xl,scat trnsl CHT frag,g intxl-tr ool POR,g dull-bri yel FLOR,fr mbrn STN-rr blk spty dd o STN,g mod fast-fast stmg CUT"

9080.00 9090.00 "LS AA,sl incr crpxl,occ plty,sl dol LS PKST,sl decr POR,FLOR-STN-CUT AA"

9090.00 9100.00 "LS ltbrn-brn,occ crm-tan-ltgy,micxl-vfxl,gran-suc,v rr crpxl-plty,pred sl oolicastic LS GRNST,v rr LS PKST,v sl dol,v rr ANHY xl,scat trnsl CHT frag,g intxl-tr ool POR,g dull-bri yel FLOR,fr mbrn STN-rr blk spty dd o STN,g mod fast-fast stmg CUT"

DEPTH	LITHOLOGY

9100.00 9110.00 "LS AA,pred oolicastic LS GRNST,scat trnsll-bf CHT frag,rr LS PKST,g intxl-fr ool POR,g dull-bri yel FLOR,tr-fr brn STN,rr blk dd o STN,g fast stmg CUT"

9110.00 9130.00 "LS AA,sl incr LS PKST,v sl vis decr POR,FLOR-STN-CUT AA"

9130.00 9145.00 "LS ltbrn-brn,rr crm-tan,micxl-vfxl,gran-suc-micsuc,rr crpxl,v sl ool,occ dol,rr ANHY xl-v rr intxl,pred LS GRNST,rr LS PKST lams-incl,fr-g intxl-tr ool POR,g dull-bri yel FLOR,fr-g brn-rr blk STN,g fast stmg CUT"

FORMATION TOPS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #18-21 NW 1-B/1-D HORIZONTAL LATERAL

FORMATION NAME		SAMPLES MEASURED DEPTH	SAMPLES TRUE VERTICAL DEPTH	DATUM KB:5114'
PARADOX SHALE		5725'	5717'	-603'
UPPER ISMAY		5734'	5725'	-611'
LOWER ISMAY		5884'	5842'	-728'
GOTHIC SHALE		5911'	5859'	-745'
DESERT CREEK		5939'	5873'	-759'
DC 1-A		5950'	5878'	-764'
DC 1-B		6049'	5905'	-791'
DC 1-B / 1-C transition		6465'	5926'	-812'
DC 1-A / 1-B transition		8756'	5883'	-769'

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #18-21 Horizontal Lateral Leg 1 was a re-entry of the Mobil Ratherford Unit #18-21 located in Section 18, T41S, R23E, and was sidetracked in a southeasterly direction from a 5607' measured depth, 5607' true vertical depth, on June 5, 1997. The lateral reached a measured depth of 9145', true vertical depth of 5874' at total depth, with a horizontal displacement of 3392' and true vertical plane 320.2 degrees, on June 15, 1997, in the 1-D zone, when the MWD tool failed. The lateral was drilled with only minor problems, which were very minor water flows, with minor traces of H_2S gas, noted while drilling the window and the curve section of the lateral, which was due inpart to the well having been used for injection prior to the lateral being drilled. This lateral used fresh water and then brine water with polymer sweeps as the drilling fluid. Also a trip was made at a measured depth of 7059' to repair an MWD sensor and check the mud motor, change the bit, as well as to add more drill pipe below the collars. A very minor amount of oil was noted while drilling the lateral through the 1-B section. The background gases noted on the accompanying mud log were only moderately high through out the drilling of the 1-B Zone, and gradually decreased as the lateral was continued through the 1-B Zone. The samples showed a fair amount of oil shows through out the drilling of the lateral in the 1-B section.

The primary objectives of the Ratherford Unit #18-21 Leg 1 horizontal lateral were the upper 1-B and 1-D porosity benches of the Desert Creek to identify and define the porosity benches, the effective porosity, staining and reservoir properties in both 1-B and 1-D zones of the Desert Creek Member of the Upper Paradox Formation.

The Upper Ismay, Lower Ismay, Gothic Shale, the transition zone at the top of the Desert Creek, as well as the 1-A and 1-B porosity benches were encountered while drilling the curve section of the lateral. Kick off point for this lateral was just above the top of the Upper Ismay in the basal carbonates of the Honaker Trail.

The base of the Honaker Trail Formation of the Upper Hermosa Group was interbedded gray to gray brown, cryptocrystalline to microcrystalline, dense, slightly argillaceous dolomite and cream to tan, brown to light gray brown, cryptocrystalline to microcrystalline limestones. The limestones were slightly silty to very slightly sandy. Scattered buff to dark brown cherts were noted through the basal Honaker Trail section. There was no to very rare visible porosity noted in the lower Honaker Trail, with no sample shows or gas increases. The dolomites at the base of the Honaker Trail graded into the medium gray to dark gray-brown, carbonaceous, dolomitic, micaceous shale at the base locally referred to as the Paradox Shale.

The Upper Ismay was picked at a measured depth of 5734' (5725' TVD) at the base of the Honaker Trail. The Upper Ismay was predominately light gray to cream to tan, occasionally brown, micro to cryptocrystalline, chalky, cherty, and occasionally fossiliferous limestone. Minor amounts of silty limestone grading to very limy siltstone, with very thin interbedded argillaceous, brown to gray brown, microcrystalline to microsucrosic dolomite were present as well as minor amounts of very thin black, carbonaceous, slightly calcareous to dolomitic shale, and scattered brown to black to translucent chert fragments. There was very little visible porosity noted in the Upper Ismay, with only a few zones of poor intercrystalline porosity with very rare visible stain, fluorescence and cut and no associated gas increases. The dolomites at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5884' measured depth, 5842' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was predominately a cream to tan, light gray to brown limestone, microcrystalline to cryptocrystalline, microsucrosic to granular, slightly silty to clean, slightly cherty with a trace of scattered micro fossils. Very little to no intercrystalline porosity, with only very poor visible fluorescence, stain or cut was present in the limestone. Interbedded in the limestones were scattered light to dark brown, thin dolomites which were cryptocrystalline to microcrystalline, earthy to clean, with poor intercrystalline porosity, faint dull yellow fluorescence, rare spotty brown stain and a very poor diffuse to residual ring cut. The limestones in the base of the Lower Ismay were very thin mottled gray to gray brown, cryptocrystalline to microcrystalline, and clean to argillaceous. The basal limestones and dolomites became very marly and graded into the Gothic Shale.

The top of the Gothic Shale was at 5911' measured depth, 5859' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and a distinct increase in the percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this leg occurred at a measured depth of 5939' and a true vertical depth of 5873'. In this well the zone was interbedded a very silty, dolomitic limestone, and brown, limy, argillaceous dolomites. The limestones were cream to tan, some gray to white to brown to dark brown, cryptocrystalline to microcrystalline, argillaceous, with very rare intercrystalline porosity, but only very spotty dull mineral fluorescence, and visible stain or cut. The interbedded dolomites were microcrystalline to granular, slightly silty and had no to very rare intercrystalline porosity, with a very poor sample show. The limestones graded into the oolicastic porosity of the 1-A zone.

The top of the Desert Creek 1-A zone was picked at 5950' measured depth, 5878' true vertical depth. The pick was based primarily on sample identification as well as a significant increase in the penetration rate. The top in this lateral was in a very oolicastic, slightly cherty limestone grainstone. Noted in the limestone were thinly interbedded slightly silty and limy dolomite grainstones near the top and a very tight, cherty, slightly dolomitic limestone at the base of the zone. The limestone was predominately granular with intercrystalline to oolitic and rare algal porosity and had very rare scattered chert fragments. The zone exhibited fair dull to bright yellow fluorescence, brown stain and a moderately fast cut.

The top of the Desert Creek 1-B zone was picked at a measured depth of 6049', true vertical depth of 5905'. The pick was based on a decrease in rate of penetration between the 1-A and 1-B zones and sample identification. The top in this lateral was a tight, occasionally cherty, very slightly dolomitic limestone packstone between the 1-A and 1-B zones. Below this transition, the zone was interbedded light to medium gray brown, occasionally tan to brown, limy dolomite grainstones grading to packstone with minor traces of translucent to tan chert, interbedded with white to cream to light brown, oolicastic, dolomitic to very dolomitic limestone grainstones and packstones. The limestones increased with depth and became predominate. The dolomite and limestones were predominately granular with streaks of moderately fair intercrystalline to rare oolicastic porosity, a trace to fair fluorescence, light brown stain and a slow to moderately fast streaming cut. The dolomites decreased and became very thin with depth.

The curve was landed in the upper most porosity bench of the 1-B zone. The limestones in this upper bench became increasingly granular and oolicastic with an increase in stain, fluorescence and cut. It appears that the 1-B porosity bench is possibly defined by the interval 6049' measured depth, 5905' true vertical depth to 5925' true vertical depth. The top of the porosity bench was marked by a slightly gradational facies change as the drill rate increased rather rapidly. The base of the porosity zone was encountered after landing the curve, while drilling the lateral section.

At a measured depth of 6110', 5911' true vertical depth, with a horizontal displacement of 366.4' a trip was made to change the bottom hole assemblies and bits. Upon resumption of drilling in the lateral section, the well bore was drilled at a very slight downward angle and encountered a slightly dolomitic limestone grainstone, which was cream to tan to brown, cryptocrystalline to very finely crystalline, increasing very finely crystalline with depth. The limestones were slightly cherty, and increasingly oolicastic, with fair to good intercrystalline porosity, fluorescence, stain and cut. The oolicastic limestone porosity of the upper 1-B interval continued to a measured depth of 6305', 5916' true vertical depth, with 561' of horizontal displacement, as the well bore was allowed to drift downward through upper most porosity zone. At a measured depth of 6305' the limestones became increasingly tight, anhydritic and dolomitic, with decreasing porosity, stain, fluorescence and cut.

As the well bore was allowed to drop and was pulled downward by the formation, from a measured depth of 6305', to a measured depth of 6465', 5926' true vertical depth, with a horizontal displacement 721', the lateral encountered very streaky porosity in an interbedded oolicastic limestone grainstone and tight, cherty, occasionally platy limestone packstone. The oolicastic limestone grainstone had good porosity, fluorescence, stain and cut, with the packstones having little or no sample show. At 6465' measured depth the lateral encountered the tight, very dense, cherty, occasionally argillaceous limestone packstones to wackstones, in the base of the 1-B zone. This basal limestone of the 1-B was from 6465' to a measured depth of 6696', 5922' true vertical depth, with a horizontal displacement of 951' and had no to very rare poor visible porosity or sample show. The basal most porosity of the 1-B was calculated to be dipping at an angle of 90.9 degrees. Through this interval the well bore was slowly turned back upward with approximately 4 feet of the tight basal 1-B penetrated and the very streaky porosity previously noted was again encountered at a measured depth of 6696'. The well was continued back up through the very streaky porosity of the middle 1-B zone at a very shallow angle.

From a measured depth of 6696' to 7013' measured depth, 5907' true vertical depth, with 1267' of horizontal displacement, as the well bore was continued upward at an angle of 92 degrees, the very good upper most porosity of the 1-B was again penetrated. The lithology was predominately a light brown to medium brown, occasionally white to dark brown, microcrystalline to very finely crystalline, some cryptocrystalline to platy, limestone grainstone, with very thin interbedded tight limestone packstone. The limestone was dolomitic to having dolomite rich cement, slightly anhydritic. There was very rare scattered gray brown, cryptocrystalline to microcrystalline dolomite packstone fragments noted in the limestones, which decreased as the well was continued upward. The limestone grainstones had fair to good intercrystalline to oolicastic porosity, with fair to good fluorescence, stain and cut. The platy packstones were very tight and had no visible fluorescence, stain or cut. The background gas increased, which were associated with the drilling breaks and very good porosity.

At a measured depth of 7013' to a measured depth of 8629', 5885' true vertical depth, and a horizontal displacement of 2880', the base of the best porosity in the 1-B zone and the 1-B to 1-C transition zone was penetrated. Also during this interval at a measured depth of 7059', 5907' true vertical depth, with a horizontal displacement of 1311', a trip was made when the MWD tool failed and the MWD tool and the bit were changed. The lithology through this interval was a brown to light brown, microcrystalline to very finely crystalline, micsucrosic to sucrosic, oolicastic and very slightly algal limestone grainstone. This oolcastic limestone had very rare, scattered tight dolomite fragment, some dolomite rich cement, scattered chert fragment, some anhydrite crystals and porosity filling, and a good sample show. Also noted through this interval, were very thin, cream to tan, tight, limestone

packstones as the well bore bumped the top and base to this very good upper porosity zone. The top of this upper most porosity zone in the 1-B appeared to have an overall dip to 90.3 degrees. As the lateral was drilled through the upper porosity, the background gas gradually increased until reaching a horizontal displacement of 2626', at which time the background gas began decreasing rapidly. Also oil was noted on the pits and increased until reaching 2120' of horizontal displacement and then began decreasing. After drilling in to the top of the upper most 1-B porosity, which was turning downward at approximately 88 degrees, instead of continuing upward as was first thought, the angle was slowly raised an attempt to reacquire the porosity, believed at this time to be above the well bore.

As the drilling was continued from 8029' to 8895' measured depth, 5881' true vertical depth and a horizontal displacement of 3145', the lithology was predominately a light brown to brown, microcrystalline to very finely crystalline, occasionally granular, to microsucrosic, oolicastic to very slightly algal limestone grainstone with interbedded tight, cream to tan, cryptocrystalline limestone packstone. The limestone grainstones showed a rather fast decrease in amount of sample shows and the packstones had no visible porosity and sample show as the well bore was continued upward. At a measured depth of 8756', 5883' true vertical depth, and a horizontal displacement of 3006', the well bore was turned downward in an attempt to reach the 1-D, as at this time it was still unclear that the top rather than the base of the 1-B had been penetrated. As the well bore was continued downward the rate of penetration which had slowed, began increasing, but the sample shows continued to decrease. Through this interval minor amounts of dolomite were noted starting from a measured depth of 8740', 5883' true vertical depth and a horizontal displacement of 2991'. A significant amount of dolomite was encountered from a measured depth of 8860', 5881.9' true vertical depth, with 3111' of horizontal displacement, to a measured depth of 8895', 5581' true vertical depth and a horizontal displacement of 3145'. This dolomite was a tan to dark brown, cryptocrystalline to occasionally microcrystalline, slightly limy dolomite packstone. The dolomite had no to very poor visible porosity, with no visible sample show. The oolicastic limestone grainstones were reacquired at the above mentioned 8895' measured depth.

As the well bore was continued roughly horizontal to a very slightly upward angle, from a measured depth of 8895', to a measured depth of 9145', 5873' measured depth, with a horizontal displacement from 3392', the top of the 1-B porosity zone turned upward and the lateral again penetrated the upper most porosity zone of the 1-B. The lithology returned to the tan to brown to dark brown, microcrystalline to very finely crystalline, granular to microsucrosic, slightly dolomitic, very oolicastic, and occasionally cherty limestone grainstone. The limestone had varying amounts dolomite rich cement and very rare, very thin interbedded limestone packstones, with no fluorescence, stain or cut. The limestones had very good intercrystalline to oolitic porosity, with fair to good fluorescence, trace to good brown, to stain and a fair to good fast cut. The background gases also increased as the lithology returned to oolicastic limestone grainstones of the 1-B zone.

The well bore began to climb upward on its own in the 1-B zone, reaching a maximum angle of 93 degrees, as the well bore was rotated ahead in light brown to brown, microcrystalline to very finely crystalline oolicastic limestone grainstone. At a measured depth of 9145', 5873' true vertical depth, with a horizontal displacement of 3392', the MWD tool failed and the decision to terminate the lateral was made on June 15, 1997. The well bore was 9' above the proposed target line at this time.

In tracking the well bore through the 1-B bench, the upper most limestone porosity was very good and appears to be very consistent, with the lower limestone porosities being thin and streaky. As the well bore approached the base of the 1-B zone and approached the transition zone between the 1-B and 1-C zones, a facies change was noted. The change noted was vertical, from the oolicastic limestone grainstones and interbedded tight limestone packstones to a very tight, cherty, slightly dolomitic limestone packstone. As the well bore penetrated the 1-B zone above the upper most porosity bench, the lithology returned to a very tight platy limestone packstone and very rare, slightly limy, tight dolomite packstones. In tracking the lateral through out its length the 1-B zone, appears to trend upward overall toward the R.U. #12-33 well.

Predominant facies changes were associated with the vertical changes with in the limestones, with no noticeable lateral change, as the environment of deposition changed when encountering the top or base of the 1-B zone. With the classification changes, the oolicastic to very slightly algal limestones encountered were of varying thickness, from 5' in the upper and best porosity bench, to 3' or less in thickness in the middle bench of the 1-B and were continuous through the 1-B zone penetrated. The effective or the better porosity was associated with the oolicastic, to very slightly algal limestone grainstone facies which had fair to good, intercrystalline to oolicastic and occasionally algal porosities, and the absence of any major anhydrite plugging. The limestone packstone at the top and base of the 1-B zone had no visible porosity and no to very poor permabilities. The dolomite packstones noted from a measured depth of 8740' to 8920' had no to very poor visible porosities, but no sample shows.

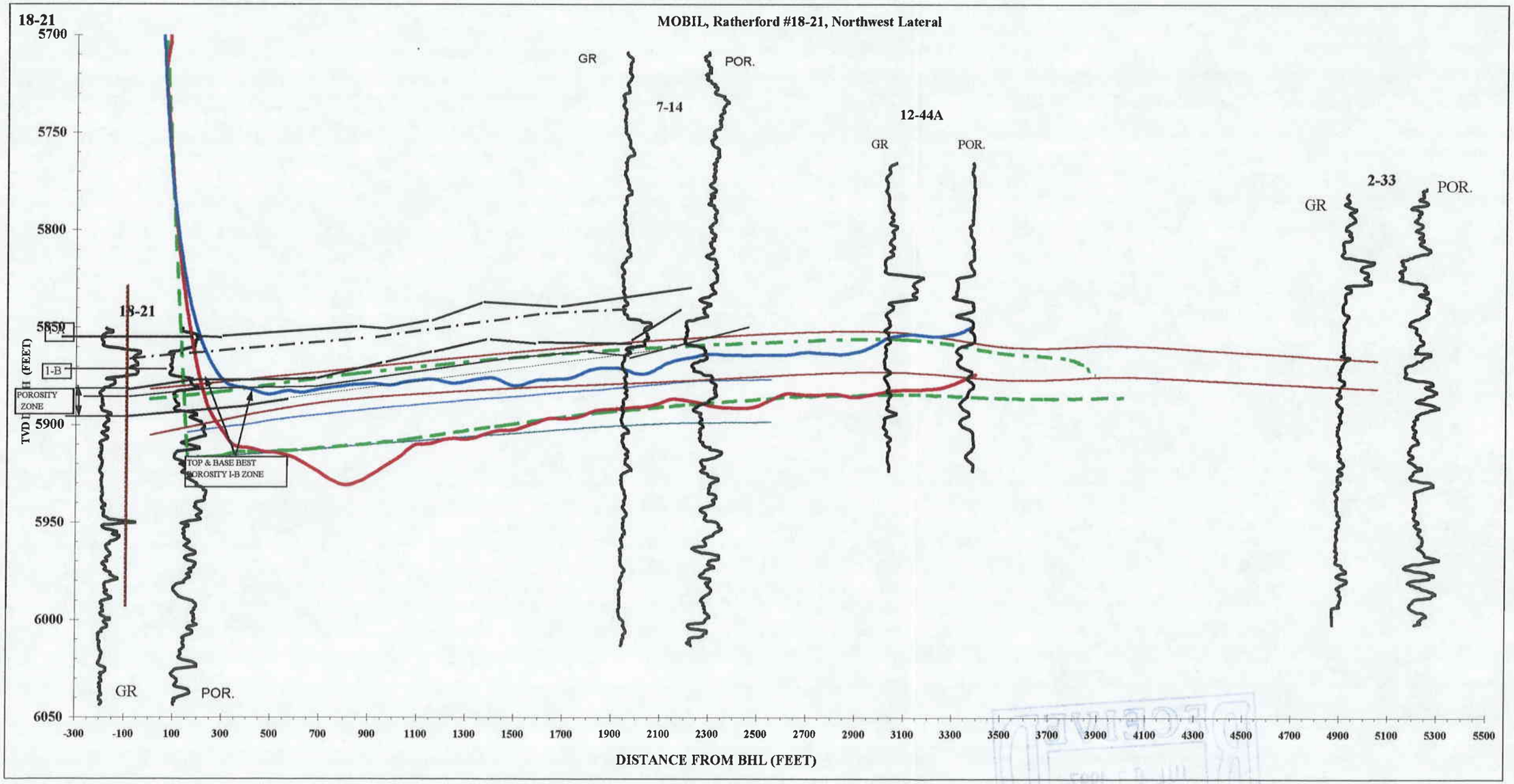
From the top of the 1-B porosity bench to a measured depth of 9145', the limestone lithology was consistent, ranging from light brown to medium brown, cryptocrystalline to very finely crystalline, occasionally microsucrosic to granular, with thin platy limestone packstone and scattered chert fragments, with increases in chert and very thin dolomites as the well bore penetrated top of the 1-B, and approached the 1-B to 1-A transition zone. The limestones had fair to good intercrystalline to oolicastic and a slight trace of algal porosity, predominately fair to good dull to bright yellow fluorescence, with noticeable decreases when at the top of the zone. The staining in the limestones ranged from a trace to good light brown to dark brown, and scattered traces of black dead oil stain and the associated cuts being a predominately fair to good moderately fast to fast streaming cuts. The very thin platy limestones in the middle and the massive limestone packstones at the base of the 1-B lateral had no visible porosity, fluorescence, staining, or cut. The sample shows were affected in part due to the oil & water emulsion used as the drilling fluid toward the end of the lateral sections, along with the oil made from the zone while drilling the lateral.

The conclusion drawn from the northwesterly lateral in the 1-B zone is that in this area the limestone porosities were consistent through the zone. Also having an effect on the porosity, was the minor amounts of anhydrite filled porosity and the very thin, platy limestone packstones near the top 1-B and scattered through out the middle of the 1-B zone. Staining was rare to poor and there were significant sections where staining was fair to good, with some black dead oil staining trapped in the intercrystalline porosity. The lateral used the proposed target line as a reference point through the 1-B bench, with the well bore planing to following the line of best porosity after entering the 1-B porosity bench and then attempting to turn downward into the 1-D after approximately 3100' of the lateral had been drilled.

While drilling the lateral, the high background gas was due to the oil encountered while drilling the lateral. A slow drop in the background gases was noted through the 1-B and 1-A zone transition zone. This lateral can be interpreted to having very good reservoir qualities through out. It appears that the porosities are well enough developed, in this northwesterly direction to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

ROCKY MOUNTAIN GEO-ENGINEERING CORP. 2450 INDUSTRIAL BLVD. GRAND JUNCTION, CO 81505 (970) 243-3044



RECEIVED JUL 2 - 1997 DIV. OF OIL, GAS & MINING

ROCKY MOUNTAIN GEO-ENGINEERING
Well Logging • Consulting Geology • Coal Bed Methane Services • Computerized Logging Equipment & Software
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
2450 INDUSTRIAL BLVD. • GRAND JUNCTION, CO 81505
(970) 243-3044 • (FAX) 241-1085

Monday, June 30, 1997

RECEIVED
JUL 03 1997
DIV. OF OIL, GAS & MINING

Division of Oil & Gas Mining
State of Utah
355 W. North, Suite 350
Salt Lake City, UT 84180-1203

Re: Ratherford Unit #18-21
Sec. 18, T41S, ~~R23E~~ 24E
San Juan County, Utah
43 037 16418 DRL

Dear Sirs:

Enclosed are the final computer colored logs and geology reports for the above referenced well.
FILED WITH LOGS

We appreciate the opportunity to be of service to you and look forward to working with you again in the near future.

If you have any questions regarding the enclosed data, please contact us.

