

UTAH OIL AND GAS CONSERVATION COMMISSION

REMARKS: WELL LOG ELECTRIC LOGS FILE WATER SANDS LOCATION INSPECTED OIL WELL SUB. REPORT/abd.

* Operator name change (9-17-85): 930928 BHP to General Atlantic off. 5-1-93:
 950418 Fr. Gen. ATLANTIC to UMC off 11-15-94
 * 960552 Commenced Insection eff. 10-31-95

DATE FILED 2-7-81

LAND: FEE & PATENTED STATE LEASE NO. PUBLIC LEASE NO. U-02651-A INDIAN

DRILLING APPROVED: 3-5-81

SPUDED IN: 3-21-81

COMPLETED: 6-10-81 POW PUT TO PRODUCING: 6-10-81

INITIAL PRODUCTION: 94 BOPD; 197 BWPD

GRAVITY A.P.I. ± 28.0°

GOR: --

PRODUCING ZONES: 5340-5382.5' KB GR "K" Zone; 5244-5244.5 KB GR "J" Zone; 4720-4756' KB GR "H"

TOTAL DEPTH: 5480' KB (B.P.W.)

WELL ELEVATION: 5123' KB; 5110' GL

DATE ABANDONED:

FIELD: Walker Hollow

UNIT:

COUNTY: Uintah

WELL NO. Broadhurst #14 API NO. 43-047-30904

LOCATION 1980 FT. FROM (N) LINE. 659 FT. FROM (E) LINE. SE NE 1/4 - 1/4 SEC. 9

FNK

TWP.	RGE.	SEC.	OPERATOR	TWP.	RGE.	SEC.	OPERATOR
			UMC Petroleum Corp.				

GEOLOGIC TOPS:

QUATERNARY	Star Point	Chinle	Molas
Alluvium	Wahweap	Shinarump	Manning Canyon
Lake beds	Masuk	Moenkopi	Mississippian
Pleistocene	Colorado	Sinbad	Humbug
Lake beds	Sego	PERMIAN	Brazer
TERTIARY	Buck Tongue	Kaibab	Pilot Shale
Pliocene	Castlegate	Coconino	Madison
Salt Lake	Mancos	Cutler	Leadville
Oligocene	Upper	Hoskinnini	Redwall
Norwood	Middle	DeChelly	DEVONIAN
Eocene	Lower	White Rim	Upper
Duchesne River	Emery	Organ Rock	Middle
Uinta	Blue Gate	Cedar Mesa	Lower
Bridger	Ferron	Halgaita Tongue	Ouray
Green River	Frontier	Phosphoria	Elbert
G zone	Dakota	Park City	McCracken
H	Burro Canyon	Rico (Goodridge)	Aneth
I	Cedar Mountain	Supai	Simonson Dolomite
J	Buckhorn	Wolfcamp	Sevy Dolomite
K	JURASSIC	CARBON I FEROUS	North Point
Wasatch	Morrison	Pennsylvanian	SILURIAN
Stone Cabin	Salt Wash	Oquirrh	Laketown Dolomite
Colton	San Rafael Gr.	Weber	ORDOVICIAN
Flagstaff	Summerville	Morgan	Eureka Quartzite
North Horn	Bluff Sandstone	Hermosa	Pogonip Limestone
Almy	Curtis		CAMBRIAN
Paleocene	Entrada	Pardox	Lynch
Current Creek	Moab Tongue	Ismay	Bowman
North Horn	Carmel	Desert Creek	Tapeats
CRETACEOUS	Glen Canyon Gr.	Akah	Ophir
Montana	Navajo	Barker Creek	Tintic
Mesaverde	Kayenta		PRE - CAMBRIAN
Price River	Wingate	Cane Creek	
Blackhawk	TRIASSIC		

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
 DRILL DEEPEN PLUG BACK

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

2. NAME OF OPERATOR
 Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
 Box 3280 Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)*
 At surface
 At proposed prod. zone 1,980' FNL & 659' FEL SE/NE

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
 Approx. 18 Miles South East of Jensen, Utah

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 659'

16. NO. OF ACRES IN LEASE 1280'

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. 1300'

19. PROPOSED DEPTH 5600' *Green River*

20. ROTARY OR CABLE TOOLS Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
 5110' GR (ungraded)

22. APPROX. DATE WORK WILL START*
 Feb. 1981

5. LEASE DESIGNATION AND SERIAL NO.
 U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
 Broadhurst

9. WELL NO.
 14

10. FIELD AND POOL, OR WILDCAT
 Walker Hollow

11. SEC., T., E., M., OR BLM. AND SURVEY OR AREA
 Sec. 9, T7S-R23E

12. COUNTY OR PARISH
 Uintah

13. STATE
 Utah

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12 1/4"	8 5/8"	24#	500' ±	Cement to surface
7 7/8"	5 1/2"	14#	5,600'	Sufficient to protect Green River Formation

APPROVED BY THE DIVISION
 OF OIL, GAS, AND MINING
 DATE: 3-13-81
 BY: M.S. Winder

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 [Signature] TITLE Field Services Adm. DATE 2-9-81

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

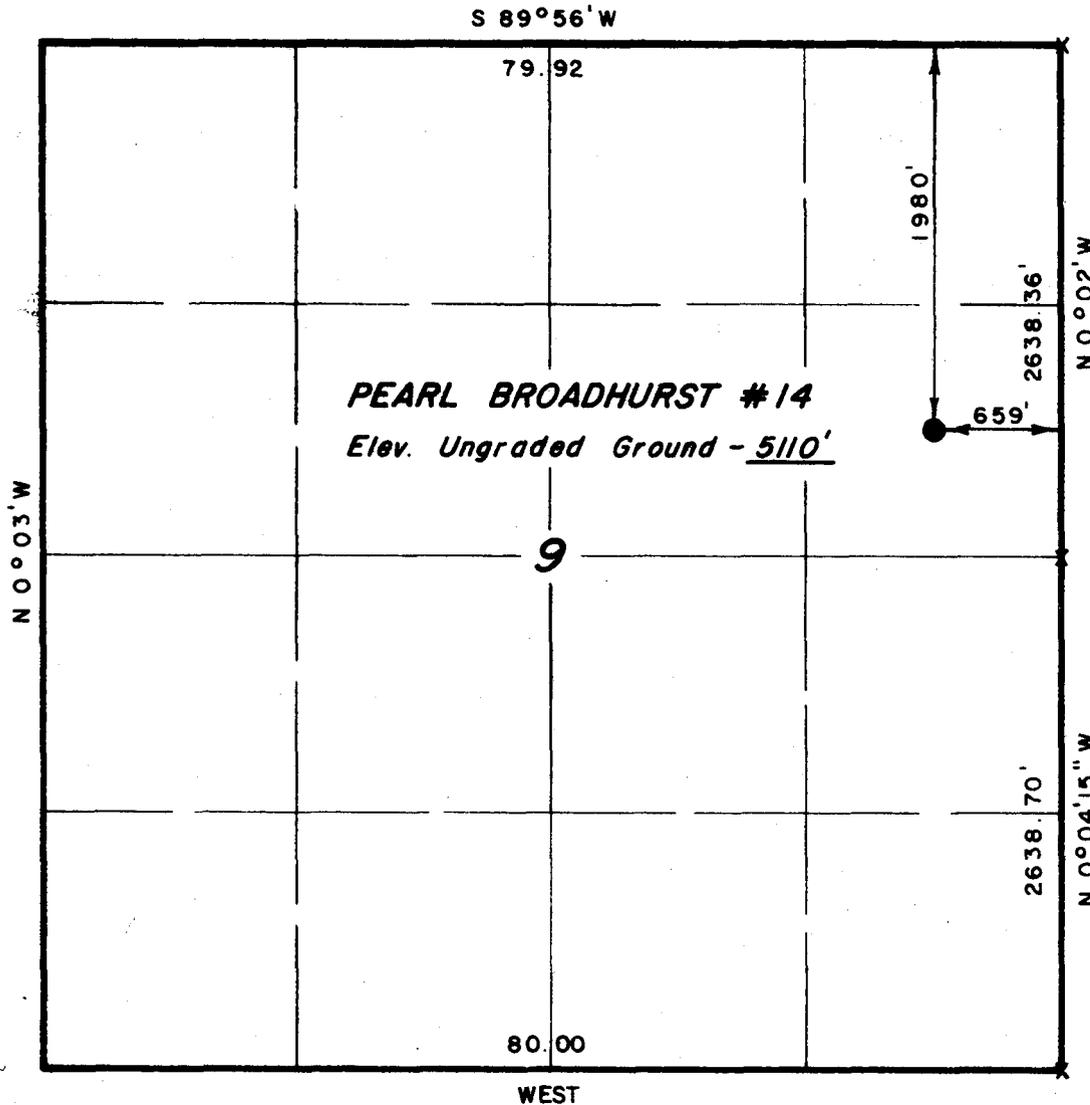
APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

T 7 S, R 23 E, S.L.B. & M.

PROJECT
ENERGY RESERVE GROUP

Well location, *PEARL BROADHURST #14*, located as shown SE1/4 NE1/4 Section 9, T7S, R23E, S.L.B. & M. Uintah County, Utah.



CERTIFICATE

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

Dana Stewart
REGISTERED LAND SURVEYOR
REGISTRATION NO 3154
STATE OF UTAH

UINTAH ENGINEERING & LAND SURVEYING
P. O. BOX Q - 110 EAST - FIRST SOUTH
VERNAL, UTAH - 84078

SCALE	1" = 1000'	DATE	1/27/81
PARTY	MS KH MH AC	REFERENCES	GLO Plat
WEATHER	Clear / Cool	FILE	ENERGY RESERVES GROUP

X = Section Corners Located

Identification CER/EA No. 317-81 and
317-81A

United States Department of the Interior
Geological Survey
2000 Administration Bldg.
1745 West 1700 South
Salt Lake City, Utah 84104

NEPA CATEGORICAL EXCLUSION REVIEW

PROJECT IDENTIFICATION

Operator Energy Reserves Group
Project Type Oil Well Drilling and Tank Battery Construction
Project Location 659' FEL 1980' FNL Section 9, T. 7S, R. 23E
Well No. Broadhurst 14 Lease No. U-02651-A
Date Project Submitted February 11, 1981

FIELD INSPECTION

Date February 18, 1981

Field Inspection
Participants

<u>Greg Darlington</u>	<u>USGS, Vernal</u>
<u>Cory Bodman</u>	<u>BLM, Vernal</u>
<u>Bill Fiant</u>	<u>Energy Reserves Group</u>
<u>Ray Radke</u>	<u>Energy Reserves Group</u>
<u>Earl Cady</u>	<u>Ross Construction</u>
<u>Leonard Heeney</u>	<u>Ross Construction</u>

Related Environmental Documents: Unit Resource Analysis, Bonanza Planning
Unit, BLM, Vernal

I have reviewed the proposal in accordance with the categorical exclusion review guidelines. This proposal would not involve any significant effects and, therefore, does not represent an exception to the categorical exclusions.

February 19, 1981
Date Prepared

Greg Darlington
Environmental Scientist

I concur
2/26/81
Date

Ed [Signature]
District Supervisor

Typing In 2/19/81 Typing Out 2/19/81

PROPOSED ACTION:

Energy Reserve Group, Inc. proposes to drill the Broadhurst #14 well, a 5600 foot test for oil in the Green River Formation. About .2 miles of new access road with an 18 foot driving surface is proposed for this well. A pad 185 feet by 315 feet and a reserve pit 80 feet by 150 feet are also planned for this location. Some existing dry washes crossing the pad will be rerouted as indicated in the APD. Plans for a new tank battery to serve this and other wells nearby were submitted at the onsite and will be referred to as CER 317-81A although they are attached to this CER 317-81. *A flowline route is proposed in the APD.*

RECOMMENDED APPROVAL CONDITIONS:

Drilling should be approved provided the operator agrees to adhere to the following additional measures:

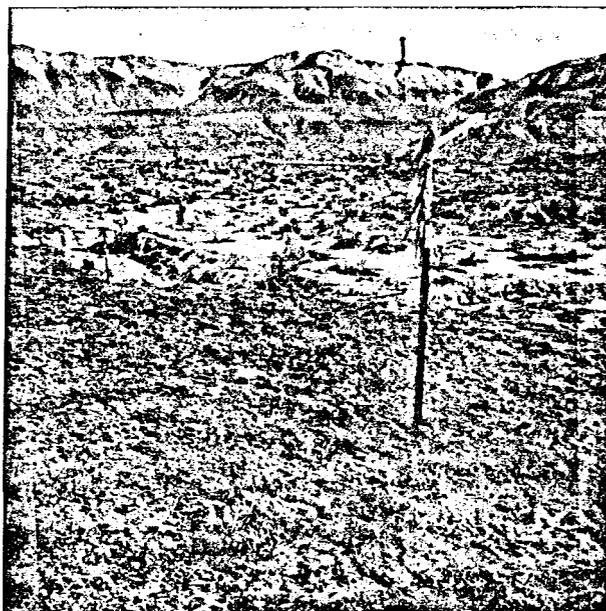
1. BLM Stipulations
2. Lease Stipulations
3. Furnish adequate logs of other potentially valuable mineral deposits as requested in the Mineral Evaluation Report and Mining Report.

PROPOSED ACTION:

Energy Reserves Group, Inc. proposes the construction of a Tank Battery along an existing road in Section 9. Soon to be completed wells 12 and 13 and eventually planned wells 14, 18, 19, and 20 would use this as a central tank battery. Previous plans for a tank battery submitted with the APD for well #12 would be amended for this new location. See attached map and diagram for details.

RECOMMENDED APPROVAL CONDITIONS:

1. BLM Stipulations
2. Lease Stipulations



*Northeast View
of Broadhurst 14*

2/18

FIELD NOTES SHEET

Date of Field Inspection: February 18, 1981

Well No.: 14

Lease No.: U-02651-A

Approve Location: ✓

Approve Access Road: ✓

Modify Location or Access Road: add a culvert to access road and divert drainages to go around pad.

Evaluation of Criteria for Categorical Exclusion

1. Public Health and Safety
2. Unique Characteristics
3. Environmentally Controversial Items
4. Uncertain and Unknown Risks
5. Establishes Precedents
6. Cumulatively Significant
7. National Register Historic Places
8. Endangered/Threatened Species
9. Violate Federal, State, Local, or Tribal Laws

If this project is not eligible for Categorical Exclusion circle the numbers of the above criteria requiring the preparation of an EA.

Comments and special conditions of approval discussed at onsite: (include local topography) pretty good location

Plans for a tank battery were also submitted at the onsite and evaluated by a visit to the proposed battery location

CATEGORICAL EXCLUSION REVIEW INFORMATION SOURCE

Criteria 516 DM 2.3.A	Federal/State Agency			Local and private corre- spondence (date)	Previous NEPA	Other studies and reports	Staff expertise	Onsite inspection (date)	Other
	Corre- spondence (date)	Phone check (date)	Meeting (date)						
1. Public health and safety							1, 2, 5, 6	2-18-81	
2. Unique charac- teristics							1, 2, 5, 6	2-18	
3. Environmentally controversial							1, 2, 5, 6	2-18	
4. Uncertain and unknown risks							1, 2, 5, 6	2-18	
5. Establishes precedents							1, 2, 5, 6	2-18	
6. Cumulatively significant							1, 2, 5, 6	2-18	
7. National Register historic places							1, 6	2-18	
8. Endangered/ threatened species							1, 6	2-18	
9. Violate Federal, State, local, tribal law							1, 2, 5, 6	2-18	

CATEGORICAL EXCLUSION REVIEW COMMON REFERENCE LEGEND

1. Surface Management Agency Input
2. Reviews Reports, or information received from Geological Survey
(Conservation Division, Geological Division, Water Resource Division,
Topographic Division)
3. Lease Stipulations/Terms
4. Application Permit to Drill
5. Operator Correspondence
6. Field Observation
7. Private Rehabilitation Agreement
8. *USGS conditions of approval.*

TEN POINT PROGRAM

1) SURFACE FORMATION: Uintah

2 & 3) ESTIMATED TOPS:

Green River	2,850'
Green River "G"	4,370'
Green River "H"	4,675'
Green River "I"	4,920'
Green River "J"	5,200'
Green River "K"	5,350'
T.D.	5,600'

} oil & gas

4) CASING PROGRAM:

0-500' 8 5/8", K-55, 24#, New Casing, ST&C
0-5,600' 5 1/2", k-55, 14#, New Casing, ST&C

5) PRESSURE CONTROL EQUIPMENT: (See attached schematic diagram) BOP's and choke manifold will be installed and pressure tested before drilling out under surface casing and then will be checked daily as to mechanical operating condition. Ram type preventors and related pressure control equipment will be pressure tested to rated working pressure of the stack assembly or to 70% of the minimum internal yield pressure of the casing. Annular type preventors will be tested to 50% of their rated working pressure. BOP's will be pressure tested at least once every 30 days.

6) MUD PROGRAM:

Fresh water base gel mud will be used during the entire drilling operation. Mud weight 9.5 ppg. VIS 50-55, Water loss, PH 9.5

Sufficient mud materials to maintain mud properties, control lost circulation and to contain blowout will be available at wellsite.

7) AUXILLIARY EQUIPMENT:

- a. Kelly cocks
- b. Bit floats will be available
- c. Mud monitoring will be visual unless otherwise specified
- d. A full opening valve with drill pipe thread will be available on the rig floor

8) LOGGING: DIL, SGR, CN-D

CORING: None

TESTING: None

STIMULATION: 60,000 gallons of gelled water with 100,000# sand. All applicable state & federal regulations concerning equipment placement will be adhered to.

9) ABNORMAL PRESSURE: None

ESTIMATED BOTTOMHOLE PRESSURE: 2200 PSI

10) ANTICIPATED STARTING DATE: Feb. 1981

DURATION OF OPERATION: 30 days

LEASE: Pearl Broadhurst No. 14

Lease No. U-02651-A

LOCATION: SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 9

DATE: 2-9-81

SURFACE USE AND OPERATIONS PLAN

1. Existing roads

- A. Proposed well site & access road staked - See attached topo map
- B. Route and distance from nearest town: Proceed south from Jensen, Utah State Hwy. 264 8.6 miles to the junction of this Hwy. and an existing improved road to the South East. Proceed along this road for approx. 6 miles to the junction of the proposed access road.
- C. Access roads to location: Color coded.
- D. Exploratory well: Not applicable.
- E. Development well: For all existing roads within a one mile radius See Map.
- F. Plans for improvement and/or maintenance:
Existing roads are currently maintained by Energy Reserves Group, Inc.

2. Planned access roads. See Map.

1. Width: 18' crowned running surface - 32' with ditches
2. Maximum grade: 3%
3. Turnouts: None
4. Drainage design: Road to be ditched on both sides to provide drainage
5. Location and size of culverts: None
Major cuts and fills: None
6. Surface Materials: Gravel - will be obtained from a private source.
7. Gates: None
Cattleguards: None
Fence cuts: None
8. Center-line road flagging: The route of the new access road is flagged as shown on Map.

3. Location of existing wells

1. Water wells: None
2. Abandoned wells: Well No. 3 SW $\frac{1}{4}$ NE $\frac{1}{4}$ - Sec. 9
3. Temporarily Abandoned Wells: Well No. 5 SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 10
4. Disposal wells: None
5. Drilling wells: Wells 11, 12, 13, 14, 15, 16 & 17
6. Producing wells: Wells 1, 2, 4, 5, 7, 8, 9 & 10
7. Shut-in wells: None
8. Injection wells: None
9. Monitoring or observation wells: None

4. Location of existing and/or proposed facilities owned and/or controlled by Energy Reserves Group, Inc.
- A. Existing facilities:
1. Tank batteries: Located @ wells #1, #2, #4, #6 between #8 & #9
 2. Production facilities: See above
 3. Oil gathering lines: From well #7 to #6 - from well #8 & #9 to battery site in SE $\frac{1}{4}$ NW $\frac{1}{4}$ from well #10 to #6
 4. Gas gathering lines: Each well has a gas gathering line.
 5. Injection lines: From Red Wash Field to well No. 3
 6. Disposal lines: None
- B. New production facilities:
1. Proposed tank battery: The tank battery for this well will be located either @ well No. 1 or at the battery between wells 8 & 9
 2. Dimensions of facilities: N/A
 3. Construction methods and materials: Area to be used will be leveled with dozer, materials used for foundation will consist of crushed rock and native materials.
 4. Protective measures and devices: Pits will be fenced and flagged to protect livestock, wildlife and waterfowl.
- C. Plans for rehabilitation of disturbed area: All disturbed areas not needed for operation will be contoured to match existing terrain and reseeded with the seed mixture recommended by the surface owner.
5. Location and type of water supply
- A. Location: Near well No. 3 SW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec 9
Supply: Pipeline
- B. Method of transportation: Water will be hauled by tank trucks using existing roads.
- C. Water wells to be drilled: None
6. Source of construction materials
- A. Location: (tank battery) private sources
- B. From Federal or Indian lands: None
- C. Additional materials: None
- D. Access roads on Federal or Indian lands: As shown on attached map
7. Methods of handling waste disposal
- 1 & 2. Cuttings and drilling fluids: Deposited during drilling operations will be put in reserve pits.
 3. Produced fluids: Tanks will be used for storage of produced fluids during testing.
 4. Sewage: Sewage will be contained in a portable latrine or bored hole and a suitable chemical will be used to decompose waste materials.
 5. Garbage and other waste materials: Garbage and other waste materials will be put in burn pit and all flammable materials will be burned. Burn pits will be enclosed with small mesh wire to prevent littering.

6. Proper clean-up of well-site: Upon completion of drilling all trash and litter will be picked up and placed in the burn pit which will be buried. The reserve pits will be fenced on three sides during drilling and the fourth side will be fenced when drilling is completed. They will remain fenced until dry at which time they will be backfilled.

8. Ancillary facilities

1. None planned.

9. Wellsite layout

1. Cuts and fills: See Diagram.
2. Location of pits and stockpiles: For location of mud tanks, reserve, burn and trash pits, pipe racks, living facilities and soil materials stockpiles, See Diagram.
3. Pad orientation: For rig orientation parking areas and access roads, see Diagram.
4. Lining of pits: No plans to line reserve pits at this time.
5. O.S.H.A. requirements: Area needed to conduct the fracturing operations in a safe manner and in accordance with O.S.H.A. standards will be within the areas already disturbed.

10. Plans for restoration of surface

1. Backfilling, leveling, contouring, and waste disposal: Topsoil will be stripped from the location and stockpiled for use after completion of contouring at which time it will be redistributed on the location. Backfilling of the reserve pits will be done as soon as the pits are dry. Contouring of the location will be done, in the event of a dry hole, to restore the surface to as near its original condition as possible. In the event of production those portions of the pad not needed for operations will be contoured in such a manner as to support vegetation and blend into the surrounding topography as much as possible. Waste disposal will begin immediately after completion of drilling. All trash and litter will be picked up, placed in the burn pit and buried.
2. Revegetation and rehabilitation: Revegetation of the location and access roads (those not left for landowner use) will begin with reseeding which will be done in the Spring or Fall of the year with the seed mixture specified by the appropriate agency or landowner. Rehabilitation of the location and access road will include contouring, replacement of topsoil and reseeding as discussed above.
3. Prior to rig release: The pits will be fenced on four sides to protect livestock and wildlife. Fence will remain until pits are backfilled.
4. Oil on pit will be removed or overhead flagging will be installed for the protection of waterfowl.
5. Timetable of rehabilitation operations: Commencement of rehabilitation work will be upon completion of drilling. Completion of rehabilitation work will depend on weather conditions and time required for pits to dry.

11. Other information used

1. Topography, soil characteristics, geologic features, flora and fauna:

The Topography of the General Area - (See Topographic Map "A")

The area is a large basin formed by the Uinta Mountains to the North and the Book Cliff Mountains to the South.

The basin floor is interlaced with numerous canyons and ridges formed by the non-perennial streams of the area. The sides of these canyons are steep and ledges formed in sandstone ledges, conglomerate deposits, and shale are common in this area.

The geologic structures of the area that are visible are of the Uinta formation (Eocene Epoch) Tertiary Period in the upper elevations and the cobblestone and younger alluvial deposits from the Quaternary Period.

Outcrops of sandstone ledges, conglomerate deposits and shale are common in this area.

The topsoils in the area range from a light brownish-gray sandy clay (SM-ML) type soil with poorly graded gravels to a clayey (OL) soil.

The majority of the numerous washes and draws in the area are of a non-perennial nature flowing during the early spring run-off and heavy rain storms of long duration which are rare as the normal annual rainfall in the area is only 8".

Due to the low precipitation average, climatic conditions and the marginal types of soils, the vegetation that is found in the area are common of the semi-arid regions and consists of areas of sagebrush, rabbitbrush, some grasses and cacti as the primary flora. This is also true of the lower elevations.

The fauna of the area is sparse and consists predominantly of the mule deer, pronghorn antelope, coyotes, rabbits, and varieties of small ground squirrels and other types of rodents. The area is used by man for the primary purpose of grazing domestic sheep and cattle.

The birds of the area are raptors, finches, ground sparrows, magpies, crows, and jays.

The Topography of the Immediate Area - (See Topographic Map "B").

Pearl Broadhurst #14. is located above the Right fork of Walker Hollow.

The terrain in the vicinity of the location slopes from the Southwest through the location site to the Northeast at approximately a 5.6% grade.

The vegetation in the immediate area surrounding the location site consists of grasses and sparse amounts of sagebrush.

2. Surface-use and ownership:

3. Proximity of water, occupied dwellings, archeological, historical or cultural sites:

The Green River is located approximately 15 miles to the West of the location site.

There are no occupied dwellings or other facilities of this nature in the general area.

There are no visible archaeological, historical, or cultural sites within any reasonable proximity of the proposed location site.

12. Lessee or operator's field representative

ENERGY RESERVES GROUP, INC.

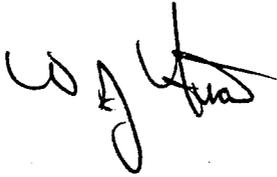
P.O. BOX 3280

CASPER, WYOMING 82602

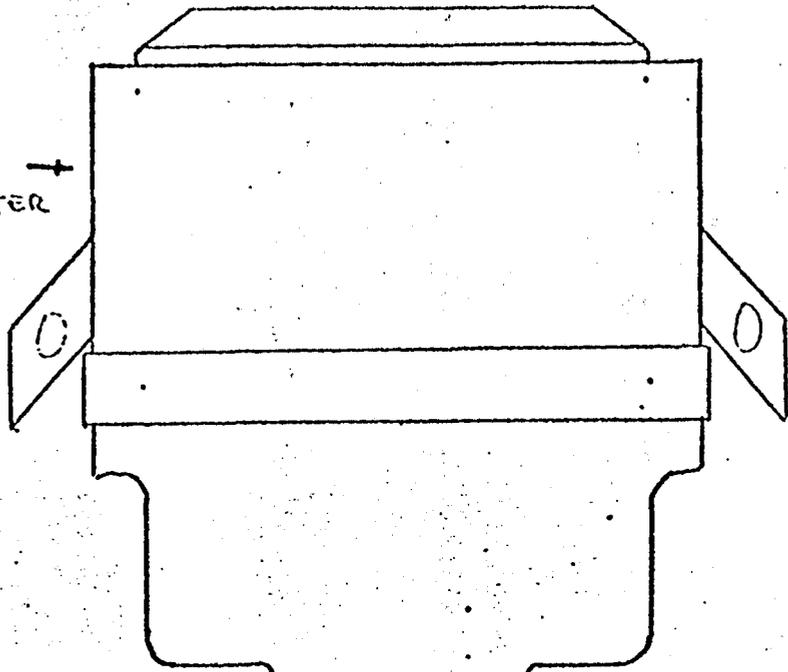
Phone No. 307-265-7331 (office)

13. Certification

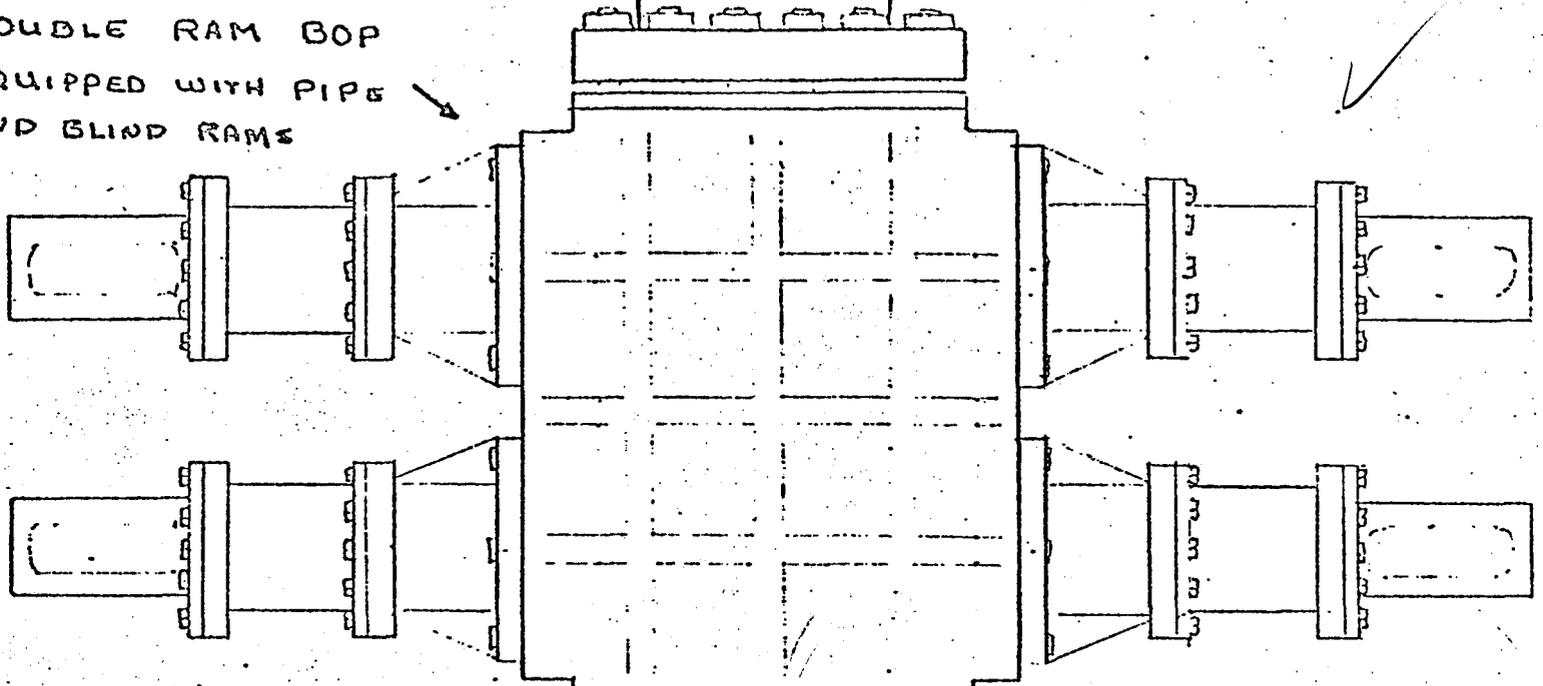
I hereby certify that I, or persons under my direct supervision have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are to the best of my knowledge true and correct; and, that the work associated with the operations proposed herein will be performed by Energy Reserves Group, Inc. and its contractos and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

A handwritten signature in black ink, appearing to be 'W. J. [unclear]', is written over the certification text.

8" SERIES 900
BAG TYPE PREVENTER



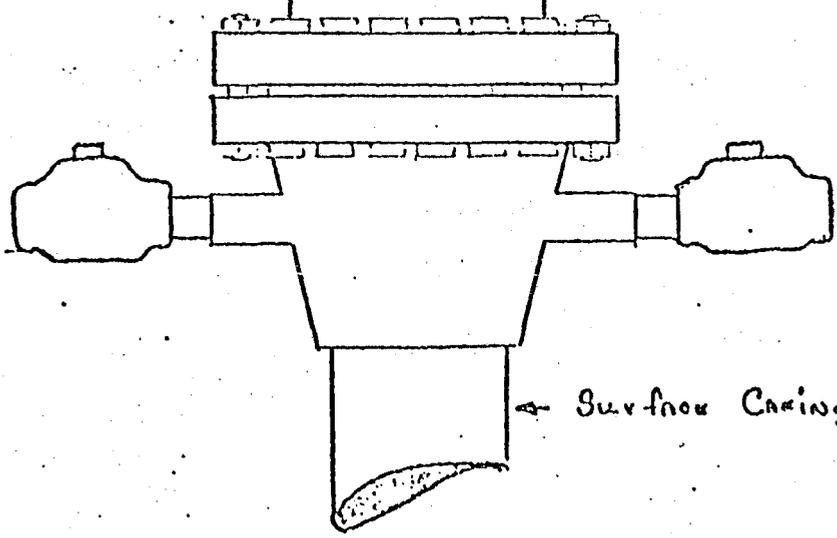
10" SERIES 900
DOUBLE RAM BOP
EQUIPPED WITH PIPE
AND BLIND RAMS



KILL LINE



BLEED OFF
LINE



Surface Casing

** FILE NOTATIONS **

DATE: Feb. 23, 1981
OPERATOR: Energy Reserves Group, Inc.
WELL NO: Broadhurst #14
Location: Sec. 9 T. 75 R. 23E County: Uintah

File Prepared: Entered on N.I.D.:
Card Indexed: Completion Sheet:

API Number 43-047-30904

CHECKED BY:

Petroleum Engineer: M. L. Minder 3-13-81

Director: _____

Administrative Aide: C-3 spacing - ok on Indus. top class
to gas well in section 16P - (Converted in 1968 to GW)
Plotted 635' ENL + 685' FEL (75, 23E)

APPROVAL LETTER:

Bond Required: Survey Plat Required:

Order No. _____ O.K. Rule C-3

Rule C-3(c), Topographic Exception - company owns or controls acreage
within a 660' radius of proposed site

Lease Designation Fed Plotted on Map

Approval Letter Written

Hot Line P.I.

DUPLICATE

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
 DRILL DEEPEN PLUG BACK

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

2. NAME OF OPERATOR
 Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
 Box 3280 Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
 At surface
 At proposed prod. zone 1,980' FNL & 659' FEL SE/NE

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
 Approx. 18 Miles South East of Jensen, Utah

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)
 659'

16. NO. OF ACRES IN LEASE
 1280'

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.
 1300'

19. PROPOSED DEPTH
 5600'

20. ROTARY OR CABLE TOOLS
 Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
 511- ' GR (ungraded)

22. APPROX. DATE WORK WILL START*
 Feb. 1981

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12 1/4"	8 5/8"	24#	500' ±	Cement to surface
7 7/8"	5 1/2"	14#	5,600'	Sufficient to protect Green River Formation

RECEIVED
 MAR 10 1981
 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 [Signature] TITLE Field Services Adm. DATE 2-9-81

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY [Signature] TITLE FOR E. W. GUYNN DISTRICT ENGINEER DATE MAR 05 1981

CONDITIONS OF APPROVAL, IF ANY:

NOTICE OF APPROVAL

CONDITIONS OF APPROVAL ATTACHED TO OPERATOR'S COPY

FLARING OR VENTING OF GAS IS SUBJECT TO NTL 4-A DATED 1/1/80

Utah State Oil & Gas



United States Department of the Interior

IN REPLY REFER TO

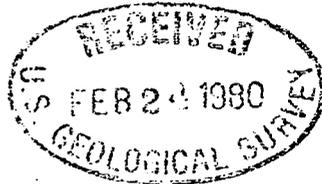
T & R
U-802

BUREAU OF LAND MANAGEMENT
VERNAL DISTRICT OFFICE
170 South 500 East
Vernal, Utah 84078

February 20, 1981

Ed Guynn, District Engineer
USGS, Conservation Division
2000 Administration Building
1745 West 1700 South
Salt Lake City, Utah 84104

Re: Energy Reserve Group, Inc.
Walker Hollow Unit
Well #14 Sec 9, T7S, R23E
Well #15 Sec 9, T7S, R23E
Well #16 Sec 10, T7S, R23E
Well #17 Sec 10, T7S, R23E
Uintah County, Utah
U-02651-A



Dear Mr. Guynn:

A joint examination was made on February 18, 1981, of the above referenced well site locations and proposed access roads. We feel that the surface use and operating plans are adequate with the following stipulations:

1. Construction and maintenance of roads, rehabilitation of disturbed areas, and construction of pipeline routes, shall be in accordance with surface use standards as set forth in the brochure, "Surface Operating Standards for Oil and Gas Exploration and Development,"
2. Traveling off access road rights-of-way will not be allowed. The maximum width of access road (both existing and planned) will be 30 feet total disturbed area, except where backslopes and fills require additional area. Turnouts will not be required.
3. The BLM must be contacted at least 24 hours prior to any construction activities.
4. The BLM will be contacted at least 24 hours prior to any rehabilitation activities. The operator may be informed of any additional needed seeding and restoration requirements.
5. Burn pits will be constructed. There will be no burning or burying of trash or garbage at the well sites. Refuse must be contained and hauled to an approved disposal site.

Continued . . .



6. The reserve pits will be fenced on three sides during drilling and on the fourth upon removal of the rig.

Site Specific
Well #14

1. The reserve pits demensions were changed from 80 feet by 150 feet to 100 feet by 150 feet.
2. The top 6-8 inches of topsoil will be collected and stockpiled between reference points #1 and #2.
3. We have no objection to the proposed flowline route provided no blading of the route occurs.
4. We have no objection to the proposed tank battery location that will service this well provided the top 2-4 inches of top soil is gathered and stockpiled adjacent to the location.
 - a. That the water pit is fenced on all sides.
 - b. That the company follow stipulations #2 in construction of the proposed turn around road.

Well #15

1. The top 2-4 inches of topsoil will be gathered and stockpiled between reference point #2 and #3.
2. The proposed flowline will be laid on the surface adjacent to the existing road. The only surface disturbance allowed will be where the flowline is buried where it crosses roads.

Well #16

1. The top 3-5 inches of top soil will be gathered and stockpiled at reference points #1 and #2.
2. The reserve pits demensions were changed from 80 feet by 150 feet to 50 feet by 250 feet.
3. The proposed flowline route will not be bladed. A bulldozer may be used to assist trucks in steep terrain, drag pipeline into position and for the construction of ford type crossings on drainages which cannot otherwise be crossed. Construction of drainage crossing is the only type surface disturbance authorized.

Continued . . .

Well #17

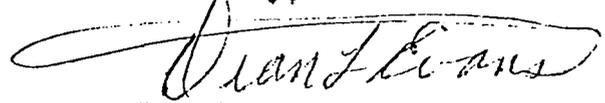
1. This location was moved 200 feet to the south and rotated 90°.
2. The top 6-8 inches of topsoil will be gathered and stockpiled between reference corners #2 and #3.
3. We have no objection to the installation of the proposed flowline provided the only surface disturbance is where the line is buried under existing roads.

All the proposed locations, access routes, and flowline routes were surveyed for cultural resources and none were found.

The proposed activities do not jeopardize listed, threatened, or endangered flora/fauna or their habitats.

The BLM representative will be Cory Bodman, 789-1362.

Sincerely,



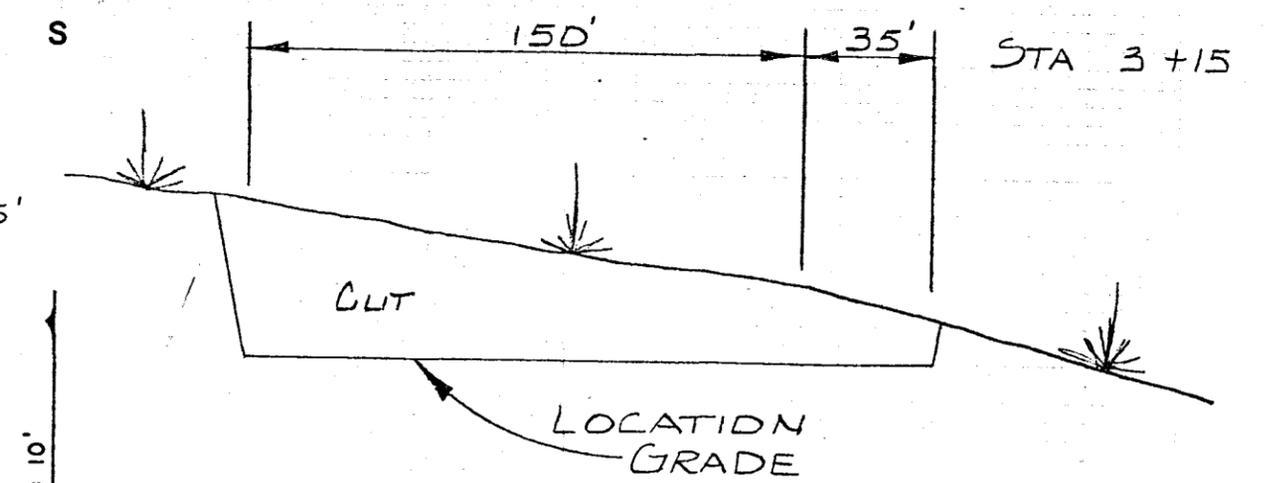
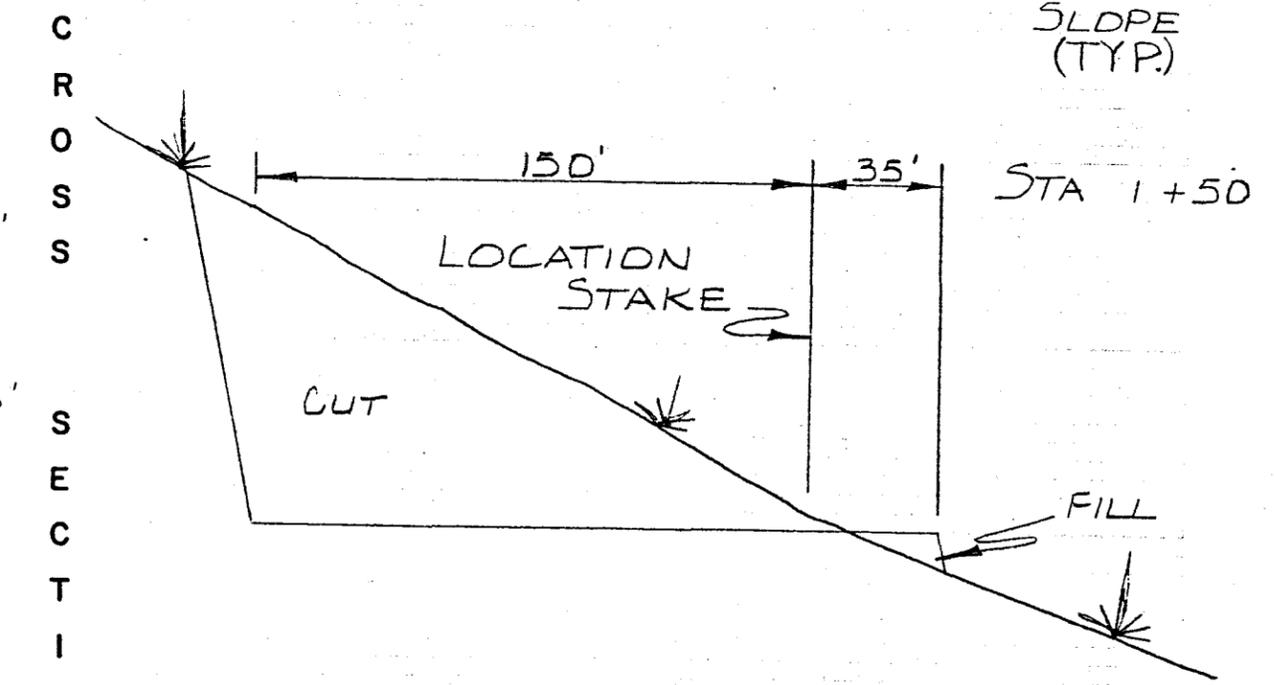
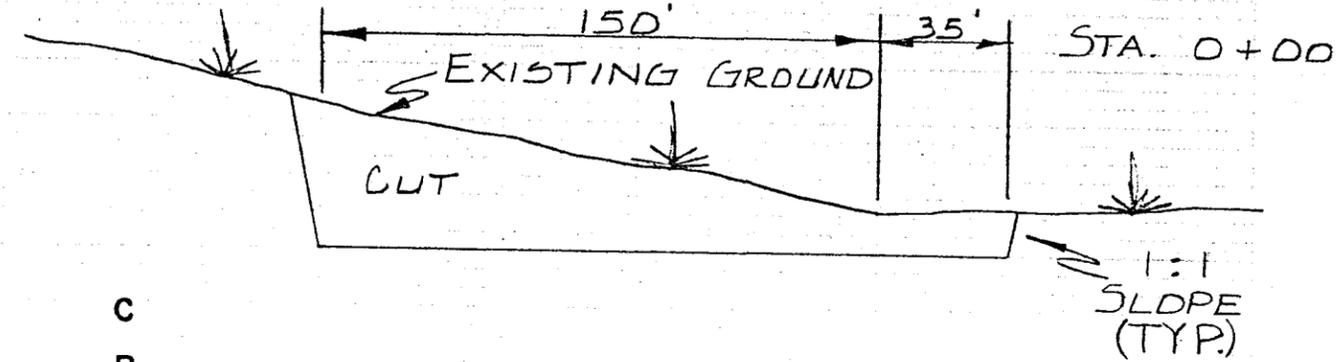
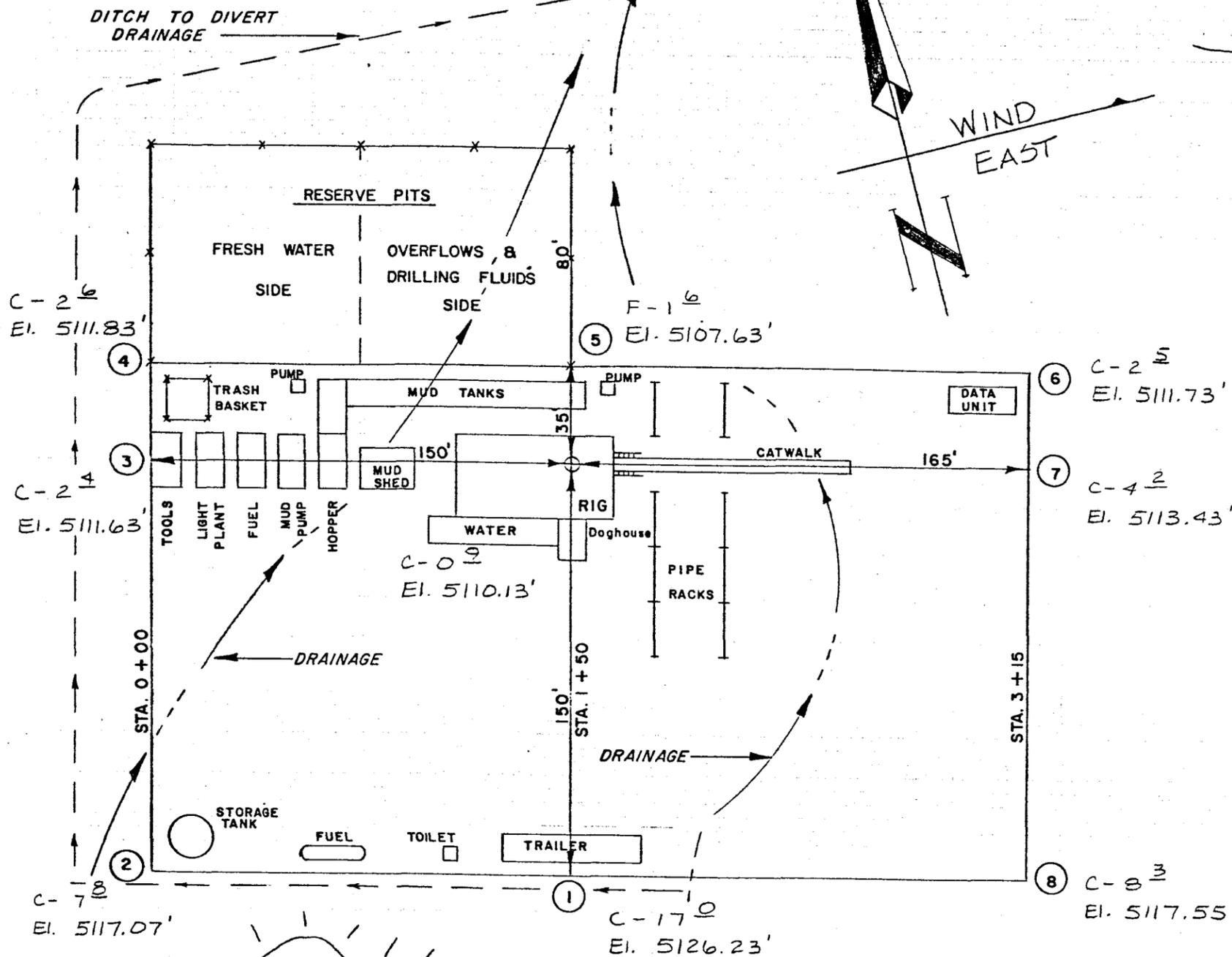
Dean L. Eyans
Area Manager
Bookcliffs Resource Area

cc: USGS, Vernal

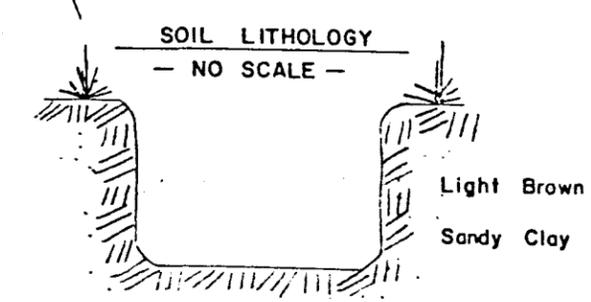
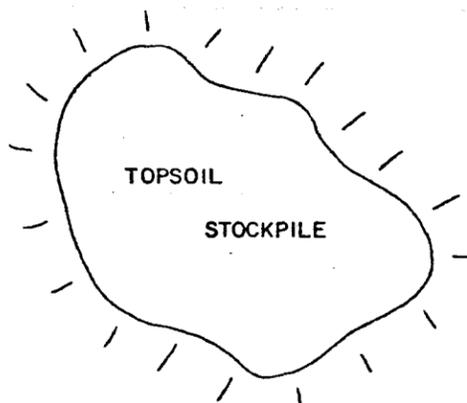
ENERGY RESERVE GROUP

