

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK  
 DRILL  DEEPEN  PLUG BACK

b. TYPE OF WELL  
 OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR  
 SOUTHERN UNION EXPLORATION COMPANY (505) 327-4481

3. ADDRESS OF OPERATOR  
 P. O. BOX 2179 FARMINGTON, NEW MEXICO 87499

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.\*)  
 At surface 460' FWL, 2180' FSL  
 At proposed prod. zone Same

5. LEASE DESIGNATION AND SERIAL NO.  
 U 54031

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
 Tin Cup

9. WELL NO.  
 1-31

10. FIELD AND POOL, OR WILDCAT  
 UNDESIGNATED  
 Wildcat - Ismay

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
 Sec 31, T38S, R26E

12. COUNTY OR PARISH  
 San Juan

13. STATE  
 Utah

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
 2.5 miles North & 6.4 miles East of Hatch Trading Post (See Map)

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 460'

16. NO. OF ACRES IN LEASE 120

17. NO. OF ACRES ASSIGNED TO THIS WELL 40

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

19. PROPOSED DEPTH 6500' *Wash*

20. ROTARY OR CABLE TOOLS  
 Rotary 0' - 6500'

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
 5011 GR

22. APPROX. DATE WORK WILL START\*  
 Feb. 25, 1987

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17 1/2"	13 3/8"	48.0#	80'	65 sx Ready mix
12 1/4"	8 5/8"	24.0#	1500'	750 sx "B" w/2% CaCl <sub>2</sub>
7 7/8"	5 1/2"	15.5#	5800'	240 sx "B" w/50/50 poz, 2% gel

- Spud rat and mouse hole, drill 17 1/2" conductor hole to 80' w/Benex & water, run 2 jts 13 3/8", 48#, H.40 ST&C, casing cement w/65 sks Class "B" w/2% CaCl<sub>2</sub> WOC 8 hrs. Nipple up flow line.
- Drill 12 1/4" surface hole to 1500', run 38 jts 8 5/8" 24.0# K-55 LT&C casing. Cement w/200 sks Class "B" w/2% CaCl<sub>2</sub> circulate to surface. WOC 12 hrs, NU BOP pressure test to 1000 psi
- Drill out surface casing and 7 7/8" hole to 5800' with low solid mud. Run DIL/GR & CNL/FDC "E" logs, if warranted.

RECEIVED  
FEB 17 1987

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

24. SIGNED Martin D. Boggs TITLE Drlg & Prod Supt DATE 2/12/87

(This space for Federal or State office use)

PERMIT NO. 43-037-31308

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING

APPROVAL DATE 2-19-87

BY John R. Boggs

WELL SPACING: 302

\*See Instructions On Reverse Side

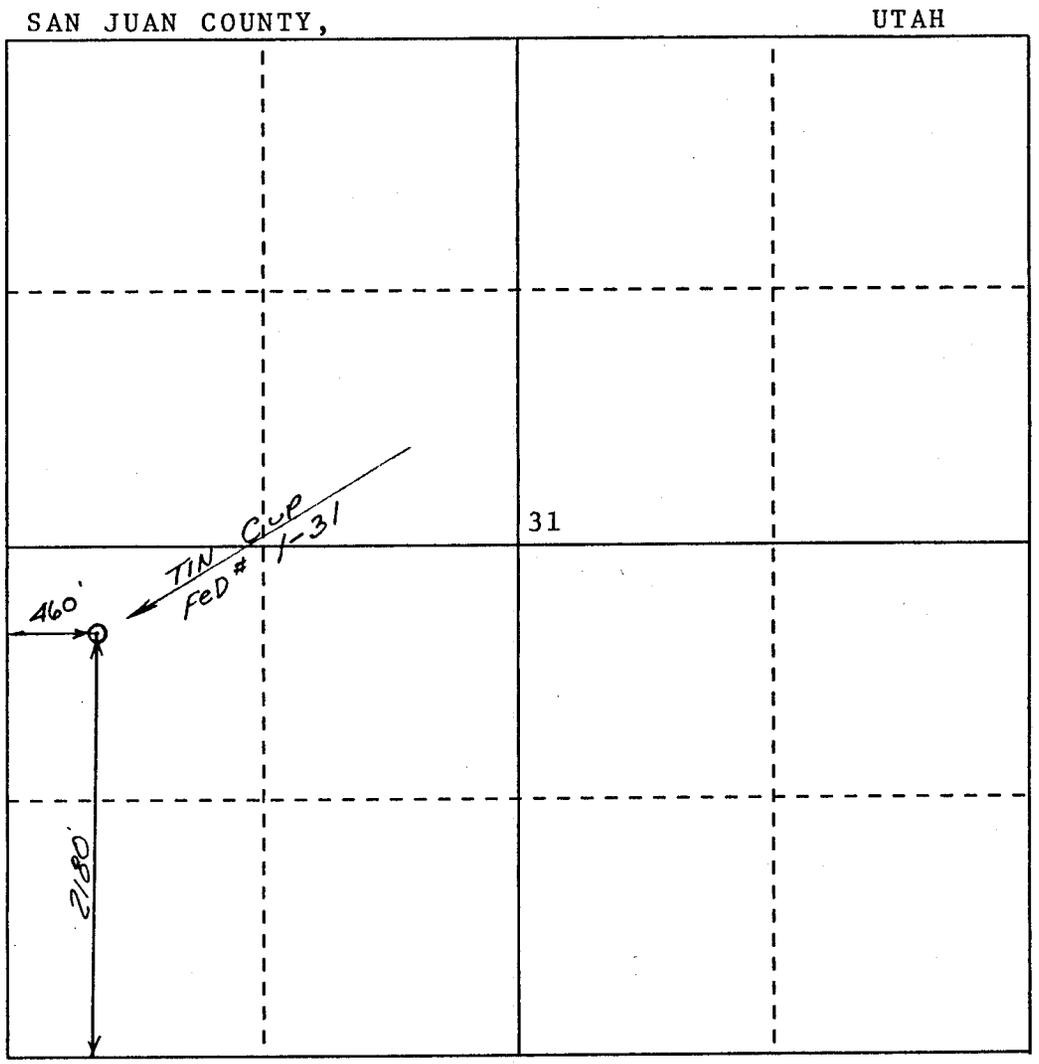
COMPANY SOUTHERN UNION EXPLORATION COMPANY

LEASE TIN CUP FEDERAL WELL NO. 1-31

SEC. 31 T. 38 SOUTH R. 26 EAST, S.L.M.

LOCATION 2180 FEET FROM THE SOUTH LINE AND  
460 FEET FROM THE WEST LINE

ELEVATION 5011 UNGRADED GROUND



SCALE - 1 INCH EQUALS 1000 FEET

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

SEAL:

*James P. Lane*  
 Registered Land Surveyor.  
 UTAH REG. NO. 1472

SURVEYED DECEMBER 5, 19 86

BASIN PLAN FOR EAST HATCH

Southern Union Exploration Company  
Tin Cup Federal 1-31  
460' FWL, 2180' FSL  
Sec 31, T38S, R26E

U-54031

10-Point Plan of Operations

1. GEOLOGIC NAME OF SURFACE FORMATION.

2. THE ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS.

5012' GL  
5021' KB

Honaker Trail: 4241'  
Ismay: 5385'  
Desert Creek: 5654'  
Akah: 5749'  
TD: 5800'

3. THE ESTIMATED DEPTHS OF ANTICIPATED WATER, OIL, GAS AND MINERAL BEARING FORMATIONS.

Intermittent fresh water sands are expected from surface to approximately 1,500 feet. Interbedded shale and sand sections with little possibility of any fluid-bearing zones will be encountered to approximately 5,385 feet. Ismay and Desert Creek have potential oil and gas. If any zones produce water, they will be adequately protected and reported.

4. THE PROPOSED CASING PROGRAM.

Conductor Casing-80', 13 3/8", 48# ST & C set from 80' to surface, cement with 65 sacks red dy mix.

Surface casing: 1,500 feet of 8 5/8", 24#, K-55, ST & C, new casing set from 1,500 feet to surface.

Cement with 750 sacks class "B"; Circulate to surface. 2% CaCl<sub>2</sub> and 1/4#/sk celloflakes.

Production Casing: 5,800 feet of 5 1/2", 15.50#, K-55, LT & C, new casing set from 5,800 feet to surface.

Cement with 240 sacks class "B", cement containing 0.8% fluid loss additive.

5. THE OPERATOR'S MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL EQUIPMENT.

A double gate hydraulic BPO, Shaffer type LWS, 11", 3000# WP (or equivalent) with pipe rams and blind rams will be installed on the 8 5/8" casinghead. Stack will be tested to 1000# PSI prior to drilling

under surface; and operational checks will be made daily or on trips. Please see attached schematic diagram.

6. THE TYPE AND CHARACTERISTICS OF THE PROPOSED DRILLING FLUID.

The conductor hole (17 1/2") will be drilled to 80' and the surface hole (12 1/4") drilled to 1,500'. Both will be drilled with fresh water/circulated reserve pit, 813-8.6 PPG, 30-35 vis. after setting surface casing, drill out and ahead with water/native mud as above, using high vis gel sweeps to keep hole clean, mud-up will occur approximately 1000' above the Ismay top; and the hole will be drilled to TD using a gelled mud system with an anticipated maximum MW at 12 ppg.

7. THE AUXILIARY EQUIPMENT TO BE USED.

- A. A kelly cock will be used at all times.
- B. Drill pipe floats will be used.
- C. A full opening stabbing valve will be on the floor at all times.
- D. The mud system will be visually monitored.

8. THE TESTING, LOGGING, AND CORING PROGRAMS TO BE FOLLOWED.

- A. Cores-none.
- B. DSTS-two anticipated. 1-Ismay, 1-Desert Creek.
- C. E-logs-PIL/GR and CNL/FDC.
- D. Completion will be selectivity perforated in the zone of interest.

BREAKDOWN

To initially breakdown and test for production, acidize with 1,000 gallons 15% acid containing the following additives, iron and clay control. Treatment will be via tubing below packer.

MAJOR STIMULATION:

Non anticipated.

No additional surface disturbance will be required for this job.

9. ANY ABNORMAL PRESSURES OR TEMPERATURES EXPECTED.

No abnormal temperatures, pressures or potential hazards such as H2S have been encountered in this area.

10. THE ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS.

Projected spud date for this well is February 25, 1987, with completion of drilling operations within 25 days. It is estimated that completion for production will be accomplished in an additional 10-15 days.

Productive zones will be perforated, treated, and tested. Gas will be flared during testing periods. Water produced during testing will be contained in the temporary drilling reserve pit all produced oil will be stored and sold.

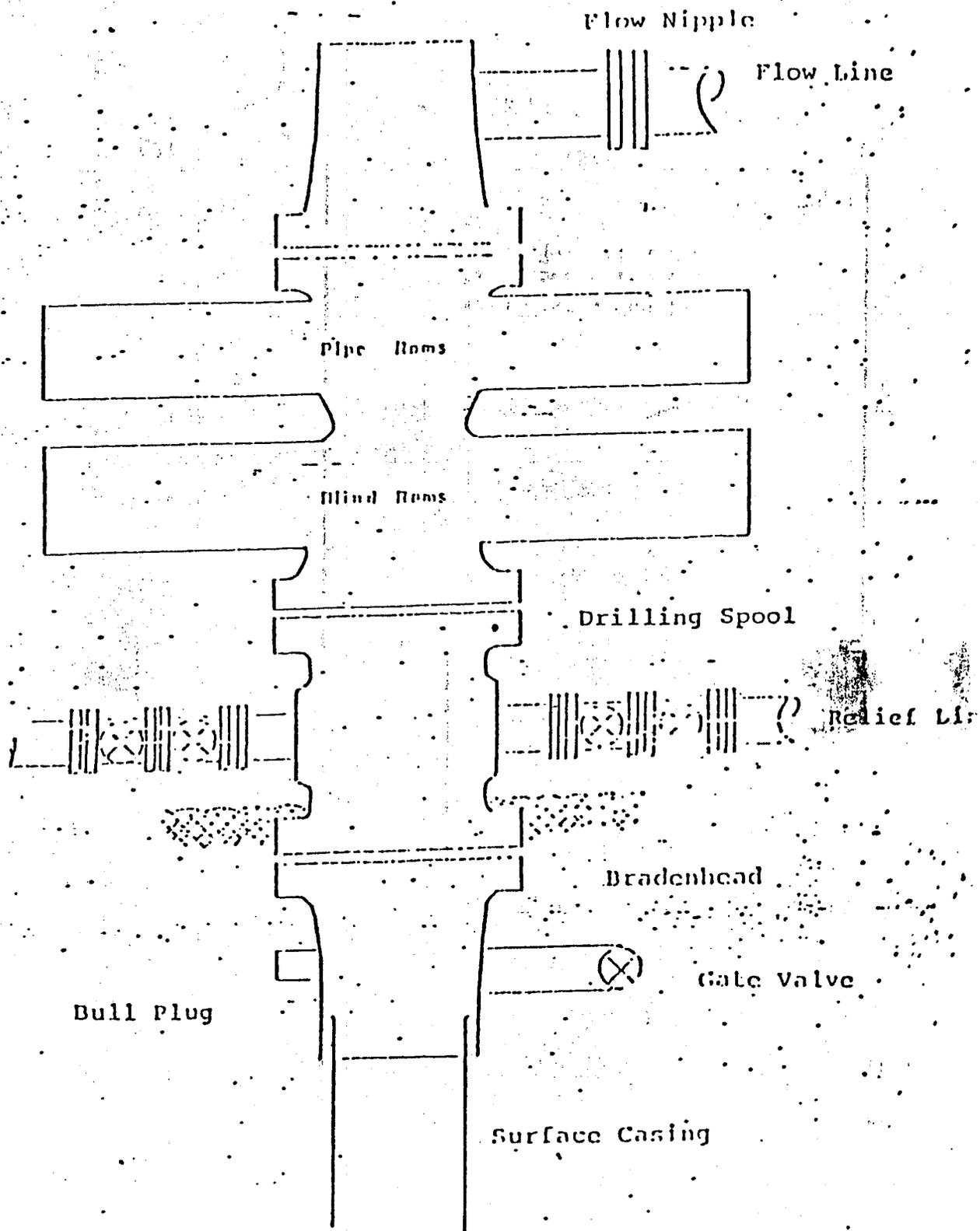
OPERATOR'S REPRESENTATIVE

Field personnel who can be contacted concerning compliance of this plan are as follows:

Martin Boggs  
P.O. Box 2179  
Farmington, NM 87499  
(505) 327-4481 office  
(505) 325-6041 home

Cecil Bell  
P. O. Box 2179  
Farmington, NM 87499  
(505) 327-4481 office  
(505) 632-3138 home

Typical B.O.P. Installation  
for : Dakota Well



PLAT #4 BLOWOUT PREVENTER SCHEMATIC

Series 900 Double Gate BOP, rated  
at 3000 psi Working Pressure

When gas drilling operations begin a Shaffer type  
50 or equivalent rotating head is installed on top of  
the flow nipple and the flow line is converted into  
a blowline.

Southern Union Exploration Company  
Tin Cup Fed 1-31 U-54031  
460' FWL, 2180' FSL  
Sec 31, T38S, R26E  
San Juan County, Utah

Multi Point Surface Use Plan for: Tin Cup Fed. 1-31 U-54031

I. EXISTING ROADS

- A. Proposed Well Site Location: See Exhibits 1, 2, & 3
- B. Go North from Hatch Trading Post on San Juan County Road #246 for 2.5 miles to junction of San Juan County Road #299 turn right or east on San Juan County Road #299 and go for 6.4 miles to MCOR Canyon 2-36 well. Turn south off SJC Rd #299 and follow new flagged access road .75 miles to Tin Cup Fed. 1-31 location.
- C. Planned Access Route: There will be .75 miles of new access road. See exhibit #2, total disturbed width will be 20'. No surfacing material will be used. All grades are less than 10%. The road will be upgraded to Class III standards after completion.
- D. Access Road Labelled: See Exhibit 2
- E. The existing roads are shown on Exhibit 2. San Juan County road department (801)-587-2231 Ext. 43) will be contacted before county roads are used.
- F. Existing Road Maintenance or Improvement: Existing dirt road will be maintained to surface management agency standards Class III i.e.; crowned and ditched or dipped from existing road to the location prior to use for moving the drill rig on site.

II. PLANNED ACCESS ROUTE

- A. Route Location: See I B above and Exhibit 2.  
The proposed new access route was selected to provide the shortest distance to the well site with safe and acceptable grades from the main connector road. Temporary access per surface management agency requirements will be built initially. If the well is a producer, the temporary road will be improved as follows:
  - 1. Width: The average dirt width will be 30 feet. The average traveled surface width will be 20 feet. Road construction will be in accordance with the surface management agency BLM standards.
  - 2. Maximum Grades: Grades will be kept to a minimum using all available engineering techniques. We will construct safe and passable grades that use existing topographic and surface geologic conditions. Maximum grades of new access will be less than 8%.
  - 3. Turnouts: Not required

4. Ditching, crowning and drainage design: Prior to construction of the new access road, the surface vegetation and topsoil will be windrowed to each side of the alignment outside construction limits. The subgrade surface will be minimum elevation of one foot above ditch grade. The road surface will be center crowned and the inslopes will have a maximum slope of 3:1. Fill slopes will be a maximum of 2:1. Water bars and/or water dips will be placed per BLM requirements. SX will contact the San Juan Resource Area Manages at least 48 hours prior to commencing construction of access road and well pad.
5. Construction activity will cease when soils of road and well pad surface become saturated to a depth of 3 (three) inches or more unless otherwise approved by San Juan Resource Area Manager. During the summer and periods of dry weather, dust will be abated using water or other Resource Manager approved method.
6. Culvert Use, major cuts and fills: There is a possibility of installing a culvert under the road by the location, if deemed necessary for drainage.  
Maximum cut: Cuts will be to a minimum.  
Maximum fill: Fill will be to a minimum.
7. Surfacing Material: The proposed new access road will be constructed using native materials.
8. Gates, Cattleguards, Fence Cuts:  
Gates: N/A  
Cattleguards: N/A  
Fence cuts: None
9. New portion of access road will be center staked. Access road will be built along line flagged for pre-drill inspection.

### III. LOCATION OF EXISTING WELLS

The proposed well is a wildcat well, nearby wells include:

- A. Water Wells: N/A
- B. Abandoned Wells: See map
- C. Temporarily Abandoned Wells: See attached map
- D. Disposal Wells: N/A

- E. Producing Wells: see attached map
- F. Shut-In: N/A
- G. Injection Wells: N/A
- H. Monitoring or Observation Wells: N/A

IV. LOCATION OF EXISTING AND /OR PROPOSED FACILITIES AND CONSTRUCTION METHODS

A. Existing facilities owned or controlled by Lessee/Operator within one mile:

- 1. Tank batteries: N/A
- 2. Production facilities: N/A
- 3. Oil gathering lines: N/A
- 4. Gas gathering lines: N/A
- 5. Injection lines: N/A
- 6. Disposal lines: N/A

B. New facilities in the event of production.

- 1. New facilities may consist of a well head, storage tank, production unit, meter house, all of which would remain within the disturbed area.
- 2. All permanent facilities will be painted natural to match soil color.

C. Construction Methods

- 1. Refer to Exhibit 3 for pad topography and cross sections.
- 2. The location and proposed access road will be cleared prior to any construction. All dead trees from chaining activities will be disposed of by SX. Stumps will be buried in areas designated by surface management agency or burned in reserve pit prior to placement of drilling facilities. If any burning is done, SX will obtain a state burning permit and notify the San Juan County Health Department 20 hours in advance. Any stump left in place will be cut to a height not to exceed 12 inches: All slash less than four inches in diameter will be chipped and scattered outside of cleared area. All material four inches or greater diameter will be removed. SX will provide the dirt contractor with a copy of the surface use plan prior to any surface disturbance.
- 3. SX will immediately notify the San Juan Resource Area Manager of any and all cultural/historical resources discovered as a result of operations under this permit. All activities will be suspended in the area of any such object found and leave such discoveries intact until told to proceed by San Juan Resource Area Manager. Notice to proceed will be based upon evaluation of the cultural significance of the object. Evaluation of such object will be conducted by a qualified professional selected by San Juan Resource Area Manager from a federal agency where possible and practical. When not

practical, SX will follow the mitigation requirements set forth by the San Juan Resource Area Manager concerning protection, preservation or disposition of any sites or material discovered. In those situations where the San Juan Resource Area Manager determines that data recovery and/or salvage excavations are necessary, SX will bear the cost of such data recovery and/or salvage operations.

4. Land ownership: The planned site lies on fee surface.

: The planned access road lies on fee surface (set footage new road).

5. Construction of pad will be conducted as follows: Topsoil will be stripped to a depth of 12 inches. Topsoil will then be stockpiled on the northeast corner of the location and identified in some manner to avoid accidental waste or improper usage. Pits will be constructed with soil materials native to site. Construction methods will be employed to assure that no drainage flows are impounded and to prevent the loss of any hydrocarbon from site. This will be done in a manner to facilitate rapid recovery and clean-up operations. Pits will be lined with native bentonite (to prevent any possibility of seepage).

6. Protective measures for wildlife and livestock: Pits will be fenced on 3 (three sides) during drilling and on 4 (four sides) after completion to prevent entry of livestock or wildlife in the following manner; four strand barbed wire with metal post.

D. Plans for re-habilitation of disturbed areas no longer needed for operations after construction and drilling completed.

1. Upon completion of well, areas required for continued use will be graded to provide drainage and minimize erosion. Those areas unnecessary for use will be graded to blend with the surrounding topography. Topsoil will be replaced on those areas and seeded according to the surface managing agency's specifications. See X C. Seeding will be completed after October 1 and before February 28.

#### V. LOCATION AND TYPE OF WATER SUPPLY

A. The water will be obtained from a legal private source: Benally water well.

B. Water transportation system: Water will be trucked to the location over existing roads.

C. Water wells: Benally well location.

VI. SOURCE OF CONSTRUCTION MATERIALS

A. Material: Construction materials will consist of soil encountered within the boundaries.

B. Materials foreign to site: N/A

C. Refer to Exhibit #2 for access road detail.

VIII. A. Cuttings will be contained within the limits of the reserve pit.

B. Drilling fluids will be retained in the reserve pit.

C. Produced fluids: No substantial amount of produced water is anticipated. The amount of fluid hydrocarbons that may be produced while treating will be retained in the reserve pit. Prior to cleanup operations, the hydrocarbons will be skimmed or removed as the situation dictates.