Sincerely,

Bill Nagel

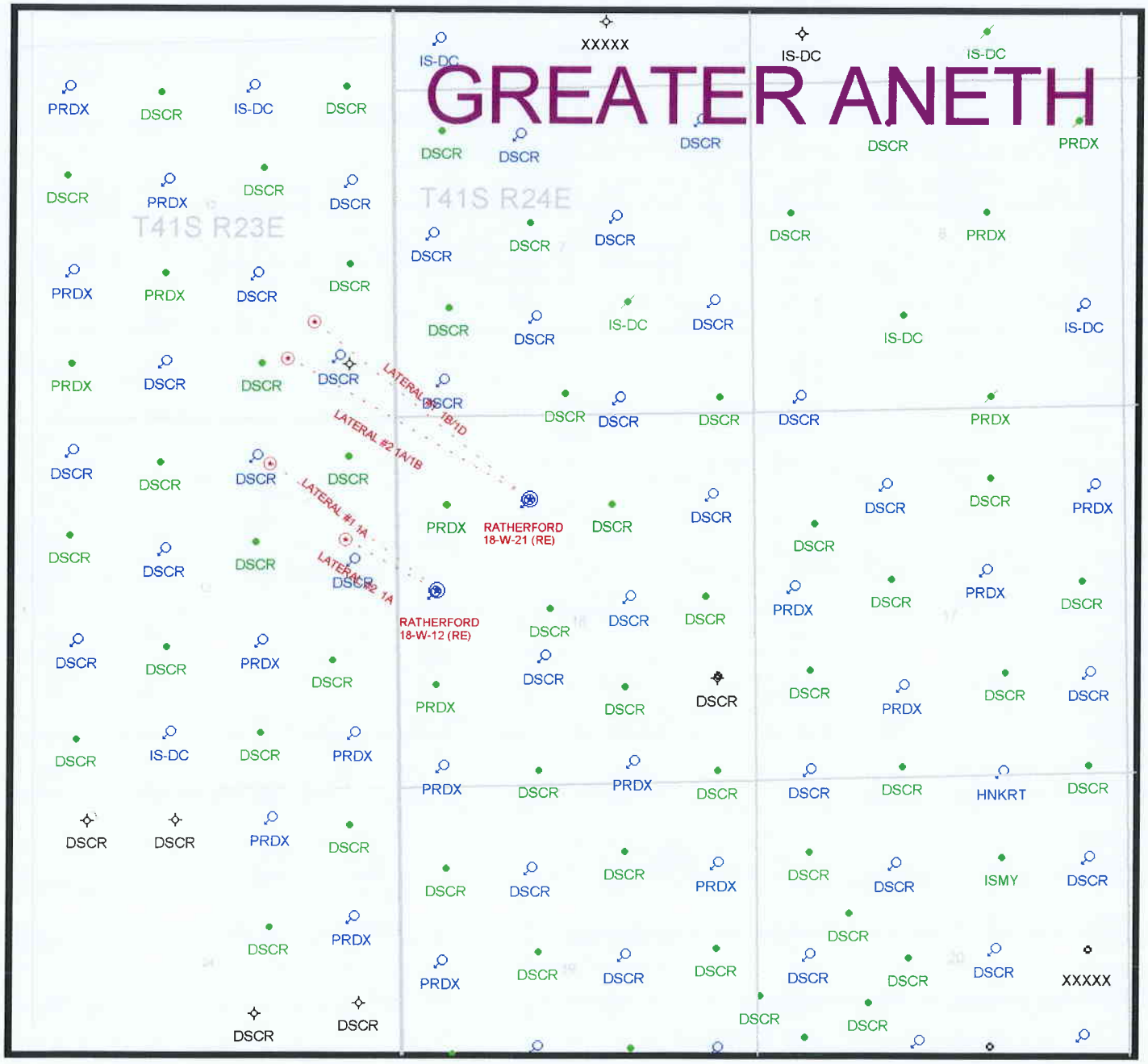
Bill Nagel
Senior Geologist

BN/dn

Enc. 1 Final Computer Colored Log & 1 Geology Report

cc Letter Only; Dana Larson; Mobil E & P U.S., Inc.; Midland, TX

OPERATOR: MOBIL (N7370)
FIELD: GREATER ANETH (365)
SEC, TWP, RNG: 18, T41S, R24E
COUNTY: SAN JUAN
UAC: R649-2-3 (RATHERFORD UNIT)



PREPARED:
DATE:1-MAY-97

WORKSHEET
APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 04/18/97

API NO. ASSIGNED: 43-037-16418

WELL NAME: RATHERFORD 18-W-21
OPERATOR: MOPBIL EXPL & PROD (N7370)

PROPOSED LOCATION:
NENW 18 - T41S - R24E
SURFACE: 0660-FNL-1882-FWL
BOTTOM: ~~0780-FSL-1760-FEL~~ See comments
SAN JUAN COUNTY
GREATER ANETH FIELD (365)

LEASE TYPE: IND
LEASE NUMBER: 14-20-603-353

PROPOSED PRODUCING FORMATION: PRDX

INSPECT LOCATION BY: / /		
TECH REVIEW	Initials	Date
Engineering		
Geology		
Surface		

RECEIVED AND/OR REVIEWED:

___ Plat
___ Bond: Federal[] State[] Fee[]
(Number _____)
___ Potash (Y/N)
___ Oil shale (Y/N)
___ Water permit
(Number _____)
___ RDCC Review (Y/N)
(Date: _____)

LOCATION AND SITING:

✓ R649-2-3. Unit: Ratherford

___ R649-3-2. General.

___ R649-3-3. Exception.

___ Drilling Unit.
Board Cause no: _____
Date: _____

COMMENTS: Navajo tribal land - Sundry notice accepted as APD.
BHL lateral #1 - 1911' FSL, 1182' FEL, Sec. 12, T. 41S, R. 23E
BHL lateral #2 - 1400' FSL, 1582' FEL, Sec. 12, T. 41S, R. 23E

STIPULATIONS: 1 - Directional drilling

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

May 7, 1997

Mobil Exploration & Producing
P.O. Box 633
Midland, Texas 79702

Re: Ratherford 18-W-21 Well, 660' FNL, 1882' FWL, NE NW, Sec. 18, T. 41 S., R. 24 E., San Juan County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. 40-6-1 et seq., Utah Administrative Code R649-3-1 et seq., and the attached Conditions of Approval, approval to re-enter and drill the referenced well is granted.

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date. The API identification number assigned to this well is 43-037-16418.

Sincerely,

John R. Baza
for LPB
Lowell P. Braxton
Deputy Director

lwp
Enclosures
cc: San Juan County Assessor
Bureau of Land Management, Moab District Office

Operator: Mobil Exploration & Producing

Well Name & Number: Ratherford 18-W-21

API Number: 43-037-16418

Lease: 14-20-603-353

Location: NE NW **Sec.** 18 **T.** 41 S. **R.** 24 E.

Conditions of Approval

1. General
   Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for Permit to Drill.

2. Notification Requirements
   Notify the Division within 24 hours following spudding the well or commencing drilling operations. Contact Jimmie Thompson at (801)538-5336.

   Notify the Division prior to commencing operations to plug and abandon the well. Contact John R. Baza (801)538-5334 or Mike Hebertson at (801) 538-5333.

3. Reporting Requirements
   All required reports, forms and submittals shall be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. In accordance with Utah Admin. R. 649-3-11, Directional Drilling, submittal of a complete angular deviation and directional survey report is required.

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

Name of Company: MOBIL E & P

Well Name: RATHERFORD UNIT 18-W-21 (RE-ENTRY)

Api No. 43-037-16418

Section: 18 Township: 41S Range: 24E County: SAN JUAN

Drilling Contractor BIG "A"

Rig # 25

SPUDDED:

Date 6/3/97

Time

How ROTARY

Drilling will commence

Reported by BENNY BRIGGS

Telephone # 1-801-651-3473

Date: 6/4/97 Signed: JLT

DIVISION OF OIL, GAS AND MINING

ENTITY ACTION FORM - FORM 6

OPERATOR MOBIL PRODUCING TX & NM, INC.

ADDRESS P. O. BOX 633

MIDLAND, TEXAS 79702

OPERATOR ACCT. NO. N 7370

ACTION CODE	CURRENT ENTITY NO.	NEW ENTITY NO.	API NUMBER	WELL NAME	WELL LOCATION QQ	SC	TP	RG	COUNTY	SPUD DATE	EFFECTIVE DATE
B	99999	06280	43-037-16418	RATHERFORD 18-W-21		18	41S	24E	SAN JUAN	5-19-97	7-08-97

WELL 1 COMMENTS: Entity added 9-18-97 Cfatherford Unit) Lee.

WELL 2 COMMENTS:

WELL 3 COMMENTS:

WELL 4 COMMENTS:

WELL 5 COMMENTS:

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ACTION CODES (See instructions on back of form)

A - Establish new entity for new well (single well only)
B - Add new well to existing entity (group or unit well)
C - Re-assign well from one existing entity to another existing entity
D - Re-assign well from one existing entity to a new entity
E - Other (explain in comments section)

NOTE: Use COMMENT section to explain why each Action Code was selected.

(3/89)

Sue Moseley for Shirley Houchins

Signature SHIRLEY HOUCHINS

ENV & REG TECHNICIAN

Title

9-16-97

Date

Phone No. (915) 688-2585

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other SIDETRACT/INJECTOR
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL & 1882' FWL SEC.18, T41S, R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other SIDETRACT	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BOTTOM HOLE LOCATION:

LATERAL #1 2215' NORTH & 2570' WEST F/SURFACE SPOT (ZONE 1b/1d)
LATERAL #2 1650' NORTH & 2952' WEST F/SURFACE SPOT (ZONE 1a/1b)

SEE ATTACHED PROCEDURE.

RECEIVED
SEP 18 1997
DIV. OF OIL, GAS & MINING

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

Signed Sue Mosley for Shirley Houchins Title ENV. & REG. TECHNICIAN Date 09-12-97

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-21
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH

05-16-97	NOTIFIED NOLA RESWOOD W/BLM @ 8:45 AM OF INTENT TO BEGIN W/O OPERATIONS. NOTIFIED MELVIN CAPITAN W/NAVAJO EPA @ 8:50 AM OF INTENT TO DIG & LINE PITS. NOTIFIED JIM THOMPSON W/UTAH O&G, 9:00 AM OF INTENT TO BEING W/O OPERATIONS.
05-19-97	MIRU NAVAJO WEST RIG #15, TEST TBG PRESSURE 2200 PSI, FLOW DOWN TO TANKS UNTIL FTP = 30 PSI. ND WELLHEAD, NU BOPS. SWI, SDFN.
05-20-97	1750 PSI ON WELL, FLOW DOWN, SLUG TBG W/BRINE, UNSET GUIBERSON PKR, POOH & LD DUOLINE TBG. RIH W/BIT & SCRAPER TO 5852', WELL FLOWING OUT BACKSIDE, SDFN, CSG & BOP TEST OK TO 1000 PSI.
05-21-97	1000 PSI @ 7:30 AM, RU SCHLUMBERGER, RUN METT F/5690-1880', RUN, GR, CNL, CCL LOGS F/5900-5384'. RDMO WIRELINE UT. RIG UP 2ND FRAC TANK, FLOW TO TANK OVERNIGHT.
05-22-97	WELL FLOWING TO TANK OVERNIGHT, PU RBP, RIH & SET @ 4060', CIRC ABOVE RBP W/90 BBL 10# BRINE. ND BOP, ND TBG HEAD, NU & TEST TBG HD, TEST OK TO 1500 PSI FOR 30 MIN. NU BOP, RIH, UNSET RBP, RU WELL TO FLOW TO TANKS OVERNIGHT, SDFN.\
05-23-97	FLOWED BACK 430 BBL ON, RU LINES TO FLOW BACK TO TANK AFTER RIG MOVES OUT. RDMO NAVAJO WEST RIG #15./FINISH PREP/WO RIG.
06-03-97	MIRU NAVAJO WEST 25, 10% RIGGED UP.
06-04-97	FINISH RIGGING UP, NU BOP, POH W/RBP, TEST BOP, RIH W/GAGE RING TO 5715'.
06-05-97	RIH W/TIW KEYWAY LATCH ASSM, SET LATCH ASSM IN PKR @ 5615', KEYWAY @ 312 DEG. & TOP OF WHIPSTOCK @ 5600' @ 310 DEG. BREAK CIRC & CUT WINDOW W/STARTING MILL F/5600-5602. POH W/MILL LATERAL #1.
06-05-97	LATERAL #1, RIH W/5 1/2" TIW WHIPSTOCK PKR, SET PKR @ 5615' RD WIRELINE, RIH W/TIW KEYWAY LATCH ASSM. LATCH INTO PKR @ 5615', GYRO DATA RAN GYRO SURVEY F/200'-5606' & FOUND PKR KEYWAY SET @ 312 DEG. GTF, RD WIRELINE, POOH W/UBHO & LATCH ASSEMBLEY, FINAL REPORT RE-ENTRY.
06-06-97	FIN POH W/STARTER MILL, CUT DRILLING LINE, RIH W/WINDOW & WATERMELLON MILLS ON SAME BHA, MILLED WINDOW F/5600-5606 & FORMATION TO 5607'.
06-06-97	LATERAL 1, RIH W/GYRO, 3 GOOD GTF, TIME DRILL CURVE 1 F/5607-5611. PUMPED SWEEP & CIRC HOLE CLEAN, POH W/MILLS.
06-07-97	CURVE LATERAL #1 SLIDE & ROTATE DRILL CURVE F/5611-5673 W/GYRO, & SLIDE & ROTATE DRILL CURVE USING MWD F/5673-5890'.
06-08-97	SLIDE & ROTATE DRILLED CURVE 1 F/5890-6110', PUMPED SWEEP & CIRC, POOH W/CURVE ASSM, RIH W/LATERAL ASSEMBLY.
06-09-97	LATERAL #1, ROTATE & SLIDE DRILL F/6110-6555'.
06-10-97	LATERAL #1, ROTATE & SLIDE DRILL F/6555-6990'.
06-11-97	LATERAL #1, ROTATE & SLIDE DRILL TO 7059', TIH NEW DIRECTIONAL TOOLS, CONTINUE SLIDING & ROTATING TO 7200'
06-12-97	LATERAL #1, ROTATE & SLIDE DRILL F/7200-7860'
06-13-97	LATERAL #1, ROTATE & SLIDE DRILL F/7860-8406'
06-14-97	LATERAL #1, ROTATE & SLIDE DRILL F/8406-8710', DIRECTIONAL DRILL TO 8745'.
06-15-97	LATERAL #1, ROTATE & SLIDE DRILL F/8745-9100'.

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-21
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH
PAGE 2

06-16-97	LATERAL #1, ROTATE & SLIDE DRILL F/9100-9145', POOH TO 5600', DISPLACE HOLE, POOH & LD ALL DIRECTIONAL TOOLS, PU HOOK TO RETRIEVE WHIPSTOCK AND TIH, LATCH ONTO WS, SHEAR FREE AND POOH LD SAME, END OF REPORT LATERAL #1.
06-16-97	LATERAL #2 PU WHIPSTOCK ASSEMBLY & ORIENT FOR 300 DEG W/PKR LATCH ORIENTED TO 312 DEG, TIH W/WHIPSTOCK ASSEMBLY ON 2 7/8 DRILL PIPE.
06-17-97	FTIH W/WHIPSTOCK ASSM, LATCH INTO PKR & SHEAR OFF, MADE START MILL CUT 5582-83', CIRC SWEEP, PU 4 3/4" WATERMELON MILL & 4 3/4" FLATBOTTOM MILL ASSM TIH W/SAME, CUT WINDOW FOR LATERAL #2 5583-5589' AND OPEN HOLE TO 5592', CIRC SWEEP TO SURFACE, POOH W/WINDOW MILL ASSM.
06-17-97	PU 4 3/4" MF3P BIT, & REST OF CURVE ASSEMBLY, ORIENT AT SURFACE & TEST. TIH TO 3400' SWI 500# CSG. PSI. CIRC THRU CHOKES, CONTINUE TIH W/CURVE ASSM, WELL FLOWING 1" STREAM, CIRC OUT OIL & GAS, MIRU GYRO DATA, TIW W/GYRO & TOOK THREE CONSISTANT TOOL FACE SHOTS 328 DEG, AZ 282 DEG. PREP TO START TIME DRILLING
06-18-97	DRILL ON CURVE SECTION LATERAL #2 TO 5645', MWD GETTING GOOD TOOL FACE & INCLINATION AT THIS POINT, POOH & RD GYRO DATA, DRILL CURVE TO 5768'. CONTINUE DRILL CURVE SLIDING TO 5780'.
06-19-97	CONTINUE DRILLING CURVE SECTION OF LATERAL #2 TO 5986', SLIDING & ROTATING TO 6040'. LOOKING FOR TOP OF PAY ZONE A.
06-20-97	CONTINUE DRILL CURVE SECTION OF LATERAL #2 TO 6094', TAKE SURVEY AT CURVE TD., CIRC SWEEP, LD CURVE DRILL TOOLS, TIH W/LATERAL ASSM, DRILL LATERAL #2 SECTION F/6094-6256'.
06-21-97	CONTINUE DRILLING LATERAL #2 F/6256-7251'.
06-22-97	CONTINUE DRILLING LATERAL #2 TO 7665'.
06-23-97	CONTINUE DRILLING LATERAL #2 TO 7883', CIRC SWEEPS, RIG REPAIR, CONTINUE TO 8026'.
06-24-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8026-8741'.
06-25-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8741-8928'.
06-26-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8928-9115 TD.
06-27-97	ND BOP, JET & CLEAN PIT, RIG DOWN & RELEASE NAVAJO WEST #25 @ MIDNIGHT 6-26-97.

COMPLETION

06-30-97	MIRU NAVAJO WEST RIG #26, RU PUMP, PIT & LINES, SICP 300 PSI. FLOW WELL BACK TO TANK, BLOW DOWN GAS & RECOVER 40 BBLS, PUMP 40 BBL BRINE, ND WELL CAP, NU BOP, RIH W/TAIL PIPE, PKR & 8 RD. TBG TO 6102'. SET & TEST PKR TO 750 PSI, OK. SWIFN.
07-01-97	SITP @ 6:00 @ 310 PSI, MIRU DOWELL ACID UNIT & PUMP TRUCKS. RIH W/1.75 COILED TBG TO 9115', POH TO 9084'. ACIDIZE LATERAL #2 F/9084-6118' W/62,286 GALS OF 15% HCL ACID @ E BBL PER/MIN. POH RIG DOWN COILED TBG UT., FLOW WELL TO TEST TANK.

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-21
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH
PAGE 3

07-02-97	TBG PRESSURE @ 500 PSI. FLOW WELL TEST TO TANK, KILL WELL, RELEASE PKR POH & STAND BACK PH6 TAIL PIPE & PKR. PICK-UP RETV TOOLS FOR WHIPSTOCK, RIH TO 5583', LATCH ONTO WHIPSTOCK, RELEASE POH & LAY DOWN. PICK UP & ORIENT RETV. WHIPSTOCK TOOL, RIH TO 5607'. SET RETV WHIPSTOCK, POH LAY DOWN SETTING TOOL, RIH W 2 3/8" TBG TO 6133.62'. PKR DEPTH @ 5415.36', TEST TP 750 PSI, OK, SWIFN.07-03-97 SITP @ 4:00 AM WAS 0 PSI. RU DOWELL ACID UNIT & PUMP TRUCKS, RIH W 1 3/4" COILED TBG TO 9145', ACIDIZE LATERAL #1 F/9145-6144' W/58,002 GALS 15% HCL ACID. FLUSH TO END OF COILED TBG, POH, FLOW WELL TO TEST TANK ON FULL OPEN CHOKE, PH TO 7, SWIFN..
07-04-97	SHUT IN FOR 4TH OF JULY HOLIDAY.
07-05-97	SITP @ 7:30 AM WAS 850 PSI, OPEN TO TEST TANK, BLEED DOWN TO 500 PSI, RU & KILL WELL DOWN TBG W/40 BBLS OF 10# BRINE, RELEASE PKR, POH, RIH W/RETV. TOOLS FOR WHIPSTOCK, RELEASE WHIPSTOCK POH & LAY DOWN WORK STRING, SIFN.
07-06-97	SHUT IN CSG PRESS @ 7:30 WAS 400 PSI, KILL WELL W/80 BBLS OF 10# BRINE. WELL DEAD. RU POWER TONGS. PICK-UP PKR, SIFN.
07-07-97	SICP @ 7:30 WAS 50 PSI. RU & KILL WELL, PICK-UP & RIH W/GUIBERSON PKR & BHA RUN ON 2 3/8' CMT LINED TBG TO 5435.06', TEST TO 1000 PSI. OK. CALLED EARL AHTOSOSIE,INJECTION FOREMAN, HOOK UP READY CALLED THOMPSON TSOSIE, INFORMED OF MIT READY. CALLED DIANE WILSON INFORMED OF INJECTION WELL READY.
07-08-97	RIG DOWN MOVE OFF NAVAJO WEST RIG #36, MOVE OFF EQUIPMENT, FINAL COMPLETION REPORT, WELL TURN TO PRODUCTION.

DIVISION OF OIL, GAS AND MINING

ENTITY ACTION FORM - FORM 6

OPERATOR MOBIL PRODUCING TX & NM, INC.

ADDRESS P. O. BOX 633

MIDLAND, TEXAS 79702

OPERATOR ACCT. NO. N

ACTION CODE	CURRENT ENTITY NO.	NEW ENTITY NO.	API NUMBER	WELL NAME	WELL LOCATION QQ	SC	TP	RG	COUNTY	SPUD DATE	EFFECTIVE DATE
			43-037-16418	RATHERFORD 18-W-21		18	41S	24E	SAN JUAN	5-19-97	7-08-97
WELL 1 COMMENTS:											
WELL 2 COMMENTS:											
WELL 3 COMMENTS:											
WELL 4 COMMENTS:											
WELL 5 COMMENTS:											

ACTION CODES (See instructions on back of form)

A - Establish new entity for new well (single well only)
B - Add new well to existing entity (group or unit well)
C - Re-assign well from one existing entity to another existing entity
D - Re-assign well from one existing entity to a new entity
E - Other (explain in comments section)

NOTE: Use COMMENT section to explain why each Action Code was selected.

(3/89)

Sue Moseley for Shirley Houchins

Signature SHIRLEY HOUCHINS

ENV & REG TECHNICIAN

Title

9-16-97

Date

Phone No. (915) 688-2585

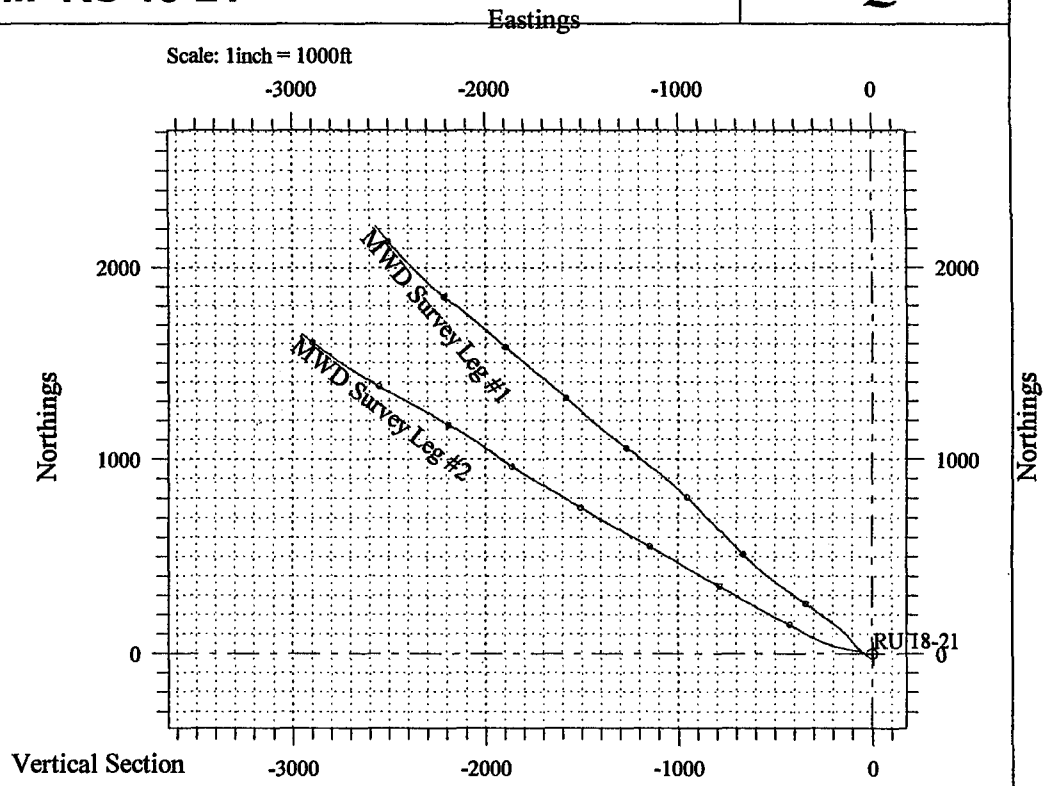
sperry-sun DRILLING SERVICES

Well: RU 18-21

DrillQuest™

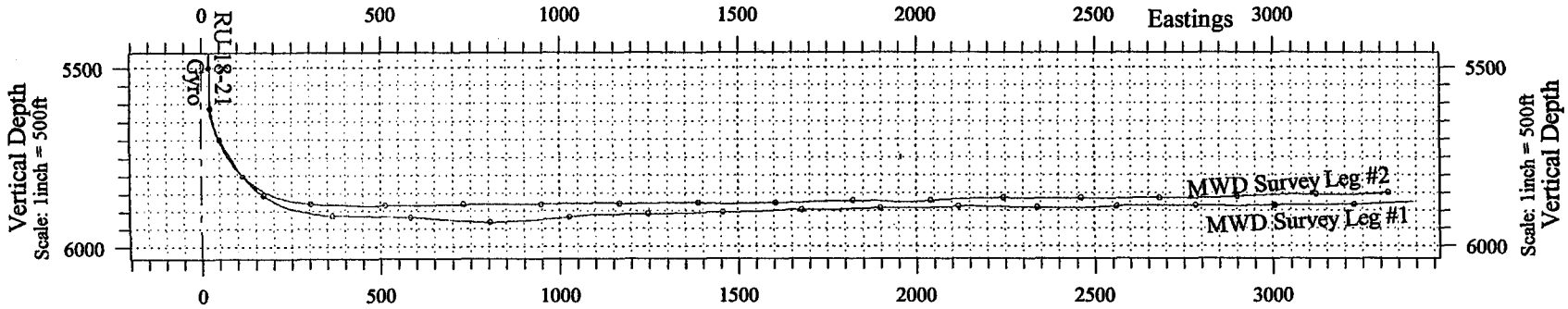
Customer: Mobil
Folder: Mobil
Field: San Juan County
Project: Utah
Structure: Ratherford Unit
Well: RU 18-21

Mobil



Scale: 1inch = 500ft
Section Azimuth: 310.000 (True North)

Scale: 1inch = 1000ft
Reference is True North



Scale: 1inch = 500ft
Section Azimuth: 310.000 (True North)

Prepared:	Checked:	Approved:

