

CONFIDENTIAL

Form 3160-3  
(December 1990)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPlicate  
Other instructions on  
reverse side  
**RECEIVED**  
AUG 07 1995  
DIV. OF OIL, GAS & MINING

Form approved.  
Budget Bureau No. 1004-0136  
Expires: December 31, 1991

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK

DRILL

DEEPEN

b. TYPE OF WELL

OIL WELL

GAS WELL

OTHER

SINGLE ZONE

MULTIPLE ZONE

2. NAME OF OPERATOR

Chandler & Associates, Inc.

3. ADDRESS AND TELEPHONE NO.

475 Seventeenth St., Suite 1000 Denver, CO 80202

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*

At surface

505' FNL 2011' FWL

At proposed prod. zone

NE 1/4 NW 1/4

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*

See Topo Map "A"

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT.

505'

16. NO. OF ACRES IN LEASE

160

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.

19. PROPOSED DEPTH

1930'

20. ROTARY OR CABLE TOOLS

Rotary

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

5853' GR

22. APPROX. DATE WORK WILL START\*

A.S.A.P.

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12 1/4"	8 5/8"	24#	300'	(See Attached Drilling Plan)
7 7/8"	5 1/2"	15.5#	1930'	(See Attached Drilling Plan)

1. M.I.R.U.
2. Drill to T.D. 1930'
3. Run 5 1/2" casing if commercial production is indicated
4. If dry hole, well will be plugged and abandoned as instructed.
5. Well will be drilled with air/mist to T.D. mud will be in place to run 5 1/2" casing.

I hereby certify that I am responsible by the term and conditions of the lease to conduct lease operations. Bond coverage for lease activities is being provided by Chandler & Associates, Inc. State Bond # 19S19040787.

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

SIGNED Robert L. Kay TITLE Agent for Chandler DATE 8-3-95  
Robert L. Kay

(This space for Federal or State office use)

PERMIT NO. 43-015-30262 APPROVAL DATE \_\_\_\_\_

Application approval 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. CONDITIONS OF APPROVAL, IF ANY:

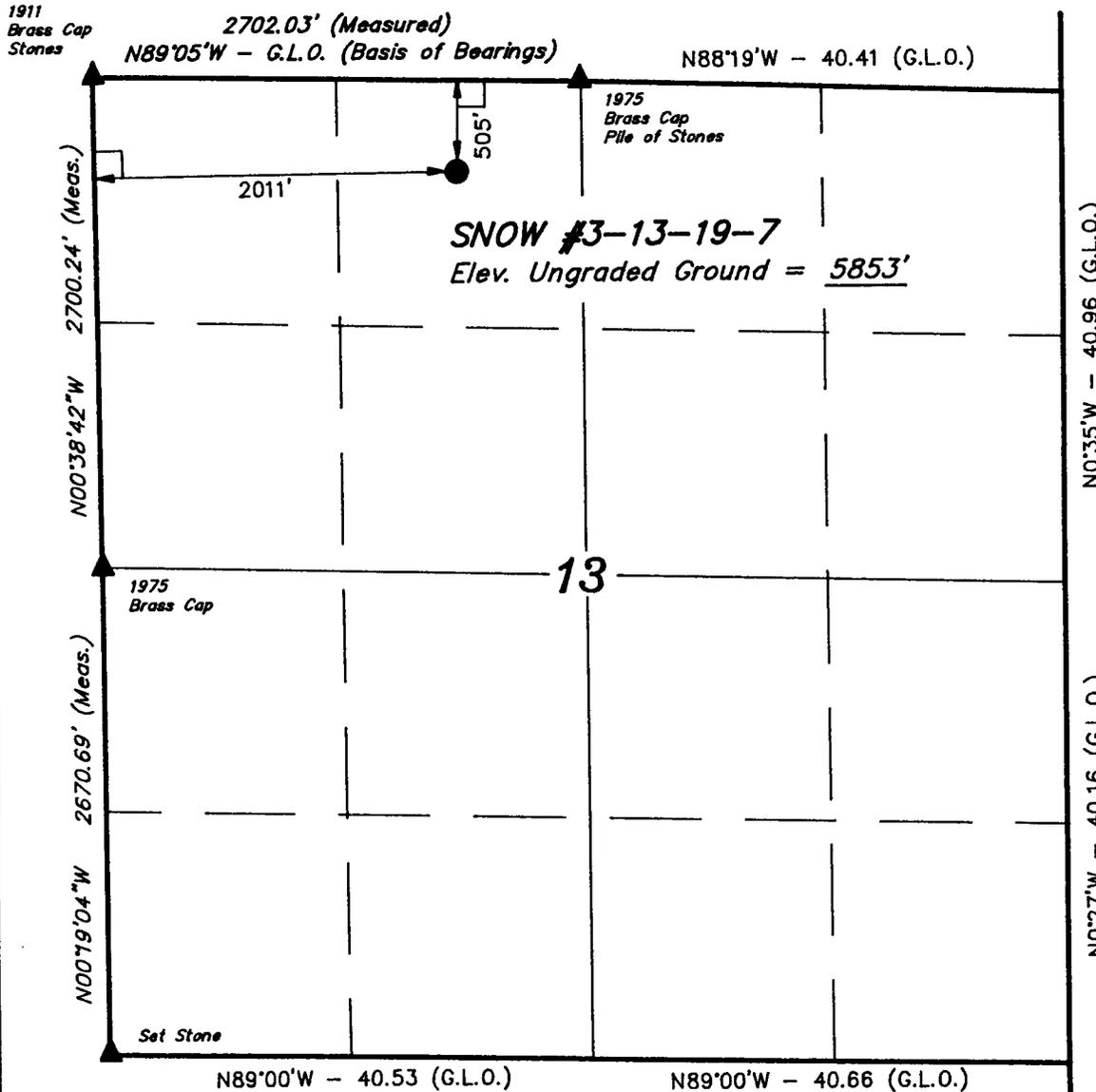
APPROVED BY [Signature] TITLE Petroleum Engineer DATE 8/23/95

\*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.

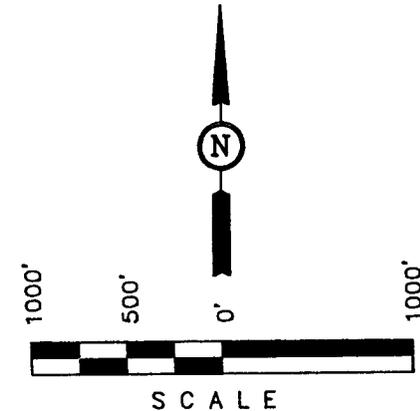
T19S, R7E, S.L.B.&M.

Well location, SNOW #3-13-19-7, located as shown in the NE 1/4 NW 1/4 of Section 13, T19S, R7E, S.L.B.&M. Emery County, Utah.



BASIS OF ELEVATION

JOHNSON TRIANGULATION IN THE SE 1/4 OF SECTION 11, T19S, R7E, S.L.B.&M. TAKEN FROM THE CASTLE DALE QUADRANGLE, UTAH, EMERY COUNTY, 7.5 MINUTE QUAD. (TOPOGRAPHIC MAP) PUBLISHED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. SAID ELEVATION IS MARKED AS BEING 5958 FEET.



CERTIFICATE

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

*Robert L. Gray*  
 REGISTERED LAND SURVEYOR  
 REGISTRATION NO. 161319  
 STATE OF UTAH

<b>UINTAH ENGINEERING &amp; LAND SURVEYING</b> 85 SOUTH 200 EAST - VERNAL, UTAH 84078 (801) 789-1017		
SCALE 1" = 1000'	DATE SURVEYED: 8-02-95	DATE DRAWN: 8-03-95
PARTY B.B. G.O. D.R.B.	REFERENCES G.L.O. PLAT	
WEATHER WARM	FILE CHANDLER & ASSOCIATES, INC.	

LEGEND:

- = 90° SYMBOL
- = PROPOSED WELL HEAD.
- = SECTION CORNERS LOCATED.

R  
7  
E

**CHANDLER & ASSOCIATES, INC.  
DRILLING PLAN FOR THE  
SNOW #3-13-19-7**

**I. DRILLING PLAN:**

1. Geological Surface Formation: EMERY

2. Estimated Tops:

<u>Name</u>	<u>Top</u>	<u>Prod. Phase Anticipated</u>
Bluegate	75'	
Top of Ferron	1513' ✓	GAS ✓
Tununk	1780'	
TD	1930'	

3. CASING PROGRAM:

	<u>Depth</u>	<u>Hole Size</u>	<u>Csg. Size</u>	<u>Type</u>	<u>Weight</u>
Surface	300'	12-1/4"	8-5/8"	J-55	24#/ft (new)
Prod.	1930'	7-7/8"	5-1/2"	J-55	15.5#/ft (new)

4. Operator's Specification for Pressure Control Equipment:

- A. 2,000 psi W.P. Double Gate BOP or Single Gate BOP (Schematic attached).
- B. Functional test daily.
- C. All casing strings shall be pressure-tested (0.2 psi/foot or 1500 psi, whichever is greater) prior to drilling the plug after cementing; test pressure shall not exceed the internal yield pressure of the casing.
- D. All ram-type preventers and related control equipment shall be tested at the rated working pressure of the stack assembly or at 70 percent of the minimum internal yield pressure of the casing, whichever is less. Tests shall be done at the time of installation, prior to drilling out, and weekly. All tests shall be for a period of 15 minutes.

Chandler & Associates, Inc.  
Snow #3-13-19-7

5. Auxiliary Equipment:

- A. Kelly Cock - yes.
- B. Float at the bit - no.
- C. Monitoring equipment on the mud system - visually.
- D. Full opening safety valve on rig floor - yes.
- E. Rotating head - no.
- F. The blooie line shall be a least 6" in diameter and extend at least 100' from the wellbore into the reserve/blooie pit.
- G. Blooie line ignition shall be provided by a continuous pilot (ignited when drilling below 500').
- H. Compressor shall be tied directly to the blooie line through a manifold.
- I. A mistor with a continuous stream of water shall be installed near the end of the blooie lines for dust suppression.

6. Proposed Circulating Medium:

<u>Depth</u>	<u>Mud Type</u>	<u>Density (lb./gal)</u>	<u>Viscosity</u>	<u>Water Loss</u>
0'-1930'	Air/Mist	-	-	-

7. Testing, Logging, and Coring Program:

- A. Cores - None anticipated.
- B. DST - none anticipated.
- C. Logging - DIL-GR (TD to base of surface casing).  
FDC-CNL-GR-Cal (TD to base of surface casing).

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Snow #3-13-19-7

- D. Formation and Completion Interval: Ferron interval, final determination of completion will be made by analysis of logs. Stimulation - Stimulation will be designed for the particular area of interest as encountered.
- E. Frac gradient - approximately .80 psi/ft.

8. Cementing Program:

<u>Casing</u>	<u>Volume</u>	<u>Type &amp; Additives</u>
Surface	145 sx	Class "G" (based on 100% access)
Production	190 sx*	180 sx 50-50 poz, plus 10 sx class "G".

Cement Characteristics:

Class "G" - yeild = 1.18 cu.ft. per. sack  
weight = 15.8 lb./gal  
strength = 3200 psi in 72 hrs @ 135 degrees

\* Final cement volumes to be calculated from caliper log with an attempt to be made to circulate cement to the surface.

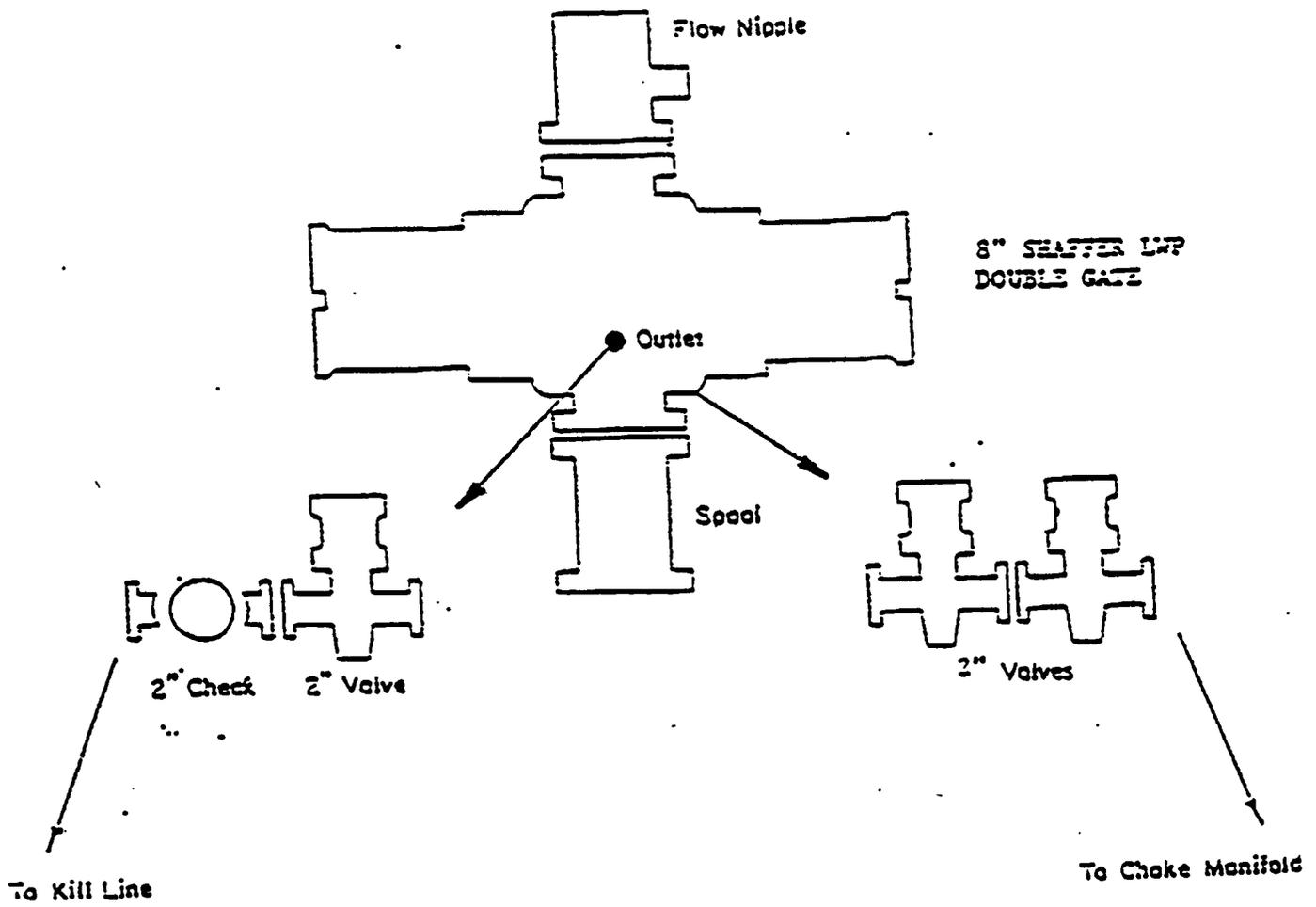
A bond log will be run across the zone of interest and across zones as required by the authorized officer to insure protection of natural resources.