D. Sewage: Sanitary facilities will consist of at least one chemical toilet and after completion of operations, the sewage will be removed and disposed of by subcontractor and hauled by truck to a sanitary land-fill.

E. Garbage: The small amount of refuse will be contained in a trash cage until operations are completed and then will be disposed of at a legal and environmentally safe location.

F. Clean up of well site: After drilling, the surface of the drill pad will be cleaned and graded to accommodate a completion rig. The mouse hole and rat hole will be backfilled to prevent injury and hazard for livestock and personnel. Reserve pit will be fenced until dry and then will be backfilled using native materials except topsoil, and contoured to natural terrain.

VIII. ANCILLARY FACILITIES

A. N/A

IX. WELL SITE LAYOUT

A. Refer to Exhibits

1. location of pits: 3
2. Rig Orientation: 3 & 4

X. PLANS FOR RESTORATION OF SURFACE

- A. The San Juan Resource Area Manager will be notified at least 48 hours prior to commencing reclamation work.
- B. Reserve Pit Clean-up. The pit will be fenced on three sides prior to rig release and maintained until clean-up. Prior to backfill operations, any hydrocarbon material on pit surface will be removed. The fluids contained in the pit shall be allowed to evaporate and then the pit shall be backfilled with soil excavated from the site (excluding any topsoil removed during construction). The restored surface of the reserve pit will be contoured to prevent impoundment of drainage flows. The gradient of the surface will be maintained to prevent sudden acceleration of drainage flows which could cause continued erosion of the surface. Following backfill completion, topsoil removed from the disturbed areas will be replaced in a uniform layer over the surface. The reserve pit will be seeded per Managing agent's specifications.
- C. Restoration plans if production is developed: The reserve pit will be backfilled and restored as described in X B. In addition, those disturbed areas not required for production facilities will be contoured to approximate original topography. SX will upgrade and maintain access roads as necessary to prevent soil erosion and accommodate year-round traffic. Topsoil will then be placed on those areas of pad not needed for operations, ripped or disked and seeded, per the following mix:

4 lbs/acre	Galleta ( <i>Hilaria jamosii</i> )
3 lbs/acre	Crested wheatgrass ( <i>Agropyron desertorum</i> )
2 lbs/acre	Fourning saltbush ( <i>Atriplex Canenscens</i> )
2 lbs/acre	Shadscale ( <i>Atriplex confertifilia</i> )

SX will use certified seed. Seedbed will be prepared by disking or ripping following natural contours. Seed will be drilled on contour at depth no greater than 1/2 inch. In areas that cannot be drilled, we will broadcast at double the seeding rate and harrow the seed into the soil. Seeding will be completed after September 1 and prior to prolonged ground frost. Perennial vegetation will be established. SX will perform any additional work necessary in the event of seeding failures.

Following final improvement and surfacing of the portion of new access road, the topsoil windrowed to each side of the alignment will be placed on cut slopes.

D. Restoration plans if no production is developed: The reserve pit will be backfilled and restored as described in X B. Access road and location will be restored to approximate the original contours. During reclamation of site, fill material will be pushed into cuts and up over backslope. No water trapping depressions will be left. Topsoil will be distributed evenly over location and seeded according to the method, manner and type described in X C.

E. Private surface restoration: N/A

XI. OTHER INFORMATION

- A. Surface Description: The topography is relatively sloping, with a fairly steep drainage (Big Canyon) west of the location. Vegetation includes crested wheatgrass, wild sunflower, and fourwing saltbush.
- B. Other Surface-Use Activities:  
The predominant surface use is grazing.
- C. Proximity of Water, Dwelling and Historical Sites:
1. Water: Water tank
  2. Occupied Dwellings: None within one (1) mile.
  3. Historical Sites: An archaeological reconnaissance survey has been performed for this location and access and the report will be on file with the appropriate area surface management agency.

XII. OPERATOR'S REPRESENTATIVE

Field personnel who can be contacted concerning compliance of this Surface Use Plan are as follows:

Martin Boggs  
Box 2179  
Farmington, NM 87499  
(505) 327-4481

Cecil Bell  
Box 2179  
Farmington, NM 87499  
(505) 327-4481

XIII. CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions as they actually exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Southern Union Exploration Company and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved.

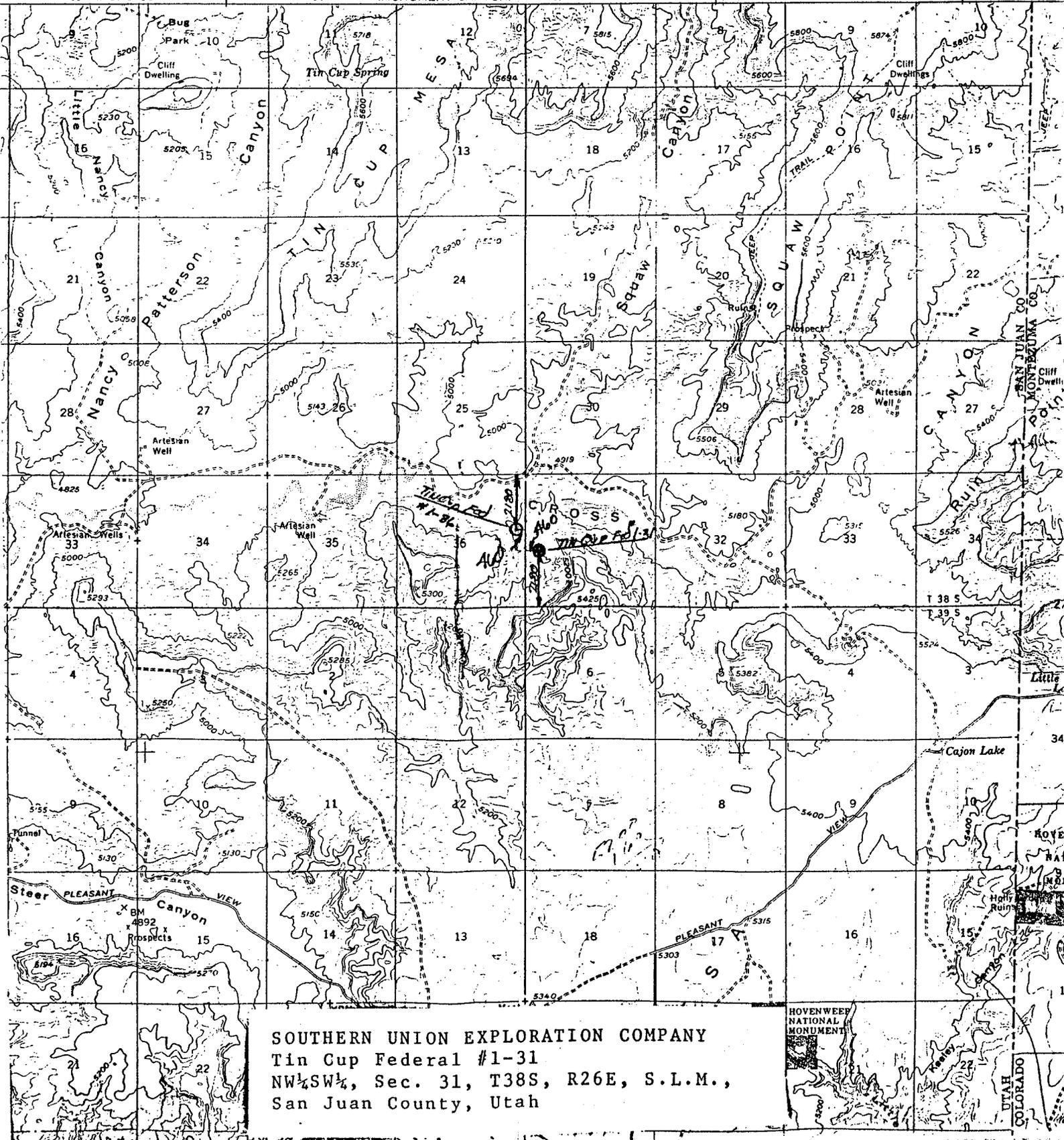
DATE: 2/12/87

Martin D. Boggs

Martin D. Boggs  
Drilling & Production Supt.  
Southern Union Exploration Co.

UNITED STATES  
ATOMIC ENERGY COMMISSION

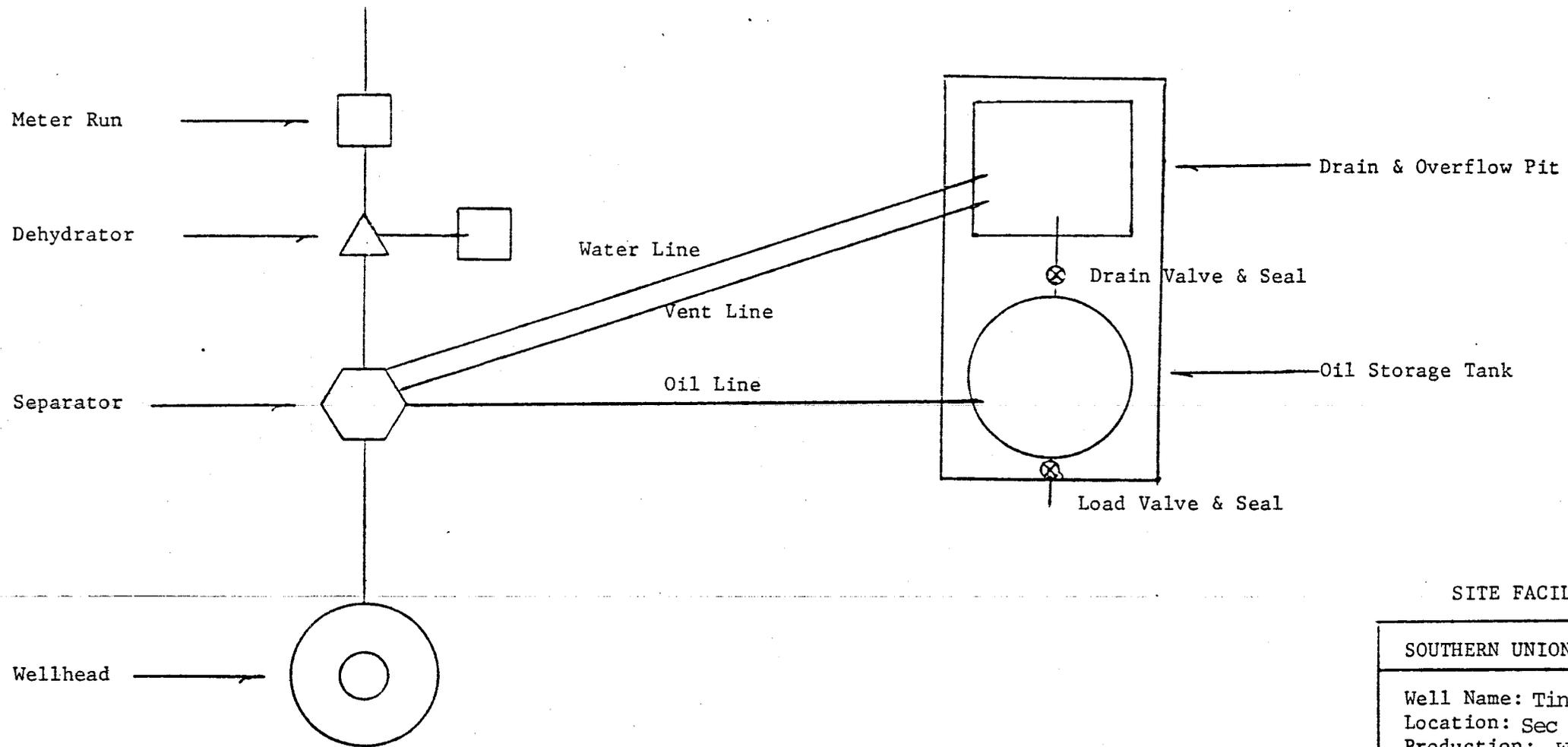
661 R 25 E 10' 664 (MONUMENT CANYON) 667 668 5' R 26 E. 671 673



SOUTHERN UNION EXPLORATION COMPANY  
Tin Cup Federal #1-31  
NW $\frac{1}{4}$ SW $\frac{1}{4}$ , Sec. 31, T38S, R26E, S.L.M.,  
San Juan County, Utah

UTAH  
COLORADO





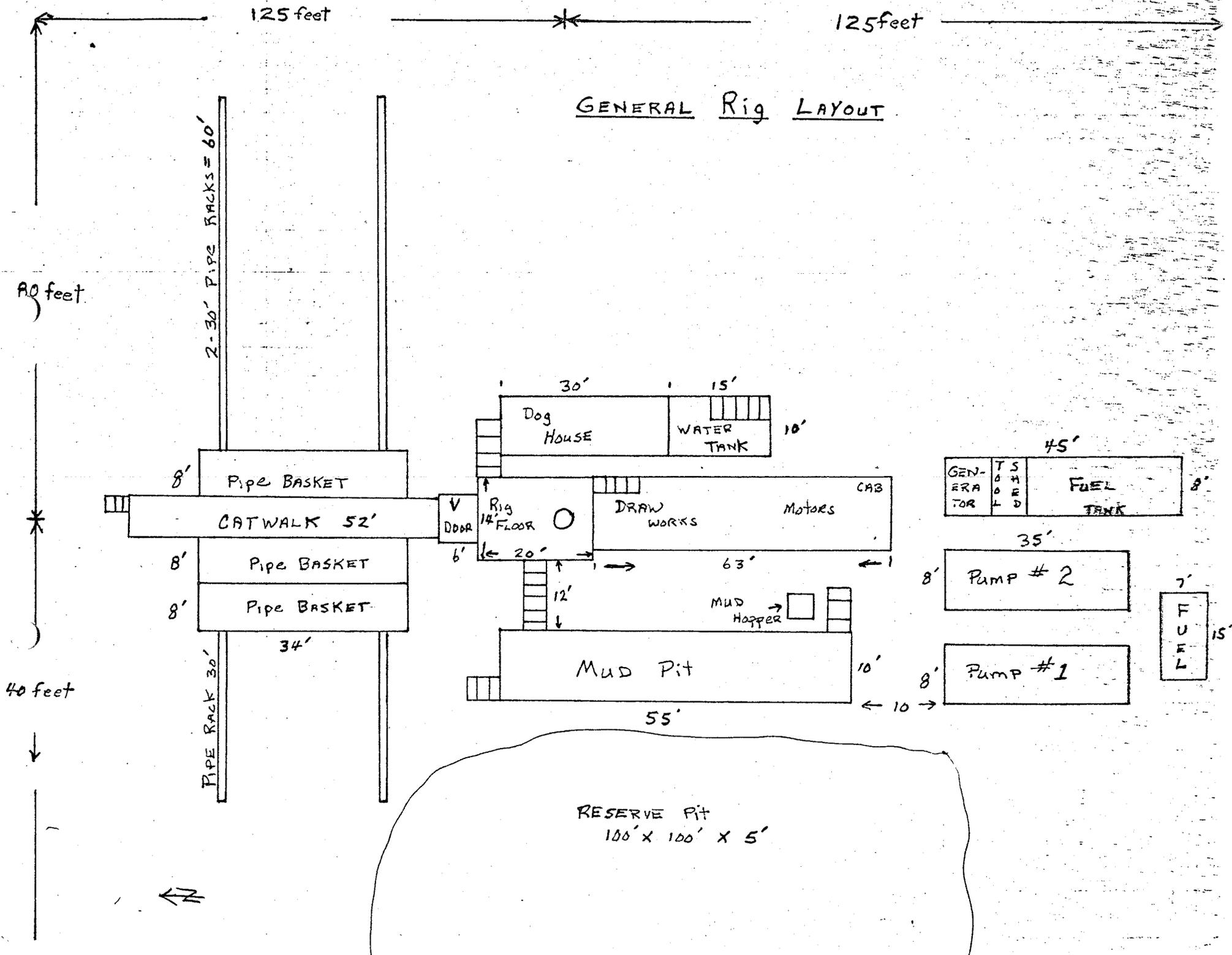
SITE FACILITY DIAGRAM

SOUTHERN UNION EXPLORATION

Well Name: Tin Cup 1-31  
 Location: Sec 31.T38S R26E  
 Production: Wildcat-Ismay  
 Lease: U 54031

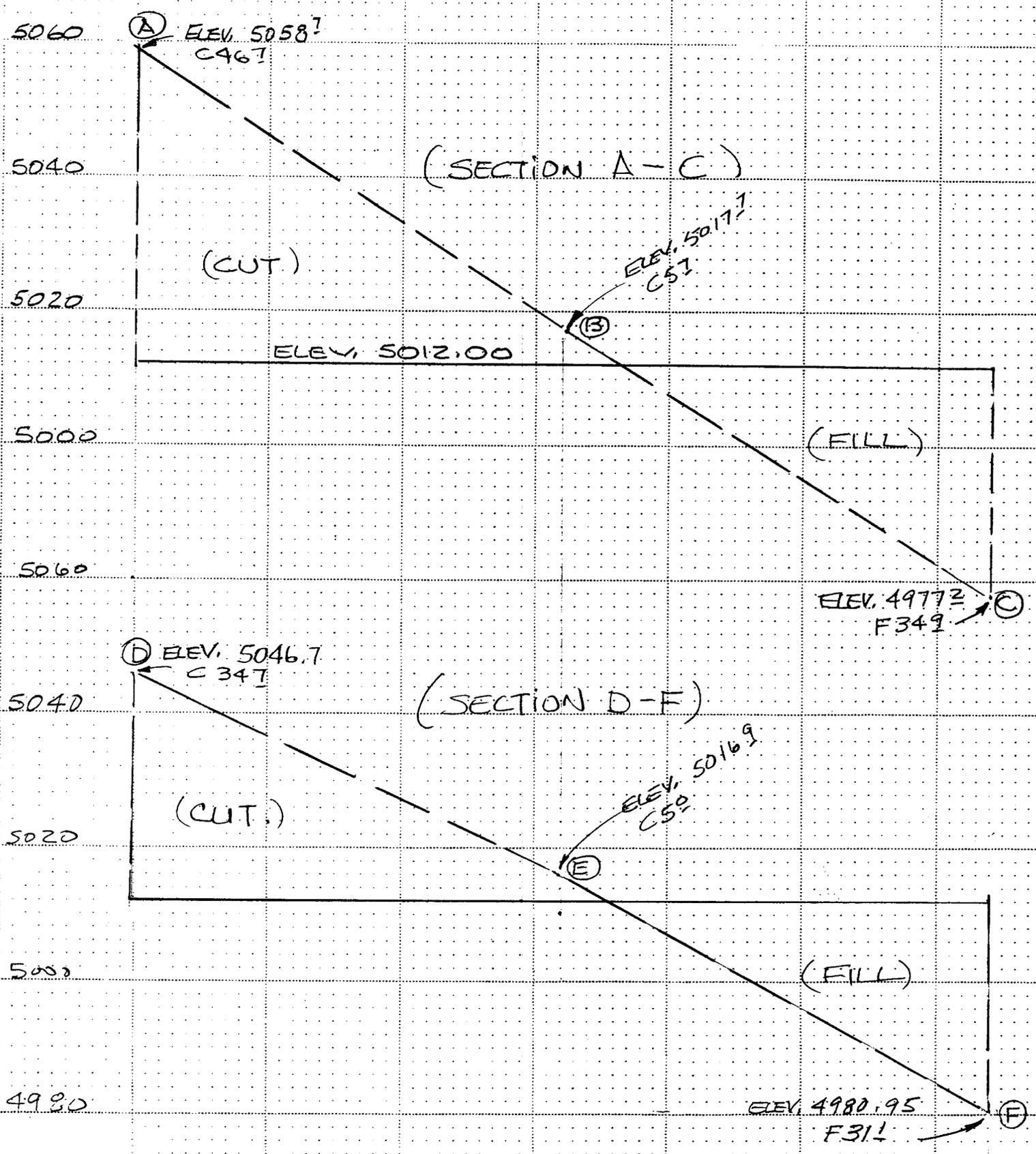


# GENERAL Rig LAYOUT

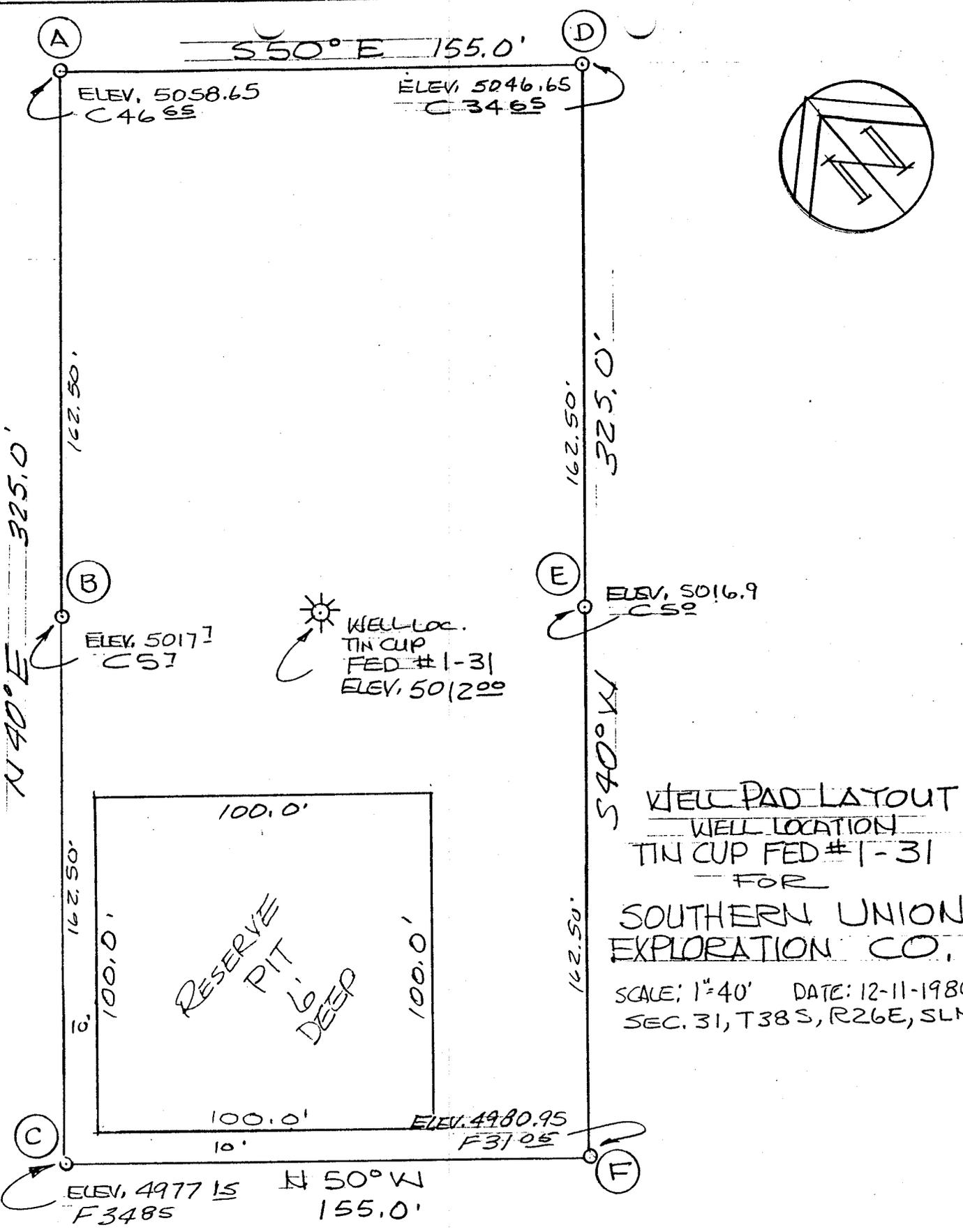


CUT & FILL SHEET  
FOR

SOUTHERN UNION EXPLORATION COMPANY  
WELL LOC. TIN CUP FED # 1-31



DATE: 12-12-86  
JOB NO.