PEARL BROADHURST #14

SCALE 1" = 50'

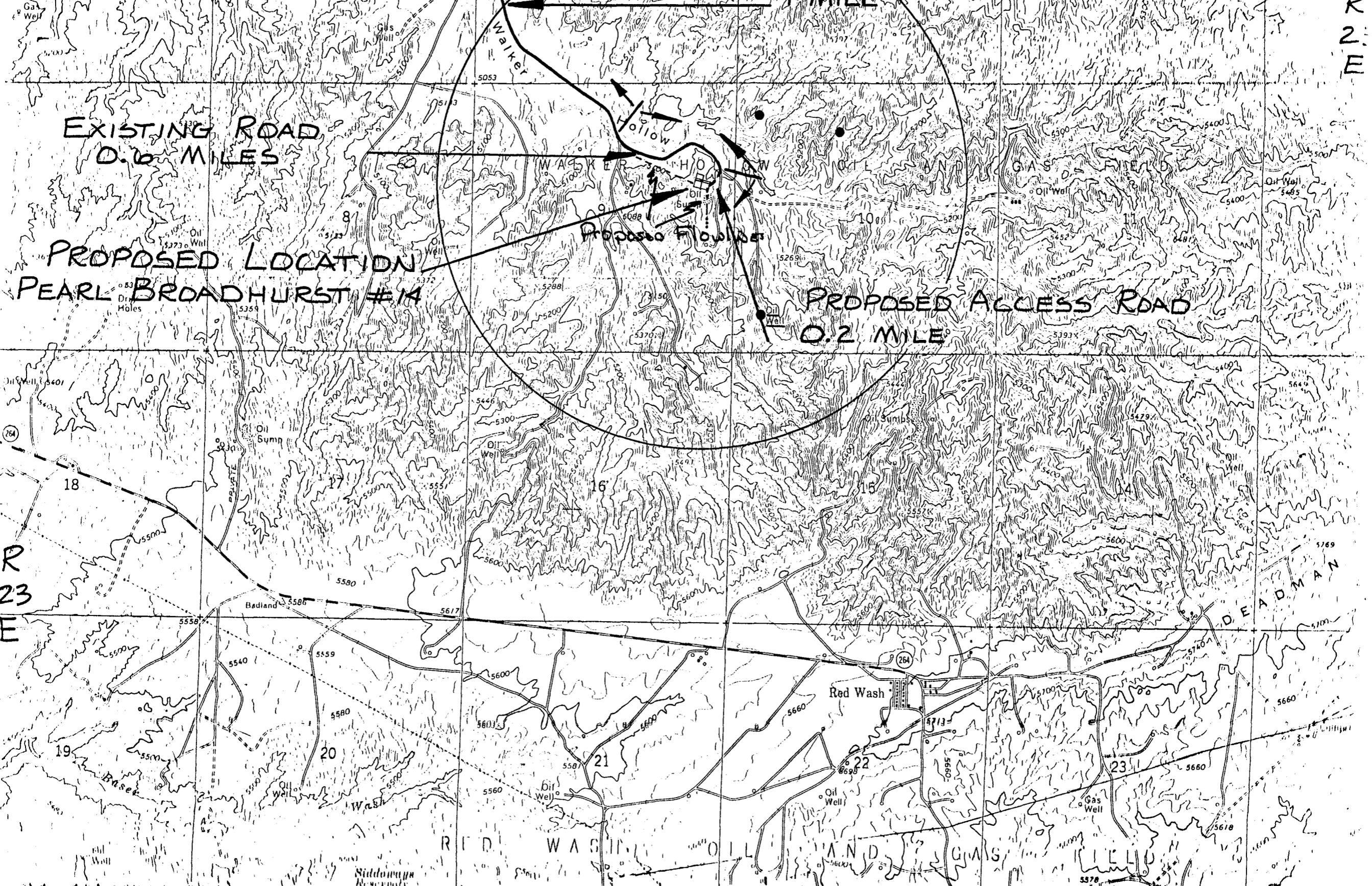


SCALE
1" = 50'



APPROXIMATE YARDAGES

Cubic Yards of Cut	14611
Cubic Yards of Fill	114



EXISTING ROAD
0.6 MILES

PROPOSED LOCATION
PEARL BROADHURST #14

PROPOSED ACCESS ROAD
0.2 MILE

Proposed Flowlines

Walker

Hollow

GAS FIELD

Red Wash

DEADMAN

RED WASH OIL AND GAS FIELD

R 23
E

R 23
E

March 23, 1981

Energy Reserves Group, Inc.
Box 3280
Casper, Wyoming 82602

Re: Well No. Broadhurst #14
Sec. 9, T. 7S, R. 23E, SE NE,
Uintah County, Utah

Insofar as this office is concerned, approval to drill the above referred to oil well is hereby granted in accordance with Rule C-3, General Rules and Regulations and Rules of Practice and Procedure.

Should you determine that it will be necessary to plug and abandon this well, you are hereby requested to immediately notify the following:

MICHAEL T. MINDER - Petroleum Engineer
Office: 533-5771
Home: 876-3001

Enclosed please find Form OGC-8-X, which is to be completed whether or not water sands (aquifers) are encountered during drilling. Your cooperation in completing this form will be appreciated.

Further, it is requested that this Division be notified within 24 hours after drilling operations commence, and that the drilling contractor and rig number be identified.

The API number assigned to this well is 43-047-30904.

Sincerely,

DIVISION OF OIL, GAS, AND MINING


Michael T. Minder
Petroleum Engineer

MTM/ko
cc: USGS

Energy Reserves
Group

NOTICE OF SPUD

Caller: Roscoe Gillespie

Phone: _____

Well Number: Pearl Broadhurst #14

Location: SENE 9-7S-23E

County: Uintah State: Utah

Lease Number: U-02651-A

Lease Expiration Date: _____

Unit Name (If Applicable): _____

Date & Time Spudded: 3-21-81 9:00

Dry Hole Spudder (Rotary)

Details of Spud (Hole, Casing, Cement, etc.) 12 1/4" hole

Rotary Rig Name & Number: MGE Rig 65

Approximate Date Rotary Moves In: _____

FOLLOW WITH SUNDRY NOTICE

Call Received By: K.R.

Date: 3-23-81

RECEIVED
MAR 24 1981

DIVISION OF
OIL, GAS & MINING

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MAR 25 1981

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. oil well gas well other

2. NAME OF OPERATOR
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
P.O. Box 3280 - Casper, Wyoming 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1,980' FNL & 659' FEL (SE/NE)
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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

REQUEST FOR APPROVAL TO:	SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF <input type="checkbox"/>	<input checked="" type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE <input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES <input type="checkbox"/>	<input type="checkbox"/>
ABANDON* <input type="checkbox"/>	<input type="checkbox"/>
(other) <input type="checkbox"/>	<input type="checkbox"/>

5. LEASE
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Broadhurst

9. WELL NO.
14

10. FIELD OR WILDCAT NAME
Walker Hollow

11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA
Sec. 9-T7S-R23E

12. COUNTY OR PARISH
Uintah

13. STATE
Utah

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
G.L. 5,110'; K.B. 5,123'

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

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

The above referenced well was spudded @ 9:00 AM 3-21-81.

Drilled 12-1/4" hole to 497'. Ran 12 jts 8-5/8" O.D., 24# K-55, R-3, ST&C new casing set @ 497' (K.B.). Cemented w/380 sx of Class G cement w/2% CaCl₂ and 1/4# Flocele/sx. Plug down @ 3:30 AM 3-22-81. Good cement returns.

N.U. & pressure tested BOPE to 1200 psi; Hydril to 800 psi. hold o.k.

3-23-81: Drilling 7-7/8" @ 888'.

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

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

SIGNED Karen C. Dillinger TITLE Drlg Supt-RMD DATE 3-23-81

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

JOHNSTON-MACCO
Schlumberger

technical
report

RECEIVED

APR 6 1981

DIVISION OF
OIL, GAS & MINING

----- WELL IDENTIFICATION -----

COMPANY:	ENERGY RESERVES GROUP, INC. BOX 3280 CASPER, WY. 82602	CUSTOMER:	SAME
WELL:	R. BROADHURST #14	LOCATION:	SEC. 9 - T7S - R23E
TEST INTERVAL:	4714' TO 4736'	FIELD:	WALKER HOLLOW (WILD CAT)
TEST NO:	2	TEST DATE:	4-3-81
COUNTY:	UINTAH	STATE:	UTAH
TECHNICIAN:	TORGENSEN (VERNAL)	TEST APPROVED BY:	MR. C.H. BOLKEN

----- EQUIPMENT AND HOLE DATA -----

TEST TYPE:	M.F.E. OPEN HOLE	DRILL PIPE LENGTH:	-	FT.
ELEVATION:	5110	DRILL PIPE I.D.:	-	IN.
TOTAL DEPTH:	4736	DRILL COLLAR LENGTH:	-	FT.
MAIN HOLE/CASING SIZE:	8 3/4	DRILL COLLAR I.D.:	-	IN.
RAT HOLE/LINER SIZE:	-	PACKER DEPTHS:	4710 & 4714	FT.
FORMATION TESTED:	GREEN RIVER "H"		&	FT.
NET PROD. INTERVAL:	10	DEPTHS REF. TO:	KELLY BUSHING	FT.
POROSITY:	15			%

----- TEST TOOL CHAMBER DATA -----

SAMPLER PRESSURE:	112	PSIG
RECOVERED OIL GRAVITY:	API @	DEG. F.
RECOVERY GOR:		FT3/BBL.
SAMPLE CHAMBER CONTENTS		
FLUID	VOLUME	MEAS.
		RESIST. TEMP. CHLOR.
		(OHM-M) (DEG F.) (PPM)
GAS:	1.72 FT.3	
OIL:	- CC	
WATER:	- CC	
MUD:	50 CC	
FILTRATE:		
TOTAL LIQUID:	50 CC	

----- MUD DATA -----

TYPE:	LIGHTLY TREATED
WEIGHT:	9.1 LB/GAL.
VISCOSITY:	48 SEC.
WATER LOSS:	8.0 CC
FLUID	RESIST TEMP CHLOR
	(OHM-M) (DEG F) (PPM)
MUD:	1.8 44
FILTRATE:	2.7 52 550

----- REMARKS -----

NO. OF REPORTS REQUESTED: 6 (3X)

FIELD REPORT NO. 32269D

----- SURFACE INFORMATION -----

DESCRIPTION(RATE OF FLOW)	TIME	PRESSURE PSIG	SURFACE CHOKE
SET PACKER	Ø723	Ø	-
OPENED TOOL	Ø726	-	-
BLOW OFF BOTTOM OF BUCKET	Ø73Ø	1	-
CLOSED FOR INITIAL SHUT-IN	Ø741	-	-
FINISHED SHUT-IN	Ø811	-	-
RE-OPENED TOOL, BLOW OFF BOTTOM OF BUCKET	Ø815	1	-
BLOW OFF BOTTOM OF BUCKET FOR BALANCE OF FLOW	Ø83Ø	1.5	-
CLOSED FOR FINAL SHUT-IN	Ø915	1.5	-
FINISHED SHUT-IN	1115	-	-
PULLED PACKER LOOSE	1116	-	"

CUSHION TYPE:	FT	PSIG	15/16 IN. BOTTOM CHOKE
---------------	----	------	------------------------

----- RECOVERY INFORMATION -----

RECOVERY	FEET	BARRELS	%OIL	%WATER	%OTHERS	API GRAV.	DEG.	RESIST DEG.	CHL PPM
PARAFIN-GAS CUT	665	-							

FIELD REPORT NO. 32269D

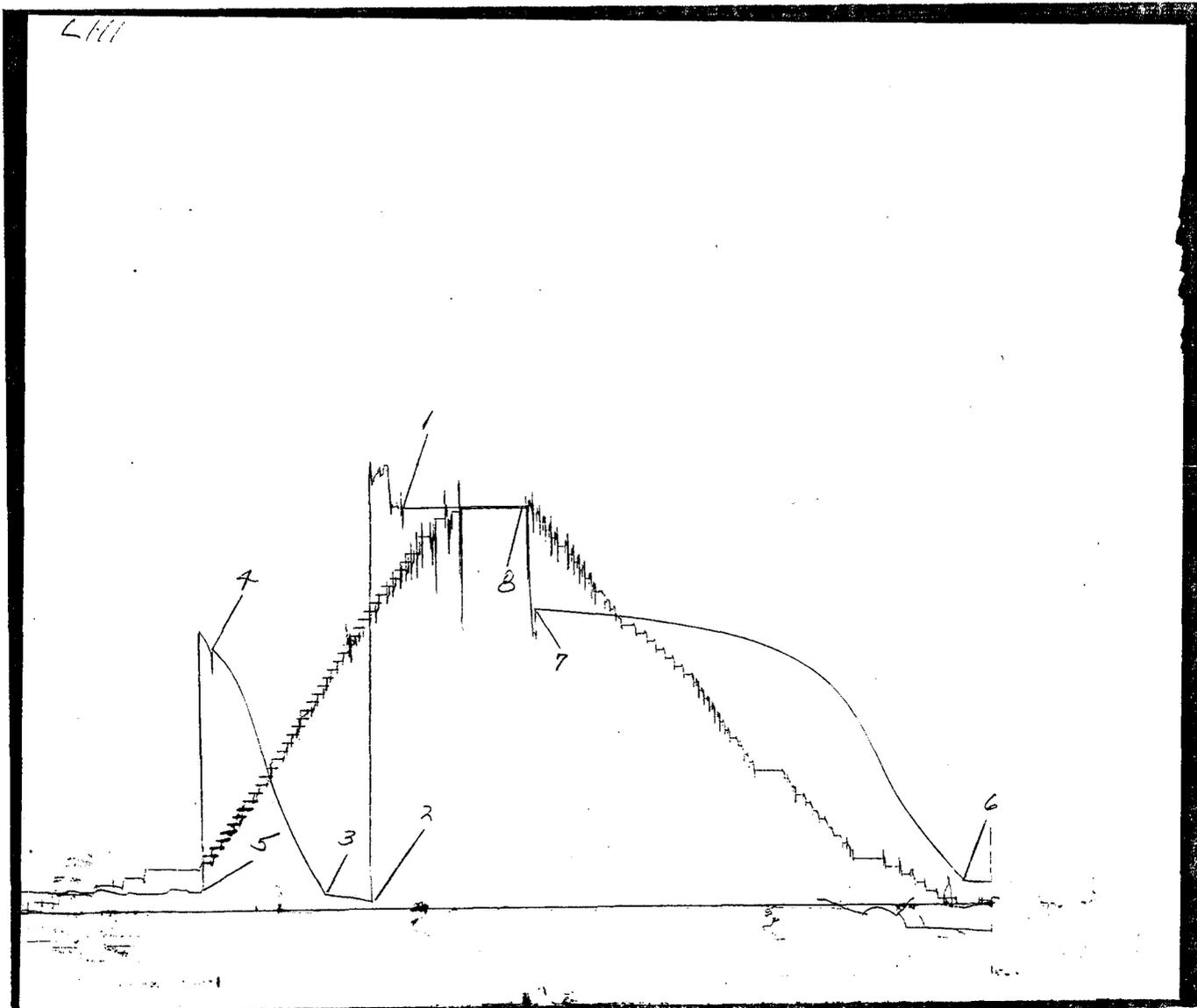
FIELD REPORT NO.: 32269 D

CAPACITY: 4700#

JOHNSTON
Schlumberger

INSTRUMENT NO.: J-1117

NUMBER OF REPORTS: 6

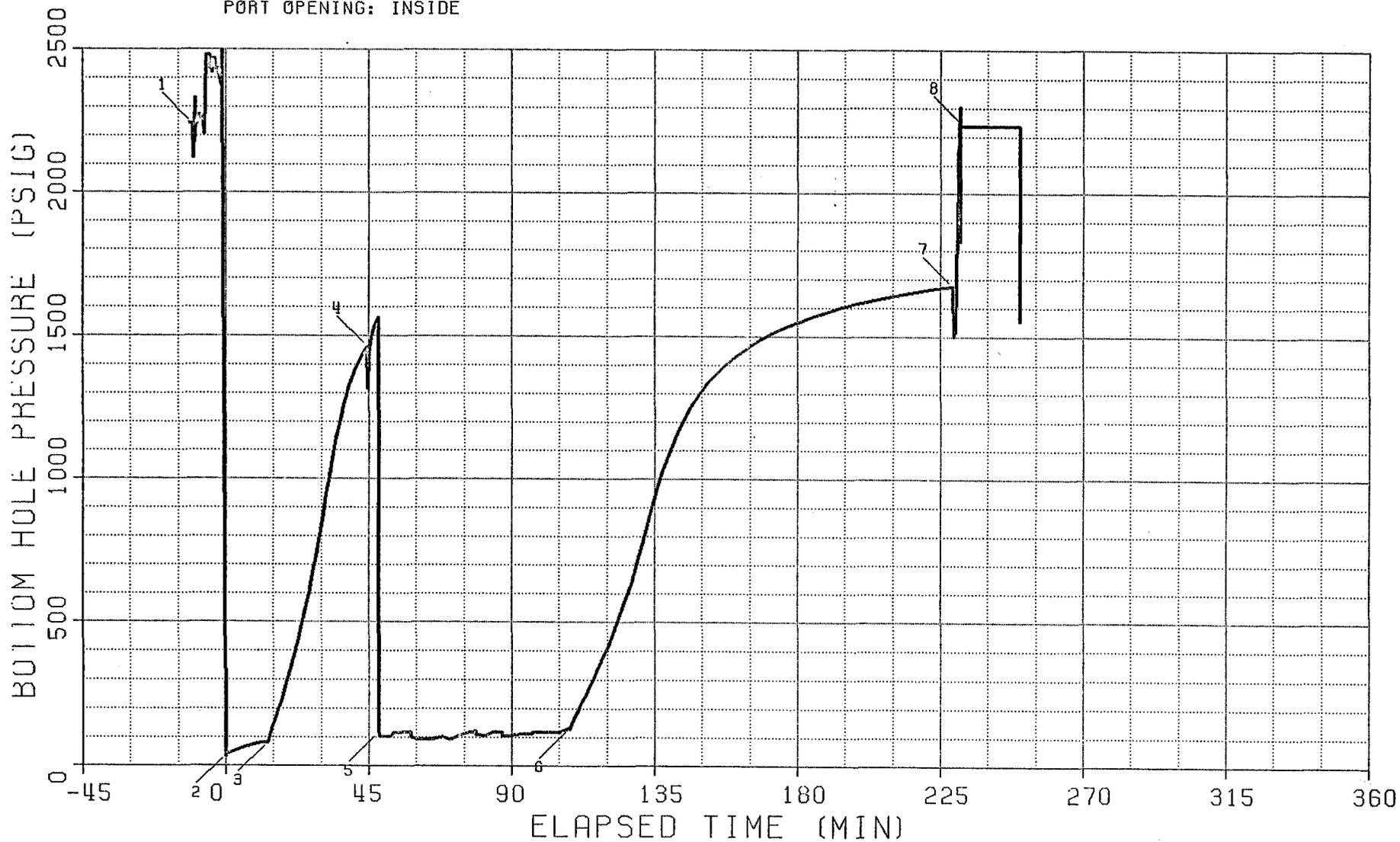


PRESSURE LOG

FIELD REPORT NO. 322690

INSTRUMENT:

NUMBER: J-1117
CAPACITY: 4700 PSI
DEPTH: 4685 FT
PORT OPENING: INSIDE



BOTTOM HOLE PRESSURE AND TIME DATA

INSTRUMENT NO.: J-1117
 PORT OPENING: INSIDE

CAPACITY (PSI): 4700
 BOTTOM HOLE TEMP (F): 108

DEPTH (FT): 4685
 PAGE 1

EXPLANATION	LABELED POINT	PRESSURE (PSIG)	ELAPSED TIME (MIN)
HYDROSTATIC MUD	1	2244	-10.5
START FLOW	2	39	0.0
END FLOW & START SHUT-IN	3	82	13.3
END SHUT-IN	4	1463	44.5
START FLOW	5	118	48.0
END FLOW & START SHUT-IN	6	132	108.1
END SHUT-IN	7	1676	228.9
HYDROSTATIC MUD	8	2238	232.3

 * SUMMARY OF FLOW PERIODS *

FLOW PERIOD	ELAPSED TIME AT START (MIN)	ELAPSED TIME AT END (MIN)	DURATION OF FLOW (MIN)	PRESSURE AT START (PSIG)	PRESSURE AT END (PSIG)
1	0.0	13.3	13.3	39	82
2	48.0	108.1	60.1	118	132

 * SUMMARY OF SHUT-IN PERIODS *

SHUT-IN PERIOD	ELAPSED TIME AT START (MIN)	ELAPSED TIME AT END (MIN)	DURATION OF SHUT-IN (MIN)	PRESSURE AT START (PSIG)	PRESSURE AT END (PSIG)	FINAL FLOW PRESSURE (PSIG)	PRODUCING TIME (MIN)
1	13.3	44.5	31.2	82	1463	82	13.3
2	108.1	228.9	120.8	132	1676	132	73.4

TEST PHASE : FLOW PERIOD # 1

ELAPSED TIME (MIN)	DELTA TIME (MIN)	FLOWING PRESSURE (PSIG)
0.0	0.0	39
5.0	5.0	61
10.0	10.0	77
13.3	13.3	82

TEST PHASE : SHUT-IN PERIOD # 1

1. FINAL FLOW PRESSURE ["P_{WF}"] = 82 PSIG
2. PRODUCING TIME ["T_P"] = 13.3 MIN

ELAPSED TIME (MIN)	DELTA TIME ["DT"] (MIN)	SHUT-IN PRESSURE ["P _{WS} "] (PSIG)	LOG [(T +DT)/DT] P	DELTA PRESSURE [P _{WS} - P _{WF}]
13.3	0.0	82		0
14.3	1.0	119	1.154	36
15.3	2.0	153	0.883	71
16.3	3.0	189	0.734	106
17.3	4.0	223	0.635	140
18.3	5.0	260	0.563	177
19.3	6.0	298	0.507	215
20.3	7.0	336	0.462	254
21.3	8.0	376	0.424	294
22.3	9.0	418	0.393	335
23.3	10.0	466	0.367	383
25.3	12.0	559	0.323	476
27.3	14.0	664	0.289	582
29.3	16.0	790	0.262	707
31.3	18.0	927	0.240	845
33.3	20.0	1057	0.221	975
35.3	22.0	1171	0.205	1089
37.3	24.0	1263	0.191	1180
39.3	26.0	1338	0.179	1255
41.3	28.0	1397	0.168	1314
43.3	30.0	1443	0.159	1361
44.5	31.2	1463	0.154	1380

TEST PHASE : FLOW PERIOD # 2

ELAPSED TIME (MIN) *****	DELTA TIME (MIN) *****	FLOWING PRESSURE (PSIG) *****
48.0	0.0	118
53.0	5.0	114
58.0	10.0	120
63.0	15.0	95
68.0	20.0	103
73.0	25.0	105
78.0	30.0	122
83.0	35.0	113
88.0	40.0	107
93.0	45.0	113
98.0	50.0	118
103.0	55.0	118
108.0	60.0	132
108.1	60.1	132

TEST PHASE : SHUT-IN PERIOD # 2

1. FINAL FLOW PRESSURE ["P_{WF} "] = 132 PSIG
2. PRODUCING TIME ["T_P "] = 73.4 MIN

ELAPSED TIME (MIN) *****	DELTA TIME ["DT"] (MIN) *****	SHUT-IN PRESSURE ["P _{WS} "] (PSIG) *****	LOG [(T +DT)/DT] P *****	DELTA PRESSURE [P - P _{WS}] WS WF *****
108.1	0.0	132		
109.1	1.0	152		0
110.1	2.0	176	1.071	20
111.1	3.0	199	1.576	44
112.1	4.0	222	1.406	67
113.1	5.0	246	1.286	90
114.1	6.0	269	1.195	114
115.1	7.0	293	1.121	137
116.1	8.0	316	1.060	161
117.1	9.0	339	1.007	184
118.1	10.0	365	0.961	207
120.1	12.0	414	0.921	233
122.1	14.0	469	0.852	282
124.1	16.0	524	0.795	337
126.1	18.0	586	0.747	392
128.1	20.0	654	0.705	453
130.1	22.0	733	0.669	522
132.1	24.0	817	0.637	601
134.1	26.0	898	0.608	685
136.1	28.0	978	0.582	766
			0.559	846

COMPANY ENERGY RESERVES GROUPWELL R. BROADHURST #14 TEST NO. 2 COUNTY UINTAH STATE UTAH
INC.

JOHNSTON-MACCO

Schlumberger

technical
report

FIELD REPORT # 32269 D

----- WELL IDENTIFICATION -----

COMPANY:	ENERGY RESERVES GROUP, INC. BOX 3280 CASPER, WY. 82601	CUSTOMER:	SAME
WELL:	R. BROADHURST #14	LOCATION:	SEC. 9 - 7S - 23E
TEST INTERVAL:	3444' TO 3520'	FIELD:	RED WALSH
TEST NO:	1	TEST DATE:	3-29-81
COUNTY:	UINTAH	STATE:	UTAH
TECHNICIAN:	SIRONEN (ROCK SPRINGS)	TEST APPROVED BY:	-

----- EQUIPMENT AND HOLE DATA -----

TEST TYPE:	M.F.E. OPEN HOLE	DRILL PIPE LENGTH:	2959	FT.
ELEVATION:	-	DRILL PIPE I.D.:	-	IN.
TOTAL DEPTH:	3520	DRILL COLLAR LENGTH:	450	FT.
MAIN HOLE/CASING SIZE:	7 7/8	DRILL COLLAR I.D.:	-	IN.
RAT HOLE/LINER SIZE:	-	PACKER DEPTHS:	3440 & 3444	FT.
FORMATION TESTED:	GREEN RIVER		&	FT.
NET PROD. INTERVAL:	76	DEPTHS REF. TO:	KELLY BUSHING	FT.
POROSITY:	-			%

----- TEST TOOL CHAMBER DATA -----

SAMPLER PRESSURE:	110	PSIG
RECOVERED OIL GRAVITY:	- API @	- DEG. F.
RECOVERY GOR:	-	FT3/BBL.

SAMPLE CHAMBER CONTENTS

FLUID	VOLUME	RESIST. (OHM-M)	MEAS. TEMP. (DEG F.)	CHLOR. (PPM)
GAS:	- FT.3			
OIL:	- CC			
WATER:	1800 (MUDDY) CC	-	-	-
MUD:	- CC	1.4	64	
FILTRATE:		1.5	60	650
TOTAL LIQUID:	1800 CC			

----- MUD DATA -----

TYPE:	LIGHTLY TREATED
WEIGHT:	9.0 LB/GAL.
VISCOSITY:	35 SEC.
WATER LOSS:	- CC
FLUID	RESIST (OHM-M) TEMP (DEG F) CHLOR (PPM)
MUD:	1.9 58
FILTRATE:	2.0 56 400

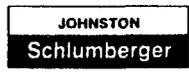
----- REMARKS -----

NO. OF REPORTS REQUESTED: 6 (3X)

FIELD REPORT NO. 28287D

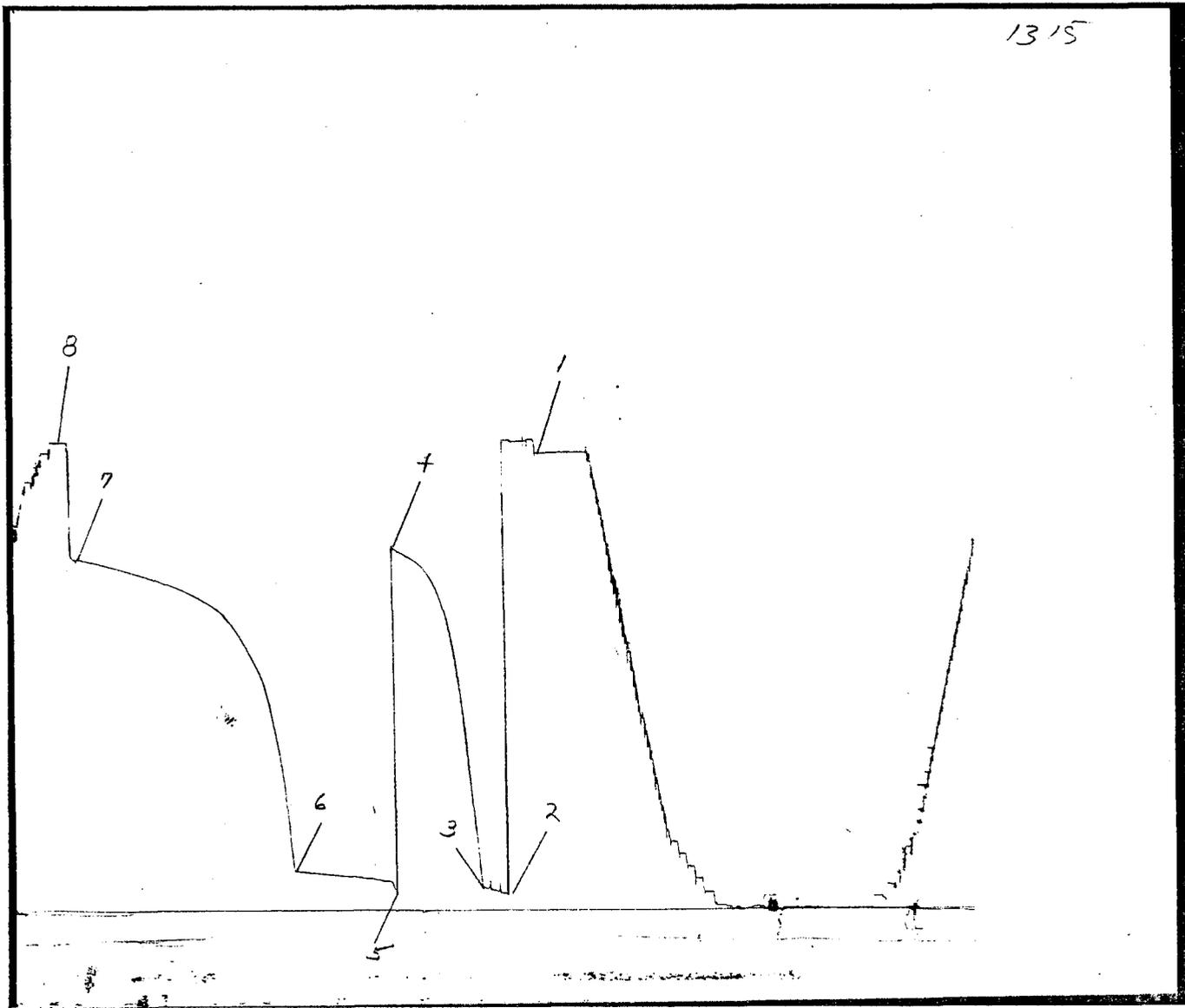
FIELD REPORT NO.: 28287 D

CAPACITY: 2800#



INSTRUMENT NO.: J-1315

NUMBER OF REPORTS: 6



PRESSURE LOG

FIELD REPORT NO. 28287D

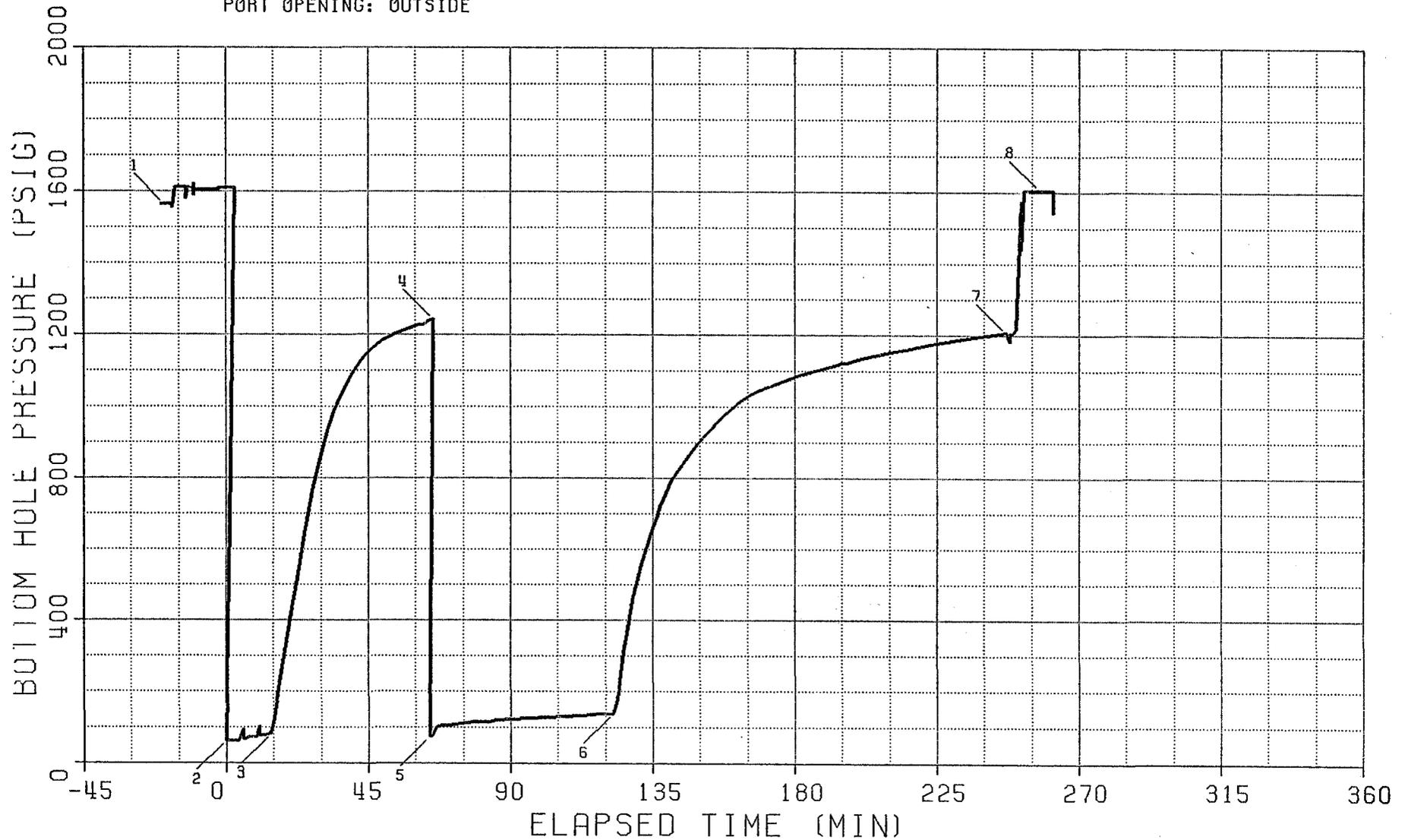
INSTRUMENT:

NUMBER: J-1315

CAPACITY: 2800 PSI

DEPTH: 3450 FT

PORT OPENING: OUTSIDE



BOTTOM HOLE PRESSURE AND TIME DATA

INSTRUMENT NO.: J-1315
 PORT OPENING: OUTSIDE

CAPACITY (PSI): 2800
 BOTTOM HOLE TEMP (F): 95

DEPTH (FT): 3450

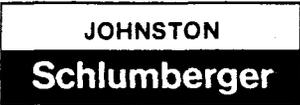
EXPLANATION	LABELED POINT	PRESSURE (PSIG)	ELAPSED TIME (MIN)
HYDROSTATIC MUD	1	1565	-19.4
START FLOW	2	63	0.0
END FLOW & START SHUT-IN	3	82	14.1
END SHUT-IN	4	1243	65.6
START FLOW	5	74	64.4
END FLOW & START SHUT-IN	6	139	122.4
END SHUT-IN	7	1207	246.8
HYDROSTATIC MUD	8	1606	257.4

 * SUMMARY OF FLOW PERIODS *

FLOW PERIOD	ELAPSED TIME AT START (MIN)	ELAPSED TIME AT END (MIN)	DURATION OF FLOW (MIN)	PRESSURE AT START (PSIG)	PRESSURE AT END (PSIG)
1	0.0	14.1	14.1	63	82
2	64.4	122.4	58.0	74	139

 * SUMMARY OF SHUT-IN PERIODS *

SHUT-IN PERIOD	ELAPSED TIME AT START (MIN)	ELAPSED TIME AT END (MIN)	DURATION OF SHUT-IN (MIN)	PRESSURE AT START (PSIG)	PRESSURE AT END (PSIG)	FINAL FLOW PRESSURE (PSIG)	PRODUCING TIME (MIN)
1	14.1	65.6	51.5	82	1243	82	14.1
2	122.4	246.8	124.4	139	1207	139	72.1



DISTRIBUTION FOR TECHNICAL REPORTS

JS-223

FIELD REPORT NO.	28287 D
DATE	3-29-81
NO.	14

COMPANY	ENERGY RESERVES GROUP, INC.	WELL	R. BROADHURST	NO.	14
CUSTOMER	SAME	FIELD	RED WALSH		
COUNTY	UINTAH	STATE	UTAH		

THIS TEST ONLY ALL TESTS ON THIS WELL

JOHNSTON HAS BEEN REQUESTED TO FURNISH THE FOLLOWING COMPANIES WITH TECHNICAL REPORTS. THIS DISTRIBUTION WILL BE AS INDICATED AT LEFT UNLESS OTHERWISE STATED.

<input checked="" type="checkbox"/> 2	ENERGY RESERVES GROUP, INC. 3200 - 633-17TH ST. DENVER, CO. 80202	<input type="checkbox"/>
<input checked="" type="checkbox"/> 1	ENERGY RESERVES GROUP, INC. BOX 3280 CASPER, WY. 82601	<input type="checkbox"/>
<input checked="" type="checkbox"/> 2	U.S.G.S. 2000 ADMINISTRATION BLDG.; 1745 W. 1700 S. OIL & GAS OPERATIONS SALT LAKE CITY, UTAH 84104	<input type="checkbox"/>
<input checked="" type="checkbox"/> 1	UTAH STATE GEOLOGICAL SURVEY STATE OIL & GAS COMMISSION 1588 W. NORTH TEMPLE SALT LAKE CITY, UTAH 84116	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>

RECEIVED

APR 6 1981

DIVISION OF OIL, GAS & MINING

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. oil well gas well other

2. NAME OF OPERATOR
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
P.O. Box 2380 - Casper, Wyoming 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1,980' FNL & 659' FEL (SE/NE)
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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

REQUEST FOR APPROVAL TO:	SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF <input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE <input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES <input type="checkbox"/>	<input type="checkbox"/>
ABANDON* <input type="checkbox"/>	<input type="checkbox"/>
(other) Well History <input checked="" type="checkbox"/>	X <input checked="" type="checkbox"/>

5. LEASE
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Broadhurst

9. WELL NO.
14

10. FIELD OR WILDCAT NAME
Walker Hollow

11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA
Sec. 9-T7S-R23E

12. COUNTY OR PARISH
Uintah

13. STATE
Utah

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD), G.L. Elev. 5,110'; K.B. 5,123'

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

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

Drilled 7-7/8" hole to 5,480' and ran logs.
Ran 134 jts 5-1/2" O.D., 14#, K-55, R-3, ST&C new casing set @ 5,480'
Cemented w/1200 sx of HOWCO Lite cement w/1/4# Flocele & 10# Gilonite
& 1% Thick-set components; followed by 570 sx of 50-50 Pozmix w/2% Gel
1/4# Flocele/sx; 0.6% Halad-9 & 5% KCl. Plug down @ 3:20 AM 4-8-81. Cement did not circulate.

Subsurface Safety Valve: Manu. and Type _____ Ft.

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

SIGNED R.C. Gilligan TITLE Drlg Supt - RMD DATE 4-8-81

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE APR 10 1981

CONDITIONS OF APPROVAL, IF ANY:

FORM OGC-8-X

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple
Salt Lake City, Utah 84116

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number U.S.A. Pearl Broadhurst #14

Operator Energy Reserves Group, Inc. Address P.O. Box 3280, Casper, WY-82602 - 307/265-7331

Contractor MGF Drilling Company Address P.O. Box 940, Mills, WY-82644 - 307/234-7389

Location SE 1/4 NE 1/4 Sec. 9 T. 7 N R. 23 E Uintah County, Utah
S W

Water Sands:

<u>Depth</u>		<u>Volume</u>	<u>Quality</u>
From	To	Flow Rate or Head	Fresh or Salty
1. <u>(During drilling operations no water flows were encountered. The drilling was</u>			
2. <u>essentially water from surface to ± 2,728' and chemical/gel mud system from ±</u>			
3. <u>2,728' to T.D., with mud weights ranging from 8.8-9.2 ppg).</u>			
4. _____			
5. _____			

(Continue on reverse side if necessary)

Formation Tops:

Uintah @ surface
Green River ± 2,788'

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APR 17 1981

Remarks:

- NOTE:
- (a) Upon diminishing supply forms, please inform this office.
 - (b) Report on this form as provided for in Rule C-20, **DIVISION OF OIL, GAS & MINING** General Rules and Regulations and Rules of Practice and Procedure, (See Back of form).
 - (c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

LITHOLOGY

- 2,800 - 2,820 80% SHALE - yel, lt gn, gy, rdorng, sft-frm, sbblky, n-mod slty, occ sme vf sd, tr mica, grdg to gy SLTST, arg, sdy, NSOFC.
20% SANDSTONE - gy, frm-hd, m-c gr, sbrd-sbang, n-sl arg, sme mica, sme fr-g \emptyset , NSOFC.
- 2,820 - 2,860 70% SHALE - var col, sft-frm, sbblky-sbfis, n-mod slty, tr mica, tr BENT.
10% SILTSTONE - gy spec, blk, frm-hd, arg, occ sme vf-f gr sd, NSOFC.
20% SANDSTONE - gy, wh-clr, frm-hd, f-c gr, sbang-sbrd, p srt, occ qtztc, sme fr \emptyset , NSOFC.
- 2,860 - 2,880 90% SHALE - yel gn gy brn-rdbrn, sft, sbblky, n-sl slty, tr mas PYR, tr BENT.
10% SANDSTONE - gy-clr, frm-hd, f-c gr, ang-sbrd, p srt, occ qtztc, sme calc mtx cmt, gen p \emptyset , occ fr intgr \emptyset , NSOFC.
- 2,880 - 2,900 70% SHALE - var col, yel gn gy brn, sft-frm, sbblky, n-sl slty.
Tr SILTSTONE - gy-wh, frm-hd, arg, occ sme vf gr sd, NSOFC.
30% SANDSTONE - gy-wh-clr, frm-hd, f-c gr, ang-sbrd, p srt, occ qtztc, sil cmt, occ calc mtx cmt, n-sl arg, occ sl slty, gen n-p \emptyset , occ fr intgr \emptyset , NSOFC.
- 2,900 - 2,920 10% CHERT - lt-m gy, v hd, sil.
20% SANDSTONE - gy-clr-wh, frm-hd, f-c gr sbrd-sbang, mod srt, occ calc mtx cmt, occ qtztc, gen n-p \emptyset , occ slty, n-v sl arg, NSOFC.
10% SILTSTONE - gy, frm, arg, sme vf sd, n \emptyset , NSOFC.
60% SHALE - var col, sft-frm, occ slty, gen a/a.
- 2,920 - 2,940 70% SHALE - brn gy gn yel, sft, sbblky, n-mod slty, occ sl calc, tr BENT, gygn, sft, amor.
20% SANDSTONE - gy wh-clr, frm-hd, m-c gr sbang-ang, mod w srt, occ calc cmt, gen n mtx cmt, p-occ fr \emptyset , NSOFC.
10% SILTSTONE - gy, frm, arg, sme vf gr sd, occ sl calc, n \emptyset , NSOFC, tr mas-xln PYR.
- 2,940 - 2,980 40% SANDSTONE - wh-clr, occ gy, frm-hd, f-c gr sbrd-sbang, p-mod w srt, gen n mtx cmt, occ calc-sil cmt, sme p-fr \emptyset , occ slty-sl arg, NSOFC.
60% SHALE - orng-rdorng yel gy-gn, sft, sbblky, a/a.
Tr BENT.
Tr mas PYR.
- 2,980 - 3,000 60% SANDSTONE - wh-clr, occ gy, frm-hd, f-c gr, sbrd-ang, mod w srt, sl-mod slty, occ mod arg, sme calc mtx cmt, gen n-p \emptyset , occ fr \emptyset , NSOFC.
40% SHALE - var col, sft, sbblky-sbfis, sl-mod calc, n-sl slty.