9. Anticipated Abnormal Pressures and Temperatures, Other Potential Hazards:

No abnormal temperatures or pressures are anticipated. No H<sub>2</sub>S has been encountered in or known to exist from previous wells drilled to similar depths in the general area. Maximum anticipated bottom hole pressure equals approximately 1,500 psi (calculated at 0.777 psi/ft) and maximum anticipated surface pressure equals approximately 1075 psi (bottom hole pressure minus the pressure of a partially evacuated hole calculated at 0.22 psi/ft).

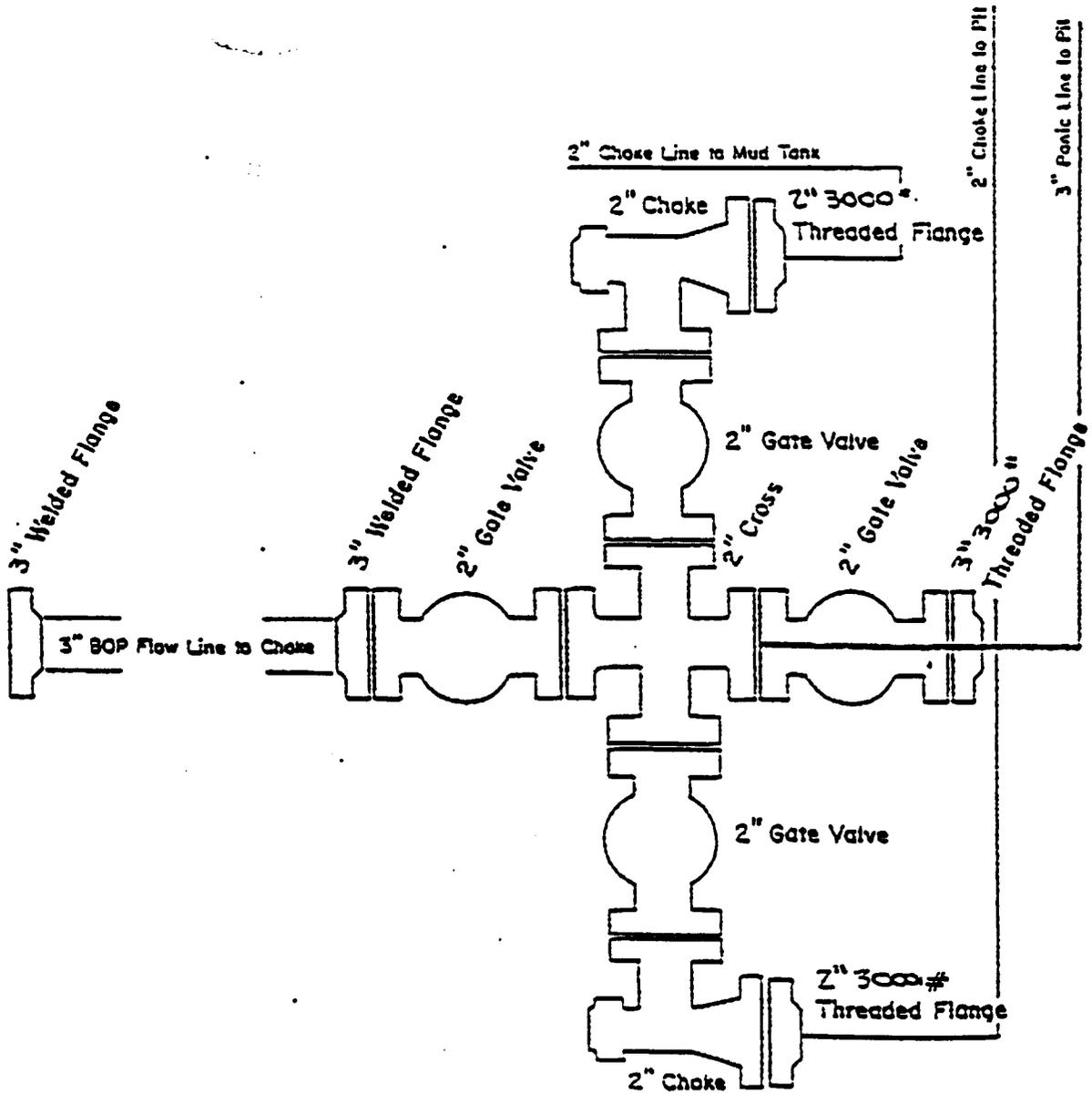
# CHANDLER DRILLING

RIG NO.7



# CHANDLER DRILLING

RIG NO.7



**II. SURFACE USE PLAN  
CHANDLER & ASSOCIATES, INC.  
SNOW #3-13-19-7**

1. Existing Road:

- A. Topo Map "A" is the vicinity map, showing the access routes from Castle Dale, Utah.
- B. Topo Map "B" shows the proposed access road to each individual well. It also shows existing roads in the immediate area.
- C. The existing and proposed access road, unless otherwise stated, shall be crowned, ditched, and dipped from the nearest improved road.
- D. Occasional maintenance blading and storm repairs will keep roads in good condition.
- E. There shall be no mud blading on the access road. Vehicles may be towed through the mud provided they stay on the roadway.

2. Planned Access Roads:

There is an existing access road to the proposed location which will require some minor upgrading.

3. Location of Existing Wells:

N/A

4. Location of Existing and/or Proposed Facilities:

- A. All Petroleum Production Facilities are to be contained within the proposed location sites.
- B. In the event that production of these wells is established, the following will be shown:
  - 1. Proposed location and attendant lines, by flagging, if off well pad.
  - 2. Dimensions of facilities.

Chandler & Associates, Inc.  
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3. Construction methods and materials.

- C. The area used to contain the proposed production facilities will be built using native materials. If these materials are not acceptable, then other arrangements will be made to acquire them from private sources. These facilities will be constructed using bulldozers, graders, and workman crews to construct and place the proposed facilities.
- D. All permanent facilities placed on the locations shall be painted a non-reflective color that will blend with the natural environment.
- E. A dike shall be constructed around the tank battery, of sufficient capacity to adequately contain at least 110 percent of the storage capacity of the largest tank within the dike.
- F. All buried pipelines shall be covered to a depth of 3 feet except at road crossings where they shall be covered to a depth of 4 feet.
- G. Construction width of the right-of way/pipeline route shall be restricted to 30 feet of disturbance.
- H. Pipeline location warning signs shall be installed within 90 days upon completion of construction.

5. Location and Type of Water Supply:

Any water to be used for the drilling of this well will be a private water supply which is located in the area.

No water wells are to be drilled.

Chandler & Associates, Inc.  
Snow #3-13-19-7

6. Source of Construction Materials:

- A. No construction materials are needed for drilling operations. In the event of production, the small amount of gravel needed for facilities will be hauled in by truck from a local gravel pit over existing access roads from the area. No special access other than for drilling operations and pipeline construction is needed.
- B. All access roads are described under item #2 and shown on Map #B.

All Construction material for these location sites and access roads shall be borrow material accumulated during the construction of the location sites and access roads. No additional construction material from other sources is anticipated at this time, but if it is required, the appropriate actions will be taken to acquire it from private sources.

- C. All well pad surface disturbance area is on Fee lands

7. Methods for Handling Waste Disposal:

- A. Drill cuttings will be buried in the reserve pit when covered.
- B. Drilling fluids will be contained in the reserve pit.
- C. Any hydrocarbon liquids produced while production testing will be contained in a test tank. Any unavoidable spills of oil or other adverse substances or materials will be removed immediately during drilling progress or during completion operations.
- D. Portable chemical toilets will be provided and serviced by a local commercial sanitary service.

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- E. Garbage and trash will be collected in a trash cage and its contents hauled to a sanitary landfill.

All wastes caused by the construction activities shall be promptly removed and disposed of in a sanitary landfill or as directed by the authorized officer.

- F. Prior to commencement of drilling, the reserve pit will be fenced on three sides using 39-inch net wire with at least one (1) strand of barbed wire. All wire is to be stretched before attaching to corner posts. When drilling activities are completed it will be fenced on the fourth side and allowed to dry (if liquids are present). After drying, the fences will be removed and the pit shall be buried. Reclamation will be undertaken no later than the fall of the year after all drilling activity has ceased.

8. Ancillary Facilities:

No air strips, camps, or other living facilities will be built off the location. Housing and office trailers will be on the location as seen on the location layout.

9. Well Site Layout:

- A. See attached cutsheet.
- B. The areas authorized officer will be contacted at least 24 hours prior to commencing construction of the access road and well pad.
- C. The authorized officer will determine after the location is constructed whether the pit is to be lined, and if so, the type of material to be used.
- D. Topsoil shall be stripped to a depth of 4 to 6 inches and stockpiled as shown on the location layout plat.
- E. The backslopes of the locations will be no steeper than vertical or 1/4:1 in rock, and 2:1 elsewhere.

Chandler & Associates, Inc.  
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- F. The upper edges of all cut banks on the access roads and well pads will be rounded.

10. Plans for Restoration:

- A. Immediately upon completion, the location and surrounding area will be cleared of all debris, materials, trash and junk not required for production.
- B. Before any dirt work to restore the location takes place, the reserve pit must be completely dry. The reserve pit will be reclaimed within 90 days from the date of well completion.
- C. The area officer shall be notified at least 48 hours prior to commencing reclamation work.
- D. All disturbed areas will be seeded with the a mixture which is found suitable by the state.
- E. The seed bed will be prepared by disking, following the natural contour. Drill seed on contour at a depth no greater than 1/2 inch. In areas that cannot be drilled, the seed will be broadcast at double the seeding rate and harrowed into soil. Certified seed is recommended.
- F. Fall seeding will be completed after September, and prior to prolonged ground frost.

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- G. If the well is a producer, access roads will be upgraded and maintained as necessary to prevent soil erosion, and accommodate year round traffic. Areas unnecessary to operations will be reshaped, topsoil distributed, and seed distributed according to the above mixtures. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.
- H. If the well is abandoned or is a dry hole, the access road and location will be restored to approximate the original contours. During reclamation of the site the fill material will be pushed into cuts and up over the backslope. No depressions will be left that would trap water or form ponds. Topsoil will be distributed evenly over the location and seeded according to the above mixture. The access road and the location shall be ripped or disked prior to seeding. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.
- I. Annual or noxious weeds shall be controlled on all disturbed areas. Method of control shall be by an approved mechanical method or an Environmental Protection Agency (EPA) registered herbicide. All herbicide application proposals must be approved. Application of herbicides must be under direct field supervision of an EPA certified pesticide applicator.

11. Other Information:

- A. The area is used by man for the primary purpose of grazing domestic livestock.

All activity shall cease when soils or road surfaces become saturated to a depth of three inches, unless otherwise approved by the Authorized Officer.

If any fossils are discovered during construction, the operator shall cease construction immediately and notify the Authorized Officer so as to determine the significance of the discovery.

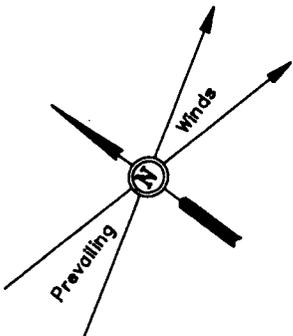
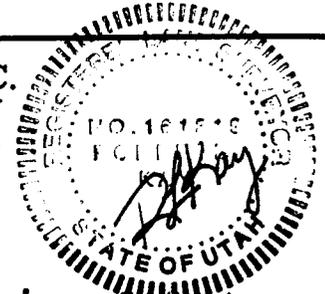
Chandler & Associates, Inc.  
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- B. The State considers the development of groundwater resources to be necessary and frequently indispensable to effective land management. Therefore, any groundwater intercepted by the party conducting mineral exploration shall be reported to the authorized officer immediately including approximate quantities and a sample in a sealed quart container. The undersigned may file for water rights only with a written waiver from the State.
- C. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials and contact the authorized officer (AO). Within five working days the AO will inform the operator as to:
- whether the materials appear eligible for the National Register of Historic Places;  
the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary);  
and a timeframe for the AO to complete an expedited review under 36 CFR 800-11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate.