Vertical Section

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-21 - MWD Survey Leg #1

SURVEY REPORT

8 July, 1997

Survey Ref: svy1761

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.250	79.750	100.00	0.04 N	0.21 E	-0.14	0.250
200.00	0.080	70.160	200.00	0.10 N	0.50 E	-0.31	0.172
400.00	0.240	265.500	400.00	0.12 N	0.21 E	-0.09	0.159
600.00	0.320	275.640	600.00	0.14 N	0.76 W	0.67	0.047
800.00	0.610	262.830	799.99	0.06 N	2.38 W	1.86	0.153
1000.00	0.750	270.600	999.98	0.06 S	4.74 W	3.59	0.084
1200.00	0.800	269.890	1199.96	0.05 S	7.45 W	5.67	0.025
1400.00	1.210	269.250	1399.93	0.08 S	10.95 W	8.34	0.205
1600.00	0.980	272.210	1599.89	0.04 S	14.78 W	11.29	0.118
1800.00	0.930	273.030	1799.86	0.11 N	18.11 W	13.94	0.026
2000.00	0.610	277.030	1999.84	0.33 N	20.78 W	16.13	0.162
2200.00	0.450	286.500	2199.83	0.68 N	22.59 W	17.74	0.091
2400.00	0.590	259.500	2399.83	0.72 N	24.36 W	19.12	0.139
2600.00	0.410	226.520	2599.82	0.04 N	25.89 W	19.86	0.166
2800.00	0.280	175.030	2799.82	0.94 S	26.37 W	19.59	0.161
3000.00	0.250	120.980	2999.81	1.65 S	25.95 W	18.82	0.121
3200.00	0.220	76.290	3199.81	1.79 S	25.20 W	18.16	0.090
3400.00	0.200	352.100	3399.81	1.35 S	24.88 W	18.19	0.141
3600.00	0.170	28.210	3599.81	0.74 S	24.79 W	18.51	0.059
3800.00	0.080	139.980	3799.81	0.59 S	24.56 W	18.43	0.107
4000.00	0.190	293.910	3999.81	0.56 S	24.77 W	18.61	0.132
4200.00	0.160	194.620	4199.81	0.70 S	25.14 W	18.81	0.134
4400.00	0.250	183.100	4399.81	1.40 S	25.24 W	18.43	0.049
4600.00	0.370	195.170	4599.81	2.46 S	25.43 W	17.90	0.068
4800.00	0.410	232.470	4799.80	3.52 S	26.17 W	17.78	0.126
5000.00	0.490	280.670	4999.80	3.80 S	27.57 W	18.68	0.187
5200.00	0.420	272.290	5199.79	3.61 S	29.15 W	20.01	0.048
5400.00	0.350	279.020	5399.78	3.49 S	30.48 W	21.11	0.042
MWD Survey Leg #1							
5500.00	0.390	285.200	5499.78	3.35 S	31.11 W	21.68	0.056
5598.00	0.460	302.990	5597.78	3.05 S	31.76 W	22.37	0.152
5606.00	3.400	307.100	5605.77	2.89 S	31.98 W	22.64	36.767
5626.00	9.000	307.200	5625.65	1.58 S	33.70 W	24.80	28.000
5646.00	15.100	307.300	5645.20	0.94 N	37.02 W	28.97	30.500
5666.00	21.900	309.600	5664.16	4.90 N	41.97 W	35.31	34.189
5686.00	26.200	310.000	5682.42	10.12 N	48.23 W	43.46	21.515
5706.00	29.000	310.200	5700.14	16.09 N	55.32 W	52.72	14.008
5726.00	28.900	308.500	5717.64	22.23 N	62.81 W	62.40	4.145
5746.00	28.800	308.000	5735.16	28.20 N	70.38 W	72.05	1.306

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5766.00	29.900	314.900	5752.59	34.69 N	77.71 W	81.83	17.772
5786.00	31.800	316.800	5769.76	42.05 N	84.85 W	92.03	10.675
5806.00	36.500	320.100	5786.31	50.46 N	92.28 W	103.13	25.252
5826.00	40.400	320.700	5801.97	60.04 N	100.20 W	115.36	19.589
5846.00	43.200	321.000	5816.88	70.38 N	108.62 W	128.45	14.036
5866.00	47.500	321.200	5830.93	81.45 N	117.55 W	142.40	21.512
5886.00	51.500	318.500	5843.92	93.07 N	127.36 W	157.39	22.477
5906.00	55.500	313.700	5855.82	104.63 N	138.51 W	173.36	27.780
5926.00	58.800	311.000	5866.67	115.94 N	150.93 W	190.15	20.020
5946.00	62.600	310.300	5876.45	127.30 N	164.16 W	207.58	19.243
5966.00	67.400	307.300	5884.90	138.64 N	178.29 W	225.70	27.579
5986.00	73.700	306.600	5891.56	149.97 N	193.35 W	244.52	31.672
6006.00	78.600	307.100	5896.35	161.61 N	208.89 W	263.90	24.620
6026.00	79.400	306.500	5900.16	173.37 N	224.61 W	283.50	4.967
6046.00	79.700	306.200	5903.79	185.03 N	240.45 W	303.13	2.104
6066.00	79.700	305.800	5907.37	196.60 N	256.37 W	322.76	1.968
6087.00	85.000	305.800	5910.16	208.77 N	273.24 W	343.51	25.238
6110.00	89.500	306.700	5911.26	222.35 N	291.77 W	366.43	19.952
6138.82	89.700	307.200	5911.47	239.67 N	314.80 W	395.21	1.869
6170.67	87.600	306.200	5912.22	258.70 N	340.32 W	426.99	7.302
6202.42	88.100	306.000	5913.41	277.40 N	365.96 W	458.65	1.696
6233.27	90.300	305.800	5913.84	295.48 N	390.95 W	489.41	7.161
6265.07	88.400	304.800	5914.20	313.86 N	416.90 W	521.10	6.752
6296.83	88.200	304.100	5915.14	331.81 N	443.07 W	552.70	2.291
6328.71	87.300	305.500	5916.39	349.99 N	469.23 W	584.42	5.218
6360.62	86.600	306.900	5918.09	368.81 N	494.94 W	616.22	4.900
6392.26	85.300	306.700	5920.33	387.72 N	520.21 W	647.73	4.157
6424.13	85.300	309.200	5922.94	407.25 N	545.26 W	679.47	7.818
6455.95	85.300	309.700	5925.54	427.40 N	569.75 W	711.18	1.566
6487.63	85.800	311.300	5928.00	447.91 N	593.76 W	742.76	5.277
6519.46	87.100	313.400	5929.97	469.31 N	617.24 W	774.50	7.749
6551.27	90.000	314.300	5930.78	491.34 N	640.17 W	806.23	9.545
6583.03	92.800	315.300	5930.00	513.71 N	662.70 W	837.86	9.361
6614.82	93.400	315.300	5928.28	536.27 N	685.02 W	869.47	1.887
6646.01	94.400	315.500	5926.16	558.43 N	706.87 W	900.45	3.269
6677.84	94.900	315.700	5923.58	581.10 N	729.07 W	932.02	1.691
6709.65	94.600	314.800	5920.95	603.61 N	751.39 W	963.59	2.973
6741.51	94.100	314.400	5918.53	625.92 N	774.01 W	995.26	2.008
6773.37	95.400	314.800	5915.89	648.21 N	796.61 W	1026.90	4.268
6805.22	97.000	314.800	5912.45	670.52 N	819.08 W	1058.45	5.024
6837.08	91.600	315.000	5910.07	692.94 N	841.58 W	1090.10	16.961
6868.88	89.200	315.000	5909.84	715.42 N	864.06 W	1121.77	7.547
6900.58	92.000	315.900	5909.51	738.01 N	886.30 W	1153.32	9.278
6932.42	92.600	316.200	5908.23	760.91 N	908.38 W	1184.96	2.107
6964.17	91.100	314.400	5907.21	783.47 N	930.70 W	1216.56	7.377

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6996.01	90.100	311.100	5906.87	805.07 N	954.07 W	1248.35	10.829
7027.00	88.900	310.200	5907.15	825.26 N	977.58 W	1279.34	4.840
7046.15	90.200	310.400	5907.30	837.65 N	992.19 W	1298.49	6.868
7077.97	92.400	310.200	5906.57	858.22 N	1016.45 W	1330.30	6.942
7109.85	92.500	310.200	5905.21	878.78 N	1040.77 W	1362.15	0.314
7141.55	92.400	309.200	5903.86	899.01 N	1065.14 W	1393.82	3.167
7173.34	90.600	308.600	5903.02	918.96 N	1089.87 W	1425.59	5.968
7205.10	90.400	308.100	5902.75	938.67 N	1114.78 W	1457.34	1.696
7236.94	90.600	307.600	5902.47	958.21 N	1139.92 W	1489.15	1.691
7268.60	93.000	308.500	5901.47	977.71 N	1164.84 W	1520.78	8.095
7300.30	91.800	307.600	5900.15	997.23 N	1189.78 W	1552.43	4.730
7331.30	92.800	307.600	5898.90	1016.13 N	1214.32 W	1583.38	3.226
7363.13	93.400	308.100	5897.18	1035.63 N	1239.41 W	1615.14	2.452
7394.90	89.600	305.800	5896.35	1054.72 N	1264.79 W	1646.84	13.979
7426.65	89.600	305.100	5896.57	1073.13 N	1290.65 W	1678.49	2.205
7457.28	90.300	306.500	5896.60	1091.05 N	1315.49 W	1709.04	5.110
7489.01	91.200	307.200	5896.18	1110.07 N	1340.88 W	1740.72	3.593
7520.82	92.200	308.600	5895.24	1129.60 N	1365.97 W	1772.49	5.407
7552.59	93.700	309.400	5893.60	1149.57 N	1390.63 W	1804.21	5.349
7584.42	90.900	309.700	5892.33	1169.82 N	1415.15 W	1836.01	8.847
7616.18	90.400	309.400	5891.97	1190.04 N	1439.64 W	1867.77	1.836
7648.03	90.500	310.900	5891.72	1210.58 N	1463.98 W	1899.62	4.720
7679.12	90.400	312.700	5891.47	1231.30 N	1487.16 W	1930.69	5.798
7710.98	90.900	312.300	5891.11	1252.82 N	1510.64 W	1962.52	2.010
7741.96	90.100	310.600	5890.84	1273.33 N	1533.86 W	1993.49	6.064
7773.70	90.900	310.600	5890.56	1293.98 N	1557.96 W	2025.22	2.520
7804.70	91.100	312.200	5890.02	1314.48 N	1581.21 W	2056.21	5.201
7836.46	92.800	312.500	5888.94	1335.86 N	1604.67 W	2087.92	5.435
7868.23	93.300	312.500	5887.25	1357.29 N	1628.06 W	2119.62	1.574
7899.19	89.300	310.400	5886.55	1377.78 N	1651.25 W	2150.55	14.591
7931.06	89.400	309.900	5886.91	1398.33 N	1675.61 W	2182.42	1.600
7962.86	88.400	309.500	5887.52	1418.63 N	1700.07 W	2214.21	3.387
7994.75	88.700	309.700	5888.33	1438.95 N	1724.63 W	2246.09	1.131
8026.50	88.300	310.100	5889.16	1459.31 N	1748.98 W	2277.83	1.781
8058.38	88.500	309.700	5890.05	1479.76 N	1773.43 W	2309.70	1.402
8089.34	89.000	310.200	5890.72	1499.63 N	1797.16 W	2340.65	2.284
8120.45	89.900	310.100	5891.02	1519.69 N	1820.94 W	2371.76	2.911
8152.19	89.800	309.900	5891.11	1540.09 N	1845.25 W	2403.50	0.704
8183.81	90.100	310.100	5891.13	1560.42 N	1869.47 W	2435.12	1.140
8215.53	90.700	310.900	5890.91	1581.02 N	1893.59 W	2466.83	3.153
8247.49	93.000	310.800	5889.88	1601.91 N	1917.75 W	2498.77	7.203
8279.33	93.300	310.800	5888.13	1622.68 N	1941.82 W	2530.56	0.942
8311.24	93.500	310.900	5886.24	1643.52 N	1965.92 W	2562.41	0.700
8342.99	93.300	310.600	5884.36	1664.20 N	1989.93 W	2594.10	1.134
8374.71	89.500	310.200	5883.58	1684.75 N	2014.07 W	2625.81	12.046

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8406.48	89.200	310.200	5883.94	1705.26 N	2038.33 W	2657.57	0.944
8438.27	89.200	309.900	5884.39	1725.71 N	2062.67 W	2689.36	0.944
8470.09	90.300	309.900	5884.52	1746.12 N	2087.08 W	2721.18	3.457
8501.83	90.200	309.400	5884.39	1766.37 N	2111.52 W	2752.92	1.606
8533.67	90.800	309.000	5884.11	1786.50 N	2136.19 W	2784.75	2.265
8565.53	89.100	307.800	5884.14	1806.29 N	2161.16 W	2816.60	6.531
8596.36	88.700	307.800	5884.73	1825.18 N	2185.51 W	2847.40	1.297
8628.20	88.600	308.100	5885.48	1844.75 N	2210.61 W	2879.21	0.993
8660.04	91.200	309.200	5885.53	1864.64 N	2235.48 W	2911.04	8.866
8691.95	91.600	310.800	5884.75	1885.14 N	2259.91 W	2942.94	5.167
8723.76	91.100	312.900	5884.00	1906.36 N	2283.60 W	2974.72	6.784
8755.39	92.000	313.900	5883.15	1928.08 N	2306.57 W	3006.28	4.253
8787.06	90.900	314.800	5882.35	1950.21 N	2329.21 W	3037.85	4.487
8818.88	90.200	314.400	5882.04	1972.55 N	2351.87 W	3069.57	2.534
8850.67	90.400	314.800	5881.88	1994.88 N	2374.50 W	3101.25	1.407
8882.43	89.600	315.300	5881.88	2017.35 N	2396.94 W	3132.89	2.970
8914.19	90.500	316.700	5881.85	2040.20 N	2419.00 W	3164.48	5.240
8946.04	90.900	317.400	5881.46	2063.51 N	2440.70 W	3196.08	2.531
8977.24	90.200	318.000	5881.16	2086.58 N	2461.70 W	3227.00	2.955
9009.10	91.800	319.000	5880.60	2110.44 N	2482.80 W	3258.50	5.922
9040.92	92.900	320.200	5879.30	2134.65 N	2503.41 W	3289.85	5.114
9072.74	93.000	320.200	5877.66	2159.07 N	2523.75 W	3321.13	0.314
9145.00	93.000	320.200	5873.88	2214.51 N	2569.94 W	3392.15	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 310.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 9145.00ft.,
The Bottom Hole Displacement is 3392.44ft., in the Direction of 310.751° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-21 - MWD Survey Leg #2

SURVEY REPORT

8 July, 1997

Survey Ref: svy1771

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.250	79.750	100.00	0.04 N	0.21 E	-0.17	0.250
200.00	0.080	70.160	200.00	0.10 N	0.50 E	-0.38	0.172
400.00	0.240	265.500	400.00	0.12 N	0.21 E	-0.12	0.159
600.00	0.320	275.640	600.00	0.14 N	0.76 W	0.73	0.047
800.00	0.610	262.830	799.99	0.06 N	2.38 W	2.09	0.153
1000.00	0.750	270.600	999.98	0.06 S	4.74 W	4.08	0.084
1200.00	0.800	269.890	1199.96	0.05 S	7.45 W	6.43	0.025
1400.00	1.210	269.250	1399.93	0.08 S	10.95 W	9.45	0.205
1600.00	0.980	272.210	1599.89	0.04 S	14.78 W	12.78	0.118
1800.00	0.930	273.030	1799.86	0.11 N	18.11 W	15.74	0.026
2000.00	0.610	277.030	1999.84	0.33 N	20.78 W	18.16	0.162
2200.00	0.450	286.500	2199.83	0.68 N	22.59 W	19.91	0.091
2400.00	0.590	259.500	2399.83	0.72 N	24.36 W	21.45	0.139
2600.00	0.410	226.520	2599.82	0.04 N	25.89 W	22.44	0.166
2800.00	0.280	175.030	2799.82	0.94 S	26.37 W	22.36	0.161
3000.00	0.250	120.980	2999.81	1.65 S	25.95 W	21.65	0.121
3200.00	0.220	76.290	3199.81	1.79 S	25.20 W	20.93	0.090
3400.00	0.200	352.100	3399.81	1.35 S	24.88 W	20.87	0.141
3600.00	0.170	28.210	3599.81	0.74 S	24.79 W	21.09	0.059
3800.00	0.080	139.980	3799.81	0.59 S	24.56 W	20.97	0.107
4000.00	0.190	293.910	3999.81	0.56 S	24.77 W	21.17	0.132
4200.00	0.160	194.620	4199.81	0.70 S	25.14 W	21.43	0.134
4400.00	0.250	183.100	4399.81	1.40 S	25.24 W	21.15	0.049
4600.00	0.370	195.170	4599.81	2.46 S	25.43 W	20.79	0.068
4800.00	0.410	232.470	4799.80	3.52 S	26.17 W	20.90	0.126
5000.00	0.490	280.670	4999.80	3.80 S	27.57 W	21.98	0.187
5200.00	0.420	272.290	5199.79	3.61 S	29.15 W	23.44	0.048
MWD Survey Leg #2							
5400.00	0.350	279.020	5399.78	3.49 S	30.48 W	24.66	0.042
5583.00	0.440	300.640	5582.78	3.04 S	31.64 W	25.88	0.094
5589.00	2.700	307.100	5588.78	2.94 S	31.77 W	26.04	37.722
5592.00	3.700	306.670	5591.77	2.84 S	31.91 W	26.21	33.343
5612.00	7.900	303.870	5611.67	1.69 S	33.56 W	28.22	21.041
5632.00	11.500	301.070	5631.38	0.10 N	36.41 W	31.59	18.149
5652.00	15.200	298.270	5650.83	2.38 N	40.43 W	36.20	18.775
5672.00	18.500	295.470	5669.97	4.98 N	45.61 W	41.99	16.987
5692.00	21.700	292.680	5688.75	7.77 N	51.89 W	48.82	16.698
5712.00	24.300	289.880	5707.16	10.60 N	59.17 W	56.54	14.101

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5732.00	29.100	287.080	5725.02	13.43 N	67.69 W	65.34	24.805
5752.00	33.400	284.280	5742.12	16.22 N	77.68 W	75.38	22.688
5772.00	37.500	281.480	5758.41	18.79 N	88.99 W	86.46	22.045
5792.00	42.500	278.670	5773.73	21.02 N	101.64 W	98.53	26.576
5812.00	46.900	275.800	5787.94	22.78 N	115.59 W	111.49	24.201
5832.00	50.200	277.790	5801.18	24.56 N	130.47 W	125.27	18.106
5852.00	53.400	279.780	5813.55	26.96 N	146.00 W	139.92	17.807
5872.00	57.400	281.770	5824.90	30.05 N	162.17 W	155.47	21.610
5892.00	61.600	283.760	5835.05	33.86 N	178.97 W	171.92	22.681
5912.00	65.200	285.750	5844.01	38.42 N	196.26 W	189.17	20.078
5932.00	68.300	287.740	5851.90	43.71 N	213.85 W	207.06	17.994
5952.00	72.200	289.730	5858.66	49.76 N	231.67 W	225.51	21.631
5972.00	76.100	291.720	5864.12	56.57 N	249.66 W	244.50	21.721
5992.00	77.100	293.710	5868.76	64.08 N	267.60 W	263.79	10.894
6012.00	79.600	295.700	5872.79	72.27 N	285.40 W	283.30	15.849
6032.00	81.700	297.690	5876.04	81.14 N	303.02 W	303.00	14.375
6052.00	84.400	299.680	5878.46	90.67 N	320.44 W	322.84	16.727
6067.00	86.000	301.200	5879.72	98.24 N	333.32 W	337.79	14.688
6094.00	90.200	299.900	5880.61	111.95 N	356.56 W	364.76	16.283
6106.94	90.000	299.800	5880.59	118.39 N	367.78 W	377.70	1.728
6138.54	87.200	298.600	5881.36	133.80 N	395.35 W	409.29	9.640
6170.33	87.400	297.700	5882.86	148.78 N	423.35 W	441.03	2.897
6202.15	88.600	296.500	5883.97	163.27 N	451.66 W	472.78	5.332
6234.04	91.100	296.700	5884.05	177.55 N	480.17 W	504.61	7.864
6265.89	92.700	297.200	5883.00	191.97 N	508.55 W	536.40	5.263
6297.71	89.400	298.500	5882.42	206.83 N	536.67 W	568.19	11.146
6329.63	88.200	298.500	5883.08	222.06 N	564.72 W	600.09	3.759
6361.49	91.100	298.800	5883.28	237.33 N	592.67 W	631.94	9.151
6393.25	91.800	299.700	5882.47	252.85 N	620.37 W	663.68	3.589
6425.07	91.100	300.000	5881.67	268.68 N	647.96 W	695.49	2.393
6456.92	91.000	299.700	5881.09	284.53 N	675.58 W	727.34	0.993
6488.77	91.200	300.000	5880.47	300.38 N	703.20 W	759.18	1.132
6520.59	90.900	300.400	5879.89	316.38 N	730.70 W	791.00	1.571
6552.23	91.100	300.400	5879.34	332.39 N	757.99 W	822.63	0.632
6583.41	89.600	299.300	5879.15	347.91 N	785.03 W	853.81	5.966
6615.19	90.800	299.200	5879.04	363.44 N	812.75 W	885.58	3.789
6646.95	90.100	299.000	5878.79	378.88 N	840.50 W	917.34	2.292
6678.63	88.500	298.600	5879.18	394.14 N	868.26 W	949.01	5.206
6710.36	90.000	299.300	5879.59	409.50 N	896.02 W	980.73	5.217
6742.18	92.300	300.700	5878.95	425.41 N	923.57 W	1012.54	8.461
6774.03	91.100	300.600	5878.01	441.63 N	950.96 W	1044.37	3.781
6805.86	91.100	300.200	5877.40	457.74 N	978.41 W	1076.20	1.256
6837.72	90.800	300.400	5876.87	473.81 N	1005.91 W	1108.05	1.132
6869.41	90.400	300.200	5876.54	489.80 N	1033.27 W	1139.74	1.411
6901.23	88.700	299.200	5876.79	505.56 N	1060.91 W	1171.56	6.198

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6933.03	87.500	299.000	5877.84	521.02 N	1088.68 W	1203.34	3.826
6964.87	89.600	298.500	5878.65	536.33 N	1116.59 W	1235.16	6.780
6996.70	91.100	299.000	5878.45	551.64 N	1144.49 W	1266.98	4.967
7028.53	92.000	299.900	5877.59	567.28 N	1172.20 W	1298.79	3.998
7060.39	90.900	299.700	5876.78	583.11 N	1199.83 W	1330.64	3.509
7092.15	91.400	299.000	5876.15	598.67 N	1227.51 W	1362.39	2.708
7123.99	90.500	298.800	5875.62	614.06 N	1255.38 W	1394.22	2.896
7155.79	86.400	297.700	5876.48	629.10 N	1283.38 W	1425.99	13.349
7187.56	86.800	297.000	5878.36	643.67 N	1311.55 W	1457.67	2.534
7219.49	88.300	297.200	5879.73	658.20 N	1339.94 W	1489.53	4.739
7251.25	92.300	298.800	5879.56	673.11 N	1367.98 W	1521.26	13.564
7283.03	93.000	300.400	5878.09	688.79 N	1395.58 W	1553.00	5.490
7314.78	91.100	300.700	5876.96	704.92 N	1422.91 W	1584.73	6.058
7345.86	90.000	300.700	5876.66	720.78 N	1449.63 W	1615.81	3.539
7377.73	90.400	300.200	5876.55	736.93 N	1477.10 W	1647.68	2.009
7408.90	90.200	300.400	5876.38	752.66 N	1504.01 W	1678.84	0.907
7440.74	91.100	300.200	5876.02	768.72 N	1531.50 W	1710.68	2.896
7471.81	92.200	299.200	5875.13	784.11 N	1558.48 W	1741.74	4.784
7503.67	94.100	299.500	5873.38	799.70 N	1586.21 W	1773.55	6.037
7535.41	92.400	299.900	5871.58	815.40 N	1613.73 W	1805.23	5.502
7567.18	90.600	299.900	5870.75	831.23 N	1641.26 W	1836.99	5.666
7599.07	90.100	299.500	5870.55	847.03 N	1668.96 W	1868.88	2.008
7630.13	89.600	299.700	5870.63	862.37 N	1695.97 W	1899.94	1.734
7662.04	89.400	300.200	5870.91	878.30 N	1723.62 W	1931.85	1.688
7693.78	86.400	299.500	5872.07	894.09 N	1751.12 W	1963.56	9.705
7724.89	88.200	299.900	5873.54	909.49 N	1778.12 W	1994.64	5.927
7756.67	91.300	300.900	5873.68	925.57 N	1805.52 W	2026.41	10.249
7788.44	93.400	302.100	5872.38	942.15 N	1832.59 W	2058.14	7.611
7820.23	93.900	302.700	5870.35	959.15 N	1859.37 W	2089.84	2.454
7851.96	93.800	303.900	5868.22	976.53 N	1885.83 W	2121.44	3.787
7900.46	90.800	305.500	5866.28	1004.11 N	1925.67 W	2169.73	7.009
7962.54	91.700	304.600	5864.92	1039.76 N	1976.48 W	2231.56	2.050
7994.34	91.600	303.700	5864.01	1057.60 N	2002.78 W	2263.26	2.846
8026.24	90.400	303.200	5863.45	1075.18 N	2029.39 W	2295.10	4.075
8057.22	89.100	302.700	5863.58	1092.03 N	2055.39 W	2326.04	4.496
8088.34	89.600	302.300	5863.94	1108.75 N	2081.63 W	2357.12	2.058
8120.13	90.200	302.700	5863.99	1125.83 N	2108.44 W	2388.88	2.268
8151.67	89.700	301.400	5864.02	1142.57 N	2135.18 W	2420.40	4.416
8183.45	90.200	300.900	5864.05	1159.01 N	2162.37 W	2452.18	2.225
8214.43	90.400	300.600	5863.89	1174.85 N	2189.00 W	2483.15	1.164
8246.38	89.600	300.200	5863.89	1191.01 N	2216.56 W	2515.10	2.799
8278.27	90.300	300.000	5863.91	1207.01 N	2244.14 W	2546.99	2.283
8310.02	89.800	299.500	5863.89	1222.76 N	2271.71 W	2578.74	2.227
8341.74	90.000	299.000	5863.94	1238.26 N	2299.39 W	2610.46	1.698
8373.58	91.200	299.200	5863.61	1253.75 N	2327.20 W	2642.29	3.821

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8405.39	91.800	299.200	5862.77	1269.26 N	2354.96 W	2674.09	1.886
8437.19	89.400	298.500	5862.44	1284.60 N	2382.81 W	2705.88	7.861
8469.01	88.900	297.900	5862.91	1299.64 N	2410.85 W	2737.68	2.454
8500.78	90.400	298.600	5863.11	1314.67 N	2438.84 W	2769.43	5.210
8532.63	89.100	298.800	5863.25	1329.97 N	2466.77 W	2801.27	4.130
8564.51	89.300	299.000	5863.69	1345.37 N	2494.68 W	2833.14	0.887
8596.35	92.100	299.500	5863.30	1360.93 N	2522.45 W	2864.97	8.933
8628.20	90.800	299.700	5862.50	1376.65 N	2550.14 W	2896.81	4.130
8659.96	92.600	300.900	5861.55	1392.67 N	2577.55 W	2928.56	6.811
8691.77	93.500	300.900	5859.86	1408.98 N	2604.80 W	2960.32	2.829
8723.66	94.700	301.600	5857.58	1425.48 N	2632.00 W	2992.12	4.353
8755.51	93.000	302.000	5855.44	1442.23 N	2659.00 W	3023.88	5.483
8787.36	91.000	302.100	5854.33	1459.12 N	2685.98 W	3055.69	6.287
8819.16	90.900	303.000	5853.81	1476.23 N	2712.78 W	3087.45	2.847
8850.78	90.500	303.700	5853.42	1493.61 N	2739.19 W	3119.01	2.550
8881.96	89.100	304.400	5853.53	1511.06 N	2765.03 W	3150.11	5.020
8913.74	89.300	306.000	5853.97	1529.38 N	2790.99 W	3181.76	5.073
8945.49	89.000	306.700	5854.44	1548.20 N	2816.56 W	3213.31	2.398
8977.33	91.000	306.700	5854.44	1567.22 N	2842.09 W	3244.93	6.281
9009.14	91.300	306.700	5853.80	1586.23 N	2867.59 W	3276.52	0.943
9040.86	91.100	306.000	5853.14	1605.03 N	2893.13 W	3308.04	2.295
9072.52	93.500	306.900	5851.87	1623.82 N	2918.57 W	3339.47	8.095
9083.00	93.700	307.400	5851.21	1630.14 N	2926.91 W	3349.85	5.130
9115.00	93.700	307.400	5849.15	1649.53 N	2952.28 W	3381.51	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 300.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 9115.00ft.,
The Bottom Hole Displacement is 3381.85ft., in the Direction of 299.194° (True).