LITHOLOGY (Cont.)

- 3,000 - 3,020 50% SANDSTONE - clr-wh-gy, frm-hd, f-m gr, rd-sbang, occ c gr sbrd-sbang, mod w srt, calc mtx cmt, gen n-p Ø, NSOFC.
50% SHALE - yel gy gn orng-rdorng, sft, sbblky-sbfis, sl-mod calc, n-sl slty.
- 3,020 - 3,040 30% SILTSTONE - gy, frm-hd, v arg, occ sme vf sd, sil.
20% SANDSTONE - gy, frm-hd, vf-f gr w srt gen qtztc, occ sme calc mtx cmt, n arg, n-p Ø, NSOFC.
50% SHALE - orng gy yelgn, sft, sbblky-sbfis, n-sl slty, n sdy, sl-mod calc.
- 3,040 - 3,060 10% SANDSTONE - gy wh, occ pk, frm-hd, vf-f gr w srt, sme calc mtx cmt, gen n-p Ø, n-sl arg, sl slty, NSOFC.
30% SILTSTONE - lt-m gy, sft-hd, sme vf gr sd, arg, sl-mod calc, occ sil, NSOFC.
60% SHALE - var col m gy, sft-hd, sbblky-sbfis, n-sl slty, sl-mod calc, occ mod sil, tr PYR.
- 3,060 - 3,080 40% SILTSTONE - lt-m gy, frm, occ sdy, arg, sl-mod calc, occ sil, tr lt gybrn, dif-dk brn tar dd o stn, NFOC.
10% SANDSTONE - gy-wh, frm-hd, vf-m gr, mod w srt, occ slty, n-p Ø, occ fr intgr Ø, NSOFC.
50% SHALE - var col, brn-orng, sft, gen a/a.
- 3,080 - 3,140 20-30% SILTSTONE - m gy, frm, occ sdy, v arg, sl-mod calc, occ sil, tr gybrn tar, NFOC.
10-30% SANDSTONE - wh-clr, occ gy, frm-hd, f-m gr sbang-sbrd, mod w srt, n-v sl arg, occ slty, sme calc mtx cmt, gen n-p Ø, NSOFC.
50-60% SHALE - yel gy gn orng-brn, sft, sbblky, occ mod slty, n sdy, sl-mod calc.
- 3,140 - 3,280 90-95% SHALE - yel orng, gy-gybrn-brn, sft-hd, sbblky, occ slty, sl-mod dol, calc, occ tr dd brn o stn.
5-10% LIMESTONE - crm, gybrn-brn, frm-hd, micxln, micrite, n-sl slty, occ sl arg, occ sl dol, n-vp Ø, NSOFC.
- 3,280 - 3,320 30-50% SHALE - wh-lt gy-gn orng-rdbrn yel, sft, sbblky, n-v sl slty occ tr vf-f gr sd, sl-mod calc.
40-50% SILTSTONE - lt-m gy, frm-hd, arg, n-sl sdy, sl-mod calc, occ sil, n Ø, NSOFC.
10-20% SANDSTONE - lt gy, frm-hd, vf-f gr w srt, tt, qtztc, occ calc cmt, gen p Ø, tr m gy-lt gybrn dif o stn, g-exc yelgn-gol flor occ dul yel dif flor, occ stng yelgn dif-stmg cut, sme/NC.
- 3,320 - 3,340 40% SANDSTONE - wh-lt gy, occ clr, frm-hd, vf-c gr sbang-sbrd, mod w srt, occ sl slty, occ sl arg, gen p-occ g Ø, tr ltgy-lt brn dif o stn-dd o stn.
50% SHALE - var col brn, sft, sbblky-fis, occ sl slty, mod calc-dol, occ sil, tr dd brn o stn.
10% LIMESTONE - brn-gybrn, frm-hd, micxln, micrite, arg, occ sl sil, n Ø, tr dd brn o stn, NFOC.

LITHOLOGY (Cont.)

- 3,340 - 3,360 90% SHALE - orng gn-gy yel brn, sft-hd, sbblky-sbfis, mod calc-dol, occ slty, occ sil.
10% SILTSTONE - dk gy, frm-hd, arg, mod calc-dol, occ sil, NSOFC.
- 3,360 - 3,380 20% SILTSTONE - gy, frm-hd, arg, calc-dol, n Ø, tr lt gy dd o stn, occ vf sd grdg to slty SS, qtztc/n Ø.
10% LIMESTONE - gy-gybrn-brn, frm, micxln, micrite, sl-mod arg, sl-mod dol, n intxln Ø, tr gybrn-brn dd o stn, NFOC.
70% SHALE - orng-brn-gybrn-lt gy, sft-hd, occ mod slty, sl-mod calc-dol, occ sil, tr dd o stn.
- 3,380 - 3,400 70% SHALE - var col gy brn, sft-hd, gen a/a.
10% SILTSTONE - gy, frm-hd, arg, occ sdy, sl-mod calc, occ sil, n Ø, NSOFC.
20% SANDSTONE - gy-gybrn-brn, frm-hd, vf-f gr w srt, qtztc, occ sl calc, sl arg-sl slty, gen n-vp intgr Ø, tr dd brn o stn, wk flor, NC.
- 3,400 - 3,460 20% SANDSTONE - lt-m brngy, hd, f-m gr sbang-sbrd, w srt, occ arg, sl slty, fr-exc Ø, g-exc dul gol flor, vg-exc yelgn dif-strg stmg cut.
20-30% SILTSTONE - gy-gybrn, frm-hd, arg, occ sdy, occ fr Ø, sme fr-g dul gol flor, wk yelgn dif-stmg cut, gen NFOC.
50-60% SHALE - orng-brn gy, sft-hd, occ slty, occ sil, sl-mod calc-dol, tr dd brn o stn.
- 3,460 - 3,520 60-90% SHALE - var col, gygn orng-rdbrn, sft-hd, sbblky-fis, occ slty, sl-mod calc, occ fr dd o stn, NFOC.
10-40% SILTSTONE - brn-gybrn-gy, frm-hd, arg, fr-vg dif-ptchy brn o stn, ptchy-dif bri-dul yel flor occ wk dul yelgn stmg-wk dif cut, occ sdy grdg to slty SS, gy-brn, vf-m gr mod w srt, p-g Ø, fr-g brn dif o stn, ptchy-dif flor, occ wk yelgn stmg cut.
- 3,520 - 3,620 40-60% SILTSTONE - gy-gybrn, frm-hd, v arg, vf-f gr, sd, sl calc mtx, occ sil, gen n-p Ø, tr lt brn-brngy dif-ptchy dd o stn.
20-30% SHALE - brngy orng yel gygn, sft-frm, sbblky, occ slty, sl-mod calc-dol, occ sil.
10-20% SANDSTONE - lt-m brn, lt gy, frm-hd, vf-m gr, sbang-rd, w srt, occ slty-arg, sil-qtztc, tt occ calc mtx, gen n-vp Ø, occ fr-g intgr Ø, occ fr brn dif-dd o stn, occ dul yelgn flor, occ stng yelgn stmg-wl dif cut, gen NFOC.
- 3,620 - 3,720 10-40% SILTSTONE - lt-m gy-gybrn, frm-hd, arg, sdy, sl-mod calc, occ sil, n Ø, NSOFC.
40-70% SHALE - gn gy yel orng-brn, sft-frm, sbblky sl calc-dol, occ sil.
20% SANDSTONE - wh-crm lt gy, hd, vf-f gr w srt, slty-arg, occ calc-dol mtx, sil-qtztc, tt, gen n Ø, n-tr lt gybrn dd o stn, tr dul flor, NC.

LITHOLOGY (Cont.)

- 3,720 - 3,760 10-40% SANDSTONE - wh-lt gy, frm-hd, vf-f gr, sbang-rd w srt, occ slty-arg, gen cln, occ calc mtx, gen fr-exc \emptyset , occ n-p intgr \emptyset , NSOFC.
40-50% SHALE - gn gy orng brn yel, sft-frm, sbblky, occ sl slty, occ calc-dol, occ sil.
10-20% DOLOMITE - brn-gybrn, hd, micxln, mod-v arg, calc, n \emptyset , NSOFC.
10% LIMESTONE - wh-gy-gybrn-tan, sft-hd, micxln, micrite, arg, dol, n \emptyset , NSOFC.
- 3,760 - 3,800 Tr-10% SANDSTONE - wh ltgybrn-brn, frm-hd, vf-m gr, mod w srt, occ arg-slty, occ sl dol mtx, n-exc \emptyset , occ fr lt brn dif o stn, occ dul yelgn dif flor, occ wk yelgn stmg-dif cut, gen NSOFC.
20-30% DOLOMITE - m gy-gybrn-brn, hd, micxln, arg, occ slty, mod calc, n \emptyset , occ tr dd brn o stn, NFOC.
10% SILTSTONE - m gy-gybrn, frm-hd, arg, sdy, calc mtx, occ sil, n \emptyset , tr dd brn o stn, occ dul yel flor, NC.
45-50% SHALE - gy-gn orng mot yel brn, sft-hd, sbblky occ slty, occ calc-dol, occ dd o stn, NFOC.
- 3,800 - 3,840 Tr-10% SANDSTONE - wh-lt gy, hd, f-c gr sbang-rd, w srt, n-sl arg, n slty, cln, occ sl calc, g-exc intgr \emptyset , NSOFC.
Tr-10% SILTSTONE - gy-gybrn, frm-hd, arg, sdy, calc mtx, occ sil, n \emptyset , tr dd o stn, NFOC.
60-70% SHALE - var col, sft-hd, sbblky, occ slty, sl-mod calc.
20-30% DOLOMITE - brn-tan-gybrn, hd, micxln, arg, calc, n \emptyset , tr dd brn o stn, occ dul flor, NC.
- 3,840 - 3,860 98% SANDSTONE - wh-clr, hd, f-m gr sbang-rd mod w srt, n arg, n-sl slty, sl-mod calc, fr-exc intgr \emptyset , NSOFC.
- 3,860 - 3,900 Tr-20% DOLOMITE - gy-gybrn, hd, crp-micxln, v arg, occ slty, sl-mod calc, n \emptyset , NSOFC.
50-70% SHALE - yel orng rdbrn gy gn, sft-hd, sbblky occ sil, occ slty, sl-mod dol-calc, NSOFC.
10-20% SANDSTONE - wh-lt gy, frm-hd, f-m gr, sbang-sbrd, mod w srt, sl arg-slty, sl-mod calc-dol, p-vf intgr \emptyset , NSOFC.
10-20% SILTSTONE - lt-m gy-gybrn tan, frm-hd, arg, sme vf sd, sl-mod dol-calc, occ sil, n \emptyset , occ dd o stn, NC.
- 3,900 - 3,920 20% SANDSTONE - wh-lt gy clr, hd, vf-m gr, sbang-rd, w srt, sl-mod arg-slty, mod calc, occ sil, tt, sme g-exc \emptyset , NSOFC.
10% SILTSTONE - lt-m gy, frm-hd, arg-sdy, calc-dol, NSOFC.
50% SHALE - var col, sft-frm, sbblky, calc-dol, occ slty.
20% LIMESTONE - lt brn-tan occ gybrn, frm-hd, micxln, micrite, sl-mod dol, arg, n \emptyset , NSOFC.

LITHOLOGY (Cont.)

- 3,920 - 4,000 SHALE - var col, sft-hd, blk-y-sbblky, calc-dol, occ slty grdg to SLTST.
SANDSTONE - wh-gy, hd, vf-f gr sbang-sbrd, mod w srt occ fri, occ calc, sme cht, sme pyr, gen p-occ vg Ø, NSOFC.
- 4,000 - 4,060 10% LIMESTONE - tan-lt brn, frm-hd, vf-micxln, micrite, arg, dol, n Ø, NSOFC.
30-80% SHALE - gy-gygn yel orng, sft-frm, sbblky-sbfis, occ slty, calc-dol.
20-50% SANDSTONE - wh-ltgy clr, frm-hd, vf-m gr sbang-rd, mod w srt, occ fri, sl arg-slty, sl-mod calc, occ exc Ø, NSOFC.
Tr-10% LIMESTONE - tan, lt brn-buff, frm-hd, vf-micxln, micrite, arg, occ dol, n intxln Ø, NSOFC.
Tr-10% SILTSTONE - lt gy-gybrn-tan, frm-hd, arg, occ sdy, sl-mod calc-dol, occ sil, NSOFC.
- 4,060 - 4,120 10% SANDSTONE - tan-ltbrn gy wh, frm-hd, f gr sbang-sbrd, w srt, arg slty, sl-mod calc, gen n-vp Ø, occ fr-g intgr Ø, sme fr lt brn dif o stn, dull yelgn dif flor, stng yelgn stng-stng yelgn dif cut.
10-40% LIMESTONE - gy-gybrn, frm-hd, crp-micxln, micrite, arg, sl-mod dol, n in xln Ø, sme fr dd o stn, NFOC.
20-60% SHALE - var col, sft-frm, sbblky, occ slty, calc-dol, tr dd brn o stn, NFOC.
15-30% SILTSTONE - m gy-gybrn, tan, frm-hd, arg, calc, n Ø, tr dd o stn, tr dul yelgn flor, n cut.
- 4,120 - 4,140 10% LIMESTONE - lt gybrn-tan-buff, hd, crp-micxln, micrite, arg-slty, sl dol, n intxln Ø, NSOFC.
20% SILTSTONE - gy-gybrn, frm-hd, arg, calc, n Ø, NSOFC.
70% SHALE - yel rdorng-brn gy-gn, sft-frm, a/a.
- 4,140 - 4,300 Tr-25% LIMESTONE - lt-m brn buff-tan gybrn, hd, vf-micxln, micrite, arg, dol, gen n-p Ø, occ sme fr gybrn dd o stn, occ dul-bri yelgn flor, NC.
Tr-20% SANDSTONE - gy-gybrn, lt brn-buff, hd, vf-f gr, w srt, arg-slty, calc, occ fr intgr Ø, gen tt, occ dd o stn, sme fr dul-bri yelgn flor, n cut.
40-88% SHALE - var col, sft, n-mod slty, calc occ dol, sbblky-sbfis, occ s plty.
- 4,300 - 4,340 10-20% SANDSTONE - lt brn-buff-gybrn-lt gy, sft-hd, vf-f gr sbang-sbrd w srt, occ arg-slty, calc-dol mtz cmt, gen fr-exc intgr Ø, occ tt-qtztc, fr-g lt brn dif o stn, sme g yelgn dif-ptchy flor, occ stng bri yelgn stng-stng dif cut.
50-60% SHALE - yel orng-rdbrn gy-gn, sft-frm, sme sl slty, calc-dol, NSOFC.
10-20% LIMESTONE - buff-brn gybrn lt gy, frm-hd, vf-micxln, arg-slty, n-vp intxln Ø, g brn dif-strk dd o stn, occ dull yelgn flor, n cut.
10-20% SILTSTONE - lt-m gy gybrn-brn, arg-sdy, calc-dol, tt, fr-g brn dif dd o stn, occ g dif flor, n cut.

LITHOLOGY (Cont.)

- 4,340 - 4,400 10% LIMESTONE - buff, lt gy-gybrn, frm-hd, micrite, arg, occ slty, n-p \emptyset , occ lt brn dif o stn-dk brn tar, sme dul yelgn flor, occ wk dif cut.
Tr-10% SANDSTONE - wh-clr-lt gy, vf-f gr, arg-slty, calc-dol, occ tt, gen g-exc intgr \emptyset , occ lt brn dif dd o stn, tr flor, NC.
10-30% SILTSTONE - m gy-gybrn, brn-tan, frm-hd, arg sl-mod sdy, tt, calc-dol, occ fr-g lt brn dif dd o stn, NFOC.
55-70% SHALE - var col, sft-frm, sme sl slty, calc, occ sl dol, tr tar strk, NFOC.
- 4,400 - 4,440 20% LIMESTONE - buff-tan, lt brn, hd, micrite, sl-mod arg, sl dol, n \emptyset , occ mnl flor, NSOC.
10% SANDSTONE - wh-lt gy, frm-hd, vf-f gr, w srt, arg-slty, calc-dol, v occ brn dif o stn, v dul yelgn flor, stng yelgn dif cut.
10% SILTSTONE - gy-gybrn, brn-tan, arg, occ sdy, tt, calc-dol, occ dd o stn, NFOC.
60% SHALE - yel-orng, rdbrn-brn, gy gn, sft-frm, calc, occ tar strk, NFOC.
Tr CHERT - clr, hd.
- 4,440 - 4,460 Tr COAL - blk, sft, sl vit.
10% LIMESTONE - tan-lt brn-buff, occ gybrn, frm-hd, micxln, micrite, arg, sl dol, n \emptyset , NSOFC.
20% SILTSTONE - lt-m gy-gybrn, occ tan, a/a.
20% SANDSTONE - wh-clr, lt-m gy, gybrn, frm-hd, vf-f gr w srt, arg-slty, calc-dol, occ tt, gen fr-exc \emptyset , occ tr brn dif o stn, NFOC.
48% SHALE - var col, sft-frm, sbblky-fis, occ slty-sdy, calc, tr tar strk, NFOC.
- 4,460 - 4,490 Shaker bypassed for repair - no samples.
- 4,490 - 4,520 20-30% SANDSTONE - wh-lt gy-clr, occ gybrn, frm-hd, f gr sbang-sbrd, w srt, sl-mod arg-slty, qtztc, calc, gen tt, occ exc \emptyset , tr dd o stn, NFOC.
10-20% SILTSTONE - lt-m gy, gybrn-brn tan-buff, frm-hd, arg-sdy, sl-mod calc, tt, tr dd o stn, NFOC.
10-20% SANDSTONE - wh-lt, clr-v lt brn, frm-hd, vf-f gr sbang-sbrd, mod w srt, slty-arg, sl-mod calc, gen tt, sme fr-exc \emptyset , occ lt brn dif dd o stn-strk tar, NFOC.
50% SHALE - orng-rdbrn, yel, gy-gn, sft-frm, sbblky-sbfis, sl slty-occ sdy, calc, NSOFC.

LITHOLOGY (Cont.)

- 4,520 - 4,600 Tr-10% SANDSTONE - wh-lt gy-clr, sft-hd, vf-f gr occ m gr sbang-sbrd, w srt, occ fri, mod calc mtx cmt, arg-slty, calc, occ fr Ø, NSOFC.
58-78% SHALE - yel gy, gn, rdbrn-orng, sft-frm, sbblky-sbfis, occ splty, calc, sl slty-sdy, NSOFC.
10-20% SILTSTONE - buff-tan, lt-m gy, gybrn-brn, sft-hd, arg, occ sme vf sd, calc, n-p Ø, occ brn dif dd o stn, NFOC.
- 4,600 - 4,700 20-30% SANDSTONE - wh-clr, lt gy-lt brn, sft-hd, vf-m gr, sbang-sbrd, mod w srt, occ arg-slty, occ fri, sme fr-exc Ø, occ lt brn o stn, tr wk yelgn flor, tr bri yelgn stmg-dif cut, gen NSOFC.
10-30% SILTSTONE - buff-brn, lt-m gy, sft-hd, arg, occ v sdy, n Ø, occ tr dd o stn, NFOC.
Tr-10% LIMESTONE - buff-lt brn, frm-hd, vf-micxln, micrite, arg-slty, sl dol, n Ø, tr dd o stn, NFOC.
50% SHALE - var col, sft-frm, sbblky-sbfis, calc, occ slty, NSOFC.
- 4,700 - 4,740 10% SANDSTONE - clr lt gy, lt brn, sft-frm, f gr sbang, w srt, n-sl arg-slty, n-sl arg-slty, n-sl calc, fr exc Ø, lt brn dif o stn, exc bri yel dif flor, stng yelgn stmg-dif cut.
Tr-10% LIMESTONE - wh-crm brn, sft-frm, occ hd, micxln, micrite, n-sl arg, occ sl dol, n-tr intxln Ø, occ fr lt gybrn dif o stn, exc yelgn diff flor, wk yelgn-blgn stmg-stng dif cut.
30% SILTSTONE - brn lt-m gy yel var col, frm-hd, arg, occ v sdy, sl calc, tt, occ sme g lt-m brn dif dd o stn, NFOC.
50-60% SHALE - var col, sft-frm, sbblky, occ slty, sme v calc, NSOFC.
- 4,740 - 4,760 10% SANDSTONE - lt brn, lt gy, clr-wh, sft-hd, vf-f gr, mod-w srt, occ v arg-slty, calc mtx cmt, occ qtztc, tt, sme fr-exc Ø, sme lt brn dif-ptchy o stn, sme fr-exc yelgn dif-ptchy flor, wk stmg-dif cut.
20% SILTSTONE - lt-m gy, rdbrn-brn, frm-hd, arg sme sdy, sl calc, occ sil, tt, occ tr dd o stn, NFOC.
70% SHALE - yel gy-gn rdbrn-orng buff-tan, sft-frm, occ slty, occ sdy, mod calc, tr dk brn strk dd o stn, NFOC.

LITHOLOGY (Cont.)

- 4,760 - 4,780 70% SANDSTONE - lt gy-wh, occ clr, frm-hd, f gr w srt, arg-slty, calc mtx cmt, p intgr \emptyset , n-tr lt gy o stn, occ fr yelgn flor, v wk dul yel dif-resid cut.
Tr LIMESTONE - wh-crm, micrite, n arg, occ sl slty, sl dol, n \emptyset , NSOFC.
28% SHALE - var col, sft, gen a/a.
- 4,780 - 4,800 50% SANDSTONE - clr, lt gy, occ wh, frm-hd, vf-f gr, sbang-sbrd, mod w srt, arg-slty, calc mtx cmt, gen n \emptyset , occ sme fr-g intgr \emptyset , occ fr lt gy dif o stn, occ tr yelgn ptchy flor, NC.
10% SILTSTONE - lt-m gy gybrn, frm-hd, arg, occ sdy, sl calc, tt, tr dd o stn, NFOC.
40% SHALE - rdbrn-orng, yel, gy-gn, sft-frm, sbblky-fis, occ slty, calc, NSOFC.
- 4,800 - 4,900 10-30% SANDSTONE - clr, lt gy, occ lt brn, frm-hd, vf-f gr w srt, slty-arg, calc mtx cmt, gen tt, p intgr \emptyset , n-tr dd o stn, NFOC.
10-30% SILTSTONE - lt gy-gygn, occ lt gybrn, frm-hd, arg, occ sdy, sl calc, tt, occ tr mnl flor, NSOC.
48-68% SHALE - var col, sft-frm, a/a.
Tr LIMESTONE - lt-m gy brn-buff, frm-hd, micxln-ooltc, micrite, arg, sl dol, n-vp intxln \emptyset , NSOFC.
- 4,900 - 4,960 10-40% SILTSTONE - gy-gygn, gybrn-brn-buff, frm-hd, arg, occ sdy, sl-mod calc, tt occ strk-ptchy tar, NFOC.
10% SANDSTONE - wh-lt gy clr, frm-hd, vf-f gr cons w srt, sl slty, arg, n-sl calc, n-vp \emptyset , occ tr dd o stn, NFOC.
- 4,960 - 5,000 20-40% SILTSTONE - lt-m gy, gybrn-brn-buff, sft-frm, arg, occ sdy, sl-mod dol, NSOFC.
45-55% SHALE - var col, sft, sbblky-fis, occ v slty, sl sdy, calc, NSOFC.
Tr-20% SANDSTONE - lt brn, lt gy-clr, frm-hd, vf-f gr, mod w srt, slty-arg, sl calc mtx cmt, occ qtztc, n-fr \emptyset , occ dif o stn, NF, occ wk dif-resid cut, gen NSOFC.
Tr-20% LIMESTONE - lt brn-tan-buff, occ gy, frm-hd, crp-micxln, micrite, occ ool, arg, occ sl dol, n \emptyset , NSOC, sme dul yel mnl flor.

LITHOLOGY (Cont.)

- 5,000 - 5,100 Tr-10% SANDSTONE - brn lt gy-gybrn, sft-hd, vf-f gr mod w srt, arg-slty, sl calc, occ fr \emptyset , tr brn dif o stn, occ dul yelgn flor, tr wk dif yel gn cut.
20-30% SILTSTONE - gy-gybrn-dk brn, frm-hd, arg, occ mod sdy, occ sil, tt, n-vp \emptyset , fr brn dd o stn, NFOC.
35-60% SHALE - var col, sft, sbblky-fis, occ splty, occ slty, calc, tr tar specs, NFOC.
10-25% LIMESTONE - buff-tan-brn-gybrn, occ clr, frm-hd, crp-micxln, micrite, arg, dol, n \emptyset , sme ool/calc mtx cmt, tr fr dd o stn, occ mnl flor, n cut.
- 5,100 - 5,120 10% LIMESTONE - tan-buff m gybrn, frm-hd, micrite, a/a.
20% SILTSTONE - brn-tan gybrn, arg, occ sl sdy, sl calc, occ sil, tt, fr dd o stn, NFOC.
70% SHALE - var col, sbblky-splty, calc, occ sl slty, tr tar specs, NFOC.
- 5,120 - 5,220 Tr-10% SANDSTONE - gy, gybrn, lt brn, occ clr, frm-hd, f gr, sil-qtztc, sl-mod arg, gen n-vp \emptyset , n-tr dd o stn, NFOC.
55-60% SHALE - gy-gn, buff-brn yel orng, sft-frm, sbblky-sbfis, occ splty, calc, sl-mod slty, occ sme vf sd, NSOFC.
10-15% LIMESTONE - brn-gybrn, frm-hd, micxln, micrite, arg occ slty, sl dol, n intxln \emptyset , occ fr dd o stn, NFOC.
20-25% SILTSTONE - gy-gybrn-brn, occ buff, sft-frm, arg, sme v sdy, sl calc, sil, tt, sme fr dd o stn, NFOC.
- 5,220 - 5,230 10% SANDSTONE - clr smky gy, frm-hd, vf-f gr cons sbrd -rd, mod w srt, occ fri, sl calc, sme sil mtx cmt, occ f-m gr uncons sbang, NSOFC.
20% SILTSTONE - gy-gybrn-buff, sft-frm, arg, occ v sdy, sl calc, occ sil-qtztc, tt, n \emptyset , occ blk-brn tar strk-spec, NFOC.
70% SHALE - rdbrn-orng, gy-gn, tan-yel, sft-frm, sbblky-sbfis, occ slty, sme vf sd, calc, NSOFC.
- 5,230 - 5,270 Shaker down for repair - no samples.
- 5,270 - 5,300 20-30% SANDSTONE - clr-wh, lt gy-occ lt brn, hd, vf-m gr, cons, p srt, sme calc mtx cmt, occ sil, arg-slty, occ fri, sme fr-exc \emptyset , tr brn dif o stn, bri yel dif flor, stng-wk stmg-dif cut.
50-60% SHALE - var col, sft, sbblky-fis, slty, occ sdy, calc, NSOFC.

LITHOLOGY (Cont.)

- 5,300 - 5,380 50-70% SHALE - var col, sft-frm, gen a/a.
Tr-10% LIMESTONE - lt brn-buff, micxln, micrite, arg,
n intxln \emptyset , tr-p brn dd o stn, occ dul gol mnrl flor,
n cut.
10-20% SANDSTONE - wh-clr, occ lt brn, vf-f gr cons,
mod w srt, sl arg-slty, occ sil-qtztc, sl calc, sme
fr-exc \emptyset , occ fr-g lt brn dif o stn, occ fr ptchy-dif
dul gol flor, occ sme stng stmg-dif cut, gen NSOFC.
10-25% SILTSTONE - gy-gybrn, occ var col, sft-frm,
arg, occ v sdy, sl-mod calc, occ sil, gen tt, tr gy-
gybrn dd o stn, NFOC.
- 5,380 - 5,420 20% SILTSTONE - gy-gybrn, tan-yelbrn-buff, sft-frm,
arg sme sdy, sl-mod calc, NSOFC.
Tr LIMESTONE - gy-gybrn, frm-hd, micxln, micrite, arg,
n \emptyset , NSOFC.
68-78% SHALE - var col, sft, sbblky-fis occ splty,
calc, sl-mod slty, occ sdy, NSOFC.
- 5,420 - 5,440 20% SILTSTONE - gy-gybrn, sft-frm, arg, occ v sdy,
n-sl calc, sme tar specs, NFOC.
80% SHALE - var col, gygn, yel, orng, rdbrn-brn, sft,
gen a/a.
- 5,440 - 5,460 10% SANDSTONE - gy-gybrn, brn-clr, vf-f gr, cons p srt,
sme calc mtx cmt, occ sil cmt, occ qtztc, p \emptyset , occ
fr dif brn o stn-tar, sme dul yelgn flor, v wk dif cut.
10% LIMESTONE - gy brn-gy, brn-buff, crm, crp-micxln,
n \emptyset , fr brn-gybrn dd o stn, tr dul yel mnrl flor, n cut.
20% SILTSTONE - gy-gybrn-yelbrn, arg sme sdy, sl calc,
n-p \emptyset , fr dd o stn, NFOC.
60% SHALE - var col, sft, sbblky-fis, splty, n-mod
slty, occ sdy, calc, NSOFC.
- 5,460 - 5,480 15% SANDSTONE - clr, lt brn, wh, hd, vf-f gr, cons, p
srt, n-sl arg, n-sl slty, n-sl calc, occ qtztc, gen
p \emptyset , tr lt brn dd o stn, fr yel gn flor, n cut, occ
f-m gr uncons rd-sbrd.
Tr LIMESTONE - gy-gybrn, micrite, arg, sl dol, n \emptyset ,
NSOFC.
20% SILTSTONE - gen a/a.
63% SHALE - var col, sft, sbblky-fis splty, occ slty-
sl sdy, calc, NSOFC.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. oil well gas well other

2. NAME OF OPERATOR
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
P.O. Box 3280 - Casper, Wyoming 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1,980' FNL & 659' FEL (SE/NE)
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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

5. LEASE
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
USA Pearl Broadhurst

9. WELL NO.
14

10. FIELD OR WILDCAT NAME
Walker Hollow

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 9-T7S-R23E

12. COUNTY OR PARISH
Uintah

13. STATE
Utah

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
K.B. 5,123' (GRD + 13')

REQUEST FOR APPROVAL TO: SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

PULL OR ALTER CASING

MULTIPLE COMPLETE

CHANGE ZONES

ABANDON*

(other) Top of Cement X

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

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

On May 4, 1981 a Cement Bond Log indicated the top of cement to be at 1,500' K.B. on the subject well.

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

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

SIGNED Bobby Patrick TITLE Prod. Engr-RMD DATE _____

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

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.

8

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. Other _____

2. NAME OF OPERATOR
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
P.O. Box 3280 - Casper, Wyoming 82601

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface 1,980' FNL & 659' FEL (SE/NE)

At top prod. interval reported below
At total depth

RECEIVED
JUN 27 1981
DIVISION OF OIL, GAS & MINING

14. PERMIT NO. 43-04730904 DATE ISSUED 3-5-81

5. LEASE DESIGNATION AND SERIAL NO.
U-02651-A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME
7. UNIT AGREEMENT NAME
8. FARM OR LEASE NAME
USA Pearl Broadhurst
9. WELL NO.
14
10. FIELD AND POOL, OR WILDCAT
Walker Hollow
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA
Sec. 9-T7S-R23E
12. COUNTY OR PARISH
Utah
13. STATE
Utah

15. DATE SPUNDED 3-21-81 16. DATE T.D. REACHED 4-7-81 17. DATE COMPL. (Ready to prod.) 6-10-81 18. ELEVATIONS (DF, RKB, RT, GR, ETC.)* 5,123' KB; 5,110' GL 19. ELEV. CASINGHEAD -----

20. TOTAL DEPTH, MD & TVD. 5,480' KB 21. PLUG, BACK T.D., MD & TVD 5,438' KB 22. IF MULTIPLE COMPL., HOW MANY* NA 23. INTERVALS DRILLED BY → 24. ROTARY TOOLS 0-TD 25. CABLE TOOLS -----

24. PRODUCING INTERVAL(S) OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*
5,340'-5,382.5' KB Green River "K" Zone
5,244'-5,244.5' KB Green River "J" Zone
4,720'-4,756' KB Green River "H" Zone
25. WAS DIRECTIONAL SURVEY MADE NO

26. TYPE ELECTRIC AND OTHER LOGS RUN
Compensated Densilog/Neutron, BHC Acoustilog, Dual Induction
27. WAS WELL CORED NO

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

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8" OD	24#	497' KB	12-1/4"	380 sx "G" w/2% CaCl ₂ & 1/4# Flocele/sk	-0-
5-1/2" OD	14#	5,480' KB	7-7/8"	1200 sx HOWCO Light + add & 570 sx 50-50 Pozmix + add.	-0-

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)
		None			2-7/8"	4,710' K.B.	None

31. PERFORATION RECORD (Interval, size and number)

5,340'-42', 5,374'-78', 5,382.5' w/1 JSPF (9 perfs)
 5,244', 5,244.5' w/1 JSPF (2 perfs)
 4,720'-22', 4,724'-26', 4,728', 4,747'-48'
 4,750', 4,752'-54', 4,756' w/1 JSPF (14 perfs)

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
5,244'-5,382.5'	800 gal 7½% HCL + additives and ball sealers
4,720'-4,756'	750 gal 7½% HCL + additives and ball sealers. Frac'd see back

33.* PRDUCTION

DATE FIRST PRODUCTION 6-10-81 PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Pumping 2-1/2" x 1-3/4" x 14' Rod Pump WELL STATUS (Producing or shut-in) Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
6-18-81	24	-----	-----	94	NA	197	NA

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

----- 94 NA 197 ± 28.0°

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

35. LIST OF ATTACHMENTS VENTED DURING TEST

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

SIGNED R Wagner TITLE Production Engineer-RMD DATE 6-25-81

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

INSTRUCTIONS

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

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

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

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

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

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

37. SUMMARY OF POROUS ZONES:

SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.
No DST's			<p><u>Sample Descriptions Attached</u></p> <p>Cont'd from front page:</p> <p><u>Fracture:</u> - 5,244'-5,382.5' - Frac'd w/ 35,000 gal Super E w/55,000# 20-40 sand, 8000 gal Super E w/24,000# 10-20 sand.</p> <p>4,720'-4,756' - Frac'd w/ 35,000 gal Super E w/55,000# 20-40 sand, 8000 gal Super E w/24,000# 10-20 sand.</p>

38.

GEOLOGIC MARKERS

NAME	TOP	
	MEAS. DEPTH	TRUE VERT. DEPTH
<u>LOG TOPS</u>		
Uintah	Surface	
Green River	2,792'	
"G" zone	4,362'	
"H" zone	4,608'	
"I" zone	4,852'	
"J" zone	5,135'	
"K" zone	5,300'	
T.D. Logger	5,480'	
T.D. Driller	5,480'	

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.)

RECEIVED

JUN 03 1985

DIVISION OF OIL
GAS & MINING

5. LEASE DESIGNATION AND SERIAL NO.
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
USA Pearl Broadhurst

9. WELL NO.

10. FIELD AND POOL, OR WILDCAT
Walker Hollow Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Section 9 T1S-R1E

12. COUNTY OR PARISH | 13. STATE
| Uintah | Utah

1. OIL WELL GAS WELL OTHER

2. NAME OF OPERATOR
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR
P. O. Box 3280 Casper, Wyoming 82602

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

14. PERMIT NO.

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

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 type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	

(Other) Consolidate Tank Batteries

(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.)

Energy Reserves Group, Inc. is proposing to consolidate the five existing tank batteries to one central tank battery to be located at the USA Pearl Broadhurst #1 present tank battery site. The location of the central tank battery site and the additional flowlines are shown on the attached topo map. All of the additional flowlines required will be in existing pipeline routes and will be insulated surface lines, so there should not be any additional surface disturbances. The entire lease has already had archaeological clearance. The present #1 Broadhurst Tank Battery already has the required tank storage, additional heater treaters will have to be moved to the present #1 battery.

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

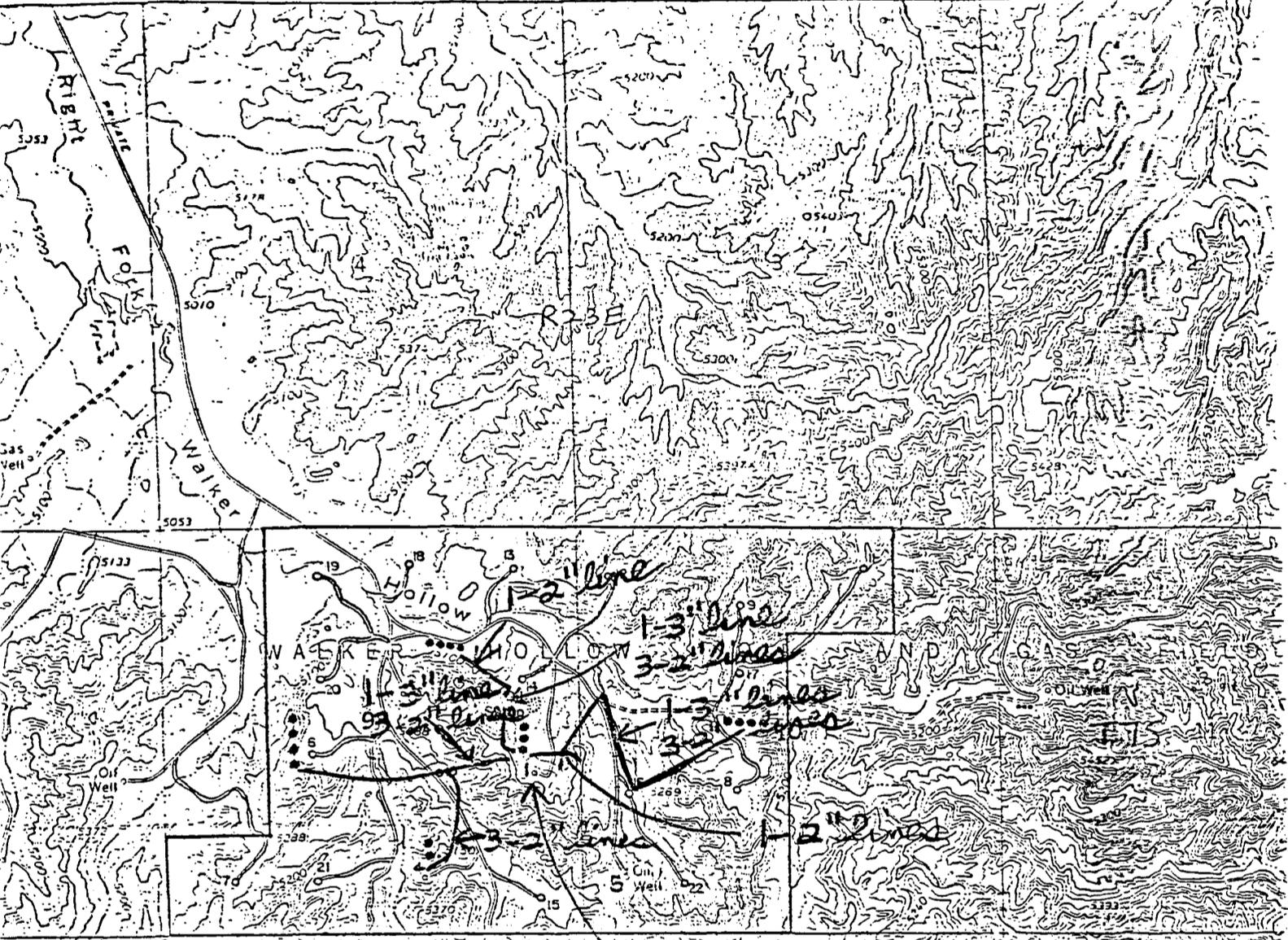
SIGNED Bobby Patrick TITLE Petroleum Engineer DATE 5-31-85
Bobby Patrick
 (This space for Federal or State office use)

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

*See Instructions on Reverse Side

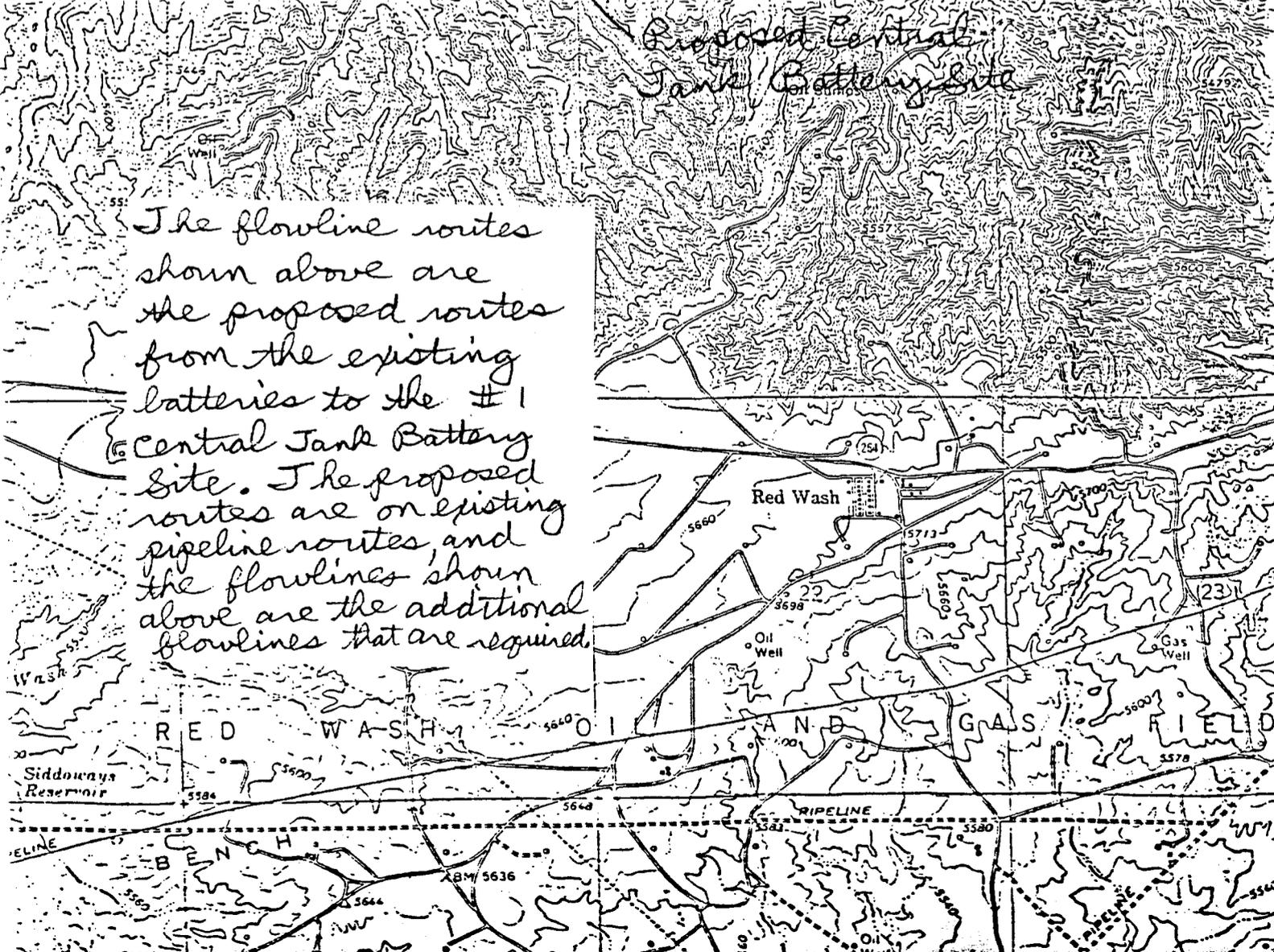
Energy Reserves Group
 USA Pearl Broadhurst Lease
 Walker Hollow Field
 Uintah Co., Utah

15 W 10 UTAH 244 20' 142 143 4184 IV SE (JENSEN) 144 45 17'30"



Proposed Central Tank Battery Site

The flowline routes shown above are the proposed routes from the existing batteries to the #1 Central Tank Battery Site. The proposed routes are on existing pipeline routes and the flowlines shown above are the additional flowlines that are required.



913 North Foster Road
Post Office Box 3280
Casper, Wyoming 82602
Telephone (307) 265-7331
Fax (307) 266-1999

RECEIVED

OCT 24 1985

DIVISION OF OIL
GAS & MINING



BHP
Petroleum
(Americas) Inc

September 17, 1985

Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

*Broadhurst #14
75.23E.9*

Re: Corporate name change, ENERGY RESERVES GROUP, INC.

Gentlemen:

By authority of the enclosed copies and affidavit, please change your records to reflect the change of the name of ENERGY RESERVES GROUP, INC. to BHP Petroleum (Americas) Inc. for all former ERG operations in Utah.

Affected leases and numbers are as follows:

USA Pan American
Federal Lease #81-06579
(Utah entity #00220)

USA Pearl Broadhurst
Federal Lease #U-02651-A
(Utah entity #00225)

Roosevelt Unit - Wasatch
Federal Lease #I-109-IND-5248 and I-109-IND-5242
(Utah entity #00221)

If further information is needed, please contact me at the letterhead address or telephone number.

Thank you for your assistance.

BHP Petroleum (Americas) Inc.