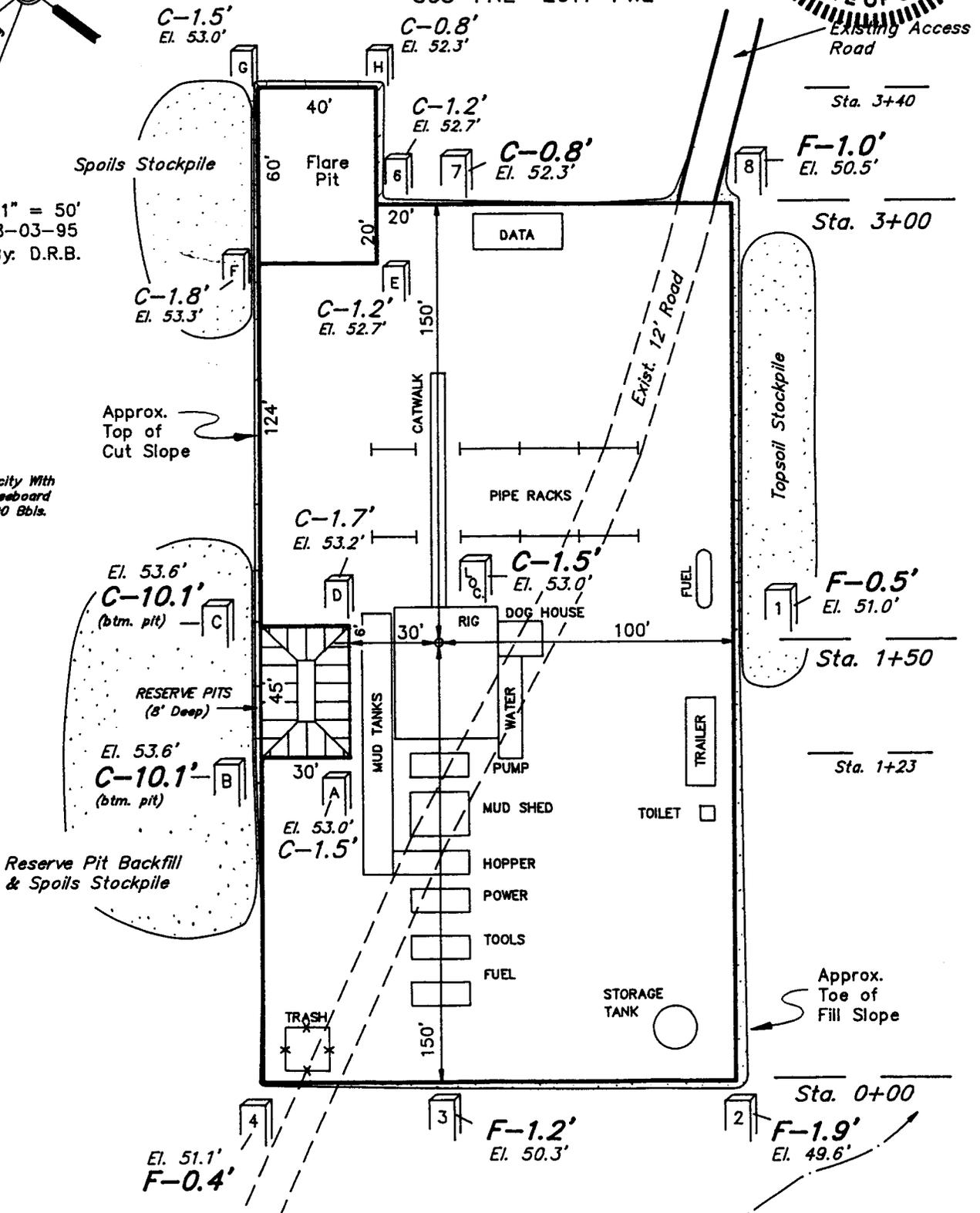
# CHANDLER & ASSOCIATES, INC.

## LOCATION LAYOUT FOR

SNOW #3-13-19-7  
SECTION 13, T19S, R7E, S.L.B.&M.  
505' FNL 2011' FWL



SCALE: 1" = 50'  
DATE: 8-03-95  
Drawn By: D.R.B.



Pit Capacity With  
2' of Freeboard  
is ±2,190 Bbls.

Reserve Pit Backfill  
& Spoils Stockpile

Approx.  
Toe of  
Fill Slope

Elev. Ungraded Ground at Location Stake = 5853.0'

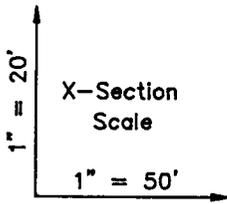
Elev. Graded Ground at Location Stake = 5851.5'

UINTAH ENGINEERING & LAND SURVEYING  
85 So. 200 East • Vernal, Utah 84078 • (801) 789-1017

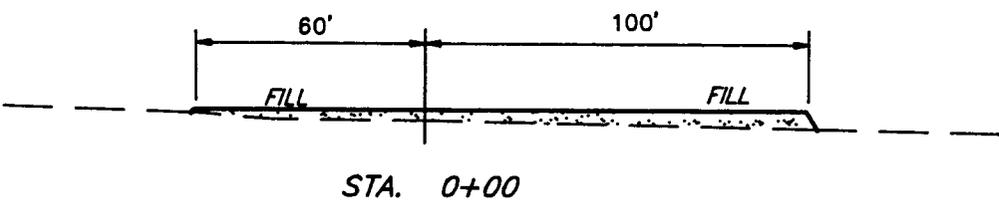
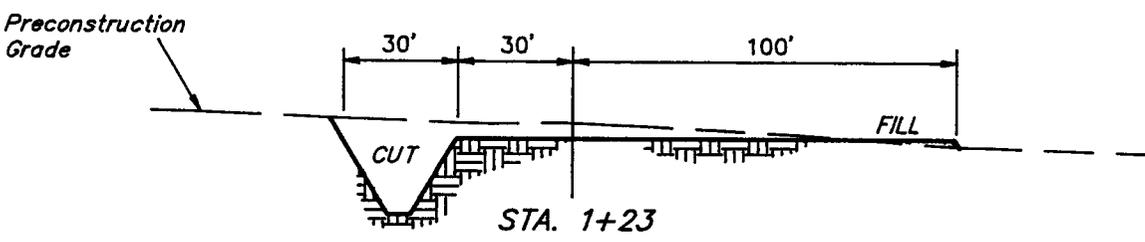
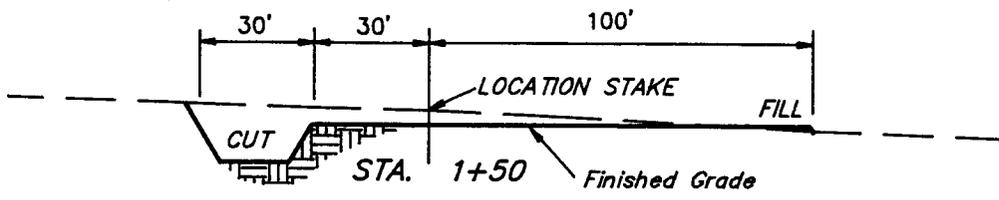
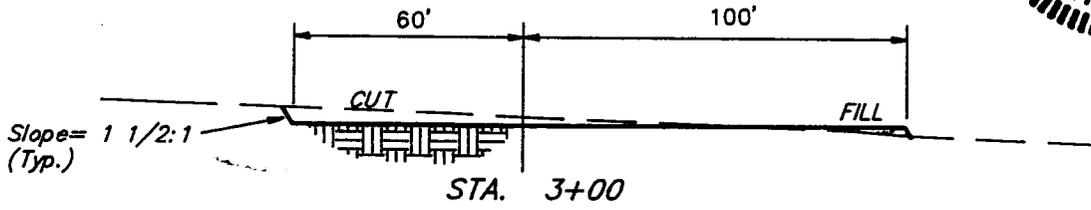
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## TYPICAL CROSS SECTIONS FOR

SNOW #3-13-19-7  
SECTION 13, T19S, R7E, S.L.B.&M.  
505' FNL 2011' FWL



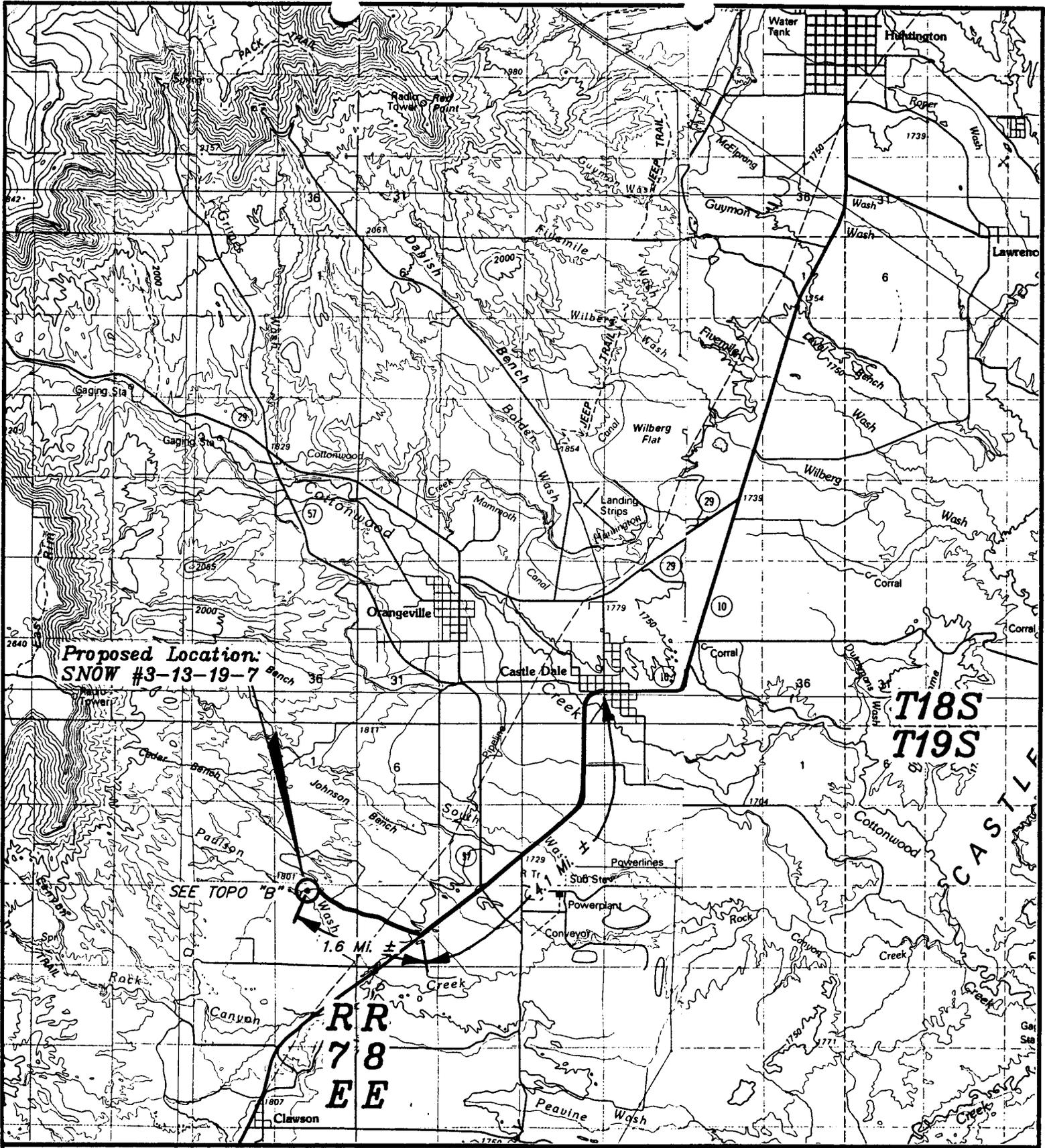
DATE: 8-03-95  
Drawn By: D.R.B.



### APPROXIMATE YARDAGES

(6") Topsoil Stripping	= 1,020 Cu. Yds.
Remaining Location	= 880 Cu. Yds.
<b>TOTAL CUT</b>	<b>= 1,900 CU.YDS.</b>
<b>FILL</b>	<b>= 750 CU.YDS.</b>

EXCESS MATERIAL AFTER 5% COMPACTION	= 1,110 Cu. Yds.
Topsoil & Pit Backfill (1/2 Pit Vol.)	= 1,110 Cu. Yds.
EXCESS UNBALANCE (After Rehabilitation)	= 0 Cu. Yds.



**Proposed Location:  
SNOW #3-13-19-7**

**T18S  
T19S**

SEE TOPO "B"

1.6 Mi. ±

**RR  
78  
E**

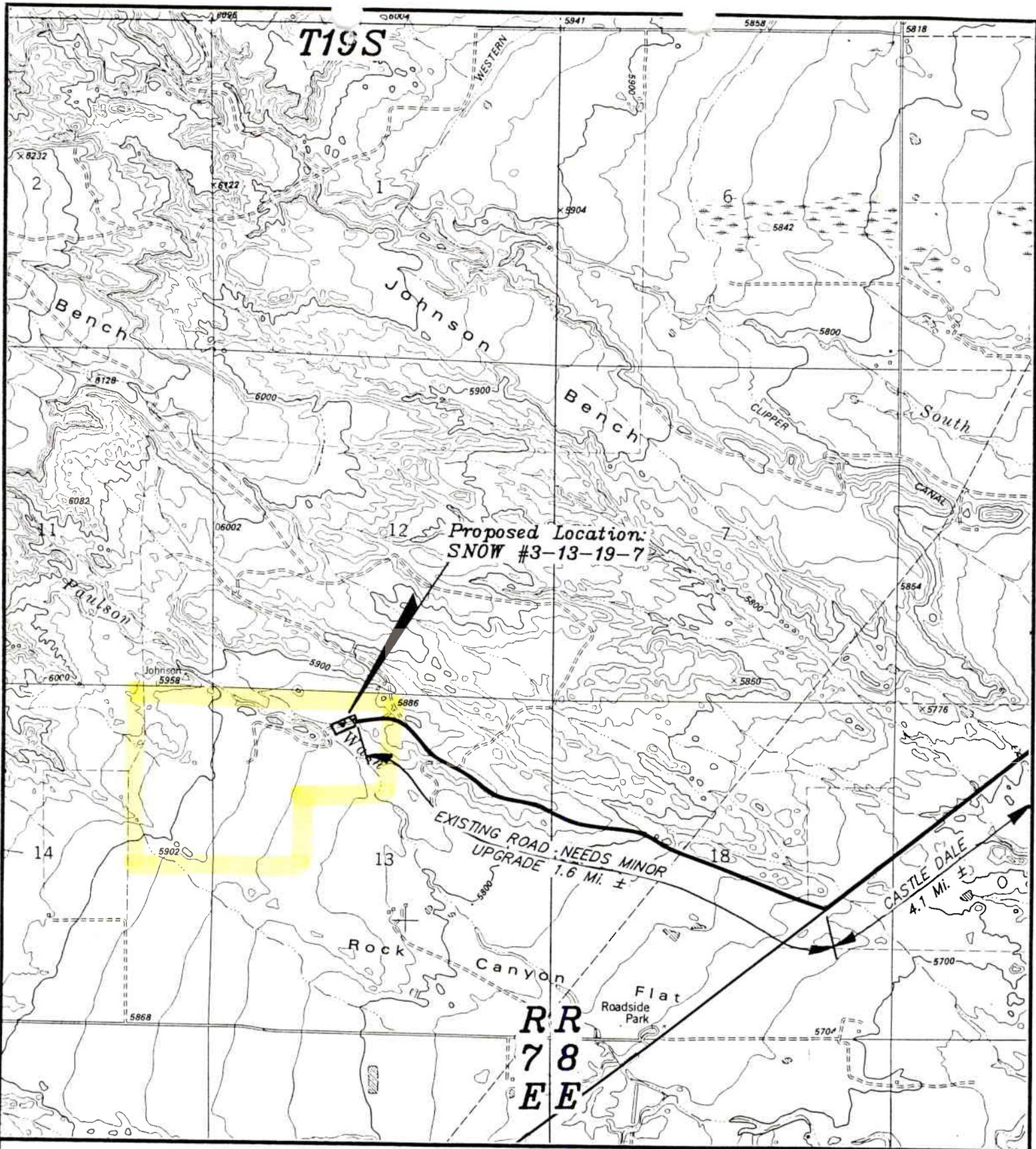
**TOPOGRAPHIC  
MAP "A"**

**CHANDLER & ASSOCIATES, INC.**

SNOW #3-13-19-7  
SECTION 13, T19S, R7E, S.L.B.&M.  
505' FNL 2011' FWL

DATE: 8/3/95 D.COX





TOPOGRAPHIC  
MAP "B"

SCALE: 1"=2000'

DATE: 8/3/95 D.COX



CHANDLER & ASSOCIATES, INC.