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other SIDETRACT/INJECTOR
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL & 1882' FWL SEC.18, T41S, R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other SIDETRACT	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BOTTOM HOLE LOCATION:

LATERAL #1 2215' NORTH & 2570' WEST F/SURFACE SPOT (ZONE 1b/1d)
LATERAL #2 1650' NORTH & 2952' WEST F/SURFACE SPOT (ZONE 1a/1b)

SEE ATTACHED PROCEDURE.

RECEIVED
SEP 18 1997
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Mosley for Shirley Houchins Title ENV. & REG. TECHNICIAN Date 09-12-97

(This space for Federal or State office use)
Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

09/26/97
JRB

DRILLED FOOTAGE CALCULATION FOR DIRECTIONAL AND HORIZONTAL WELLS

Well Name: **Ratherford 18-W-21**
Surface Location: **660' FNL, 1882' FWL, 18-41S-24**

First leg description: Leg #1

KOP MD:	5598.00
KOP TVD:	5597.78
EOL MD:	9145.00
EOL TVD:	5873.88
Footage drilled:	3547.00

Second leg description: Leg #2

KOP MD:	5583.00
KOP TVD:	5582.78
EOL MD:	9115.00
EOL TVD:	5849.15
Footage drilled:	3532.00

Third leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

Fourth leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

Fifth leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

09/26/97
JRB

Total Footage Drilled (MD):	***7079.00***
Deepest point (TVD):	***5930.78***

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-21
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH

05-16-97	NOTIFIED NOLA RESWOOD W/BLM @ 8:45 AM OF INTENT TO BEGIN W/O OPERATIONS. NOTIFIED MELVIN CAPITAN W/NAVAJO EPA @ 8:50 AM OF INTENT TO DIG & LINE PITS. NOTIFIED JIM THOMPSON W/UTAH O&G, 9:00 AM OF INTENT TO BEING W/O OPERATIONS.
05-19-97	MIRU NAVAJO WEST RIG #15, TEST TBG PRESSURE 2200 PSI, FLOW DOWN TO TANKS UNTIL FTP = 30 PSI. ND WELLHEAD, NU BOPS. SWI, SDFN.
05-20-97	1750 PSI ON WELL, FLOW DOWN, SLUG TBG W/BRINE, UNSET GUIBERSON PKR, POOH & LD DUOLINE TBG. RIH W/BIT & SCRAPER TO 5852', WELL FLOWING OUT BACKSIDE, SDFN, CSG & BOP TEST OK TO 1000 PSI.
05-21-97	1000 PSI @ 7:30 AM, RU SCHLUMBERGER, RUN METT F/5690-1880', RUN, GR, CNL, CCL LOGS F/5900-5384'. RDMO WIRELINE UT. RIG UP 2ND FRAC TANK, FLOW TO TANK OVERNIGHT.
05-22-97	WELL FLOWING TO TANK OVERNIGHT, PU RBP, RIH & SET @ 4060', CIRC ABOVE RBP W/90 BBL 10# BRINE. ND BOP, ND TBG HEAD, NU & TEST TBG HD, TEST OK TO 1500 PSI FOR 30 MIN. NU BOP, RIH, UNSET RBP, RU WELL TO FLOW TO TANKS OVERNIGHT, SDFN.\
05-23-97	FLOWED BACK 430 BBL ON, RU LINES TO FLOW BACK TO TANK AFTER RIG MOVES OUT. RDMO NAVAJO WEST RIG #15./FINISH PREP/WO RIG.
06-03-97	MIRU NAVAJO WEST 25, 10% RIGGED UP.
06-04-97	FINISH RIGGING UP, NU BOP, POH W/RBP, TEST BOP, RIH W/GAGE RING TO 5715'.
06-05-97	RIH W/TIW KEYWAY LATCH ASSM, SET LATCH ASSM IN PKR @ 5615', KEYWAY @ 312 DEG. & TOP OF WHIPSTOCK @ 5600' @ 310 DEG. BREAK CIRC & CUT WINDOW W/STARTING MILL F/5600-5602. POH W/MILL LATERAL #1.
06-05-97	LATERAL #1, RIH W/5 1/2" TIW WHIPSTOCK PKR, SET PKR @ 5615' RD WIRELINE, RIH W/TIW KEYWAY LATCH ASSM. LATCH INTO PKR @ 5615', GYRO DATA RAN GYRO SURVEY F/200'-5606' & FOUND PKR KEYWAY SET @ 312 DEG. GTF, RD WIRELINE, POOH W/UBHO & LATCH ASSEMBLEY, FINAL REPORT RE-ENTRY.
06-06-97	FIN POH W/STARTER MILL, CUT DRILLING LINE, RIH W/WINDOW & WATERMELLON MILLS ON SAME BHA, MILLED WINDOW F/5600-5606 & FORMATION TO 5607'.
06-06-97	LATERAL 1, RIH W/GYRO, 3 GOOD GTF, TIME DRILL CURVE 1 F/5607-5611. PUMPED SWEEP & CIRC HOLE CLEAN, POH W/MILLS.
06-07-97	CURVE LATERAL #1 SLIDE & ROTATE DRILL CURVE F/5611-5673 W/GYRO, & SLIDE & ROTATE DRILL CURVE USING MWD F/5673-5890'.
06-08-97	SLIDE & ROTATE DRILLED CURVE 1 F/5890-6110', PUMPED SWEEP & CIRC, POOH W/CURVE ASSM, RIH W/LATERAL ASSEMBLY.
06-09-97	LATERAL #1, ROTATE & SLIDE DRILL F/6110-6555'.
06-10-97	LATERAL #1, ROTATE & SLIDE DRILL F/6555-6990'.
06-11-97	LATERAL #1, ROTATE & SLIDE DRILL TO 7059', TIH NEW DIRECTIONAL TOOLS, CONTINUE SLIDING & ROTATING TO 7200'
06-12-97	LATERAL #1, ROTATE & SLIDE DRILL F/7200-7860'
06-13-97	LATERAL #1, ROTATE & SLIDE DRILL F/7860-8406'
06-14-97	LATERAL #1, ROTATE & SLIDE DRILL F/8406-8710', DIRECTIONAL DRILL TO 8745'.
06-15-97	LATERAL #1, ROTATE & SLIDE DRILL F/8745-9100'.

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06-16-97	LATERAL #1, ROTATE & SLIDE DRILL F/9100-9145', POOH TO 5600', DISPLACE HOLE, POOH & LD ALL DIRECTIONAL TOOLS, PU HOOK TO RETRIEVE WHIPSTOCK AND TIH, LATCH ONTO WS, SHEAR FREE AND POOH LD SAME, END OF REPORT LATERAL #1.
06-16-97	LATERAL #2 PU WHIPSTOCK ASSEMBLY & ORIENT FOR 300 DEG W/PKR LATCH ORIENTED TO 312 DEG, TIH W/WHIPSTOCK ASSEMBLY ON 2 7/8 DRILL PIPE.
06-17-97	FTIH W/WHIPSTOCK ASSM, LATCH INTO PKR & SHEAR OFF, MADE START MILL CUT 5582-83', CIRC SWEEP, PU 4 3/4" WATERMELON MILL & 4 3/4" FLATBOTTOM MILL ASSM TIH W/SAME, CUT WINDOW FOR LATERAL #2 5583-5589' AND OPEN HOLE TO 5592', CIRC SWEEP TO SURFACE, POOH W/WINDOW MILL ASSM.
06-17-97	PU 4 3/4" MF3P BIT, & REST OF CURVE ASSEMBLY, ORIENT AT SURFACE & TEST. TIH TO 3400' SWI 500# CSG. PSI. CIRC THRU CHOKES, CONTINUE TIH W/CURVE ASSM, WELL FLOWING 1" STREAM, CIRC OUT OIL & GAS, MIRU GYRO DATA, TIW W/GYRO & TOOK THREE CONSISTANT TOOL FACE SHOTS 328 DEG, AZ 282 DEG. PREP TO START TIME DRILLING
06-18-97	DRILL ON CURVE SECTION LATERAL #2 TO 5645', MWD GETTING GOOD TOOL FACE & INCLINATION AT THIS POINT, POOH & RD GYRO DATA, DRILL CURVE TO 5768'. CONTINUE DRILL CURVE SLIDING TO 5780'.
06-19-97	CONTINUE DRILLING CURVE SECTION OF LATERAL #2 TO 5986', SLIDING & ROTATING TO 6040'. LOOKING FOR TOP OF PAY ZONE A.
06-20-97	CONTINUE DRILL CURVE SECTION OF LATERAL #2 TO 6094', TAKE SURVEY AT CURVE TD., CIRC SWEEP, LD CURVE DRILL TOOLS, TIH W/LATERAL ASSM, DRILL LATERAL #2 SECTION F/6094-6256'.
06-21-97	CONTINUE DRILLING LATERAL #2 F/6256-7251'.
06-22-97	CONTINUE DRILLING LATERAL #2 TO 7665'.
06-23-97	CONTINUE DRILLING LATERAL #2 TO 7883', CIRC SWEEPS, RIG REPAIR, CONTINUE TO 8026'.
06-24-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8026-8741'.
06-25-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8741-8928'.
06-26-97	CONTINUE SLIDE & ROTATE LATERAL #2 F/8928-9115 TD.
06-27-97	ND BOP, JET & CLEAN PIT, RIG DOWN & RELEASE NAVAJO WEST #25 @ MIDNIGHT 6-26-97.

COMPLETION

06-30-97	MIRU NAVAJO WEST RIG #26, RU PUMP, PIT & LINES, SICP 300 PSI. FLOW WELL BACK TO TANK, BLOW DOWN GAS & RECOVER 40 BBLS, PUMP 40 BBL BRINE, ND WELL CAP, NU BOP, RIH W/TAIL PIPE, PKR & 8 RD. TBG TO 6102'. SET & TEST PKR TO 750 PSI, OK. SWIFN.
07-01-97	SITP @ 6:00 @ 310 PSI, MIRU DOWELL ACID UNIT & PUMP TRUCKS. RIH W/1.75 COILED TBG TO 9115', POH TO 9084'. ACIDIZE LATERAL #2 F/9084-6118' W/62,286 GALS OF 15% HCL ACID @ E BBL PER/MIN. POH RIG DOWN COILED TBG UT., FLOW WELL TO TEST TANK.

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07-02-97	TBG PRESSURE @ 500 PSI. FLOW WELL TEST TO TANK, KILL WELL, RELEASE PKR POH & STAND BACK PH6 TAIL PIPE & PKR. PICK-UP RETV TOOLS FOR WHIPSTOCK, RIH TO 5583', LATCH ONTO WHIPSTOCK, RELEASE POH & LAY DOWN. PICK UP & ORIENT RETV. WHIPSTOCK TOOL, RIH TO 5607'. SET RETV WHIPSTOCK, POH LAY DOWN SETTING TOOL, RIH W 2 3/8" TBG TO 6133.62'. PKR DEPTH @ 5415.36', TEST TP 750 PSI, OK, SWIFN.07-03-97 SITP @ 4:00 AM WAS 0 PSI. RU DOWELL ACID UNIT & PUMP TRUCKS, RIH W 1 3/4" COILED TBG TO 9145', ACIDIZE LATERAL #1 F/9145-6144' W/58,002 GALS 15% HCL ACID. FLUSH TO END OF COILED TBG, POH, FLOW WELL TO TEST TANK ON FULL OPEN CHOKE, PH TO 7, SWIFN..
07-04-97	SHUT IN FOR 4TH OF JULY HOLIDAY.
07-05-97	SITP @ 7:30 AM WAS 850 PSI, OPEN TO TEST TANK, BLEED DOWN TO 500 PSI, RU & KILL WELL DOWN TBG W/40 BBLS OF 10# BRINE, RELEASE PKR, POH, RIH W/RETV. TOOLS FOR WHIPSTOCK, RELEASE WHIPSTOCK POH & LAY DOWN WORK STRING, SIFN.
07-06-97	SHUT IN CSG PRESS @ 7:30 WAS 400 PSI, KILL WELL W/80 BBLS OF 10# BRINE. WELL DEAD. RU POWER TONGS. PICK-UP PKR, SIFN.
07-07-97	SICP @ 7:30 WAS 50 PSI. RU & KILL WELL, PICK-UP & RIH W/GUIBERSON PKR & BHA RUN ON 2 3/8' CMT LINED TBG TO 5435.06', TEST TO 1000 PSI. OK. CALLED EARL AHTOSOSIE,INJECTION FOREMAN, HOOK UP READY CALLED THOMPSON TSOSIE, INFORMED OF MIT READY. CALLED DIANE WILSON INFORMED OF INJECTION WELL READY.
07-08-97	RIG DOWN MOVE OFF NAVAJO WEST RIG #36, MOVE OFF EQUIPMENT, FINAL COMPLETION REPORT, WELL TURN TO PRODUCTION.

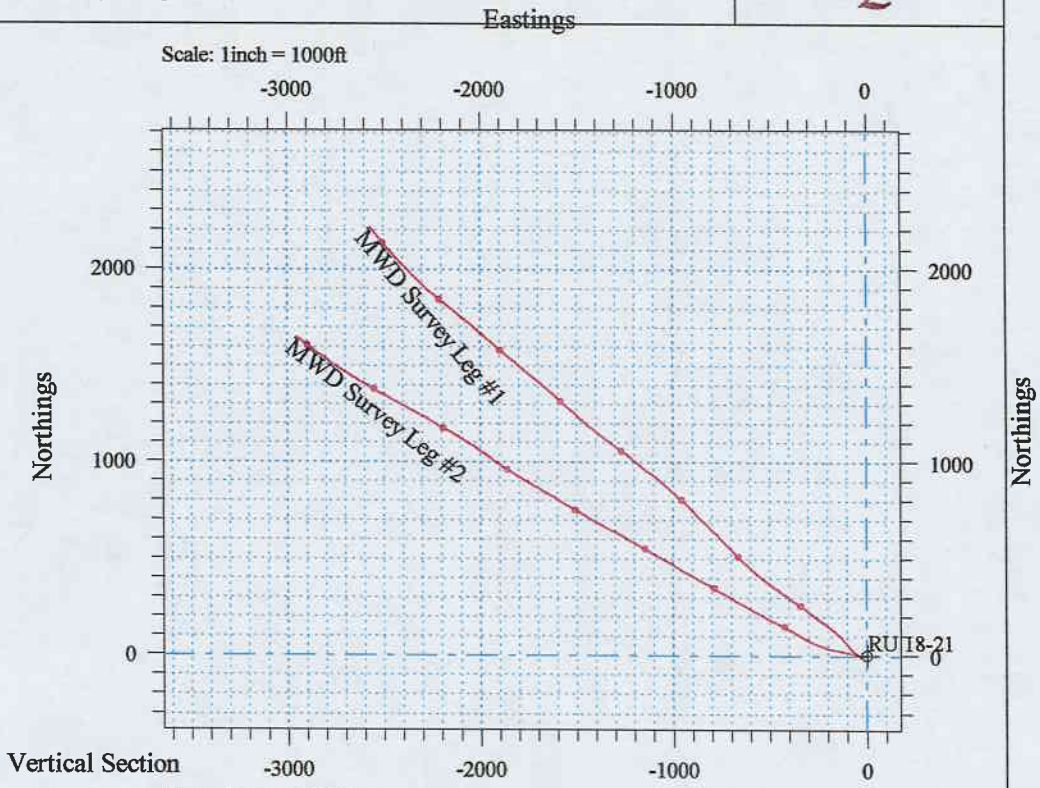
sperry-sun DRILLING SERVICES

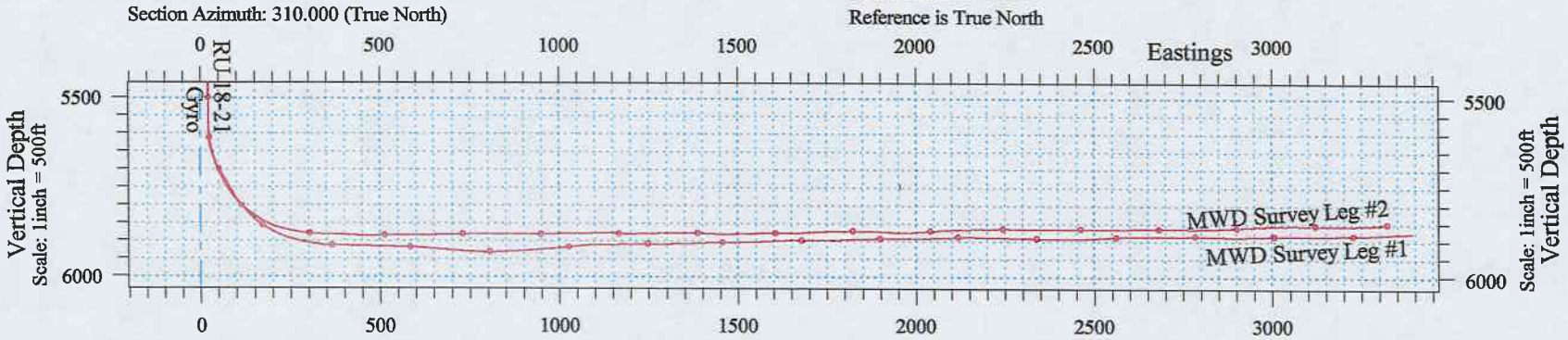
Well: RU 18-21

DrillQuest™

Customer: Mobil
Folder: Mobil
Field: San Juan County
Project: Utah
Structure: Ratherford Unit
Well: RU 18-21

Mobil





Prepared:	Checked:	Approved:

Vertical Section

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-21 - MWD Survey Leg #1

SURVEY REPORT

8 July, 1997

Survey Ref: svy1761

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.250	79.750	100.00	0.04 N	0.21 E	-0.14	0.250
200.00	0.080	70.160	200.00	0.10 N	0.50 E	-0.31	0.172
400.00	0.240	265.500	400.00	0.12 N	0.21 E	-0.09	0.159
600.00	0.320	275.640	600.00	0.14 N	0.76 W	0.67	0.047
800.00	0.610	262.830	799.99	0.06 N	2.38 W	1.86	0.153
1000.00	0.750	270.600	999.98	0.06 S	4.74 W	3.59	0.084
1200.00	0.800	269.890	1199.96	0.05 S	7.45 W	5.67	0.025
1400.00	1.210	269.250	1399.93	0.08 S	10.95 W	8.34	0.205
1600.00	0.980	272.210	1599.89	0.04 S	14.78 W	11.29	0.118
1800.00	0.930	273.030	1799.86	0.11 N	18.11 W	13.94	0.026
2000.00	0.610	277.030	1999.84	0.33 N	20.78 W	16.13	0.162
2200.00	0.450	286.500	2199.83	0.68 N	22.59 W	17.74	0.091
2400.00	0.590	259.500	2399.83	0.72 N	24.36 W	19.12	0.139
2600.00	0.410	226.520	2599.82	0.04 N	25.89 W	19.86	0.166
2800.00	0.280	175.030	2799.82	0.94 S	26.37 W	19.59	0.161
3000.00	0.250	120.980	2999.81	1.65 S	25.95 W	18.82	0.121
3200.00	0.220	76.290	3199.81	1.79 S	25.20 W	18.16	0.090
3400.00	0.200	352.100	3399.81	1.35 S	24.88 W	18.19	0.141
3600.00	0.170	28.210	3599.81	0.74 S	24.79 W	18.51	0.059
3800.00	0.080	139.980	3799.81	0.59 S	24.56 W	18.43	0.107
4000.00	0.190	293.910	3999.81	0.56 S	24.77 W	18.61	0.132
4200.00	0.160	194.620	4199.81	0.70 S	25.14 W	18.81	0.134
4400.00	0.250	183.100	4399.81	1.40 S	25.24 W	18.43	0.049
4600.00	0.370	195.170	4599.81	2.46 S	25.43 W	17.90	0.068
4800.00	0.410	232.470	4799.80	3.52 S	26.17 W	17.78	0.126
5000.00	0.490	280.670	4999.80	3.80 S	27.57 W	18.68	0.187
5200.00	0.420	272.290	5199.79	3.61 S	29.15 W	20.01	0.048
5400.00	0.350	279.020	5399.78	3.49 S	30.48 W	21.11	0.042
MWD Survey Leg #1							
5500.00	0.390	285.200	5499.78	3.35 S	31.11 W	21.68	0.056
5598.00	0.460	302.990	5597.78	3.05 S	31.76 W	22.37	0.152
5606.00	3.400	307.100	5605.77	2.89 S	31.98 W	22.64	36.767
5626.00	9.000	307.200	5625.65	1.58 S	33.70 W	24.80	28.000
5646.00	15.100	307.300	5645.20	0.94 N	37.02 W	28.97	30.500
5666.00	21.900	309.600	5664.16	4.90 N	41.97 W	35.31	34.189
5686.00	26.200	310.000	5682.42	10.12 N	48.23 W	43.46	21.515
5706.00	29.000	310.200	5700.14	16.09 N	55.32 W	52.72	14.008
5726.00	28.900	308.500	5717.64	22.23 N	62.81 W	62.40	4.145
5746.00	28.800	308.000	5735.16	28.20 N	70.38 W	72.05	1.306

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5766.00	29.900	314.900	5752.59	34.69 N	77.71 W	81.83	17.772
5786.00	31.800	316.800	5769.76	42.05 N	84.85 W	92.03	10.675
5806.00	36.500	320.100	5786.31	50.46 N	92.28 W	103.13	25.252
5826.00	40.400	320.700	5801.97	60.04 N	100.20 W	115.36	19.589
5846.00	43.200	321.000	5816.88	70.38 N	108.62 W	128.45	14.036
5866.00	47.500	321.200	5830.93	81.45 N	117.55 W	142.40	21.512
5886.00	51.500	318.500	5843.92	93.07 N	127.36 W	157.39	22.477
5906.00	55.500	313.700	5855.82	104.63 N	138.51 W	173.36	27.780
5926.00	58.800	311.000	5866.67	115.94 N	150.93 W	190.15	20.020
5946.00	62.600	310.300	5876.45	127.30 N	164.16 W	207.58	19.243
5966.00	67.400	307.300	5884.90	138.64 N	178.29 W	225.70	27.579
5986.00	73.700	306.600	5891.56	149.97 N	193.35 W	244.52	31.672
6006.00	78.600	307.100	5896.35	161.61 N	208.89 W	263.90	24.620
6026.00	79.400	306.500	5900.16	173.37 N	224.61 W	283.50	4.967
6046.00	79.700	306.200	5903.79	185.03 N	240.45 W	303.13	2.104
6066.00	79.700	305.800	5907.37	196.60 N	256.37 W	322.76	1.968
6087.00	85.000	305.800	5910.16	208.77 N	273.24 W	343.51	25.238
6110.00	89.500	306.700	5911.26	222.35 N	291.77 W	366.43	19.952
6138.82	89.700	307.200	5911.47	239.67 N	314.80 W	395.21	1.869
6170.67	87.600	306.200	5912.22	258.70 N	340.32 W	426.99	7.302
6202.42	88.100	306.000	5913.41	277.40 N	365.96 W	458.65	1.696
6233.27	90.300	305.800	5913.84	295.48 N	390.95 W	489.41	7.161
6265.07	88.400	304.800	5914.20	313.86 N	416.90 W	521.10	6.752
6296.83	88.200	304.100	5915.14	331.81 N	443.07 W	552.70	2.291
6328.71	87.300	305.500	5916.39	349.99 N	469.23 W	584.42	5.218
6360.62	86.600	306.900	5918.09	368.81 N	494.94 W	616.22	4.900
6392.26	85.300	306.700	5920.33	387.72 N	520.21 W	647.73	4.157
6424.13	85.300	309.200	5922.94	407.25 N	545.26 W	679.47	7.818
6455.95	85.300	309.700	5925.54	427.40 N	569.75 W	711.18	1.566
6487.63	85.800	311.300	5928.00	447.91 N	593.76 W	742.76	5.277
6519.46	87.100	313.400	5929.97	469.31 N	617.24 W	774.50	7.749
6551.27	90.000	314.300	5930.78	491.34 N	640.17 W	806.23	9.545
6583.03	92.800	315.300	5930.00	513.71 N	662.70 W	837.86	9.361
6614.82	93.400	315.300	5928.28	536.27 N	685.02 W	869.47	1.887
6646.01	94.400	315.500	5926.16	558.43 N	706.87 W	900.45	3.269
6677.84	94.900	315.700	5923.58	581.10 N	729.07 W	932.02	1.691
6709.65	94.600	314.800	5920.95	603.61 N	751.39 W	963.59	2.973
6741.51	94.100	314.400	5918.53	625.92 N	774.01 W	995.26	2.008
6773.37	95.400	314.800	5915.89	648.21 N	796.61 W	1026.90	4.268
6805.22	97.000	314.800	5912.45	670.52 N	819.08 W	1058.45	5.024
6837.08	91.600	315.000	5910.07	692.94 N	841.58 W	1090.10	16.961
6868.88	89.200	315.000	5909.84	715.42 N	864.06 W	1121.77	7.547
6900.58	92.000	315.900	5909.51	738.01 N	886.30 W	1153.32	9.278
6932.42	92.600	316.200	5908.23	760.91 N	908.38 W	1184.96	2.107
6964.17	91.100	314.400	5907.21	783.47 N	930.70 W	1216.56	7.377