Dale Belden
District Clerk
Rocky Mountain District

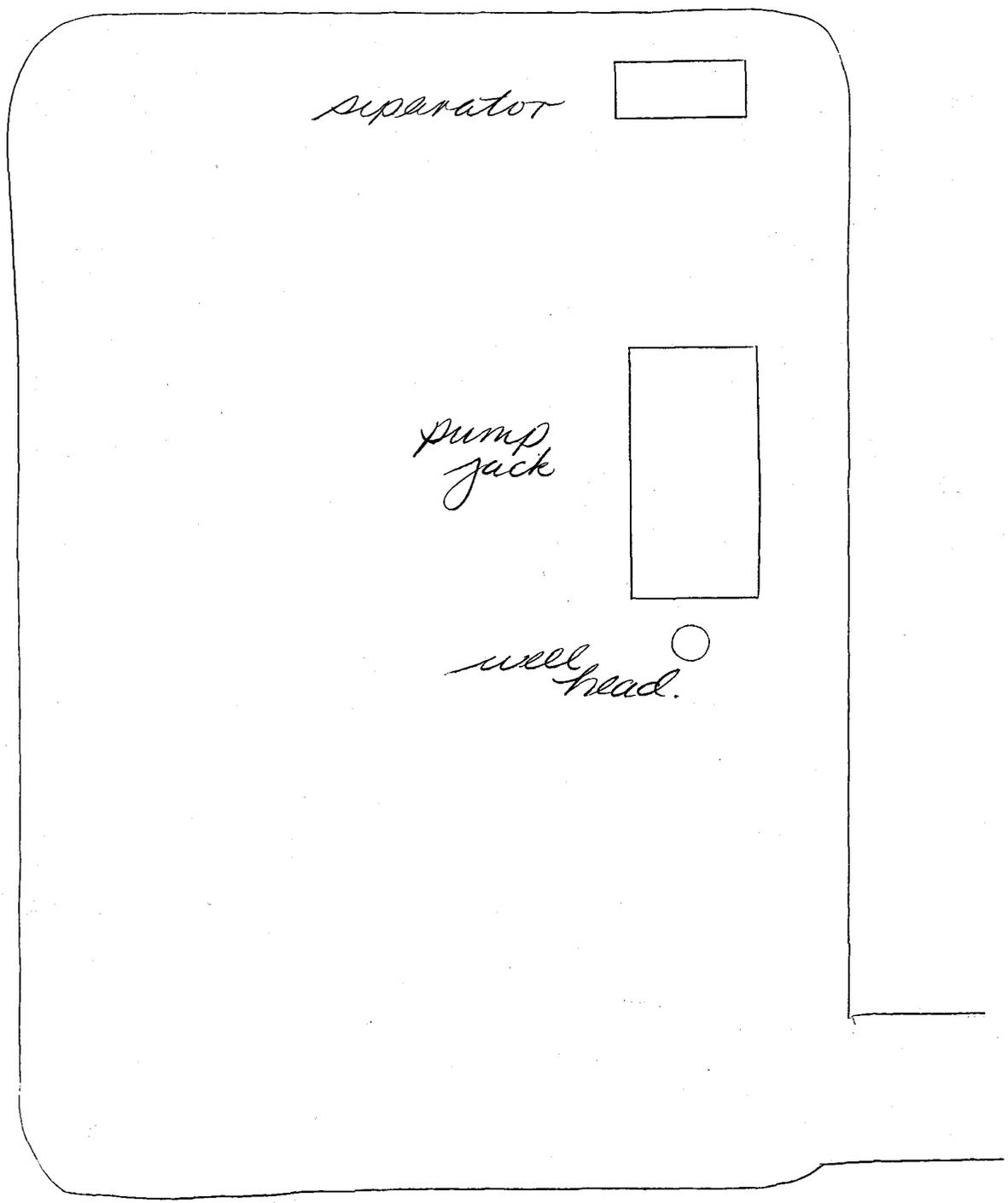
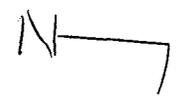
DB/mz

Enclosure

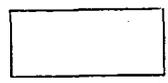
OCT 25 1985

Pearl, Broadhurst #11 Sec 9, T80, J3E

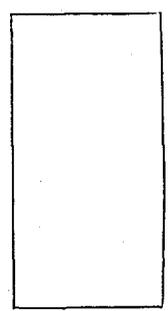
D. G. G. 9/28/88



separator



pump
jack



well
head.



42-381 50 SHEETS 3 SQUARE
42-382 100 SHEETS 3 SQUARE
42-383 200 SHEETS 3 SQUARE
MADE IN U.S.A.
NATIONAL

GENERAL ATLANTIC

RESOURCES, INC.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 14, 1993

RECEIVED

JUN 17 1993

State of Utah
Oil & Gas Conservation Commission
Three Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

DIVISION OF
OIL, GAS & MINING

RE: Change of Operator
Sundry Notices and
Reports on Wells

Gentlemen:

By Assignment dated April 30, 1993, effective January 1, 1993, General Atlantic Resources, Inc. ("GARI") purchased the interests of BHP Petroleum (Americas) Inc., Hamilton Brothers Oil Company, Hamilton Brothers Exploration Company and The Norwegian Oil Corporation (DNP-U.S.) collectively ("BHP"), in the properties referenced on the enclosed forms. BHP was the designated operator of said properties, resigning effective May 1, 1993. GARI has been acting as the operator in the interim while balloting was being conducted to determine the successor operator.

GARI has been named successor operator. Enclosed are executed forms for your review and approval reflecting this change. In the event you have questions or concerns relative to this transfer of operatorship, please contact Jim Lee Wolfe, Vice President of Operations or the undersigned at the letterhead address and/or call (303) 573-5100. Thank you for your timely attention in this matter.

Very truly yours,

GENERAL ATLANTIC RESOURCES, INC.


Lynn D. Becker, CPL
Landman

Enclosures



STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

<p>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>		<p>5. LEASE DESIGNATION & SERIAL NO. SEE BELOW</p> <p>6. IF INDIAN, ALLOTTEE OR TRIBE NAME</p>
<p>1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/></p>	<p>7. UNIT AGREEMENT NAME SEE BELOW</p> <p>8. FARM OR LEASE NAME</p>	
<p>2. NAME OF OPERATOR BHP Petroleum (Americas) Inc. (PREVIOUS OPERATOR)</p>		<p>9. WELL NO. SEE ATTACHED</p>
<p>3. ADDRESS OF OPERATOR 5847 San Felipe, Suite 3600, Houston, Texas 77057</p>		<p>10. FIELD AND POOL, OR WILDCAT</p>
<p>4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface Sections 9,10,13,18,19,20,21,23,25,26,27,28 At proposed prod. zone</p>		<p>11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA</p>
<p>14. API NO.</p>	<p>15. ELEVATIONS (Show whether DF, RT, GR, etc.)</p>	<p>12. COUNTY Utah</p>
		<p>13. STATE Utah</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 type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) CHANGE OF OPERATOR <input checked="" type="checkbox"/>	
(Other) _____		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	
APPROX. DATE WORK WILL START _____		DATE OF COMPLETION 5/01/93	

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

* Must be accompanied by a cement verification report.

EFFECTIVE DATE: January 1, 1993.
NEW OPERATOR: General Atlantic Resources, Inc.
ADDRESS: 410 17th Street, Suite 1400, Denver, Colorado 80202

LEASE: USA Pearl Broadhurst	LEASE #: UTU02651A
USA Pan American	UTSL065759
Roosevelt Unit Wasatch	892000886A

RECEIVED

JUN 17 1993

DIVISION OF OIL GAS & MINING

Attached is a list of the wells which make up the above leases along with their respective API numbers. This method of ownership change was suggested by Lisha Romero, Division of Oil, Gas and Mining, Salt Lake City, Utah.

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

SIGNED Carl Kollie TITLE Regulatory Off. Rep. DATE 4/27/93

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

<u>LEASE</u>	<u>WELL#</u>	<u>API NUMBER</u>
USA Pearl Broadhurst	1 — Sec 9 T75 R23E	43-047-15692
" " "	2 — 10	43-047-15693
" " "	4 — 9	43-047-15694
" " "	5 — 10	43-047-15695
" " "	6 — 9	43-047-30705
" " "	7 — 9	43-047-30730
" " "	8 — 10	43-047-30696
" " "	9 — 10	43-047-30787
" " "	10 — 9	43-047-30839
" " "	11 — 11	43-047-30840
" " "	12 — 10	43-047-30841
" " "	13 — 9	43-047-30842
" " "	14 — 9	43-047-30904
" " "	15 — 9	43-047-30901
" " "	16 — 10	43-047-30903
" " "	17 — 10	43-047-30905
" " "	18 — 9	43-047-30939
" " "	19 — 9	43-047-30940
" " "	20 — 9	43-047-30941
" " "	21 — 9	43-047-30942
" " "	22 — 10	43-047-31025
USA Pan American	1 Sec 23 T55 R 22E	43-047-15682
" " "	2 — 26	43-047-15683
" " "	3 — 26	43-047-15684
" " "	4 — 22	43-047-15685
" " "	5 — 26	43-047-15686
" " "	6 — 26	43-047-15687
" " "	7 — 25	43-047-15688
" " "	8 — 22	43-047-15689
" " "	9 — 27	43-047-15690
" " "	10 — 22	43-047-15691
Roosevelt Unit Wasatch	5W — Sec 20 T15 1E	43-047-31254
" " "	6 — 20	43-047-31366
" " "	7 — 19	43-047-31402
" " "	9W — 28	43-047-31445
" " "	10W — 21	43-047-31446
" " "	C11 — 12	43-047-31500
" " "	Mary 278 13	43-047-31845

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

RECEIVED
SEP 20 1993

SUBMIT IN TRIPLICATE SEP 20 1993

5. Lease Designation and Serial No.
USA U-02651-A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No. 14 (see at Pearl Broadhurst exhibit)

9. API Well No. 43-047-30904 (see att. exhibit A)

10. Field and Pool, or Exploratory Area

11. County or Parish, State
Uintah County, Utah

1. Type of Well
 Oil Well Gas Well Other

DIVISION OF
OIL, GAS & MINING

2. Name of Operator
General Atlantic Resources, Inc.

3. Address and Telephone No.
410 17th Street, Suite 1400, Denver, Colorado 80202 (303) 573-5100

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
(See attached exhibit A)
Sections 9 and 10, Township 7 South-Range 23 East

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

TYPE OF SUBMISSION	TYPE OF ACTION
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input checked="" 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>change of operator</u>
	<input 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.)

On May 1, 1993 General Atlantic Resources, Inc. took over operations of the referenced well from BHP Petroleum (Americas) Inc.

Bond coverage pursuant to 43 CFR 3104 for lease activities is being provided by General Atlantic Resources, Inc. under their nationwide bond, BLM bond number C01023. They will be responsible for compliance under the lease terms and conditions for that portion of the lease associated with this notice.

VERNAL DIST.
WNG. 22-968
GEOL. _____
E.S. _____
PET. _____
A.M. _____

SEP 28 1993

14. I hereby certify that the foregoing is true and correct
Signed [Signature] Title Lynn D. Becker Landman Date August 20, 1993

(This space for Federal or State office use)
Approved [Signature] Title ASSISTANT DISTRICT MANAGER MINERALS Date SEP 10 1993
Conditions of approval if any:

Routing:

1- LEC /GIL
2- DTG /9-SJ
3- VLC 8-FILE
4- RJE
5- IEC
6- PL

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

- Change of Operator (well sold) Designation of Agent
 Designation of Operator Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 5-1-93)

TO (new operator) <u>GENERAL ATLANTIC RES INC</u>	FROM (former operator) <u>BHP PETROLEUM/AMERICAS INC</u>
(address) <u>410 17TH ST #1400</u>	(address) <u>5847 SAN FELIPE #3600</u>
<u>DENVER, CO 80202</u>	<u>HOUSTON, TX 77057</u>
<u>LYNN BECKER, LANDMAN</u>	<u>CARL KOLBE (713) 780-5301</u>
phone <u>(303) 573-5100</u>	phone <u>(713) 780-5245</u>
account no. <u>N 0910</u>	account no. <u>N0390</u>

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

Name: <u>BROADHURST #9/GRRV</u>	API: <u>43-047-30787</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>U02651A</u>
Name: <u>PEARL BH #10/GRRV</u>	API: <u>43-047-30839</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>PEARL BH #11/GRRV</u>	API: <u>43-047-30840</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>PEARL BH #12/GRRV</u>	API: <u>43-047-30841</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>PEARL BH #13/GRRV</u>	API: <u>43-047-30842</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>BROADHURST #14/GRRV</u>	API: <u>43-047-30904</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>BROADHURST #15/GRRV</u>	API: <u>43-047-30901</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>

CCMT.

OPERATOR CHANGE DOCUMENTATION

- See* 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). *(Rec'd 6-17-93)*
- See* 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). *(Rec'd 6-17-93)*
- See* 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) ____ If yes, show company file number: # 92898.
- See* 4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of Federal and Indian well operator changes should take place prior to completion of steps 5 through 9 below.
- See* 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. *(9-28-93)*
- See* 6. Cardex file has been updated for each well listed above. *(9-28-93)*
- See* 7. Well file labels have been updated for each well listed above. *(9-28-93)*
- See* 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. *(9-28-93)*
- See* 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

- 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- 2. A copy of this form has been placed in the new and former operators' bond files.
- 3. The former operator has requested a release of liability from their bond (yes/no) . Today's date 19 . If yes, division response was made by letter dated 19 .

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- 1. (Rule R615-2-10) The former operator/lessee of any fee lease well listed above has been notified by letter dated 19 , of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- 2. Copies of documents have been sent to State Lands for changes involving State leases.

FILMING

- All attachments to this form have been microfilmed. Date: 10-12 1993.

FILING

- 1. Copies of all attachments to this form have been filed in each well file.
- 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

90920 P. Am / Manual Approved 9-10-93. (Lease UTR02651-A Only) Other leases/wells will be handled on separate change.

UMC Petroleum Corporation

December 19, 1994

Mr. Gil Hunt and Mr. Daniel Jarvis
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
350 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RE: Walker Hollow Enhanced Recovery Injection Well Permits for the
Pearl Broadhurst # 4 and #14, Uintah County, Utah.

Dear Mr. Sirs,

Enclosed is the Injection Well Permit package for the subject wells. We have contacted the Salt Lake Tribune and the Vernal Express to publish a copy of the public notice for the public comment period. We will send a copy and an affidavit from those papers when we receive them.

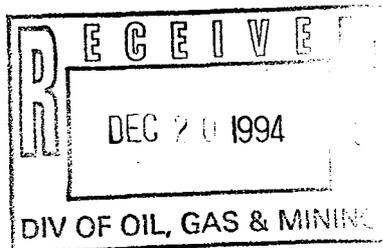
Please note the company name change, we will be filing all of our change of operator notices shortly. If you have any questions or need additional information, I can be reached at (303) 573-4721.

Sincerely,

United Meridian Petroleum Corp.
Operations Department



Scott M. Webb
Regulatory Coordinator



MISCELLANEOUS DATA

Estimated Plugging Costs

Monitoring Program

Well Failure Plans

Well Bore Deviation

Injection Procedures

ESTIMATED PLUGGING COSTS

(Cost estimated on per well basis)

Well Specifics: (Averages for field)

Surface Casing: 8-5/8" set to 500'
Production Casing: 5-1/2" set to 6000'
Perforations: 4000' to 6000'

Plugging and Abandonment Procedures:

- 1) Pull all tubing from well bore casing.
- 2) Install CICR - Cast Iron Cement Retainer at 4000'.
- 3) Circulate 600 sx class "G" cement below CICR.
Circulate 10 sx Class "G" cement on top of CICR.
- 4) Install "Bullhead" at top of 8-5/8" casing with 100 sx class "G" cement circulating down annulus of 8-5/8" and 5-1/2" casing.
- 5) Install 20 sx plug in 8-5/8" casing at surface.
- 6) Excavate 3' below surface grade, cut off and remove 8-5/8" and 5-1/2" casing and seal with welded cap. Will place surface marker if required.
- 7) Remove all deadman anchors and surface equipment.
- 8) Re-claim surface to original condition, re-contour and re-seed as per state and federal requirements.

Equipment and Labor for P & A:

- 1) Move in rig, pump and tanks. Pull tubing and rods.
- 2) Trip in hole, clean-out to PBTD.
- 3) Pressure test casing for mechanical integrity.
- 4) Begin cementing and plugging operations outlined above.

Costs for Plugging and Abandonment:

Rig total rates:	\$10,000.00
Tools and Cement:	\$6,500.00
Labor/Roustabout:	\$6,000.00
Site Reclamation:	\$2,500.00
Total P&A Cost:	\$25,000.00 / Well

MONITORING PROGRAM

There are no shallow monitoring wells in the area of review for this field. Monitoring will be done with existing off-set production wells located with-in the field unit.

Monitoring at each injection and off-set well shall include:

- 1) Backside pressure monitoring at the packer to determine if the casing or tubing is leaking.
- 2) Off-set production wells will be monitored for increased water production.
- 3) Pressure indicator meeters will be permanently installed at all injection wells, with remote sensors installed above injection zones to indicate packer or casing leaks.
- 4) Testing Parameters:
 - a. Backside pressure tests will be performed on an annual basis.
 - b. Remote sensor testing will be done on a daily basis.
 - c. Fluctuations in pressure at all off-set wells will be monitored on a daily basis
 - d. Fluctuation such as large drops or increases in pressure will be documented and monitored on a daily basis at the well head, manifold and subsurface sensors in the injection wells.

PLANS FOR WELL FAILURES

1) Surface equipment failures:

In the event of a surface equipment failure, berms installed around all facilities are designed to hold 150% of the largest vessel used on the injection plant. All facilities at this project have complete SPCC plans in place.

2) Subsurface equipment failures:

The injection system for all wells will be equipped with automatic head pressure shut-off and relief switches. The switches will be activated to shut down the system to prevent pressure build-up that could cause fluid migration to other zones including USDW sources. High and low pressure switches will be utilized to shut-off surface systems to avoid damage to the gathering system.

3) Alternate Disposal Plans:

In the event of an emergency shut down of the system to either the #4 or #14 injection well, fluid will be re-routed to the existing #2 and #5 injection wells through the manifold distribution system.

Alternate Injection well locations: (see attached map)

#2 Pearl Broadhurst
SWNW Sec. 10-T7S-R23E
2140' FNL, 500' FWL

#5 Pearl Broadhurst
SWSW Sec. 10-T7S-R23E
743' FSL, 564' FWL

4) Remediation Plans:

Well failures that would occur in the injection zones would require the well to be shut down for repairs. This would include temporarily plugging off the casing at the damaged area and circulating cement to seal the damaged area. In an extreme case of damage removal and replacement of the tubing and casing or plugging and abandonment of the well would be required. If the fluid has migrated to a different zone, perforating the casing at that zone to extract and flush the damaged zone would be required. Cement bond logs and temperature logs would be re-run to insure no further migration hazards exist.

Surface remediation plans are covered in the SPCC plans designed specifically for this field.

DRILL HOLE DEVIATION

The intended injection wells #14 & #4 are existing production wells that are being converted to inject production water from other producing wells in the unit. The information required by this attachment has been provided in the other attachments included with the permit application except the following drill hole deviation record:

Depth	Deviation
106'	1 degree
231'	3/4 degree
355'	1 degree
496'	3/4 degree
1007'	1 degree
1536'	3/4 degree
2034'	1/2 degree
2066'	1/2 degree
2699'	Misrun
2718'	1 degree
3434'	1-1/2 degree
3520'	1-1/4 degree
4200'	1/4 degree
4736'	Misrun
5480'	1 degree

INJECTION PROCEDURES

1) Fluid delivery to the injection wells will be by pipeline to the manifolds at the injection plant sites.

2) On-site storage of injection fluid will be in two 300 BBL fiberglass insulated steel tanks, located at each injection plant.

3) Pump operation. injection fluid will be pumped through a Triplex pump, with an Ajax DP 60 primemover power source.

4) Emergency procedures. The injection system will be equipped with an automatic head pressure shut-off switch tied into the injection pump set to shut down in the event of head pressure build-up. Overflow indicators will shut down system in the event of the tanks overflowing. High and low pressure switches will be utilized to control rupturing gathering system lines.

5) Tank batteries will have large enough berms to hold the contents of 150% of the largest tank in use at the facility.

ATTACHMENT R649-5-1 (2.3)

DESCRIPTION OF OPERATIONS

DESCRIPTION OF OPERATIONS

United Meridian Petroleum Corporation, formerly General Atlantic Resources, Inc., is in the process of evaluating the expansion of the Walker Hollow Field Enhanced Oil Recovery project. The initial plans for this field include conversion of two wells to injection, for the purpose of determining if a full scale waterflood of the lease would be economical, and that a single zone waterflood is feasible in the Green River "H" zones.

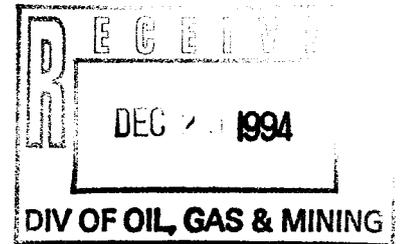
The company would like to begin injecting water from wells producing out of the Green River "H" zone at a maximum rate of 1000 BWPD and a maximum pressure of 1200 psi into the "H" zones. Fluid delivery to the injection wells will be by pipeline to the manifolds situated at the injection plants. On-site storage of injection fluid will be in two 300 BBL fiberglass insulated steel tanks at each injection plant. Injection fluid will be pumped through a Triplex pump, with an Ajax DP 60 primemover power source.

Testing parameters would include backside pressure tests on an annual basis, remote sensor testing on a daily basis and fluctuations in pressure at all off-set wells daily. Fluctuation such as large drops or increases in pressure will be monitored and documented on a daily basis at the wellhead, manifold and sub-surface sensors in the injection wells.

For emergency procedures, the injection system will be equipped with an automatic head pressure shut-off switch tied into the injection pump set to shut down in the event of head pressure build-up. Overflow indicators will shut down the system if the tanks are in danger of overflowing. High and low pressure switches will be utilized to prevent rupturing of gathering system lines. Injection tank batteries will have large enough berms to hold the contents of 150% of the largest tank in use at the facility, in accordance with the SPCC plans for the field.

If the initial stages of the project are successful, additional production in-fill wells will be drilled and other wells will be converted to injection to complete the plan.

ATTACHMENT R649-5-2 (2.1)



AREA OF OPERATIONS 1/2 MILE RADIUS OF THE INTENDED INJECTION WELLS

Location Plat Topo

Unit Boundary Plat

Injection Well locations

Abandoned and Active Wells Within 1/2 Mile Radius

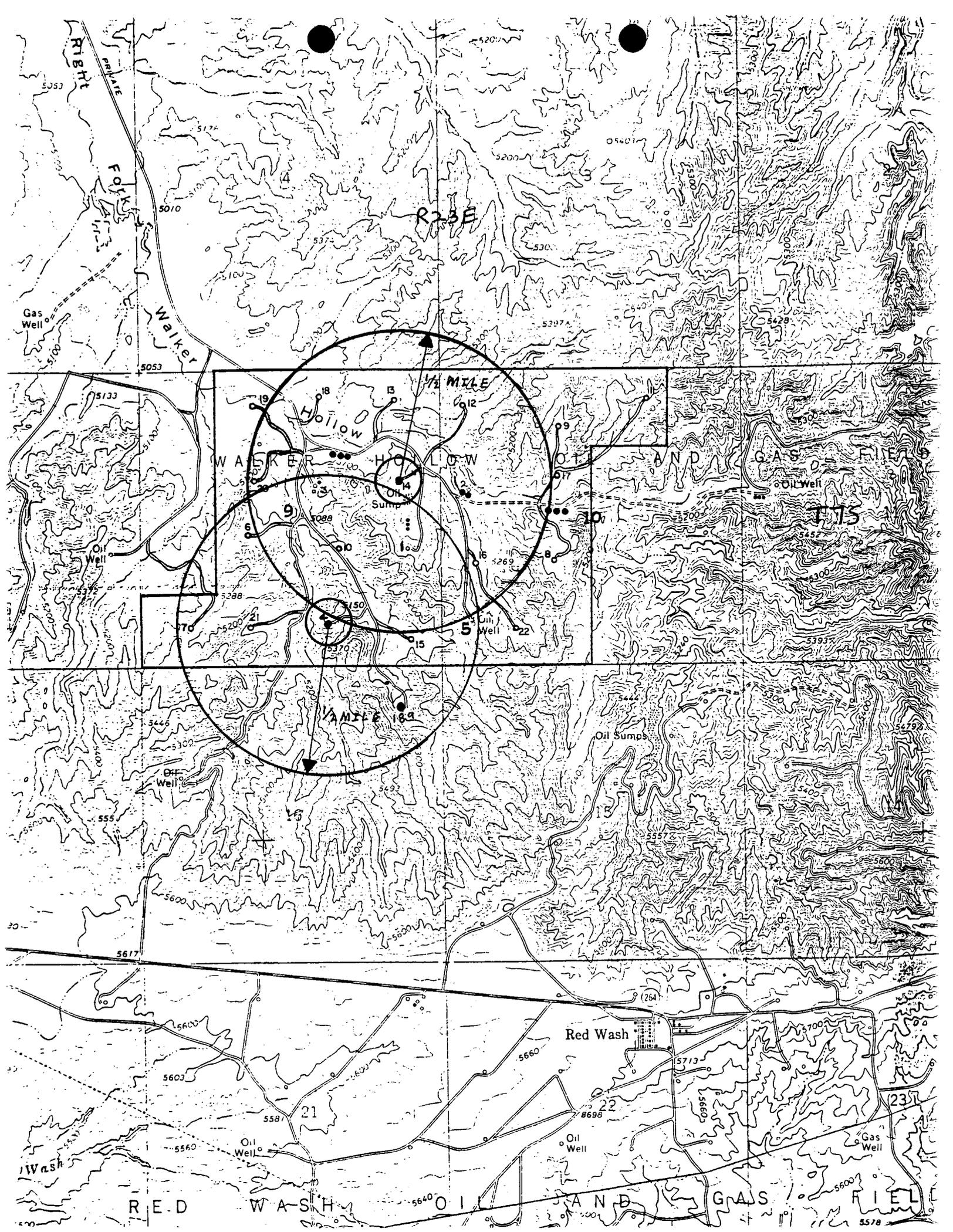
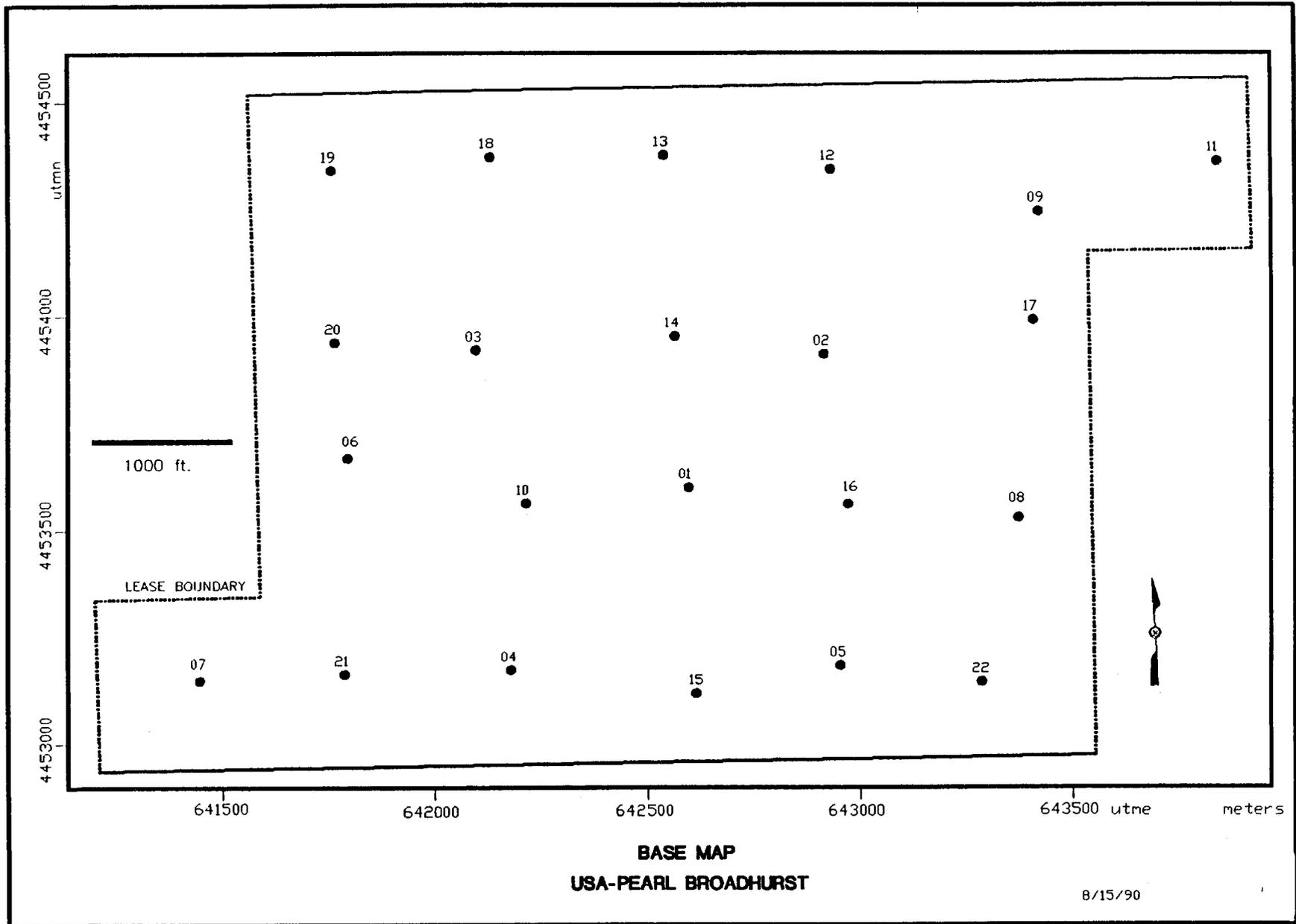


FIGURE 31



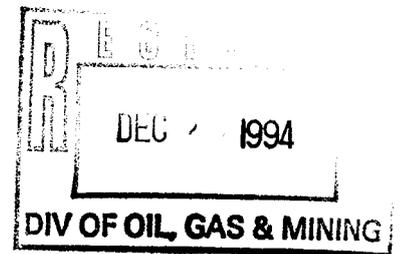
8/15/90

WELL LOCATIONS WITHIN 1/2 MILE OF INJECTION WELLS

Intended Injection Wells				
Well #	Footage	1/4-Sec.	Township	Range
4	760'FSL & 1980'FEL	SWSE 9	7S	23E
14	1980'FNL & 659'FEL	SENE 9	7S	23E
Permitted Injection Wells				
2	2140'FNL & 500'FWL	SWNW 10	7S	23E
5	743'FSL & 564'FWL	SWSW 10	7S	23E
Producing Wells				
1	2130'FSL & 575'FEL	NESE 9	7S	23E
6	2404'FSL & 2062'FWL	NESW 9	7S	23E
7	723'FSL & 879'FWL	SWSW 9	7S	23E
13	592'FNL & 713'FEL	NENE 9	7S	23E
18	581'FNL & 2042'FEL	NWNE 9	7S	23E
20	1980'FNL & 1978'FWL	SENW 9	7S	23E
21	753'FSL & 1993'FWL	SESW 9	7S	23E
12	721'FNL & 579'FWL	NWNW 10	7S	23E
16	1977'FSL & 662'FWL	NWSW 10	7S	23E
Shut-in Wells				
10	2029'FSL & 1819'FEL	NWSE 9	7S	23E
15	552' FSL & 555'FEL	SESE 9	7S	23E
1894116B	635'FNL & 685' FEL	NENE 16	7S	23E
Plugged and Abandoned Wells				
3	2055'FNL & 2205'FEL	SWNE 9	7S	23E

United Meridian Corp., formerly General Atlantic Resources, Inc., is the sole operator in the field. The surface ownership is listed as "BLM" by the Uintah County Clerk and Recorder's Office.

ATTACHMENT R649-5-2 (2.5)



INJECTION WELL CASING DATA

Injection Well Casing Program

Casing Test Program

Production Zones:

5244' - 5244.5'	1 JSPF	"J" Zone
5340' - 5342'	1 JSPF	"K" Zone
5374' - 5378'	1 JSPF	"K" Zone
5382.5'	1 JSPF	"K" Zone

11 Total Perforations in the "J" & "K" Sands.

Packer Depth and Sizes:

Injection packer set at 4770' below the H4 and H5 sands. The well will be placed on production from the lower "J" and "K" sands, and injection will be down the backside into the H4 and H5 sands.

Cement Squeezes: (top-base)

Surface to 1500' of the 8-5/8" x 5-1/2" annulus to insure cement to the surface. A CBL will be run to insure proper bonding of the casing.

USDW Sources:

There are no viable USDW sources in the area of review.

Confining Zones:

(Top) Green River "H"1 Zone	4608' - 4634'	= 26'
(Base) Green River "H" Base	4798' - 4812'	= 14'

Injection Zones:

Green River "H"4 Zone	4719' - 4730'
Green River "H"5 Zone	4745' - 4762'

Tubing Detail:

Jts.	Description	Length	KB to Top
145	2-7/8", 6.5#/ft J-55 Coated	4576.51'	13'
	5-1/2" Tubing Anchor	2.80'	4563.51'
22	2-7/8", 6.5#/ft J-55 Coated	692.63'	4566.31'
	Seating Nipple	1.00'	5258.94'
1	2-7/8", 6.5#/ft J-55 Coated	31.60'	5259.94'
169 Jts.		5304.54'	5291.54'

COMPLETION DATA

Acidized "K" perms with 500 gallons of 7-1/2% HCL with 11 balls. Good ball action. ISIP = 1000 psi, 10 minutes = vacuum. Acidized "J" perms with 300 gallons 7-1/2% HCL. ISIP = 1700 psi, 15 minutes = 600 psi.

Frac'd "J" & "K" zones down 5-1/2" casing as follows:

10,000 gallons of Super "E" for pad.
22,000 gallons of Super "E" frac fluid.
55,000 lbs. of 20/40 sand.
24,000 lbs. of 10/20 sand.
Average rate = 33 bpm @ 3000 psi.

ISIP = 1750 psi, 15 minutes = 1380 psi.

Isolated the "J" & "K" sands with RBP. Perforated the "H" interval. Acidized the "H" with 750 gallons of 7-1/2% HCL with 18 balls. Good ball action. ISIP = 1000 psi, 10 minutes = vacuum.

Frac'd down 5-1/2" casing as follows:

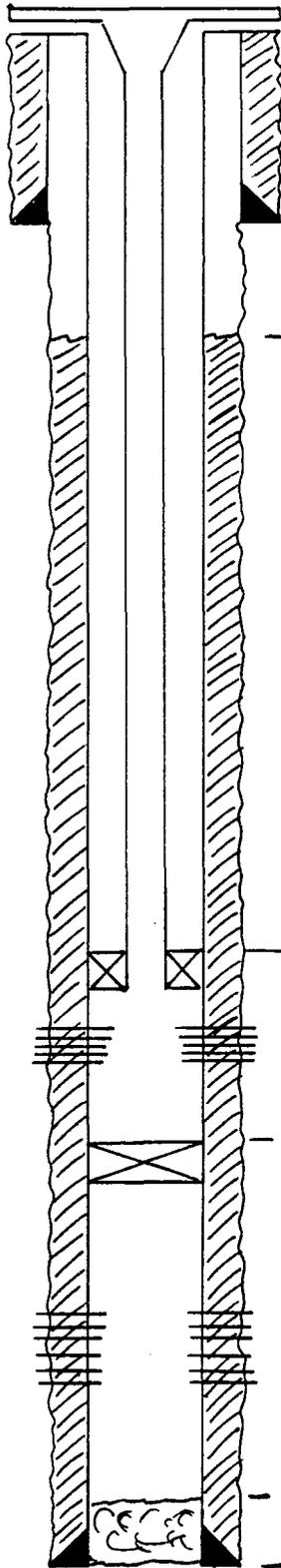
10,000 gallons of Super "E" for pad.
25,000 gallons of Super "E" frac fluid.
55,000 lbs. of 20/40 sand.
24,000 lbs. of 10/20 sand.
Average rate of 36 bpm, 2800 psi.

ISIP = 1200 psi, 15 minute = 770 psi.

Displacement fluid was 2% KCL water on all jobs.

Placed well on rod pump. IPP was 94 bopd and 197 bwpd.

Pearl Broadhurst # 14
SENE Sec. 9, T7S-R23E
Uintah County, Utah



- 8-5/8" , 24#/FT K-55 set @ 497'.
 Cemented to surface.

- TOC = 1520'

Proposed Injection Configuration

2-7/8" , 6.5#/FT J-55 EUE Tbg. Surf. to 4680'
 Injection packer at 4680'

Inhibited 2% KCl water on backside

- Injection Packer at 4680'

- H sand Perforations: 4719' to 4756'
 (Gross Interval)

- CIRP to be set at 4850'.

J&K Sand Perforations: 5244' to 5382.5'
 (Gross Interval)

- PBSD = 5420'

- TD = 5480'. 5-1/2" , 14#/FT K-55
 Cemented w/ 1770 sx. TOC = 1520'

Scale: NTS

Confining Zones:

(Top) Green River "H" 1 Zone 4632' - 4664' = 32'
(Base) Green River "H" Base 4816' - 4852' = 36'

Injection Zones:

Green River "H" 4 Zone 4741' - 4772'

Tubing Detail:

Jts.	Description	Length	KB to Top
1	2-7/8" 6.5#/ft J-55 Coated.	31.73'	12'
1	2-7/8" 6.5#/ft J-55 Pup Jt.	10.02'	19.73'
137	2-7/8" 6.6#/ft J-55 Coated.	4485.29'	29.75'
	5-1/2" Tubing Anchor.	2.80'	4515.04'
25	2-7/8" 6.5#/ft J-55 Coated.	824.64'	4517.84'
	Seating Nipple.	1.00'	5342.48'
1	2-7/8" 6.5#/ft J-55 Coated.	33.03'	5343.48'
	Notched Collar w/Pin.	0.60'	5376.51'
169 Jts.		5389.11'	5377.11'

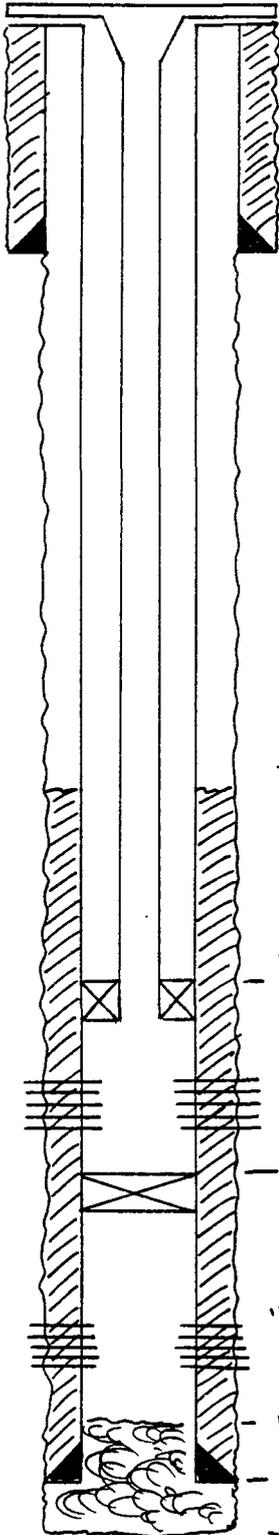
Completion Data

Perforated at 5345', 5366' and 5386' ("K" Sand). Acidized with 500 gallons of mud acid. Frac'ed with 10000 lbs, of 20-40 and 8000 lbs, of resin hull mixture. Average rate of 52 bpm at 1900 psi. ISIP = 1400 psi, 45 min = 600 psi.

Set RBP at 5200'. Perforated at 4751' and 4743'. Acidized with 500 gallons of mud acid (15% HCL). Frac'ed with 10000 lbs, of 10-20 sand and 6000 lbs, of resin and 2000 lbs, of cottonseed hulls.

Placed well on rod pump. IPP was 216 bopd, 108 mcf/d and 105 bwpd.

Pearl Broadhurst #4
SWSE Sec.9, T7S-R23E
Uintah County, Utah



- 10-3/4", 32.75#/FT H-40 set at 475'
 Cemented to surface with 490sx.

Proposed Injection Configuration

2- 7/8", 6.5#/FT J-55 EUE Tbg. Surf to 4700'
 Injection Packer at 4700'

Inhibited 2% KCL water on
 backside.

TOC at 4388'

- Injection Packer at 4700'

"H" sand perforations: 4741' - 4772'
 (Gross Interval)

- CIBP at 4850'

"K" sand Perforations: 5270' - 5388'
 (Gross Interval)

- PBTD = 5486'

- 7", 20 & 23#/FT J-55 set at 5521'
 Cemented with 2855x. TOC = 4388'

- TD = 5900'

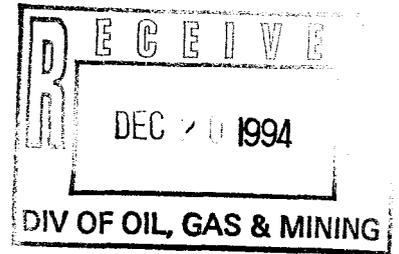
Scale: NTS

CASING TEST PROGRAM

Monitoring at each injection and off-set well shall include:

- 1) Backside pressure monitoring at the packer to determine if the casing or tubing is leaking.
- 2) Off-set production wells will be monitored for increased water production.
- 3) Pressure indicator meeters will be permanently installed at all injection wells, with remote sensors installed above injection zones to indicate packer or casing leaks.
- 4) Testing Parameters:
 - a. Backside pressure tests will be performed on an annual basis.
 - b. Remote sensor testing will be done on a daily basis.
 - c. Fluctuations in pressure at all off-set wells will be monitored on a daily basis
 - d. Fluctuation such as large drops or increases in pressure will be documented and monitored on a daily basis at the well head, manifold and subsurface sensors in the injection wells.

ATTACHMENT R649-5-2 (2.6)



INJECTION FLUID DATA

ATTACHMENT R649-5-2 (2.7)

FLUID ANALYSIS

ATTACHMENT R649-5-2 (2.8)

INJECTION PRESSURE DATA

FLUID DATA

(Using Pearl Broadhurst #14 as an example)

Surface to 2787' Uinta Formation

Lithology:

Interbedded red and gray siltstone and shale, gray brown and red medium grained sandstone, gritty to coarse conglomerate and gray to pink limestone containing algal balls. (Source; USGS Investigations Series Map I-931, 1976.)

TDS: (Zones in actual elevation above sea level)

Upper zone - Max 9360' / 9760 mg/l
 Min 5110' / 146 mg/l
 Avg 6093' / 2157 mg/l PH=8.28

Middle and lower zone

 Max 4895' / 73015 mg/l
 Min 26' / 441 mg/l
 Avg 3503' / 9918 mg/l PH=7.97

2788' to DTD 5480' Green River Formation

Lithology:

Shale, light gray to green, in part silty or limy interbedded with gray thin bedded silty or sandy limestone, containing algal balls. Light to dark gray to buff colored sandstone, gritty with occasional beds of conglomerate. (USGS Map I-931)

TDS:

Zone 1 MAX 9770' / 24379 mg/l
 Min 4580' / 180 mg/l
 Avg 6711' / 1641 mg/l PH = 8.25

Zone 2 Max 4475' / 204150 mg/l
 Min 1800' / 417 mg/l
 Avg 2866' / 19742 mg/l PH = 8.48

Zone 3 Max 1800' / 170853 mg/l
 Min -1497' / 873 mg/l
 Avg 265' / 21464 mg/l PH = 8.60

Zone 4 Max -1511' / 179035 mg/l
 Min 3947' / 399 mg/l
 Avg -2751' / 24722 mg/l PH = 8.13

Zone 5 Max -4271' / 56772 mg/l
 Min -8908' / 298 mg/l
 Avg -5019' / 20152 mg/l PH = 7.93

(Source: Gwynn 1992, p-309-310.)

INJECTION FLUID DATA

Operating Data

Average Injection Volume = 600 BWPD
Maximum Injection Volume = 1000 BWPD

Average Injection Pressure = 1000 psi
Maximum Injection Pressure = 1200 psi

Annulus Fluid = 2% Potassium Chloride Water with 2 gallons/1000
oxygen scavenger

Sources of Injection Water

Green River Formation
H4 Zone and the H5 zone sources are all producing wells in unit.

Type of Injection Fluid - produced water from oil & gas production
Operator - General Atlantic Resources Inc.

Fluid Analysis Summary:

Pearl Broadhurst #2:

Test Date = 2/11/94
TDS = 4500 mg/l
Specific Gravity = 1.0
Conductivity = 6700 umhos/cm @ 25 degrees C
PH = 8.6

Pearl Broadhurst #5:

Test Date = 2/11/94
TDS = 4400 mg/l
Specific Gravity = 1.0
Conductivity = 6600 umhos/cm @ 25 degrees C
PH = 8.7



AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: General Atlantic Resources
Date Received: March 4, 1994
Lab Sample ID Number: 17737-01
Field Sample ID: Walker Hollow Field/Pearl Broadhurst #14

Contact: Scott Webb
Received By: Jennifer Habel

Analytical Results

	<u>Method Used:</u>	<u>Detection Limit:</u> mg/L	<u>Amount Detected:</u> mg/L
TOTAL METALS			
Calcium	6010	0.05	5.5
Magnesium	6010	0.05	1.3
Potassium	6010	0.1	20.
Sodium	6010	0.1	1,500.

OTHER CHEMISTRIES

Bicarbonate (as CaCO ₃)	310.1	10.	2,200.
Carbonate (as CaCO ₃)	310.1	10.	<10.
Chloride	4500 CLB	0.5	170.
Conductivity	120.1	10.	3,400. µmhos/cm @ 25° C
Specific Gravity	NA	0.1	1.0
Nitrate (as N)	353.2	0.1	<0.1
pH	150.1	0.1	8.2
Sulfate	375.4	5.0	<5.0
TDS	160.1	1.0	3,700.

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Laboratory Supervisor

Report Date 3/10/94

1 of 1



AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: General Atlantic Resources
Date Received: February 11, 1994
Lab Sample ID Number: 17554-01
Field Sample ID: Walker Hollow Field/Pearl Broadhurst/#2

Contact: Jeff Oaks
Received By: Jennifer Habel

Analytical Results

	<u>Method Used:</u>	<u>Detection Limit: mg/L</u>	<u>Amount Detected: mg/L</u>
TOTAL METALS			
Calcium	6010	0.05	1.9
Magnesium	6010	0.05	1.1
Potassium	6010	0.1	6.2
Sodium	6010	0.1	2100.

OTHER CHEMISTRIES

Bicarbonate (as CaCO ₃)	310.1	10.	2500.
Carbonate (as CaCO ₃)	310.1	10.	110.
Chloride	4500 CLB	0.5	570.
Conductivity	120.1	10.	6700. μ mhos/cm @ 25° C
Nitrate (as N)	353.2	0.01	0.02
Sulfate	375.4	5.0	<5.0
TDS	160.1	1.0	4500.
Specific Gravity	NA	0.1	1.0

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

Released by:


Laboratory Supervisor

Report Date 2/17/94

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AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: General Atlantic Resources
Date Received: February 11, 1994
Lab Sample ID. Number: 17678-01
Field Sample ID.: Walker Hollow Field/Pearl Broadhurst/#2

Contact: Scott Webb
Received By: Jennifer Habel

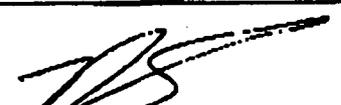
Analytical Results

	<u>Method Used:</u>	<u>Detection Limit:</u>	<u>Amount Detected:</u>
pH	150.1	0.1	8.6

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AMERICAN
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INORGANIC ANALYSIS REPORT

Client: General Atlantic Resources
Date Received: February 11, 1994
Lab Sample ID Number: 17554-02
Field Sample ID: Walker Hollow Field/Pearl Broadhurst/#5

Contact: Jeff Caks
Received By: Jennifer Habel

Analytical Results

	<u>Method Used:</u>	<u>Detection Limit:</u> mg/L	<u>Amount Detected:</u> mg/L
TOTAL METALS			
Calcium	6010	0.05	1.9
Magnesium	6010	0.05	1.1
Potassium	6010	0.1	6.6
Sodium	6010	0.1	2100.