A  
ELEV. 5058.65  
C 46 65

D  
ELEV. 5046.65  
C 34 65

N 40° E  
325.0'

162.50'

162.50'

10'

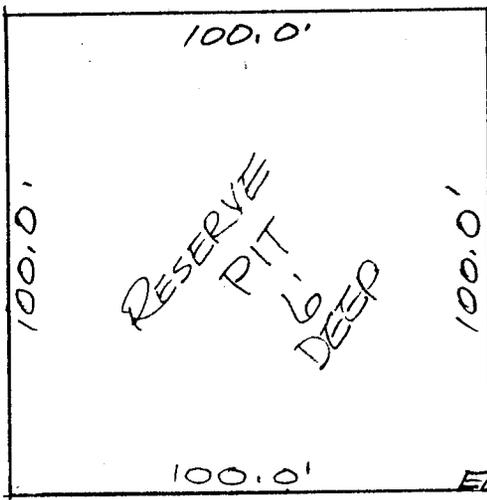
B  
ELEV. 50171  
C 57

WELL LOC.  
TIN CUP  
FED # 1-31  
ELEV. 501200

E  
ELEV. 5016.9  
C 52

162.50'  
325.0'

S 40° W  
162.50'



T  
ELEV. 4980.95  
F 31 05

C  
ELEV. 4977.15  
F 34 85

WELL PAD LAYOUT  
WELL LOCATION  
TIN CUP FED # 1-31  
FOR  
SOUTHERN UNION  
EXPLORATION CO.

SCALE: 1"=40' DATE: 12-11-1986  
SEC. 31, T38S, R26E, SLM.

## DESIGNATION OF OPERATOR

The undersigned is, on the records of the Bureau of Land Management, holder of lease

DISTRICT LAND OFFICE:  
SERIAL No.: U-54031

and hereby designates

NAME: Southern Union Exploration Company  
ADDRESS: Renaissance Tower, Suite 1800, 1201 Elm Street  
Dallas, Texas 75270

as his operator and local agent, with full authority to act in his behalf in complying with the terms of the lease and regulations applicable thereto and on whom the supervisor or his representative may serve written or oral instructions in securing compliance with the Operating Regulations with respect to (describe acreage to which this designation is applicable):

TOWNSHIP 38 SOUTH - RANGE 26 EAST

Section 31: NW4SW4, S2SW4

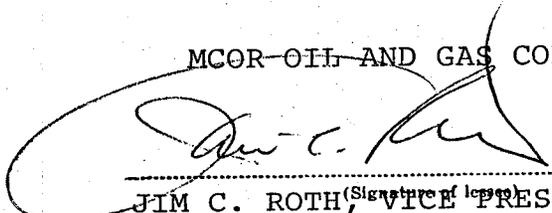
San Juan County, Utah

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

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

The lessee agrees promptly to notify the supervisor of any change in the designated operator.

~~MCOR OIL AND GAS CORPORATION~~

  
.....  
JIM C. ROTH, (Signature of lessee) VICE PRESIDENT

12/15/86

.....  
(Date)

5718 Westheimer  
Houston, Texas 77057  
.....  
(Address)

## DESIGNATION OF OPERATOR

The undersigned is, on the records of the Bureau of Land Management, holder of lease

DISTRICT LAND OFFICE: Vernal, Utah  
SERIAL NO.: U-54031

and hereby designates

NAME: Southern Union Exploration Co.  
ADDRESS: Renaissance Tower, Suite 800  
1201 Elm Street, Dallas, TX 75270

as his operator and local agent, with full authority to act in his behalf in complying with the terms of the lease and regulations applicable thereto and on whom the supervisor or his representative may serve written or oral instructions in securing compliance with the Operating Regulations with respect to (describe acreage to which this designation is applicable):

Township 38 South, Range 26 East  
Sec. 31: Lot 3

San Juan County, Utah

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

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

The lessee agrees promptly to notify the supervisor of any change in the designated operator.

BHP PETROLEUM (AMERICAS) INC.

By: 

(Signature of lessee)

Bernard A. Wirth  
Attorney-in-fact

December 15, 1986

(Date)

5613 DTC Parkway, Suite 600, Englewood,  
CO 80111 (Address)

# DESIGNATION OF OPERATOR

The undersigned is, on the records of the Bureau of Land Management, holder of lease

DISTRICT LAND OFFICE: Monticello, Utah 84535  
SERIAL NO.: U-54031

and hereby designates

NAME: Southern Union Exploration Company  
ADDRESS: Renaissance Tower, Suite 1800 Attn: Craig Nielson  
1201 Elm Street, Dallas, TX 75270

as his operator and local agent, with full authority to act in his behalf in complying with the terms of the lease and regulations applicable thereto and on whom the supervisor or his representative may serve written or oral instructions in securing compliance with the Operating Regulations with respect to (describe acreage to which this designation is applicable):

Township 38 South, Range 26 East, San Juan County, Utah  
Section 31: NWSW

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

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

The lessee agrees promptly to notify the supervisor of any change in the designated operator:

Total Petroleum, Inc.

Tom E. Bailey  
(Signature of lessee)

By: Tom E. Bailey  
999 18th Street Suite 3080  
Denver, CO 80202  
(Address)

12/17/86  
(Date)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

03-51-23

STATE OR NATIONWIDE OIL AND GAS BOND  
Act of February 25, 1920 (30 U.S.C. Sec. 181);  
Act of August 7, 1947 (30 U.S.C. Sec. 351)

KNOW ALL MEN BY THESE PRESENTS, That we Southern Union Properties, Inc.

of Dallas, Texas

as principal, and American Home Assurance Company  
of Dallas, Texas  
as surety, are held and firmly bound unto the United States of America in the sum of One hundred fifty thousand  
and no/100-----dollars (\$ 150,000.00-----), lawful money  
of the United States, which sum may be increased or decreased by a rider hereto executed in the same manner as this  
bond, for the use and benefit of (1) the United States; (2) the owner of any of the land subject to the coverage of this  
bond, who has a statutory right to compensation in connection with a reservation of the oil and gas deposits to the  
United States; and (3) any lessee or permittee under a lease or permit issued by the United States prior to the issu-  
ance of an oil and gas lease for the same land subject to this bond, covering the use of the surface or the prospecting  
for, or development of, other mineral deposits in any portion of such land, to be paid to the United States. For such  
payment, well and truly to be made, we bind ourselves, and each of our heirs, executors, administrators, successors  
and assigns, jointly and severally.

If the amount of this bond is \$150,000 or if it is increased to that amount, the coverage shall extend to all of the prin-  
cipal's holdings of federal oil and gas leases in the United States, including Alaska, under the Acts cited in Sched-  
ule A.

If the amount of this bond is less than \$150,000, its coverage extends only to the principal's holdings of federal oil  
and gas leases in the States named in Schedule A and to any other State or States that may be named in a rider at-  
tached hereto by the lessor with the consent of the surety.

SCHEDULE A

Public Domain Leasing Act of February 25, 1920  
(30 U.S.C. Sec. 181)

NAMES OF STATES

All States

Acquired Lands Leasing Act of August 7, 1947  
(30 U.S.C. Sec. 351)

NAMES OF STATES

All States

The conditions of the foregoing obligations are such that, whereas the said principal has an interest in oil and gas leases issued under the Act or Acts cited in Schedule A of this bond: (1) as lessee; (2) as the approved holder of operating rights in all or part of the lands covered by such leases under operating agreements with the lessees; or (3) as designated operator or agent under such leases pending approval of an assignment or operating agreement; and

WHEREAS the principal is authorized to drill for, mine, extract, remove, and dispose of oil and gas deposits in or under the lands covered by the leases, operating agreements or designations and is obligated to comply with certain covenants and agreements set forth in such instruments; and

WHEREAS the principal and surety agree that without notice to the surety the coverage of this bond, in addition to the present holdings of the principal, shall extend to and include:

1. Any oil and gas lease hereafter issued to, or acquired by the principal in the States now named in Schedule A, or later named in a rider, the coverage to be confined to the principal's holdings under the Act or Acts cited at the head of the column in which the name of the State appears and to become effective immediately upon such issuance or upon departmental approval of a transfer in favor of the principal.

2. Any operating agreement hereafter entered into or acquired by the principal affecting oil and gas leases in the States now named in Schedule A, or later named in a rider. The coverage shall become

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

TO THE HONORABLE SECRETARY OF THE INTERIOR OF THE UNITED STATES:

Supron Energy Corporation, for the purpose of establishing qualifications of Southern Union Properties, Inc. to own and hold oil and gas leases on United States Public Lands, does hereby state:

1. Supron Energy Corporation is a corporation organized under the laws of the State of Delaware with its address being Bldg. V, Fifth Floor, 10300 North Central Expressway, Dallas, Texas 75231, and it is the owner and holder of all of the outstanding capital stock of Southern Union Properties, Inc.
2. Supron Energy Corporation is a publicly held corporation with its common stock listed on the American Stock Exchange. Southern Union Company, a Delaware corporation, with its address being Suite 1800, First International Building, Dallas, Texas 75270, is the owner and holder of approximately 27% of the outstanding stock of Supron Energy Corporation and no other party is known to hold beneficially more than 10% of Supron Energy Corporation's outstanding stock.
3. The percentage of voting stock of Supron Energy Corporation known to it to be owned by parties having addresses outside of the United States is less than one-fourth of one percent of the total outstanding stock of Supron Energy Corporation.

Respectfully submitted this 17th day of September, 1980.

SUPRON ENERGY CORPORATION

By: William S. Jameson  
William S. Jameson  
Vice President

STATE OF TEXAS        )  
                                  )  
COUNTY OF TEXAS    )

William S. Jameson, being first duly sworn, hereby states that he is Vice President of Supron Energy Corporation, and that as such officer, he has executed the above and foregoing statement on behalf of Supron Energy Corporation; that he has read such statement and that to the best of his knowledge, information and belief, all statements of fact contained herein are true and correct.

William S. Jameson  
William S. Jameson

SUBSCRIBED AND SWORN TO before me, the undersigned authority on this 17th day of September, 1980.

Notary Public  
Notary Public in and for  
Dallas County, Texas

My Commission expires:



KNOW ALL MEN BY THESE PRESENTS:

That American Home Assurance Company, a New York corporation, and National Union Fire Insurance Company of Pittsburgh, Pa., a Pennsylvania corporation, does each hereby appoint

H. A. Gibson; Joe Bruce; Janice G. Correy; Robert D. White; W. Lawrence Brown;  
 Dorothy Valek; William D. Baldwin; of Dallas, Texas

its true and lawful Attorney(s)-in-Fact, with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa. have each executed these presents



this 24 day of September, 1980

*J. A. Wilsterman*  
 J. A. Wilsterman, Vice President

STATE OF NEW YORK  
 COUNTY OF NEW YORK } ss.

On this 24 day of September, 1980

before me came the above named officer of American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa., to me personally known to be the individual and officer described herein, and acknowledged that he executed the foregoing instrument and affixed the seals of said corporations thereto by authority of his office.



*Judith G. Solarz*  
 JUDITH G. SOLARZ  
 Notary Public, State of New York  
 No. 30.01504628239  
 Qualified in Nassau County  
 Certificate filed in New York County  
 Commission Expires March 30, 1982.

CERTIFICATE

Excerpts of Resolutions adopted by the Boards of Directors of American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa. on May 18, 1976:

"RESOLVED, that the Chairman of the Board, the President, or any Vice President be, and hereby is, authorized to appoint Attorneys-in-Fact to represent and act for and on behalf of the Company to execute bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, and to attach thereto the corporate seal of the Company, in the transaction of its surety business;

"RESOLVED, that the signatures and attestations of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company when so affixed with respect to any bond, undertaking, recognizance or other contract of indemnity or writing obligatory in the nature thereof;

"RESOLVED, that any such Attorney-in-Fact delivering a secretarial certification that the foregoing resolutions still be in effect may insert in such certification the date thereof, said date to be not later than the date of delivery thereof by such Attorney-in-Fact."

I, Marion E. Fajen, Secretary of American Home Assurance Company and of National Union Fire Insurance Company of Pittsburgh, Pa. do hereby certify that the foregoing excerpts of Resolutions adopted by the Boards of Directors of these corporations, and the Powers of Attorney issued pursuant thereto, are true and correct, and that both the Resolutions and the Powers of Attorney are in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of each corporation

this 9th day of October, 1980



*Marion E. Fajen*  
 Marion E. Fajen, Secretary

effective immediately upon de[m]ental approval of the agreement or of a transfer of an operating agreement to the principal.

3. Any designation subsequent hereto of the principal as operator or agent of a lessee under a lease issued pursuant to the Act or Acts cited in Schedule A and covering lands in a State named in Schedule A, either presently or by rider. This coverage shall become effective immediately upon the filing of such a designation under a lease.

4. Any extension of a lease covered by this bond, such coverage to continue without any interruption due to the expiration of the term set forth in the lease.

Provided, that the surety may elect to have the additional coverage authorized under this paragraph become inapplicable as to all interests of the principal acquired more than thirty (30) days after the receipt of notice of such election by the Bureau of Land Management.

The surety hereby waives any right to notice of, and agrees that this bond shall remain in full force and effect notwithstanding:

1. A transfer or transfers, either in whole or in part, of any or all of the leases, or of the operating agreements, and further agrees to remain bound under this bond as to the interests either in the leases or in the operating agreements, or in both, retained by the principal when the approval of the transfer or transfers become effective.

2. Any modification of a lease or operating agreement, or obligations thereunder, whether made or effected by commitment of such lease or operating agreement to unit, cooperative, communitization or storage, agreements, or development contracts, suspensions of operations or production, waivers, suspensions or changes in rental, minimum royalty and royalties, compensatory royalty payments, or otherwise; and

WHEREAS the principal and surety hereby agree that notwithstanding the termination of any lease or leases, operating agreements or designations as operator or agent, covered by this bond, whether the termination is by operation of law or otherwise, the bond shall remain in full force and effect as to all remaining leases, operating agreements, or designations covered by the bond; and

WHEREAS the principal, as to any lease or part of a lease for lands as to which he has been designated as operator or agent, or approved as operator, in consideration of being permitted to furnish this bond in lieu of the lessees, agrees and by these presents does hereby bind himself to fulfill on behalf of each lessee all obligations of each such lease for the entire leasehold in the same manner and to the same extent as though he were the lessee; and

WHEREAS the principal and surety agree that the neglect or forbearance of said lessor in enforcing, as against the lessees of such lessor, the payment of rentals or royalties or the performance of any other covenant, condition or agreement of the leases, shall not, in any way, release the principal and surety, or either of them, from any liability under this bond; and

WHEREAS the principal and surety agree that in the event of any default under the leases, the lessor may commence and prosecute any claim, suit, action, or other proceeding against the principal and surety, or either of them, without the necessity of joining the lessees.

NOW, THEREFORE, IF said principal shall in all respects faithfully comply with all of the provisions of the leases referred to hereinbefore, then the above obligations are to be void; otherwise to remain in full force and effect.

Signed on this 9th day of October, 19 80, in the presence of:

NAMES AND ADDRESSES OF WITNESSES

ATTEST:

*Richard H. Mosh*

Assistant Secretary

Southern Union Properties, Inc.

By: *Bill Curtis* (L.S.)

(Principal)

Bill Curtis, Vice President

(Business address)

American Home Assurance Company

By: *Joe Bruce* (L.S.)

(Surety)

Joe Bruce, Attorney-in-Fact

(Business address)

*Laurie Sneed*  
Diamond Shamrock Tower  
19th Floor — Lock Box # 8  
Dallas, Texas 75201

*Bill Curtis*  
Diamond Shamrock Tower  
19th Floor — Lock Box # 8  
Dallas, Texas 75201

2001 Bryan Tower, 21st Floor  
Dallas, Texas 75201



American Home Assurance Company  
 National Union Fire Insurance Company of Pittsburgh, Pa.  
 Principal Bond Office: 102 Maiden Lane, New York, N. Y. 10005

POWER OF ATTORNEY

No. 09-B-06016

KNOW ALL MEN BY THESE PRESENTS:

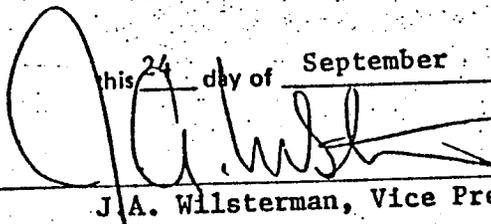
That American Home Assurance Company, a New York corporation, and National Union Fire Insurance Company of Pittsburgh, Pa., a Pennsylvania corporation, does each hereby appoint

H. A. Gibson; Joe Bruce; Janice G. Correy; Robert D. White; W. Lawrence Brown;  
 Dorothy Valek; William D. Baldwin; of Dallas, Texas

its true and lawful Attorney(s)-in-Fact, with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa. have each executed these presents



this 24 day of September, 1980  
  
 J. A. Wilsterman, Vice President

STATE OF NEW YORK }  
 COUNTY OF NEW YORK } ss.

On this 24 day of September, 1980,  
 before me came the above named officer of American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa., to me personally known to be the individual and officer described herein, and acknowledged that he executed the foregoing instrument and affixed the seals of said corporations thereto by authority of his office.



  
 JUDITH G. SOLARZ  
 Notary Public, State of New York  
 No. 30-01504628239  
 Qualified in Nassau County  
 Certificate filed in New York County  
 Commission Expires March 30, 1982

CERTIFICATE

Excerpts of Resolutions adopted by the Boards of Directors of American Home Assurance Company and National Union Fire Insurance Company of Pittsburgh, Pa. on May 18, 1976:

"RESOLVED, that the Chairman of the Board, the President, or any Vice President be, and hereby is, authorized to appoint Attorneys-in-Fact to represent and act for and on behalf of the Company to execute bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, and to attach thereto the corporate seal of the Company, in the transaction of its surety business;

"RESOLVED, that the signatures and attestations of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company when so affixed with respect to any bond, undertaking, recognition or other contract of indemnity or writing obligatory in the nature thereof;

"RESOLVED, that any such Attorney-in-Fact delivering a secretarial certification that the foregoing resolutions still be in effect may insert in such certification the date thereof, said date to be not later than the date of delivery thereof by such Attorney-in-Fact"

I, Marion E. Fajen, Secretary of American Home Assurance Company and of National Union Fire Insurance Company of Pittsburgh, Pa. do hereby certify that the foregoing excerpts of Resolutions adopted by the Boards of Directors of these corporations, and the Powers of Attorney issued pursuant thereto, are true and correct, and that both the Resolutions and the Powers of Attorney are in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of each corporation

this 30th day of January, 1981



  
 Marion E. Fajen, Secretary

American Home Assurance Company  
Granite State Insurance Company  
The Insurance Company of the State of Pennsylvania  
National Union Fire Insurance Company of Pittsburgh, Pa.  
New Hampshire Insurance Company



American International Companies  
Principal Bond Office  
70 Pine Street, New York, N. Y. 10005

SURETY RIDER

To be attached to and form a part of Bond No. 035153 dated October 9, 1980  
executed by Southern Union Properties, Inc. as Principal, and  
American Home Assurance Company as Surety, in favor of  
United States of America as Obligor.

In consideration of the premium charged, it is understood and agreed that, effective on January 1, 1981  
The name of Principal is hereby amended to read:  
Southern Union Exploration Company

Provided, however, that the liability of the Surety under the attached bond and under the attached bond as changed by this rider shall not be cumulative.  
Nothing herein contained shall be held to vary, waive, alter or extend any of the terms, conditions, agreements or warranties of the above-mentioned bond, other than as stated above.

Signed, sealed and dated January 30, 1981

*to A-14  
3/11/81*

Accepted:

SOUTHERN UNION EXPLORATION COMPANY  
(Principal) (Seal)

By Dwaine Houtchens Treasurer (Title)

\_\_\_\_\_  
(Obligor)

AMERICAN HOME ASSURANCE COMPANY  
(Surety)

By \_\_\_\_\_ (Title)

By Joe Bruce Attorney-in-Fact

# FILING FOR WATER IN THE STATE OF UTAH

## APPLICATION TO APPROPRIATE WATER

Rec. by SA  
 Fee Paid \$ 15.00  
 Platted 21652  
 Microfilmed \_\_\_\_\_  
 Roll # \_\_\_\_\_

For the purpose of acquiring the right to use a portion of the unappropriated water of the State of Utah, application is hereby made to the State Engineer, based upon the following showing of facts, submitted in accordance with the requirements of the Laws of Utah.