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6996.01	90.100	311.100	5906.87	805.07 N	954.07 W	1248.35	10.829
7027.00	88.900	310.200	5907.15	825.26 N	977.58 W	1279.34	4.840
7046.15	90.200	310.400	5907.30	837.65 N	992.19 W	1298.49	6.868
7077.97	92.400	310.200	5906.57	858.22 N	1016.45 W	1330.30	6.942
7109.85	92.500	310.200	5905.21	878.78 N	1040.77 W	1362.15	0.314
7141.55	92.400	309.200	5903.86	899.01 N	1065.14 W	1393.82	3.167
7173.34	90.600	308.600	5903.02	918.96 N	1089.87 W	1425.59	5.968
7205.10	90.400	308.100	5902.75	938.67 N	1114.78 W	1457.34	1.696
7236.94	90.600	307.600	5902.47	958.21 N	1139.92 W	1489.15	1.691
7268.60	93.000	308.500	5901.47	977.71 N	1164.84 W	1520.78	8.095
7300.30	91.800	307.600	5900.15	997.23 N	1189.78 W	1552.43	4.730
7331.30	92.800	307.600	5898.90	1016.13 N	1214.32 W	1583.38	3.226
7363.13	93.400	308.100	5897.18	1035.63 N	1239.41 W	1615.14	2.452
7394.90	89.600	305.800	5896.35	1054.72 N	1264.79 W	1646.84	13.979
7426.65	89.600	305.100	5896.57	1073.13 N	1290.65 W	1678.49	2.205
7457.28	90.300	306.500	5896.60	1091.05 N	1315.49 W	1709.04	5.110
7489.01	91.200	307.200	5896.18	1110.07 N	1340.88 W	1740.72	3.593
7520.82	92.200	308.600	5895.24	1129.60 N	1365.97 W	1772.49	5.407
7552.59	93.700	309.400	5893.60	1149.57 N	1390.63 W	1804.21	5.349
7584.42	90.900	309.700	5892.33	1169.82 N	1415.15 W	1836.01	8.847
7616.18	90.400	309.400	5891.97	1190.04 N	1439.64 W	1867.77	1.836
7648.03	90.500	310.900	5891.72	1210.58 N	1463.98 W	1899.62	4.720
7679.12	90.400	312.700	5891.47	1231.30 N	1487.16 W	1930.69	5.798
7710.98	90.900	312.300	5891.11	1252.82 N	1510.64 W	1962.52	2.010
7741.96	90.100	310.600	5890.84	1273.33 N	1533.86 W	1993.49	6.064
7773.70	90.900	310.600	5890.56	1293.98 N	1557.96 W	2025.22	2.520
7804.70	91.100	312.200	5890.02	1314.48 N	1581.21 W	2056.21	5.201
7836.46	92.800	312.500	5888.94	1335.86 N	1604.67 W	2087.92	5.435
7868.23	93.300	312.500	5887.25	1357.29 N	1628.06 W	2119.62	1.574
7899.19	89.300	310.400	5886.55	1377.78 N	1651.25 W	2150.55	14.591
7931.06	89.400	309.900	5886.91	1398.33 N	1675.61 W	2182.42	1.600
7962.86	88.400	309.500	5887.52	1418.63 N	1700.07 W	2214.21	3.387
7994.75	88.700	309.700	5888.33	1438.95 N	1724.63 W	2246.09	1.131
8026.50	88.300	310.100	5889.16	1459.31 N	1748.98 W	2277.83	1.781
8058.38	88.500	309.700	5890.05	1479.76 N	1773.43 W	2309.70	1.402
8089.34	89.000	310.200	5890.72	1499.63 N	1797.16 W	2340.65	2.284
8120.45	89.900	310.100	5891.02	1519.69 N	1820.94 W	2371.76	2.911
8152.19	89.800	309.900	5891.11	1540.09 N	1845.25 W	2403.50	0.704
8183.81	90.100	310.100	5891.13	1560.42 N	1869.47 W	2435.12	1.140
8215.53	90.700	310.900	5890.91	1581.02 N	1893.59 W	2466.83	3.153
8247.49	93.000	310.800	5889.88	1601.91 N	1917.75 W	2498.77	7.203
8279.33	93.300	310.800	5888.13	1622.68 N	1941.82 W	2530.56	0.942
8311.24	93.500	310.900	5886.24	1643.52 N	1965.92 W	2562.41	0.700
8342.99	93.300	310.600	5884.36	1664.20 N	1989.93 W	2594.10	1.134
8374.71	89.500	310.200	5883.58	1684.75 N	2014.07 W	2625.81	12.046

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8406.48	89.200	310.200	5883.94	1705.26 N	2038.33 W	2657.57	0.944
8438.27	89.200	309.900	5884.39	1725.71 N	2062.67 W	2689.36	0.944
8470.09	90.300	309.900	5884.52	1746.12 N	2087.08 W	2721.18	3.457
8501.83	90.200	309.400	5884.39	1766.37 N	2111.52 W	2752.92	1.606
8533.67	90.800	309.000	5884.11	1786.50 N	2136.19 W	2784.75	2.265
8565.53	89.100	307.800	5884.14	1806.29 N	2161.16 W	2816.60	6.531
8596.36	88.700	307.800	5884.73	1825.18 N	2185.51 W	2847.40	1.297
8628.20	88.600	308.100	5885.48	1844.75 N	2210.61 W	2879.21	0.993
8660.04	91.200	309.200	5885.53	1864.64 N	2235.48 W	2911.04	8.866
8691.95	91.600	310.800	5884.75	1885.14 N	2259.91 W	2942.94	5.167
8723.76	91.100	312.900	5884.00	1906.36 N	2283.60 W	2974.72	6.784
8755.39	92.000	313.900	5883.15	1928.08 N	2306.57 W	3006.28	4.253
8787.06	90.900	314.800	5882.35	1950.21 N	2329.21 W	3037.85	4.487
8818.88	90.200	314.400	5882.04	1972.55 N	2351.87 W	3069.57	2.534
8850.67	90.400	314.800	5881.88	1994.88 N	2374.50 W	3101.25	1.407
8882.43	89.600	315.300	5881.88	2017.35 N	2396.94 W	3132.89	2.970
8914.19	90.500	316.700	5881.85	2040.20 N	2419.00 W	3164.48	5.240
8946.04	90.900	317.400	5881.46	2063.51 N	2440.70 W	3196.08	2.531
8977.24	90.200	318.000	5881.16	2086.58 N	2461.70 W	3227.00	2.955
9009.10	91.800	319.000	5880.60	2110.44 N	2482.80 W	3258.50	5.922
9040.92	92.900	320.200	5879.30	2134.65 N	2503.41 W	3289.85	5.114
9072.74	93.000	320.200	5877.66	2159.07 N	2523.75 W	3321.13	0.314
9145.00	93.000	320.200	5873.88	2214.51 N	2569.94 W	3392.15	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 310.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 9145.00ft.,
The Bottom Hole Displacement is 3392.44ft., in the Direction of 310.751° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-21 - MWD Survey Leg #2

SURVEY REPORT

8 July, 1997

Survey Ref: svy1771

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.250	79.750	100.00	0.04 N	0.21 E	-0.17	0.250
200.00	0.080	70.160	200.00	0.10 N	0.50 E	-0.38	0.172
400.00	0.240	265.500	400.00	0.12 N	0.21 E	-0.12	0.159
600.00	0.320	275.640	600.00	0.14 N	0.76 W	0.73	0.047
800.00	0.610	262.830	799.99	0.06 N	2.38 W	2.09	0.153
1000.00	0.750	270.600	999.98	0.06 S	4.74 W	4.08	0.084
1200.00	0.800	269.890	1199.96	0.05 S	7.45 W	6.43	0.025
1400.00	1.210	269.250	1399.93	0.08 S	10.95 W	9.45	0.205
1600.00	0.980	272.210	1599.89	0.04 S	14.78 W	12.78	0.118
1800.00	0.930	273.030	1799.86	0.11 N	18.11 W	15.74	0.026
2000.00	0.610	277.030	1999.84	0.33 N	20.78 W	18.16	0.162
2200.00	0.450	286.500	2199.83	0.68 N	22.59 W	19.91	0.091
2400.00	0.590	259.500	2399.83	0.72 N	24.36 W	21.45	0.139
2600.00	0.410	226.520	2599.82	0.04 N	25.89 W	22.44	0.166
2800.00	0.280	175.030	2799.82	0.94 S	26.37 W	22.36	0.161
3000.00	0.250	120.980	2999.81	1.65 S	25.95 W	21.65	0.121
3200.00	0.220	76.290	3199.81	1.79 S	25.20 W	20.93	0.090
3400.00	0.200	352.100	3399.81	1.35 S	24.88 W	20.87	0.141
3600.00	0.170	28.210	3599.81	0.74 S	24.79 W	21.09	0.059
3800.00	0.080	139.980	3799.81	0.59 S	24.56 W	20.97	0.107
4000.00	0.190	293.910	3999.81	0.56 S	24.77 W	21.17	0.132
4200.00	0.160	194.620	4199.81	0.70 S	25.14 W	21.43	0.134
4400.00	0.250	183.100	4399.81	1.40 S	25.24 W	21.15	0.049
4600.00	0.370	195.170	4599.81	2.46 S	25.43 W	20.79	0.068
4800.00	0.410	232.470	4799.80	3.52 S	26.17 W	20.90	0.126
5000.00	0.490	280.670	4999.80	3.80 S	27.57 W	21.98	0.187
5200.00	0.420	272.290	5199.79	3.61 S	29.15 W	23.44	0.048
MWD Survey Leg #2							
5400.00	0.350	279.020	5399.78	3.49 S	30.48 W	24.66	0.042
5583.00	0.440	300.640	5582.78	3.04 S	31.64 W	25.88	0.094
5589.00	2.700	307.100	5588.78	2.94 S	31.77 W	26.04	37.722
5592.00	3.700	306.670	5591.77	2.84 S	31.91 W	26.21	33.343
5612.00	7.900	303.870	5611.67	1.69 S	33.56 W	28.22	21.041
5632.00	11.500	301.070	5631.38	0.10 N	36.41 W	31.59	18.149
5652.00	15.200	298.270	5650.83	2.38 N	40.43 W	36.20	18.775
5672.00	18.500	295.470	5669.97	4.98 N	45.61 W	41.99	16.987
5692.00	21.700	292.680	5688.75	7.77 N	51.89 W	48.82	16.698
5712.00	24.300	289.880	5707.16	10.60 N	59.17 W	56.54	14.101

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5732.00	29.100	287.080	5725.02	13.43 N	67.69 W	65.34	24.805
5752.00	33.400	284.280	5742.12	16.22 N	77.68 W	75.38	22.688
5772.00	37.500	281.480	5758.41	18.79 N	88.99 W	86.46	22.045
5792.00	42.500	278.670	5773.73	21.02 N	101.64 W	98.53	26.576
5812.00	46.900	275.800	5787.94	22.78 N	115.59 W	111.49	24.201
5832.00	50.200	277.790	5801.18	24.56 N	130.47 W	125.27	18.106
5852.00	53.400	279.780	5813.55	26.96 N	146.00 W	139.92	17.807
5872.00	57.400	281.770	5824.90	30.05 N	162.17 W	155.47	21.610
5892.00	61.600	283.760	5835.05	33.86 N	178.97 W	171.92	22.681
5912.00	65.200	285.750	5844.01	38.42 N	196.26 W	189.17	20.078
5932.00	68.300	287.740	5851.90	43.71 N	213.85 W	207.06	17.994
5952.00	72.200	289.730	5858.66	49.76 N	231.67 W	225.51	21.631
5972.00	76.100	291.720	5864.12	56.57 N	249.66 W	244.50	21.721
5992.00	77.100	293.710	5868.76	64.08 N	267.60 W	263.79	10.894
6012.00	79.600	295.700	5872.79	72.27 N	285.40 W	283.30	15.849
6032.00	81.700	297.690	5876.04	81.14 N	303.02 W	303.00	14.375
6052.00	84.400	299.680	5878.46	90.67 N	320.44 W	322.84	16.727
6067.00	86.000	301.200	5879.72	98.24 N	333.32 W	337.79	14.688
6094.00	90.200	299.900	5880.61	111.95 N	356.56 W	364.76	16.283
6106.94	90.000	299.800	5880.59	118.39 N	367.78 W	377.70	1.728
6138.54	87.200	298.600	5881.36	133.80 N	395.35 W	409.29	9.640
6170.33	87.400	297.700	5882.86	148.78 N	423.35 W	441.03	2.897
6202.15	88.600	296.500	5883.97	163.27 N	451.66 W	472.78	5.332
6234.04	91.100	296.700	5884.05	177.55 N	480.17 W	504.61	7.864
6265.89	92.700	297.200	5883.00	191.97 N	508.55 W	536.40	5.263
6297.71	89.400	298.500	5882.42	206.83 N	536.67 W	568.19	11.146
6329.63	88.200	298.500	5883.08	222.06 N	564.72 W	600.09	3.759
6361.49	91.100	298.800	5883.28	237.33 N	592.67 W	631.94	9.151
6393.25	91.800	299.700	5882.47	252.85 N	620.37 W	663.68	3.589
6425.07	91.100	300.000	5881.67	268.68 N	647.96 W	695.49	2.393
6456.92	91.000	299.700	5881.09	284.53 N	675.58 W	727.34	0.993
6488.77	91.200	300.000	5880.47	300.38 N	703.20 W	759.18	1.132
6520.59	90.900	300.400	5879.89	316.38 N	730.70 W	791.00	1.571
6552.23	91.100	300.400	5879.34	332.39 N	757.99 W	822.63	0.632
6583.41	89.600	299.300	5879.15	347.91 N	785.03 W	853.81	5.966
6615.19	90.800	299.200	5879.04	363.44 N	812.75 W	885.58	3.789
6646.95	90.100	299.000	5878.79	378.88 N	840.50 W	917.34	2.292
6678.63	88.500	298.600	5879.18	394.14 N	868.26 W	949.01	5.206
6710.36	90.000	299.300	5879.59	409.50 N	896.02 W	980.73	5.217
6742.18	92.300	300.700	5878.95	425.41 N	923.57 W	1012.54	8.461
6774.03	91.100	300.600	5878.01	441.63 N	950.96 W	1044.37	3.781
6805.86	91.100	300.200	5877.40	457.74 N	978.41 W	1076.20	1.256
6837.72	90.800	300.400	5876.87	473.81 N	1005.91 W	1108.05	1.132
6869.41	90.400	300.200	5876.54	489.80 N	1033.27 W	1139.74	1.411
6901.23	88.700	299.200	5876.79	505.56 N	1060.91 W	1171.56	6.198

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6933.03	87.500	299.000	5877.84	521.02 N	1088.68 W	1203.34	3.826
6964.87	89.600	298.500	5878.65	536.33 N	1116.59 W	1235.16	6.780
6996.70	91.100	299.000	5878.45	551.64 N	1144.49 W	1266.98	4.967
7028.53	92.000	299.900	5877.59	567.28 N	1172.20 W	1298.79	3.998
7060.39	90.900	299.700	5876.78	583.11 N	1199.83 W	1330.64	3.509
7092.15	91.400	299.000	5876.15	598.67 N	1227.51 W	1362.39	2.708
7123.99	90.500	298.800	5875.62	614.06 N	1255.38 W	1394.22	2.896
7155.79	86.400	297.700	5876.48	629.10 N	1283.38 W	1425.99	13.349
7187.56	86.800	297.000	5878.36	643.67 N	1311.55 W	1457.67	2.534
7219.49	88.300	297.200	5879.73	658.20 N	1339.94 W	1489.53	4.739
7251.25	92.300	298.800	5879.56	673.11 N	1367.98 W	1521.26	13.564
7283.03	93.000	300.400	5878.09	688.79 N	1395.58 W	1553.00	5.490
7314.78	91.100	300.700	5876.96	704.92 N	1422.91 W	1584.73	6.058
7345.86	90.000	300.700	5876.66	720.78 N	1449.63 W	1615.81	3.539
7377.73	90.400	300.200	5876.55	736.93 N	1477.10 W	1647.68	2.009
7408.90	90.200	300.400	5876.38	752.66 N	1504.01 W	1678.84	0.907
7440.74	91.100	300.200	5876.02	768.72 N	1531.50 W	1710.68	2.896
7471.81	92.200	299.200	5875.13	784.11 N	1558.48 W	1741.74	4.784
7503.67	94.100	299.500	5873.38	799.70 N	1586.21 W	1773.55	6.037
7535.41	92.400	299.900	5871.58	815.40 N	1613.73 W	1805.23	5.502
7567.18	90.600	299.900	5870.75	831.23 N	1641.26 W	1836.99	5.666
7599.07	90.100	299.500	5870.55	847.03 N	1668.96 W	1868.88	2.008
7630.13	89.600	299.700	5870.63	862.37 N	1695.97 W	1899.94	1.734
7662.04	89.400	300.200	5870.91	878.30 N	1723.62 W	1931.85	1.688
7693.78	86.400	299.500	5872.07	894.09 N	1751.12 W	1963.56	9.705
7724.89	88.200	299.900	5873.54	909.49 N	1778.12 W	1994.64	5.927
7756.67	91.300	300.900	5873.68	925.57 N	1805.52 W	2026.41	10.249
7788.44	93.400	302.100	5872.38	942.15 N	1832.59 W	2058.14	7.611
7820.23	93.900	302.700	5870.35	959.15 N	1859.37 W	2089.84	2.454
7851.96	93.800	303.900	5868.22	976.53 N	1885.83 W	2121.44	3.787
7900.46	90.800	305.500	5866.28	1004.11 N	1925.67 W	2169.73	7.009
7962.54	91.700	304.600	5864.92	1039.76 N	1976.48 W	2231.56	2.050
7994.34	91.600	303.700	5864.01	1057.60 N	2002.78 W	2263.26	2.846
8026.24	90.400	303.200	5863.45	1075.18 N	2029.39 W	2295.10	4.075
8057.22	89.100	302.700	5863.58	1092.03 N	2055.39 W	2326.04	4.496
8088.34	89.600	302.300	5863.94	1108.75 N	2081.63 W	2357.12	2.058
8120.13	90.200	302.700	5863.99	1125.83 N	2108.44 W	2388.88	2.268
8151.67	89.700	301.400	5864.02	1142.57 N	2135.18 W	2420.40	4.416
8183.45	90.200	300.900	5864.05	1159.01 N	2162.37 W	2452.18	2.225
8214.43	90.400	300.600	5863.89	1174.85 N	2189.00 W	2483.15	1.164
8246.38	89.600	300.200	5863.89	1191.01 N	2216.56 W	2515.10	2.799
8278.27	90.300	300.000	5863.91	1207.01 N	2244.14 W	2546.99	2.283
8310.02	89.800	299.500	5863.89	1222.76 N	2271.71 W	2578.74	2.227
8341.74	90.000	299.000	5863.94	1238.26 N	2299.39 W	2610.46	1.698
8373.58	91.200	299.200	5863.61	1253.75 N	2327.20 W	2642.29	3.821

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-21

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8405.39	91.800	299.200	5862.77	1269.26 N	2354.96 W	2674.09	1.886
8437.19	89.400	298.500	5862.44	1284.60 N	2382.81 W	2705.88	7.861
8469.01	88.900	297.900	5862.91	1299.64 N	2410.85 W	2737.68	2.454
8500.78	90.400	298.600	5863.11	1314.67 N	2438.84 W	2769.43	5.210
8532.63	89.100	298.800	5863.25	1329.97 N	2466.77 W	2801.27	4.130
8564.51	89.300	299.000	5863.69	1345.37 N	2494.68 W	2833.14	0.887
8596.35	92.100	299.500	5863.30	1360.93 N	2522.45 W	2864.97	8.933
8628.20	90.800	299.700	5862.50	1376.65 N	2550.14 W	2896.81	4.130
8659.96	92.600	300.900	5861.55	1392.67 N	2577.55 W	2928.56	6.811
8691.77	93.500	300.900	5859.86	1408.98 N	2604.80 W	2960.32	2.829
8723.66	94.700	301.600	5857.58	1425.48 N	2632.00 W	2992.12	4.353
8755.51	93.000	302.000	5855.44	1442.23 N	2659.00 W	3023.88	5.483
8787.36	91.000	302.100	5854.33	1459.12 N	2685.98 W	3055.69	6.287
8819.16	90.900	303.000	5853.81	1476.23 N	2712.78 W	3087.45	2.847
8850.78	90.500	303.700	5853.42	1493.61 N	2739.19 W	3119.01	2.550
8881.96	89.100	304.400	5853.53	1511.06 N	2765.03 W	3150.11	5.020
8913.74	89.300	306.000	5853.97	1529.38 N	2790.99 W	3181.76	5.073
8945.49	89.000	306.700	5854.44	1548.20 N	2816.56 W	3213.31	2.398
8977.33	91.000	306.700	5854.44	1567.22 N	2842.09 W	3244.93	6.281
9009.14	91.300	306.700	5853.80	1586.23 N	2867.59 W	3276.52	0.943
9040.86	91.100	306.000	5853.14	1605.03 N	2893.13 W	3308.04	2.295
9072.52	93.500	306.900	5851.87	1623.82 N	2918.57 W	3339.47	8.095
9083.00	93.700	307.400	5851.21	1630.14 N	2926.91 W	3349.85	5.130
9115.00	93.700	307.400	5849.15	1649.53 N	2952.28 W	3381.51	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 300.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 9115.00ft.,
The Bottom Hole Displacement is 3381.85ft., in the Direction of 299.194° (True).

Form 3160-4
(July 1992)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

FORM APPROVED
OMB NO. 1004-0137
Expires: February 28, 1995

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

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

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

2. NAME OF OPERATOR Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.

3. ADDRESS AND TELEPHONE NO. P.O. Box 633, Midland, TX 79702 (915) 688-2585

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface 660 FNL & 1882' FWL
At top prod. interval reported below 112' FNL & 357' FWL
At total depth * #37

5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353
6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL
7. UNIT AGREEMENT NAME RATHERFORD UNIT
8. FARM OR LEASE NAME, WELL NO. RATHERFORD 18-W-21
9. API WELL NO. 43-037-16418
10. FIELD AND POOL, OR WILDCAT GREATER ANETH
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA SEC. 18, T41S, R24E

14. PERMIT NO.	DATE ISSUED	12. COUNTY OR PARISH	13. STATE
	05-07-97	SAN JUAN	UTAH

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
06-03-97	06-27-97	07-08-97	5101' GR, 5111' RKB	

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
** #37	** #37		→	X	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD)*
** # 37 PRDX

25. WAS DIRECTIONAL SURVEY MADE YES

26. TYPE ELECTRIC AND OTHER LOGS RUN
MUD LOG 7-3-97

27. WAS WELL CORED NO

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

CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED
13 3/8"	27.1#	175'	17 1/4"	SURFACE W/175 SXS	
8 5/8"	24#	1878'	12 1/4"	SURFACE W/935 SXS	
5 1/5"	14 & 15,5#	6084'	7 7/8"	6054' W/146 SXS	

29. LINER RECORD

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

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	5435'	5435'

31. PERFORATION RECORD (Interval, size and number)

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
6118-9084'	LAT #2/ACIDIZE W/62286 GALS
	15% HCL ACID
6144-9145'	LAT #1/ACIDIZE W/58002 GALS
	15% HCL ACID

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping - size and type of pump)	WELL STATUS (Producing or shut-in)
7-08-97		INJECTOR

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL - BBL.	GAS - MCF.	WATER - BBL.	GAS - OIL RATIO
7-11-97	24					1200	

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL - BBL.	GAS - MCF.	WATER - BBL.	OIL GRAVITY - API (CORR.)
2800	0					

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

TEST WITNESSED BY

RECEIVED
SEP 18 1997
DIV. OF OIL, GAS & MINING

35. LIST OF ATTACHMENTS
DIRECTIONAL SURVEY REPORT

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

SIGNED Sue Moseley for Shirley Houchins TITLE ENV. & REG. TECHNICIAN DATE 09-16-97

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

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdicton.

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.
* #4			LAT #1 2215' NORTH & 2570' WEST F/SURFACE SPOT (ZONE 1b/1d) LAT #2 1650' NORTH & 2952 WEST F/SURFACE SPOT (ZONE 1a/1b)
** #20 & 24			LAT #1 (5911-5874' TVD) (6110-9145' TMD) LAT #2 (5881-5849' TVD) (6094-9115 TMD)

38. GEOLOGIC MARKERS

NAME	TOP	
	MEAS. DEPTH	TRUE VERT. DEPTH

U.S. GOVERNMENT PRINTING OFFICE: 1992-774-672

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
(NE/NW) 660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other MIT TESTS	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

SEE ATTACHED MIT AND CHART.

RECEIVED
MAY 11 1998
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Moseley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 5-13-98

(This space for Federal or State office use)
Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

ANNULAR PRESSURE TEST
(Mechanical Integrity Test)

Operator Mobil E. & P., Inc **Date of Test** 7-28-97

Well Name RU # 18W-21 **EPA Permit No.**

Location Sec. 18, T41S-R24E **Tribal Lease No.** 14-20-603-353

State and County San Juan County, UT

Continuous Recorder? YES ☒ NO ☐ **Pressure Gauge?** YES ☒ NO ☐

Bradenhead Opened? YES ☐ NO ☒ **Fluid Flow?** YES ☐ NO ☐

TIME	ANNULUS PRESSURE, psi	TUBING PRESSURE, psi
9:30	1100	1150
9:35	1100	1150
9:40	1105	1150
9:50	1110	1150
10:00	1120	1150

MAX. INJECTION PRESSURE: _____ **PSI**

MAX. ALLOWABLE PRESSURE CHANGE: _____ **PSI** **(TEST PRESSURE X 0.05)**

REMARKS: **Passed? Failed? If failed, cease injection until well passes MIT (40CFR§144.21(c)(6)).**

SHUT-IN WELL, RECENT WORKOVER
PASSED M.I.T.