SNOW #3-13-19-7  
SECTION 13, T19S, R7E, S.L.B.&M.  
505' FNL 2011' FWL

LEASE BOUNDARY

CONFIDENTIAL

Form 3160-3  
(December 1990)

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RECEIVED  
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DIV. OF OIL, GAS & MINING

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK  
 DRILL  DEEPEN

b. TYPE OF WELL  
 OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR  
 Chandler & Associates, Inc.

3. ADDRESS AND TELEPHONE NO.  
 475 Seventeenth St., Suite 1000 Denver, CO 80202

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*  
 At surface 505' FNL 2011' FWL  
 At proposed prod. zone

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
 See Topo Map "A"

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 505'

16. NO. OF ACRES IN LEASE 160

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. 1930'

19. PROPOSED DEPTH 1930'

20. ROTARY OR CABLE TOOLS Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.) 5853' GR

22. APPROX. DATE WORK WILL START\* A.S.A.P.

5. LEASE DESIGNATION AND SERIAL NO. 8706-089-00

6. INDIAN, ALLOTTEE OR TRIBE NAME N/A

7. LEASE AGREEMENT NAME N/A

8. FARM OR LEASE NAME, WELL NO. Snow

9. AIRWELL NO. # 3-13-19-7

10. FIELD AND POOL, OR WILDCAT Ferron

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec. 13, T19S, R7E, S.L.M.

12. COUNTY OR PARISH Emery

13. STATE UT

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12 1/4"	8 5/8"	24#	300'	(See Attached Drilling Plan)
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5. Well will be drilled with air/mist to T.D. mud will be in place to run 5 1/2" casing.

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24. SIGNED Robert L. Kay TITLE Agent for Chandler DATE 8-3-95  
 (This space for Federal or State office use)

PERMIT NO. 43-015-30262 APPROVAL DATE \_\_\_\_\_

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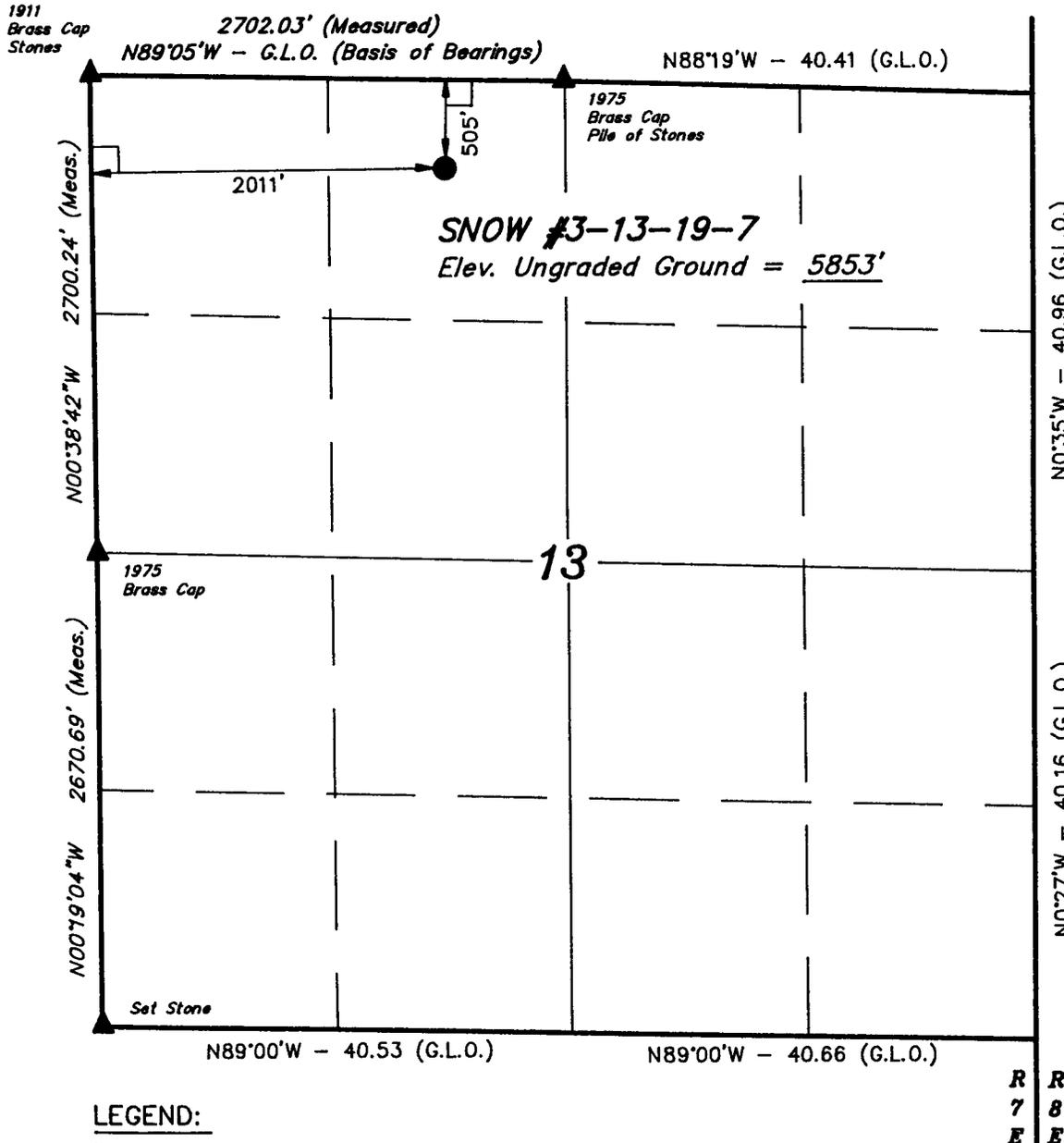
APPROVED BY [Signature] TITLE Petroleum Engineer DATE 8/23/95

\*See Instructions On Reverse Side

**CHANDLER & ASSOCIATES, INC.**

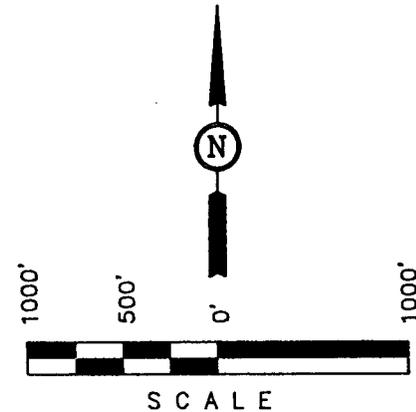
**T19S, R7E, S.L.B.&M.**

Well location, SNOW #3-13-19-7, located as shown in the NE 1/4 NW 1/4 of Section 13, T19S, R7E, S.L.B.&M. Emery County, Utah.



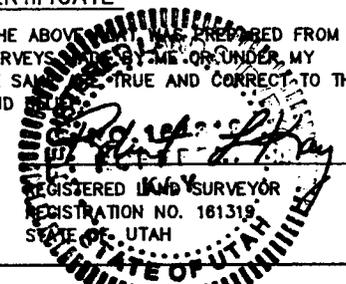
**BASIS OF ELEVATION**

JOHNSON TRIANGULATION IN THE SE 1/4 OF SECTION 11, T19S, R7E, S.L.B.&M. TAKEN FROM THE CASTLE DALE QUADRANGLE, UTAH, EMERY COUNTY, 7.5 MINUTE QUAD. (TOPOGRAPHIC MAP) PUBLISHED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. SAID ELEVATION IS MARKED AS BEING 5958 FEET.



**CERTIFICATE**

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



<b>UINTAH ENGINEERING &amp; LAND SURVEYING</b>		
85 SOUTH 200 EAST - VERNAL, UTAH 84078		
(801) 789-1017		
SCALE 1" = 1000'	DATE SURVEYED: 8-02-95	DATE DRAWN: 8-03-95
PARTY B.B. G.O. D.R.B.	REFERENCES G.L.O. PLAT	
WEATHER WARM	FILE CHANDLER & ASSOCIATES, INC.	

**LEGEND:**

- └─┘ = 90° SYMBOL
- = PROPOSED WELL HEAD.
- ▲ = SECTION CORNERS LOCATED.

R  
7  
E



State of Utah  
Division of Oil, Gas & Mining (OGM)

**ON-SITE PREDRILL EVALUATION AND REVIEW  
FOR  
APPLICATION FOR PERMIT TO DRILL (APD)**

OPERATOR

Chandler & Associates Inc.

WELL NO.

Snow 3-13-19-7

LEASE NO.

Snow

API No.

43 - 015 - 30262

LEASE TYPE

State

Fee

PROPOSED LOCATION

1/4/1/4 NE NW	SECTION 13	TOWNSHIP 19 South	RANGE 7 East
COUNTY Emery		FIELD Undesignated	
SURFACE 505' FNL      2011'      FWL			
BOTTOM HOLE Same as Above			
GPS COORDINATES North 4335990      East 492475			

SURFACE OWNER

Snow

SURFACE AGREEMENT

Yes

No

CONFIDENTIAL

Yes

No

LOCATING AND SITING

UAC R649-2-3.      Unit

UAC R649-3-2.      General

UAC R649-3-3.      Exception

UCA 40-6-6.      Drilling Unit      --      Cause No.

## DRILLING PROGRAM

The following information should be included in the Application for Permit to Drill submitted.

- 1 Surface Formation and Estimated Tops/Geologic Markers
- 2 Estimated Depths and Names of Anticipated Water, Oil, Gas or other Mineral Bearing Formations  
  
(All fresh water sands encountered during drilling shall be recorded and reported to the Division on Form 7.)
- 3 Well Control Equipment & Testing Procedures
- 4 Proposed Casing and Cementing Program
- 5 Mud Program, Circulating Medium, and Monitoring equipment
- 6 Coring, Testing, and Logging Program
- 7 Expected Bottom Hole Pressures and any anticipated Abnormal Pressures, Temperatures or Potential Hazards such as hydrogen sulfide, expectations and contingency plans for mitigating identified hazards
- 8 Any other information relative to the proposed operation.

## SURFACE USE PLAN

### 1. Current Surface Use

Cattle grazing and wildlife habitat.

### 2. Proposed Surface Disturbance

Location and access road about 1.6 miles.

### 3. Existing Roads

Utah State Highway 10 south of Castledale about 4 miles.

### 4. Planned Access Roads (include length of new road, length of existing road to be upgraded, maximum disturbed and travel surface widths, maximum grades, turnouts, surface materials, drainage, cattleguards)

Approximately 1/2 mile along existing road, the operator intends to divert onto a 2 track jeep trail, that will be upgraded. This road will run approximately one mile to the location. This is a change from the diagram that was submitted at the time of the presite. Operator will submit a Sundry Notice with the new road changes. A 24" culvert will be installed in a existing ditch approximately 500' from Highway 10.

### 5. Location of existing wells within one-mile radius of proposed location, include water, injection, producing, drilling with present status of each well

None.

### 6. Location of Production Facilities and Pipelines

There is a compressor station located 1 1/2 north and east of the proposed location.

### 7. Waste Management Plan

See the Surface Use Plan submitted with the APD.

### 8. Ancillary Facilities

None.

### 9. Well Site Layout

See site diagram attached as part of the APD.

10. Reserve Pit

a. Characteristics

Pit will be located on the northwest side of the location, and will be 30' x 45' x 8'.

b. Lining (Site ranking form attached)

Liner will not be required.

11. Surface Restoration Plans

Restoration will be completed as stipulated by the surface owners agreement.

**SURFACE GEOLOGY AND OTHER OBSERVATIONS**

1. Regional Setting/Topography Gentle terrain, flat, open rangeland.
2. Soil Type and Characteristics Clay mixed with sand.
3. Surface Formation & Characteristics Mancos shale, weathering to a light tan.
4. Erosion/Sedimentation/Stability None observed.
5. Paleontological Potential Observed N/A
6. Location and Type of Water Supply (include Division of Water Rights approval or identifying number) Operator will provide with submittal of APD.
7. Cultural Resources/Archaeology (if proposed location is on State land, has an archaeology clearance been obtained?) None.
8. Affected Floodplain and/or Wetlands Is a 404 dredge and fill permit required? (Any activity which will change the bottom elevation of the "waters of the United States" including wetlands, natural and artificially created waters, and even some drainages may require a permit from the Army Corps of Engineers) N/A
9. Flora/Fauna (Briefly describe the flora found on the proposed site and the fauna evidenced or sighted on or near the proposed location) Greasewood, Tamarac, sagebrush, Deer, Raptors, Elk.
Comments A major drainage on the west side of the location will not be impacted.
Onsite Participants Jim Simonton, Joe Murphy-Chandler & Associates, Jim Thompson, Michael Hebertson-DOGM, Brandon Bowthorpe, Greg Olsen-Uintah Engineering.

J. Thompson, M. Hebertson	8/9/95 11:00 am
OGM Representative	Date and Time

**STATEMENTS OF BASIS**

**FOR**

**OGM Review and Approval of Application for Permit to Drill (APD)**

Operator Chandler & Associates

Well Snow 3-13-19-7

**ENGINEERING/LOCATING and SITING**

The proposed location meets the location and siting requirements of R649-3-2. The application and proposed casing and drilling plan appear to be consistent with accepted industry standards of practice and sound engineering design. A casing design safety check is attached. Blow out prevention monitoring/contingency plans are adequate.