JAN 20 1987

WATER USER CLAIM NO. 09 - 1501

APPLICATION NO. T62248

WATER RIGHTS  
SALT LAKE

1. PRIORITY OF RIGHT: January 16, 1987 FILING DATE: January 16, 1987

2. OWNER INFORMATION

Name: Southern Union Exploration Company  
 Address: P.O. Box 2179, Farmington, NM 87499  
 The land is not owned by the applicant(s), see explanatory.

3. QUANTITY OF WATER: 5.0 acre feet (Ac. Ft.)

4. SOURCE: Benally Water Well DRAINAGE: San Juan River COUNTY: San Juan  
POINT(S) OF DIVERSION:

(1) S. 2340 feet, E. 1320 feet, from the NW Corner of Section 33,  
 Township 38 S, Range 25 E, SLB&M

Description of Diverting Works: Inch diameter well.

COMMON DESCRIPTION: 4 mi. NE Hatch Trading Post

5. NATURE AND PERIOD OF USE

Oil Exploration From January 30 to June 15.

6. PURPOSE AND EXTENT OF USE

Oil Exploratio: Oil Well Drilling

7. PLACE OF USE

The water is used in all or parts of each of the following legal subdivisions.

TOWN RANGE SEC	North East Quarter				North West Quarter				South West Quarter				South East Quarter			
	NE $\frac{1}{4}$	NW $\frac{1}{4}$	SW $\frac{1}{4}$	SE $\frac{1}{4}$	NE $\frac{1}{4}$	NW $\frac{1}{4}$	SW $\frac{1}{4}$	SE $\frac{1}{4}$	NE $\frac{1}{4}$	NW $\frac{1}{4}$	SW $\frac{1}{4}$	SE $\frac{1}{4}$	NE $\frac{1}{4}$	NW $\frac{1}{4}$	SW $\frac{1}{4}$	SE $\frac{1}{4}$
38 S 26 E 31											X					

All locations in Salt Lake Base and Meridian

EXPLANATORY

The surface owner is the BLM. Southern Union has the minerals.  
 The water will be used to drill the Southern Union Exploration Company  
 Tin Cup Federal #1-31 well. Location of the well is N. 2180 ft. & E. 460 ft.  
 from the SW Cor., Sec. 31, T38S, R26E, SLB&M.

\*\*\*\*\*

The applicant hereby acknowledges he/they are a citizen(s) of the United States or intends to become such a citizen.

\*\*\*\*\*

The quantity of water sought to be appropriated is limited to that which can be beneficially used for the purpose herein described.

\*\*\*\*\*

The undersigned hereby acknowledges that even though he/they may have been assisted in the preparation of the above-numbered application through the courtesy of the employees of the Division of Water Rights, all responsibility for the accuracy of the information contained therein, at the time of filing, rests with the applicant(s).

  
\_\_\_\_\_  
Signature of Applicant

STATE ENGINEER'S ENDORSEMENT

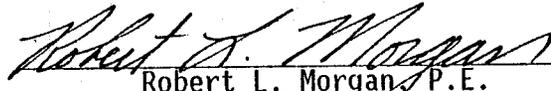
WATER RIGHT NUMBER: 09 - 1501

APPLICATION NO. T62248

1. January 16, 1987      Application received by MP.
  2. January 16, 1987      Application designated for APPROVAL by MP and SG.
  3. Comments:
- 
- 

Conditions:

This application is hereby APPROVED, dated January 30, 1987, subject to prior rights and this application will expire on January 30, 1988.

  
Robert L. Morgan, P.E.  
State Engineer

022302

OPERATOR Southern Union Exploration DATE 2-18-87

WELL NAME San Camp 1-31

SEC NW SW 31 T 38S R 26E COUNTY San Juan

43-037-31308  
API NUMBER

Fed  
TYPE OF LEASE

CHECK OFF:

PLAT

BOND

NEAREST WELL

LEASE

FIELD

POTASH OR OIL SHALE

PROCESSING COMMENTS:

No other well within 920'

Water or - #09-1501 (T02248)

APPROVAL LETTER:

SPACING:

203

UNIT

302

CAUSE NO. & DATE

302.1

STIPULATIONS:

1- Water



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

February 19, 1987

Southern Union Exploration Company  
P. O. Box 2179  
Farmington, New Mexico 87499

Gentlemen:

Re: Tin Cup 1-31 - NW SW Sec. 31, T. 38S, R. 26E  
2180' FSL, 460' FWL - San Juan County, Utah

Approval to drill the referenced well is hereby granted in accordance with Rule 302, Oil and Gas Conservation General Rules.

In addition, the following actions are necessary to fully comply with this approval:

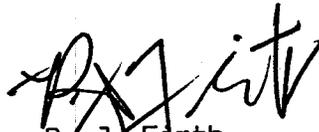
1. Spudding notification to the Division within 24 hours after drilling operations commence.
2. Submittal to the Division of completed Form OGC-8-X, Report of Water Encountered During Drilling.
3. Prompt notification to the Division should you determine that it is necessary to plug and abandon this well. Notify John R. Baza, Petroleum Engineer, (Office) (801) 538-5340, (Home) 298-7695, or R. J. Firth, Associate Director, (Home) 571-6068.
4. Compliance with the requirements and regulations of Rule 311.3, Associated Gas Flaring, Oil and Gas Conservation General Rules.
5. Prior to commencement of the proposed drilling operations, plans for toilet facilities and the disposal of sanitary waste at the drill site shall be submitted to the local health department having jurisdiction. Any such drilling operations and any subsequent well operations must be conducted in accordance with applicable State and local health department regulations. A list of all local health departments and copies of applicable regulations are available from the Division of Environmental Health, Bureau of General Sanitation, telephone (801) 533-6163.

Page 2  
Southern Union Exploration Company  
Tin Cup 1-31  
February 19, 1987

6. This approval shall expire one (1) year after date of issuance unless substantial and continuous operation is underway or an application for an extension is made prior to the approval expiration date.

The API number assigned to this well is 43-037-31308.

Sincerely,



R. L. Firth  
Associate Director, Oil & Gas

as  
Enclosures  
cc: Branch of Fluid Minerals  
D. R. Nielson  
8159T

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK <b>DRILL</b> <input checked="" type="checkbox"/> <b>DEEPEN</b> <input type="checkbox"/> <b>PLUG BACK</b> <input type="checkbox"/>			5. LEASE DESIGNATION AND SERIAL NO. U 54031
b. TYPE OF WELL OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/> SINGLE ZONE <input checked="" type="checkbox"/> MULTIPLE ZONE <input type="checkbox"/>			6. IF INDIAN, ALLOTTEE OR TRIBE NAME
2. NAME OF OPERATOR SOUTHERN UNION EXPLORATION COMPANY			7. UNIT AGREEMENT NAME
3. ADDRESS OF OPERATOR P. O. BOX 2179 FARMINGTON, NEW MEXICO 87499			8. FARM OR LEASE NAME Tin Cup
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)* At surface 460' FWL, 2180' FSL At proposed prod. zone Same			9. WELL NO. 1-31
14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE* 2.5 miles North & 6.4 miles East of Hatch Trading Post (See Map)			10. FIELD AND POOL, OR WILDCAT Wildcat-Ismay
15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 460'	16. NO. OF ACRES IN LEASE 120	17. NO. OF ACRES ASSIGNED TO THIS WELL 40	11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 31, T38S, R26E
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. N/A	19. PROPOSED DEPTH 6500'	20. ROTARY OR CABLE TOOLS Rotary 0" - 6500'	12. COUNTY OR PARISH   13. STATE San Juan   Utah
21. ELEVATIONS (Show whether DF, RT, GR, etc.) 5011 GR		22. APPROX. DATE WORK WILL START* Feb. 25, 1987	
23. PROPOSED CASING AND CEMENTING PROGRAM			

RECEIVED  
FEB 27 1987

DIVISION OF  
OIL, GAS & MINING

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

24. SIGNED Martin D. Boggs TITLE Drlg & Prod Supt DATE 2/2/87

(This space for Federal or State office use)

PERMIT NO. 43-037-31308 APPROVAL DATE \_\_\_\_\_

APPROVED BY Kenneth V. Rhea TITLE Acting DISTRICT MANAGER DATE FEB 26 1987

CONDITIONS OF APPROVAL, IF ANY:

FLARING OR VENTING OF  
GAS IS SUBJECT TO NTL 4-A

CONDITIONS OF APPROVAL ATTACHED

\*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.

COMPANY SOUTHERN UNION EXPLORATION COMPANY

LEASE TIN CUP FEDERAL WELL NO. 1-31

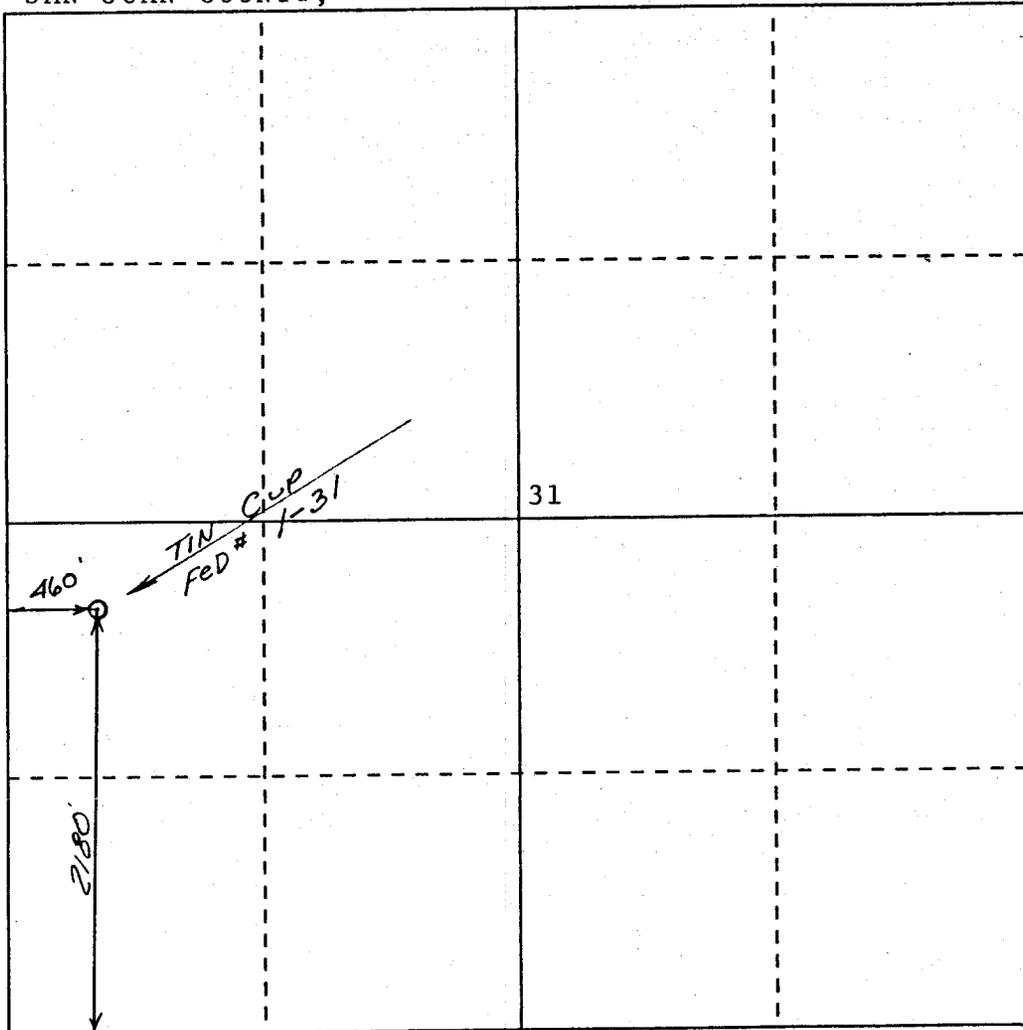
SEC. 31 T. 38 SOUTH R. 26 EAST, S.L.M.

LOCATION 2180 FEET FROM THE SOUTH LINE AND  
460 FEET FROM THE WEST LINE

ELEVATION 5011 UNGRADED GROUND

SAN JUAN COUNTY,

UTAH



SCALE - 1 INCH EQUALS 1000 FEET

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

SEAL:

*James P. Lane*  
Registered Land Surveyor.

UTAH REG. NO. 1472

SURVEYED DECEMBER 5, 19 86

Southern Union Exploration Company  
Well No. Tin Cup Federal 1-31  
Sec. 31, T. 38 S., R. 26 E.  
San Juan County, Utah  
Lease U-54031

CONDITIONS OF APPROVAL

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

A. DRILLING PROGRAM

1. The permitted TD is 5800 feet (as shown in the ten point plan) and not 6500 feet as shown on the APD cover sheet.
2. The surface casing will be set in the Chinle Formation.
3. The B.O.P.E. and surface casing must be tested to 2100 psi. The pipe rams will be closed daily and the blind rams will be closed on each trip to insure good working order. This will be reported on the drillers log.
4. The operator should be aware that a small water flow was experienced at 2887 feet (+2042 S.L.) on the Canyon State 3-36, 1706 feet to the northwest. The flow required 10 ppg mud to kill.

All lease operations will be conducted in full compliance with applicable regulations (43 CFR 3100), Onshore Oil and Gas Order 1, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors. A copy of these conditions and the approved plan will be made available to the field representative to insure compliance.

No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the District Office. If operations are to be suspended, prior approval of the District Office will be obtained and notification given before resumption of operations.

The spud date will be reported orally to the District Office within a minimum of 24 hours prior to spudding. Written notification in the form of a Sundry Notice (Form 3160-5) will be submitted to the District Office within 24 hours after spudding. If the spudding occurs on a weekend or holiday, the written report will be submitted on the following regular work day.

In accordance with Onshore Order No. 1 this well will be reported on Form 3160-6, "Monthly Report of Operation", starting with the month in which operations commence and continued each month until the well is plugged and abandoned. This report will be sent to the District Office, P.O. Box 970, Moab, Utah 84532.

Immediate Report: Spills, blowouts, fires, leaks, accidents, or any other unusual occurrences shall be promptly reported to the Area Office in accordance with requirements of NTL-3A.

If a replacement rig is needed for completion operations, a Sundry Notice (Form 3160-5) to that effect will be filed for prior approval from the District Office, and all conditions of this approved plan are applicable during all operations conducted with the replacement rig. In emergency situations verbal approval to bring on a replacement rig will be approved through the District Office.

Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted to the District Office not later than thirty (30) days after completion of the well or after completion of operations being performed, in accordance with 43 CFR 3164. Two copies of all logs, core descriptions, core analyses, well test data, geologic summaries, sample description, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4. Samples (cuttings, fluids, and/or gases) will be submitted when requested by the Moab District Manager.

If the well is to be completed for production the Area Office is to be contacted in order to set up a pre-production conference. When the well is placed in a producing status the District Office is to be notified by telegram or other written communication within five working days.

Approval to vent/flare gas during initial well evaluation will be obtained from the District Office. This preliminary approval will not exceed 30 days. Approval to vent/flare beyond this initial test period will require District Office approval pursuant to guidelines in NTL-4A.

No well abandonment operations will be commenced without the prior approval of the District Office. In the case of newly-drilled dry holes or failures, and in emergency situations, oral approval will be obtained from the District Office. A Subsequent Report of Abandonment (Form 3160-5) will be sent to the District Office within 30 days following completion of the well for abandonment. This report will indicate where plugs were placed and the current status of surface restoration. Final abandonment will not be approved until the surface reclamation work required by the approved APD or approved abandonment notice has been completed to the satisfaction of the Area Office, or the appropriate surface managing agency. Upon completion of approved plugging a dry hole marker will be erected in accordance with 43 CFR 3162.6. The top of the marker will be closed or capped. The following minimum information will be permanently placed on the marker; "Fed" or "Ind", as applicable, "Lease number", "Well number", location of well by 1/41/4 section, township, and range.

## B. THIRTEEN POINT SURFACE USE PLAN

### 1. Production Facilities

If a tank battery is constructed on this lease, it will be surrounded by a dike of sufficient capacity to contain 1 1/2 times the storage capacity of the battery.

All loading lines will be placed inside the berm surrounding the tank battery.

All site security guidelines identified in 43 CFR 3162.7 regulations will be adhered to. All product lines entering and leaving hydrocarbon storage tanks will be effectively sealed.

All off-lease storage, off-lease measurement, or commingling on-lease or off-lease will have prior written approval from the District Manager.

Gas meter runs for each well will be located within 500 feet of the wellhead. The gas flowline will be buried from the wellhead to the meter and 500 feet downstream of the meter run or any production facilities. Meter runs will be housed and/or fenced.

The oil and gas measurement facilities will be installed on the well location. The oil and gas meters will be calibrated in place before any deliveries. Tests for meter accuracy will be conducted monthly for the first 3 months on new meter installations and at least quarterly thereafter. The San Juan Area Manager will be provided with a date and time for the initial meter calibration and all future meter proving schedules. A copy of the meter calibration reports will be submitted to the San Juan Area Manager. All meter measurement facilities will conform with the API standards for liquid hydrocarbons and the AGA standard for natural gas measurement.

### 2. Water Supply

Use of water for this operation will be approved by obtaining a temporary use permit from the Utah State Engineer, (801) 637-1303 and by receiving permission from the land owner or surface management agency to use the land containing the water source.

040753

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

API # 43-037-31308

NAME OF COMPANY: SOUTHERN UNION EXPLORATION

WELL NAME: TINCUP FEDERAL I-31

SECTION NW SW 31 TOWNSHIP 38S RANGE 26E COUNTY SAN JUAN

DRILLING CONTRACTOR COLEMAN

RIG # 4

SPUDDED: DATE 3-26-87

TIME \_\_\_\_\_

How Rotary

DRILLING WILL COMMENCE \_\_\_\_\_

REPORTED BY June Raglin

TELEPHONE # (505) 327-4481

DATE 4-7-87

SIGNED Wm. Hutchinson

Dulg  
43-037-31308

FORM OGC-8-X

**RECEIVED**  
APR 14 1987

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING  
3 TRIAD CENTER, SUITE 350  
SALT LAKE CITY, UT 84180-1203

DIVISION OF  
OIL, GAS & MINING

041703

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number Tin Cup Federal 1-31  
Operator Southern Union Exp. Address FARMINGTON  
Contractor Coleman Dels Co. Address FARMINGTON  
Location NW 1/4 SW 1/4 Sec. 31 T. 38S R. 26E County S.J. UTAH

Water Sands

	<u>Depth</u>		<u>Volume</u>	<u>Quality</u>
	From	To	Flow Rate or Head	Fresh or Salty
1.	2940	2960	1/2" @ Flowline 200# SIP	<u>SALTY</u>
2.				
3.				
4.				
5.				

(Continue on reverse side if necessary)

Formation Tops attached

Remarks

- NOTE: (a) Report on this form as provided for in Rule 806, Oil and Gas Conservation General Rules.
- (b) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

# Formation Tops

Chinle	1490
Shinarump	2200
Moenkopi	2298
De Chelly	2370
Cuttler	2445
Cedar Mesa	2940
Halgaito	3534
Konahe Trail	4320
Upper Ismay	5412
Upper Ismay	5480
Lower Ismay	5578
Lower Ismay	5610
Gothic	5650
Desert Creek	5670
Chimney Rock	5741

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 DIVISION OF  
 OIL, GAS & MINING

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

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

Form approved.  
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.)

<p>1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/></p> <p>2. NAME OF OPERATOR Southern Union Exploration Company</p> <p>3. ADDRESS OF OPERATOR P. O. Box 2179 Farmington, NM 87499</p> <p>4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 460' FWL, 2180' FSL</p> <p>14. PERMIT NO.</p>	<p>5. LEASE DESIGNATION AND SERIAL NO. U-54031</p> <p>6. IF INDIAN, ALLOTTEE OR TRIBE NAME</p> <p>7. UNIT AGREEMENT NAME</p> <p>8. FARM OR LEASE NAME Tin Cup Federal</p> <p>9. WELL NO. 1-31</p> <p>10. FIELD AND POOL, OR WILDCAT Wildcat-Ismay</p> <p>11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 31, T38S, R26E</p> <p>12. COUNTY OR PARISH San Juan</p> <p>13. STATE Utah</p>
<p>15. ELEVATIONS (Show whether DF, RT, GR, etc.) 5011' GR</p>	

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

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input checked="" type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	

\*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.)\*

4-12-87 Set 1st plug at TD to 5620'.  
Set 2nd plug fro 5530'-5430'.  
Set 3rd plug at 1575'-1475'.  
Set 10 sks cement surface plug.  
Total of 110 sks of cement.

4-21-87 P/A marker was installed.

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APR 27 1987

DIVISION OF  
OIL, GAS & MINING

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

SIGNED Walter B. [Signature] TITLE Drlg. & Prod. Supt. DATE 4-23-87

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED BY THE STATE  
OF UTAH DIVISION OF  
OIL, GAS, AND MINING

\*See Instructions on Reverse Side. DATE: 4-28-87  
[Signature]

RE: Management Report

FR: Pat G. Harrell/rg

Tin Cup Federal #1-31 (cont'd)

04-12-87 Day 17: Depth @ 5753'. Plugged and abandoned well. 3  
hrs - P & A. 4 hrs - ND and clean pits. Released rig @  
1:00 pm on 4-11-87. Set 1st plug from TD to 5620'. Set  
2nd plug from 5530'-5430'. Set 3rd plug from 1575'-1475'.  
Set 10 sks surface plug. P & A information provided by  
Greg Noble of Utah BLM office. Total of 110 sks of  
cement.  
DC \$3,000 Accum \$206,750

FINAL REPORT!!!