OTHER CHEMISTRIES

Bicarbonate (as CaCO ₃)	310.1	10.	2600.
Carbonate (as CaCO ₃)	310.1	10.	110.
Chloride	4500 CLB	0.5	610.
Conductivity	120.1	10.	6000. μ mhos/cm @ 25° C
Nitrate (as N)	353.2	0.01	0.01
Sulfate	375.4	5.0	<5.0
TDS	160.1	1.0	4400.
Specific Gravity	NA	0.1	1.0

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Report Date 2/17/94

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FEB-25-94 FRI 06:12 COOPER



INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: General Atlantic Resources
Date Received: February 11, 1994
Lab Sample ID. Number: 17678-02
Field Sample ID.: Walker Hollow Field/Pearl Broadhurst/#5

Contact: Scott Webb
Received By: Jennifer Habel

Analytical Results

	<u>Method Used:</u>	<u>Detection Limit:</u>	<u>Amount Detected:</u>
463 West 3600 South Salt Lake City, Utah 84115	pH	150.1	0.1
			8.7

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Laboratory Supervisor

Report Date 3/2/94

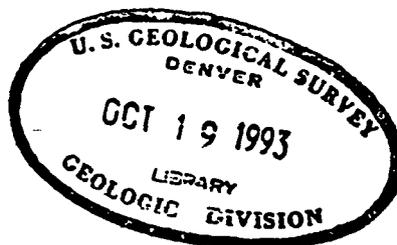
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30-100
11/1/70

Hydrocarbon and Mineral Resources of the Uinta Basin, Utah and Colorado

Utah Geological Association Guidebook 20



Thomas D. Fouch, Vito F. Nuccio, and Thomas C. Chidsey, Jr.
Editors

*Utah Geological Association
P.O. Box 11334
Salt Lake City, Utah 84147*

1992 Field Symposium

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THE OIL WELL SALINE-WATER RESOURCES OF THE UINTA BASIN, UTAH: THEIR CHARACTER AND DISTRIBUTION

J. Wallace Gwynn¹

ABSTRACT

The Uinta structural and topographic basin, located in northeastern Utah, contains many of the state's major oil and gas fields. During the production of liquid and gaseous hydrocarbons from these fields, water of varying salinities is normally co-produced.

The cumulative production of saline water from these fields, through December 1990, is approximately 1.346 billion barrels. It is produced mainly from reservoirs in the Green River and Wasatch Formations in the oil fields of Duchesne and Uintah Counties. The water/oil ratio within these two counties is increasing over time. This is due to normal encroachment of formation water into the oil and gas reservoirs and increased use of water-flood production techniques.

Four methods are used to dispose of most of the co-produced saline water. These include regulated surface discharge; reinjection back into the ground during water flood or enhanced oil-recovery projects; reinjection into salt-water disposal wells; and disposal into large, open, salt-water evaporation pits.

Uinta Basin oil well saline waters vary in total dissolved solids (salinity) and chemistry both vertically and laterally within individual formations, and throughout the basin. The six major ions (or ion-pairs) present in the saline water include sodium (plus potassium), magnesium, calcium, chloride, sulfate and bicarbonate (plus carbonate). Each of the six ions appears to vary independently throughout the basin. Areas where the saline water contains low sulfate, magnesium and calcium, and high sodium and chloride, are coincident with the basin's major oil fields. Depending on economic factors, potentially-valuable mineral salts or saturated brines could be produced from these saline waters through the processes of solar evaporation and salt precipitation.

INTRODUCTION

Utah's production of oil and gas comes mainly from fields in the eastern half of the state, within the Colorado Plateau and Rocky Mountains physiographic provinces. Figure 1 shows the three major physiographic provinces in Utah, the thirteen counties in which crude oil and gas are found and/or produced, and the Uinta structural basin study area.

Water, which is commonly saline in nature, is frequently encountered during exploration drilling for liquid and gaseous hydrocarbons. During commercial hydrocarbon production, saline water is normally co-produced, and in many cases, its volume exceeds that of the oil. Now, saline water is co-produced in more than 75 percent of the active oil and gas fields within the state (Utah Division of Oil, Gas and Mining, December issues 1984-1990).

The salinity and chemical composition of co-produced saline water are variable. Salinity is a measure

of the quantity of dissolved salt(s) per unit volume (mg/l). Chemical composition is a comparison of the relative abundances of the various dissolved ions. Sodium (Na^+), potassium (K^+), magnesium (Mg^{+2}), calcium (Ca^{+2}), chloride (Cl^-), sulfate (SO_4^{-2}), bicarbonate (HCO_3^-) and carbonate (CO_3^{-2}) are the most common ions.

Variations in the chemical composition or ion ratios of saline water are due to several factors. These factors include the chemical composition of the connate waters trapped within the sediments at the time of deposition, and the composition of descending meteoric waters recharged at the surface. Variations are further dependent upon the many subsurface chemical and bacteriological interactions that take place between water and its confining rock and sediments. They also vary during the mixing of dissimilar saline waters.

After saline water is co-produced with, and then separated from the hydrocarbons, it must be disposed of in a proper and acceptable manner. This saline water may, however, represent a valuable resource rather than a disposal problem.

¹Utah Geological Survey, 2363 South Foothill Drive, Salt Lake City, Utah 84019-1491

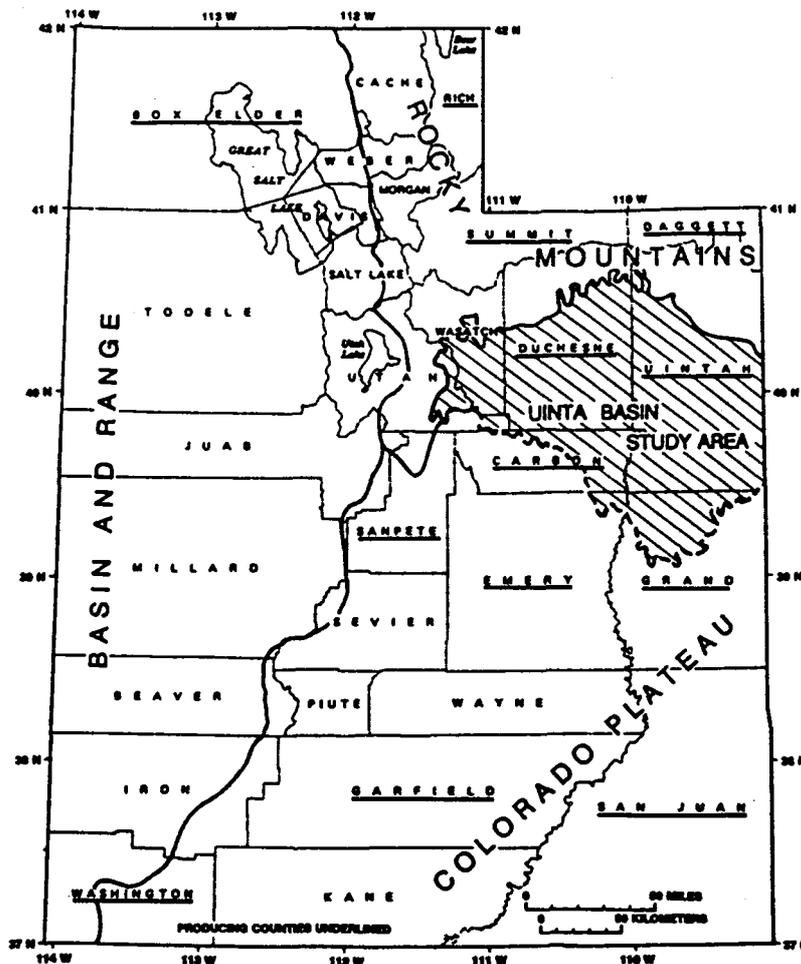


Figure 1. Utah's major physiographic provinces, the thirteen counties in which oil and/or gas are found, and the Uinta structural basin study area.

This report: (1) describes the geologic setting and stratigraphy of the Uinta Basin, (2) describes the compilation of a ground-water/oil well saline-water chemical data base, (3) discusses the quantity and disposition of co-produced saline waters, (4) characterizes the salinity, chemistry and the vertical and lateral variations of these waters, and (5) addresses the potential economic uses of the saline waters.

GENERAL GEOLOGY OF THE UINTA BASIN

Geologic setting and history

The Uinta Basin is a broad, elongate, east-west trending, asymmetrical structure, located in northeastern Utah and northwestern Colorado. It lies within the northern part of the Colorado Plateau physiographic province. The portion of the basin within Utah, which is underlain by Tertiary rocks, covers an area of about 8,700 square miles (22,500 square km). Surface eleva-

tions range from about 5,000 ft (1,500 m) near Ouray to nearly 9,500 ft (2,900 m) along the southern rim.

The Uinta Basin is both a structural and a topographic basin. Its structural axis is displaced to the north of the topographic axis, and lies almost at the foot of the east-west trending Uinta Mountains which form its northern boundary. The rim of the Tavaputs Plateau forms the southern boundary of the basin; and the Wasatch Mountains the western boundary. The Douglas Creek arch, located in western Colorado, forms the eastern boundary.

The Uinta Basin began to develop in Latest Cretaceous time with the deposition of the North Horn Formation. The main tectonic factors in its development were the rise of the Uinta Mountains block and the simultaneous subsidence of the synclinal axis of the basin (Osmond, 1964). Nearly 10,000 ft (3,000 m) of lower Tertiary lacustrine, fluvial, and volcanic sedimentary rocks fill the basin. Details of the subsurface interfingering within the basin, and of the origin and

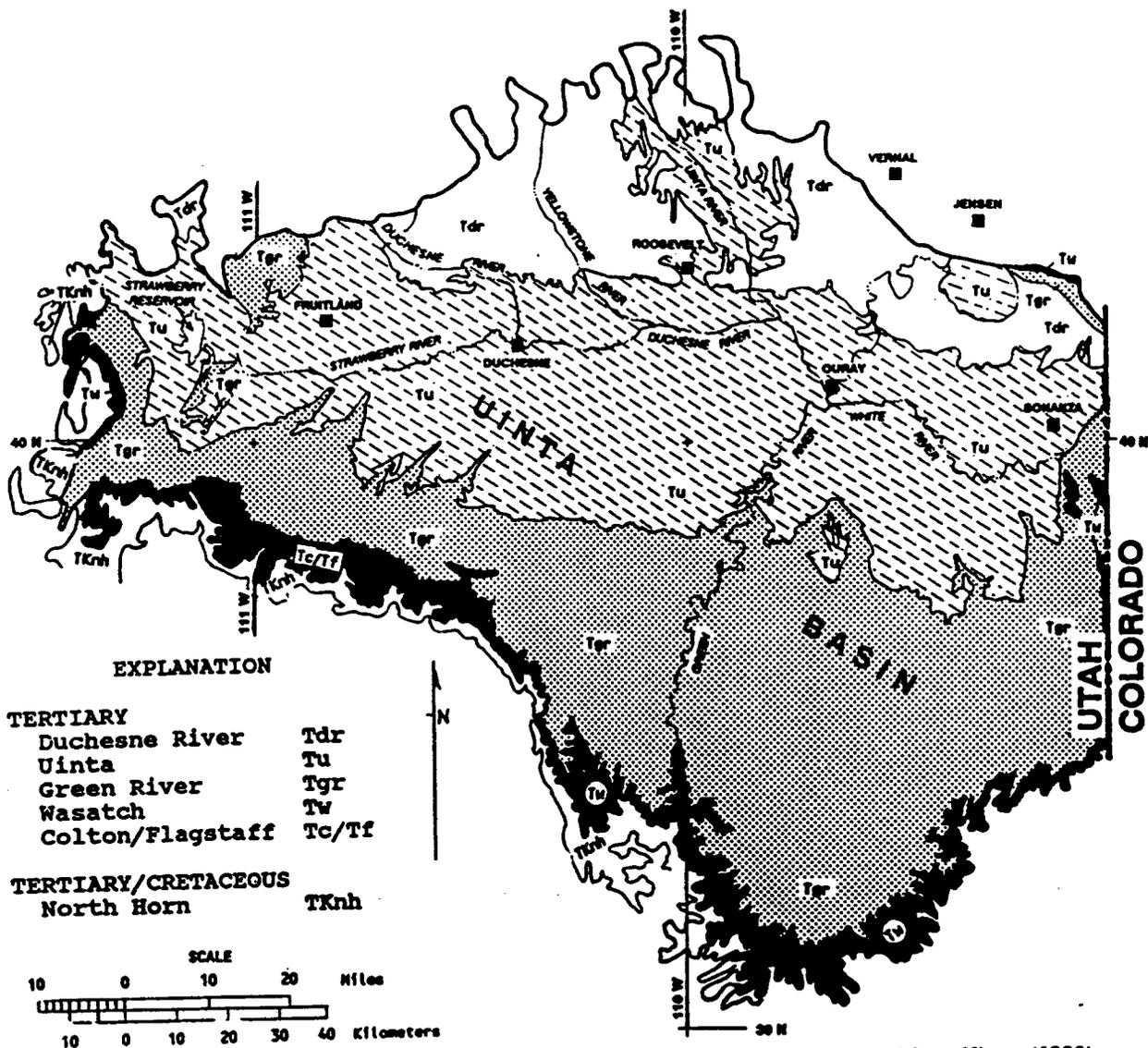


Figure 2. Generalized geologic map of the Uinta structural basin. Map modified from Hintze (1980).

evolution of Lake Uinta are described by Johnson (1985), and by Ryder and others (1976).

Stratigraphy

The stratigraphic sequence of rocks within the Uinta Basin, from oldest to youngest, includes the Cretaceous and Tertiary North Horn Formation, and the Paleocene and Eocene Wasatch, Colton and Green River Formations. It also contains the Eocene Uinta Formation and the Eocene and Oligocene Duchesne River Formation. All these formations are widely exposed in the study area (Fig. 2). However, the Paleocene and Eocene Flagstaff Member of the Green River Formation is mainly exposed in Price Canyon, and in the Emma and Whitmore Park areas.

Fouch (1975) classified the facies or environments-of-deposition of the five main Tertiary forma-

tions in the basin, and characterized their rock types as follows. The Wasatch (Colton), Uinta and Duchesne River Formations all are alluvial facies. They typically contain sandstone, conglomerate, and red to gray claystone of alluvial fan, high mudflat, lower deltaic plain and paludal marsh origin. The Flagstaff Member of the Green River Formation and other portions of the Green River Formation are marginal lacustrine facies. The rocks in this facies are represented by sandstone, gray-green claystone and carbonates of deltaic, interdeltic and lake-margin carbonate. The remaining portion of the Green River Formation is an open lacustrine facies. Rock belonging to this facies are represented by gray and brown claystone and mud-supported carbonate of nearshore and offshore open lacustrine origin. Fouch (1975) notes that the marginal lacustrine facies contains the primary reservoir rocks in the major oil and gas fields of the Uinta Basin.

Formation name changes and reassignments of lithologic units were made in the lower part of the Tertiary System in the southern portion of the basin (Fouch, 1976). The names Wasatch Formation (not Colton Formation) and Flagstaff Limestone will be used in this report to maintain continuity with the formation names used on most drilling- and brine-analysis records.

SALINE-WATER DATA BASE DEVELOPMENT

Sources of chemical analyses

The major sources of chemical data for oil well production and other waters include the following: Utah Geological Survey (UGS) and U.S. Geological Survey (USGS) data files; Celsius Energy Company files; and Utah Division of Oil, Gas and Mining files. Other sources included: The University of Oklahoma (Geological Information Systems), Woodward-Clyde Consultants (1982), Hanshaw and Gilman (1969), and other contributions from private sources.

Most of the chemical data collected and used in this report represent saline water from producing oil and gas wells and from wildcat wells. Others are from shallow water wells and springs. The chemical data are part of a state-wide, UGS database containing the chemical composition of oil-well saline and other waters. Because of the varied sources of the water analyses, and uncertainty about the sample collection and analytical methods used, the degree of accuracy is unknown, and not assumed to be uniform. The data are interpreted with these uncertainties in mind.

Charge-balance screening

Chemical analyses were collected, compiled and entered into the UGS computer system. The software used was Reflex, version 2.0 by Borland, Inc. The data were then subjected to a charge-balance screening procedure before being used in interpretive studies. This screening procedure involved the following steps:

- (1) Analyses complete in Na^+ , Mg^{+2} , Ca^{+2} , Cl^- , SO_4^{-2} and HCO_3^- ; were selected for inclusion in the data base. Analyses also containing K^+ and CO_3^{-2} were used as well.
- (2) The milliequivalents (MEQ) of each major ion (Na^+ , Mg^{+2} , K^+ , Ca^{+2} , Cl^- , SO_4^{-2} , HCO_3^- and CO_3^{-2}) were calculated by dividing the milligrams-per-liter of each ion by its appropriate equivalent-weight value. These values are 22.989, 12.156, 39.102,

20.040, 35.453, 48.029, 61.017 and 30.004 respectively.

- (3) The sum of the anion-milliequivalents (Cl^- , SO_4^{-2} , HCO_3^- and CO_3^{-2}) were then subtracted from the sum of the cation-milliequivalents (Na^+ , K^+ , Mg^{+2} and Ca^{+2}). The difference between the two values is the charge-imbalance.
- (4) Analyses having a charge-imbalance greater than 11 MEQ, either positive or negative, were discarded.

The total dissolved solids (TDS) values are the sum of the concentrations of the eight ions, reported in milligrams-per-liter.

GEOGRAPHICAL AND GEOLOGIC DISTRIBUTION OF OIL WELL AND OTHER WATERS

Geographic distribution

The 1,533 chemical analyses within the data base are from six of the seven counties in the Uinta Basin. The distribution of these analyses by county, is as follows: Carbon 24, Duchesne 712, Emery 3, Grand 34, Uintah 743, and Wasatch 17.

These analyses represent co-produced water from 33 oil and gas fields within four counties. The number of fields in each county, or shared with another county, is as follows: Carbon 2, Duchesne 12, Grand 1, and Uintah 20. In addition, many analyses represent wildcat wells, or shallow water-wells and springs.

Geologic Distribution

The 1,533 chemical analyses represent waters from six Tertiary formations in the basin. These analyses are distributed among six formations as follows: Browns Park 5, Duchesne River 47, Uinta 85, Green River 952, Wasatch 426, and the Flagstaff Limestone 18. Insufficient information is available to separate analyses from the Green River Formation into its individual members, or to subdivide analyses from the Uinta Formation.

QUANTITY AND RATE OF OIL WELL SALINE-WATER PRODUCTION

Quantity of co-produced saline water

The greatest quantities of co-produced saline water are from Uintah and Duchesne Counties. They account for more than 99.9 percent of the cumulative

Table 1. Cumulative production, through December 1990, of oil, gas and co-produced water from counties within the Uinta Basin. Data taken from Utah Division of Oil, Gas and Mining (December issues, 1984 through 1990).

COUNTY	OIL (Barrels)	GAS (Mcf)	WATER (Barrels)
CARBON*	142,949	5,205,656	4,234
DUCHESNE	210,168,843	319,604,517	273,989,457
EMERY	0	0	0
GRAND*	76,417	173,659,546	318,712
UINTAH	166,860,561	668,934,508	1,072,087,669
UTAH	0	0	0
WASATCH	0	0	0

Source: Utah Division of Oil, Gas and Mining
(December issues, 1984 through 1990).

* Includes only production from within the Uinta Basin boundary.

1.346 billion barrels that have been produced in the Uinta Basin through December 1990 (Utah Division of Oil, Gas and Mining, December issues 1984-1990). A summary, by county, of the cumulative production of oil, gas and co-produced saline water through December 1990, is shown in Table 1. The 1.346 billion-barrels of saline-water production includes that coming from within the outlined boundary of the Uinta Basin and the the Ashley Valley field, just north of the basin boundary fault near the town of Vernal, in Uintah County.

Rate of saline water production

The rate at which saline water is co-produced with oil and gas varies between wells, fields and counties. Part of the co-production rate is dependent upon the consumer-demand for hydrocarbon products. An increase in the demand for hydrocarbons results in an increase in the co-production of saline water. The co-production rate is also dependent upon the water/oil ratio of these fluids which changes with locality, over time due to different or changing hydrologic and geologic conditions within the hydrocarbon reservoirs.

The annual production rates, from 1984 through 1990, of oil and water in Duchesne and Uintah Counties, and the water/oil ratios for these areas, are shown in Figure 3. The graphs for Duchesne County suggest that overall production of oil is decreasing slightly and that the water/oil ratio is increasing. A similar but more subtle trend is seen in the production of oil from Uintah

County, but the water/oil ratio is increasing at a lower rate. G.L. Hunt (Utah Division of Oil, Gas and Mining, written commun., 1991) suggests that the apparent, excessive water/oil ratio seen in Uintah County is due to two factors: (1) the large volumes of relatively fresh water produced and discharged in the Ashley Valley field, and (2) much of the water production in Uintah County comes from gas wells.

The trend of an increasing water/oil ratio suggests greater costs for hydrocarbon producers in the future. These increased costs will include the production, handling, processing, and the appropriate disposal of greater volumes of saline water.

DISPOSAL OF CO-PRODUCED PRODUCTS

Disposal of co-produced saline waters

During 1989, some 72,774,305 barrels of saline water were co-produced in Duchesne and Uintah Counties. The disposition of this saline water is shown in Table 2, taken from Hill (1990). The four "largest-volume" disposal methods now employed in the Uinta Basin are surface discharge, water-flood injection, salt-water disposal wells, and disposal pits. Descriptions of these methods are as follows.

NPDES surface discharge. Co-produced water can be discharged to the surface only with special National Pollutant Discharge Elimination System (NPDES) or UPDES (Utah) permits and only if such

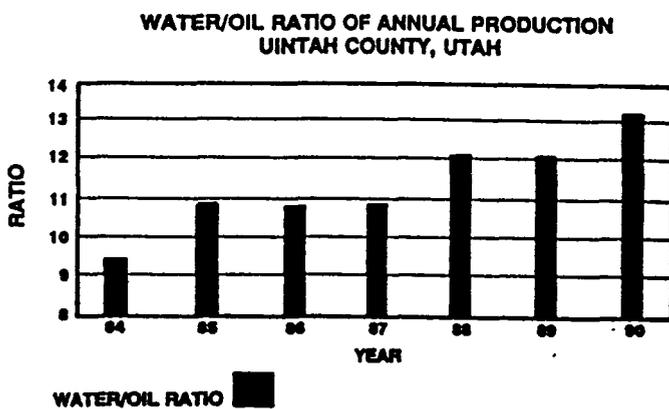
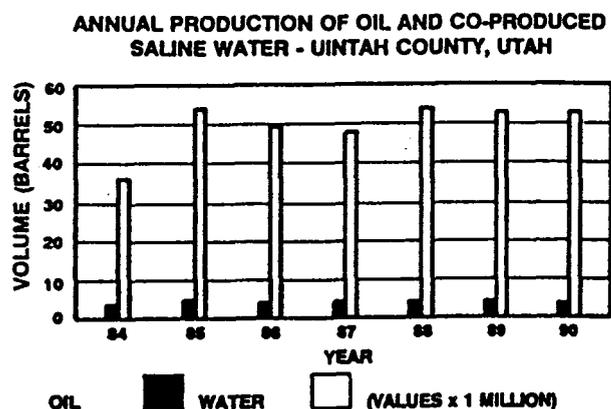
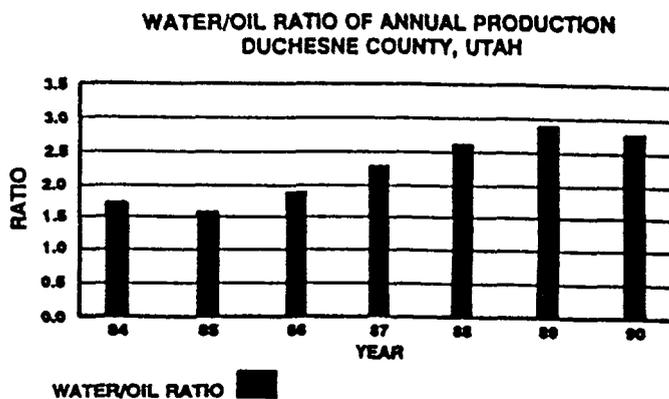
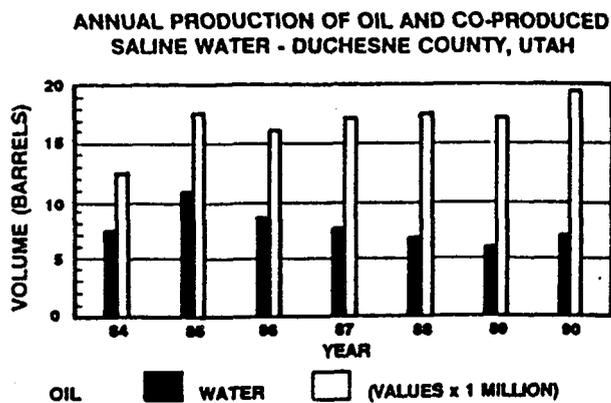


Figure 3. Annual production of oil and co-produced saline waters, and the water/oil ratios for 1984-1990, Duchesne and Uintah Counties, Utah. Data from Utah Division of Oil, Gas and Mining (December issues 1984 through 1990).

discharge meets certain federal requirements. The discharged water must be put to a beneficial use (agriculture, stock watering, etc.). It must contain less than 3,500 mg/l total dissolved solids or be diluted to or below this level by less saline water. Water chemistry, particularly sodium chloride content, is considered of major importance (S. McNeal, Utah Department of Health, oral commun., 1990). In Utah, the State Health Department (UDOH, 1988) regulates surface discharge through NPDES rules, and grants discharge permits on a case-by-case basis. Surface discharge (see Table 2) is now only being done in the Ashley Valley field (located just outside the boundary of the Uinta Basin), Uintah County (L. Morton, Utah Department of Health, oral commun., 1990).

Waterflood injection. Waterflood injection, one of the petroleum industry's main secondary oil-recovery techniques, involves reinjecting co-produced water back into the same or another oil-producing formation. The reintroduction of saline and fresh water helps to maintain reservoir pressure and move the remaining oil towards producing wells. During 1989, there were seven waterflood injection projects in the Uinta Basin (Fig. 4); one in Duchesne County, and six in Uintah County (Jarvis, 1989). These combined

projects injected an average volume of 86,856 barrels of saline water (plus makeup water) per day back into the Green River Formation.

Several precautions are taken during water flood operations to insure that the reinjected saline water is comparable to, or less saline than the natural water in the host formation. Injected and indigenous water must also be chemically compatible. Geologic conditions must be such that the injected saline water will remain confined within the host aquifer, and will not adversely affect the ground water in other aquifers. The mechanical and hydraulic integrity of the injection well must also be adequate. For example, saline water must not leak out of corroded well casings into freshwater aquifers. The Utah Division of Oil, Gas and Mining and the U.S. Environmental Protection Agency regulate waterflood operations.

Salt-water disposal wells. Saline water is disposed of by simply reinjecting it into an approved zone or aquifer through salt-water disposal (SWD) wells. This disposal process is the third most commonly used technique in the Uinta Basin. During 1989, 21 active salt-water disposal wells in Duchesne County, and three in Uintah County injected a total of 14.95 million barrels of saline water (Fig. 5). Thirteen saline-water

Table 2. Disposition of co-produced brine in Duchesne and Uintah Counties, Utah. Data taken from Hill (1990).

METHOD OF DISPOSAL	DUCHEсне COUNTY		UINTAH COUNTY	
	VOLUME (Barrels)	% TOTAL	VOLUME (Barrels)	% TOTAL
Disposal Wells	14,907,412	86.18	43,876	0.08
Waterflood Injection	0	0.00	25,689,420	48.29
Disposal Pits	1,713,135	6.768	512,115	0.96
On site pits	3,005	0.02	281	<0.01
Drilling/Workover	237,359	1.37	0	0.00
NPDES Surface Discharge	0	0.00	26,743,450	50.27
Storage Tanks	0	0.00	0	0.00
Not Reported	976,294	5.64	206,631	0.39

Source: Hill (1990)

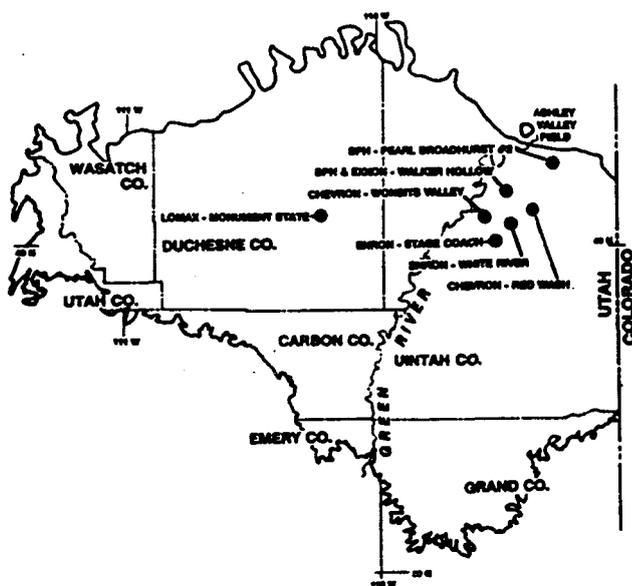


Figure 4. Locations of the seven water flood injection projects within the Uinta Basin. (G.L. Hunt, Utah Division of Oil, Gas and Mining, written commun., 1990).

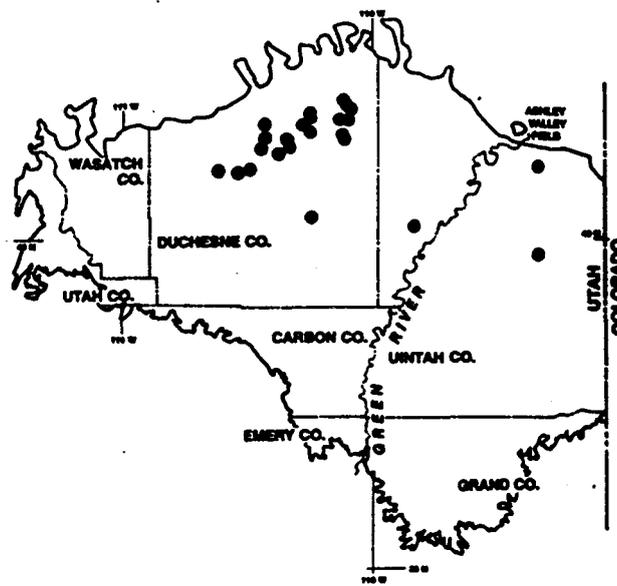


Figure 5. Locations of the twenty-four saline-water disposal wells, Duchesne and Uintah Counties, Utah. Data from Jarvis (1989).

wells injected 9.6 million barrels into the Duchesne River Formation; and two injected 1.6 million barrels into the Uinta Formation. An additional eight wells injected 3.7 million barrels into the Green River Formation, and one well injected .015 million barrels into the Mesaverde Group (Jarvis, 1989).

The same care and restrictions apply to the disposal of saline water into SWD wells as into waterflood/enhanced recovery wells. The Utah Division of Oil, Gas and Mining and the U.S. Environmental

Protection Agency also regulate the reinjection of saline water into SWD wells.

Salt water disposal pits. Some saline water is discharged into large pits and allowed to evaporate, rather than being reinjected back into the reservoir or aquifer. The Utah Division of Oil, Gas and Mining (Utah Board of Oil, Gas and Mining, 1987) regulates the construction and operation of such pits. Disposal pits must be pre-approved and then constructed in such a manner that the contained saline waters cannot con-

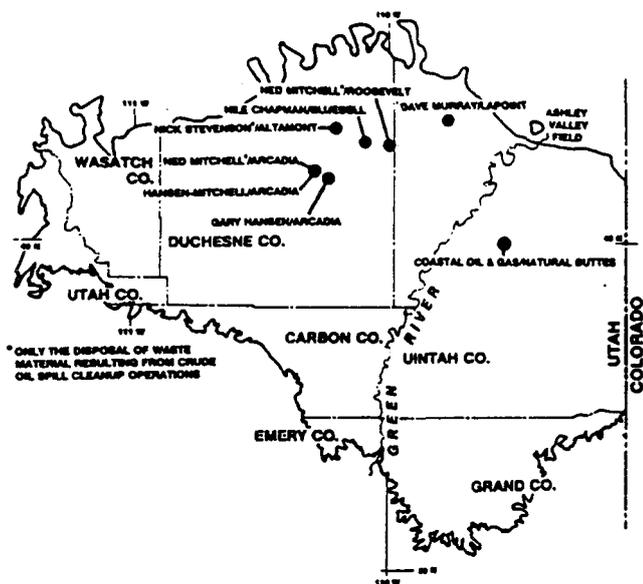


Figure 6. Locations of the eight saline-water disposal pits in Duchesne and Uintah Counties, Utah. (G.L. Hunt, Utah Division of Oil, Gas and mining, written commun., 1990).

taminate surface or subsurface waters. They must be constructed in geologically stable areas, and provisions must be made to remove and properly dispose of salts which may precipitate as the water evaporates. During 1989, a total of 16,852,250 barrels of saline water were pumped into eight disposal pits in the basin (Fig. 6); 11.7 million barrels in Duchesne County, and 5.1 million barrels in Uintah County (Hill, 1990).

Disposal of co-produced gases

Co-produced saline water sometimes contains toxic gases such as hydrogen sulfide. In most instances, the disposal of oil-well saline water by reinjection is done in such a manner that these gases are not released from the water to the atmosphere. If such gas-containing saline waters are discharged into open evaporation ponds for disposal, however, they will degas to the atmosphere over a short period of time. The Utah Division of Environmental Health, Bureau of Air Quality (1987) regulates the discharge of toxic gases to the atmosphere. It must also approve all mitigation measures.

CHARACTERIZATION OF UINTA BASIN SALINE WATER

Resistivity versus concentration of dissolved solids

Members of the petroleum industry and others measure the electrical resistivity of oil-well saline

waters on a routine basis with geophysical logs to calculate hydrocarbon saturations. Resistivity measurements are also a convenient measure of water salinity. A composite log-log plot of resistivity values versus salinity (TDS) for all Tertiary formations in the Uinta Basin is shown in Figure 7. It shows that as salinity increases, resistivity decreases. The linear-regression equation for a best-fit curve to the data (Wm. Case, Utah Geological Survey, oral commun., 1990) is given as follows:

$$\ln \text{TDS} = -0.967 (\ln \text{resistivity}) + 9.035,$$

where TDS = total dissolved solids in milligrams/liter and resistivity is in ohm-meters. Most data-base resistivity measurements were reported at either 68 or 77 degrees F. Corrections between the two temperatures were not made since values were relatively close and there was not significant difference in the resistivity-total dissolved solids plot.

Formation-specific depth-interval changes in salinity and ion concentrations

The salinity and chemical composition of the water from oil and gas wells change both vertically and laterally throughout the Uinta Basin and within a given formation. Graphs showing salinity and individual-ion concentrations plotted against depth were used to determine the elevations where the chemical composition of formation water changed notably. Based on the observed breaks, each formation was divided into several elevation intervals, with each interval representing a different type of formation water.

Appendix A gives the elevation-interval breakdowns assigned to each formation, and the number of chemical analyses represented by each plot. It further gives the maximum, minimum and average values for the calculated total dissolved solids, and the milliequivalent-percents of each ion in the cation and anion groupings and the average pH. The actual sample elevations, and water resistivities are also given. The milliequivalent-percents total to 100 percent in

The chemical composition of the saline water is illustrated on paired triangular plots (Fig. 8), for each formation-specific elevation interval. One plot shows the milliequivalent-cation percents (total to 100 percent), and the other the milliequivalent-anion percents (total to 100 percent). The index maps show the geographic locations of the interval-specific sampling sites represented by each set of triangular plots. Each point on the map represents the average of all analyses from within a given section of a township. Figures 8-a through 8-p show the triangular plots and sample-location maps for the sixteen formation-specific

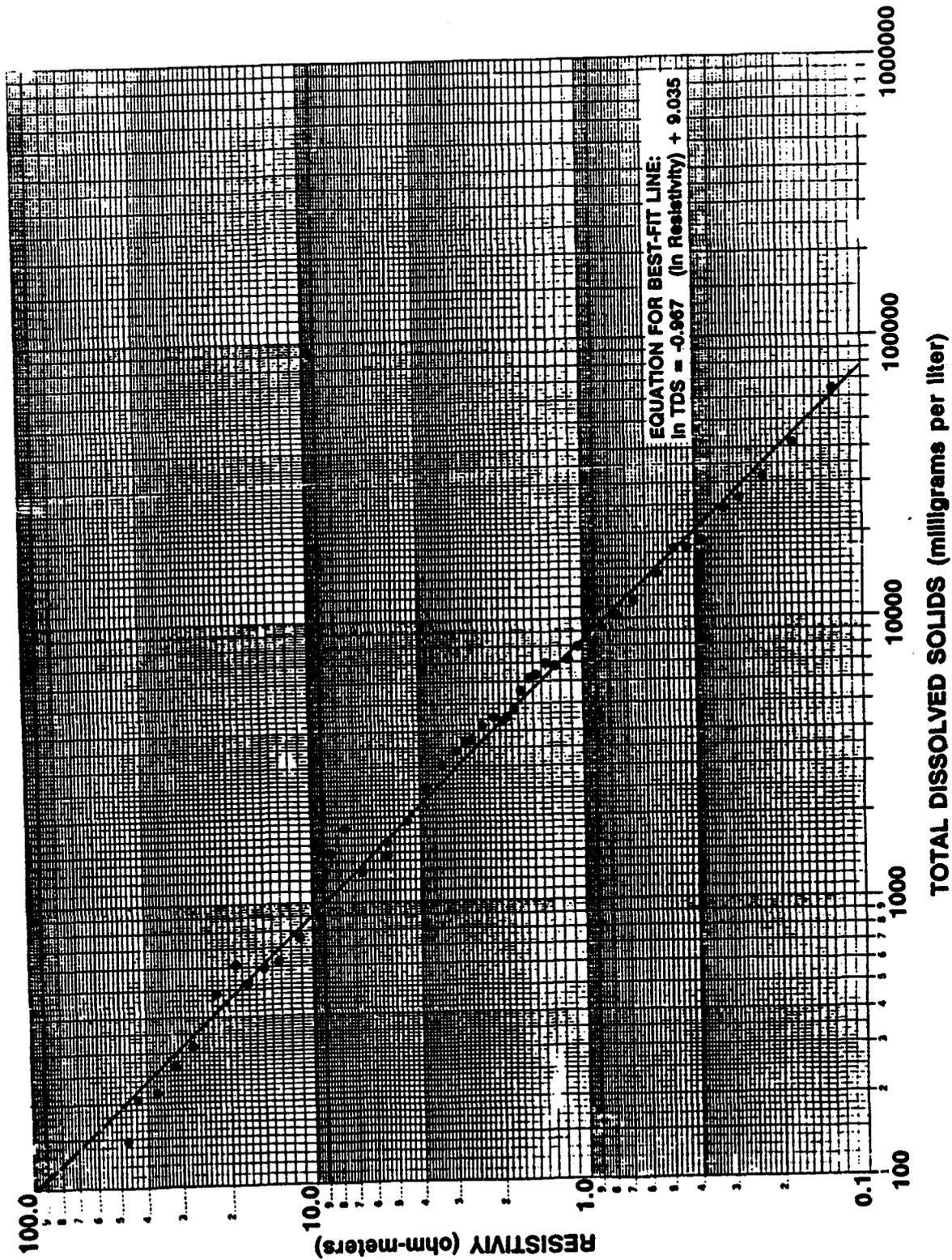
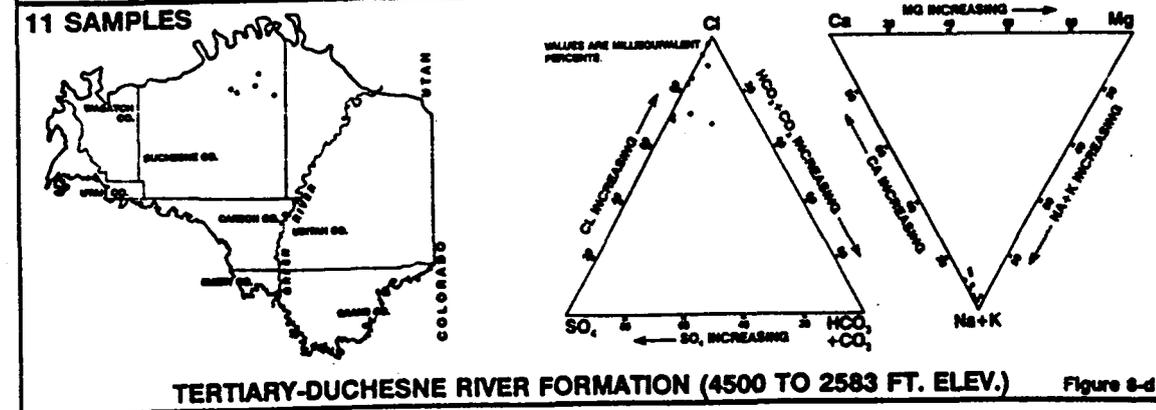
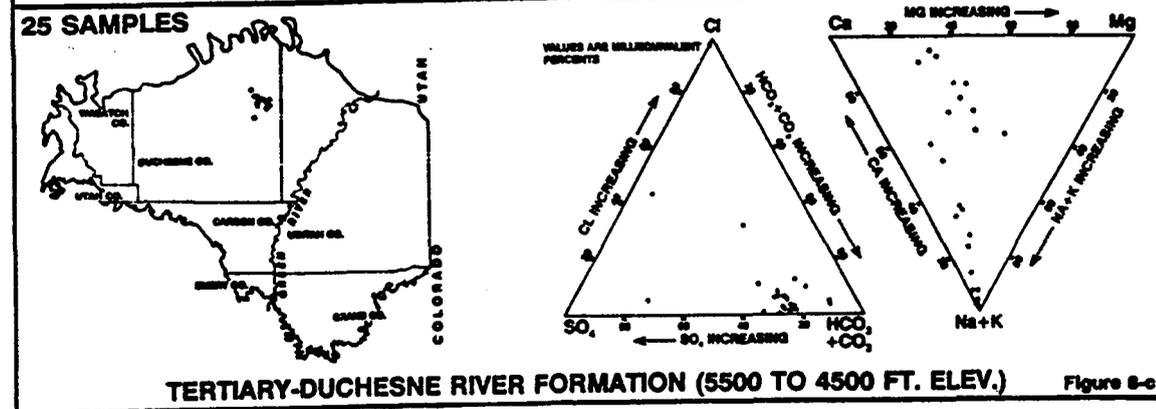
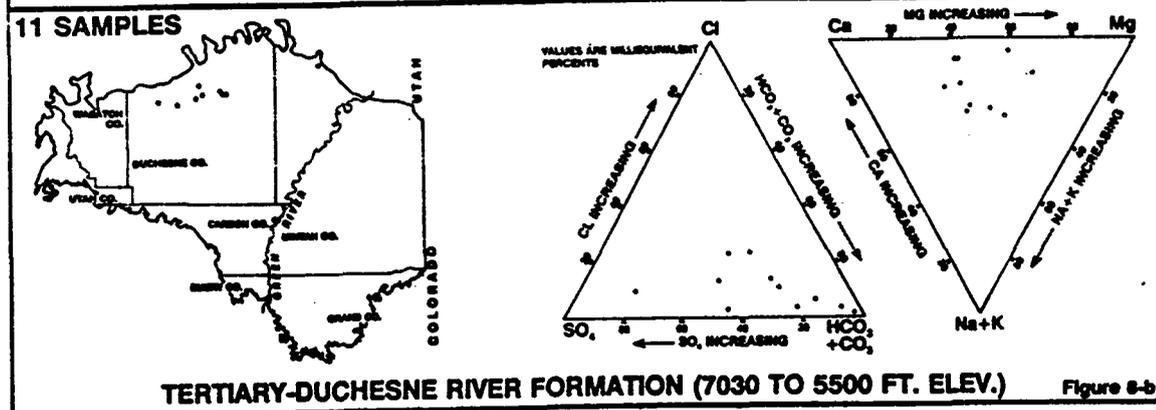
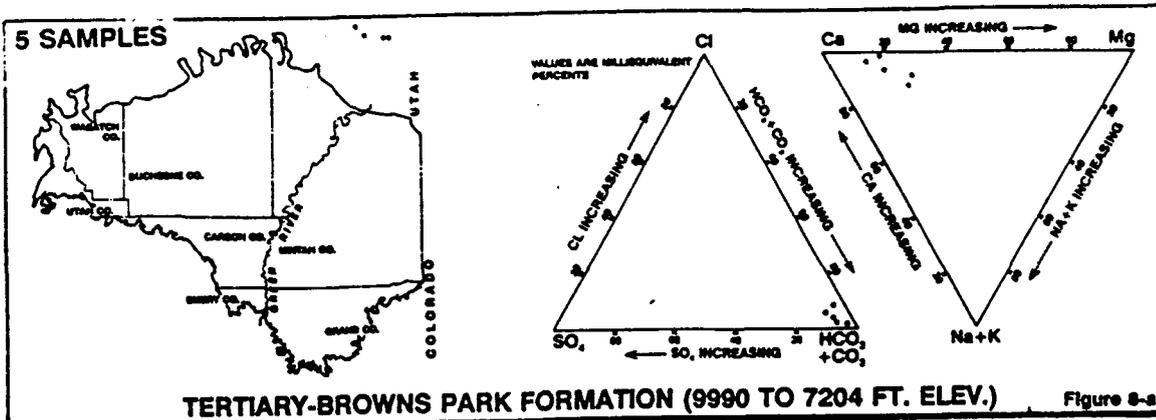
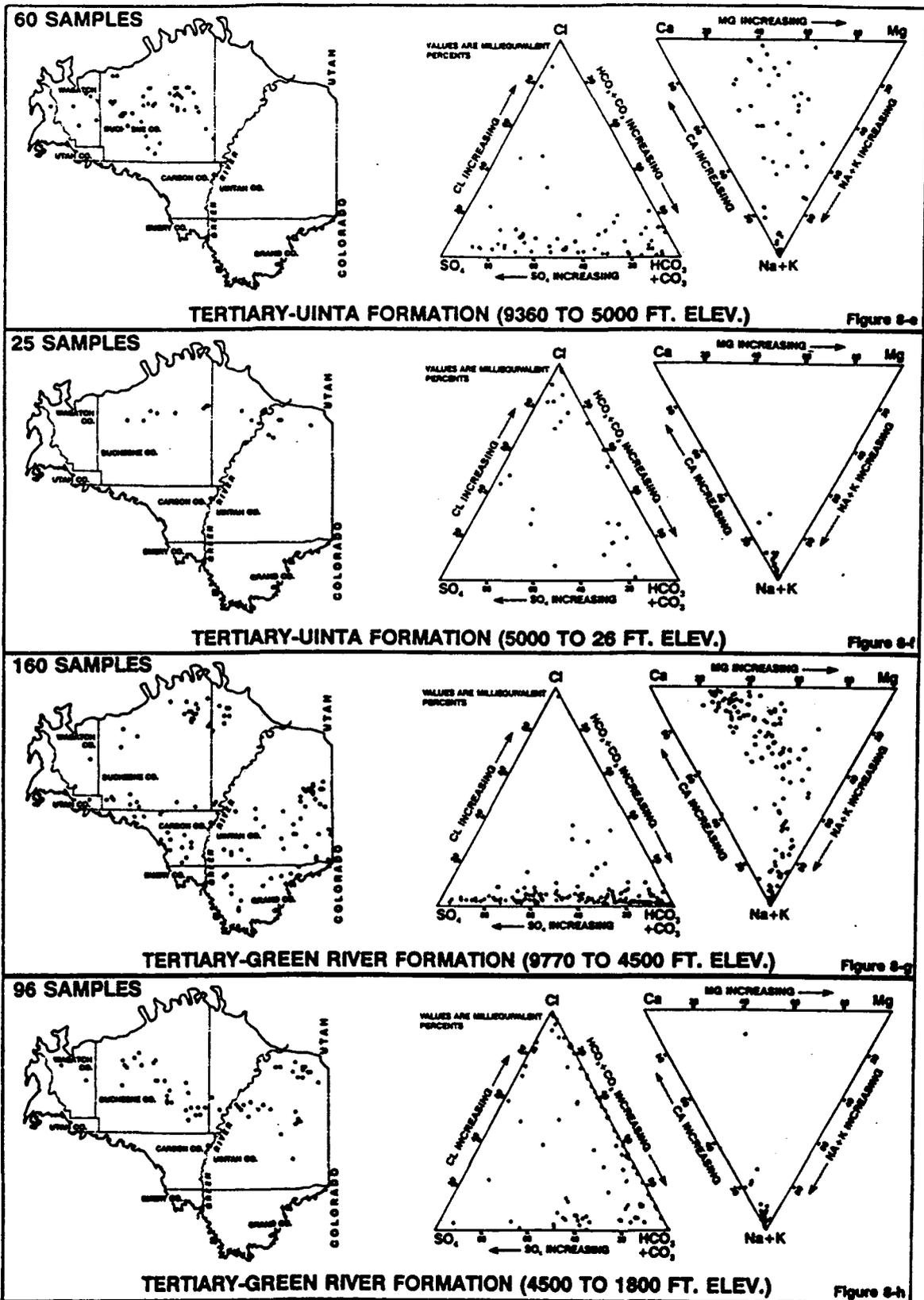