RICK AUTHUR [signature] 7-28-97

COMPANY REPRESENTATIVE: **(Print and Sign)** **DATE**

Melvin Capitan Jr. [signature] 7-28-97

INSPECTOR: **(Print and Sign)** **DATE**

REGION-IX-FORM-935 (6/13/96) *USEPA - Region IX (White)* *NEPA-GPCP (Yellow)* *Operator (Pink)*

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF INSPECTION

Address (EPA Regional Office)	Inspection Contractor	Firm To Be Inspected
Region 9 Environmental Inspection Agency 215 Fremont Street (W-6-2) San Francisco, CA 94105	Navajo EPA ~~THE CARMUS GROUP, INC~~ ~~CORPORATE OFFICE~~ ~~Waltham, MA 02154~~	Mobil E.&P., Inc. P.O Box Dawer G Cortez, Co 81321

Date 7-28-97	Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300 f et seg.).
Hour 8:30 AM	

Reason For Inspection

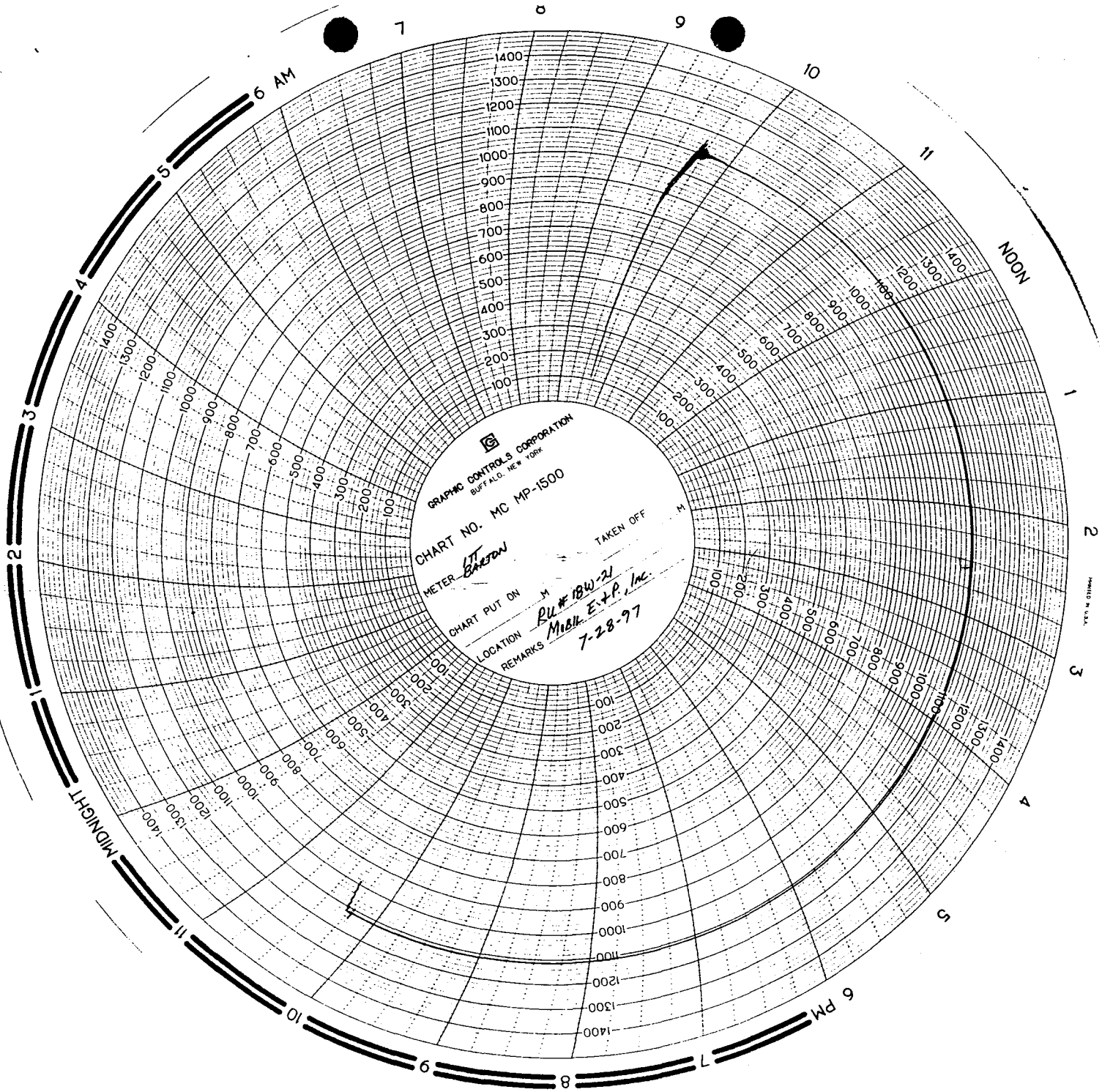
For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable permit or rule.

RU # 7W-32, WATER INJECTION WELL, M.I.T. - PASSED
RU # 18W-21, WATER INJECTION WELL, M.I.T. - PASSED
RU # 18W-43B, WATER INJECTION WELL, M.I.T. - PASSED
RU # 19W-43, WATER INJECTION WELL, M.I.T. - PASSED
RU # 20W-21, WATER INJECTION WELL, M.I.T. - PASSED
RU # 20W-23, WATER INJECTION WELL, M.I.T. - PASSED
RU # 20W-41, WATER INJECTION WELL, M.I.T. - PASSED
RU # 21W-43, WATER INJECTION WELL, M.I.T. - PASSED

Section 1445(b) of the SDWA (42 U.S.C. §300 j-4 (b) is quoted on the reverse of this form.

Receipt of this Notice of Inspection is hereby acknowledged.

Firm Representative	Date	Inspector
[illegible]	7-28-97	[illegible]


GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
CHART NO. MC MP-1500
METER LT BARTON
CHART PUT ON M
TAKEN OFF M
LOCATION BU # 18W-21
REMARKS Mobil E+P, Inc.
7-28-97
MIDNIGHT
6 AM
NOON
6 PM

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

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Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

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6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
(NE/NW) 660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
	[ ] Recompletion	[ ] New Construction
[ ] Subsequent Report	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
[ ] Final Abandonment Notice	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other LINER / INJECTOR	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

SEE ATTACHED PROCEDURE AND WELLBORE SKETCHES.

RECEIVED
JUN 01 1998
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Mosley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 5-30-98

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Accepted by the
Utah Division of
Oil, Gas and Mining

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FOR RECORD ONLY

* See Instruction on Reverse Side

Ratherford Unit #18-21

Polybore Liner Procedure

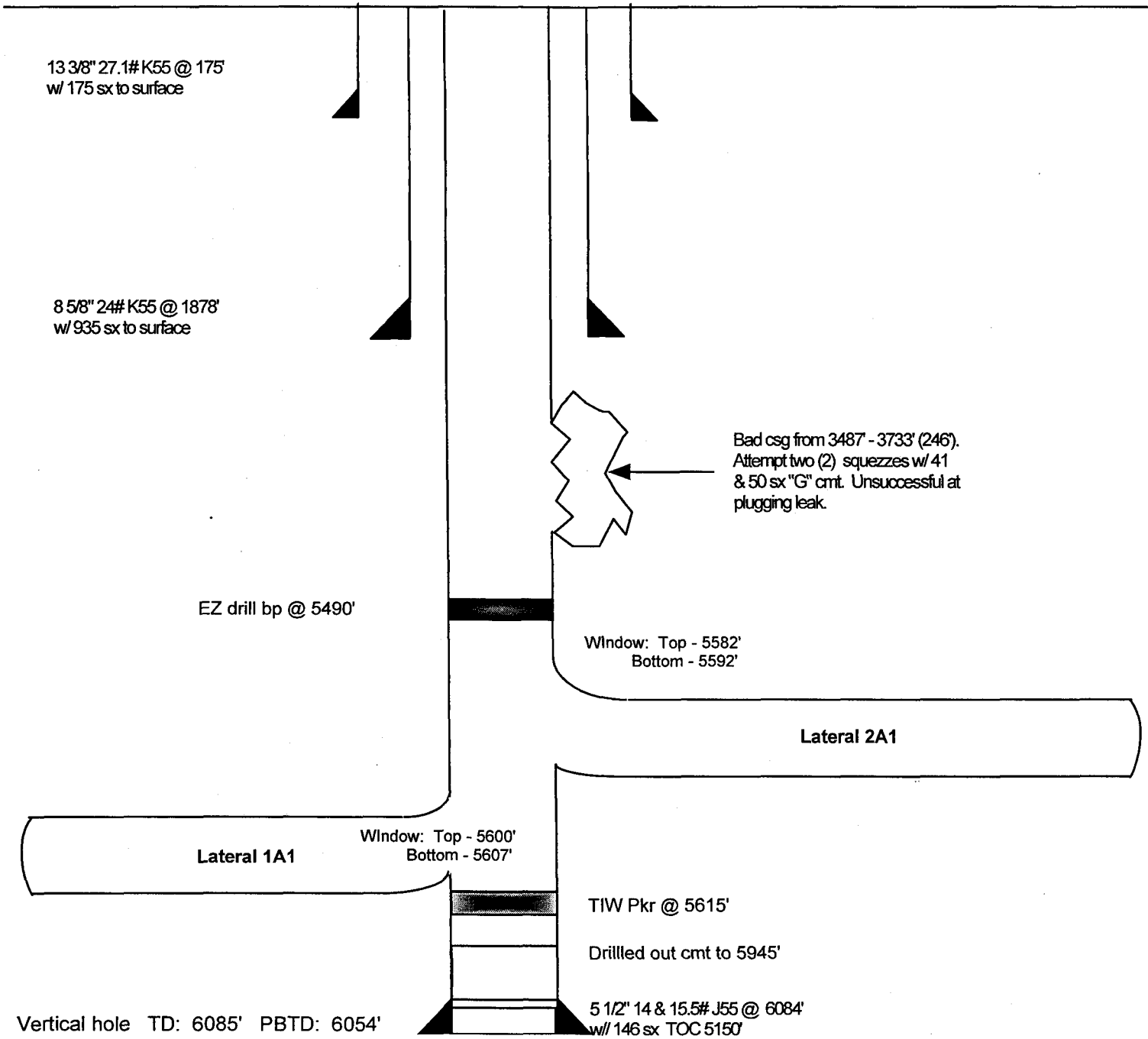
The objective of this operation is to repair casing leak by installing a polybore liner from surface to 5490'.

1. MIRU PU. ND wellhead. NU BOP. Pressure test BOPs
2. RIH w/ 4 ¾" bit + csg scraper + ws and clean out to BP @ 5490'. Circ. POOH
3. Tag for fluid. If present, swab down csg.
4. Run gauge tool..
5. MIRU Polybore installation unit..
6. Run polybore liner down csg to 5490'.
7. Set liner. RD unit. Wait on liner minimum 12 hrs..
8. TIH and mill out guide shoe + EZ drill bridge plug..
9. RIH w/ inj pkr + inj tbg. Circ 110 deg water.
10. Circ pkr fluid. Run MIT.
11. ND BOP. NU WH. RDMO.

660 FNL
1882' FWL
S-18
T41S
R24E
San Juan Co., Utah

Ratherford Unit
18-21
Current Wellbore

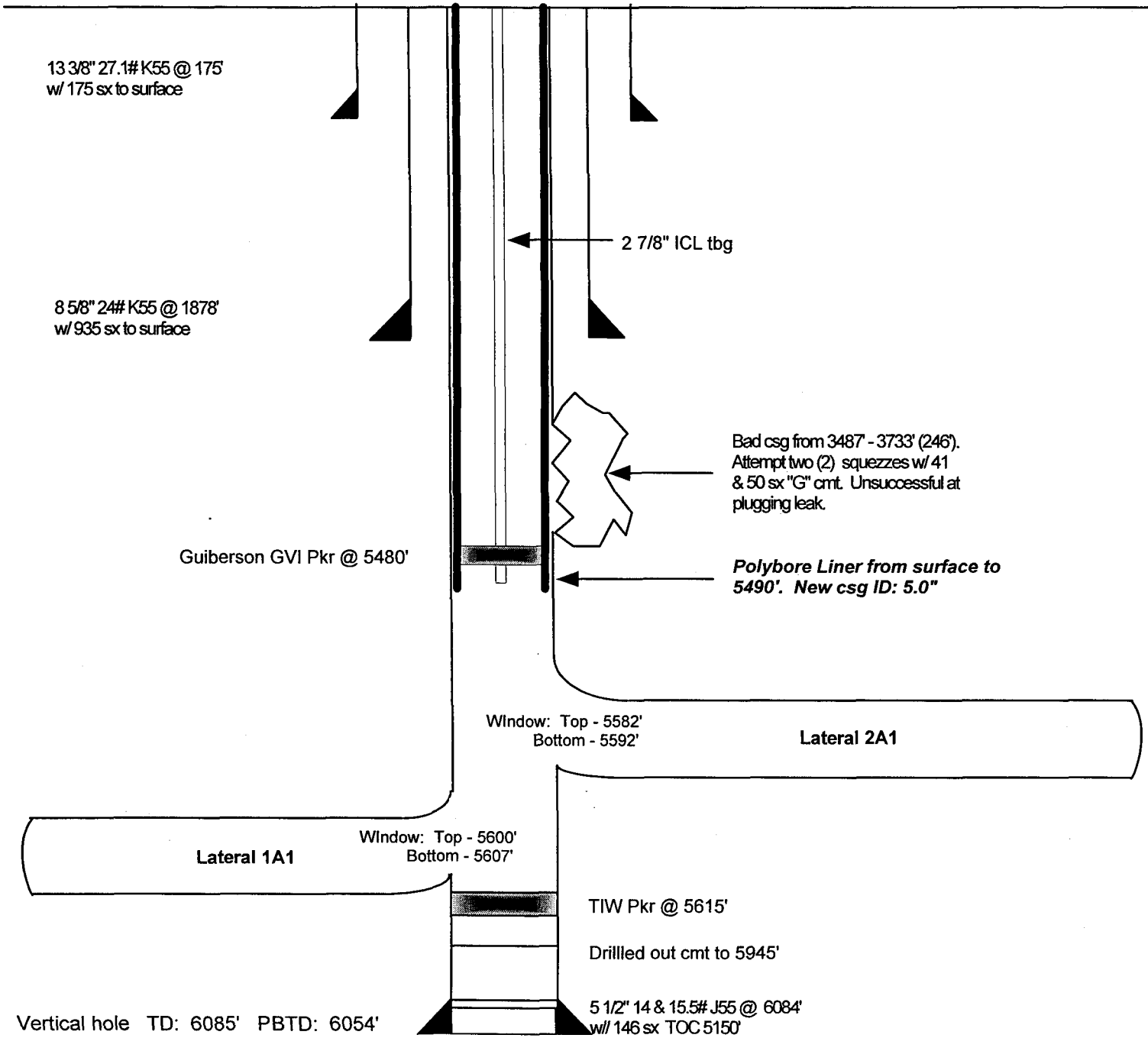
YPO: 5/27/98



660 FNL
1882' FWL
S-18
T41S
R24E
San Juan Co., Utah

Ratherford Unit
18-21
Proposed Wellbore

YPO: 5/27/98



Vertical hole TD: 6085' PBTD: 6054'

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

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SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
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1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

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[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
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[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other INJECTOR/TA'D	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BHL:

LATERAL #1A1 2215' FNL & 2570' FWL/SURFACE SPOT.
LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED: (4-10-98 / 4-30-98).

TEMPORARILY ABANDONED WELLBORE.

RECEIVED
JUN 01 1998
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Mosley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 5-27-98

(This space for Federal or State office use)
Approved by _____ Title _____ Date _____
Conditions of approval, if any:

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*** See Instruction on Reverse Side**

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT 18-W-21
14-20-603-353
NAVAJO TRIBAL
SAN JUAN, UTAH

04-10-98	SHUT IN PRESSURE @ 9:00 WAS 1200 PSI ON TBG. AND CSG. MIRU TEFTELLER SLICKLINE UNIT. 1.78" 'R' PLUG TO 5545' SET PLUG. RIG DOWN MOVE OFF TEFTELLER
04-11-98	SHUT IN PRESSURE @ 7:30 WAS 0 PSI. MIRU NAVAJO WEST RIG #15. RIG UP PUMP AND PIT. RIG UP FLOW LINES. POH AND INSPECT TBG.
04-13-98	SHUT IN PRESSURE @ 7:30 WAS 0 PSI. RIH, IN STANDS, 2.875" CMT LINED TBG. TO 5435'
04-14-98	SHUT IN PRESSURE @ 7:30 WAS 0 PSI. SPACE OUT 2 7/8" CMT. LINED TBG. NIPPLE DOWN BOPE. SET TBG. HANGER. MAKE UP PRODUCTION TREE. HOLE WITH 200 BBLS PACKER FLUID. LATCH ONTO ON/OFF TOOL. TEST CSG. LEAKED NIPPLE UP BOPE. POH WITH CMT. LINED TBG. SI.
04-15-98	PICK-UP GUIBERSON UNIPACKER VI BRIDGE PLUG, AND GUIBERSON UNIPACKER TEST PACKER. 5378' AND SET BRIDGE PLUG. 5353'. SET PACKER. TEST PACKER AND BRIDGE PLUG TO 1000 PSI. OK. FOR CSG. LEAK TO 3487' TOP OF CSG. LEAK, BOTTOM OF CSG. LEAK @ 3733' RIH, TO 5378'. RELEASE BRIDGE PLUG. SET @ 3943'. PACKER TO 3903'. SIFN
04-16-98	SHUT IN TBG. PRESSURE @ 7:30 WAS 0 PSI. POH, LAY DOWN GUIBERSON PACKER. RIH WITH OPEN END TBG. TO 3922'. DISPLACE HOLE WITH FRESH WATER. PUMP SAND ONTO BRIDGE PLUG. RIG UP AND PUMP CSG. PRESSURE UP TO 1000 PSI @ .25 BBL PER/MIN. WELL BLEED OFF TO 450 IN 3 MIN.. NO INJECTION RATE. PUMP 48 CU/FT. OF CLASS 'G' CMT. + 1% FLUID LOSS + .25 % DISPERSENT + 2% CACL2 @ 15.8 PPG, 1.17 YIELD FROM 3733' TO 3387'. POH WITH 2.875" TBG. PRESSURE UP CSG. TO 1000 PSI. PUMP 2.5 BBLS OF CMT. INTO CSG. PRESSURE TO 1000 PSI AND HOLDING RDMO DOWELL CMT. UNIT. SIFN.
04-17-98	SHUT IN CSG. PRESSURE @ 7:30 WAS 0 PSI. PICK-UP DRLG. COLLARS RUN ON 2.875" TBG. TO 3508' . TAG. TOP OF CMT. RIG UP AND TEST CSG. TO 1000 PSI. OK. MAKE-UP POWER SWIVEL DRLG. OUT CMT. FROM 3508-3618' MAKE CONNECTION DRLG. OUT CMT. FROM 3618' TO 3620'. PIPE STUCK. WORK PIPE COULD NOT WORK FREE. SIFN.
04-18-98	SHUT IN PRESSURE @ 7:30 WAS 0 PSI. WORK STUCK PIPE. SCREW INTO FISH. JAR ON FISH. UNABLE TO JAR FREE. SIFN.
04-19-98	SHUT IN PRESSURE @ 7:30 WAS 0 PSI. MIRU. WEATHERFORD FREE POINT UNIT. MAKE UP STRING SHOT. RIH TO 3517'. (W. L. M.) FIRE SHOT. RDMO WEATHERFORD FREE POINT UNIT. LAY DOWN. DRLG. COLLAR (FISH) RIH WITH 4.5" WASH PIPE TO 3523' WASH OVER FISH FROM 3523' TO 3588'. POH AND LAY DOWN WASH PIPE. SIFN
04-20-98	SIP=0, TOH L/D FISH & FISHING TOOLS TEST CSG TO 1000# LEAKED, UP BIT, TIH TO 3588', ON PUMP BROKE CIRC & PUMPED 50 BBLS TO CHECK OUT PUMP SI & SDFN
04-21-98	DRILL CMT FROM 3612'-3778' CIRC CLEAN. PRESS CSG TO 1000# BLED TO 800# IN 5 MINS, 200PSI DROP. TOH W TBG, DC'S, & BIT. TIH W 120JTS-3713' OPEN END TBG TO PREPARE FOR DUMP SQUEEZE #2 SI & SDFN
04-22-98	BOTTOM OF TBG @ 3736.48', RIG UP HOWCO & PUMP 50SKS CL-G CMT W 3% HALAD-322, .75% CACL. PULL BACK TO 3218' SQUEEZE TO 1250#, TOH CLOSE BLINDS & PRES TO 1100# SI & SDFN.

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT 18-W-21
14-20-603-353
NAVAJO TRIBAL
SAN JUAN, UTAH
PAGE 2

04-23-98	SIP=780# BLEED OFF IN 15MINS. TIH W DC'S & TBG, TAG CMT @ 3391'. +- DRILL CMT FROM 3391'-3608' +-, CIRC CLEAN & SI & SDFN.
04-24-98	WHP=0, DRILL CMT FROM 3608-3738' DROP TO 3766' CIRC CLEAN TEST SQUEEZE TWICE TO 1000#, BLED TO 540# IN 30MINS. SIFN.
04-25-98	WELL DEAD, FINISH TIH LATCH ON RBP & REL, TIH W FLUOR-LINED TBG, LATCH ON PKR. RIG UP TEFTELLAR S/L, TIH TO PUNCTURE DISC. COULD NOT PUNCTURE, PULLED S/L OUT OF ROPE SOCKET, BAILER & JARS LEFT IN HOLE, WILL RIG UP S/L W HYD JARS MONDAY 27TH ATTEMPT TO FISH.
04-28-98	SITP=1200#, CSG=0. PUMP, 13.6# DOWN TBG TO KILL REL PKR, 800# ON ANN, CIRC. TBG DEAD, CSG=600#. PUMP 16# DOWN ANN, 10, WELL DEAD, TOH W TBG & PKR. RIG UP HOWCO, SET COMPOSITE FAS DRILL B/P @ 5490', COLLAR @ 5502'+, [NO CORRELATION LOG]. TEST PLUG TO 500# FOR 15 MIN-GOOD, TIH KILL STRING, SI & SDFN.
04-29-98	TIH W FLUOR-LINED TBG, CIRCULATE HOLE W FRESH WATER TO RECOVER USUABLE MUD, LAY DOWN FLUOR-LINED TBG. SI & SDFN.
04-30-98	WELL DEAD FINISH LAYING DOWN CMT LINED, ND BOP, INSTALL WELLHEAD, NO TUBING IN HOLE, CLEAN OUT STEEL PIT & START ON LOCATION CLEANUP. WELL TA'D 4/30/98, WAIT ON ORDERS FROM WITHIN MOBIL.

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

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	[X] Casing Repair	[ ] Water Shut-Off
[ ] Final Abandonment Notice	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other INJECTOR	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BHL:

LATERAL #1A1 2215' FNL & 2570' FWL/SURFACE SPOT.
LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED PROCEDURE (REPAIR CASING LEAK)

Accepted by the Utah Division of Oil, Gas and Mining
FOR RECORD ONLY

RECEIVED
JUN 04 1998
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Moseley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 6-02-98

(This space for Federal or State office use)
Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*** See Instruction on Reverse Side**

Ratherford Unit #18-21

Casing Leak Operation

The objective of this operation is to repair casing leak by squeezing w/ cement.

1. MIRU PU. ND wellhead. NU BOP. Pressure test BOPs
2. POOH w/ injection equipment.
3. TIH w/ pkr + RBP and attempt to isolate leak..
4. Isolated leak from 3487' – 3733' (246') bad casing.
5. Attempt puddle squeeze w/ 48 cuft "G" (15.8 ppg). WOC
6. DO cmt. Test squeeze to #1000. Did not hold.
7. Attempt 2nd squeeze w/ 50 sx "G". WOC.
8. DO cmt. Test squeeze to #1000. Did not hold
9. TA Well for further evaluation.

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other 4" LINER	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

BHL:

LATERAL #1A1 2215' FNL & 2570' FWL/SURFACE SPOT.
LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED PROCEDURE (RUN 4" LINER)

RECEIVED
JUL 23 1998
DIV. OF OIL, GAS & MINING

COPY SENT TO OPERATOR
Date: 7-31-98
Initials: DDR

14. I hereby certify that the foregoing is true and correct
Signed Lee Moseley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 7-21-98

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Accepted by the Utah Division of Oil, Gas and Mining

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FOR RECORD ONLY

* See Instruction on Reverse Side

Ratherford Unit 18-21
Liner Operation
RT1767918021

GENERAL INFORMATION

Section Ties	Section/TWP/Rng	County/State
2587' FSL & 2410' FWL	18/41S/24E	San Juan/Utah
API	**Prism ID**	**Location**
43-037-16418-00	0043064	17679-00

AFE Code
EAXP

Objective:

The well has a EZSV bridge plug @ 5490' w/ one joint of tbg in well . The well was twice unsuccessfully squeezed from 3487' – 3733'. An an attempt to run a polybore casing liner was aborted due to influx of fluid from previously squeezed perfs.

Call Laniya Tucker (970-882-2334) after rigged up. She will update well history and wellbore diagram upon completion of operations.

Call Diana Spendlove (970 564-5202) to determine which tubing string to use after completion.

NOTIFY THE BLM and NAVAJO EPA 48 HOURS PRIOR TO RIG UP. Document date and time of notification of both parties. Record documentation on DRS. If representative are on location during plugging procedures, record names, dates, etc. and report on DRS.

1. MIRU PU and associated equipment.
2. Prepare WH for new 4" liner. Spear 5 ½" casing. Remove old slips. Cut off existing casing. Prepare for 4" liner.
3. NU BOPs (pipe, blinds and annular). Test BOPs. To ?

4. PU and RIH w/ 4" liner to 5490'. Slip type elevators and lift nubbings required. **DO NOT USE LIFT NUBBINGS TO SUSPEND LOAD.** Use casing crews to make up casing. If possible utilize tongs w/ integral backup & a dump valve @ 1800 ft/lbs . **DO NOT USE LOOMIS FOR TORQUE TURNING.**

4" 11.6#/ft L-80 w/ FL-4S Connection

Dimensions in.	Performance psi	Torque ft-lbs
4 od	10010 burst	1600 min
3.428 id	10270 collapse	**1750 opt**
3.3003 drift	140000 lbs jt strength	1900 max

5. Baker lock float shoe and float collar onto first joint of casing. Utilize one (1) joint cement shoe. Run liner to 5490'. RU Dowell to cement. Pump designed slurry. **See *PROPOSED WELLBORE* for slurry and hookload details.**

6. RD DS. Strip BOP and install slips for 4" liner. Set casing slips with 40M# minimum. WOC 12 hrs.

7. NU BOPs and test.

8. RU 2.5 power swivel to drill out liner. TIH w/ 3¼" cone bustermill or bladed bit + ws. Clean out liner to EZSV @ 5490'. Drill out EZSV. Circ well clean. POOH.