4-21-87 PTA marker was installed.  
FINAL REPORT

SX  
 Tin Cup Federal #1-31  
 460' FWL & 2180' FSL  
 Sec. 31, T38S, R26E  
 San Juan County, Utah  
 Projected Depth 6500' Desert Creek  
 SX W.I. BPO 50%  
 SX W.I. APO 30%  
 SX N.R.I. BPO 39%  
 SX N.R.I. APO 22.8%

as of 04-14-87

04-09-87 Day 14: Depth @ 5,753'. MW 11.2 ppg, Vis 50, WL 12 cc.  
 8 1/2 hrs - Logging. 3 hrs - LD DC's. 7 1/2 hrs -  
 Waiting on orders. RU Welex and ran DIL/Guard log from  
 5754' to 1527' and CNL/FDC/GR from 5754' to 4690'. Ran GR  
 and caliper to 1527'.  
 DC \$24,300 Accum \$188,350

Upper Ismay	5412'	-363.5'
Anhydrite	5416'	-367.5'
Ismay Porosity	5480'	-431.5'
Hovenweep	5588'	-539.5'
Lower Ismay	5610'	-561.5'
Gothic	5652'	-603.5'
Desert Creek	5668'	-619.5'

04-10-87 Day 15: Depth @ 5,753'. MW 11.2 ppg, Vis 50, WL 12 cc.  
 4 hrs - Trip. 15 1/2 hrs - Waiting on orders. 2 hrs - PU  
 19 DC's. 2 1/2 hrs - PU DST test tools. Opened tool @  
 6:45 am.  
 DC \$4,050 Accum \$192,400

04-11-87 Day 16: Depth @ 5,753'. Ran DST #2 in the Ismay  
 Porosity. MW 11.2 ppg, Vis 50, WL 12 cc. 1 3/4 hrs -  
 Trip. 5 3/4 hrs - LD DP & DC. 12 1/2 hrs - DST #2. 3  
 1/2 hrs - WO Dowell.  
 DC \$11,350 Accum \$203,750

DST #2: Ismay Porosity from 5491' - 5532'. Pkrs set @  
 5481' and 5540'. Tools on location @ 12:00 am. 2:00 am -  
 PU Straddle pack tools and TIH. 6:45 am - Pump up  
 inflatable pkrs. 7:15 am - Opened tool. Had strong blow.  
 1 min - 2 psi, 2 mins - 11 psi, 4 mins - 20 psi, End of IF  
 - 26 psi. 7:20 am - ISI. Pressure bled off. Gas to  
 surface after 15 mins of SI period. 8:20 am - Opened  
 tools for final flow. Gas flowing. 15 mins - 10 psi, 30  
 mins - 8 psi, 45 mins - 4 psi, 60 mins - fluid to surface.  
 SI @ 9:20 am. Reversed out fluid, released pkrs and TOH.  
 IF - 5 mins, ISI - 60 mins, FF - 60 mins, FSI - 120 mins.

	<u>Upper Recorder</u>	<u>Lower Recorder</u>
IH	3144 psi	3208 psi
IF	1046-909 psi	1083-961 psi
ISI	3060 psi	3108 psi
FF	743-2257 psi	818-2327 psi
FSI	3033 psi	3062 psi
FH	3116 psi	3166 psi

Drill pipe recovery: 5442' of fluid.  
 200' of GCM, 800' of OCM & SW, 4442' of GCSW w/  
 trace of oil.

RW of top sample @ 65 deg F - 7500 ppm CL.  
 RW of middle sample @ 65 deg F - 60,000 ppm CL.  
 RW of bottom sample @ 65 deg F - 60,000 ppm CL.

SX  
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 San Juan County, Utah  
 Projected Depth 6500' Desert Creek  
 SX W.I. BPO 50%  
 SX W.I. APO 30%  
 SX N.R.I. BPO 39%  
 SX N.R.I. APO 22.8%

as of 04-08-87

04-07-87 Day 12: Drlg @ 5575', made 94' in 4 3/4 hrs of drlg in limestone and shale. Ran DST #1 in the Ismay Porosity. Bit #5, 7 7/8", Smith F-3, Serial #FE0876. In @ 4530', out @ 5490', made 960' in 69 1/2 hrs. ROP 13.68 fph. Bit #6, 7 7/8", Smith F-3, Serial #FE7387. In @ 5490', made 85' in 4 3/4 hrs. ROP 17.89 fph. WOB 40,000 lbs. RPM 60. BHA: Same. Deviation: 1 deg @ 5490'. MW 11.1 ppg, Vis 44, WL 9.6 cc, PH 12.5, CL 17,500 ppm, Solids 21%, Gels 4/11, YP 9, PV 14. Pump #1, DPI 700 HDL, 6" liner x 8" stroke, PP 1650 psi, SPM 92, GPM 270. 4 3/4 hrs - Drlg. 10 hrs - Trips. 1 1/4 hrs - Circ. 7 hrs - Testing. 1 hr - R. R. Made short trip and circ to condition hole for DST. POH w/ drill string. PU test tools. RIH to perform DST #1. Set pkrs @ 5458' and 5467'. Testing interval from 5467' to 5490'. Opened tool for initial flow @ 2:30 pm. Had 1 1/2" blow in bucket. 3" blow in 3 mins, 4" blow in 7 mins, 4" blow in 10 mins. Initial SI @ 2:40 pm. Final flow began @ 3:40 pm. 2" blow immediately, 11" after 4 mins, 12" after 5 mins, 13" after 20 mins, 15" after 25 mins, 17" after 30 mins, 20" after 25 mins, 25" after 45 mins, 31" after 50 mins, 34" after 55 mins, 37" @ end of FF. SI well @ 4:40 pm. Released tools and began TDH @ 6:40 pm. Tools out of hole @ 10:00 pm. Broke down and loaded out tools.

DST #1: Ismay Porosity from 5467' to 5490'

	Upper Recorder	Lower Recorder
IH	3120 psi	3145 psi
IF	56-75 psi	80-99 psi
ISI	2150 psi	2180 psi
FF	75-94 psi	99-126 psi
FSI	2150 psi	2180 psi
FH	3101 psi	3140 psi

Drill pipe recovery: 250' of slightly GCM.  
 Sample Chamber: Pressure - 60 psi, 2100 cc w/ 2050 cc of mud and gas TSTM. CL - 7200 ppm.  
 DC \$8,650 Accum \$159,200

04-08-87 Day 13: Depth @ 5,753', made 178' in 16 hrs of drlg in limestone and shale. Bit #6, 7 7/8", Smith F-3, Serial #FE7387. In @ 5490', out @ 5753', made 263' in 20 3/4 hrs. ROP 12.67 fph. WOB 40,000 lbs. RPM 60. BHA: Same. MW 11.2 ppg, Vis 55, WL 9.6 cc, PH 12.0, CL 7500 ppm, Solids 21%, Gels 4/11, YP 14, PV 17. Pump #1, DPI 700 HDL on stand by. Pump #2, Wilson 600, 5 1/2" liner x 14" stroke, PP 1650 psi, SPM 50, GPM 220. 16 hrs - Drlg. 1 hr - Trip. 6 1/2 hrs - Circ and WD loggers. 1/2 hr - R.S. Reached total depth @ 10:30 pm.  
 DC \$4,850 Accum \$164,050

SX  
 Tin Cup Federal #1-31  
 460' FWL & 2180' FSL  
 Sec. 31, T38S, R26E  
 San Juan County, Utah  
 Projected Depth 6500' Desert Creek  
 SX W.I. BPO 50%  
 SX W.I. APO 30%  
 SX N.R.I. BPO 39%  
 SX N.R.I. APO 22.8%

as of 04-07-87

04-04-87 Day 9: Drlg @ 4978', made 341' in 23 hrs of drlg in shale. Bit #5, 7 7/8" Smith F-3, Serial #FT0876. In @ 4530', made 448' in 29 1/2 hrs. ROP 15.19 fph. WOB 45,000 lbs. RPM 75. BHA: Same. MW 11.2 ppg, Vis 55, WL 18 cc, PH 12.0, CL 13,900 ppm, Solids 19%, Gels 8/19, YP 14, PV 12. Pump #1, OPI 700 HDL, 6" liner x 8" stroke, PP 2100 psi, SPM 92, GPM 270. 23 hrs - Drlg. 1/2 hr - R. S. 1/2 hr - Rig Repair.  
 DC \$6,500 Accum \$137,100

04-05-87 Day 10: Drlg @ 5278', made 300' in 22 hrs of drlg in shale. Bit #5, 7 7/8" Smith F-3, Serial #FT0876. In @ 4530', made 748' in 51 1/2 hrs. ROP 14.52 fph. WOB 45,000 lbs. RPM 75. BHA: Same. Deviation: 3/4 deg @ 5054'. MW 11.2 ppg, Vis 51, WL 10 cc, PH 12.5, CL 10,500 ppm, Solids 20%, Gels 9/27, YP 20, PV 18. Pump #1, OPI 700 HDL, 6" liner x 8" stroke, PP 2100 psi, SPM 92, GPM 270. 22 hrs - Drlg. 1/2 hr - R.S. 1/2 hr - Survey.  
 DC \$5,850 Accum \$142,950

04-06-87 Day 11: Circulating a drlg break for samples @ 5481', made 203' in 18 hrs of drlg in shale, anhydrite and limestone. Bit #5, 7 7/8", Smith F-3, Serial #FT0876. In @ 4530', made 951' in 69 1/2 hrs. ROP 13.68 fph. WOB 40,000 lbs. RPM 60. BHA: Same. MW 11.1 ppg, Vis 48, WL 11 cc, PH 12.5, CL 9500 ppm, Solids 22%, Gels 11/3, YP 7, PV 17. Pump #1, OPI 700 HDL, 6" liner x 8" stroke, PP 2100 psi, SPM 92, GPM 270. 18 1/2 hrs - Drlg. 1 hr - Circ for samples. 1/2 hr - R.S. 4 1/2 hrs - Waiting on and installing csg rubbers on drill pipe. Had been getting metal in mud returns. Currently circ samples and preparing to run DST #1. Had to repair leak in reserve pit wall.  
 DC \$7,600 Accum \$150,550

Upper Ismay	5402'	-353.5'
Anhydrite	5408'	-359.5'
Ismay Porosity	5475'	-426.5'

Mud logger's Report:

Short trip gas @ 5435' - 275 units: C1-112, C2-88, C3-16, BGG - 22 units: C1-24, C2-8, C3-2  
 CG - 10 unit increase from BGG.  
 5475' - 5485': Went from 6 mpf to 3 mpf  
 5485' - 5490': Went from 3 mpf to 1 mpf  
 Total Gas - 110 units: C1-80, C2-44, C3-12, C4-2

General Lithology:

Anhydrite: w/ red mud stains, amorphous, soft

Dolomite: 5475'-5485': lt grey to lt grey brown, crystalline to micro crystalline, generally dense, few fine to medium vugs, argillaceous to very argillaceous. No stain. Trace of pale fluorescence. Trace of streaming cut. Fair to poor intra crystalline porosity. 8% to trace of fair to vugular porosity.

5485'-5490': Same as above. Abundant bright yellow flourescence w/ good streaming cut.

MB

RE: Management Report

PR: Pat G. Harrell/rg

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 San Juan County, Utah  
 Projected Depth 6500' Desert Creek  
 SX W.I. BPO 50%  
 SX W.I. APD 30%  
 SX N.R.I. BPO 39%  
 SX N.R.I. APD 22.8%

as of 04-03-87



- 03-30-87 PD @ 3:00 pm. Pumped 75 sks of DSLW cmt down csg annulus. (cont'd) Cmt fell to 20' from surface. Will fill up excess hole w/ pea gravel on Monday. 2 1/2 hrs - Drlg. 1/2 hr - RS. 4 hrs - Running csg and cmtg. 6 hrs - WOC. 4 hrs - NU BOP's. 1 hr - Testing BOP's. 6 hrs - Leveling rig (location has settled 5" under rig). DC \$23,750 Accum \$74,800
- 03-31-87 Day 5: Drlg @ 2528', made 1000' in 18 hrs of drlg in shale and sand. Bit #4, 7 7/8", ATJ-22C, Serial #MJ114. In @ 1528', made 1000' in 18 hrs. ROP - 55.56 fph. WOB 40,000 lbs. RPM 70. BHA: bit, junk basket, bit sub, 24 - 6 1/2" DC's, 4 jts of heavy wt drill pipe. Deviation: 1 3/4 deg @ 2007'. Drlg w/ water. Pump #1, OBI 700 HDL, 5 1/2" liner x 8" stroke, SPM 96, PP 2000 psi, GPM 236. Drl'd cmt and 5' of formation. Tested csg seat to 12 ppg equivalent for 30 mins. 3 hrs - Drlg cmt and 5' of formation. 1 1/2 hrs - Tested BOP's and casing seat. 1 hr - Trip. 18 hrs - Drlg. 1/2 hr - Survey. DC \$17,650 Accum \$92,450
- 04-01-87 Day 6: Drlg @ 3560', made 1032' in 23 hrs of drlg in sand and shale. Bit #4, 7 7/8", ATJ-22C, Serial #MJ114. In @ 1528', made 2032' in 41 hrs. ROP 49.56 fph. WOB 40,000 lbs. RPM 70. BHA: Same. Deviation: 1/2 deg @ 2458', 1/2 deg @ 3055'. Drlg w/ water. Pump #1, OBI 700 HDL, 5 1/2" liner x 8" stroke, PP 2000 psi, SPM 96, GPM 236. 23 hrs - Drlg. 1 hr - Survey. Used caterpillar to repair leak in reserve pit. Encountered water flow @ 2940' of 1/2" stream. DC \$18,200 Accum 110,650
- 04-02-87 Day 7: Drlg @ 4,411', made 851' in 21 1/2 hrs of drlg in shale. Bit #4, 7 7/8", ATJ-22C, Serial #MJ114. In @ 1528', made 2883' in 62 1/2 hrs. ROP 46.13 fph. WOB 40,000 lbs. RPM 70. BHA: Same. Deviation: 3/4 deg @ 3516', 1 1/4 deg @ 4043'. Drlg w/ water. Pump #1, OBI 700 HDL, 6" liner x 8" stroke, PP 2200 psi, SPM 96, GPM 280. 21 1/2 hrs - Drlg. 1/2 hr - Circ and kill water flow. 1/2 hr - R.S. 1 hr - Survey. 1/2 hr - Clean tanks for mud-up. DC \$15,300 Accum \$125,950
- 04-03-87 Day 8: Drlg @ 4637', made 226' in 12 1/2 hrs of drlg in shale. Bit #4, 7 7/8" ATJ-22C, Serial #MJ114. In @ 1528', out @ 4530', made 3002' in 68 1/2 hrs. ROP 43.82 fph. Bit #5, 7 7/8", Smith F-3, Serial #FT0876. In @ 4530', made 107' in 6 1/2 hrs. ROP 16.46 fph. WOB 45,000 lbs. RPM 75. BHA: bit, bit sub, 24 - 6 1/2" DC's, 4 jts of heavy wt drill pipe - 836.19'. Deviation: 1 1/2 deg @ 4530'. MW 11.2 ppg, Vis 40, WL 16 cc, PH 10.5, CL 14,500 ppm, Solids 16.5%, Gels 4/13, YP 12. Pump #1, OBI 700 HDL, 6" liner x 8" stroke, PP 2000 psi, SPM 96, GPM 280. 12 1/2 hrs - Drlg. 5 hrs - Trip. 5 hrs - Mixed mud and raised MW to 11.2 ppg to kill waterflow. 1 1/2 hrs - Tested BOP and stand valve to 2100 psi for BLM requirements. Shot a graded elevation level. DC \$4,550 Accum \$130,500

Graded Elevation - 5036.4' KB Elevation - 5048.5'  
 Honaker Trail 4346' +702.5'

SX

Tin Cup Federal #1-31  
 460' FWL & 2180' FSL  
 Sec. 31, T28S, R25E  
 San Juan County, Utah  
 Projected Depth 6500' Desert Creek  
 SX W.I. BPO 50%  
 SX W.I. APO 30%  
 SX N.R.I. BPO 39%  
 SX N.R.I. APO 22.8%

as of 03-30-87

- 03-04-87 Building road and location. Had numerous interruptions due to high water levels in Montezuma Creek.  
 DC \$25,000 Accum \$25,000
- 03-27-87 Day 1: MIRU Coleman Drilling Rig #4. Drlg @ 65', made 65' in 3 hrs of drilling in surface rock. Bit #1, 17 1/2" OWB rerun. In @ 0', made 65' in 3 hrs. ROP - 21.67 fph. WOB 15,000 lbs, RPM 120. Pump #1: OPI 700 HDL, 5 1/2" liner, SPM 95, GPM 240, PP 900 psi. MW 8.5 ppg. Spud well at 3:00 am on 3-27-87. BHA: bit, shock sub, 1 - 8" DC. 12 hrs - RU. 2 hrs - Mixing mud. 4 hrs - Drlg rat and mouse holes. 3 hrs - Drlg.  
 DC \$1,150 Accum \$26,150
- 03-28-87 Day 2: Drlg @ 270', made 205' in 9 hrs of drlg in sand and shale. Bit #1, 17 1/2" OWB rerun. In @ 0', out @ 76', made 76' in 4 1/2 hrs. ROP 16.89 fph. Bit #2, 12 1/4", F-3 rerun. In @ 76', made 194' in 7 1/2 hrs. ROP 25.87 fph. WOB 20,000 lbs. RPM 90. BHA: bit, shock sub, 2 - 8" DC's, 2 - 6 1/2" DC's. Pump # 1, OBI 700 HDL, 5 1/2" liner x 8" stroke, SPM 102, PP 1000 psi, GPM 250. Pump #2, Wilson 600, 5 1/2" liner x 14" stroke, SPM 52, PP 1000 psi, GPM 225. Drlg w/ water to 76'. TOH. RU and ran 2 jts of 13 3/8", 54 ppf casing (66'). Set csg @ 76' (KB). Cmtd w/ 130 sks of Class "B" containing 2% CaCl2. Circ cmt to surface. PD @ 1:30 pm. WOC. TIH w/ a 12 1/4" bit and resumed drlg. Deviation: 1/2 deg @ 132'. 9 hrs - Drlg. 1 hr - Trip. 2 1/2 hrs - Circ. 1/2 hr - Survey. 2 1/2 hrs - Ran and cemented casing. 8 hrs - WOC. 1/2 hr - Drlg cmt.  
 DC \$4,500 Accum \$30,650
- 03-29-87 Day 3: Drlg @ 1425', made 1155' in 20 1/2 hrs of drlg in sand and shale. Bit #2, 12 1/4" F-3 rerun. In @ 76', out @ 1270', made 1194' in 25 1/2 hrs. ROP 46.82 fph. Bit #3, 12 1/4" F-3 rerun. In @ 1270', made 155' in 2 hrs. ROP 77.50 fph. WOB 45,000 lbs. RPM 85. BHA: bit, shock sub, 24 - 6 1/2" DC's, 4 jts heavy wt drill pipe. Pump #1 OBI 700 HDL, 5 1/2" liner x 8" stroke, SPM 102, PP 1000 psi, GPM 250. Pump #2, Wilson 600, 5 1/2" liner x 14" stroke, SPM 52, PP 1000 psi, GPM 225. Drlg w/ water. Deviation: 1 deg @ 608', 1 3/4 deg @ 1068'. 20 1/2 hrs - Drlg. 3 hrs - Trip. 1/2 hr - Survey.  
 DC \$20,400 Accum \$51,050
- 03-30-87 Day 4: Depth @ 1528', made 103' in 2 1/2 hrs of drlg in sand and shale. Bit #3, 12 1/4" F-3 RR. In @ 1270', out @ 1528', made 258' in 4 1/2 hrs. ROP 57.33 fph. WOB 45,000 lbs. RPM 85. Surveys: 2 deg @ 1528'. Drlg in water. Circ and cond hole. PDH w/ drill string and BHA. RU to run csg. RIH w/ guide shoe, 8 5/8" float jt, insert collar, 35 jts of 24 ppf, K-55, ST&C csg. Length - 1530.44'. Csg set @ 1528' KB. Ran 5 centralizers. Circ and cond hole. RU Dowell Schlumberger and cmtd w/ 550 sks of DSLW III + 2% CaCl2 + 0.25 lb/sk D29 (celloflake). Tailed in w/ 200 sks of Class "B" cmt and 2% CaCl2. Initial slurry 12.3 ppg. Final slurry 15.6 ppg. Good circulation through out job. Cmt did not circ to surface.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE

(See other instructions on reverse side)

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

12

WELL COMPLETION OR RECOMPLETION REPORT AND LOG \*

1a. TYPE OF WELL: OIL WELL  GAS WELL  DRY  Other \_\_\_\_\_

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

2. NAME OF OPERATOR  
Southern Union Exploration Company

3. ADDRESS OF OPERATOR  
P. O. Box 2179 Farmington, NM 87499

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface 460' FWL, 2180' FSL

At top prod. interval reported below  
At total depth same

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APR 27 1987

DIVISION OF  
OIL, GAS & MINING

4303731308  
14. PERMIT NO. 3162 (U-065) | DATE ISSUED 2-26-87

5. LEASE DESIGNATION AND SERIAL NO.  
U-54031

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT ACREAGE  
042806

8. FARM OR LEASE NAME  
Tin Cup Federal

9. WELL NO.  
1-31

10. FIELD AND POOL, OR WILDCAT  
Wildcat-Ismay

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
Sec 31, T38S, R26E

12. COUNTY OR PARISH  
San Juan

13. STATE  
Utah

15. DATE SPUDDED 3-27-87 | 16. DATE T.D. REACHED 4-08-87 | 17. DATE COMPL. (Ready to prod.) | 18. ELEVATIONS (DF, REB, RT, GR, ETC.)\* 5011' GR | 19. ELEV. CASINGHEAD 5011' GR

20. TOTAL DEPTH, MD & TVD 5753' | 21. PLUG, BACK T.D., MD & TVD Plugged | 22. IF MULTIPLE COMPL., HOW MANY\* | 23. INTERVALS DRILLED BY | ROTARY TOOLS | CABLE TOOLS

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\* | 25. WAS DIRECTIONAL SURVEY MADE Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN  
DIL/Guard, CNL/FDC/GR | 4-14-87 SPECTRAL DENSITY DSN II | 27. WAS WELL CORED No

28. 4-14-87 CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13 3/8	54	76'	17 1/2"	130 sks Class B 2% CaCl <sub>2</sub>	None
8 5/8	24	1528'	12 3/4"	750 sks Class B 2% CaCl <sub>2</sub>	None

29. LINER RECORD

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

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

31. PERFORATION RECORD (Interval, size and number)

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED

33.\* PRODUCTION

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

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

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

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) | TEST WITNESSED BY

35. LIST OF ATTACHMENTS

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

SIGNED Max U. Boyer TITLE Drlg. & Prod. Supt. DATE 4-23-87

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

# COLEMAN DRILLING CO.

Drawer 3337  
Farmington, New Mexico 87499  
(505) 325-6892—24 hour  
(505) 327-4935

APRIL 15, 1987

SOUTHERN UNION EXPLORATION COMPANY  
1201 ELM STREET SUITE 1800  
DALLAS, TEXAS 75270

RECEIVED  
APR 27 1987

DIVISION OF  
OIL, GAS & MINING

THIS LETTER IS TO CERTIFY THAT COLEMAN DRILLING COMPANY DID RUN  
DEVIATION AT THE LISTED DEPTHS ON YOUR TIN CUP FEDERAL # 1-31  
LOCATED IN SECTION 31, T-38-S, R-26-E SAN JUAN COUNTY, UTAH

<u>DEPTH</u>	<u>DEGREE DEVIATION</u>
132'	1/2°
608'	1°
1086'	1 3/4°
1525'	2°
2007'	1 3/4°
2498'	1/2°
3055'	1/2°
3516'	3/4°
4043'	1 1/4°
5054'	3/4°
5490'	1°

TO THE BEST OF MY KNOWLEDGE, I SWEAR THIS INFORMATION TO BE TRUE.