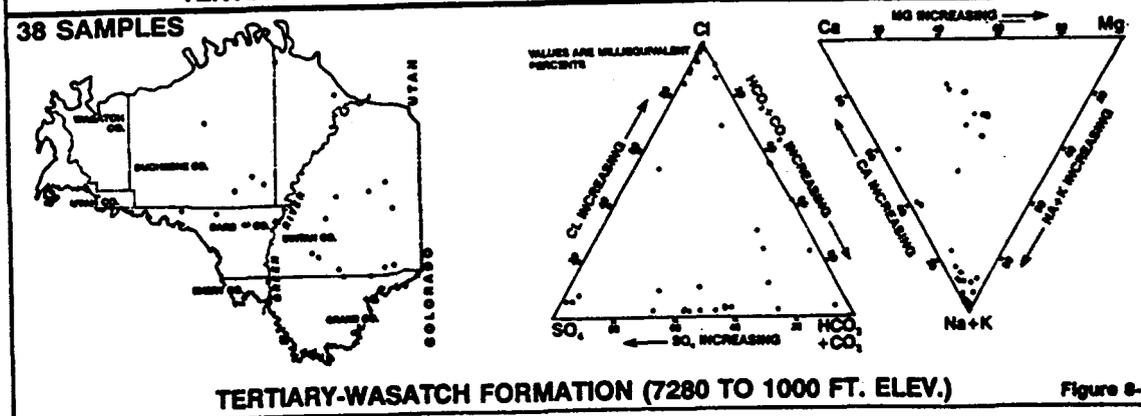
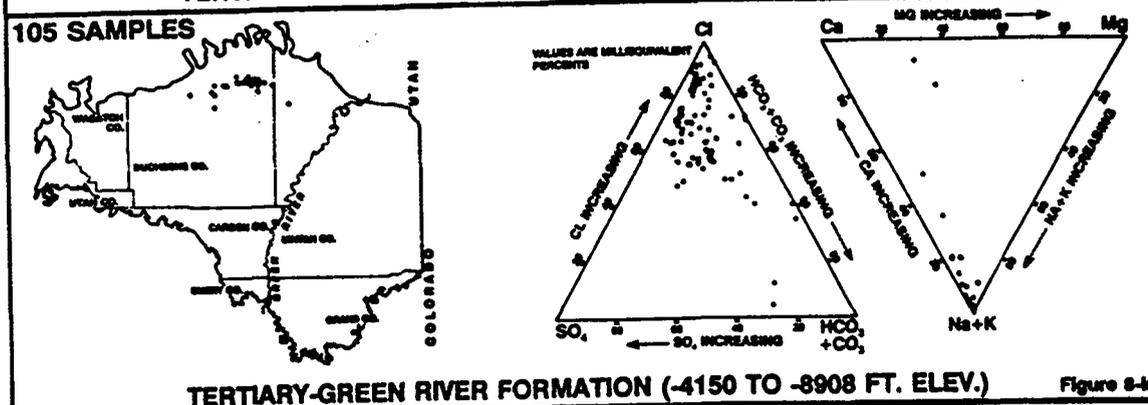
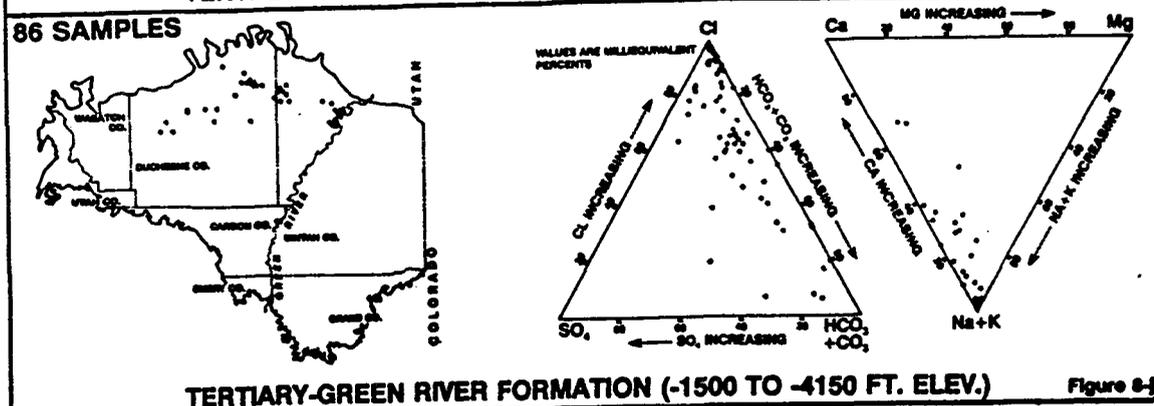
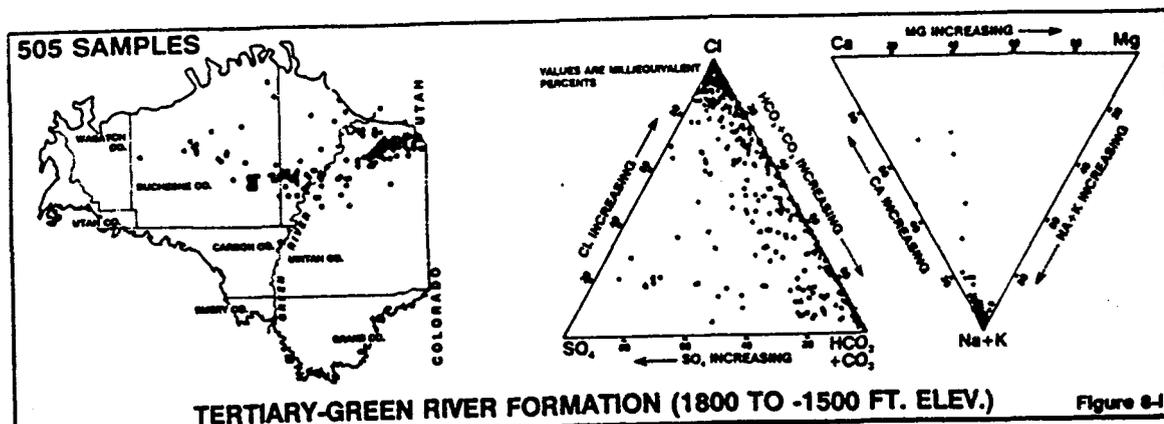
Figure 7. Plot of resistivity (ohm-meters) versus total dissolved solids (mg/l) for all Tertiary oil-well saline-water samples in the Uinta Basin. Resistivities in data base are reported at 68 or 77 degrees F.



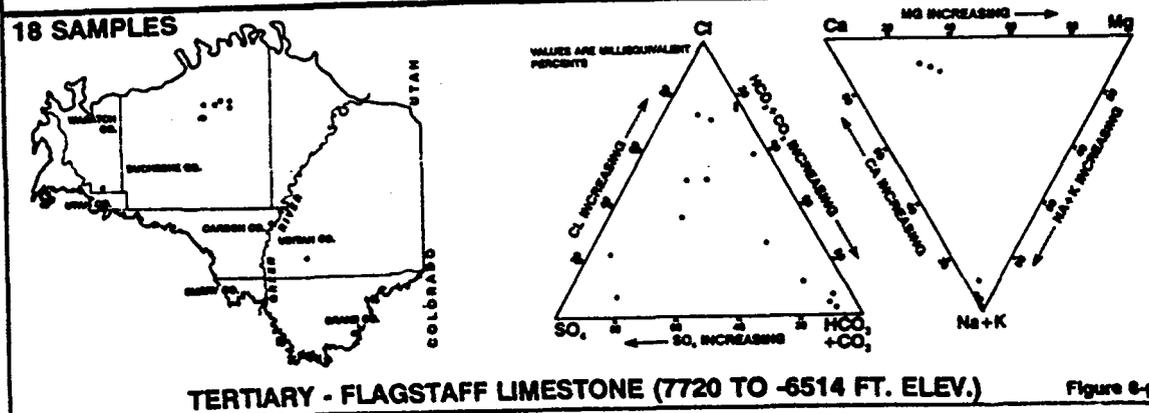
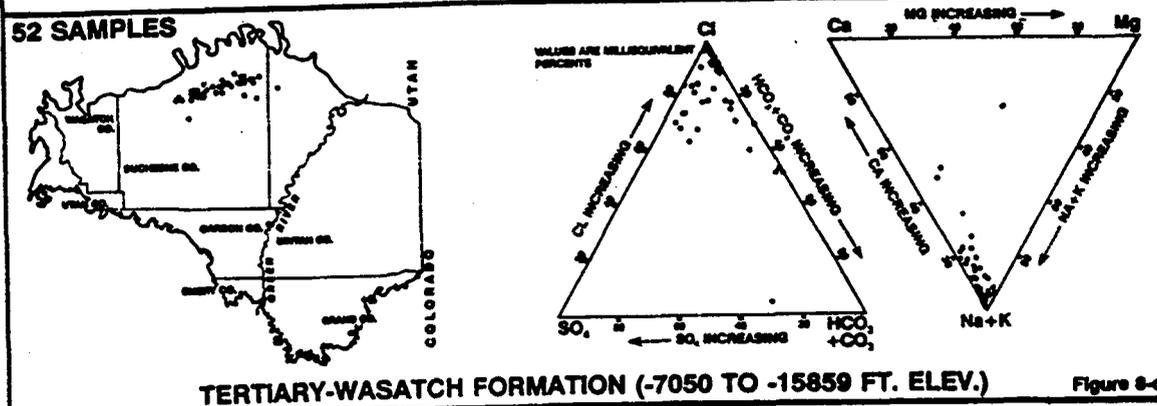
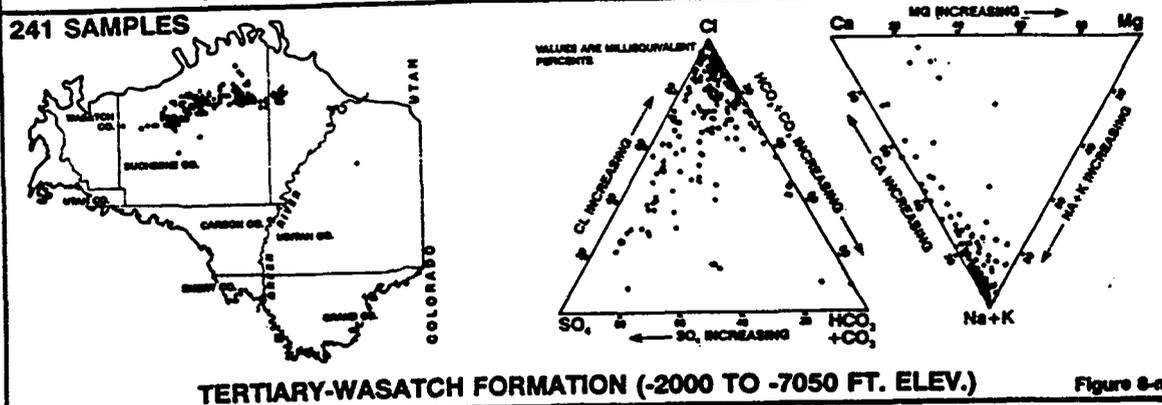
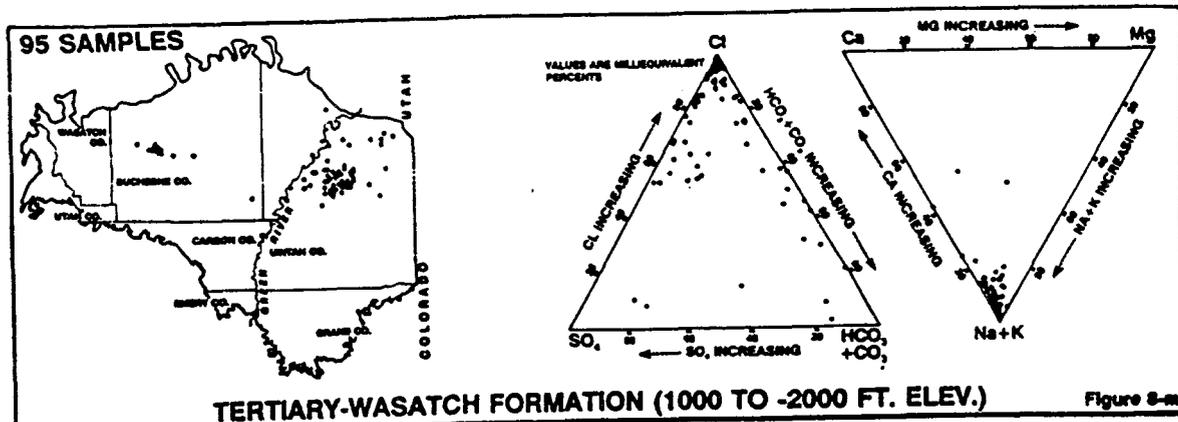
Figures 8-a through 8-d. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-e through 8-h. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-i through 8-l. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-m through 8-p. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.

intervals. Table 3 gives a summary of the saline-water chemistry for each depth interval, plus comments.

Vertical transitions in saline-water chemistry

The depth variation of TDS and each of the six ions was determined for each formation. This was done by averaging all values (TDS for example), within successive 500-ft (150-m) elevation-intervals, and plotting the averaged values against elevation. In a general analysis of the formation plots, three vertical zones, an upper, middle, and lower, were noted for the Uinta Basin as a whole.

Upper Zone. The upper zone extends from the surface down to an average sample elevation of about 6,750 ft (2,050 m) above sea level; the average sample depth is 11.5 ft (3.5 m) below the surface. The chemistry and salinity of this zone represent mainly water from springs and a few shallow water wells. The salinity in this zone is usually less than 1,000 mg/l, and averages 695 mg/l.

The milliequivalent-cation percents for calcium and magnesium fall within the 20 to 60 percent range, and average 50.5 and 32.1 percent respectively. Sodium (plus potassium) fall within the 0 to 40 percent range, and average 17.4 percent. The milliequivalent-anion percent for bicarbonate (plus carbonate) fall in the 40 to 90 percent range, and average 71.9 percent. Sulfate falls within the 0 to 60 percent range, averaging 24.7 percent; and chloride falls in the 0 to 20 percent range, averaging 3.4 percent.

Middle Zone. The middle zone falls within an average sample-elevation range of 6,750 ft (2,057 m) to 4,464 ft (1,361 m). The saline water comes from an average depth of 265 ft (81 m) and represents some springs, but mainly shallow water wells. This zone is an interval of transition from upper-zone salinity (less than 1,000 mg/l) and chemistry to those of the deeper more-saline waters. Within this zone, salinity averages 2,948 mg/l.

Of the cations, calcium averages 18.2 percent, magnesium 17.5 percent; and sodium (plus potassium) average 64.3 percent. Of the anions, chloride averages 10.8 percent, sulfate 38.1 percent and bicarbonate (plus carbonate) average 51.1 percent.

Lower Zone. The third zone falls below an average sample elevation of 4,464 ft (1,361 m) and represents the deep oil-well production waters, some of which are brines. Samples come from an average depth of 7,213 ft (2,199 m). The salinity in this zone ranges from 5,000 to nearly 40,000 mg/l, with an average of 19,666 mg/l. The cations remain relatively stable. Magnesium and calcium fall within the 0 to 20

percent range, and average 1.8 percent and 5.1 percent respectively. Sodium remains greater than 80 percent, averaging 93.1 percent. The anions, on the other hand, tend to fluctuate over a much greater range. Chloride ranges from 30 to 100 percent, averaging 64.7 percent; sulfate from 0 to 50 percent, averaging 10.2 percent, and bicarbonate (plus carbonate) from 0 to 60 percent, averaging 25.1 percent.

Chemical trends laterally within the Uinta Basin

The average salinity and chemical composition of co-produced saline waters within the Uinta Basin vary laterally. Although common trends are noted between salinity and chemistry, each appears to change independently.

Seven iso-block illustrations (Fig. 9-a through g) were prepared, one for total dissolved solids, and one for each of the six ions or ion-pairs. These figures represent an average of all samples, irrespective of depth or host formation. The individual ions within the cation and anion groups are given in milliequivalent percents. The iso-block illustrations were constructed as follows.

(1) All data points for calculated total dissolved solids, for example, were displayed as an east-west panel through the length of the basin. From this graphical display, groupings of data were identified which were separated by natural breaks.

(2) All the data in each of the east-west panel groupings were then displayed as north-south panels across the width of the basin. From these graphical displays, sub-groupings of data were identified, which again were separated by natural breaks. Thus the basin was divided into several sub-groups or rectangles of variable size characterized by similar or unique data.

(3) The average value of all samples within each sub-group or block was calculated, assigned to a numerical, pattern-value interval, and displayed on the map. The above-described process was then repeated for each of the six ions or ion-pairs, creating the seven groupings or iso-block diagrams shown in Figures 9-a through 9-g.

In nearly all cases, these figures suggest apparent salinity and chemical zonations within the basin. These zonations represent the gross vertical and horizontal dimensions of the basin. They may be heavily influenced or biased by sample population, the lithology dominating the facies of the interval, and by the chemistry at a given depth. They may represent the lateral changes found within a given stratigraphic- or elevation-interval.

Table 3. Summary of Tertiary formation depth-interval brine chemistry in the Uinta structural basin data base.

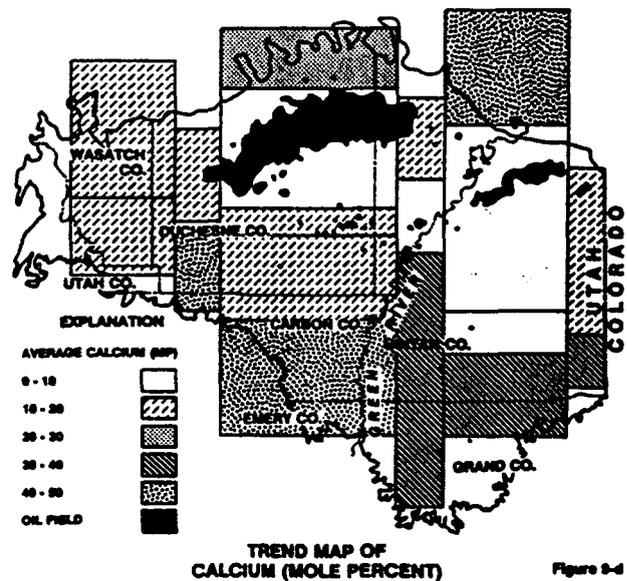
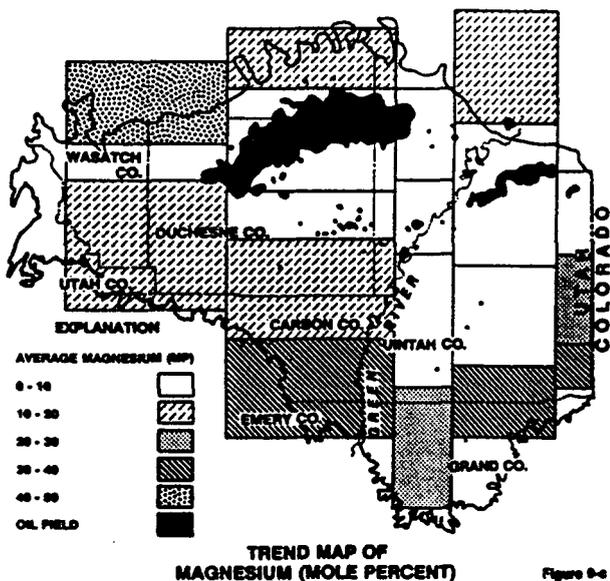
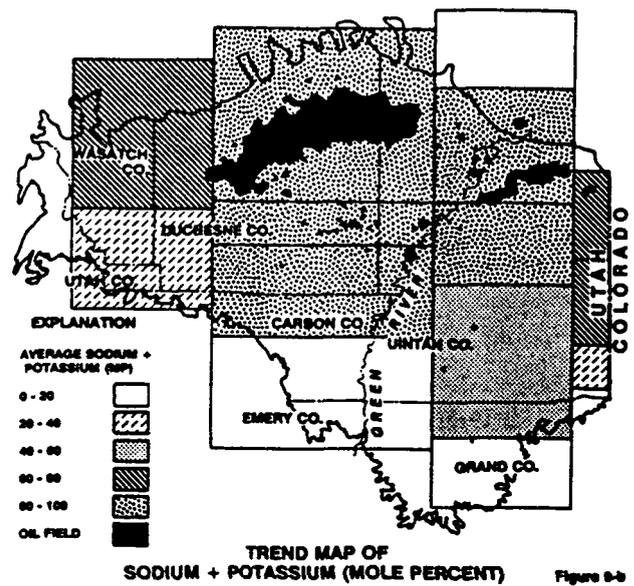
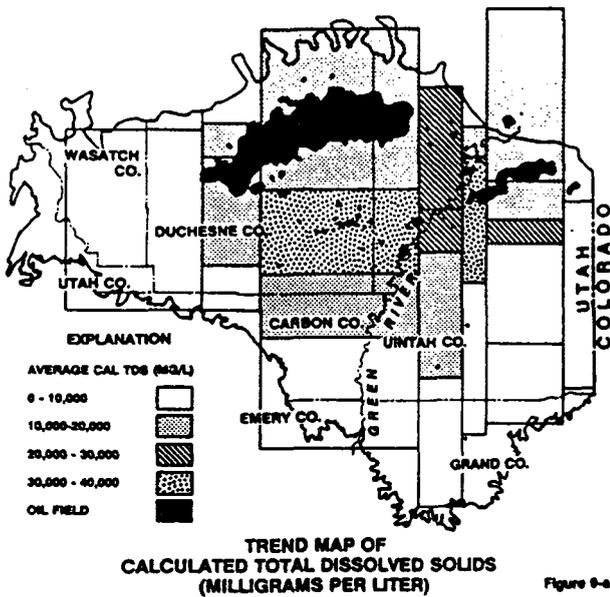
FORMATION	ELEVATION INTERVAL (FT)	CATION WATER TYPE	ANION WATER TYPE	COMMENTS
BROWNS PARK	All Elevations	Ca	HCO ₃	Located to northeast of study area
DUCHESNE RIVER	7,030-5,000 5,000-4,500 4,500-2,583	Ca = Mg > Na Ca > Mg, variable Na (10-95%) Na + K	HCO ₃ > SO ₄ > Cl HCO ₃ Cl >> SO ₄ , low HCO ₃	Transition from Ca = Mg to Na, and HCO ₃ > SO ₄ to Cl > SO ₄ at depth
UINTA	9,360-5,000 5,000-26	Ca = Mg; variable Na (5-100%) Na >> Mg + Ca	SO ₄ -HCO ₃ >> Cl Cl-HCO ₃ > SO ₄	Transition to all Na; transition from HCO ₃ > SO ₄ towards Cl with depth.
GREEN RIVER	9,770-4,500 4,500-1,800 1,800-(1,500) (1,500)-(4,150) (4,150)-(8,908)	Ca = Mg; variable Na (5-100%) Na >> Ca = Mg Na >>> Ca > Mg Na >>> Ca > Mg Na >> Ca > Mg	HCO ₃ -SO ₄ , low Cl Cl-HCO ₃ > SO ₄ Cl-HCO ₃ > SO ₄ Cl-HCO ₃ > SO ₄ Cl > HCO ₃ >> SO ₄	Transition from Na > Ca > Mg to Na > Ca. Mixture of SO ₄ -HCO ₃ changing to mixture of Cl-HCO ₃ ; with subordinate SO ₄ changing to Cl dominant system.

Table 3 (continued)

FORMATION	ELEVATION INTERVAL (FT)	CATION WATER TYPE	ANION-WATER TYPE	COMMENTS
WASATCH	7,280-1,000 1,000-(2,000) (2,000)-(7,050) (7,050)-(15,859)	Ca=Mg; variable Na (20-100%) Na>> Ca>Mg Na-Ca; low Mg Na>>Ca	SO4-HCO3 or Cl Cl>SO4=HCO3 Cl-SO4; low HCO3 Cl>>SO4-HCO3	Transition from a mixed to Na dominant system. Transition from SO4-HCO3-Cl mixture to Cl>>HCO3=SO4 to Cl-SO4 mixture to Cl dominant system
FLAGSTAFF LIMESTONE	Scattered	Na>Ca	HCO3>Cl>SO4	None

SYMBOL EXPLANATION

- | | |
|--|--|
| >Greater than | <Less than |
| +Approximately equal values | -Transition or join between two ions |
| (7050)Indicates subsea-level elevation | Na represents Na+K; HCO3 represents HCO3+CO3 |



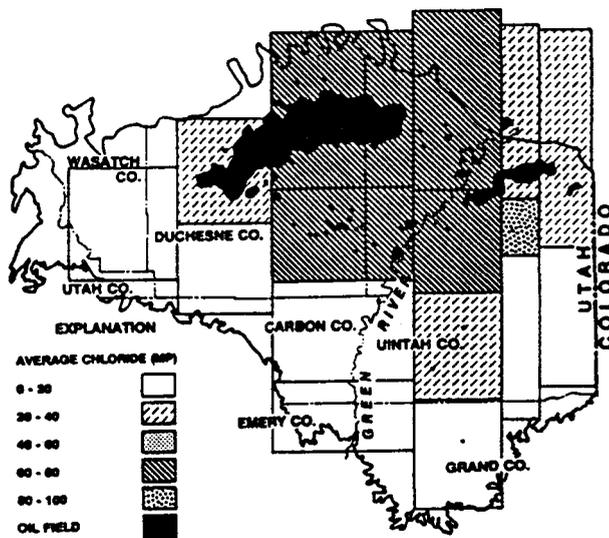
Figures 9-a through 9-d. Trend-maps showing iso-blocks of saline-water TDS and ion concentrations, and the location of oil fields within the Uinta structural basin.

TDS shows a zonation which decreases outward from the central portion of the basin; chloride follows a similar pattern. Sulfate decreases away from the southeastern portion of the basin, while bicarbonate (plus carbonate) generally decrease towards the center. Sodium (plus potassium) decreases outward from a large central-to-eastern portion of the basin. Both magnesium and calcium decrease inward towards a low-concentration arcuate zone which extends through the major oil fields.

It is interesting to note the close associations between co-produced saline-water chemistry and the location of the major oil fields. The most notable

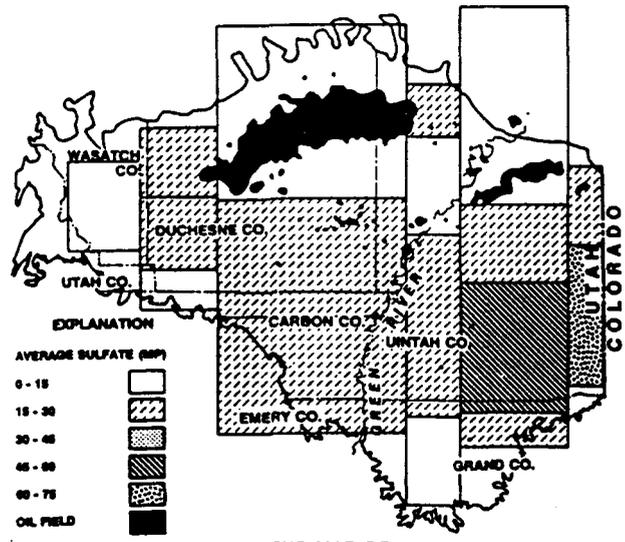
associations are the coincidence of areas of low sulfate, magnesium and calcium, low to moderate bicarbonate (plus carbonate), and of high sodium, within the oil field locations.

It is not the intent of this paper to define or determine the specific processes or mechanisms responsible for the apparent zonation or changes in brine chemistry within the Uinta Basin. These changes may be due, however, to several processes, especially rock-water interactions. White (1965) suggests that many characteristics of saline waters of sedimentary rocks are best explained by the theory that fine-grained sediments are semipermeable membranes. These mem-



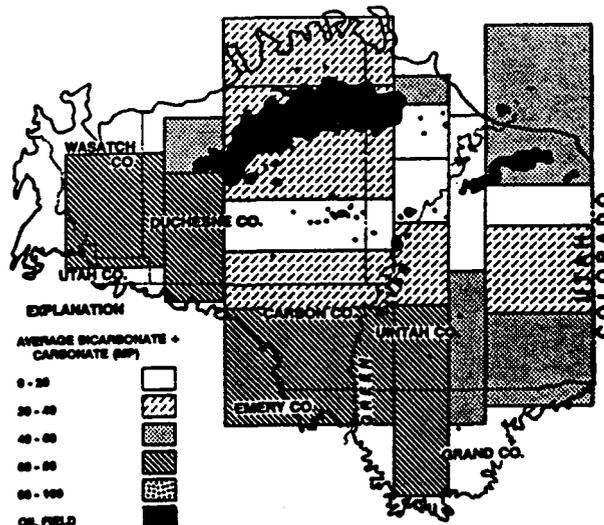
TREND MAP OF CHLORIDE (MOLE PERCENT)

Figure 9-e



TREND MAP OF SULFATE (MOLE PERCENT)

Figure 9-f



TREND MAP OF BICARBONATE + CARBONATE (MOLE PERCENT)

Figure 9-g

Figures 9-e through 9-g. Trend-maps showing iso-blocks of saline-water TDS and ion concentrations, and the location of oil fields within the Uinta structural basin.

branes permit the selective passage of some ions but to a lesser extent, others. Mechanisms discussed by Eugster and Jones (1979), "...include mineral precipitation, selective dissolution of efflorescent crusts and sediment coatings, sorption on active surfaces, degassing, and redox reactions." Hardie and Eugster (1970) conclude "...that the observed compositional diversity of natural brines can be accounted for entirely by the differences in inflow water composition, coupled with evaporative concentration and precipitation of calcite, a hydroxy silicate such as sepiolite, and gypsum." Temperature, residence time and flow paths also play

in important part in the formation and evolution of saline waters.

POTENTIAL ECONOMIC USES OF OIL WELL PRODUCTION WATER

Millions of barrels of co-produced saline water are reinjected back into the ground annually, and represent large quantities of potentially valuable dissolved salts and trace elements. Through the process of solar evaporation in surface-ponding facilities, these salts might be recovered. The most common potential salt is sodium chloride or halite. In areas where the co-

produced water contains high sulfate concentrations, sodium sulfate might be recovered. Where sulfate is low and magnesium and potassium are high, potassium chloride (sylvite) or potassium-magnesium chloride (carnallite) might be produced. A computer program, such as *The Salt Norm* (Bodine and Jones, 1986), can be used to predict the salts that will precipitate during evaporation of a saline water of known chemistry. If valuable trace elements are present, they might be removed by solvent-extraction or ion-exchange processes.

The economic recovery of these salts depends on the total salinity, chemical composition of the saline waters, and the resulting salt/brine phase relationships. It also depends on the quantity of saline water that is available for solar evaporation and on transportation distances, processing and other production-related costs.

Areas suitable for the solar evaporation of saline water must meet certain criteria. These include large, relatively-flat areas with high-clay or low-permeability ground, minimal geologic hazards, and low risk for surface and ground-water contamination. Rapid summer evaporation rates and adequate wind are both necessary for a successful solar-evaporation project.

CONCLUSIONS

As shown in Table 1, over 1.346 billion barrels of co-produced oil well saline water have been produced, most of which have been reinjected back into the earth. Saline waters vary in salinity and chemistry both vertically and laterally within individual formations, and within the basin as a whole. The six main ions or ion-pairs that are present in the saline waters include sodium (plus potassium), magnesium, calcium, chloride, sulfate and bicarbonate (plus carbonate). Each appears to vary independently. Areas which contain low sulfate, magnesium and sulfate, and high sodium are coincident with the basin's major oil fields. Potentially valuable mineral salts could be extracted from these saline waters under favorable economic conditions.

ACKNOWLEDGMENTS

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Appendix A. Summary data for all Tertiary formations within the Uinta structural basin, Utah.

FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO4	MEQP HCO3	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
BROWNS PARK 9,990 TO 7,204 5 SAMPLES	MAX	-	458.69	8.20	7.36	95.83	12.19	24.87	83.98	9,990	83.88
	MIN	-	88.32	1.69	2.47	68.90	1.80	12.33	66.03	7,204	18.66
	AVG	-	287.06	4.32	5.04	90.63	6.66	18.73	74.59	8,147	36.81
DUCHESNE RIVER 7,030 TO 5,500 11 SAMPLES	MAX	-	1,391.02	23.17	71.15	95.89	28.35	61.14	54.89	7,030	15.94
	MIN	-	537.43	1.49	2.61	19.38	4.83	29.20	25.96	5,915	4.31
	AVG	-	905.90	10.08	27.38	62.53	16.42	40.89	42.68	6,358	10.35
DUCHESNE RIVER 5,500 TO 4,500 25 SAMPLES	MAX	-	142,205.90	97.75	69.24	86.88	98.37	40.45	66.15	5,361	33.33
	MIN	-	2,743.00	0.00	2.21	0.02	5.33	0.05	1.22	4,529	0.08
	AVG	-	6,289.67	10.86	24.78	64.35	55.57	16.37	28.05	5,017	18.54
DUCHESNE RIVER 4,500 TO 2,583 11 SAMPLES	MAX	-	142,205.70	97.76	28.42	15.57	96.47	4.25	10.03	3,659	136.00
	MIN	-	7480.19	68.38	2.21	0.02	85.70	0.31	1.70	2,583	0.08
	AVG	8.09	42,307.80	79.10	17.87	3.01	91.09	2.37	6.52	3,139	12.71
UINTA 9,360 TO 5,000 60 SAMPLES	MAX	-	9,760.41	87.59	84.57	92.22	100.00	62.08	59.42	9,360	2890.00
	MIN	-	146.27	0.26	0.16	2.92	2.50	0.00	0.00	5,110	0.27
	AVG	8.28	2157.57	11.17	36.93	51.88	61.78	18.22	19.97	6,093	56.03
UINTA 5,000 TO 26 25 SAMPLES	MAX	-	73,014.79	97.43	52.53	81.66	99.95	11.55	20.89	4,895	18.21
	MIN	-	441.33	1.51	0.00	1.89	69.61	0.01	0.00	26	0.13
	AVG	7.97	9,918.10	50.49	17.45	32.05	93.09	2.18	4.71	3,503	3.977
GREEN RIVER 9,770 TO 4,500 160 SAMPLES	MAX	-	24,379	95.53	94.09	98.58	99.71	59.98	74.37	9,770	52.63
	MIN	-	180.58	0.00	0.00	3.60	2.16	0.00	0.17	4,580	0.43
	AVG	8.25	1,641.37	4.83	34.76	60.40	41.49	25.11	33.38	6,711	13.614

APPENDIX A (continued)

FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO4	MEQP HCO3	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
GREEN RIVER 4,500 TO 1,800 96 SAMPLES	MAX	-	204,150.76	98.11	990.31	97.34	100.00	36.30	53.35	4,475	17.27
	MIN	-	417.09	0.00	0.00	0.30	10.33	0.00	0.00	1,800	0.04
	AVG	8.48	19,742.91	39.78	14.70	45.51	95.41	1.45	3.12	2,866	2.50
GREEN RIVER 1,800 TO -1,500 505 SAMPLES	MAX	-	170,853.18	99.81	71.28	99.70	100.00	25.54	56.19	1,800	10.9
	MIN	-	873.66	0.16	0.00	0.18	27.97	0.00	0.00	-1,497	0.08
	AVG	8.60	21,464.55	59.08	6.40	34.50	96.84	1.00	2.15	265	1.03
GREEN RIVER -1,500 TO -4,150 86 SAMPLES	MAX	-	179,035.88	99.67	40.48	83.91	100.00	21.26	61.25	-1,511	19.12
	MIN	-	399.52	6.02	0.01	0.03	30.52	0.00	0.00	3,947	0.06
	AVG	8.13	24,722.06	70.68	7.26	22.05	91.89	1.88	6.21	-2,751	1.00
GREEN RIVER -4,150 TO -8,908 105 SAMPLES	MAX	-	56,771.96	98.23	49.84	70.08	99.70	29.26	65.12	-4,271	31.90
	MIN	-	298.79	4.25	0.00	1.36	8.03	0.00	0.13	-8,908	0.15
	AVG	7.93	20,152.13	69.40	17.14	13.45	94.83	1.35	3.80	-5,019	1.20
WASATCH 7,280 TO 1,000 36 SAMPLES	MAX	-	59,653.18	98.81	92.36	91.45	99.70	43.09	53.61	7,280	61.66
	MIN	-	82.07	1.72	0.18	0.25	16.80	0.09	0.19	1,040	0.10
	AVG	8.17	13,295.33	38.85	28.17	32.96	68.71	13.91	17.37	3,968	6.09
WASATCH 1,000 TO -2,000 95 SAMPLES	MAX	-	105,019.66	99.66	72.94	83.78	99.88	28.27	42.04	956	20.00
	MIN	-	589.25	2.01	0.00	0.00	44.86	0.00	0.01	-1,740	0.10
	AVG	7.91	22,255.32	76.80	10.17	13.02	91.77	2.40	5.81	-4,483	0.79
WASATCH -2,000 TO -7,050 241 SAMPLES	MAX	-	155,088.5	99.20	72.55	90.27	99.89	39.31	71.06	-2,007	42.00
	MIN	-	205.54	9.07	0.00	0.07	4.27	0.00	0.09	-6,987	0.06
	AVG	9.18	12,306.05	74.38	12.91	12.68	86.49	3.05	10.44	-4,821	0.97

APPENDIX A (continued)

FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO4	MEQP HCO3	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
WASATCH -7,050 TO -15,859 52 SAMPLES	MAX	-	86,796.83	99.60	27.67	67.66	99.45	42.93	40.38	-7,080	14.20
	MIN	-	953.16	4.56	0.00	0.14	25.28	0.02	0.35	-15,859	0.10
	AVG	7.77	15,785.94	83.42	5.72	10.85	87.31	3.62	9.05	-8,518	1.04
FLAGSTAFF LS 7,720 TO -6,514 18 SAMPLES	MAX	-	11,694.99	76.75	75.84	90.32	99.63	30.56	65.12	7,720	16.67
	MIN	-	556.09	2.43	1.13	7.35	9.50	0.06	0.29	-6,514	0.80
	AVG	8.80	5,266.99	35.10	24.50	40.39	82.14	5.57	12.27	-99.44	4.21

EXPLANATION OF TABLE

ELEVATION INTERVAL Selected stratigraphic interval
(mean sea level) within formation.

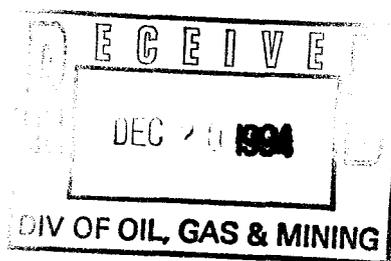
MEQP Millequivalent-percent
HCO3 Represents HCO3 + CO3
-6,514 Elevation below sea level

FRACTURE GRADIENT DATA

RECEIVED
DEC 1994
DIV OF OIL, GAS & MINING

GEOLOGICAL DATA

Lithology For Injection And Confining Zones



Well Resume*

Mud Log*

Sample Lithology

* Usinig data from the Pearl Broadhurst #14

LITHOLOGY FOR INJECTION/CONFINING ZONES

Injection Zones

Green River Formation

"H"4 Zone	4719' - 4730'	11 Feet
"H"5 Zone	4745 - 4762'	17 Feet

Lithology

"H"4 Zone:

Sandstone - Clear to grey, occasionally brown to buff colored, very fine to fine grained, friable to hard, sub-angular to angular, finely sorted with calcarious cement, bright yellow fluorescence with good porosity.

"H"5 Zone:

Sandstone - White to clear frosted, very fine to fine grained, sub-rounded, sub-angular to angular. Tight tan very fine to fine grained, friable to hard, sub-rounded-poorly sorted with calcarious cement.

Fracture Gradient

ISIP = 1200 psi
Fluid Gradient = .438 psi/ft
Mid-perf zone = 4738'

Fracture Gradient = .69 psi

Total Dissolved Solids Content of Injection Zone

TDS = 3700 mg/l PH = 8.2

Confining Zones

Top	-	Green River "H"1 Zone	4608' - 4634'	26'
Base	-	Green River Base of "H" Zone	4798' - 4812'	14'

Top "H"1:

Shale - Light to dark grey, hard blocky to smooth flaky, silty crystalline texture with some imbedded pyrite. Calcarious reddish brown, blocky silty with waxy texture. Calcarious light green, soft bulky waxy with imbedded pyrite.

Base "H":

Shale - Light green, soft blocky to flaky, bentonitic and slightly calcarious. Light dark grey, hard blocky fissile to very silty with calcarious cement.

MELTON ENTERPRISES INC.

Box 606

Vernal, Utah

Phone 801 789 2539

Company ENERGY RESERVES GROUP INC.

Well # 14 U.S.A. BROADHURST

Location SE NE SEC.9 T7S R23E 1980'FNL-659'FEL

County UINTAH State UTAH

Depth Logged
From 2000 To 5480

Date Logged
From 3-24-81 To 4-8-81

Elev. G.L. 5110 K.B. 5123
Mud Type WATER & GEL

LEGEND

Sand		Siltstone	
Shale		Chert	
Limestone		Coal	
Dolomite		Igneous	
Anhydrite			

Calibration Chromatograph

5	Pentane	1 UNIT
4	Butanes	2 UNITS
3	Propanes	2 UNITS
2	Ethane	5 UNITS
1	Methane	5 UNITS

Drill Rate - Mm. / Ft. 5 10 15 20	Depth	INTER.	PERCENT	Description	Poro Cut		Flug. - 100%	Mud Gas							
					TFG	TFG		5	10	25	50	100			
				HOLE BEING DRILLED BY MGF RIG # 65				54321							
				SET 8 5/8" SURFACE CASING AT 497'											
				DRILLING 7 7/8" HOLE WITH BIT # 3											
	50			SH-RDSH BRN SFT-FRM BLKY											
				SLTY SM SDY IP CALC ABMT											
				RED-GY MOTT LT GY SFT											
				BLKY SLTY SL BENT CALC											
	2100			SS-WH CLR FROS SME LT GY VP											
				FGR TT SUBRD SUBANG CALC											
				CMT W/SH & CHT INCL SME											
				WH VFGR CALC CLY CMT											
				ABMT CLY WH SFT CHKY											

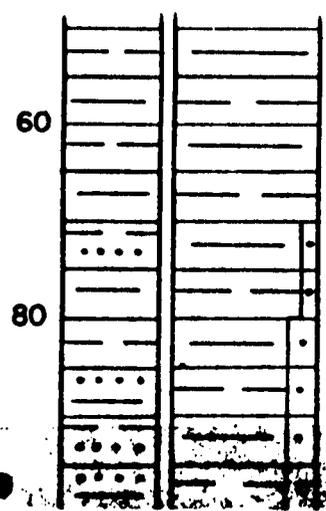
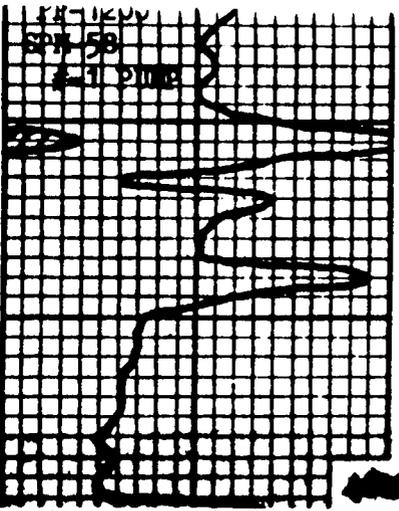
3/4 HRS. *BIT #3 STC DS

RPM-120
WOB-20,000
PP-1100
SPN-56
#1 PUMP

NOTE: SCALE CHANGE

METHANE GAS

2290-4736) 1216' IN 96 3/4 HRS.