Signature Frank Matthews

Date 11-August-1995

**GEOLOGY/GROUND WATER**

There are no shallow aquifers in the area of the proposed well. The proposed casing and cement program will adequately protect any ground water encountered .

Signature D. Jarvis

Date 15-August-1995

**SURFACE**

A onsite inspection was conducted on 8/9/95, with representatives from Chandler & Associates, Uintah Engineering and DOGM. The proposed location was discussed, and the changes in the location of access road. The access road changes were made to avoid crossing BLM land. Cut and fill diagrams were provided by Uintah Engineering. Impact to the surrounding area and the environment will be minor.

Signature J. Thompson, M. Hebertson

Date 8/9/95

**STIPULATIONS for APD Approval**

**ATTACHMENTS**

Pictures of this location are available.

**Evaluation Ranking Criteria and Ranking Score  
For Reserve and Onsite Pit Liner Requirements**

Site-Specific Factors	Ranking Score	Final Ranking Score
<b>Distance to Groundwater (feet)</b>  >200 100 to 200 75 to 100 25 to 75 <25 or recharge area	0 5 10 15 20	0
<b>Distance to Surf. Water (feet)</b>  >1000 300 to 1000 200 to 300 100 to 200 < 100	0 2 10 15 20	0
<b>Distance to Nearest Municipal Well (feet)</b>  >5280 1320 to 5280 500 to 1320 <500	0 5 10 20	0
<b>Distance to Other Wells (feet)</b>  >1320 300 to 1320 <300	0 10 20	0

<p><b>Native Soil Type</b></p> <p>Low permeability Mod. permeability High permeability</p>	<p>0 10 20</p>	<p>0</p>
<p><b>Fluid Type</b></p> <p>Air/mist Fresh Water TDS &gt;5000 and &lt;10000 TDS &gt;10000 or Oil Base Mud</p> <p>Fluid containing significant levels of hazardous constituents</p>	<p>0 5 10 15 20</p>	<p>0</p>
<p><b>Drill Cuttings</b></p> <p>Normal Rock Salt or detrimental</p>	<p>0 10</p>	<p>0</p>
<p><b>Annual Precipitation (inches)</b></p> <p>&lt;10 10 to 20 &gt;20</p>	<p>0 5 10</p>	<p>0</p>
<p><b>Affected Populations</b></p> <p>&lt;10 10 to 30 30 to 50 &gt;50</p>	<p>0 6 8 10</p>	<p>0</p>

Presence of Nearby Utility Conduits		0
Not Present	0	
Unknown	10	
Present	15	

Final Score	0
-------------	---

The summation of all of the above ranking scores will yield one value which shall be used to determine the appropriate type of containment, on a case-by-case basis. The sensitivity levels are as follows:

- Level I Sensitivity: For scores totaling  $\geq 20$
- Level II Sensitivity: For scores totaling 15 to 19
- Level III Sensitivity: For scores totaling  $< 15$

**Containment Requirements According to Sensitivity Level**

Level I: Requires total containment by synthetic liner, concrete structure or other type of total containment structure or material.

Level II: Bentonite or other compatible lining is discretionary depending on the fluid to be contained and environmental sensitivity.

Level III: No specific lining requirements.

**OTHER GUIDELINES FOR PITS**

1. Unlined pits shall not be constructed on areas of fill materials.
2. A pit shall not be constructed in a drainages or floodplain

of flowing or intermittent streams.

3. Synthetic liners used for lining reserve pits, shall be of 12 mil thickness or greater and shall be compatible with the fluid to be contained. Synthetic liners used for lining onsite pits with a longer expected life shall be a minimum of 30 mil thickness or as approved by the Division.
4. Synthetic liners shall be installed over smooth fill material which is free of pockets, loose rocks or other materials which could damage the liner.
5. Monitoring systems for pits or closed mud systems may be required for drilling in sensitive areas.

**STATE OF UTAH**

<b>Operator: CHANDLER &amp; ASSOCIATES</b>	<b>Well Name: SNOW #3-13-19-7</b>
<b>Project ID: 43-015-30262</b>	<b>Location: SEC. 13, T19S, R07E</b>

Design Parameters:

Mud weight (13.00 ppg) : 0.675 psi/ft  
 Shut in surface pressure : 1241 psi  
 Internal gradient (burst) : 0.032 psi/ft  
 Annular gradient (burst) : 0.000 psi/ft  
 Tensile load is determined using buoyed weight  
 Service rating is "Sweet"

Design Factors:

Collapse : 1.125  
 Burst : 1.00  
 8 Round : 1.80 (J)  
 Buttress : 1.60 (J)  
 Other : 1.50 (J)  
 Body Yield : 1.50 (B)

Length (feet)	Size (in.)	Weight (lb/ft)	Grade	Joint	Depth (feet)	Drift (in.)	Cost		
1	1,930	5.500	15.50	J-55	ST&C	1,930	4.825		
	Load (psi)	Collapse Strgth (psi)	S.F.	Burst Load (psi)	Min Int Strgth (psi)	Yield S.F.	Tension Load (kips)	Strgth (kips)	S.F.
1	1303	4040	3.100	1303	4810	3.69	23.97	202	8.43 J

Prepared by : MATTHEWS, Salt Lake City, UT  
 Date : 08-11-1995  
 Remarks :

Minimum segment length for the 1,930 foot well is 1,000 feet.  
 SICP is based on the ideal gas law, a gas gravity of 0.69, and a mean gas temperature of 84°F (Surface 74°F , BHT 93°F & temp. gradient 1.000°/100 ft.)  
 The mud gradient and bottom hole pressures (for burst) are 0.675 psi/ft and 1,303 psi, respectively.

**NOTE:** The design factors used in this casing string design are as shown above. As a general guideline, Lone Star Steel recommends using minimum design factors of 1.125 - Collapse (with evacuated casing), 1.0 - Burst, 1.8 - 8 Round Tension, 1.6 - Buttress Tension, and 1.5 - Body Yield. Collapse strength under axial tension was calculated based on the Westcott, Dunlop and Kemler curve. Engineering responsibility for use of this design will be that of the purchaser. Costs for this design are based on a 1987 pricing model. (Version 1.06)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED  
AUG 16 1995

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

**SUNDRY NOTICES AND REPORTS ON WELLS OF OIL, GAS & MINING**

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

5. Lease Designation and Serial No.  
8706-089-00

6. If Indian, Allottee or Tribe Name  
N/A

7. If Unit or CA, Agreement Designation  
N/A

8. Well Name and No.  
Snow # 3-13-19-7

9. API Well No.

10. Field and Pool, or Exploratory Area  
Ferron

11. County or Parish, State  
Emery, Utah

**SUBMIT IN TRIPLICATE**

1. Type of Well

Oil Well  Gas Well  Other

2. Name of Operator

Chandler & Associates, Inc.

3. Address and Telephone No.

475 Seventeenth St., Suite 1000 Denver, CO 80202 (303)295-0400

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

505' FNL 2011' FWL

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

TYPE OF SUBMISSION	TYPE OF ACTION
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input checked="" type="checkbox"/> Other <u>Road Change</u>
	<input checked="" type="checkbox"/> Change of Plans
	<input type="checkbox"/> New Construction
	<input type="checkbox"/> Non-Routine Fracturing
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Conversion to Injection
	<input type="checkbox"/> Dispose Water

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

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

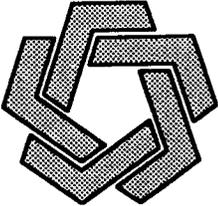
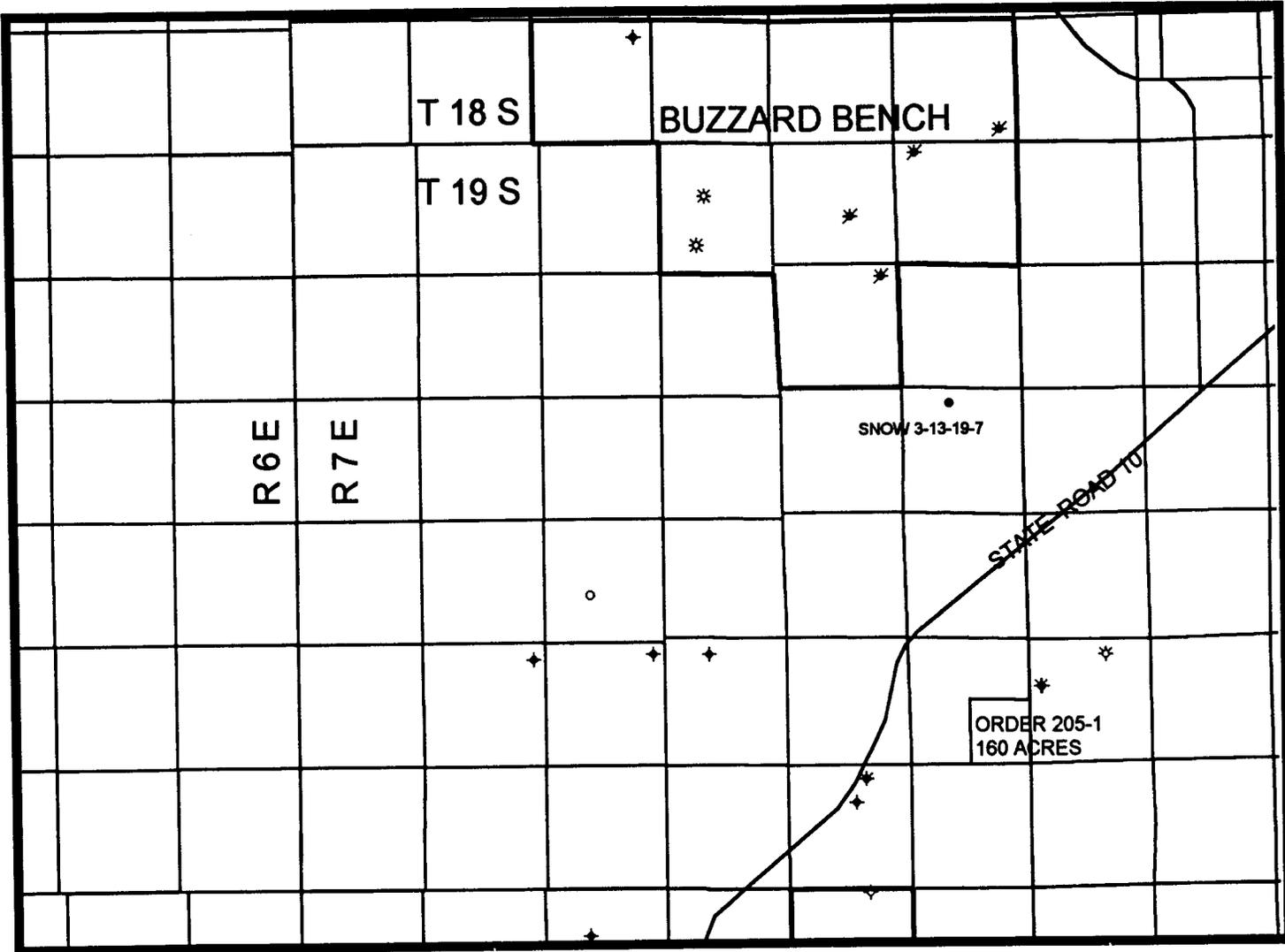
Chandler & Associates would like to submit this change of plans sundry notice for the route change on the access road for the Snow # 3-13-19-7 proposed well location. We have attached a copy of a topo map depicting the new route which was picked at the time of the onsite inspection. This route was chosen to avoid crossing B.L.M. lands to the north. The original route was shown on the topo map "b" which was attached to the application for permit to drill and was filed 8-3-95.

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

Signed Robert L. Gray Title Agent for Chandler Date 8-14-95

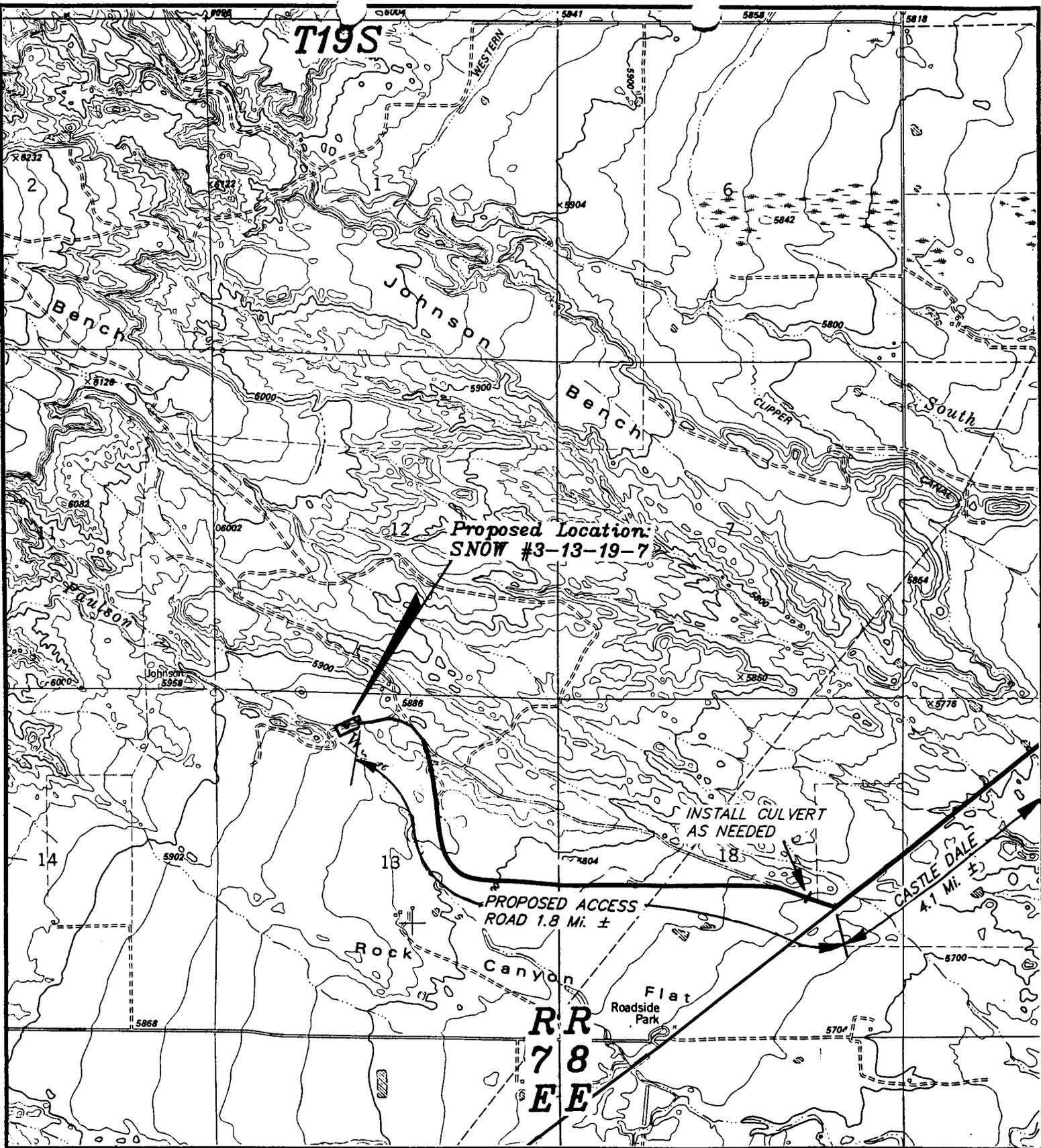
(This space for Federal or State office use)  
Approved by [Signature] Title Petroleum Engineer Date 8/23/95  
Conditions of approval, if any:

CHANDLER & ASSOCIATES  
SNOW 3-13-19-7  
SEC. 13, T19S, R7E  
EMERY COUNTY, STATE SPACING



STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS & MINING

DATE: 8/ 7/95



TOPOGRAPHIC  
MAP "B"

SCALE: 1"=2000'

REVISED: 8-10-95 D.R.B.  
DATE: 8/3/95 D.COX



CHANDLER & ASSOCIATES, INC.