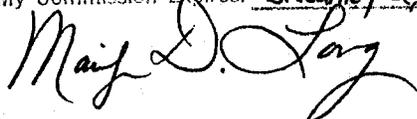
SINCERELY,



L. O. VAN RYAN  
PRESIDENT



OFFICIAL SEAL  
MARILYN D. LONG  
NOTARY PUBLIC - NEW MEXICO  
Notary Bond Filed with Secretary of State  
My Commission Expires: January 2, 1988



Contractor Coleman Drilling Top Choke 1"  
 Rig No. #4 Bottom Choke 3/4"  
 Spot -- Size Hole 7 7/8"  
 Sec. 31 Size Rat Hole --  
 Twp. 38S Size & Wt. D. P. --  
 Rng. 26E Size Wt. Pipe --  
 Field -- I. D. of D. C. 2 1/2"  
 County San Juan Length of D. C. 712 ft  
 State Utah Total Depth 5490 ft  
 Elevation 5026 ft Interval Tested 5462-5490 ft  
 Formation Upper Istmay Type of Test Bottom Hole Conventional

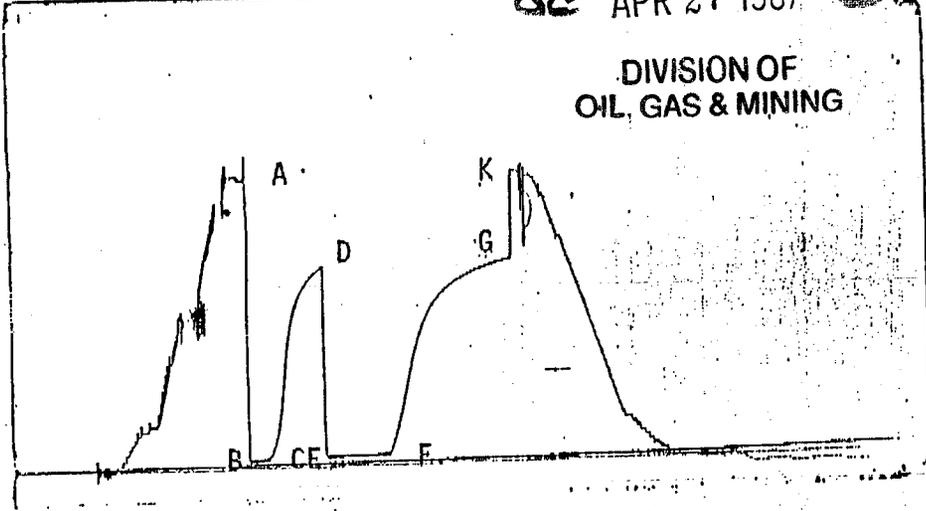
Flow No. 1 10 Min.  
 Shut-in No. 1 60 Min.  
 Flow No. 2 60 Min.  
 Shut-in No. 2 120 Min.  
 Flow No. 3 -- Min.  
 Shut-in No. 3 -- Min.

Bottom Hole Temp. 128<sup>o</sup>F  
 Mud Weight 11.2  
 Gravity --  
 Viscosity 45

Tool opened @ 2:30 am

Address  
 P.O. Box 2179  
 Farmington, NM 87499

**RECEIVED**  
 APR 27 1987



PRD Make Kuster K-3  
 No. 7661 Cap. 4900 @ 5477'

	Press	Corrected
Initial Hydrostatic	A	3150
Final Hydrostatic	K	3135
Initial Flow	B	82
Final Initial Flow	C	98
Initial Shut-in	D	2163
Second Initial Flow	E	107
Second Final Flow	F	117
Second Shut-in	G	2199
Third Initial Flow	H	--
Third Final Flow	I	--
Third Shut-in	J	--

Ticket No. 257-79851  
 Date 4-6-87

Lynes Dist.: Farmington, NM  
 Our Tester: Dave Dolyniuk  
 Witnessed By: Martin Boggs

Did Well Flow — Gas No Oil No Water No  
 RECOVERY IN PIPE: 750 ft. Slight gas cut mud = 1.22 bbls.

Blow Description:  
 1st flow: Tool opened with a 1 1/2" blow increased to 4" in 7 minutes and remained throughout the flow.  
 2nd flow: Tool opened with a 2" blow increased to 37" at the end of the flow.

Comments: The test results indicate a mechanically successful test. The flow and shut-in curves suggest relatively low permeability within the zone tested. The initial and final shut-in curves were incremented and plotted but no accurate extrapolations could be performed due to insufficient curve development.

No. Final Copies: 14

Location: 31-388-26E  
 Test Type: BOTTOM HOLE CONVENTIONAL  
 Formation: UPPER 18T MAY

Recorder Number: 7661  
 Recorder Depth: 5477 ft

TIME-PRESSURE LISTING

CHART LABEL	COMMENTS	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt ABSCISSA	PRESSURE SQUARED psi <sup>2</sup> /10 <sup>6</sup>
A	Initial Hydrostatic:	0.000		3150.0		
B	Start of 1st Flow :	0.000		82.0		
C	End of 1st Flow :	10.000	16.0	98.0		
Flow time used for SHUT-IN PERIOD 1 = 10.000 minutes						
SHUT-IN PERIOD 1		0.000	0.0	98.0	0.0000	
		5.000	86.0	184.0	3.0000	
		10.000	257.0	355.0	2.0000	
		15.000	402.0	700.0	1.6667	
		20.000	1086.0	1184.0	1.5000	
		25.000	1430.0	1528.0	1.4000	
		30.000	1630.0	1728.0	1.3333	
		35.000	1761.0	1859.0	1.2857	
		40.000	1852.0	1950.0	1.2500	
		45.000	1925.0	2023.0	1.2222	
		50.000	1983.0	2081.0	1.2000	
		55.000	2027.0	2125.0	1.1818	
D	End of 1st Shut-in :	60.000	2065.0	2163.0	1.1667	
E	Start of 2nd Flow :	0.000		107.0		
F	End of 2nd Flow :	60.000	10.0	117.0		
Flow time used for SHUT-IN PERIOD 2 = 70.000 minutes						
SHUT-IN PERIOD 2		0.000	0.0	117.0	0.0000	
		5.000	156.0	273.0	15.0000	
		10.000	344.0	461.0	8.0000	
		15.000	581.0	698.0	5.6667	
		20.000	832.0	949.0	4.5000	
		25.000	1075.0	1192.0	3.8000	
		30.000	1275.0	1392.0	3.3333	
		35.000	1421.0	1538.0	3.0000	
		40.000	1534.0	1651.0	2.7500	
		45.000	1619.0	1736.0	2.5556	
		50.000	1688.0	1805.0	2.4000	
		55.000	1746.0	1863.0	2.2727	
		60.000	1794.0	1911.0	2.1667	
		65.000	1835.0	1952.0	2.0769	
		70.000	1869.0	1986.0	2.0000	
		75.000	1902.0	2019.0	1.9333	
		80.000	1931.0	2048.0	1.8750	

DST #: 1

TIN CUP FEDERAL #1-31

5467.0 ft. - 5490.0 ft.

Location: 31-388-26E  
 Test Type: BOTTOM HOLE CONVENTIONAL  
 Formation: UPPER ISTMAY

Recorder Number: 7661  
 Recorder Depth: 5477 ft

TIME-PRESSURE LISTING  
 -----

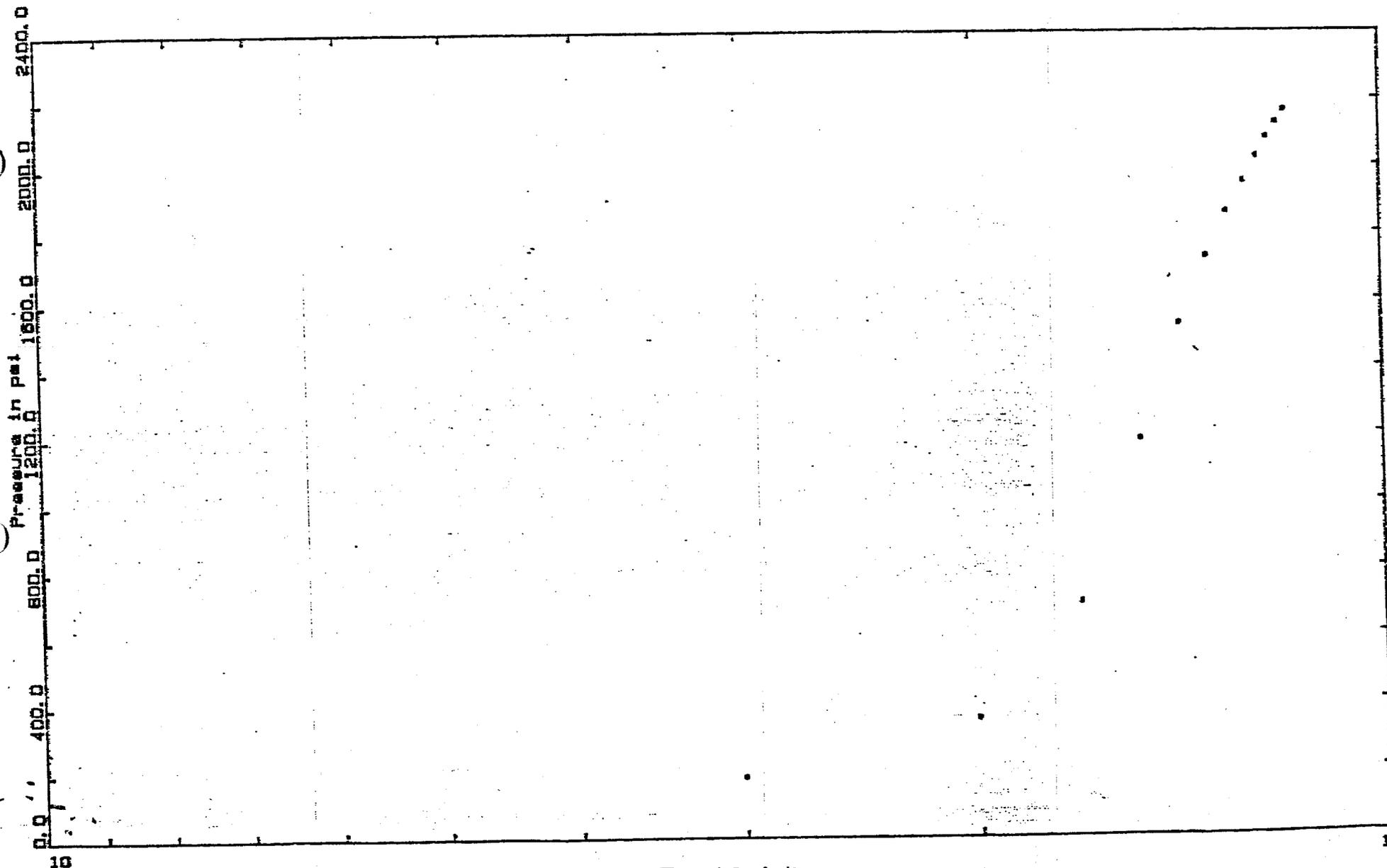
CHART LABEL	COMMENTS	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt ABSCISSA	PRESSURE SQUARED psi <sup>2</sup> /10 <sup>6</sup>
		85.000	1956.0	2073.0	1.8235	
		90.000	1981.0	2098.0	1.7778	
		95.000	2001.0	2118.0	1.7368	
		100.000	2020.0	2137.0	1.7000	
		105.000	2039.0	2156.0	1.6667	
		110.000	2053.0	2170.0	1.6364	
		115.000	2070.0	2187.0	1.6087	
		120.000	2082.0	2199.0	1.5833	
G	End of 2nd Shut-in :	120.000				
Q	Final Hydrostatic :	0.000		3135.0		

Horner Plot (Liquid) - SHUT-IN #1

OPERATOR: SOUTHERN UNION EXPLORATION COMPANY  
LOCATION: 31-30S-26E  
RECORDER: 7881

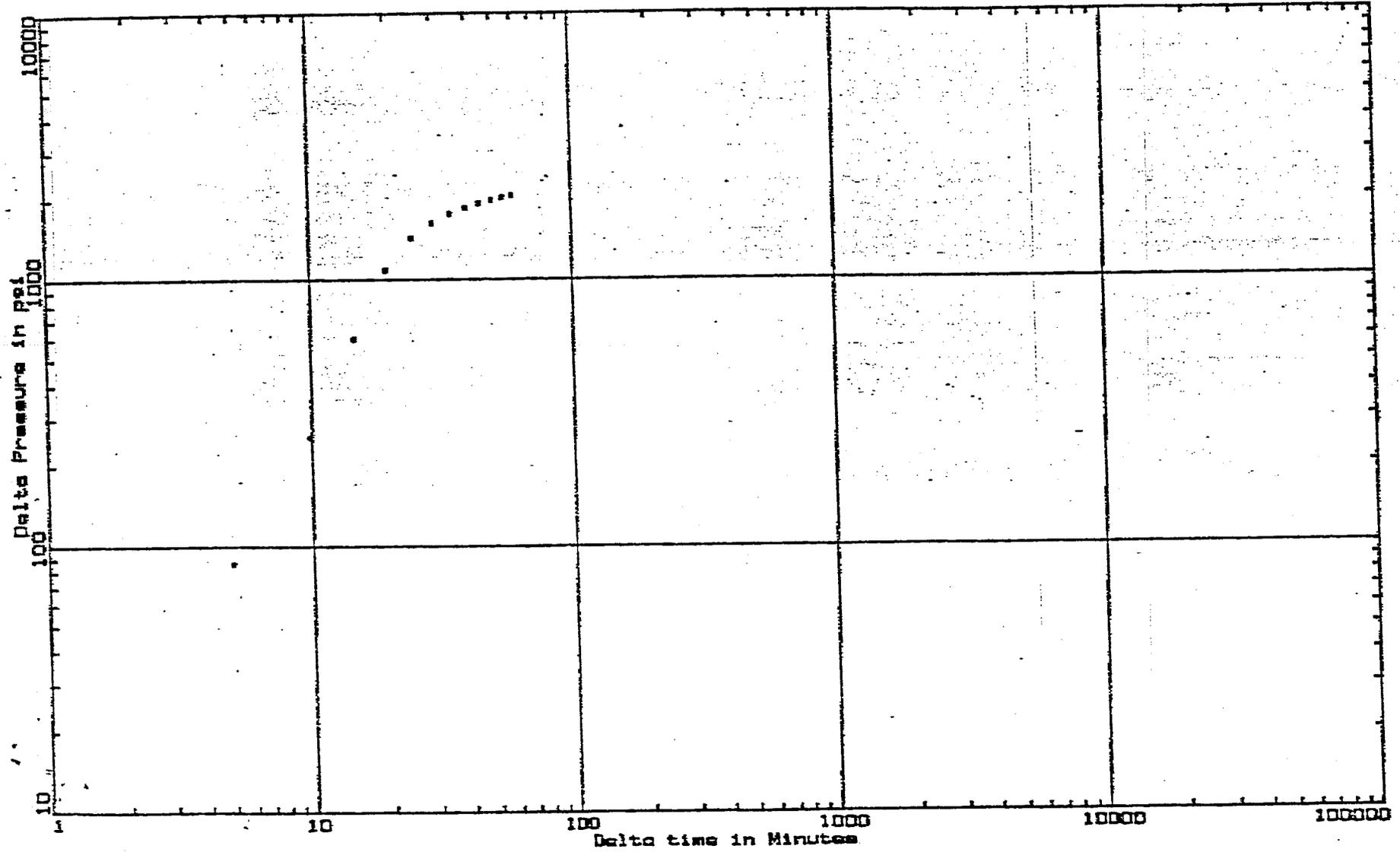
WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 1  
DEPTH: 5477.0 ft

Total Flowtime used = 10.00 Minutes



Log - Log Plot Shut-in #1 (Liquid)  
OPERATOR: SOUTHERN UNION EXPLORATION COMPANY  
LOCATION: 31-38S-26E  
RECORDER: 7881

WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 1  
DEPTH: 5477.0 ft

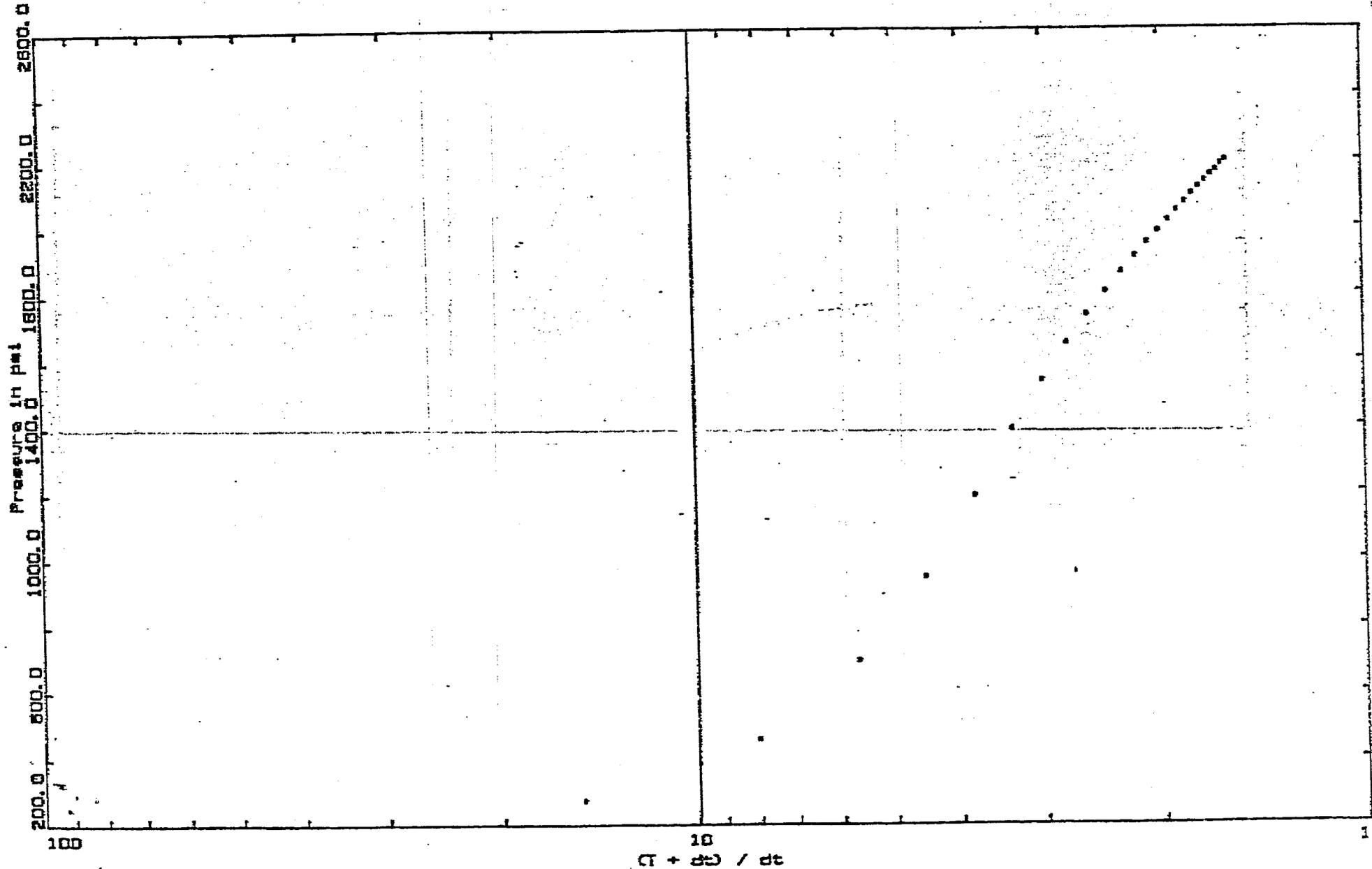


Horner Plot (Liquid) - SHUT-IN #2

OPERATOR: SOUTHERN UNION EXPLORATION COMPANY  
LOCATION: 31-385-28E  
RECORDER: 7661

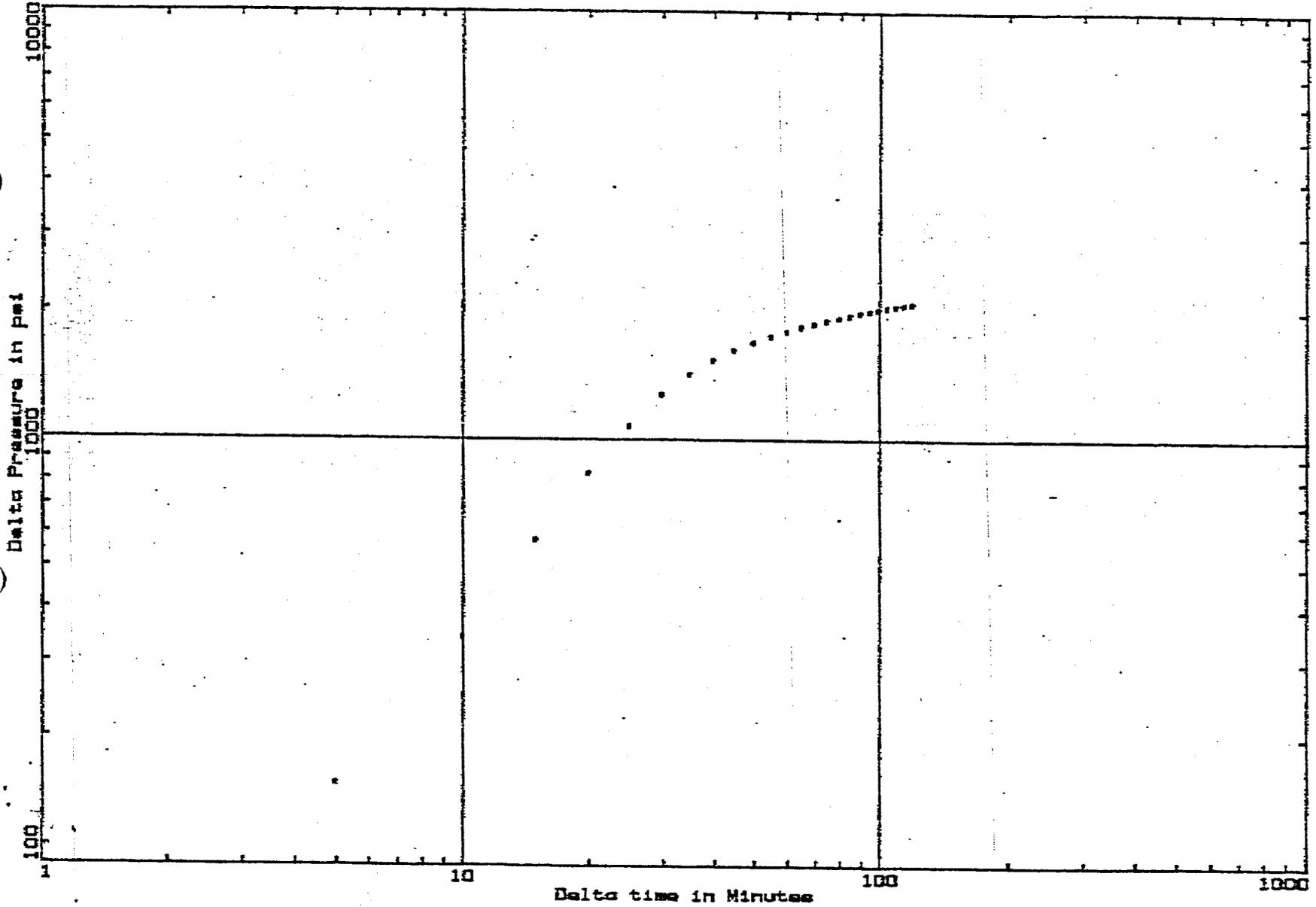
WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 1  
DEPTH: 5477.0 ft