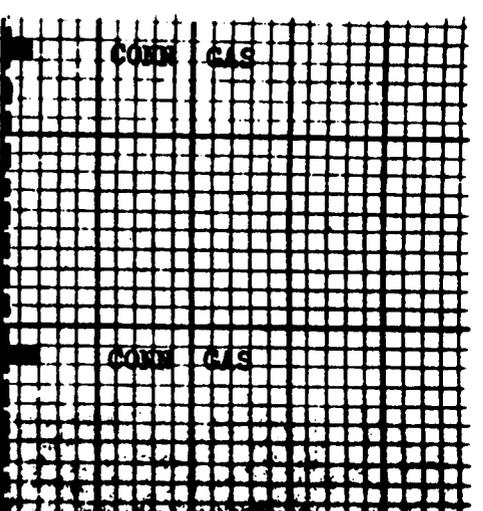
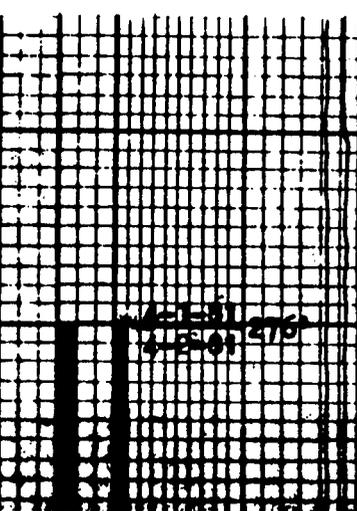


BLKY FIS SLTY CARB SL
 CALC LT GY SFT-FRM BLKY
 FLKY BENT IP ARG IP SL
 CALC LT GN SFT BLKY BENT
 SME MICA IMBD

9.0-35-8.0-2-10.0-400

SS-WH TAN LT-GY VP-FGR H&T
 SUBRD SUBANG W/ SME SH
 & MICA INCL

SS-GEN AA W/ TR MEN OIL STN
 WE HULL GOOD FLOW V WE
 FROM CUT



SH-V COL LT-BK GY FRM-HD
 BLKY BENT FLKY SLTY SME
 XL TEX W/ PYR IMBD SL
 CALC REDSH-BRN FRM BLKY
 SLTY SUB WXY CALC LT-GH
 SFT-FRM BLKY SUB WXY W/
 PYR IMBD V SL CALC

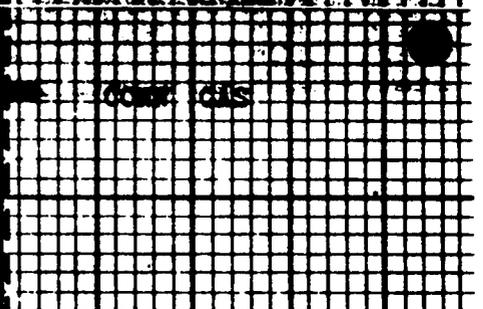
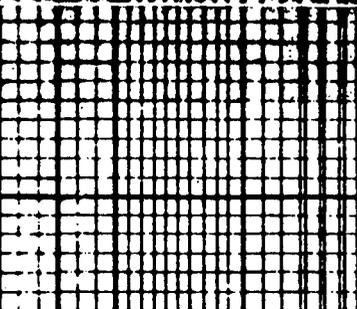
SS-WH TAN LT-GY VP-FGR H&T
 SUB RD SUB ANG W/ SH &
 PYR IMBD V SL CALC

9.0-35-8.0-2-10.0-500

SH-GEN AA SME LT-BRN FRM
 BLKY SLTY W/ PYR IMBD
 SL CALC

SH-PRED LT-DK GYLFRM-HD
 BLKY FLKY SME XL TEX W/
 SD & PYR IMBD CALC REDSH-
 BRN SFT-FRM BLKY SLTY SME
 GRDG TO SLTST SME V CALC

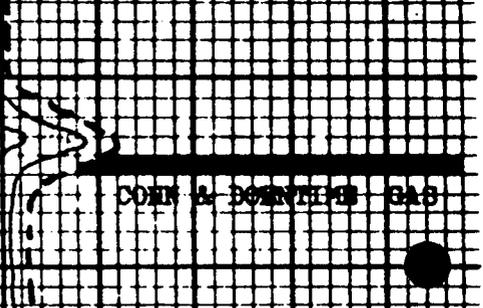
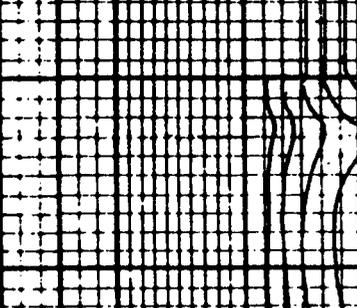
SS-WH GY CLR FROS VP-FGR
 SUB RD SUB ANG HD & TT
 CALC CUT V SL TR FLOW V
 WE FROM CUT



SH-GEN AA SME LT-BRN FRM
 BLKY SLTY W/ PYR IMBD
 SL CALC

SH-PRED LT-DK GYLFRM-HD
 BLKY FLKY SME XL TEX W/
 SD & PYR IMBD CALC REDSH-
 BRN SFT-FRM BLKY SLTY SME
 GRDG TO SLTST SME V CALC

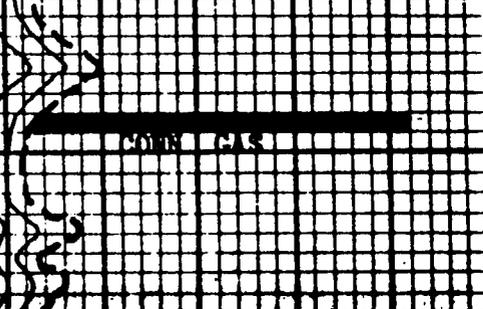
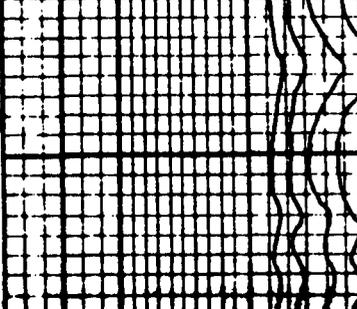
SS-WH GY CLR FROS VP-FGR
 SUB RD SUB ANG HD & TT
 CALC CUT V SL TR FLOW V
 WE FROM CUT



SH-GEN AA SME LT-BRN FRM
 BLKY SLTY W/ PYR IMBD
 SL CALC

SH-PRED LT-DK GYLFRM-HD
 BLKY FLKY SME XL TEX W/
 SD & PYR IMBD CALC REDSH-
 BRN SFT-FRM BLKY SLTY SME
 GRDG TO SLTST SME V CALC

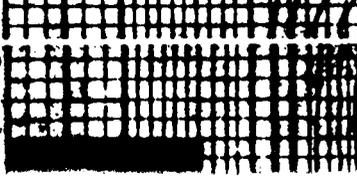
SS-WH GY CLR FROS VP-FGR
 SUB RD SUB ANG HD & TT
 CALC CUT V SL TR FLOW V
 WE FROM CUT



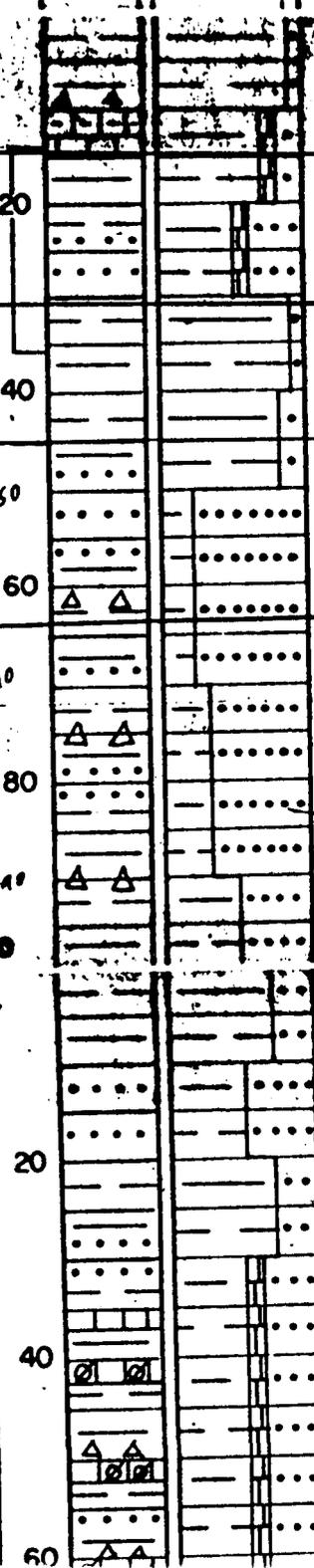
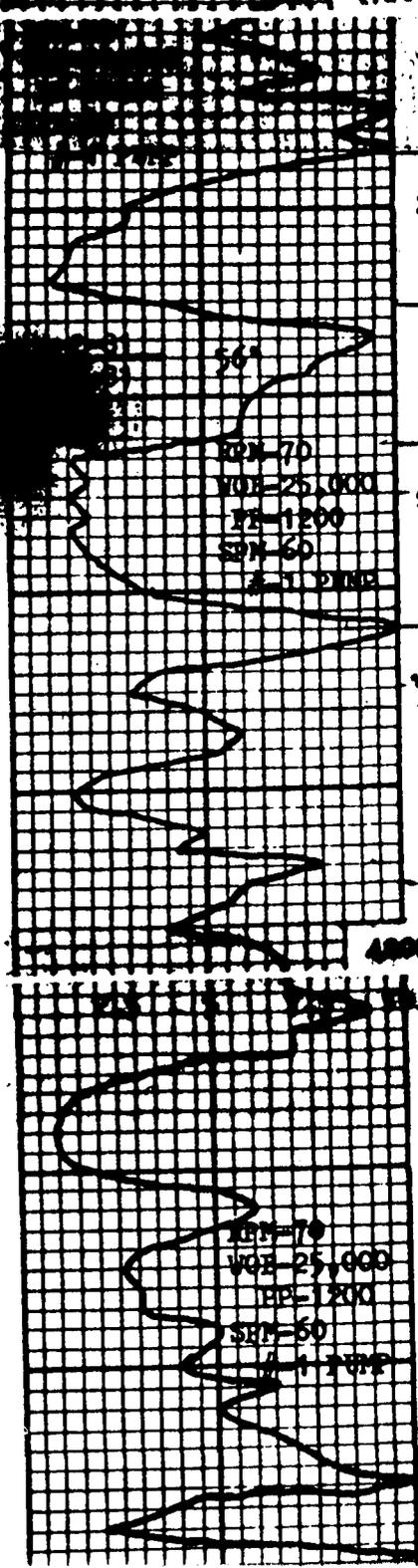
SH-GEN AA SME LT-BRN FRM
 BLKY SLTY W/ PYR IMBD
 SL CALC

SH-PRED LT-DK GYLFRM-HD
 BLKY FLKY SME XL TEX W/
 SD & PYR IMBD CALC REDSH-
 BRN SFT-FRM BLKY SLTY SME
 GRDG TO SLTST SME V CALC

SS-WH GY CLR FROS VP-FGR
 SUB RD SUB ANG HD & TT
 CALC CUT V SL TR FLOW V
 WE FROM CUT



OS 9 # 111



SS-WH TAN VP-F GR FRI-HD
SUBRD-RD SUBANG P-SRTD
CALC CMT W/BRI YEL FLUO
GOOD CUT GOOD PORO

* NOTE
DST # 2 (4714-4736)
SEE LAST PAGE OF LOG
FOR ALL DST REPORTS

SS-WH CLR FROS VP-F GR SUBRD
SUBANG-ANG TT TAN VP-F GR
FRI-HD SUBRD-RD P-SRTD
CALC CMT W/DK OIL STN
M GOLD FLUO WK CUT

SS-TAN VP-F GR FRI-HD RD
CALC CMT W/LT & DK OIL
STN GOOD PORO BRI YEL &
DULL GOLD FLUO PAIR CUT

SS-WH GY & GN VP-F GR GRDG
TO SLST SUBRD SUBANG SMC
CALC CLY CMT SMC CALC
SME

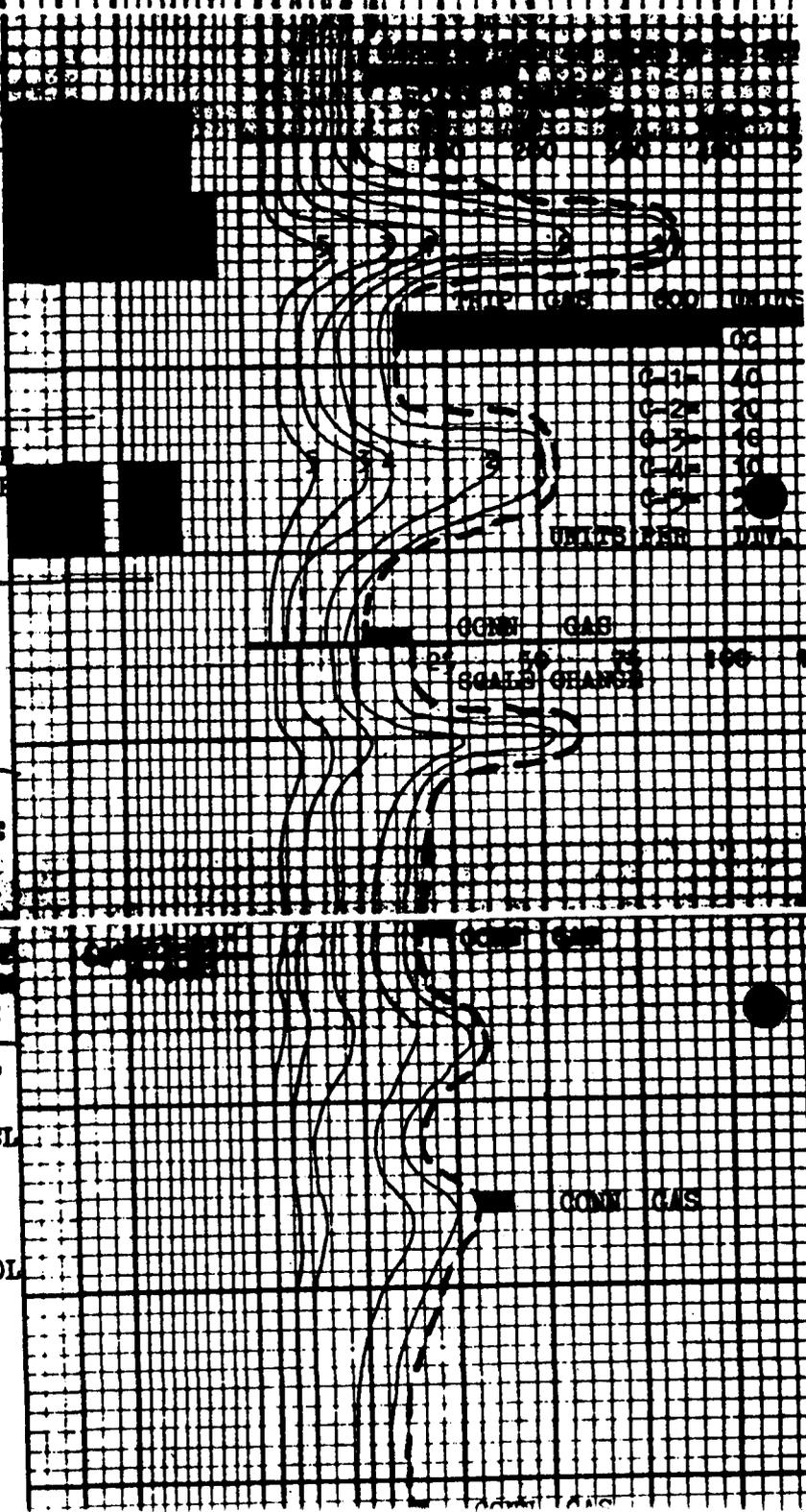
SH-LT GN SPT BKLY FLYK HNTD
IF SL CALC LT-DK GY FRI
HD BKLY FIS V SLTY CALC

SSS-WH LT GN GY VP-F GR TT
SUBRD SUBANG GLAU CALC
CMT W/SH-BENT & CHT INCL

9.1-36-8.0-2-10.0-400

LS-GY-DK GY HD VP-MICXL QOL
SHLY DNS

SH-LT-DK GY FRM-HD BKLY V
SLTY SL CARB SL CALC
ABNT FREE CHT & QTZ

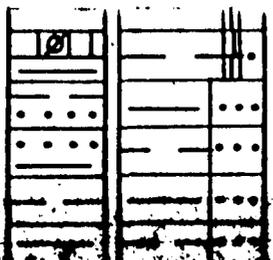


TRIP	GAS	CONV	UNITS
0-1			40
0-2			20
0-3			46
0-4			10
0-5			2

CONV GAS
SCALE CHANGE

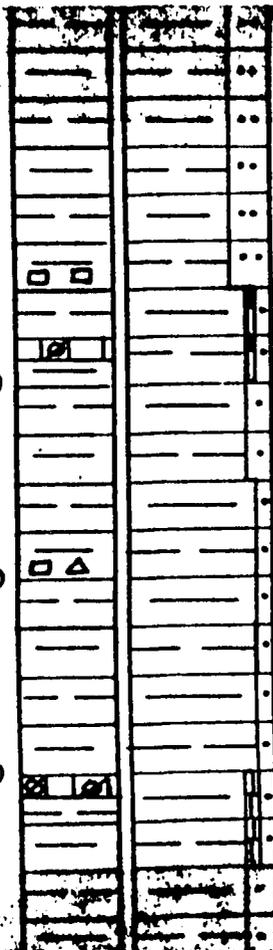
CONV GAS

80



SS-WH LT GY & GN VP-F GR TT
SUBRD SUBANG GLAU SME
CALC CLY CMT SME CALC
CMT W/SH-BENT & CHT INCL
XSOFC

20



SS-WH LS-BK GY FRM-HD
BLKY FLKY SLTY SME XL
TEX W/ PYR IMBD SL CALC
REDSH-BRN SPT-FRM BLKY
SLTY SME GRDG TO SLTST
W/ SD IMBD CALC SME FREE
SILVER PYR

LS-TAN LT-GY HD DNS OOL SL
SLTY FXL

9.1-36-8.0-10.0-500

SS-WH CLR FROS TAN VP-FGR
H&T W/ MICA INCL CALC
CMT TR LT-BRN OIL STN
V WK SLOW STRM CUT

60

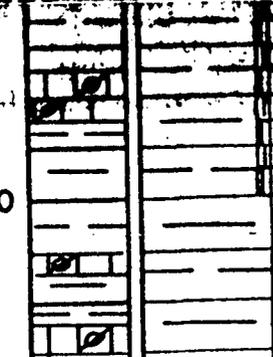
SH-GEN AA SME RED-GY MOTT
SPT-FRM SLTY SUB WXY
CALC SME YEL-BRN CLYST

80

LS-LT-BRN GY LT-GY HD DNS
OOL FXL

SH-GEN AA TR LS-BRN OIL STN
V WK SLOW STRM CUT

20



LS-TAN LS-BRN GY FRM-HD DNS
SL SLTY OOL

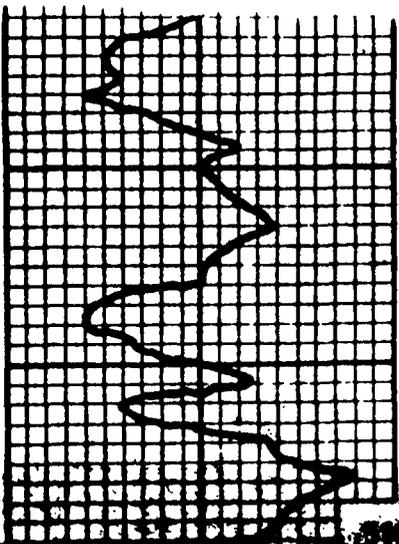
SH-LT-BK GY FRM-HD BLKY
SLTY SUB WXY SME XL TEX
SL CALC GY-GN FRM BLKY
SUB WXY SL CALC REDSH-
BRN SPT-FRM BLKY SME V
SLTY W/ SD IMBD SME FREE
SILVER PYR

CONN GAS

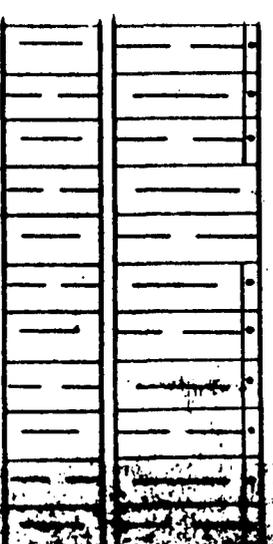
CARBIDE TAG 1/4 INCH @ 60 SEC

CONN GAS

CONN GAS



60
80

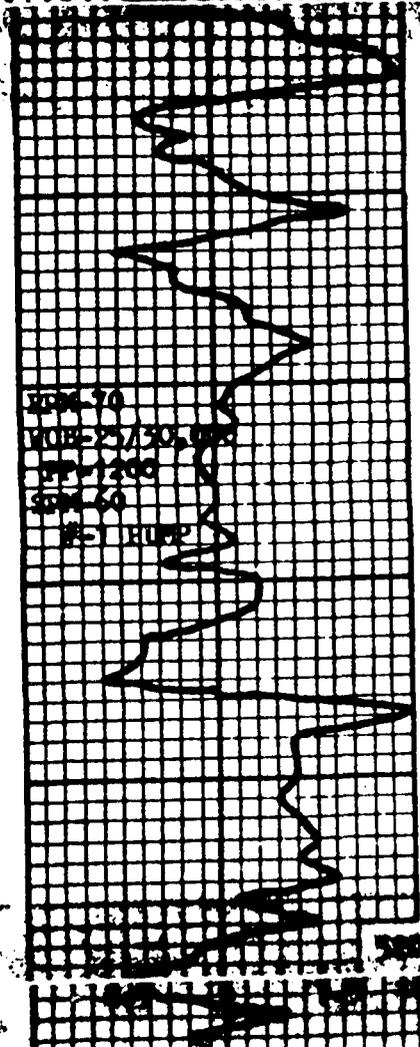


CALC CMT W/ SH & MICA
INCL

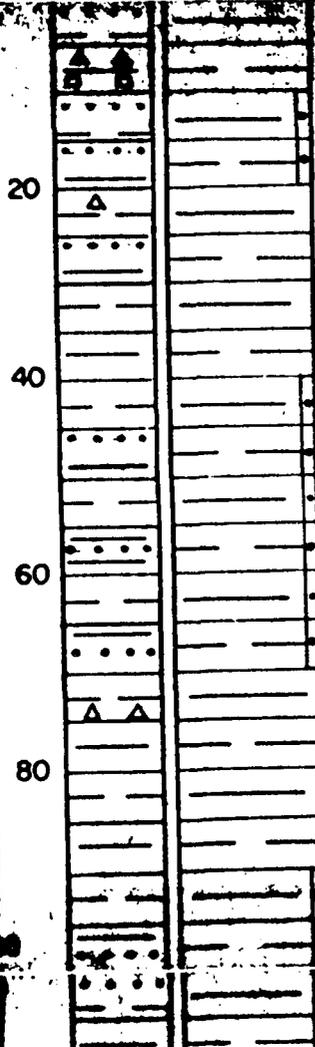
9.0-36-8.0-2-10.0-400

SH-V COL REDSH-BRN SFT-FRM
V:SLTY W/ SME SD IMBD
V CALC LT-DK GY FRM-HD
BLKY SLTY SME XL TEX W/
PYR IMBX SL CALC GY-GH
SFT-FRM BLKY SUB WXY SL
CALC

SS-WH GY FROS VP-FGR H&T
SUBRD SUBANG CALC CMT
W/ CHT & SH INCL



20
40
60
80



SS-WH LT GN & GY VP-F GR
H&T SUBRD SUBANG SME V
CHTY GLAU CALC CMT W/
CHT-SH & BENT INCL

9.0-34-7.6-2-10.0-400

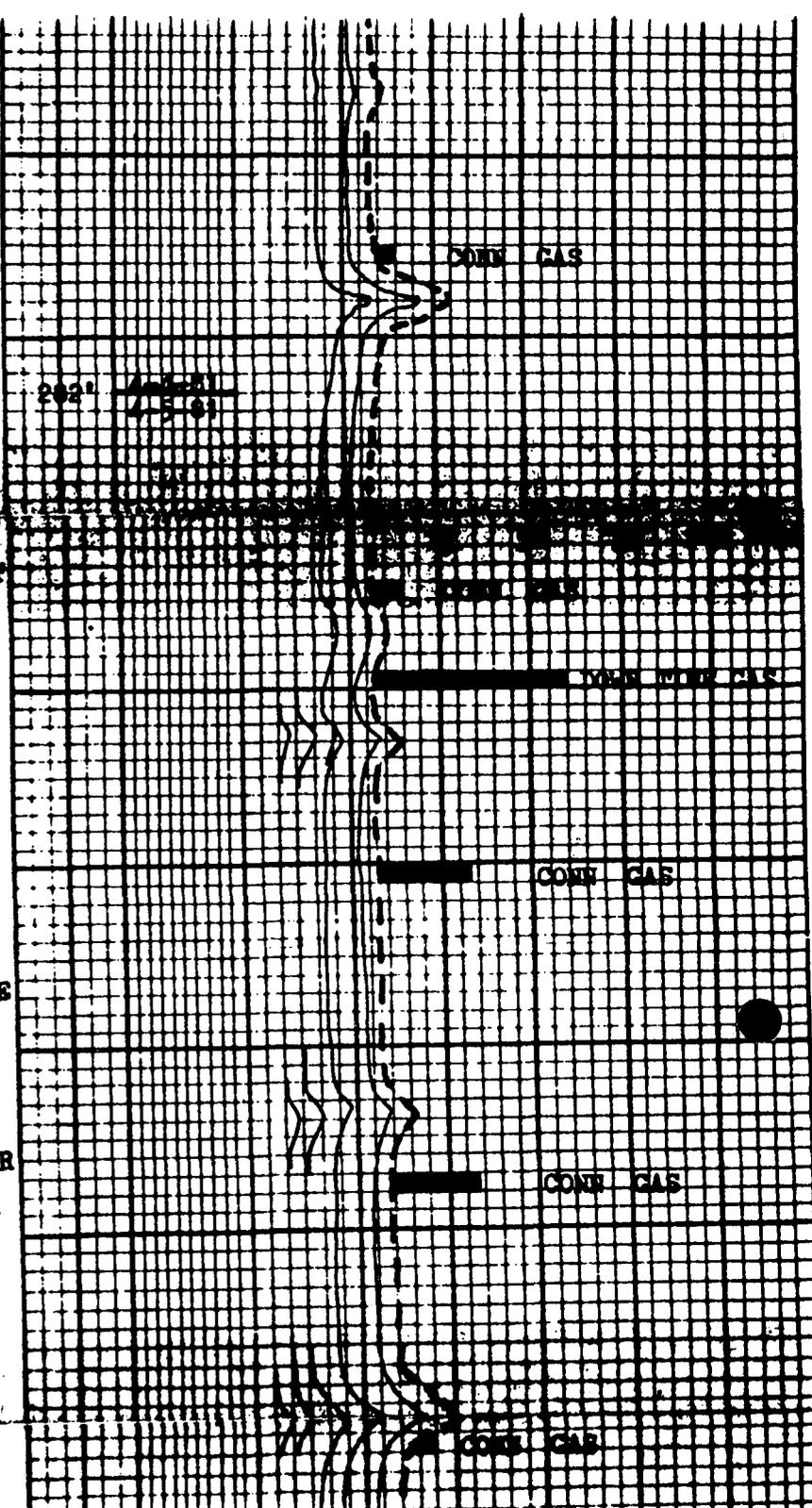
SH-RDSH BRN SFT BLKY SLTY
SDY IP CALC SME RED-GY
& OCH MOTT LT GN SFT-
FRM BLKY FLKY SUBWXY
BENT IP SL CALC LT GY
FRM-HD BLKY FIS SLTY SME
XL TEX SL CALC OCH FRM
BLKY SLTY LMY IP V CALC
DK GY HD BLKY FIS SLTY
CARB IP SL CALC

SS-LT GY & GN WH FROS VP GR
GRDG TO SLST H&T SUBRD
SUBANG SME ANG CALC CLY
CMT W/CHT & SH INCL
SME OOL INCL

SH-PRED AA

SS-WH-FROS LT GN & LT GY
VP GR GRDG TO SLST TR

WOB-25/30
SP-1200
SOM-60
R- HUPP

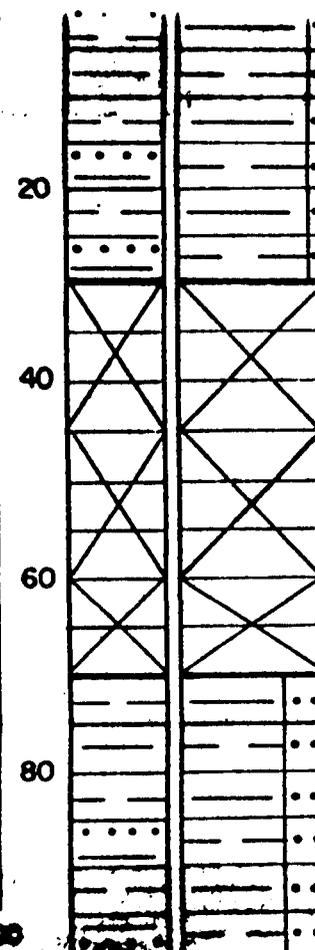
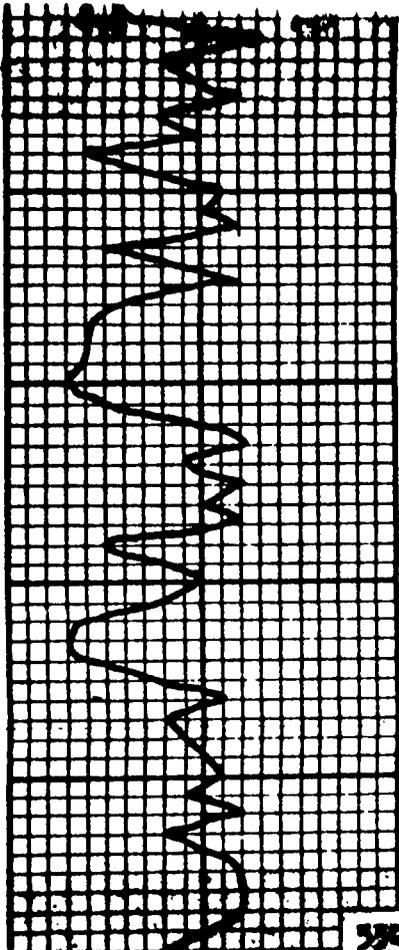


CONT GAS

CONT GAS

CONT GAS

CONT GAS



SS-WH-FROS LT GN & LT GY
 VF GR SUBRD TO SLTY TR
 P HD SUBRD SUBANG
 CLAU CALC CMT W/ SH-CHT
 CALC & PYR INCL NSOFC

SH-RDSD BRN SPT-FRM BLKY
 SLTY DOL CALC

* NOTE *

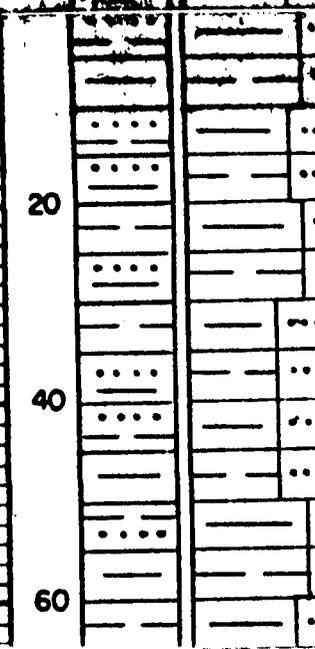
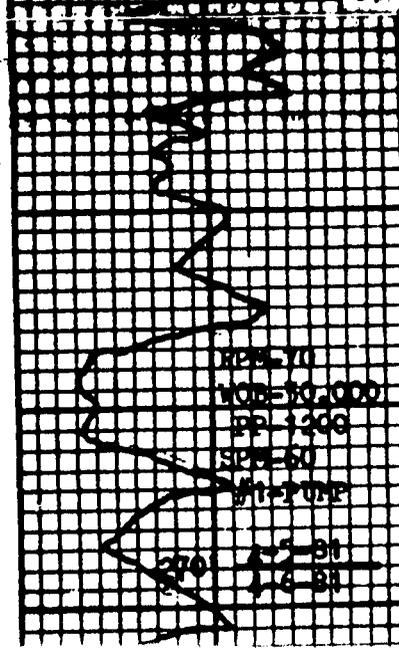
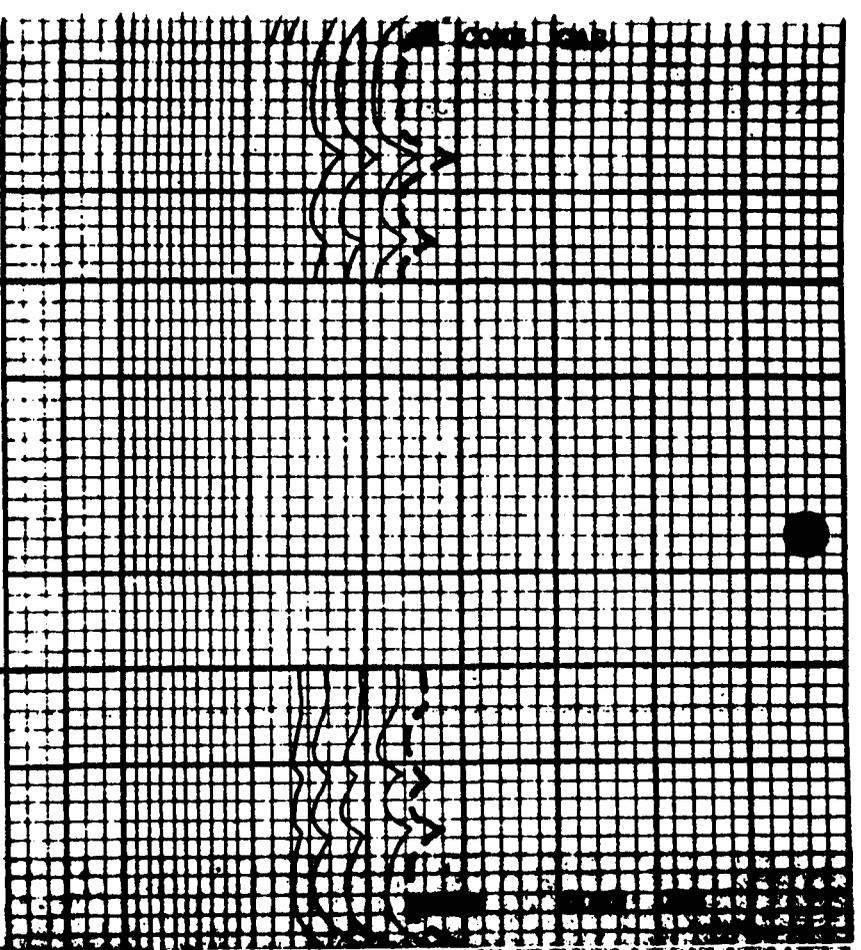
NO SAMPLE OR GAS READINGS
 REPAIRING SHAKER SCREEN

REPAIRING SHAKER SCREEN

9.0-34-7.6-2-10.0-400

SH-PRED LT GN & GY SPT-FRM
 BLKY FLKY SLTY SL CALC
 ABNT CLY SPT CHKY WH

SS-WH FROS GY TAN VF GR FRI
 HD SUBRD SUBANG P-SRTD
 IP CALC CMT W/SH & CMT
 INCL

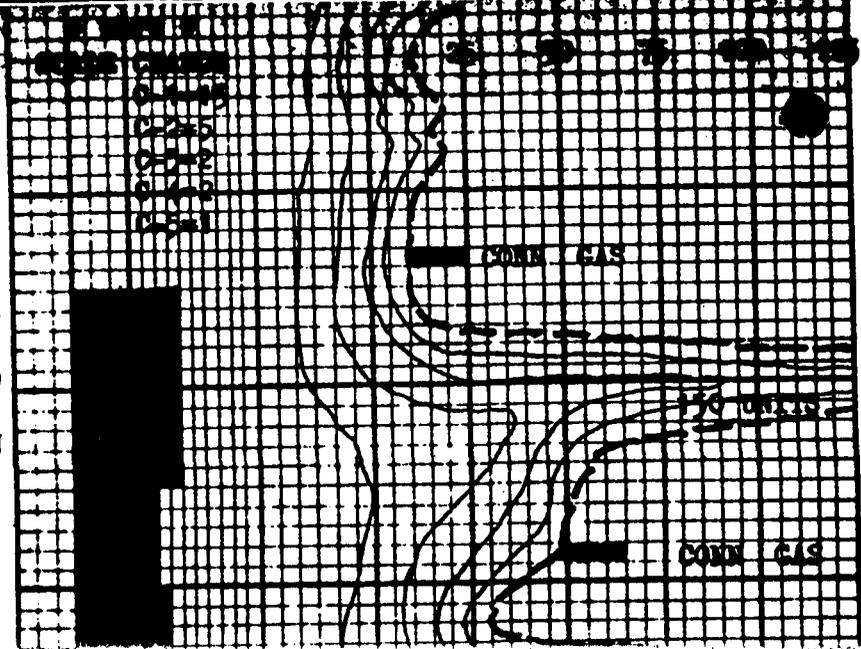


SS-LD-LK GY FRO BLKY FLS
 BLKY CABD SL CALC BRN
 HDSD-BRN SPT-FRM BLKY
 SLTY SL DOL CALC SME
 RED-GY MOTT

SS-WH FROS GY VF-PGR H&T
 SUBRD SUBANG SME ANG
 CALC CMT W/SH & CMT INCL

SS-TAN BRN VF-PGR FRI SUBRD
 RD SUBANG P-SRTD CALC
 CMT W/ LT-LK BRN OIL STM
 BRI YEL FLUO PAST WH
 MILKY STRM CUT

9.0-35-7.6-2-10.0-400



RPM 70
 MOD-10,000
 SP-1300
 SPT-60
 #1-PUMP

370 4-5-81
 1-8-81

10245
 10242
 10240
 10241

SOME GAS

SOME GAS

SOME GAS

DET # 1 (3444-3500)

IS-45 MINS.

4 lbs. @ open

3 lbs. @ 14 mins.

ISI-45 MINS.

5 lbs. @ close-decreasing
to 3½ lbs. @ 45 mins.

FP-60 MINS.

2 lbs. @ open

12 lbs. @ 60 mins.

PSI-120 MINS.

12 lbs. @ close

GTS @ 6 mins. (weak 2'
flare) dead @ 42 mins.

RECOVERY-

203' (1.24 bbls.) of
SGC WC mud

BOTTOM HOLE SAMPLER-

pressure 110 lbs.
recovery 1800 cc MC
water and 0 PSIG

RESISTIVITY DATA-

drill pipe recovery 1.4

@ 64° F 650 PPM CL

sampler 1.4 @ 64° F 650 PPM CL

mud pit 1.9 @ 58° F 400 PPM CL

20

40

60

80

DET # 2 (4714-4726)

FORMATION IS SOME GREEN SILTY

WATER CUSHION-none

IS-15 MINS.

bottom of bucket @ open

1 lb. @ 3 mins. until

end of flow

ISI-30 MINS.

blow to bottom of bucket

(0 lbs.) @ close decreasing

to 3" @ 30 mins.

FP-60 MINS.

blow to bottom of bucket

@ open 1 lb. @ 3 mins.

1½ lbs. @ 15 mins. 1½ lbs.

and GTS. @ 45 mins. ½ lb.

@ 55 mins. until end of flow

PSI-120 MINS.

12 lbs. @ close weak 2'

20

40

60

IS-1850 to-
FP-60 to-139
PSI-1204 to-

BOTTOM CHART

IS-4610 FH-1599
IS-42 to-85
ISI-1240 to-
FP-74 to-136
PSI-1200 to-

BOTTOM HOLE TEMPERATURE

95° F

IS-2249 FH-2249
IS-47 to-84
ISI-1468
FP-94 to-131
PSI-1665

TOP CHART

IS-2249 FH-2249
IS-47 to-84
ISI-1468
FP-94 to-131
PSI-1665

BOTTOM PERFORATIONS PLUGGED

40
60
80
20
40
60
80

PSI-120 MINS.
12 lbs. @ close
GTS @ 6 mins. (weak 2'
flare) dead @ 42 mins.
RECOVERY-
203' (1.24 bbls.) of
SGC WC mud
BOTTOM HOLE SAMPLER-
pressure 110 lbs.
recovery 1800 cc MC
water and 0 PSIG
RESISTIVITY DATA-
drill pipe recovery 1.4
@ 64° F 650 PPM CL
sampler 1.4 @ 64° F 650
mud pit 1.9 @ 58° F 400

TEST # 2 (494-022)
FORMATION IN SOME CASES LEVEL
WATER CUSHION-none
IP-15 MINS.
bottom of bucket @ open
1 lb. @ 3 mins. until
end of flow
ISI-30 MINS.
blow to bottom of bucket
(0 lbs.) @ close decreasing
to 3" @ 30 mins.
FP-60 MINS.
blow to bottom of bucket
@ open 1 lb. @ 3 mins.
1½ lbs. @ 15 mins. 1½ lbs.
and GTS @ 45 mins. ½ lb.
@ 55 mins. until end of flow
PSI-120 MINS.
0 lbs. @ close weak 2'
flare when SFC manifold opened
RECOVERY-
665' (6.33 bbls.) GC
heavy crude with multiple
pockets of gas
SAMPLE CHAMBER-
1.72 CFG @ 112 PSIG and
50 cc mud

BOTTOM CHART

IB-4610 FB-1599
IP-62 to-85
ISI-1240 to-
FP-74 to-136
PSI-1200 to-

BOTTOM HOLE TEMPERATURE
95° F

TEST # 2 (494-022)
FORMATION IN SOME CASES LEVEL
WATER CUSHION-none
IP-15 MINS.
bottom of bucket @ open
1 lb. @ 3 mins. until
end of flow
ISI-30 MINS.
blow to bottom of bucket
(0 lbs.) @ close decreasing
to 3" @ 30 mins.
FP-60 MINS.
blow to bottom of bucket
@ open 1 lb. @ 3 mins.
1½ lbs. @ 15 mins. 1½ lbs.
and GTS @ 45 mins. ½ lb.
@ 55 mins. until end of flow
PSI-120 MINS.
0 lbs. @ close weak 2'
flare when SFC manifold opened
RECOVERY-
665' (6.33 bbls.) GC
heavy crude with multiple
pockets of gas
SAMPLE CHAMBER-
1.72 CFG @ 112 PSIG and
50 cc mud

TOP CHART
IB-2249 FB-2249
IP-47 to-84
ISI-4468
FP-84 to-151
PSI-4665

BOTTOM PERFORATIONS PLUGGED
BOTTOM HOLE TEMPERATURE
95° F



Consultants

A division of the XCO Corporation

—Providing Geologists for Wellsite and Prospect Evaluation—

ENERGY RESERVES GROUP, INC.

USA - BROADHURST NO. 14

1980 FNL - 659 FEL

SE NE SECTION 9 - T7S - R23E

WALKER HOLLOW FIELD

UINTAH COUNTY, UTAH

MICHAEL FISHER, GEOLOGIST

**ENERGY RESERVE GROUP, INC.
OPERATIONS & DEVELOPMENT**

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RESUME

OPERATOR: Energy Reserves Group, Inc.

WELL NAME AND NUMBER: USA - Broadhurst No. 14

LOCATION: 1,980' FNL - 659' FEL
SE NE Section 9-T7S-R23E
Walker Hollow Field

COUNTY: Uintah

STATE: Utah

SPUD DATE: March 21, 1981

COMPLETION DATE (TD): April 6, 1981

ELEVATIONS: 5,110' GL 5,122' KB

TOTAL DEPTH: 5,480' DRLR 5,480' LOGS

CONTRACTOR: MGF Drilling, Casper, Wyoming

RIG: #65

TYPE RIG: National T-45

PUMPS: No. 1: National K-500A 15" Stroke, 6" Liner
No. 2: National C-250 15" Stroke, 5-1/2"
Liner

GEOLOGIST: Michael R. Fisher, GS Consultants

ENGINEER: Chet Baker, T.P. Engineering, Inc.

TOOL PUSHERS: Barry Waugh, Donny Quick

TYPE DRILLING MUD: Lightly treated

MUD COMPANY: Magcoar

MUD ENGINEER: Rob Helbing

HOLE SIZES: Surface conduit set @ 55'
12-1/4" 55' - 497'
7-7/8" 497' - 5,480'

CASING: 8-5/8" 24/K55 set @ 497'

RESUME (Cont.)

MUDLOGGING BY: Melton Enterprises, Inc.
Doug Rolfe, Tom Snyder

CORE INTERVAL: None

DST DEPTHS: No. 1: 3,444' to 3,520'
No. 2: 4,714' to 4,736'

DST COMPANY: Johnston - Macco (Schlumberger)

E-LOGS BY: Dresser - Atlas

LOGGING ENGINEER: Dan Babcock

TYPE LOGS RUN: DIFL; (5,480' to 497')
(With Depths) GR-DENSITY-CNL; (5,480' to 497')
GR-SONIC; (5,480' to 497')

BOTTOM FORMATION: 'K' Zone, Green River Formation

WELL STATUS: Awaiting completion.

SUMMARY AND CONCLUSIONS

Energy Reserves Group, Inc.'s USA-BROADHURST NO. 14, a development well in the Walker Hollow Field of the Uintah Basin, was drilled to a total depth of 5,480' on April 6, 1981. Primary objective of the well proposed testing significant hydrocarbon shows expected within the 'H' Zone of the Green River formation. An interval 600 to 700 feet above the 'G' Zone, as well as the 'J' and 'K' Zones were considered secondary targets of interest.

The Green River formation topped at 2,792'. A number of gas kicks were noted in the Green River above the top of the 'G' Zone at 4,362'. Four shows with magnitudes of 30 to 45 units occurred between 3,286' and 3,460'. Sandstone observed in samples including the intervals 3,286' to 3,298' and 3,455' to 3,460' display live oil with strong fluorescence and streaming cut. Respective porosities are 23.5% and 17.5% for these intervals, however water saturations are moderate to high. Similar saturations are seen over the intervals 3,360' to 3,370' and 3,380' to 3,390' as samples exhibit dead oil.

Two intervals from 3,470' to 3,480' and 3,490' to 3,515' recorded 30 units and 60 units of total gas respectively. Live oil, excellent fluorescence and cut were observed in a tight siltstone from intervals. Examination of the resistivity log reveals readings are off scale for both intervals. ϕ_{xp} 21.25% for the upper interval and Sw 5%. Corresponding values for the lower interval are 27.25% and 21% respectively.

Based on the presence of gas readings in excess of 35 units and live oil in observed samples, DST No. 1 was run on the interval 3,444' to 3,520'. Chart pressures and recovery were unproductive, for further details see the Drill Stem Test records contained within this report.

Three gas shows from 30 to 50 units were recorded from 3,555' to 3,630'. Live oil with good fluorescence and cut were observed in sandstone from the upper intervals. The lower interval displayed dead oil in sandstone and siltstone. Porosities are fair to excellent, however saturations are moderate to high.

Sandstone and siltstone observed from the interval 3,674' to 3,688' exhibited dead oil despite ϕ_{xp} 18% and Sw 35%. A minor increase in total gas was recorded at 25 units.

A 50 unit gas show was recorded from 4,322' to 4,330' as very fine and fine grained sandstone from the interval displayed live oil and diffuse cut. Crossplot porosity calculates out to 21%, however log correlation indicates Sw 51%.

SUMMARY AND CONCLUSIONS (Cont.)

No gas shows were observed in the 'G' Zone of the Green River.

The top of the 'H' Zone occurred at 4,608'. Several gas shows recorded throughout the zone. 30 units of gas showed from the interval 4,648' to 4,656'. Excellent porosities were observed with live brown oil stain and streaming cut from sandstone. Siltstone from the same interval displayed dead oil. Logs indicate fracturing present and a questionable water saturation of 55%.

The strongest gas show at 345 units occurred over the interval 4,720' to 4,736'. Tight siltstone observed in samples exhibited excellent oil stain and good diffuse and residual cuts. Sandstone from the same samples displayed excellent porosity, live oil and streaming cut. ϕ_{xp} 27.5% and water saturation is an encouraging 39%.

Drill Stem Test No. 2 was run on the 22' interval (4,714' to 4,736'), based on the magnitude of the show. Surface and chart pressures were pessimistic, however recovery of heavy crude from the pipe is encouraging. For further details see the DST record contained within this report.

Another interval from 4,745' to 4,786' recorded a gas show of 200 units. Samples include a silty, fine grained sandstone with excellent porosity and live oil. Log analysis reveals crossplot porosity of 30.25% and a producible saturation of 35%.

A 35 unit show occurred over the interval from 4,810' to 4,820'. Samples indicate clean to shaly sandstone with excellent porosity and occasional dead oil. Log porosity is a fair 18.75%, however Sw is 68%.

The 'I' Zone of the Green River was topped at 4,852', there were no shows although some dead oil was present in samples.

The top of the 'J' Zone occurred at a depth of 5,135'. Two shows occurred in the 'J' Zone from 5,165' to 5,175' and 5,195' to 5,210'. However, the minor magnitude of the shows, the definite lack of oil stain in samples, fair crossplot porosities and high water saturations rule out further analysis of these intervals.