SNOW #3-13-19-7  
SECTION 13, T19S, R7E, S.L.B.&M.  
505' FNL 2011' FWL

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED  
AUG 22 1995  
BUREAU OF OIL GAS & MINING

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

**SUNDRY NOTICES AND REPORTS ON WELLS**

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

Lease Designation and Serial No.  
8706-089-00

**SUBMIT IN TRIPLICATE**

1. Type of Well

Oil Well  Gas Well  Other

2. Name of Operator

Chandler & Associates, Inc.

3. Address and Telephone No.

475 Seventeenth St., Suite 1000 Denver, CO 80202 (303) 295-0400

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

505' FNL 2011' FWL (Sec. 13, T19S, R7E, S.L.B. & M.)

6. If Indian, Allottee or Tribe Name

N/A

7. If Unit or CA, Agreement Designation

N/A

8. Well Name and No.

Snow #3-13-19-7

9. API Well No.

42.015-30262

10. Field and Pool, or Exploratory Area

Ferron

11. County or Parish, State

Emery, Utah

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

TYPE OF SUBMISSION	TYPE OF ACTION
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input type="checkbox"/> Other _____
	<input checked="" type="checkbox"/> Change of Plans
	<input type="checkbox"/> New Construction
	<input type="checkbox"/> Non-Routine Fracturing
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Conversion to Injection
	<input type="checkbox"/> Dispose Water

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

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

Chandler & Associates would like to submit this sundry notice for the additional information to be included in the submitted A.P.D. for the Snow #3-13-19-7 proposed well location.

The water source for this well will be from the Cottonwood Creek Consolidated Irrigation Co. The water user claim number is 93-2185 and the two (2) points of diversion will be from the Clipper Canal or the Western Canal which ever is the most accessible. This water will be hauled by Sydbad Construction Co. over the roads which are shown on topo map A & B which are attached to the A.P.D.

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

Signed Robert L. Kay Title Agent for Chandler Date 8-18-95  
(This space for Federal or State office use)

Approved by \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_  
Conditions of approval, if any:

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



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt  
Governor

Ted Stewart  
Executive Director

James W. Carter  
Division Director

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340  
801-359-3940 (Fax)  
801-538-5319 (TDD)

August 23, 1995

Chandler & Associates, Inc.  
475 Seventeenth Street, Suite 1000  
Denver, Colorado 80202

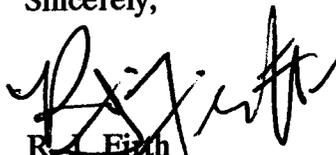
Re: Snow #3-13-19-7 Well, 505' FNL, 2011' FWL, NE NW, Sec. 13, T. 19 S., R. 7 E.,  
Emery County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. 40-6-1 et seq., Utah Admin. R. 649-3-1 et seq., and the attached Conditions of Approval, approval to drill the referenced well is granted.

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date. The API identification number assigned to this well is 43-015-30262.

Sincerely,

  
R. J. Firth  
Associate Director

ldc

Enclosures

cc: Emery County Assessor

Bureau of Land Management, Moab District Office

WAPD



Operator: Chandler & Associates, Inc.  
Well Name & Number: Snow #3-13-19-7  
API Number: 43-015-30262  
Lease: Fee  
Location: NE NW Sec. 13 T. 19 S. R. 7 E.

### Conditions of Approval

1. General

Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for Permit to Drill.

2. Notification Requirements

Notify the Division within 24 hours following spudding the well or commencing drilling operations. Contact Jimmie Thompson at (801)538-5340.

Notify the Division prior to commencing operations to plug and abandon the well. Contact Frank Matthews or Mike Hebertson at (801)538-5340.

3. Reporting Requirements

All required reports, forms and submittals shall be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. Bonding

Chandler & Associates, Inc. shall furnish a bond or provide evidence of adequate bond coverage prior to spudding the well.

**CONFIDENTIAL**

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

Name of Company: CHANDLER & ASSOCIATES

Well Name: SNOW 3-13-19-7

Api No. 43-015-30262

Section 13 Township 19S Range 7E County EMERY

Drilling Contractor CHANDLER

Rig # 7

SPUDDED: Date 10/23/95

Time \_\_\_\_\_

How ROTARY

Drilling will commence \_\_\_\_\_

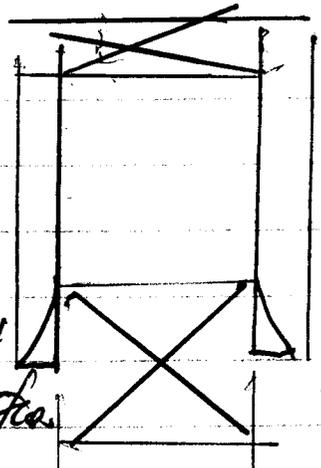
Reported by JIM SIMONTON

Telephone # 1-801-790-5467

Date: 10/20/95 Signed: JLT

Chandler & Associates  
 SNOW #3-13-19-7  
 NE 1/4 NW 1/4 13-19S-7E  
 Emery Co. UT.

8 5/8" @ 300'  
 Cased to spec.



Jim Simonton.  
 1-801-790-5467  
 1-800-790-1206

10/25/95.

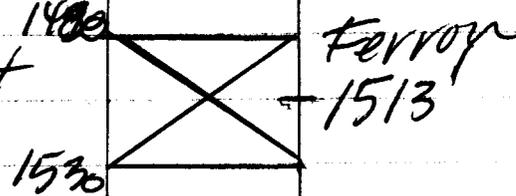
Dr. 30' to T.D.

Logging @ 7pm

probably ready to plug @ 12mm.

Mud up to set abandonment  
 plugs.

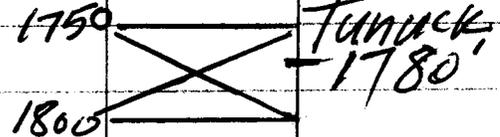
Ferron plug 1: 20 SKS. 1750'-1800'



Ferron  
 -1513'

1530

TUNUCK plug 2: 20 SKS. 1480'-1530'



TUNUCK  
 -1780'

1800

At base plug 3: 20 SKS @ shoe /  
 of surface casing  
 casing

TO 1930'

Surface plug 4: 10 SKS @ surface w/ marker

10/25/95 ✓

STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING  
RECORD OF ABANDONMENT OPERATIONS

COMPANY NAME: CHANDLER & ASSOCIATES

WELL NAME: SNOW 3-13-19-7

QTR/QTR: NE/NW SECTION: 13 TOWNSHIP: 19S RANGE: 7E

COUNTY: EMERY API NO: 43-015-30262

INSPECTOR: J. THOMPSON TIME: 6:00 PM-9:30 PM DATE: 10/26/95

SURFACE CASING SHOE DEPTH 300' CASING PULLED YES  NO

CASING PULLED: SIZE                      CUT DEPTH                      FT/CSG RECOVERED                     

CASING TESTED YES  NO  TESTED TO:                      PSI TIME:                      MIN:

CEMENTING COMPANY: BJ

CEMENTING OPERATIONS: P&A WELL:

PLUG 1. SET: FROM 1750' FT. TO 1800' FT. TAGGED YES  NO

RACKED 4 STANDS-LAYED DOWN 1 JOINT.

SLURRY: 20 SXS. CLASS "G" 4 BBLs CEMENT-19.5 DISPLACEMENT 50' PLUG.

PLUG 2. SET FROM 1480' FT. TO 1530' TAGGED YES  NO

SLURRY: 20 SXS. CLASS "G" 4 BBLs CEMENT- 16.5 DISPLACEMENT 50' PLUG.

RACKED 2 STANDS-LAYED DOWN REMAINING.

PLUG 3. SET FROM 350' FT. TO 250' FT. TAGGED YES  NO

SLURRY: 40 SXS. 50' IN AND 50' OUT OF BOTTOM OF SURFACE CASING. 8.1 BBLs

OF CEMENT-2.3 BBLs DISPLACEMENT.

PLUG 4. SET FROM 25 FT. TO SURFACE TAGGED YES  NO

RIGGED DOWN BOPES-RAN IN 1 JOINT- PUMPED 2 BBLs CEMENT TO SURFACE. CEMENT

REMAINED AT SURFACE.

SLURRY: CEMENT SLURRY WAS 15.8 PPG-2% CALC-FOR ALL PLUGS.

ALL ANNULUS CEMENTED TO SURFACE: YES  NO

PLUGGING FLUID TYPE: 6 # GEL-MIXED ON THE FLY.

PERFORATIONS: FROM                      FT. TO                      FT.

# 1 CIBP SET:                     

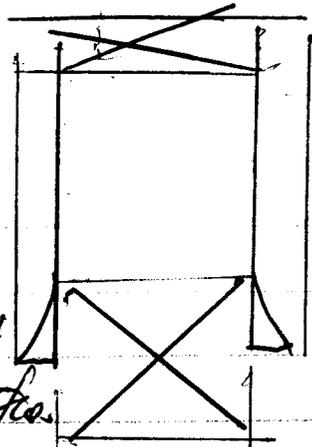
# 2 CIBP SET:                     

ABANDONMENT MARKER: PLATE:                      PIPE:                      CORRECT INFORMATION:

COMMENTS: TYPE OF MARKER WAS NOT DETERMINED AT TIME OF ABANDONMENT.

Chandler & Associates  
 SNOW #3-13-19-7  
 NE 1/4 NW 1/4 13-19S-7E  
 Emery Co. UT.

Jim Simonton.  
 1-801-790-5467  
 1-800-790-1206



8 5/8" @ 200'  
 Could to spec.

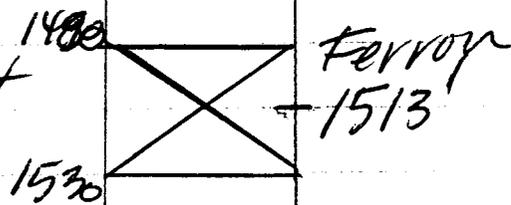
10/25/95.

Drl. 30' to T.D.

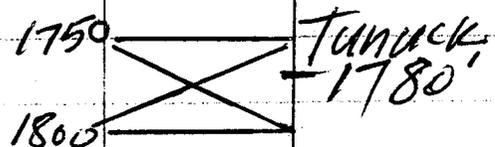
Logging @ 7pm

probably ready to plug @ 12mm.

Mud up to set abandonment  
 plugs.

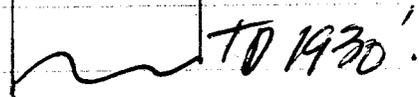


Ferron 1513' plug 1: 20 SKS. 1750'-1800'



Tunuck 1780' plug 2: 20 SKS. 1480'-1530'

At base plug 3: 20 SKS @ shoe /  
 of surface casing. Surface casing.