Total Flowtime used = 70.00 Minutes



Log - Log Plot Shut-in #2 (Liquid)  
OPERATOR: SOUTHERN UNION EXPLORATION COMPANY  
LOCATION: 31-38S-26E  
RECORDER: 7661

WELL NAME: TIN CLIP FEDERAL #1-31  
DST #: 1  
DEPTH: 5477.0 ft



Location: 31-389-26E  
Test Type: BOTTOM HOLE CONVENTIONAL  
Formation: UPPER ISTMAY

Recorder Number: 7661  
Recorder Depth: 5477 ft

SAMPLE DATA  
\*\*\*\*\*

SAMPLE CHAMBER  
\*\*\*\*\*

Capacity of sample chamber.. 2100 cc  
Volume of sample..... 2050 cc  
Pressure in sampler..... 60.00 psi  
Where sampler was drained... ON LOCATION

Sampler Contained:

Mud 2050 cc  
Gas TOO SMALL TO MEASURE cu-ft

RESISTIVITY DATA  
\*\*\*\*\*

Top.....: 6500 PPM NACL  
Middle.....: 6500 PPM NACL  
Bottom.....: 6500 PPM NACL  
Sampler.....: 6500 PPM NACL  
Mud Pit.....: 6500 PPM NACL  
Make-up Water...: 6500 PPM NACL



LYNES, INC.  
P.O. Box 12486

# DRILL STEM TESTING OPERATION REPORT

SOUTHERN UNION EXPLORATION COMPANY

DST #: 1  
TIN CUP FEDERAL #1-31  
5467.0 ft - 5490.0 ft

BEST COPY  
AVAILABLE

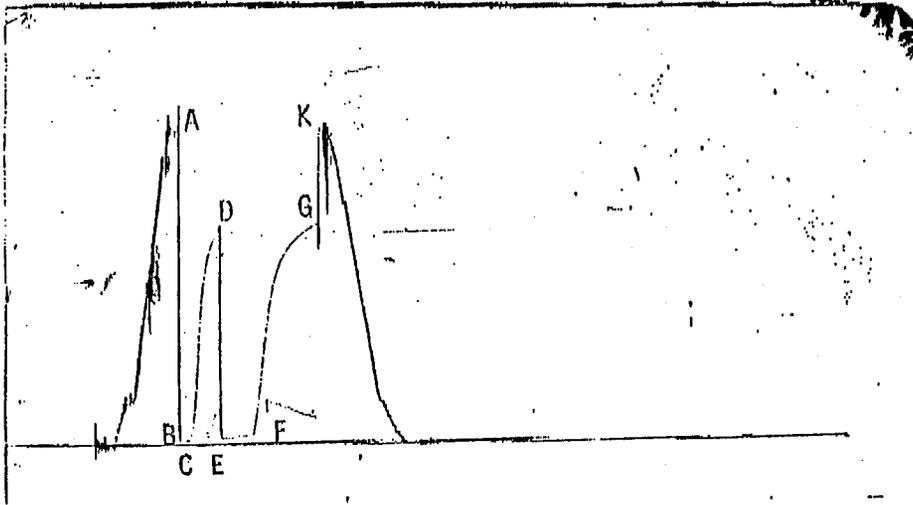
PRESSURE RECORDER NUMBER: 24648

DEPTH : 5443.00 ft  
TYPE : K-3

LOCATION : INSIDE  
CAPACITY : 4450.00 psi

PRESSURE  
psi

- A) Initial Hydrostatic : 3117
- B) Start of 1st Flow : 41
- C) End of 1st Flow : 51
- D) End of 1st Shut-in : 2150
- E) Start of 2nd Flow : 70
- F) End of 2nd Flow : 111
- G) End of 2nd Shut-in : 2175
- H) Final Hydrostatic : 3100



- TEST TIMES (MIN)
- 1st FLOW : 10
  - SHUTIN : 60
  - 2nd FLOW : 60
  - SHUTIN : 120

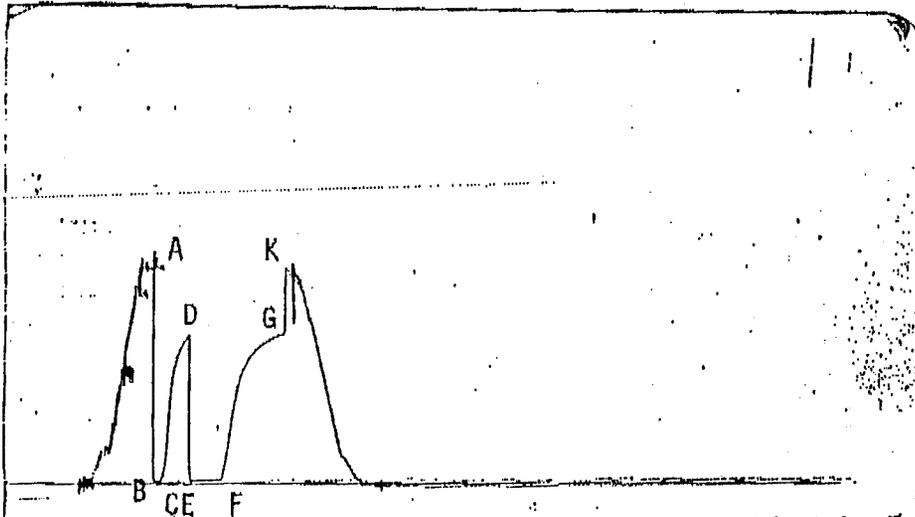
PRESSURE RECORDER NUMBER: 24519

DEPTH : 5485.00 ft  
TYPE : K-3

LOCATION : OUTSIDE  
CAPACITY : 6650.00 psi

PRESSURE  
psi

- A) Initial Hydrostatic : 312
- B) Start of 1st Flow : 6
- C) End of 1st Flow : 6
- D) End of 1st Shut-in : 213
- E) Start of 2nd Flow : 7
- F) End of 2nd Flow : 9
- G) End of 2nd Shut-in : 218
- H) Final Hydrostatic : 310







TECHNICAL SERVICES, Security Life Bldg. • Suite 1350 • 1616 Glenarm • Denver, Colorado 80202 • Phone. (303) 573-8027

Contractor <u>Coleman Drilling</u>	Top Choke <u>1"</u>	Flow No. 1 <u>5</u> Min.
Rig No. <u>#4</u>	Bottom Choke <u>3/4"</u>	Shut-in No. 1 <u>60</u> Min.
Spot <u>--</u>	Size Hole <u>7 7/8"</u>	Flow No. 2 <u>60</u> Min.
Sec. <u>31</u>	Size Rat Hole <u>--</u>	Shut-in No. 2 <u>120</u> Min.
Twp. <u>38S</u>	Size & Wt. D. P. <u>4 1/2" XH 16.60#</u>	Flow No. 3 <u>--</u> Min.
Rng. <u>26E</u>	Size Wt. Pipe <u>--</u>	Shut-in No. 3 <u>--</u> Min.
Field <u>Wildcat</u>	I. D. of D. C. <u>2 1/2"</u>	Bottom Hole Temp. <u>130<sup>0</sup>F</u>
County <u>San Juan</u>	Length of D. C. <u>537 ft</u>	Mud Weight <u>11.3</u>
State <u>Utah</u>	Total Depth <u>5751 ft</u>	Gravity <u>--</u>
Elevation <u>5206 ft</u>	Interval Tested <u>5485-5540 ft</u>	Viscosity <u>50</u>
Formation <u>Upper &amp; Lower Istmay</u>	Type of Test <u>Inflate Straddle</u>	

Operator Southern Union Exploration  
 Address P.O. Box 2179  
 Farmington, NM 87499

Well Name and No. Tin Cup Federal #1-31  
 Ticket No. 21339

Date 4-10-87  
 DST No. 2  
 No. Final Copies 12

Tool opened @ 7:15 am  
 Outside Recorder

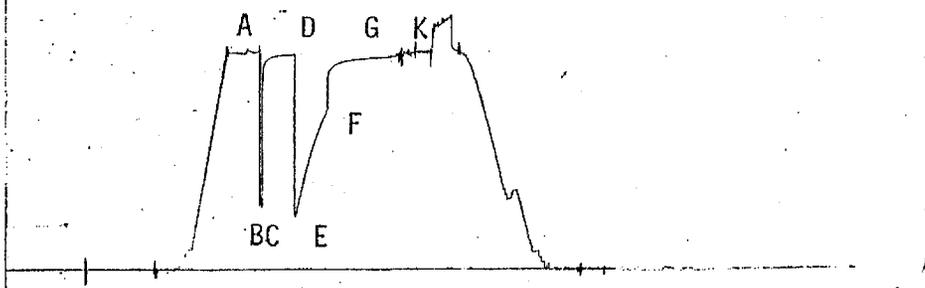
PRD Make Kuster K-3  
 No. 24519 Cap. 6650 @ 5495'

	Press	Corrected
Initial Hydrostatic	A	3145
Final Hydrostatic	K	3075
Initial Flow	B	1069
Final Initial Flow	C	917
Initial Shut-in	D	3109
Second Initial Flow	E	785
Second Final Flow	F	2324
Second Shut-in	G	3070
Third Initial Flow	H	--
Third Final Flow	I	--
Third Shut-in	J	--

Lynes Dist. Farmington, NM  
 Our Tester: Dave Dolyniuk  
 Witnessed By: Martin Boggs

**RECEIVED**  
 APR 27 1987

DIVISION OF  
 OIL, GAS & MINING



Did Well Flow - Gas Yes Oil No Water No Test was reversed circulated

RECOVERY IN PIPE:

5442 ft. Total fluid recovered	= 72.28 bbls.
200 ft. Gas cut mud	= 2.84 bbls.
800 ft. Gas cut mud, oil & salt water	= 11.36 bbls.
4442 ft. Gas cut salt water with oil film	= 58.08 bbls.

Blow Description:

- 1st flow: Tool opened with a strong blow, increased to 2 psi in 1 minutes, increased to 26 psi at the end of the flow.
- 2nd flow: Tool opened with gas to surface in 5 minutes, see gas volume report.

Comments:

The test results indicate a mechanically successful test. The flow and shut-in curves suggest high permeability within the zone tested.

SOUTHERN UNION EXPLORATION  
DST #: 2  
TIN CUP FEDERAL #1-31  
5485.0 ft - 5540.0 ft

Location: 31-385-26E  
Test Type: INFLATE STRADDLE  
Formation: UPPER & LOWER ISTMAY

Recorder Number: 24519  
Recorder Depth: 5495 ft

TIME-PRESSURE LISTING

CHART LABEL	COMMENTS	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt ABSCISSA	PRESSURE SQUARED psi <sup>2</sup> /10 <sup>6</sup>
A	Initial Hydrostatic:	0.000		3145.0		
B	Start of 1st Flow :	0.000		1069.0		
C	End of 1st Flow :	5.000	-152.0	917.0		

Flow time used for SHUT-IN PERIOD 1 = 5.000 minutes

SHUT-IN PERIOD 1	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt	
	0.000	0.0	917.0	0.0000	
	5.000	2103.0	3020.0	2.0000	
	10.000	2136.0	3053.0	1.5000	
	15.000	2158.0	3075.0	1.3333	
	20.000	2167.0	3084.0	1.2500	
	25.000	2172.0	3089.0	1.2000	
	30.000	2180.0	3097.0	1.1667*	
	35.000	2180.0	3097.0	1.1429*	
	40.000	2183.0	3100.0	1.1250*	
	45.000	2186.0	3103.0	1.1111*	
	50.000	2189.0	3106.0	1.1000*	
	55.000	2189.0	3106.0	1.0909*	
D	End of 1st Shut-in :	60.000	2192.0	3109.0	1.0833*

E Start of 2nd Flow : 0.000 785.0

F End of 2nd Flow : 60.000 1539.0 2324.0

Flow time used for SHUT-IN PERIOD 2 = 65.000 minutes

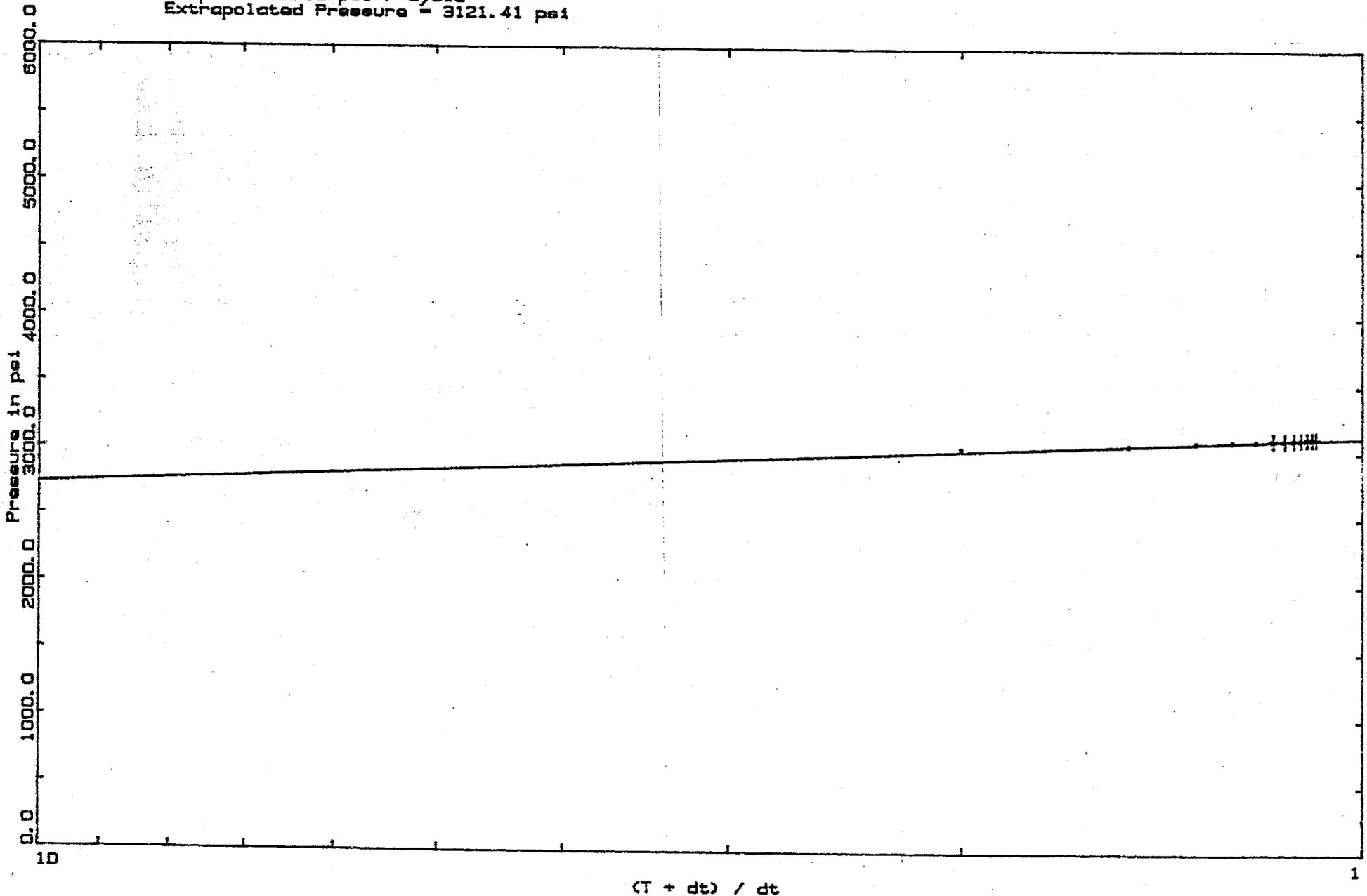
SHUT-IN PERIOD 2	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt
	0.000	0.0	2324.0	0.0000
	5.000	574.0	2898.0	14.0000
	10.000	612.0	2936.0	7.5000
	15.000	640.0	2964.0	5.3333
	20.000	660.0	2984.0	4.2500
	25.000	670.0	2994.0	3.6000
	30.000	682.0	3006.0	3.1667
	35.000	690.0	3014.0	2.8571
	40.000	698.0	3022.0	2.6250
	45.000	704.0	3028.0	2.4444
	50.000	707.0	3031.0	2.3000
	55.000	709.0	3033.0	2.1818
	60.000	712.0	3036.0	2.0833
	65.000	718.0	3042.0	2.0000
	70.000	721.0	3045.0	1.9286
	75.000	723.0	3047.0	1.8667
	80.000	729.0	3053.0	1.8125

Horner Plot (Liquid) - SHUT-IN #1

OPERATOR: SOUTHERN UNION EXPLORATION  
LOCATION: 31-38S-26E  
RECORDER: 24519

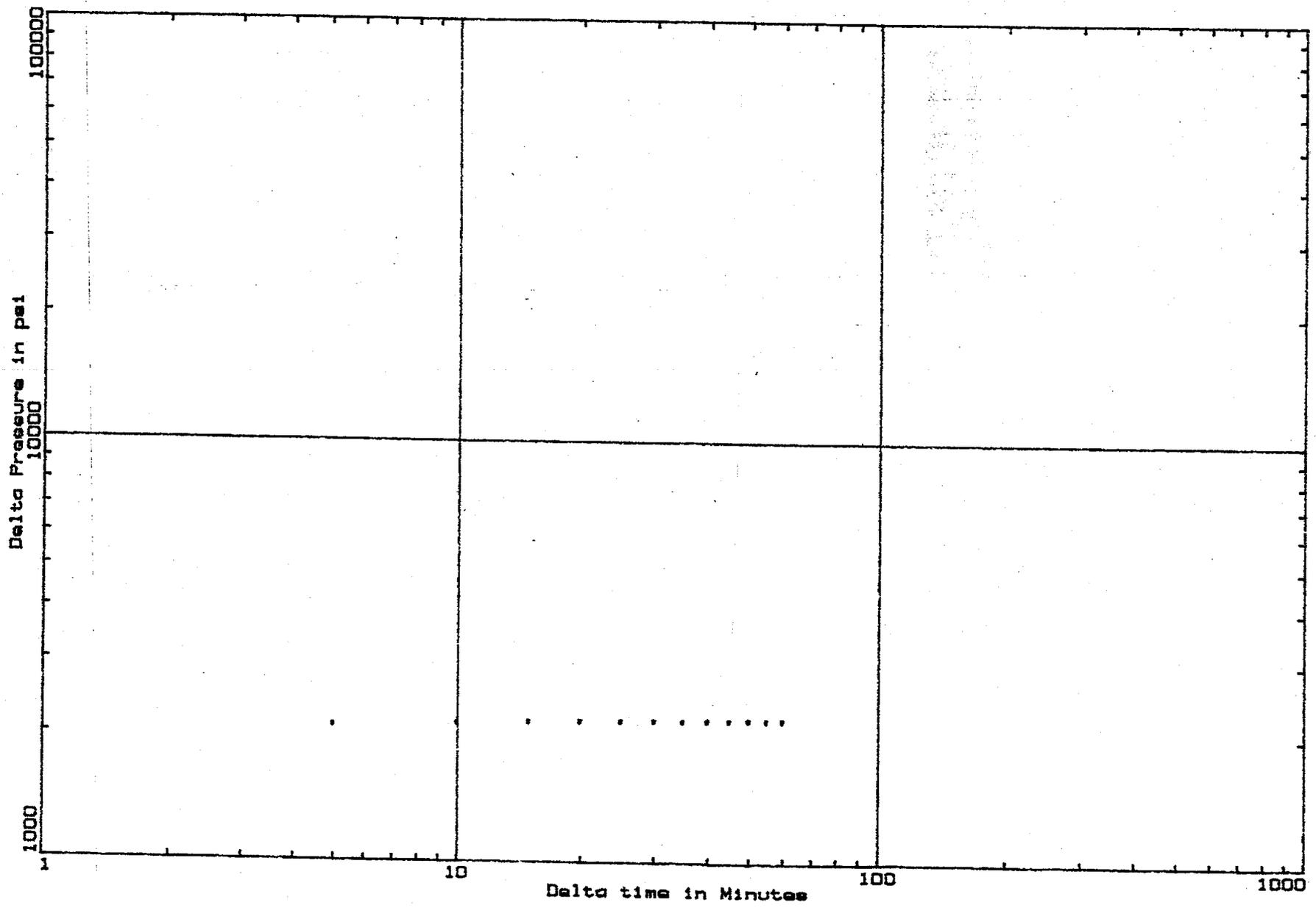
WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 2  
DEPTH: 5495.0 ft