9. GIH w/ injection equipment.

2 3/8" re-entry guide w/ pump out plug	.41	
Guiberson G-VI IPC Packer	4.10	**All w/ A.B.**
Guiberson on/off tool w/ 1.781" 'GF' profile nipple	1.92	**Modified Boxes**
2 3/8" x 2 3/8" 316 SS x/o	.75	
2 3/8" x 1.875" 316 SS 'GF'profile nipple	.95	
2 3/8" x 2 3/8" cmt lined x/o	.75	
182 jts 2 3/8" Cmt Lined tbg	5472	
	5480.47	

Make up tbg to thread interference + 500# torque. Set pkr @ ±5480

10. ND BOP. NU CO2 wellhead. RDMO PU. Turn to injection team.

Notify Earl Ahtsosie @ 970-565-1318 to nipple up injection lines, Thompson Tsosie @ 970-565-1327 to schedule MIT and Diane Wilson @ 970-564-5201 that well will be back to injection soon.

11. Turn well to injection team. Allow the team to turn well on. Contacts (Arlene, Thompson Tsosie 970-565-1327, James Madison radio #48). Notify Diane Wilson that well will soon be back on production.

***** NOTIFY ARLENE LEE PRODUCTION FOREMAN THREE (3) DAYS BEFORE YOU RIG DOWN OFF THE WELL, SO SHE CAN GET READY TO BRING THE WELL BACK ON.**

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

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Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans	
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction	
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing	
	[ ] Casing Repair	[ ] Water Shut-Off	
	[ ] Altering Casing	[ ] Conversion to Injection	
	[X] Other 4" LINER	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

13. 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.)*

BHL:

LATERAL #1A1 2215' FNL & 2570' FWL/SURFACE SPOT.
LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED (7-17-98 -- 7-27-98) RUN 4" LINER

RECEIVED
AUG 03 1998
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Sue Mosley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 7-29-98

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

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*** See Instruction on Reverse Side**

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT 18-W-21
14-20-603-353
NAVAJO TRIBAL
SAN JUAN, UTAH

07-17-98	MIRU MONTEZUMA 15, POOH LD 2 7/8" TBG. RIG DN FLOOR/NIP DN HYDRIL/BOP/WELL HEAD. SPEAR 5 1/2" CSG PULLED UP. INSTALLED CSG SPOOL, TEST 100# OK. SWI & SDFN.
07-20-98	FIN. DRIFT & TALLY 4" CSG. RU & RIH W/4" SHOE JOINT W/FLOAT COLLAR. RIH W/4" 11.4#, L-80, FL4SI CSG TO 5441.08'. 49' OF FILL. SIFN.
07-21-98	SIP @ 7:30 WAS 0 PSI. RU & CIRC. OUT FILL F/5441.08' TO 5479.86', CIRC. HOLE CLEAN. RU DOWELL CMT UT. MIX & PUMP 10 BBLS CHEM WASH, 5 BBLS FRESH WTR SPACER, FOLLOWED BY 10 BBLS OF CALCUIM CLORIDE , FOLLOWED BY 7 BBLS OF FRESH WTR SPACER. FJOLLOWED BY 10 BBLS ZONE BLOCK, FOLLOWED BY 5 BLS OF FRESH WTR. MIX & PUMP 55 BBLS (230 SACKS) OF CLASS 'B' CMT. 65-35 POZ LITE CMT. + 1.5 GALS PER SK FLUID LOSS + 3% DISPERSANT + 1% RETARDER + .5% CHEMICAL EXTENDER + .25# PER SACK CELLOPHANE. DROP PLUG & DISPLACE W/55 BBLS OF FRESH WTR. CMT TO SURFACE. PLUG, FLOAT EQUIP. HELD OK. ALL CMT. 14.0 PPG, 1.31 YIELD. PUMP 40 SACKS OF CMT TO PIT. TEST TO 1000 PSI, 30 MIN. OK NU BOPE. CHANGE OUT 4" CSG RAMS TO 2 3/4" TBG RAMS. SIFN.
07-22-98	SIP @ 7:30 WAS 0 PSI. RIH W/MILL, & 2 3/4" TBG TO 5420'. TAG TOP OF CMT. FILL. DRLG OUT CMT. FILL F/5420-5432', POOH F/5432-5395'. SIFN.
07-23-98	SICP @ 7:30 WAS 0 PSI. DRLG. OUT FLOAT COLLAR F/5432-5435', DRLG OUT CMT F/5435-5479'. (SHOE JOINT) DRLG OUT CSG SHOE F/5479-5480'. DRLG OUT F/5480-5490' (TOP OF BRIDGE PLUG) DRLG OUT BRIDGE PLUG F/5490-5493'. WELL HEAD PRESSURE TO 1200 PSI. FLOW WELL CLEAN. SIFN.
07-24-98	SIP @ 7:30 WAS 1400 PSI. RU & KILL WELL, WELL DEAD. POOH W/2 3/4" TBG & MILL, LD MILL, MAKE UP GUIBERSON G-6 PKR, RIH TO 5466.34'. SET PKR, UNLATCH F/ ON/OFF TOOL. RU & DISPLACE HOLE W/10# BRINE. KILL FLUID. SIFN.
07-25-98	SIP @ 7:30 WAS 0 PSI. POOH & LD 2 3/4" WORKSTRING F/5466-3860'. RU TO RUN CMT. LINED TBG PICK-UP GUIBERSON ON/OFF TOOL. TALLY & PICK-UP 2 3/4" CMT LINED TBG. RIH TO 5450', POH, LD 2 JTS. TBG. TALLY FOR SPACE OUT ON PUP JOINTS. & LANDING JOINTS. SIFN.
07-27-98	SIP @ 7:30 WAS 0 PSI. SPACE OUT W/1-10' & 1-2' PUP JTS. DRIFT ALL TBG, MAKE UP TBG. HANGER. SET IN WELL HEAD. LATCH UP ON/OFF TOOL TO PKR. ND BOPE. MAKE UP PROD. TREE. UNLATCH F/GUIBERSON ON/OFF TOOL & PKR. RU & DISPLACE HOLE W/PKR FLUID. NU PROD. TREE. LATCH ONTO PKR W/ ONN/OFF TOOL. RIG UP TEST CSG., PKR, & WELL HEAD TO 1000 PSI. 30 MIN. OK. RU TO TBG. PUMP OUT PKR PLUG. OK. RDMO MONTEZUMA 15, FINAL WORKOVER REPORT. WELL SHUT IN, TURN WELL TO PRODUCTION.

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

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SUBMIT IN TRIPLICATE

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7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
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10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

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[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[X] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other LINER/INJECTOR	[ ] Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

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BHL:

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LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED (6-19-98 -- 6-26-98)

RECEIVED
DEC 04 1998
DIV. OF OIL, GAS & MINING

ACCEPTED FOR RECORD

AUG 2 3 1998

FARMINGTON DISTRICT OFFICE
BY

14. I hereby certify that the foregoing is true and correct
Signed Sue Maseley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 7-28-98

(This space for Federal or State office use)
Approved by Title Date
Conditions of approval, if any:

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* See Instruction on Reverse Side

OPERATOR

W+C 3-1-99 RJK

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT 18-W-21
14-20-603-353
NAVAJO TRIBAL
SAN JUAN, UTAH

06-19-98	MIRU MONTEZUMA 15, SPOT AUX EQUIP. RD FLOWLINE, HOOK UP PUMP & LINES. SI & SDFN
06-20-98	NDWH, NUBOP, RU FLOOR & TONGS. P/U BIT & SCRAPER, TBG TO TAG CIBP @ 5520'. RU & SWAB, FROM S/N LAST 2 RUNS REC 42 BBLS H20, TBG SCALED INSIDE. HAVING TOWORK SWAB DN.
06-22-98	SIP @ 7:30 WAS 0 PSI. RU & RIH W/SWAB, ND BOPE. ND & SET OUT TBG HANGER. NU DOUBLE SPOOL. NU BOPE. MAKE UP & RIH W/4.87" CSG DRIFT RUN ON SAND LINE TO 1750', COULD NOT ADVANCE. POOH, RIH CSG DRIFT TO 5532' POH SAND LINE WET. RD SAND LINE. RIH W/ 2 7/8" SEATING NIPPLE RUN ON OPEN END 2 7/8" TBG TO 5560'. SIFN.
06-23-98	SIP @ 7:30 WAS 0 PSI. RU TO SWAB. RIH TO 5532'. TAG FLUID LEVEL @ 3500'. SWAB F/5532' CLUTCH ON SAND LINE LOCKED-UP, REPAIR. SWI.
06-24-98	REPAIR CLUTCH ON SANDLINE. PULL SANDLINE DRUM, REPLACE SANDLINE CLUTCH, RU & REPLACE SANDLINE DRUM. JOB 85% COMPLETE. WSI.
06-26-98	RDMO MONTEZUMA 15. TEMPORARILY SUSPEND OPERATIONS. WELL SHUT IN W/0 PSI ON TBG. & CSG. LATER DATE TO RUN 4" CASING LINER.

RECEIVED
DEC 1998
DIV. OF OIL, GAS & MINING

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

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BHL:

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LATERAL #2A1 1650' FNL & 2952' FWL/SURFACE SPOT.

SEE ATTACHED (7-17-98 -- 7-27-98) RUN 4" LINER

RECEIVED
DEC 04 1998
DIV. OF OIL, GAS & MINING

ACCEPTED FOR RECORD
AUG 28 1998
FARMINGTON DISTRICT OFFICE
BY

14. I hereby certify that the foregoing is true and correct
Signed Shirley Houchins for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 7-29-98

(This space for Federal or State office use)
Approved by _____ Title _____ Date _____
Conditions of approval, if any:

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* See Instruction on Reverse Side

OPERATOR

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RATHERFORD UNIT 18-W-21
14-20-603-353
NAVAJO TRIBAL
SAN JUAN, UTAH

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07-20-98	FIN. DRIFT & TALLY 4" CSG. RU & RIH W/4" SHOE JOINT W/FLOAT COLLAR. RIH W/4" 11.4#, L-80, FL4SI CSG TO 5441.08'. 49' OF FILL. SIFN.
07-21-98	SIP @ 7:30 WAS 0 PSI. RU & CIRC. OUT FILL F/5441.08' TO 5479.86', CIRC. HOLE CLEAN. RU DOWELL CMT UT. MIX & PUMP 10 BBLS CHEM WASH, 5 BBLS FRESH WTR SPACER, FOLLOWED BY 10 BBLS OF CALCUIM CLORIDE , FOLLOWED BY 7 BBLS OF FRESH WTR SPACER. FJOLLOWED BY 10 BBLS ZONE BLOCK, FOLLOWED BY 5 BLS OF FRESH WTR. MIX & PUMP 55 BBLS (230 SACKS) OF CLASS 'B' CMT. 65-35 POZ LITE CMT. + 1.5 GALS PER SK FLUID LOSS + 3% DISPERSANT + 1% RETARDER + .5% CHEMICAL EXTENDER + .25# PER SACK CELLOPHANE. DROP PLUG & DISPLACE W/55 BBLS OF FRESH WTR. CMT TO SURFACE. PLUG, FLOAT EQUIP. HELD OK. ALL CMT. 14.0 PPG, 1.31 YIELD. PUMP 40 SACKS OF CMT TO PIT. TEST TO 1000 PSI, 30 MIN. OK NU BOPE. CHANGE OUT 4" CSG RAMS TO 2 3/4" TBG RAMS. SIFN.
07-22-98	SIP @ 7:30 WAS 0 PSI. RIH W/MILL, & 2 3/4" TBG TO 5420'. TAG TOP OF CMT. FILL. DRLG OUT CMT. FILL F/5420-5432', POOH F/5432-5395'. SIFN.
07-23-98	SICP @ 7:30 WAS 0 PSI. DRLG. OUT FLOAT COLLAR F/5432-5435', DRLG OUT CMT F/5435-5479'. (SHOE JOINT) DRLG OUT CSG SHOE F/5479-5480'. DRLG OUT F/5480-5490' (TOP OF BRIDGE PLUG) DRLG OUT BRIDGE PLUG F/5490-5493'. WELL HEAD PRESSURE TO 1200 PSI. FLOW WELL CLEAN. SIFN.
07-24-98	SIP @ 7:30 WAS 1400 PSI. RU & KILL WELL, WELL DEAD. POOH W/2 3/4" TBG & MILL, LD MILL, MAKE UP GUIBERSON G-6 PKR, RIH TO 5466.34'. SET PKR, UNLATCH F/ ON/OFF TOOL. RU & DISPLACE HOLE W/10# BRINE. KILL FLUID. SIFN.
07-25-98	SIP @ 7:30 WAS 0 PSI. POOH & LD 2 3/4" WORKSTRING F/5466-3860'. RU TO RUN CMT. LINED TBG PICK-UP GUIBERSON ON/OFF TOOL. TALLY & PICK-UP 2 3/4" CMT LINED TBG. RIH TO 5450', POH, LD 2 JTS. TBG. TALLY FOR SPACE OUT ON PUP JOINTS. & LANDING JOINTS. SIFN.
07-27-98	SIP @ 7:30 WAS 0 PSI. SPACE OUT W/1-10' & 1-2' PUP JTS. DRIFT ALL TBG, MAKE UP TBG. HANGER. SET IN WELL HEAD. LATCH UP ON/OFF TOOL TO PKR. ND BOPE. MAKE UP PROD. TREE. UNLATCH F/GUIBERSON ON/OFF TOOL & PKR. RU & DISPLACE HOLE W/PKR FLUID. NU PROD. TREE. LATCH ONTO PKR W/ ONN/OFF TOOL. RIG UP TEST CSG., PKR, & WELL HEAD TO 1000 PSI. 30 MIN. OK. RU TO TBG. PUMP OUT PKR PLUG. OK. RDMO MONTEZUMA 15, FINAL WORKOVER REPORT. WELL SHUT IN, TURN WELL TO PRODUCTION.

RECEIVED
DEC 04 1998
DIV. OF OIL, GAS & MINING

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-353
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: RATHERFORD 18-W-21
9. API Well No.: 43-037-16418
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [ ] Oil Well [ ] Gas Well [X] Other
2. Name of Operator: MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM
3. Address and Telephone No.: P.O. Box 633, Midland TX 79702 (915) 688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 18, T41S, R24E
(NE/NW) 660' FNL & 1882' FWL

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other MIT CHART	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

SEE ATTACHED CHART.

RECEIVED
MAY 14 1999
DIV. OF OIL, GAS & MINING

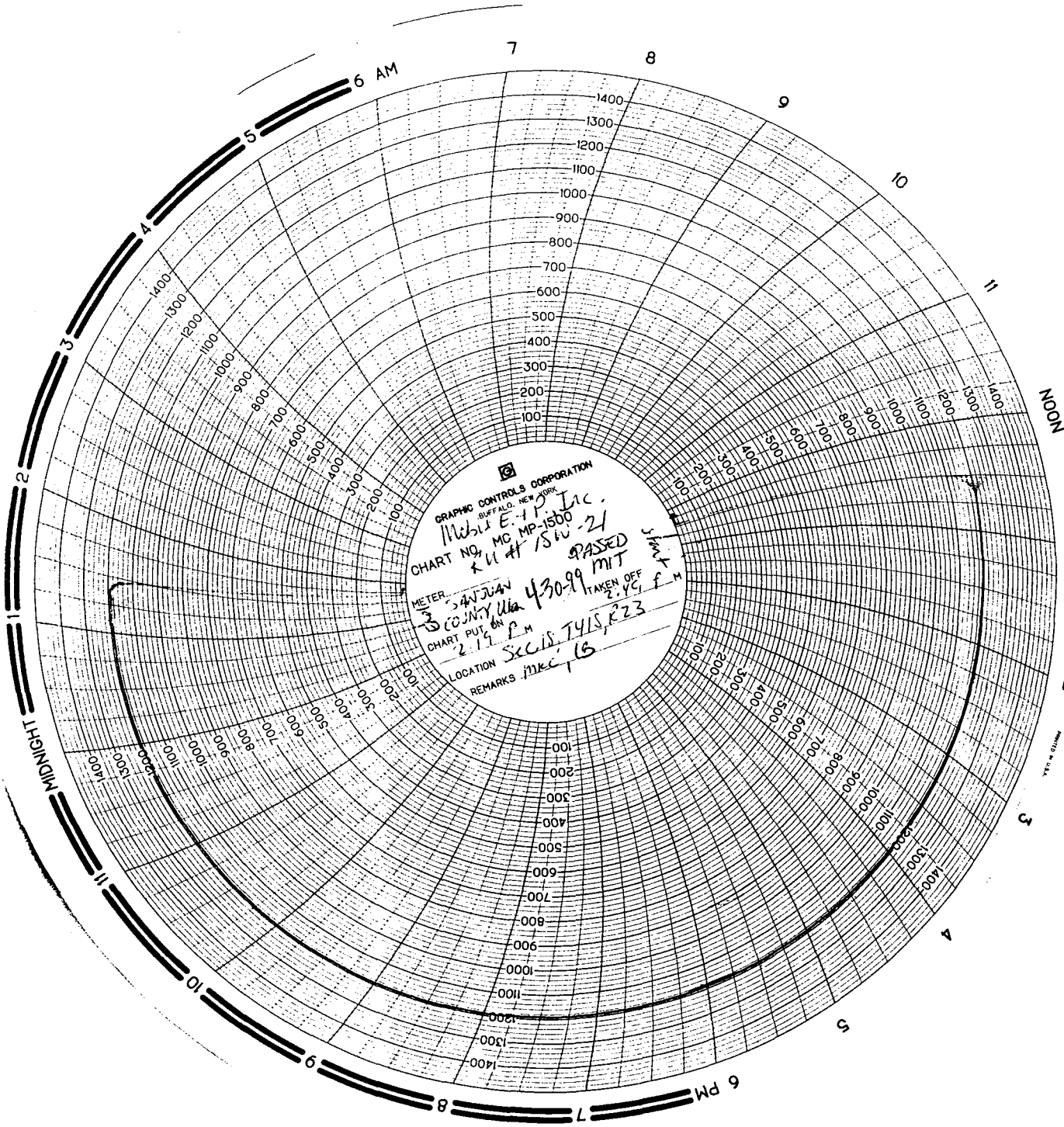
14. I hereby certify that the foregoing is true and correct
Signed Sue Mosley for Title SHIRLEY HOUCHINS/ENV & REG TECH Date 5-11-99

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side


GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
CHART NO. MC MP-1500
METER
CHART PUT ON
TAKEN OFF
LOCATION
REMARKS
MIDNIGHT
NOON
6 AM
6 PM

ExxonMobil Production Comp
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

June 27, 2001

ExxonMobil
Production

Mr. Jim Thompson
State of Utah, Division of Oil, Gas and Mining
1549 West North Temple
Suite 1210
Salt Lake City, UT 84114-5801

Change of Name – Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Mr. Thompson

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

A copy of the Certification, Bond Rider and a list of wells are attached.

If you have any questions please feel free to call Joel Talavera at 713-431-1010

Very truly yours,

Charlotte H Harper

Charlotte H. Harper
Permitting Supervisor

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

RECEIVED
[illegible] 2001
DIVISION OF
OIL, GAS AND MINING

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Navajo Area Office
NAVAJO REGION
P.O. Box 1060
Gallup, New Mexico 87305-1060

IN REPLY REFER TO:

RRES/543

AUG 30 2001

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Charlotte H. Harper, Permitting Supervisor
Exxon Mobil Production Company
U. S. West
P. O. Box 4358
Houston, TX 77210-4358

Dear Ms. Harper:

This is to acknowledge receipt of your company's name change from Mobil Oil Corporation to ExxonMobil Oil Corporation effective June 1, 2001. The receipt of documents includes the Name Change Certification, current listing of Officers and Directors, Listing of Leases, Financial Statement, filing fees of $75.00 and a copy of the Rider for Bond Number 8027 31 97. There are no other changes.

Please note that we will provide copies of these documents to other concerned parties. If you need further assistance, you may contact Ms. Bertha Spencer, Realty Specialist, at (928) 871-5938.

Sincerely,

DENNI DENETSONE

Regional Realty Officer

cc: BLM, Farmington Field Office w/enclosures
Navajo Nation Minerals Office, Attn: Mr. Akhtar Zaman, Director/w enclosures

MINERAL RESOURCES
ADM
NATV AM MIN COORD
SOLID MIN TEAM
PETRO MGMT TEAM
O & G INSPECT TEAM
ALL TEAM LEADERS
LAND RESOURCES
ENVIRONMENT
FILES

ExxonMobil Production Company
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

PB 7/12/2001

SN
543
File

June 27, 2001

ExxonMobil
Production

Certified Mail
Return Receipt Requested

RECEIVED
#477
JUL 9 - 2001
Navajo Region Office
RES - Minerals Section

Ms. Genni Denetsone
United States Department of the Interior
Bureau of Indian Affairs, Navajo Region
Real Estate Services
P. O. Box 1060
Gallup, New Mexico 87305-1060
Mail Code 543

Change of Name –
Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Ms. Denetsone:

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

Attached is the Name Change Certification, Current listing of Officers and Directors, Filing Fee of $75/-, Listing of Leases, Financial Statement and a copy of the Rider for Bond number 8027 31 97. The original Bond Rider has been sent to Ms. Barbar Davis at your Washington Office.

If you have any questions , please contact Alex Correa at (713) 431-1012.

Very truly yours,

Charlotte H. Harper

Charlotte H. Harper
Permitting Supervisor

Attachments

RECEIVED
JUL 05 2001
NAVAJO REGION OFFICE
BRANCH OF REAL ESTATE SERVICES

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

NOTE: Check forwarded to Ella Jossie

Bureau of Indian Affairs
Navajo Region Office
Attn: RRES - Mineral and Mining Section
P.O. Box 1060
Gallup, New Mexico 87305-1060

Gentlemen:

The current listing of officers and director of ExxonMobil Oil Corporation (Name of Corporation), of New York (State) is as follows:

OFFICERS

President	F.A. Risch	Address 5959 Las Colinas Blvd. Irving, TX 75039
Vice President	K.T. Koonce	Address 800 Bell Street Houston, TX 77002
Secretary	F.L. Reid	Address 5959 Las Colinas Blvd. Irving, TX 75039
Treasure	B.A. Maher	Address 5959 Las Colinas Blvd. Irving, TX 75039

DIRECTORS

Name	D.D. Humphreys	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	P.A. Hanson	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	T.P. Townsend	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	B.A. Maher	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	F.A. Risch	Address 5959 Las Colinas Blvd. Irving, TX 75039

Sincerely,

Alex Correa

This is to certify that the above information pertaining to ExxonMobil Oil Corporation (Corporation) is trust and correct as evidenced by the records and accounts covering business for the State of Utah and in the custody of Corporation Service Company (Agent), Phone: 1 (800)927-9800, whose business address is One Utah Center, 201 South Main Street, Salt Lake City, Utah 84111-2218

(CORPORATE SEAL)

Signature

AGENT AND ATTORNEY IN FACT

Title

SAL

CERTIFICATION

I, the undersigned Assistant Secretary of ExxonMobil Oil Corporation. (formerly Mobil Oil Corporation), a corporation organized and existing under the laws of the State of New York, United States of America, DO HEREBY CERTIFY, That, the following is a true and exact copy of the resolutions adopted by the Board of Directors on May 22, 2001:

CHANGE OF COMPANY NAME

WHEREAS, the undersigned Directors of the Corporation deem it to be in the best interest of the Corporation to amend the Certificate of Incorporation of the Corporation to change the name and principal office of the Corporation:

NOW THEREFORE BE IT RESOLVED, That Article 1st relating to the corporate name is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

FURTHER RESOLVED, That the amendment of the Corporation's Certificate of Incorporation referred to in the preceding resolutions be submitted to the sole shareholder of the Corporation entitled to vote thereon for its approval and, if such shareholder gives its written consent, pursuant to Section 803 of the Business Corporation Law of the State of New York, approving such amendment, the proper officers of the Corporation be, and they hereby are, authorized to execute in the name of the Corporation the Certificate of Amendment of Certificate of Incorporation, in the form attached hereto;

FURTHER RESOLVED, That the proper officers of the Corporation be and they hereby are authorized and directed to deliver, file and record in its behalf, the Certificate of Amendment of Certificate of Incorporation, and to take such action as may be deemed necessary or advisable to confirm and make effective in all respects the change of this Company's name to EXXONMOBIL OIL CORPORATION.

WITNESS, my hand and the seal of the Corporation at Irving, Texas, this 8th day of June, 2001.

S. A. Millican
Assistant Secretary

COUNTY OF DALLAS)
STATE OF TEXAS)
UNITED STATES OF AMERICA)
Sworn to and subscribed before me at Irving, Texas, U. S. A. on this the 8th day of June, 2001.

Janice M. Phillips
Notary Public

LISTING OF LEASES OF MOBIL OIL CORPORATION

	Lease Number
1)	14-20-0603-6504
2)	14-20-0603-6505
3)	14-20-0603-6506
4)	14-20-0603-6508
5)	14-20-0603-6509
6)	14-20-0603-6510
7)	14-20-0603-7171
8)	14-20-0603-7172A
9)	14-20-600-3530
10)	14-20-603-359
11)	14-20-603-368
12)	14-20-603-370
13)	14-20-603-370A
14)	14-20-603-372
15)	14-20-603-372A
16)	14-20-603-4495
17)	14-20-603-5447
18)	14-20-603-5448
19)	14-20-603-5449
20)	14-20-603-5450
21)	14-20-603-5451

6/1/01

CHUBB GROUP OF INSURANCE COMPANIES

[illegible] South, Suite [illegible], Houston, Texas 77027-3[illegible]
[illegible] (713) 927-4600 • Facsimile: (713) 297-4750

NW Bond

FEDERAL INSURANCE COMPANY RIDER
to be attached to and form a part of

BOND NO 8027 31 97
wherein
Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc. is named as Principal and

FEDERAL INSURANCE COMPANY AS SURETY,

in favor of **United States of America, Department of the Interior Bureau of Indian Affairs**

in the amount of **$150,000.00**
bond date: 11/01/65

IT IS HEREBY UNDERSTOOD AND AGREED THAT effective **June 1, 2001** the name of the Principal is changed

FROM: **Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc.**

TO : **ExxonMobil Oil Corporation**

All other terms and conditions of this Bond are unchanged.

Signed, sealed and dated this 12th of June, 2001.