Surface plug 4: 10 SKS @ surface w/ marker

CONFIDENTIAL

SUBMIT IN DUPLICATE

OCT 30 1995

STATE OF UTAH  
OIL & GAS CONSERVATION COMMISSION

See other instructions (reverse side)  
DIV. OF OIL, GAS & MINING  
5. LEASE DESIGNATION SERIAL NO.  
8706-089-00

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. RESRV.  Other \_\_\_\_\_

2. NAME OF OPERATOR  
Chandler & Associates, Inc.

3. ADDRESS OF OPERATOR  
475 17th Street, Suite 1000, Denver, CO 80202

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface **NENW (505' FNL & 2011' FWL)**  
At top prod. interval reported below **SAME**  
At total depth **SAME**

14. PERMIT NO. **43-015-30262** DATE ISSUED **08-23-95**

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

7. UNIT AGREEMENT NAME  
N.A.

8. FARM OR LEASE NAME  
SNOW

9. WELL NO.  
3-13-19-7

10. FIELD AND POOL, OR WILDCAT  
FERRON

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
Sec. 13-T19S-R7E

12. COUNTY OR PARISH  
EMERY STATE  
UTAH

15. DATE SPUNDED **10-21-94** 16. DATE T.D. REACHED **10-24-95** 17. DATE COMPL. (Ready to prod.) **N.A.** 18. ELEVATIONS (DF, REB, RT, GR, ETC.)\* **5853' GL 5863' KB** 19. ELEV. CASINGHEAD **----**

20. TOTAL DEPTH, MD & TVD **1975'** 21. PLUG, BACK T.D., MD & TVD **N.A.** 22. IF MULTIPLE COMPL., HOW MANY\* **N.A.** 23. INTERVALS DRILLED BY **0-TD** ROTARY TOOLS **0-TD** CABLE TOOLS **----**

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\*  
**N.A.** 25. WAS DIRECTIONAL SURVEY MADE  
**No**

26. TYPE ELECTRIC AND OTHER LOGS RUN  
**DI - FL/GR 10-30-95 CNL - CDL/GR** 27. WAS WELL CORRED  
**Yes**

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

CASINO SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24	330	12 1/4	230 sx. Class 'G'	-----

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)
		<b>PeA</b>

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 [Signature] TITLE Vice Pres. Operations DATE 27 Oct. 1995

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

# INSTRUCTIONS

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

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

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

**Item 18:** Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments. **Items 22 and 24:** If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

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

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

37. SUMMARY OF POROUS ZONES: SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES		38. GEOLOGIC MARKERS	
FORMATION	TOP	DESCRIPTION, CONTENTS, ETC.	TOP
			MEAS. DEPTH
			TRUE VERT. DEPTH
Bluegate	Surface	Shale	
Ferron Sandstone	1595	Sandstone, poor porosity, wet	
Tununk	1828	Shale	

RECEIVED  
 OCT 30 1995  
 DIV. OF OIL, GAS & MINING

**REPORT OF WATER ENCOUNTERED DURING OIL, GAS & MINING**

1. Well name and number: SNOW 3-13-19-7

API number: 43-015-30262

2. Well Location: QQNENW Section 13 Township 19S Range 7E County Emery

3. Well operator: Chandler & Associates, Inc.

Address: 475 17th Street, Suite 1000  
Denver, CO 80202

Phone: (303) 295-0400

4. Drilling contractor: Chandler Drilling Corporation

Address: 475 17th Street, Suite 1000  
Denver, CO 80202

Phone: (303) 295-0400

5. Water encountered (attach additional pages as needed):

DEPTH		VOLUME (FLOW RATE OR HEAD)	QUALITY (FRESH OR SALTY)
FROM	TO		
N.A.	N.A.	N.A.	N.A.

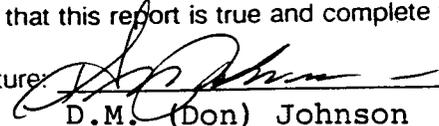
6. Formation tops: Bluegate Surface

Ferron Sandstone 1595'

Tununk 1828'

If an analysis has been made of the water encountered, please attach a copy of the report to this form.

I hereby certify that this report is true and complete to the best of my knowledge. Date: 27 Oct. 1995

Name & Signature:  Title: Vice Pres. Operations  
 D.M. (Don) Johnson

OPERATOR Chandler & Associates, Inc.  
 ADDRESS 475 17th Street, Suite 1000  
Denver, CO 80202

OPERATOR ACCT. NO. H 3320

ACTION CODE	CURRENT ENTITY NO.	NEW ENTITY NO.	API NUMBER	WELL NAME	WELL LOCATION				COUNTY	SPUD DATE	EFFECTIVE DATE
					QQ	SC	TP	RG			
A	99999	11844	43-015-30262	SNOW 3-13-19-7	NENW	13	19S	7E	Emery	10-21-95	10-21-95
WELL 1 COMMENTS: <i>Entity added 10-31-95. Lee</i>											
WELL 2 COMMENTS:											
WELL 3 COMMENTS:											
WELL 4 COMMENTS:											
WELL 5 COMMENTS:											

- ACTION CODES (See instructions on back of form)
- A - Establish new entity for new well (single well only)
  - D - Add new well to existing entity (group or unit well)
  - C - Re-assign well from one existing entity to another existing entity
  - D - Re-assign well from one existing entity to a new entity
  - E - Other (explain in comments section)

NOTE: Use COMMENT section to explain why each Action Code was selected.

(3/89)

**RECEIVED**  
 OCT 30 1995  
 DIV. OF OIL, GAS & MINING

*[Signature]*  
 Signature D.M. (Don) Johnson  
 Title V.P.-Operations Date 27 Oct. '95  
 Phone No. (303) 295-0400

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS, AND MINING

**RECEIVED**  
SUBMIT THIS APPLICATION\*  
(Other instructions on reverse side)  
OCT 30 1995

5. LEASE DESIGNATION AND SERIAL NO.  
8706-089-00  
INDIAN, ALLOTTEE OR TRIBE NAME  
N.A.

**SUNDRY NOTICES AND REPORTS ON WELLS OIL, GAS & MINING**

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

1.  OIL WELL  GAS WELL  OTHER

7. UNIT AGREEMENT NAME  
N.A.

2. NAME OF OPERATOR  
Chandler & Associates, Inc.

8. FARM OR LEASE NAME  
SNOW

3. ADDRESS OF OPERATOR  
475 17th Street, Suite 1000, Denver, CO 80202

9. WELL NO.  
3-13-19-7

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

10. FIELD AND POOL, OR WILDCAT  
FERRON

NENW (505'FNL & 2011'FWL)

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
Section 13-T19S-R7E

14. PERMIT NO.  
43-015-30262

15. ELEVATIONS (Show whether DF, RT, OR, etc.)  
5853' GL 5863' KB

12. COUNTY OR PARISH  
EMERY

13. STATE  
UTAH

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

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <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) _____	
(Other) _____		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

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

Cement used to plug and abandon as per requirements:

1. Pump 20sx. balanced plug from 1800'-1750'.
2. Circulated 156 bbls. gelled water.
3. Pump 20sx. balanced plug from 1521'-1471'.
4. Pump 40sx. balanced plug from 360'-220'.
5. Pump 10sx. cement plug at surface.

Note: All cement was Class 'G' with 2% CaCl<sub>2</sub>.

Jim Thompson witnessed plugging procedure.

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

SIGNED \_\_\_\_\_

TITLE Vice Pres. of Operations DATE 27 Oct. 1995

(This space for Federal or State office use)

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

TITLE \_\_\_\_\_ DATE \_\_\_\_\_

43-015-30262

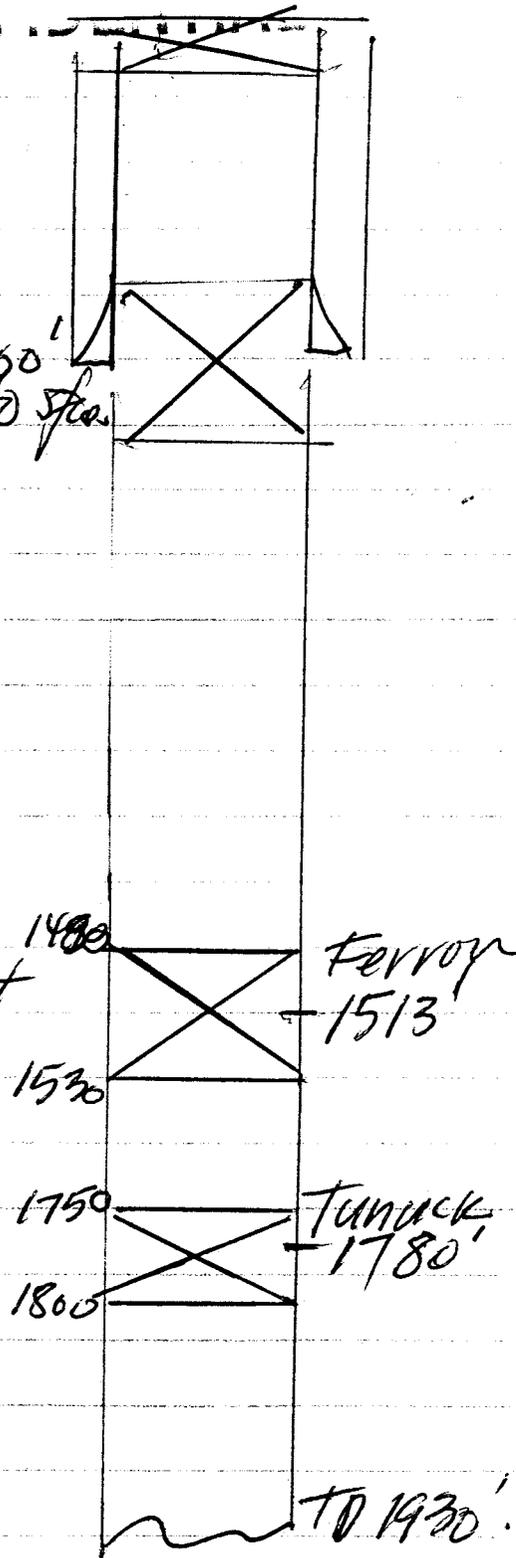
Chandler & Associates  
SNOW #3-13-19-7  
NE & NW 1/4 13-19S-7E  
Emerg Co. UT.

8 5/8" @ 390'  
Cased to spec.

Jim Simonton.  
1-801-790-5467  
1-800-790-1206

10/25/95.

Drl. 30' to T.D.  
Logging @ 7pm  
probably ready to plug @ 12mm.  
Mud up to set abandonment  
plugs.



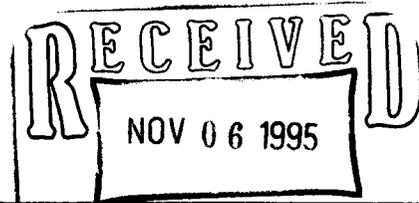
Ferron plug 1: 20 SKS. 1750'-1800'

Tunuck plug 2: 20 SKS. 1480'-1530'

At base plug 3: 20 SKS @ shoe /  
of surface casing

Surface plug 4: 10 SKS @ surface w/ marker

# == STANDARD ==



DIV. OF OIL, GAS & MINING

**LABORATORY ANALYSIS OF FERRON  
SANDSTONE SIDEWALL CORES FROM THE  
SNOW #3-13-19-7 WELL,  
13-19S-7E,  
EMERY COUNTY, UTAH**

## CONFIDENTIAL

October 30, 1995

Standard Geological Services, Inc.  
6920 Jordan Road, Suite M  
Englewood, CO 80112  
Phone (303) 680-4816  
FAX (303) 680-1206

A Report Prepared For  
Chandler & Associates, Inc.

---

LABORATORY EXAMINATION OF FERRON SANDSTONE  
SIDEWALL CORES FROM THE  
SNOW #3-13-19-7 WELL,  
13-19S-7E , EMERY COUNTY, UTAH

---

## CONCLUSIONS

① The amounts of silica and clay cements present control the porosity and permeability in the samples examined. Clays influence permeability by blocking pore throats. Mean pore size in the sandstone cores decreases as the percentage of clays present increases.

Of the six sidewall cores examined samples 1604', 1641', 1794', and 1820', represent the best potential gas reservoirs. These sandstones have approximately 5 percent clay and are principally cemented by silica in the form of quartz overgrowths. Calcite is a minor cement in all samples. Dolomite increases in abundance in the two deepest cores (1794' and 1820') comprising 6.8 percent of sample 1820'. Porosity consists of reduced intergranular pores typically 30 to 70 microns in diameter (.03 to .07 mm.). A subordinate percent of the total porosity occurs as micropores between clay cement crystals with

diameters of 2 to 6  $\mu\text{m}$  (.002 to .006 mm.). The microporosity fraction is not considered to contribute effective porosity to the reservoir. Sample 1641' has the largest mean grain size (fine to medium sand) and is, visually, the best reservoir suggesting a sedimentologic control to reservoir quality. Pore throats are in the 1 to 5 micron size range (.001 to .005 mm.).

Samples 1593' and 1756' have the highest amounts of clay and represent the poorest reservoirs. These two samples are highly bioturbated and much of the clay was introduced into the burrows and subsequently recrystallized into an illite-smectite cement. Pore throats are small, commonly in the 1 to 2 micron range (.001 to .002 mm.). Microporosity is dominant.

② The clay mineral fraction is predominantly mixed layer illite-smectite with subordinate amounts of kaolinite. The illite-smectite contains approximately 30 percent expandable layers.

Illite-smectite is the most abundant clay in the Ferron sandstone samples comprising 78% to 84% of the clay mineral fraction. The illite-smectite clay occurs largely as a patchy grain coating and partial pore filling cement. The illite-smectite is adjacent to many pore throats and could damage the reservoir if it migrates (see plate 2).. Kaolinite occurs as a patchy pore-filling cement in the form of micro-crystalline platy aggregates with a crystal size of 2 to 3  $\mu\text{m}$  (.002 to .003 mm.).

③ Potential completion problems in the Ferron sandstones include migration-of-fines and smectite expansion.

Illite-smectite platelets and fibers can become dislodged during turbulent fluid flow to migrate and settle in pores and pore throats. This reduces permeability. Migration-of-fines will be most severe in sandstone intervals with the smallest pore throats and the most illite-smectite. The introduction of water into the formation with lower salinity than the ambient formation water could cause the smectite layers to expand increasing their likelihood of detaching from grain surfaces and migrating. Also smectite expansion could lower permeability by reducing the size of

some pore throats. Acidization would likely cause the clays to break loose and migrate. It is recommended that the sandstones be stimulated in a procedure that will minimize fluid contact with clays in the pore system. Production declines in the Ferron sandstones due to permeability loss are most likely to be caused by migration-of-fines.

## PROCEDURES

Geologist T. Taylor requested examination of core sections from the Cretaceous Ferron sandstones in the Snow #3-13-19-7 well. The objectives of the examination were to: (1) identify mineralogies, particularly clays, that could result in fluid/formation reactions and cause problems during completion; and (2) describe the general reservoir characteristics of the samples.

We examined all samples with low power optical microscopy, scanning electron microscopy (SEM) and accompanying energy dispersive x-ray spectrometry (EDS), and x-ray diffraction (XRD) analysis. The results of all analyses are included in the data sheets that follow this text. The data sheets are followed by SEM photomicrographs.