Total Flowtime used = 5.00 Minutes  
Slope = 392.82 psi / cycle  
Extrapolated Pressure = 3121.41 psi



Log - Log Plot Shut-in #1 (Liquid)  
OPERATOR: SOUTHERN UNION EXPLORATION  
LOCATION: 31-38S-26E  
RECORDER: 24519

WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 2  
DEPTH: 5495.0 ft

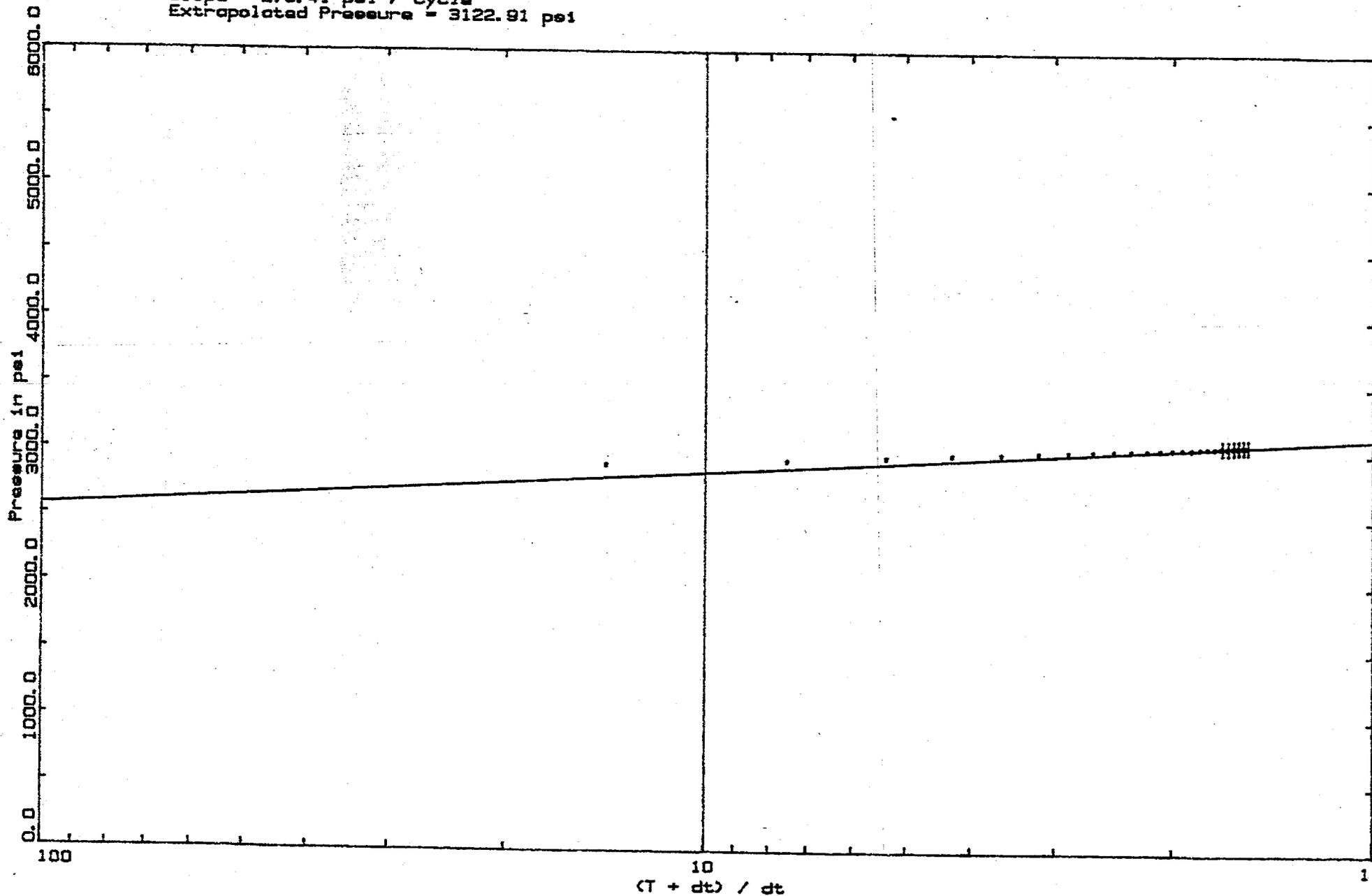


Horner Plot (Liquid) - SHUT-IN #2

OPERATOR: SOUTHERN UNION EXPLORATION  
LOCATION: 31-38S-28E  
RECORDER: 24518

WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 2  
DEPTH: 5495.0 ft

Total Flowtime used = 65.00 Minutes  
Slope = 278.41 psi / cycle  
Extrapolated Pressure = 3122.91 psi



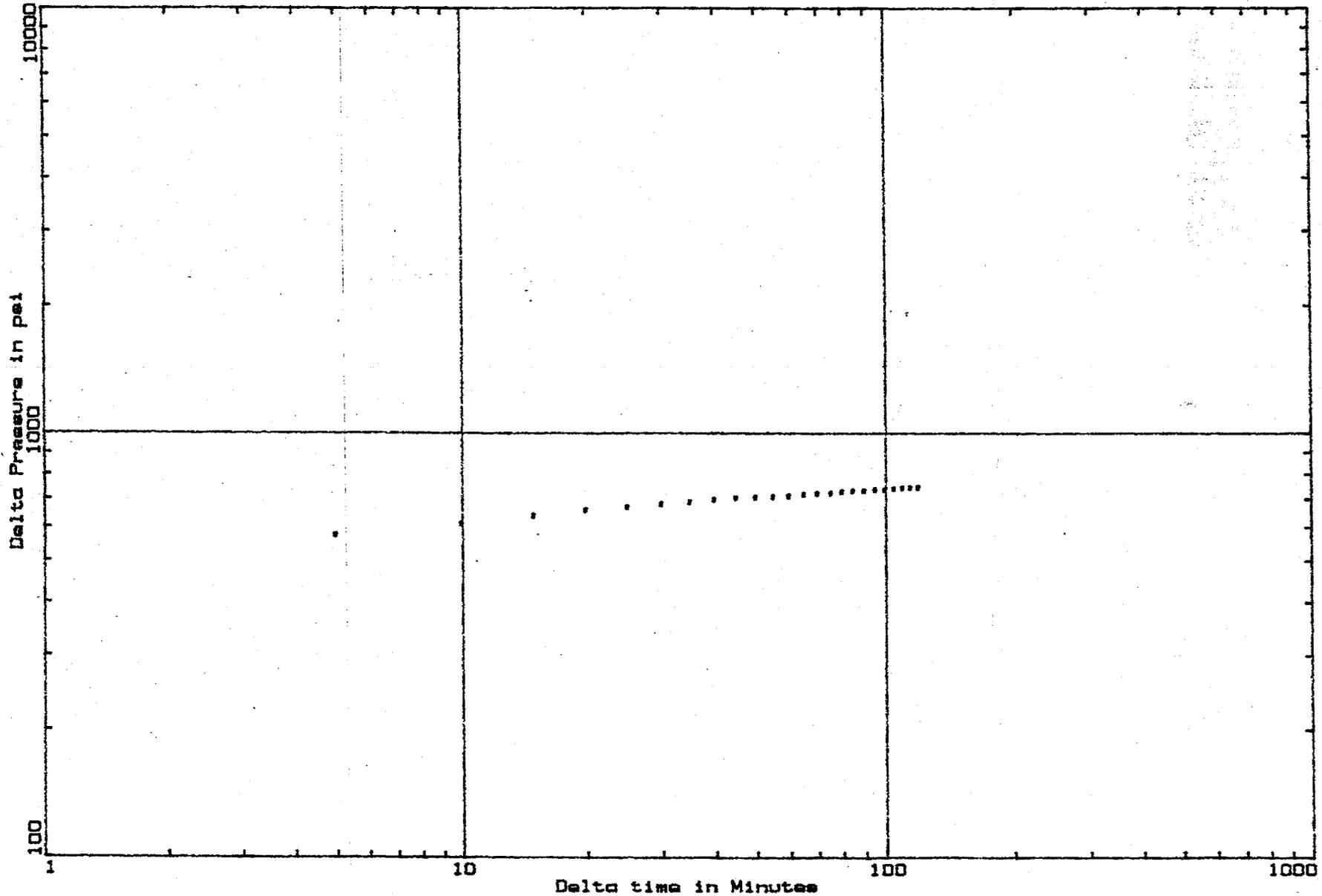
P.6

APR 22 '87 10:05 BST/DENVER CO.

OPERATOR: SOUTHERN UNION EXPLORATION  
LOCATION: 31-38S-26E  
RECORDER: 24519

Log - Log Plot Shut-in #2 (Liquid)

WELL NAME: TIN CUP FEDERAL #1-31  
DST #: 2  
DEPTH: 5495.0 ft



SOUTHERN UNION EXPLORATION

DST #: 2

TIN CUP FEDERAL #1-31

5485.0 ft - 5540.0 ft

Location: 31-385-26E

Recorder Number: 24519

Test Type: INFLATE STRADDLE

Recorder Depth: 5495 ft

Formation: UPPER &amp; LOWER ISTMAY

## TIME-PRESSURE LISTING

CHART LABEL	COMMENTS	TIME MIN.	DELTA P psi	PRESSURE psi	(T+dt)/dt ABSCISSA	PRESSURE SQUARED psi <sup>2</sup> /10 <sup>6</sup>
		85.000	732.0	3056.0	1.7647	
		90.000	732.0	3056.0	1.7222	
		95.000	737.0	3061.0	1.6842*	
		100.000	737.0	3061.0	1.6500*	
		105.000	740.0	3064.0	1.6190*	
		110.000	743.0	3067.0	1.5909*	
		115.000	746.0	3070.0	1.5652*	
G	End of 2nd Shut-in :	120.000	746.0	3070.0	1.5417*	
Q	Final Hydrostatic :	0.000		3075.0		

\* DENOTES VALUES USED FOR EXTRAPOLATION CALCULATIONS

## SHUT-IN 1:

Horner Extrapolation: 3121.42 psi

Horner Slope : 392.82 psi/cycle

## SHUT-IN 2:

Horner Extrapolation: 3122.92 psi

Horner Slope : 278.41 psi/cycle

SOUTHERN UNION EXPLORATION  
DST #: 2  
TIN CUP FEDERAL #1-31  
5485.0 ft - 5540.0 ft

Location: 31-38S-26E  
Test Type: INFLATE STRADDLE  
Formation: UPPER & LOWER ISTMAY

Recorder Number: 24519  
Recorder Depth: 5495 ft

SAMPLE DATA  
\*\*\*\*\*

SAMPLE CHAMBER  
\*\*\*\*\*

Capacity of sample chamber.. 2300 cc  
Volume of sample..... 2300 cc  
Pressure in sampler..... 100.00 psi  
Where sampler was drained... ON LOCATION

Sampler Contained:

Oil 50 cc @ 0.0 Degrees F  
Water 2250 cc

RESISTIVITY DATA:

\*\*\*\*\*

Top.....: 6500 PPM NACL  
Middle.....: 80 000 PPM NACL  
Bottom.....: 80 000 PPM NACL  
Sampler.....: 80 000 PPM NACL  
Mud Pit.....: 6500 PPM NACL  
Make-up Water...: 6500 PPM NACL

SOUTHERN UNION EXPLORATION

DST #: 2

TIN CUP FEDERAL #1-31

5485.0 ft - 5540.0 ft

GAS MEASUREMENTS

\*\*\*\*\*

Device: FLOOR MANIFOLD

Riser: 0.00 in.

Bomb #:  
Sent to:

FLOW #	TIME (min)	READING( psi)	CHOKE (in.)	Mcf/day
2	5.00	3.00	0.250	29.4
2	10.00	5.00	0.250	36.8
2	15.00	8.00	0.250	33.9
2	20.00	10.00	0.250	51.5
2	25.00	9.00	0.250	58.9
2	30.00	8.00	0.250	66.3
2	35.00	7.00	0.250	32.4
2	40.00	6.00	0.250	30.9
2	45.00	4.00	0.250	28.0
2	50.00	2.00	0.250	25.0
2	55.00	1.00	0.250	23.5
2	60.00	1.00	0.250	23.5

SOUTHERN UNION EXPLORATION

DST #: 2

TIN CUP FEDERAL #1-31

5485.0 ft - 5540.0 ft

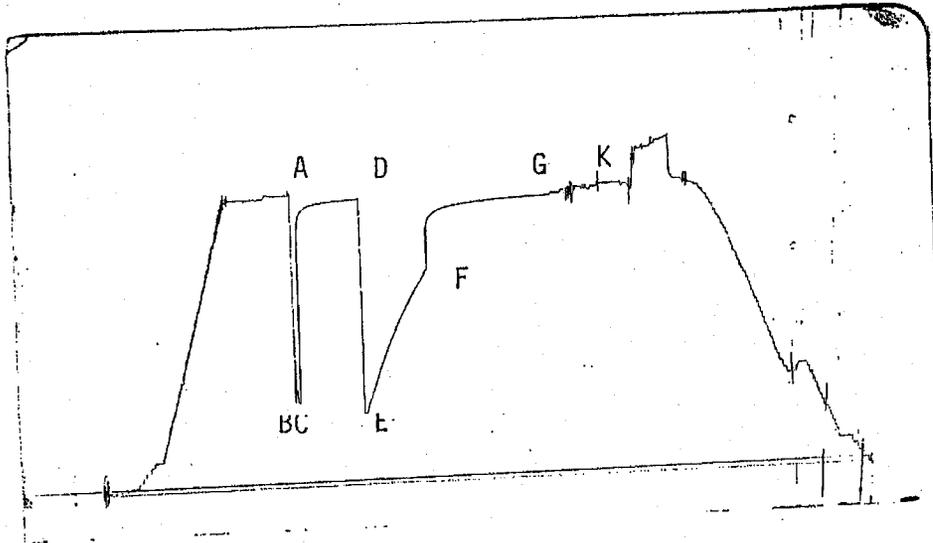
PRESSURE RECORDER NUMBER: 7661

DEPTH : 5495.00 ft  
TYPE : K-3

LOCATION : OUTSIDE  
CAPACITY : 4900.00 psi

PRESSURE  
psi

- A) Initial Hydrostatic: 3181.0
- B) Start of 1st Flow : 1086.0
- C) End of 1st Flow : 941.0
- D) End of 1st Shut-in : 3110.0
- E) Start of 2nd Flow : 804.0
- F) End of 2nd Flow : 2336.0
- G) End of 2nd Shut-in : 3069.0
- Q) Final Hydrostatic : 3165.0



TEST TIMES (MIN)		
1st FLOW :		5.00
SHUTIN:		60.00
2nd FLOW :		60.00
SHUTIN:		120.00



LYNES, INC.  
P.O. Box 12486  
Houston, Texas 77217

# DRILL STEM TESTING OPERATION REPORT

Lynnes District Farmington B4764 Date 4-10, 19 87 Field Ticket 21339  
Operator Southern Union Exploration  
Address \_\_\_\_\_

Well Name & Number Tin Cup Federal 131 DST No. 2 Net Ft. Pay 20'  
Contractor Coleman Top Choke 1 1/4" Bottom Choke 3/4" Flow No. 1 5 Min.  
Rig No. 4 Size Hole 7 7/8" Size Rat Hole - Shut-in No. 1 60 Min.  
Spot \_\_\_\_\_ Casing Size & Wt. 8 5/8" J 1528 Flow No. 2 60 Min.  
Sec. 31 Size & Wt. D. P. or Tubing 4 1/2 XH 1660 Shut-in No. 2 120 Min.  
Twp. 39 S Size Wt. Pipe \_\_\_\_\_ Flow No. 3 - Min.  
Rng. 26 E I. D. of D. C. 2 1/4" Shut-in No. 3 - Min.  
Field WIC Length of D. C. above Tool 537' Bottom Hole Temp. 130  
County San Juan Total Depth 5751 Mud Weight 11.3  
State UTah Interval Tested 5485 - 5540 Gravity \_\_\_\_\_  
K. B. Elevation 5206 Interval Perforated \_\_\_\_\_ Viscosity 50  
Formation 1st May - Lower Type of Test 14 Flute Straddle Tool Opened @ 7:15 AM  
& upper

Caliper Log Run Prior to Test: Yes  No   
Calipered Hole Size @ Top Pkr. 8 1/2" @ Bottom Pkr. 8 1/2"  
Did well flow gas yes in \_\_\_\_\_ mins.  
Did well flow oil \_\_\_\_\_ in \_\_\_\_\_ mins.  
Did well flow water \_\_\_\_\_ in \_\_\_\_\_ mins.  
well fill up Drill Pipe & collars  
BOTTOM HOLE SAMPLER  
Pressure in Sampler: 100 PSIG  
Total Volume of Sampler: 2300 cc.  
Total Volume of Sample: 2300 cc.  
Where was Sample drained? on Rig Floor  
Oil: 50 cc.  
Water: 2250 cc.  
Mud: \_\_\_\_\_ cc.  
Gas: \_\_\_\_\_ cu. ft.  
Other: \_\_\_\_\_  
Sample R. W.: 1 at 65° 60,000 cc 10,000  
Gravity \_\_\_\_\_ Gas/Oil Ratio \_\_\_\_\_  
Make Up Water R. W.: 1 at 65° 2500 cc 6,500  
Mud Pit Sample R. W.: 1 at 65° 2500 cc 6,500

Bottom of Top Packer 5485  
Bottom of Second Packer \_\_\_\_\_  
Top of Straddle Packer 5540  
Top of Fourth Packer \_\_\_\_\_  
Length of Test Interval 55'  
Test Interval: Anchor 26' Collars 29.10 DP \_\_\_\_\_  
Below Straddle: Anchor \_\_\_\_\_ Collars \_\_\_\_\_ DP \_\_\_\_\_  
Was tool plugged? NO Was anchor plugged? \_\_\_\_\_  
Did straddle pkr. hold? \_\_\_\_\_ Press. below straddle \_\_\_\_\_

REMARKS: \_\_\_\_\_  
Recorder No. \_\_\_\_\_ Ran Under Straddle Pkr. \_\_\_\_\_

RECORDED READINGS	Type <u>K-3</u> No. <u>24645</u> Clock _____			Type <u>K-3</u> No. <u>7661</u> Clock _____			Type <u>K-3</u> No. <u>24519</u> Clock _____		
	Press.	Field	Corrected	Press.	Field	Corrected	Press.	Field	Corrected
IH	A			IH 1557	3208	3181	IH 1140	3144	3145
FH	K			FH 1549	3166	3115	FH 1115	3116	3075
IF-1	B			IF-1 531	1093	10810	IF-1 388	1046	1069
FF-1	C			FF-1 4160	961	941	FF-1 333	909	917
IF-2	E			IF-2 393	818	804	IF-2 285	743	785
FF-2	F			FF-2 1144	2327	2326	FF-2 844	2257	2324
IF-3	H			IF-3	-	-	IF-3	-	-
FF-3	I			FF-3	-	-	FF-3	-	-
SIP-1	D			SIP-1 1523	3104	3110	SIP-1 1125	3061	3109
SIP-2	G			SIP-2 1503	3062	3069	SIP-2 1111	3033	3070
SIP-3	J			SIP-3	-	-	SIP-3	-	-

LYNES TECHNICIAN David Dolyniuk RESERVOIR ANALYSIS? \_\_\_\_\_ WELL OWNERS REPRESENTATIVE (Please Print Legibly) Martin Boggs  
No. Final Copies \_\_\_\_\_



LYNES, INC.  
P.O. Box 12486  
Houston, Texas 77217

# DRILL STEM TESTING SEQUENCE REPORT

2.63

Lynes District Farmington - B4764 Date 4-10 19 87 Field Ticket 21339  
Operator Southern Union Exploration  
Address \_\_\_\_\_

GAS MEASUREMENTS				DATE	TIME	SEQUENCE OPERATIONS
Measured with				4-10	12:00	On Location
Critical well tester					2:00	Pick up DST 2 (include straddle 5485-24)
Orifice well tester					6:45	Pump up inflator packers
Side static					7:15	TOOL opened - strong blow, 2psi 1min, 11psi 2min, 20psi 4min, 2psi end of 1F.
Pitot tube						
Floor manifold with chokes						
Riser size						
Pressure gauge- PSI	Oz.		MCF/D			
5	3	1/4"	26.0 21.4			
10	5	1/4"	29.0 30.0	7:20		15> bleed pressure off. Gas to surface 15min of 15
15	8	1/4"	31.9 33.9			
20	10	1/4"	34.6 51.5			
25	9	1/4"	34.6 58.5	8:20		FF 7 Tool opened Gas Flaring off. See Gas Volume For pressure and volume
30	8	1/4"	32.9 60.3			
35	7	1/4"	30.9 32.4			
40	6	1/4"	29.0 30.4			
45	4	1/4"	29.0 28.0	9:20		Shut Tool in - Gas Flared off during shut in - mud was being push out with Gas.
50	3	1/4"	25.0 25.0			
55	1	1/4"	22.0 23.5			
60	1	1/4"	22.0 23.5	11:20		Start Trip out and Reverse out.

Cushion none Amount 0 Ft.  
 Cushion none Amount 0 Ft.  
 Total Fluid Recovered 5442 Ft. Consisting of: Gas cut mud 200, 600, 4442  
 200 Ft. of Gas cut mud 2.84  
 600 Ft. of Gas cut mud, oil & salt water 11.36  
 4442 Ft. of Gas cut salt with water, with oil film 58.08  
 Ft. of \_\_\_\_\_  
 Ft. of \_\_\_\_\_  
 Ft. of Gas Recovered in Drill Pipe \_\_\_\_\_  
 Test was/was not reverse circulated? was reversed  
 Recovery  
 Top Sample R.W. 1 at 65° 2500CL 16500  
 Middle Sample R.W. 1 at 65° 6000CL 8000  
 Bottom Sample R.W. 1 at 65° 6000CL

LYNES TECHNICIAN

RESERVOIR ANALYSIS? \_\_\_\_\_

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