ExxonMobil Oil Corporation
By :

FEDERAL INSURANCE COMPANY
By: Mary Pierson
Mary Pierson, Attorney-in-fact

Chubb Surety

POWER OF ATTORNEY

Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company

Attn.: Surety Department
15 Mountain View Road
Warren, NJ 07059

Know All by These Presents, That **FEDERAL INSURANCE COMPANY,** an Indiana corporation, **VIGILANT INSURANCE COMPANY,** a New York corporation, and **PACIFIC INDEMNITY COMPANY,** a Wisconsin corporation, do each hereby constitute and appoint

Mary Pierson, Philana Berros, and Jody E. Specht of Houston, Texas R.F. Bobo,----------

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY,** and **PACIFIC INDEMNITY COMPANY** have each executed and attested these presents and affixed their corporate seals on this 10th day of May, 2001.

Kenneth C. Wendel, Assistant Secretary

Frank E. Robertson, Vice President

STATE OF NEW JERSEY
County of Somerset } ss.

On this 10th day of May, 2001, before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with Frank E. Robertson, and knows him to be Vice President of said Companies; and that the signature of Frank E. Robertson, subscribed to said Power of Attorney is in the genuine handwriting of Frank E. Robertson, and was thereto subscribed by authority of said Companies and in deponent's presence.

Notarial Seal

KAREN A. PRICE NOTARY PUBLIC NEW JERSEY

Karen A. Price
Notary Public State of New Jersey
No. 2231647
Commission Expires Oct. 28, 2004

Karen A. Price
Notary Public

CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

(i) the foregoing extract of the By-Laws of the Companies is true and correct,
(ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U. S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U. S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
(iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 12th day of June, 2001.

FEDERAL INSURANCE COMPANY INDIANA

PACIFIC INDEMNITY COMPANY INCORPORATED AUG. 16, 1926 WISCONSIN

VIGILANT INSURANCE COMPANY NEW YORK

Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903-3485 Fax (908) 903-3656 e-mail: surety@chubb.com

15-10-0225 (Ed. 4-99) CONSENT

F010601000187

CSC 45

CERTIFICATE OF AMENDMENT

OF

CERTIFICATE OF INCORPORATION

OF

MOBIL OIL CORPORATION

(Under Section 805 of the Business Corporation Law)

Pursuant to the provisions of Section 805 of the Business Corporation Law, the undersigned President and Secretary, respectively, of Mobil Oil Corporation hereby certify:

FIRST: That the name of the corporation is MOBIL OIL CORPORATION and that said corporation was incorporated under the name of Standard Oil Company of New York.

SECOND: That the Certificate of Incorporation of the corporation was filed by the Department of State, Albany, New York, on the 10th day of August, 1882.

THIRD: That the amendments to the Certificate of Incorporation effected by this Certificate are as follows:

(a) Article 1st of the Certificate of Incorporation, relating to the corporate name, is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

(b) Article 7th of the Certificate of Incorporation, relating to the office of the corporation is hereby amended to read as follows:

The office of the corporation within the State of New York is to be located in the County of Albany. The Company shall have offices at such other places as the Board of Directors may from time to time determine.

FOURTH: That the amendments to the Certificate of Incorporation were authorized by the Board of Directors followed by the holder of all outstanding shares entitled to vote on amendments to the Certificate of Incorporation by written consent of the sole shareholder dated May 22, 2001.

IN WITNESS WHEREOF, this Certificate has been signed this 22nd Day of May, 2001.

F. A. Risch, President

STATE OF TEXAS)
COUNTY OF DALLAS)

F. L. REID, being duly sworn, deposes and says that he is the Secretary of MOBIL OIL CORPORATION, the corporation mentioned and described in the foregoing instrument; that he has read and signed the same and that the statements contained therein are true.

F. L. REID, Secretary

SUBSCRIBED AND SWORN TO before me, the undersigned authority, on this the 22nd day of May, 2001.

[SEAL]

NOTARY PUBLIC, STATE OF TEXAS

JANICE M. PHILLIPS
MY COMMISSION EXPIRES
May 16, 2002

F010601000187

CSC 45

CERTIFICATE OF AMENDMENT

OF

MOBIL OIL CORPORATION

Under Section 805 of the Business Corporation Law

SAC

100 cc

STATE OF NEW YORK
DEPARTMENT OF STATE
FILED JUN 01 2001
TAX $
BY: SAC
NY | Albany

Filed by: EXXONMOBIL CORPORATION
(Name)

5959 Las Colinas Blvd.
(Mailing address)

Irving, TX 75039-2298
(City, State and Zip code)

Cust Ref # 165578MPT

RECEIVED
JUL 05 2001
DIVISION OF REAL ESTATE SERVICES

010601000195

State of New York }
Department of State } *ss:*

I hereby certify that the annexed copy has been compared with the original document in the custody of the Secretary of State and that the same is a true copy of said original.

Witness my hand and seal of the Department of State on JUN 01 2001

STATE OF NEW YORK
EXCELSIOR
DEPARTMENT OF STATE

Special Deputy Secretary of State

DOS-1266 (7/00)

Division of Oil, Gas and Mining

OPERATOR CHANGE WORKSHEET

ROUTING
1. GLH
2. CDW
3. FILE

Change of Operator (Well Sold) — Designation of Agent

X Operator Name Change — Merger

The operator of the well(s) listed below has changed, effective: **06-01-2001**

FROM: (Old Operator):	**TO:** (New Operator):
MOBIL EXPLORATION & PRODUCTION	EXXONMOBIL OIL CORPORATION
Address: P O BOX DRAWER "G"	Address: U S WEST P O BOX 4358
CORTEZ, CO 81321	HOUSTON, TX 77210-4358
Phone: 1-(970)-564-5212	Phone: 1-(713)-431-1010
Account No. N7370	Account No. N1855

CA No. **Unit:** **RATHERFORD**

WELL(S)

NAME	SEC TWN RNG	API NO	ENTITY NO	LEASE TYPE	WELL TYPE	WELL STATUS
NAVAJO A-9 (RATHERFORD 16W23)	16-41S-24E	43-037-15722	99990	INDIAN	WI	A
NAVAJO A-12 (RATHERFORD 16W21)	16-41S-24E	43-037-16414	99990	INDIAN	WI	A
RATHERFORD 16W43	16-41S-24E	43-037-16415	99990	INDIAN	WI	A
RATHERFORD 17-W-12	17-41S-24E	43-037-15726	6280	INDIAN	WI	A
17-14	17-41S-24E	43-037-15727	6280	INDIAN	WI	A
RATHERFORD 17-W-23	17-41S-24E	43-037-15728	6280	INDIAN	WI	A
17-32	17-41S-24E	43-037-15729	6280	INDIAN	WI	A
17-34	17-41S-24E	43-037-15730	6280	INDIAN	WI	A
17-41	17-41S-24E	43-037-15731	6280	INDIAN	WI	I
RATHERFORD 17-W-21	17-41S-24E	43-037-16416	99990	INDIAN	WI	A
RATHERFORD 17W43	17-41S-24E	43-037-16417	99990	INDIAN	WI	A
RATHERFORD 18-W-14	18-41S-24E	43-037-15735	6280	INDIAN	WI	A
18-W-32	18-41S-24E	43-037-15736	6280	INDIAN	WI	A
RATHERFORD 18-W-34	18-41S-24E	43-037-15737	6280	INDIAN	WI	A
DESERT A-4 (RATHERFORD 18W41)	18-41S-24E	43-037-15738	99990	INDIAN	WI	A
DESERT A-3 (RATHERFORD 18-W-21)	18-41S-24E	43-037-16418	99990	INDIAN	WI	A
18-23	18-41S-24E	43-037-30244	6280	INDIAN	WI	A
RATHERFORD U 18-W-12 (SDTRK)	18-41S-24E	43-037-31153	6280	INDIAN	WI	A
RATHERFORD UNIT 18-W-43B	18-41S-24E	43-037-31718	6280	INDIAN	WI	A
RATHERFORD U 19-W-12	19-41S-24E	43-037-15739	6280	INDIAN	WI	A

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 06/29/2001
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 06/29/2001
3. The new company has been checked through the **Department of Commerce, Division of Corporations Database on:** 04/09/2002
4. Is the new operator registered in the State of Utah: YES Business Number: 579865-0143
5. If **NO**, the operator was contacted contacted on: N/A

6. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BIA-06/01/01

7. **Federal and Indian Units:**
The BLM or BIA has approved the successor of unit operator for wells listed on: 06/01/2001

8. **Federal and Indian Communization Agreements ("CA"):**
The BLM or BIA has approved the operator for all wells listed within a CA on: N/A

9. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject,** for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: N/A
NOTE: EPA ISSUES UIC PERMIT

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database on:** 04/11/2002
2. Changes have been entered on the **Monthly Operator Change Spread Sheet on:** 04/11/2002
3. Bond information entered in RBDMS on: N/A
4. Fee wells attached to bond in RBDMS on: N/A

STATE WELL(S) BOND VERIFICATION:

1. State well(s) covered by Bond Number: N/A

FEDERAL WELL(S) BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: N/A

INDIAN WELL(S) BOND VERIFICATION:

1. Indian well(s) covered by Bond Number: 80273197

FEE WELL(S) BOND VERIFICATION:

1. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number N/A
2. The **FORMER** operator has requested a release of liability from their bond on: N/A
The Division sent response by letter on: N/A

LEASE INTEREST OWNER NOTIFICATION:

3. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS:

Division of Oil, Gas and Mining

OPERATOR CHANGE WORKSHEET

ROUTING
1. DJJ
2. CDW

X Change of Operator (Well Sold) Operator Name Change/Merger

The operator of the well(s) listed below has changed, effective: **6/1/2006**

FROM: (Old Operator):	**TO:** (New Operator):
N1855-ExxonMobil Oil Corporation	N2700-Resolute Natural Resources Company
PO Box 4358	1675 Broadway, Suite 1950
Houston, TX 77210-4358	Denver, CO 80202
Phone: 1 (281) 654-1936	Phone: 1 (303) 534-4600

CA No. **Unit:** **RATHERFORD (UIC)**

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 4/21/2006
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 4/24/2006
3. The new company was checked on the **Department of Commerce, Division of Corporations Database on:** 6/7/2006
4. Is the new operator registered in the State of Utah: YES Business Number: 5733505-0143
5. If **NO**, the operator was contacted contacted on:

6a. (R649-9-2)Waste Management Plan has been received on: requested

6b. Inspections of LA PA state/fee well sites complete on: n/a

6c. Reports current for Production/Disposition & Sundries on: ok

7. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BLM n/a BIA not yet
8. **Federal and Indian Units:**
   The BLM or BIA has approved the successor of unit operator for wells listed on: not yet
9. **Federal and Indian Communization Agreements ("CA"):**
   The BLM or BIA has approved the operator for all wells listed within a CA on: n/a
10. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject,** for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: 6/12/2006

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database on:** 6/22/2006
2. Changes have been entered on the **Monthly Operator Change Spread Sheet on:** 6/22/2006
3. Bond information entered in RBDMS on: n/a
4. Fee/State wells attached to bond in RBDMS on: n/a
5. Injection Projects to new operator in RBDMS on: 6/22/2006
6. Receipt of Acceptance of Drilling Procedures for APD/New on: n/a

BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: n/a
2. Indian well(s) covered by Bond Number: PA002769
3. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number n/a

a. The **FORMER** operator has requested a release of liability from their bond on: n/a
The Division sent response by letter on: n/a

LEASE INTEREST OWNER NOTIFICATION:

4. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: n/a

COMMENTS:

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number See attached list	API Number Attached
Location of Well Footage : See attached list County : San Juan QQ, Section, Township, Range: State : UTAH	Field or Unit Name Ratherford Unit Lease Designation and Number See attached list

EFFECTIVE DATE OF TRANSFER: 6/1/2006

CURRENT OPERATOR

Company: Exxon Mobil Oil Corporation
Address: PO Box 4358
city Houston state TX zip 77210-4358
Phone: (281) 654-1936
Comments: Exxon Mobil has submitted a separate, signed copy of UIC Form 5

Name:
Signature:
Title:
Date:

NEW OPERATOR

Company: Resolute Natural Resources Company
Address: 1675 Broadway, Suite 1950
city Denver state CO zip 80202
Phone: (303) 534-4600
Comments: A list of affected UIC wells is attached.
New bond numbers for these wells are:
BIA Bond # PA002769 and US EPA Bond # B001252

Name: Dwight E Mallory
Signature:
Title: Regulatory Coordinator
Date: 4/20/2006

(This space for State use only)

Transfer approved by:
Title: Field Operations Manager
Approval Date: 6/12/06

Comments:

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APR 24 2006
DIV. OF OIL, GAS & MINING

(5/2000)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER: See attached list
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo Tribe
7. UNIT or CA AGREEMENT NAME: Ratherford Unit
8. WELL NAME and NUMBER: See attached list
9. API NUMBER: Attached
10. FIELD AND POOL, OR WILDCAT: Greater Aneth

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Unit Agreement

2. NAME OF OPERATOR: Resolute Natural Resources Company N2700

3. ADDRESS OF OPERATOR: 1675 Broadway, Suite 1950 CITY Denver STATE CO ZIP 80202 PHONE NUMBER: (303) 534-4600

4. LOCATION OF WELL
FOOTAGES AT SURFACE: See attached list COUNTY: San Juan
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
☐ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start:	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☑ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☑ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Effective June 1, 2006 Exxon Mobil Oil Corporation resigns as operator of the Ratherford Unit. Also effective June 1, 2006 Resolute Natural Resources Company is designated as successor operator of the Ratherford Unit.

A list of affected producing and water source wells is attached. A separate of affected injection wells is being submitted with UIC Form 5, Transfer of Authority to Inject.

As of the effective date, bond coverage for the affected wells will transfer to BIA Bond # PA002769.

NAME (PLEASE PRINT) Dwight E Mallory TITLE Regulatory Coordinator
SIGNATURE DATE 4/20/2006

(This space for State use only)

APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

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DIV. OF OIL, GAS & MINING

(5/2000) (See Instructions on Reverse Side)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER:

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Ship Rock

7. UNIT or CA AGREEMENT NAME: UTU68931A

8. WELL NAME and NUMBER: Ratherford

9. API NUMBER: attached

10. FIELD AND POOL, OR WILDCAT: Aneth

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Injection

2. NAME OF OPERATOR: ExxonMobil Oil Corporation N1855

3. ADDRESS OF OPERATOR: P.O. Box 4358 CITY Houston STATE TX ZIP 77210-4358 PHONE NUMBER: (281) 654-1936

4. LOCATION OF WELL

FOOTAGES AT SURFACE:

COUNTY: San Juan

QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
☑ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start:	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
6/1/2006	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☑ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☐ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

ExxonMobil Oil Corporation is transferring operatorship of Greater Aneth field, Ratherford lease to Resolute Natural Resources Company. All change of operator notices should be made effective as of 7:00 AM MST on June 1, 2006.

Attached please find a listing of injection wells included in the transfer.

NAME (PLEASE PRINT) Laurie Kilbride TITLE Permitting Supervisor

SIGNATURE Laurie O. Kilbride DATE 4/19/2006

(This space for State use only) APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

(See Instructions on Reverse Side)

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(5/2000)

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location						
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot
RATHERFORD UNIT	1W24	430371583900S1	Shut-in	14-20-603-246A	NE	SE	1	41S	23E	0651FSL	3300FEL
RATHERFORD UNIT	2W44	430371638600S1	Active	14-20-603-246A	SE	SE	2	41S	23E	0810FSL	**0510FEL**
RATHERFORD UNIT	11W42	430371584100S1	Active	14-20-603-246A	SE	NE	11	41S	23E	3290FSL	4617FWL
RATHERFORD UNIT	11W44	430371584200S1	Shut-in	14-20-603-246A	SE	SE	11	41S	23E	0660FSL	0558FEL
RATHERFORD UNIT	12W11	430371584300S1	Active	14-20-603-246A	NW	NW	12	41S	23E	0678FNL	4620FEL
RATHERFORD UNIT	12W13	430371640400S1	Active	14-20-603-246A	NW	SW	12	41S	23E	1980FSL	4620FEL
RATHERFORD UNIT	12W22	430371584501S1	Active	14-20-603-246A	SE	NW	12	41S	23E	1920FNL	2080FWL
RATHERFORD UNIT	12W24	430373115101S1	Active	14-20-603-246A	SE	SW	12	41S	23E	0775FSL	1980FWL
RATHERFORD UNIT	12W31	430371584700S1	Active	14-20-603-246A	NW	NE	12	41S	23E	0661FNL	1981FEL
RATHERFORD UNIT	12W33	430371584800S1	Active	14-20-603-246A	NW	SE	12	41S	23E	1958FSL	3300FEL
RATHERFORD UNIT	12W42	430371585000S1	Active	14-20-603-246A	SE	NE	12	41S	23E	3275FSL	0662FEL
RATHERFORD UNIT	12W44A	430373154300S1	Shut-in	14-20-603-246A	SE	SE	12	41S	23E	0772FSL	0807FEL
RATHERFORD UNIT	13W11	430373115201S1	Active	14-20-603-247A	NW	NW	13	41S	23E	0500FNL	0660FWL
RATHERFORD UNIT	13W13	430371585100S1	Active	14-20-603-247A	NW	SW	13	41S	23E	1980FSL	4620FEL
RATHERFORD UNIT	13W22	430371585200S1	Active	14-20-603-247A	SE	NW	13	41S	23E	1988FNL	3300FEL
RATHERFORD UNIT	13W24	430371585300S1	Active	14-20-603-247A	SE	SW	13	41S	23E	0660FSL	3300FEL
RATHERFORD UNIT	13W33	430371585501S1	Active	14-20-603-247A	NW	SE	13	41S	23E	1970FSL	1979FEL
RATHERFORD UNIT	13W42	430371585700S1	Shut-in	14-20-603-247A	SE	NE	13	41S	23E	2139FNL	0585FEL
RATHERFORD UNIT	13W44	430371640700S1	Active	14-20-603-247A	SE	SE	13	41S	23E	0653FSL	0659FEL
RATHERFORD UNIT	14-31	430373171700S1	Active	14-20-603-247A	NW	NE	14	41S	23E	0754FNL	1604FEL
RATHERFORD UNIT	14W42	430371586001S1	Active	14-20-603-247A	SE	NE	14	41S	23E	1976FNL	653FEL
RATHERFORD UNIT	24W31	430371586200S1	Shut-in	14-20-603-247A	NW	NE	24	41S	24E	0560FNL	1830FEL
RATHERFORD UNIT	24W42	430371586300S1	Shut-in	14-20-603-247A	SE	NE	24	41S	24E	1980FNL	0660FEL
RATHERFORD UNIT	17W12	430371572601S1	Active	14-20-603-353	SW	NW	17	41S	24E	1980FNL	510FWL
RATHERFORD UNIT	17W14	430371572700S1	Active	14-20-603-353	SW	SW	17	41S	24E	0610FSL	0510FWL
RATHERFORD UNIT	17W21	430371641601S1	Active	14-20-603-353	NE	**NW**	17	41S	24E	0510FNL	1830FWL
RATHERFORD UNIT	17W23	430371572801S1	Active	14-20-603-353	NE	SW	17	41S	24E	1880FSL	1980FWL
RATHERFORD UNIT	17W32	430371572900S1	TA'd	14-20-603-353	SW	NE	17	41S	24E	1830FNL	2030FEL
RATHERFORD UNIT	17W34	430371573000S1	Active	14-20-603-353	SW	SE	17	41S	24E	0560FSL	1880FEL
RATHERFORD UNIT	17W41	430371573100S1	Shut-in	14-20-603-353	NE	NE	17	41S	24E	0610FNL	0510FEL
RATHERFORD UNIT	17W43	430371641701S1	Active	14-20-603-353	NE	SE	17	41S	24E	1980FSL	0660FEL
RATHERFORD UNIT	18-43B	430373171801S1	Active	14-20-603-353	NE	SE	18	41S	24E	2023FSL	0651FEL
RATHERFORD UNIT	18W12	430373115301S1	Active	14-20-603-353	SW	NW	18	41S	24E	1980FNL	560FWL
RATHERFORD UNIT	18W14	430371573501S1	Active	14-20-603-353	SW	SW	18	41S	24E	0810FSL	0600FWL
RATHERFORD UNIT	18W21	430371641801S1	Active	14-20-603-353	NE	NW	18	41S	24E	660FNL	1882FWL
RATHERFORD UNIT	18W23	430373024400S1	Shut-in	14-20-603-353	NE	SW	18	41S	24E	2385FSL	2040FWL
RATHERFORD UNIT	18W32	430371573601S1	Active	14-20-603-353	SW	NE	18	41S	24E	2140FNL	1830FEL
RATHERFORD UNIT	18W34	430371573701S1	Active	14-20-603-353	SW	SE	18	41S	24E	780FSL	1860FEL
RATHERFORD UNIT	18W41	430371573800S1	TA'd	14-20-603-353	NE	NE	18	41S	24E	0660FNL	0660FEL
RATHERFORD UNIT	19-12	430371573901S1	Active	14-20-603-353	SW	NW	19	41S	24E	1980FNL	0600FWL
RATHERFORD UNIT	19-32	430371574301S1	Active	14-20-603-353	SW	NE	19	41S	24E	2717FNL	2802FEL
RATHERFORD UNIT	19-34	430371574401S1	Active	14-20-603-353	SW	SE	19	41S	24E	0660FSL	1980FEL
RATHERFORD UNIT	19W21	430371574100S1	Shut-in	14-20-603-353	NE	NW	19	41S	24E	0660FNL	1860FWL
RATHERFORD UNIT	19W23	430371574200S1	Shut-in	14-20-603-353	NE	SW	19	41S	24E	2080FSL	1860FWL
RATHERFORD UNIT	19W43	430371642000S1	Shut-in	14-20-603-353	NE	SE	19	41S	24E	1980FSL	0760FEL
RATHERFORD UNIT	20-12	430371574601S1	Active	14-20-603-353	SW	NW	20	41S	24E	0709FNL	0748FEL
RATHERFORD UNIT	20-14	430371574701S1	Active	14-20-603-353	SW	SW	20	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	20-32	430371574901S1	Active	14-20-603-353	SW	NE	20	41S	24E	0037FNL	0035FWL
RATHERFORD UNIT	20-34	430371575001S1	Active	14-20-603-353	SW	SE	20	41S	24E	0774FNL	0617FWL
RATHERFORD UNIT	20-67	430373159000S1	Active	14-20-603-353	NE	SW	20	41S	24E	2629FSL	1412FWL
RATHERFORD UNIT	20W21	430371642300S1	Active	14-20-603-353	NE	NW	20	41S	24E	0660FNL	1880FWL
RATHERFORD UNIT	20W23	430371574800S1	Active	14-20-603-353	NW	SW	20	41S	24E	2080FSL	2120FWL
RATHERFORD UNIT	20W41	430371575100S1	Active	14-20-603-353	NE	NE	20	41S	24E	0660FNL	0660FEL
RATHERFORD UNIT	20W43	430371642400S1	TA'd	14-20-603-353	NE	SE	20	41S	24E	2070FSL	0810FEL
RATHERFORD UNIT	16W12	430371572000S1	Active	14-20-603-355	SW	NW	16	41S	24E	1880FNL	0660FWL

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location						
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot
RATHERFORD UNIT	16W14	430371572100S1	Shut-in	14-20-603-355	SW	SW	16	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	16W21	430371641400S1	Active	14-20-603-355	NE	NW	16	41S	24E	0660FNL	1880FWL
RATHERFORD UNIT	16W23	430371572201S1	Active	14-20-603-355	NE	SW	16	41S	24E	1980FSL	1980FWL
RATHERFORD UNIT	16W43	430371641501S1	Active	14-20-603-355	NE	SE	16	41S	24E	2140FSL	0820FEL
RATHERFORD UNIT	21-14	430371575301S1	Active	14-20-603-355	SW	SW	21	41S	24E	0660FSL	0460FWL
RATHERFORD UNIT	21-67	430373175301S1	Active	14-20-603-355	NE	SW	21	41S	24E	2560FSL	1325FWL
RATHERFORD UNIT	21W21	430371642501S1	Active	14-20-603-355	NE	NW	21	41S	24E	0660FNL	2030FWL
RATHERFORD UNIT	**6W14**	430371598400S1	Active	14-20-603-368	NE	SE	6	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	7W12	430371598500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2140FNL	0585FWL
RATHERFORD UNIT	7W14	430371598600S1	Active	14-20-603-368	NE	SE	7	41S	24E	1065FSL	0660FWL
RATHERFORD UNIT	7W21	430371639400S1	Active	14-20-603-368	**NE**	NW	7	41S	24E	0710FNL	1820FWL
RATHERFORD UNIT	7W34	430371598900S1	Active	14-20-603-368	SW	SE	7	41S	24E	0710FSL	2003FEL
RATHERFORD UNIT	7W43	430371639500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2110FSL	0660FEL
RATHERFORD UNIT	**8W14**	430371599200S1	Active	14-20-603-368	SW	NE	8	41S	24E	0745FSL	0575FWL
RATHERFORD UNIT	10W43	430371640300S1	TA'd	14-20-603-4037	NE	SE	10	41S	24E	1980FSL	0550FEL
RATHERFORD UNIT	29-12	430371533701S1	Active	14-20-603-407	SW	**NW**	29	41S	24E	2870FNL	1422FWL
RATHERFORD UNIT	29-32	430371533901S1	Active	14-20-603-407	SW	NE	29	41S	24E	0694FNL	0685FWL
RATHERFORD UNIT	29W21	430371643200S1	Active	14-20-603-407	NE	NW	29	41S	24E	0667FNL	2122FWL
RATHERFORD UNIT	29W41	430371643300S1	Active	14-20-603-407	NE	NE	29	41S	24E	0557FNL	0591FEL
RATHERFORD UNIT	29W43	430371643400S1	Shut-in	14-20-603-407	NE	SE	29	41S	24E	1980FSL	0660FEL
RATHERFORD UNIT	30W41	430371534300S1	Shut-in	14-20-603-407	NE	NE	30	41S	24E	0660FNL	0660FEL
RATHERFORD UNIT	28-12	430371533601S1	Active	14-20-603-409	SW	SE	28	41S	24E	2121FNL	0623FWL
RATHERFORD UNIT	28W21	430371643100S1	Shut-in	14-20-603-409	NE	NW	28	41S	24E	0660FNL	2022FWL
RATHERFORD UNIT	9W23	430371639800S1	Active	14-20-603-5046	NW	SE	9	41S	24E	1980FSL	1980FWL