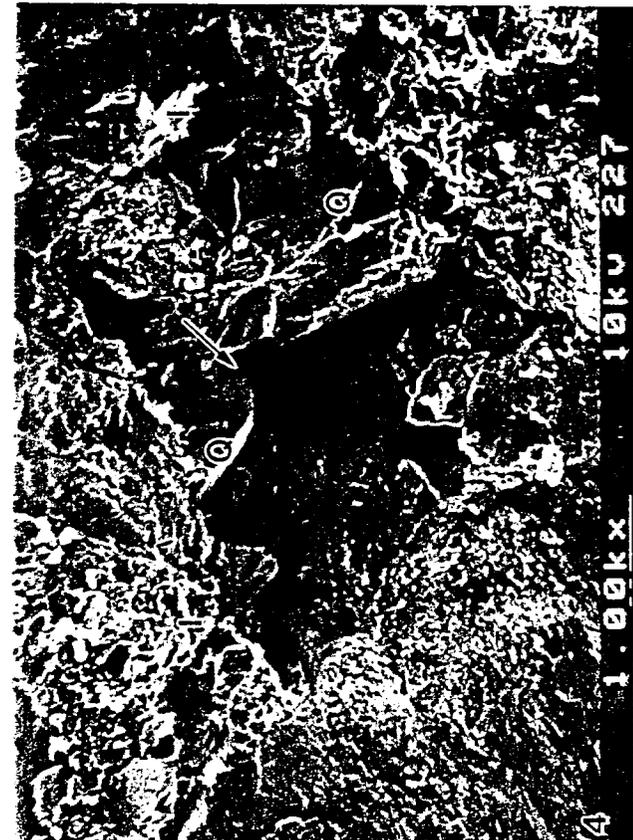
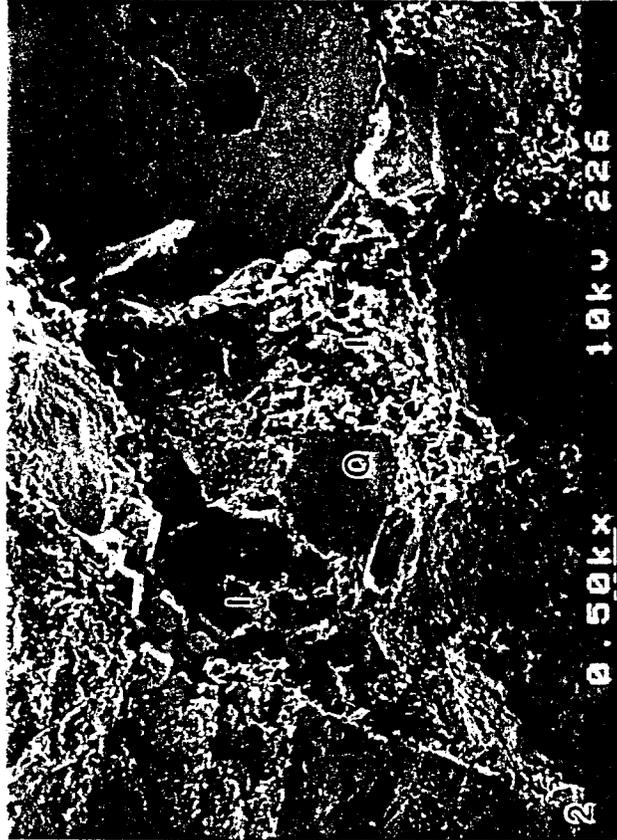
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*Robert J. Vinopal*

Robert J. Vinopal

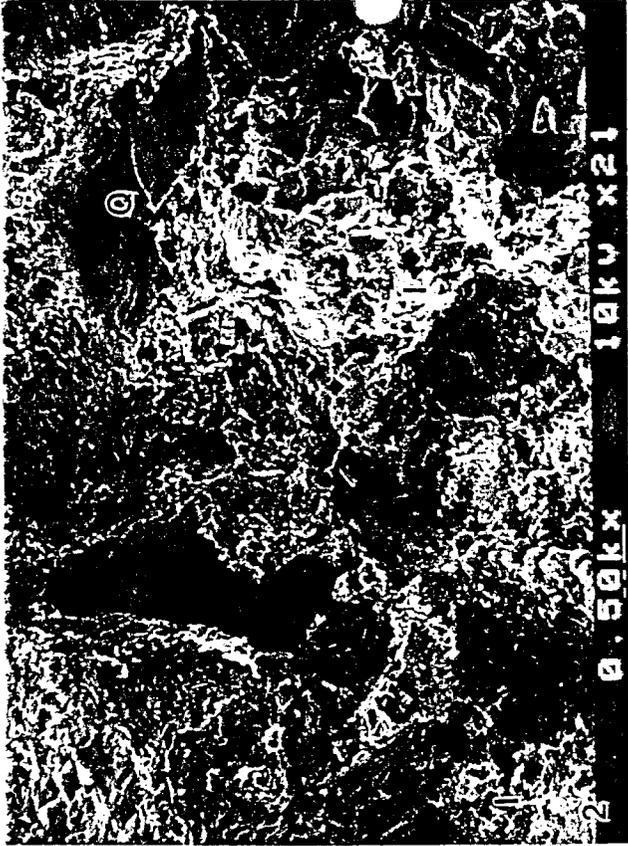
PROVIDENT SAVINGS BANK

SEM  
PHOTOMICROGRAPHS



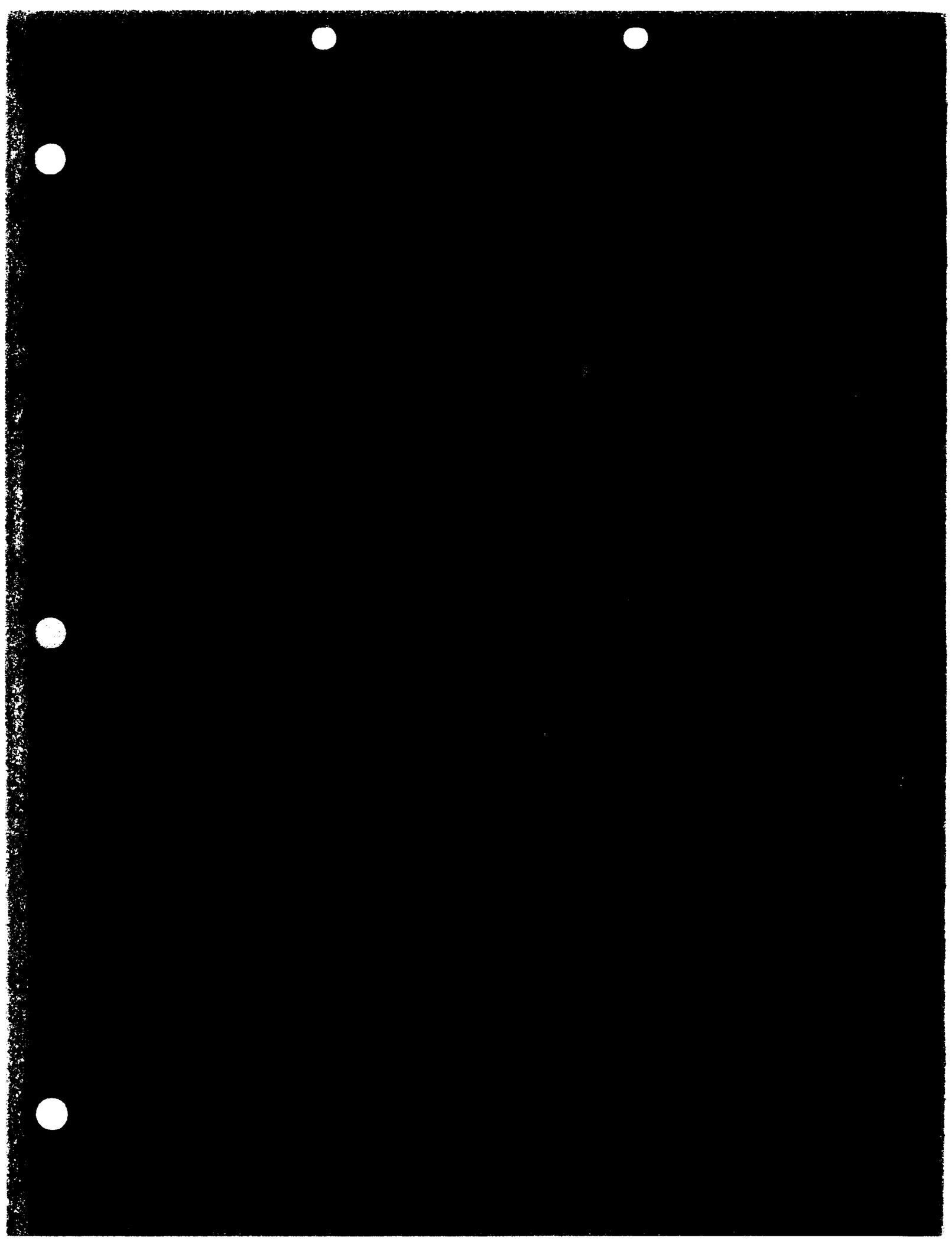












SNOW #3-13-19-7  
13-19S-7E, Emery County, Utah

Mineralogical Content (Percent by Weight)  
Determined by X-Ray Diffraction Analysis

DEPTH	Quartz	Plagioclase	Potassium Feldspar	Calcite	Dolomite	Total Clay**	Clay Fraction	
							Illite-Smectite*	Kaolinite
1604.0'	91.1	1.4	0.0	0.0	2.7	4.8	78 (31)	22
1756.0'	83.4	0.3	0.9	1.3	1.4	12.7	74 (27)	26
1820.0'	85.1	0.4	1.1	1.4	6.8	5.2	84 (30)	16

\* number in () indicates percentage expandable component in mixed layer clay structure

\*\* Includes clay in cements, in mica grains, and in rock fragments.

SNOW #3-13-19-7  
13-19S-7E  
EMERY COUNTY, UTAH

Data From SEM and Optical Microscope Examination

DEPTH	ROCK TYPE	GRAIN SIZE	CEMENTS	PORES	PORE THROATS	CLAY TYPE	CLAY LOCATION	COMMENTS
1593.0'	Sandstone Quartzose Bioturbated Clay-Lined Burrows Argillaceous	100 - 175 $\mu\text{m}$  Fine Very Fine Sand  Moderately Sorted	Silica  Clay	20 - 50 $\mu\text{m}$ Intergranular Pores Present  Microporosity in Illite-Smectite  Fair Effective Porosity	1 - 2 $\mu\text{m}$ Present  Fair-Poor Permeability  Blockage by Silica and Illite-Smectite	Illite- Smectite   Kaolinite	Patchy Grain Coating, Pore Filling, and in Rock Fragments  Pore Filling	Fair gas reservoir  Fair effective porosity  Many pore throats blocked by clay Likely requires stimulation  Potential fines migration and clay expansion
1604.0'	Sandstone Quartzose Minor Bioturbation	100 - 150 $\mu\text{m}$  Very Fine - Fine Sand  Moderately Well Sorted	Silica  Clay  Fe-Dolomite (Slightly Ferroan) (Minor)	20 - 50 $\mu\text{m}$ Intergranular Pores Common  Some Microporosity in Illite-Smectite  Fair-Good Effective Porosity	1 - 4 $\mu\text{m}$ Present  Fair Permeability  Partial Blockage by Silica and Illite-Smectite	Illite- Smectite   Kaolinite	Patchy Grain Coating, Pore Filling, and in Rock Fragments  Pore Filling	Fair-good gas reservoir  Fair-good effective porosity  Some pore throats blocked by clay May require stimulation  Potential fines migration and clay expansion

SNOW #3-13-19-7  
13-19S-7E  
EMERY COUNTY, UTAH

Data From SEM and Optical Microscope Examination

DEPTH	ROCK TYPE	GRAIN SIZE	CEMENTS	PORES	PORE THROATS	CLAY TYPE	CLAY LOCATION	COMMENTS
1641.0'	Sandstone  Quartzose  Massive	150 - 300 $\mu$ m  Fine-Medium Sand  Moderately Well Sorted	Silica  Fe Calcite  Fe Dolomite  Clay	30 - 70 $\mu$ m Intergranular Pores Common  Minor Microporosity in Clays  Good Effective Porosity	3 - 5 $\mu$ m Present  Fair-Good Permeability  Minor Blockage by Illite-Smectite	Illite-Smectite    Kaolinite	Patchy Grain Coating, Pore Filling, and in Rock Fragments  Pore Filling	Good gas reservoir  Good effective porosity  Most pore throats are free of clays  Potential fines migration and clay expansion
1756.0'	Sandstone  Quartzose  Bioturbated Clay-Lined Burrows  Argillaceous	70 - 120 $\mu$ m  Very Fine Sand  Moderately Sorted	Silica  Clay  Dolomite (minor)  Calcite (minor)	10 - 30 $\mu$ m Intergranular Pores Present  Microporosity in Illite-Smectite  Fair-Poor Effective Porosity	1 - 2 $\mu$ m Present  Poor-Fair Permeability  Blockage by Silica and Illite-Smectite	Illite-Smectite    Kaolinite	Patchy Grain Coating, Pore Filling, and in Rock Fragments  Pore Filling	Fair-poor gas reservoir  Fair-poor effective porosity  Many pore throats blocked by clay Likely requires stimulation  Potential fines migration and clay expansion

SNOW #3-13-19-7  
13-19S-7E  
EMERY COUNTY, UTAH

Data From SEM and Optical Microscope Examination

DEPTH	ROCK TYPE	GRAIN SIZE	CEMENTS	PORES	PORE THROATS	CLAY TYPE	CLAY LOCATION	COMMENTS
1794.0'	Sandstone  Quartzose  Minor Bioturbation	70 - 150 $\mu$ m  Fine Very Fine Sand  Moderately Well Sorted	Silica  Dolomite  Clay  Calcite	30 - 70 $\mu$ m Intergranular Pores Common  Minor Microporosity in Clays  Fair-Good Porosity	1 - 4 $\mu$ m Present  Fair-Good Permeability  Partial Blockage by Silica	Kaolinite  Illite- Smectite (minor)	Pore Filling  Patchy Grain Coating, Pore Filling, and in Rock Fragments	Fair-good gas reservoir  Fair-good effective porosity  Some pore throats blocked by silica May require stimulation  Potential fines migration
1820.0'	Sandstone  Quartzose  Laminated	70 - 120 m  Very Fine Sand  Well Sorted	Silica  Dolomite  Clay  Calcite	30 - 50 $\mu$ m Intergranular Pores Common  Microporosity in Clays  Fair-Good Effective Porosity	1 - 3 $\mu$ m Present  Fair Permeability  Some Blockage by Silica and Illite-Smectite	Illite- Smectite  Kaolinite	Patchy Grain Coating, Pore Filling, and in Rock Fragments  Pore Filling	Fair-good gas reservoir  Fair-good effective porosity  Some pore throats blocked by clay and by silica  May require stimulation  Potential fines migration and clay expansion