The top of the 'K' Zone was pierced at 5,300' and three excellent shows were recorded. The first interval, 5,335' to 5,348' kicked gas up from a background of 15 units to 150 units. Again, live oil with excellent fluorescence and strong cut was observed

SUMMARY AND CONCLUSIONS (Cont.)

in fine grained sandstone. Dead oil was seen in siltstone as crossplot porosity is fair at 16.75%. Log correlation determines water saturation to be 50%.

Similar samples were observed from the interval 5,356' to 5,362' along with a gas show of 110 units. Porosity is fair at 15.5% and Sw is high at 70%.

The last gas show of the 'K' Zone occurred from 5,370' to 5,385' producing a 200 unit gas kick. A much weaker diffuse cut is visible upon immersing the fine sandstone in chlorethane. Analysis of logs reveals only fair porosity at 16% and high water saturation at 72%.

The distinct lack of gas shows or minor magnitude of the shows recorded coupled with the lack of or display of dead oil in lithology rules out the necessity of further analysis for the 'G', 'I' and 'J' Zones of the Green River formation. The interval from 3,470' to 3,515' demands closer scrutiny as it boasts the lowest water saturations of the entire hole. Quite apparent from DST No. 2's results is that the interval from 4,720' to 4,736' will be productive. Nine feet below the tested interval is a 41' interval that should be examined for productive potential as its log readings better those of the previous interval tested. Although water saturations from show intervals in the 'K' Zone are high, the presence of live oil and strong gas recordings dictate further analysis.

Energy Reserve Group's USA-BROADHURST NO. 14 is another successful step toward development of the Walker Hollow Field.

FORMATION TOPS AND CORRELATION

<u>FORMATION</u>	USA - BROADHURST #14		USA - BROADHURST #13		<u>+/-</u>
	<u>DEPTH</u>	<u>DATUM</u>	<u>DEPTH</u>	<u>DATUM</u>	
Uintah		Surface		Surface	---
Green River	2,792	+2,330	2,814	+2,299	-31
'G' Zone	4,362	+ 760	4,382	+ 730	-30
'H' Zone	4,608	+ 514	4,633	+ 480	-34
'I' Zone	4,852	+ 270	4,860	+ 253	-17
'J' Zone	5,135	- 13	5,158	- 45	-32
'K' Zone	5,300	- 178	5,330	- 217	-39

DAILY CHRONOLOGY

1981 DATE	DEPTH		WOB	RPM	PP	SPM	ACTIVITY
	12AM	7AM					
3/25	2,286	2,444	20	120	1100/ 1300	56/ 54	Drilling, twisted off, wo fishing tool, fishing, drilling
3/26	2,699	2,748	20	120	1100	56	Drilling, TOH/Bit #4, TIH/Bit #5, drilling.
3/27	3,106	3,205	20	70	1200	60	Drilling.
3/28	3,405	3,477	20	70	1200	60	Drilling, circ for DST #1, sht TOH (10 stds), circ for DST.
3/29	3,520	3,520	--	--	700	42	Circ for DST, TOH, make up test tool, TIH/tool, test, TOH/tool, brk dn tool, TIH/Bit #6, drilling.
3/30	3,643	3,756	20	70	1200	58	Drilling.
3/31	3,995	4,084	20	70	1200	58	Drilling.
4/1	4,302	4,403	20	70	1200	58	Drilling.
4/2	4,583	4,634	20	70	1200	58	Drilling, circ samples, circ for DST #2, sht TOH (12 stds), circ, TOH.
4/3	4,736	4,736	20	70	1200	60	Cont TOH, make up test tool, TIH/tool, test, TOH/tool, brk dn tool, TIH/Bit #7, drilling.
4/4	4,800	4,875	20	70	1200	60	Drilling.
4/5	5,088	5,151	20/ 25/ 30	70	1200	60	Drilling.
4/6	5,356	5,424	25/ 30	70	1200	60	Drilling, TD @12:30pm, circ for logs, TOH, rig up loggers, logging.
4/7	5,480	5,480	25/ 30	70	1200	60	Logging, rig dn loggers, TIH, circ for csg, TOH, run csg IH

Mageobar

MUD RECORD

MUDDER UP AT 2745

ON March 26, 1981

1981 DATE	DEPTH	WT.	P. VIS.	P. VIS.	YIELD	GEL STRNT	PH	FILTR	CK.	ALKA.	ALKA Filtr.	CHLO	CALCIUM	GYP / SAND	SOLID / % WTR.	CUM. COST \$
3-21	SP40		NO	CHECK												\$ 0
3-22			NO	CHECK												377.07
3-23			NO	CHECK												377.07
3-24	1828	9.0	30	5	2	1/6	7.5	N/C	2/32	.6	-	400	TR	-/TR	4.9/95.1	377.07
3-25	2444	8.9	28	-	-	-	7.5	N/C	-	.2	-	400	80	-	-	377.07
3-26	2745	9.0	28	-	-	-	7.5	N/C	-	.5	.1/5	400	40	-	-	377.07
3-27	3200	9.0	36	10	12	7/13	10	13.0	2/32	1.6	7/1.3	400	TR	-/TR	4.9/95.1	1,258.00
3-28	3477	8.8	35	12	9	7/16	10	13.0	2/32	1.8	.9/1.7	400	TR	-/TR	3.4/96.6	2,382.00
3-29	3521	8.8	42	10	5	6/12	11	7.6	2/32	2.0	1.1/2.3	500	TR	-/TR	5.4/94.6	4,427.95
3-30	3740	8.8	34	10	5	4/11	10.5	8	2/32	2.4	1.4/3.3	500	TR	-/TR	3.4/96.6	4,939.37
3-31	4078	9.0	35	10	7	5/11	10	7.8	2/32	2.6	1.6/3.2	400	TR	-/TR	4.9/95.1	5,913.83
4-1	4395	9.0	34	10	7	2/-	10	8.0	2/32	1.6	.9/2.3	400	0	-/TR	4.9/95.1	7,473.21
4-2	4629	9.0	35	10	7	4/11	10	8.0	2/32	2.0	.9/2.3	400	0	-/TR	4.9/95.1	8,406.98
4-2	4736	9.1	48	20	15	11/21	10	8.0	2/32	2.0	.9/2.2	400	0	-/TR	5.6/94.4	10,219.57
4-3	4736		TESTING													10,219.57
4-4	4865	9.1	36	10	7	5/12	10	8.0	2/32	2.0	1.1/2.9	400	0	-/TR	5.6/94.4	10,639.52
4-5	5141	9.0	34	10	4	4/7	10	7.6	2/32	1.6	.8/2.0	400	0	-/TR	4.9/95.1	12,223.82
4-6	5416	8.9	34	10	7	4/11	10	8.0	2/32	1.5	.7/1.4	400	0	-/TR	4.2/95.8	12,874.28
4-6	5480	9.2	53	16	16	15/-	11	8.4	2/32	.6	.3/1.4	400	0	-/TR	6.4/93.6	14,359.89

BIT RECORD

<u>BIT #</u>	<u>SIZE</u>	<u>MAKE</u>	<u>TYPE</u>	<u>DEPTH OUT</u>	<u>FOOTAGE</u>	<u>HOURS</u>	<u>DEV.</u>
1	12-1/2	Smith	DS-J	497	442	9-1/2	1/4°
2	7-7/8	SEC	S 3	1,568	1,071	18	3/4°
3	7-7/8	STC	DS	2,097	529	15-3/4	1/2°
4	7-7/8	STC	DTJ	2,699	615	21-1/4	Misrun
5	7-7/8	SEC	S84F	3,520	821	52-1/4	1-1/4°
6	7-7/8	Smith	F 2	4,736	1,216	96-3/4	Misrun
7	7-7/8	STC	F 2A	5,480	744	67	1°

DEVIATION RECORD

<u>DEPTH</u>	<u>DEVIATION</u>
106	1°
231	3/4°
355	1°
496	3/4°
1,007	1°
1,536	3/4°
2,034	1/2°
2,066	1/2°
2,699	Misrun
2,718	1°
3,434	1-1/2°
3,520	1-1/4°
4,200	1/4°
4,736	Misrun
5,480	1°

DRILL STEM TEST #1

Formation: Green River

Interval: 3,444' to 3,520'

Reason for Test: Triple gas shows in association with live oil through test interval.

Type Test: Conventional Open Hole-Dual Packer

Testing Company: Johnston-Macco

Testers: John Sironen, Ken Fish

Water Cushion: None

IF 15 Minutes: 4" blow @ Open, Bottom of Bucket @ 3 min, 2#
NGTS @ 8 min, 3# @ 10 min, 4# @ 12 min, 5# @ 14 min.

ISI 45 Minutes: 5# @ Close, decreasing to 3-1/2# @ 45 min.
NGTS

FF 60 Minutes: 2# @ Open, 7# @ 1 min, 8# @ 2 min, 8# @ 5 min,
NGTS 8-1/2# @ 10 min, 9# @ 15 min, 10# @ 25 min, 11#
@ 40 min, 11-1/2# @ 50 min, 12# @ 60 min.

FSI 120 Minutes: 12# @ Close, decreasing to 6# when sfc choke
increased to 3/4", GTS @ 6 min, (wk 2' flare),
dead @ 42 min.

Recovery: 203' (1.24 bbls) SGC/WC Mud

Bottom Hole Sampler: Pressure: 110 PSIG
Recovery: 1800 cc MC H2O and 0 CPG (meter
questionable).

Resistivity Data: Drill pipe recovery: 1.4 @ 64°F 650 PPM Cl
Sampler: 1.4 @ 64°F 650 PPM Cl
Mud Pit: 1.9 @ 58°F 400 PPM Cl

Pressures: Top Chart Bottom Chart

IH: 1,630	IH: 1,610
IF: 49 to 54	IF: 62 to 85
ISI: 1,250	ISI: 1,240
FF: 60 to 139	FF: 74 to 136
FSI: 1,204	FSI: 1,200
FH: 1,599	FH: 1,599

DRILL STEM TEST #1 (Cont.)

Top Choke: $1/2" + 1/4" = 3/4"$ Bottom Choke: $15/16"$
Bottom Hole Temperature: 95°

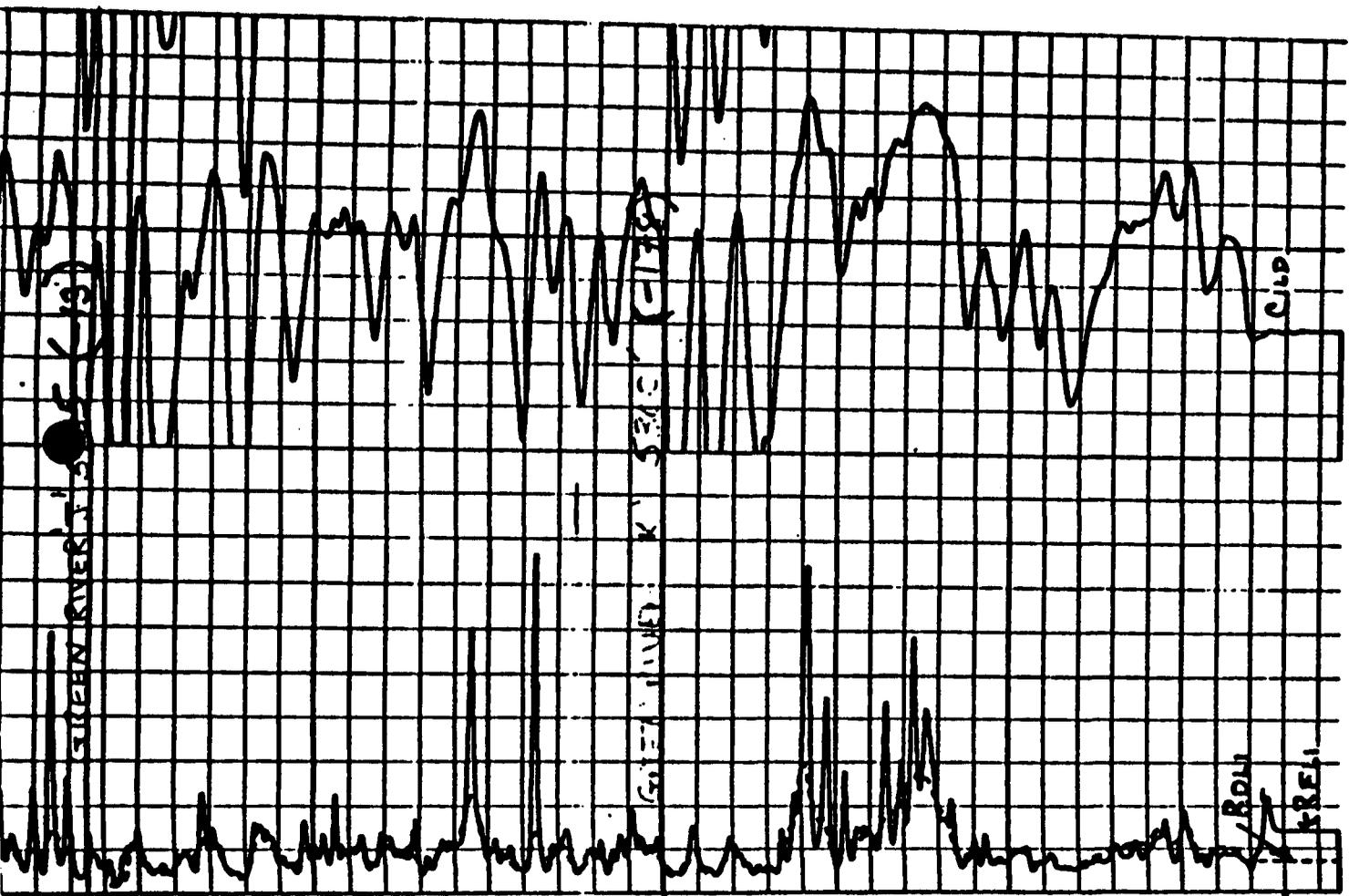
DRILL STEM TEST #2

Formation: 'H' Zone - Green River
Interval: 4,714' to 4,736'
Reason for Test: Dual gas shows in association with good oil stain, fluorescence and cut over a 17' interval.
Type Test: Conventional Open Hole - Dual Packer
Testing Company: Johnston-Macco
Tester: Eugene Torgenson
Water Cushion: None
IF 15 Minutes: Bottom of Bucket @ Open, 1# @ 3 min. until end of flow period.
ISI 30 Minutes: Blow to Bottom of Bucket (0#) @ Close decreasing to 3" @ 30 min.
FF 60 Minutes: Blow to Bottom of Bucket @ Open, 1# @ 3 min, 1-1/2# @ 30 min, 1-1/2# w/ GTS @ 45 min, 1/2# @ 55 min until end of flow period.
FSI 120 Minutes: 0# @ Close, weak 2' flare when surface manifold opened.
Recovery: 665' (6.33 bbls) GC Heavy (paraffined) crude with multiple pockets of gas.
Bottom Hole Sampler: Pressure: 112 PSIG
 Recovery: 1.72 CFG and 50 cc Mud

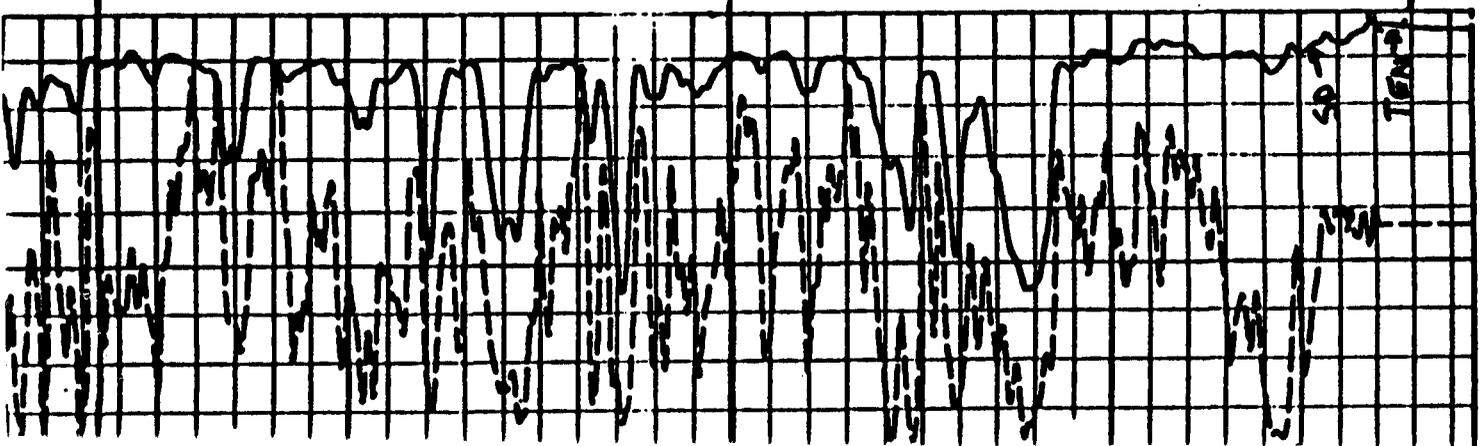
LOG ANALYSIS

<u>INTERVAL</u>	<u>TOTAL GAS</u>	<u>ØD</u>	<u>ØN</u>	<u>ØXP</u>	<u>Rt</u>	<u>Swt</u>
3,286-98	40u	26.0	21.0	23.5	25	50
3,360-70	30u	18.0	28.0	23.0	26	62
3,380-90	45u	17.5	21.0	19.25	25	90
3,455-60	40u	14.0	21.5	17.75	35	100
3,470-80	30u	14.0	28.5	21.25	N/A	5
3,490-3,515	60u	20.0	34.5	27.25	N/A	21
3,555-60	50u	46.0	32.0	39.0	5.5	100
3,575-85	45u	13.0	21.0	17.0	25	62
3,620-30	30u	22.0	22.0	22.0	30	78
3,674-88	25u	16.0	20.0	18.0	60	35
4,322-30	50u	20.5	21.5	21.0	15	51
4,648-56	30u	****FRACTURED****			18	55
4,720-36	345u	33.0	22.0	27.5	28	39
4,745-86	200u	38.0	22.5	30.25	10	35
4,810-22	35u	17.0	20.5	18.75	9	68
5,165-75	30u	16.0	17.0	16.5	15	66
5,195-5,210	25u	15.0	16.0	15.5	10	85
5,335-48	150u	16.5	17.0	16.75	15	50
5,356-62	110u	16.0	15.0	15.5	15	70
5,370-85	200u	15.0	17.0	16.0	25	72

Rw @ .19



00 05200 05300 05400



0
1000
RDL (CHM)



04900

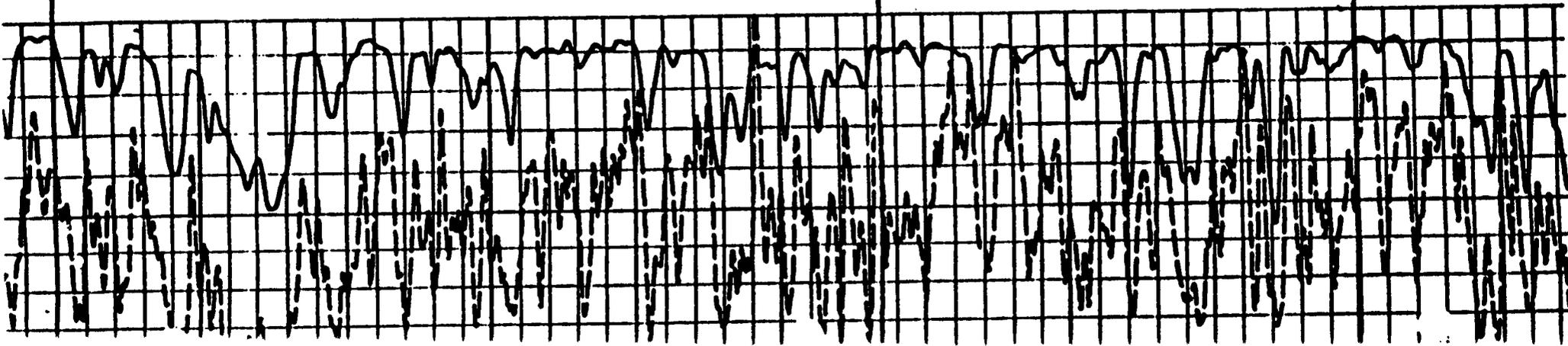
05000

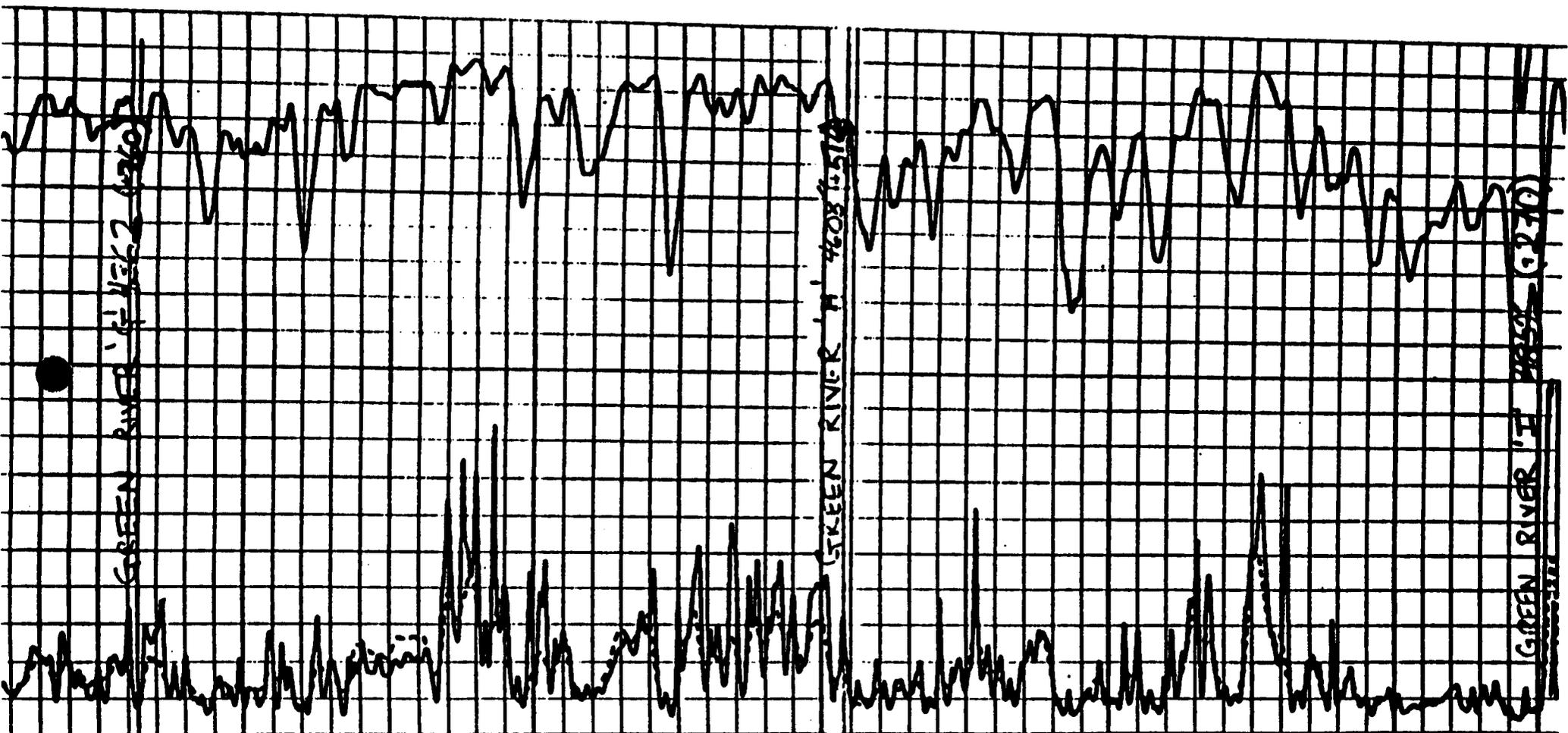
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05200

05300

-15-





04400

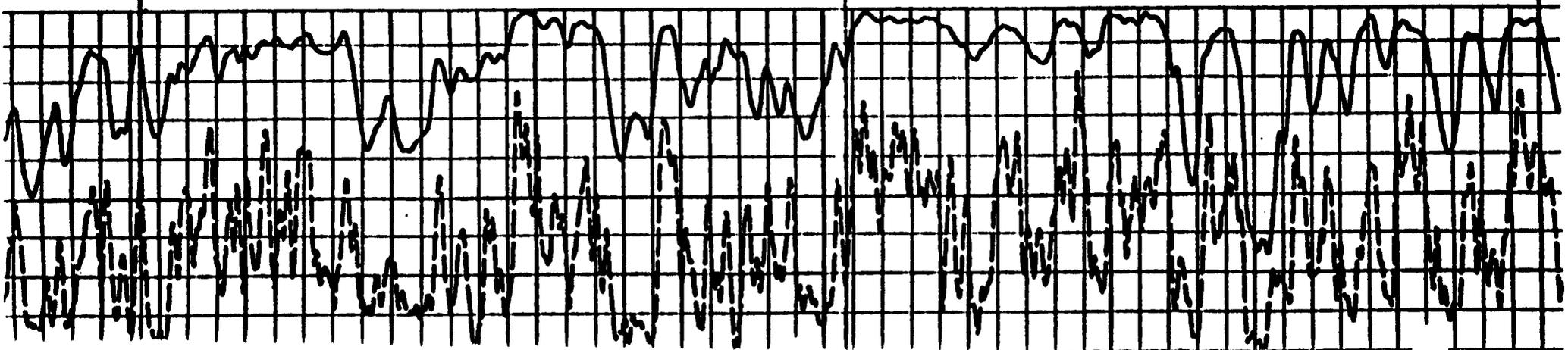
04500

04600

04700

04800

-16-



LITHOLOGY

- 2,800 - 2,820 80% SHALE - yel, lt gn, gy, rdorng, sft-frm, sbblky, n-mod slty, occ sme vf sd, tr mica, grdg to gy SLTST, arg, sdy, NSOFC.
20% SANDSTONE - gy, frm-hd, m-c gr, sbrd-sbang, n-sl arg, sme mica, sme fr-g Ø, NSOFC.
- 2,820 - 2,860 70% SHALE - var col, sft-frm, sbblky-sbfis, n-mod slty, tr mica, tr BENT.
10% SILTSTONE - gy spec, blk, frm-hd, arg, occ sme vf-f gr sd, NSOFC.
20% SANDSTONE - gy, wh-clr, frm-hd, f-c gr, sbang-sbrd, p srt, occ qtztc, sme fr Ø, NSOFC.
- 2,860 - 2,880 90% SHALE - yel gn gy brn-rdbrn, sft, sbblky, n-sl slty, tr mas PYR, tr BENT.
10% SANDSTONE - gy-clr, frm-hd, f-c gr, ang-sbrd, p srt, occ qtztc, sme calc mtx cmt, gen p Ø, occ fr intgr Ø, NSOFC.
- 2,880 - 2,900 70% SHALE - var col, yel gn gy brn, sft-frm, sbblky, n-sl slty.
Tr SILTSTONE - gy-wh, frm-hd, arg, occ sme vf gr sd, NSOFC.
30% SANDSTONE - gy-wh-clr, frm-hd, f-c gr, ang-sbrd, p srt, occ qtztc, sil cmt, occ calc mtx cmt, n-sl arg, occ sl slty, gen n-p Ø, occ fr intgr Ø, NSOFC.
- 2,900 - 2,920 10% CHERT - lt-m gy, v hd, sil.
20% SANDSTONE - gy-clr-wh, frm-hd, f-c gr sbrd-sbang, mod srt, occ calc mtx cmt, occ qtztc, gen n-p Ø, occ slty, n-v sl arg, NSOFC.
10% SILTSTONE - gy, frm, arg, sme vf sd, n Ø, NSOFC.
60% SHALE - var col, sft-frm, occ slty, gen a/a.
- 2,920 - 2,940 70% SHALE - brn gy gn yel, sft, sbblky, n-mod slty, occ sl calc, tr BENT, gygn, sft, amor.
20% SANDSTONE - gy wh-clr, frm-hd, m-c gr sbang-ang, mod w srt, occ calc cmt, gen n mtx cmt, p-occ fr Ø, NSOFC.
10% SILTSTONE - gy, frm, arg, sme vf gr sd, occ sl calc, n Ø, NSOFC, tr mas-xln PYR.
- 2,940 - 2,980 40% SANDSTONE - wh-clr, occ gy, frm-hd, f-c gr sbrd-sbang, p-mod w srt, gen n mtx cmt, occ calc-sil cmt, sme p-fr Ø, occ slty-sl arg, NSOFC.
60% SHALE - orng-rdorng yel gy-gn, sft, sbblky, a/a.
Tr BENT.
Tr mas PYR.
- 2,980 - 3,000 60% SANDSTONE - wh-clr, occ gy, frm-hd, f-c gr, sbrd-ang, mod w srt, sl-mod slty, occ mod arg, sme calc mtx cmt, gen n-p Ø, occ fr Ø, NSOFC.
40% SHALE - var col, sft, sbblky-sbfis, sl-mod calc, n-sl slty.

LITHOLOGY (Cont.)

- 3,000 - 3,020 50% SANDSTONE - clr-wh-gy, frm-hd, f-m gr, rd-sbang, occ c gr sbrd-sbang, mod w srt, calc mtx cmt, gen n-p Ø, NSOFC.
50% SHALE - yel gy gn orng-rdorng, sft, sbblky-sbfis, sl-mod calc, n-sl slty.
- 3,020 - 3,040 30% SILTSTONE - gy, frm-hd, v arg, occ sme vf sd, sil.
20% SANDSTONE - gy, frm-hd, vf-f gr w srt gen qtztc, occ sme calc mtx cmt, n arg, n-p Ø, NSOFC.
50% SHALE - orng gy yelgn, sft, sbblky-sbfis, n-sl slty, n sdy, sl-mod calc.
- 3,040 - 3,060 10% SANDSTONE - gy wh, occ pk, frm-hd, vf-f gr w srt, sme calc mtx cmt, gen n-p Ø, n-sl arg, sl slty, NSOFC.
30% SILTSTONE - lt-m gy, sft-hd, sme vf gr sd, arg, sl-mod calc, occ sil, NSOFC.
60% SHALE - var col m gy, sft-hd, sbblky-sbfis, n-sl slty, sl-mod calc, occ mod sil, tr PYR.
- 3,060 - 3,080 40% SILTSTONE - lt-m gy, frm, occ sdy, arg, sl-mod calc, occ sil, tr lt gybrn, dif-dk brn tar dd o stn, NFOC.
10% SANDSTONE - gy-wh, frm-hd, vf-m gr, mod w srt, occ slty, n-p Ø, occ fr intgr Ø, NSOFC.
50% SHALE - var col, brn-orng, sft, gen a/a.
- 3,080 - 3,140 20-30% SILTSTONE - m gy, frm, occ sdy, v arg, sl-mod calc, occ sil, tr gybrn tar, NFOC.
10-30% SANDSTONE - wh-clr, occ gy, frm-hd, f-m gr sbang-sbrd, mod w srt, n-v sl arg, occ slty, sme calc mtx cmt, gen n-p Ø, NSOFC.
50-60% SHALE - yel gy gn orng-brn, sft, sbblky, occ mod slty, n sdy, sl-mod calc.
- 3,140 - 3,280 90-95% SHALE - yel orng, gy-gybrn-brn, sft-hd, sbblky, occ slty, sl-mod dol, calc, occ tr dd brn o stn.
5-10% LIMESTONE - crm, gybrn-brn, frm-hd, micxln, micrite, n-sl slty, occ sl arg, occ sl dol, n-vp Ø, NSOFC.
- 3,280 - 3,320 30-50% SHALE - wh-lt gy-gn orng-rdbrn yel, sft, sbblky, n-v sl slty occ tr vf-f gr sd, sl-mod calc.
40-50% SILTSTONE - lt-m gy, frm-hd, arg, n-sl sdy, sl-mod calc, occ sil, n Ø, NSOFC.
10-20% SANDSTONE - lt gy, frm-hd, vf-f gr w srt, tt, qtztc, occ calc cmt, gen p Ø, tr m gy-lt gybrn dif o stn, g-exc yelgn-gol flor occ dul yel dif flor, occ stng yelgn dif-stng cut, sme/NC.
- 3,320 - 3,340 40% SANDSTONE - wh-lt gy, occ clr, frm-hd, vf-c gr sbang-sbrd, mod w srt, occ sl slty, occ sl arg, gen p-occ g Ø, tr ltgy-lt brn dif o stn-dd o stn.
50% SHALE - var col brn, sft, sbblky-fis, occ sl slty, mod calc-dol, occ sil, tr dd brn o stn.
10% LIMESTONE - brn-gybrn, frm-hd, micxln, micrite, arg, occ sl sil, n Ø, tr dd brn o stn, NFOC.

LITHOLOGY (Cont.)

- 3,340 - 3,360 90% SHALE - orng gn-gy yel brn, sft-hd, sbblky-sbfis, mod calc-dol, occ slty, occ sil.
10% SILTSTONE - dk gy, frm-hd, arg, mod calc-dol, occ sil, NSOFC.
- 3,360 - 3,380 20% SILTSTONE - gy, frm-hd, arg, calc-dol, n \emptyset , tr lt gy dd o stn, occ vf sd grdg to slty SS, qtztc/n \emptyset .
10% LIMESTONE - gy-gybrn-brn, frm, micxln, micrite, sl-mod arg, sl-mod dol, n intxln \emptyset , tr gybrn-brn dd o stn, NFOC.
70% SHALE - orng-brn-gybrn-lt gy, sft-hd, occ mod slty, sl-mod calc-dol, occ sil, tr dd o stn.
- 3,380 - 3,400 70% SHALE - var col gy brn, sft-hd, gen a/a.
10% SILTSTONE - gy, frm-hd, arg, occ sdy, sl-mod calc, occ sil, n \emptyset , NSOFC.
20% SANDSTONE - gy-gybrn-brn, frm-hd, vf-f gr w srt, qtztc, occ sl calc, sl arg-sl slty, gen n-vp intgr \emptyset , tr dd brn o stn, wk flor, NC.
- 3,400 - 3,460 20% SANDSTONE - lt-m brngy, hd, f-m gr sbang-sbrd, w srt, occ arg, sl slty, fr-exc \emptyset , g-exc dul gol flor, vg-exc yelgn dif-strg stmg cut.
20-30% SILTSTONE - gy-gybrn, frm-hd, arg, occ sdy, occ fr \emptyset , sme fr-g dul gol flor, wk yelgn dif-stmg cut, gen NFOC.
50-60% SHALE - orng-brn gy, sft-hd, occ slty, occ sil, sl-mod calc-dol, tr dd brn o stn.
- 3,460 - 3,520 60-90% SHALE - var col, gygn orng-rdbrn, sft-hd, sbblky-fis, occ slty, sl-mod calc, occ fr dd o stn, NFOC.
10-40% SILTSTONE - brn-gybrn-gy, frm-hd, arg, fr-vg dif-ptchy brn o stn, ptchy-dif bri-dul yel flor occ wk dul yelgn stmg-wk dif cut, occ sdy grdg to slty SS, gy-brn, vf-m gr mod w srt, p-g \emptyset , fr-g brn dif o stn, ptchy-dif flor, occ wk yelgn stmg cut.
- 3,520 - 3,620 40-60% SILTSTONE - gy-gybrn, frm-hd, v arg, vf-f gr, sd, sl calc mtx, occ sil, gen n-p \emptyset , tr lt brn-brngy dif-ptchy dd o stn.
20-30% SHALE - brngy orng yel gygn, sft-frm, sbblky, occ slty, sl-mod calc-dol, occ sil.
10-20% SANDSTONE - lt-m brn, lt gy, frm-hd, vf-m gr, sbang-rd, w srt, occ slty-arg, sil-qtztc, tt occ calc mtx, gen n-vp \emptyset , occ fr-g intgr \emptyset , occ fr brn dif-dd o stn, occ dul yelgn flor, occ stng yelgn stmg-wl dif cut, gen NFOC.
- 3,620 - 3,720 10-40% SILTSTONE - lt-m gy-gybrn, frm-hd, arg, sdy, sl-mod calc, occ sil, n \emptyset , NSOFC.
40-70% SHALE - gn gy yel orng-brn, sft-frm, sbblky sl calc-dol, occ sil.
20% SANDSTONE - wh-crm lt gy, hd, vf-f gr w srt, slty-arg, occ calc-dol mtx, sil-qtztc, tt, gen n \emptyset , n-tr lt gybrn dd o stn, tr dul flor, NC.

LITHOLOGY (Cont.)

- 3,720 - 3,760 10-40% SANDSTONE - wh-lt gy, frm-hd, vf-f gr, sbang-rd w srt, occ slty-arg, gen cln, occ calc mtx, gen fr-exc \emptyset , occ n-p intgr \emptyset , NSOFC.
40-50% SHALE - gn gy orng brn yel, sft-frm, sbblky, occ sl slty, occ calc-dol, occ sil.
10-20% DOLOMITE - brn-gybrn, hd, micxln, mod-v arg, calc, n \emptyset , NSOFC.
10% LIMESTONE - wh-gy-gybrn-tan, sft-hd, micxln, micrite, arg, dol, n \emptyset , NSOFC.
- 3,760 - 3,800 Tr-10% SANDSTONE - wh ltgybrn-brn, frm-hd, vf-m gr, mod w srt, occ arg-slty, occ sl dol mtx, n-exc \emptyset , occ fr lt brn dif o stn, occ dul yelgn dif flor, occ wk yelgn stmg-dif cut, gen NSOFC.
20-30% DOLOMITE - m gy-gybrn-brn, hd, micxln, arg, occ slty, mod calc, n \emptyset , occ tr dd brn o stn, NFOC.
10% SILTSTONE - m gy-gybrn, frm-hd, arg, sdy, calc mtx, occ sil, n \emptyset , tr dd brn o stn, occ dul yel flor, NC.
45-50% SHALE - gy-gn orng mot yel brn, sft-hd, sbblky occ slty, occ calc-dol, occ dd o stn, NFOC.
- 3,800 - 3,840 Tr-10% SANDSTONE - wh-lt gy, hd, f-c gr sbang-rd, w srt, n-sl arg, n slty, cln, occ sl calc, g-exc intgr \emptyset , NSOFC.
Tr-10% SILTSTONE - gy-gybrn, frm-hd, arg, sdy, calc mtx, occ sil, n \emptyset , tr dd o stn, NFOC.
60-70% SHALE - var col, sft-hd, sbblky, occ slty, sl-mod calc.
20-30% DOLOMITE - brn-tan-gybrn, hd, micxln, arg, calc, n \emptyset , tr dd brn o stn, occ dul flor, NC.
- 3,840 - 3,860 98% SANDSTONE - wh-clr, hd, f-m gr sbang-rd mod w srt, n arg, n-sl slty, sl-mod calc, fr-exc intgr \emptyset , NSOFC.
- 3,860 - 3,900 Tr-20% DOLOMITE - gy-gybrn, hd, crp-micxln, v arg, occ slty, sl-mod calc, n \emptyset , NSOFC.
50-70% SHALE - yel orng rdbrn gy gn, sft-hd, sbblky occ sil, occ slty, sl-mod dol-calc, NSOFC.
10-20% SANDSTONE - wh-lt gy, frm-hd, f-m gr, sbang-sbrd, mod w srt, sl arg-slty, sl-mod calc-dol, p-vf intgr \emptyset , NSOFC.
10-20% SILTSTONE - lt-m gy-gybrn tan, frm-hd, arg, sme vf sd, sl-mod dol-calc, occ sil, n \emptyset , occ dd o stn, NC.
- 3,900 - 3,920 20% SANDSTONE - wh-lt gy clr, hd, vf-m gr, sbang-rd, w srt, sl-mod arg-slty, mod calc, occ sil, tt, sme g-exc \emptyset , NSOFC.
10% SILTSTONE - lt-m gy, frm-hd, arg-sdy, calc-dol, NSOFC.
50% SHALE - var col, sft-frm, sbblky, calc-dol, occ slty.
20% LIMESTONE - lt brn-tan occ gybrn, frm-hd, micxln, micrite, sl-mod dol, arg, n \emptyset , NSOFC.

LITHOLOGY (Cont.)

- 3,920 - 4,000 SHALE - var col, sft-hd, blk-y-sbblky, calc-dol, occ slty grdg to SLTST.
SANDSTONE - wh-gy, hd, vf-f gr sbang-sbrd, mod w srt occ fri, occ calc, sme cht, sme pyr, gen p-occ vg Ø, NSOFC.
- 4,000 - 4,060 10% LIMESTONE - tan-lt brn, frm-hd, vf-micxln, micrite, arg, dol, n Ø, NSOFC.
30-80% SHALE - gy-gygn yel orng, sft-frm, sbblky-sbfis, occ slty, calc-dol.
20-50% SANDSTONE - wh-ltgy clr, frm-hd, vf-m gr sbang-rd, mod w srt, occ fri, sl arg-slty, sl-mod calc, occ exc Ø, NSOFC.
Tr-10% LIMESTONE - tan, lt brn-buff, frm-hd, vf-micxln, micrite, arg, occ dol, n intxln Ø, NSOFC.
Tr-10% SILTSTONE - lt gy-gybrn-tan, frm-hd, arg, occ sdy, sl-mod calc-dol, occ sil, NSOFC.
- 4,060 - 4,120 10% SANDSTONE - tan-ltbrn gy wh, frm-hd, f gr sbang-sbrd, w srt, arg slty, sl-mod calc, gen n-vp Ø, occ fr-g intgr Ø, sme fr lt brn dif o stn, dull yelgn dif flor, stng yelgn stng-stng yelgn dif cut.
10-40% LIMESTONE - gy-gybrn, frm-hd, crp-micxln, micrite, arg, sl-mod dol, n in xln Ø, sme fr dd o stn, NFOC.
20-60% SHALE - var col, sft-frm, sbblky, occ slty, calc-dol, tr dd brn o stn, NFOC.
15-30% SILTSTONE - m gy-gybrn, tan, frm-hd, arg, calc, n Ø, tr dd o stn, tr dul yelgn flor, n cut.
- 4,120 - 4,140 10% LIMESTONE - lt gybrn-tan-buff, hd, crp-micxln, micrite, arg-slty, sl dol, n intxln Ø, NSOFC.
20% SILTSTONE - gy-gybrn, frm-hd, arg, calc, n Ø, NSOFC.
70% SHALE - yel rdorng-brn gy-gn, sft-frm, a/a.
- 4,140 - 4,300 Tr-25% LIMESTONE - lt-m brn buff-tan gybrn, hd, vf-micxln, micrite, arg, dol, gen n-p Ø, occ sme fr gybrn dd o stn, occ dul-bri yelgn flor, NC.
Tr-20% SANDSTONE - gy-gybrn, lt brn-buff, hd, vf-f gr, w srt, arg-slty, calc, occ fr intgr Ø, gen tt, occ dd o stn, sme fr dul-bri yelgn flor, n cut.
40-88% SHALE - var col, sft, n-mod slty, calc occ dol, sbblky-sbfis, occ s plty.
- 4,300 - 4,340 10-20% SANDSTONE - lt brn-buff-gybrn-lt gy, sft-hd, vf-f gr sbang-sbrd w srt, occ arg-slty, calc-dol mtx cmt, gen fr-exc intgr Ø, occ tt-qtztc, fr-g lt brn dif o stn, sme g yelgn dif-ptchy flor, occ stng bri yelgn stng-stng dif cut.
50-60% SHALE - yel orng-rdbrn gy-gn, sft-frm, sme sl : slty, calc-dol, NSOFC.
10-20% LIMESTONE - buff-brn gybrn lt gy, frm-hd, vf-micxln, arg-slty, n-vp intxln Ø, g brn dif-strk dd o stn, occ dull yelgn flor, n cut.
10-20% SILTSTONE - lt-m gy gybrn-brn, arg-sdy, calc-dol, tt, fr-g brn dif dd o stn, occ g dif flor, n cut.

LITHOLOGY (Cont.)

- 4,340 - 4,400 10% LIMESTONE - buff, lt gy-gybrn, frm-hd, micrite, arg, occ slty, n-p \emptyset , occ lt brn dif o stn-dk brn tar, sme dul yelgn flor, occ wk dif cut.
Tr-10% SANDSTONE - wh-clr-lt gy, vf-f gr, arg-slty, calc-dol, occ tt, gen g-exc intgr \emptyset , occ lt brn dif dd o stn, tr flor, NC.
10-30% SILTSTONE - m gy-gybrn, brn-tan, frm-hd, arg sl-mod sdy, tt, calc-dol, occ fr-g lt brn dif dd o stn, NFOC.
55-70% SHALE - var col, sft-frm, sme sl slty, calc, occ sl dol, tr tar strk, NFOC.
- 4,400 - 4,440 20% LIMESTONE - buff-tan, lt brn, hd, micrite, sl-mod arg, sl dol, n \emptyset , occ mnl flor, NSOC.
10% SANDSTONE - wh-lt gy, frm-hd, vf-f gr, w srt, arg-slty, calc-dol, v occ brn dif o stn, v dul yelgn flor, stng yelgn dif cut.
10% SILTSTONE - gy-gybrn, brn-tan, arg, occ sdy, tt, calc-dol, occ dd o stn, NFOC.
60% SHALE - yel-orng, rdbrn-brn, gy gn, sft-frm, calc, occ tar strk, NFOC.
Tr CHERT - clr, hd.
- 4,440 - 4,460 Tr COAL - blk, sft, sl vit.
10% LIMESTONE - tan-lt brn-buff, occ gybrn, frm-hd, micxln, micrite, arg, sl dol, n \emptyset , NSOFC.
20% SILTSTONE - lt-m gy-gybrn, occ tan, a/a.
20% SANDSTONE - wh-clr, lt-m gy, gybrn, frm-hd, vf-f gr w srt, arg-slty, calc-dol, occ tt, gen fr-exc \emptyset , occ tr brn dif o stn, NFOC.
48% SHALE - var col, sft-frm, sbblky-fis, occ slty-sdy, calc, tr tar strk, NFOC.
- 4,460 - 4,490 Shaker bypassed for repair - no samples.
- 4,490 - 4,520 20-30% SANDSTONE - wh-lt gy-clr, occ gybrn, frm-hd, f gr sbang-sbrd, w srt, sl-mod arg-slty, qtztc, calc, gen tt, occ exc \emptyset , tr dd o stn, NFOC.
10-20% SILTSTONE - lt-m gy, gybrn-brn tan-buff, frm-hd, arg-sdy, sl-mod calc, tt, tr dd o stn, NFOC.
10-20% SANDSTONE - wh-lt, clr-v lt brn, frm-hd, vf-f gr sbang-sbrd, mod w srt, slty-arg, sl-mod calc, gen tt, sme fr-exc \emptyset , occ lt brn dif dd o stn-strk tar, NFOC.
50% SHALE - orng-rdbrn, yel, gy-gn, sft-frm, sbblky-sbfis, sl slty-occ sdy, calc, NSOFC.

LITHOLOGY (Cont.)

- 4,520 - 4,600 Tr-10% SANDSTONE - wh-lt gy-clr, sft-hd, vf-f gr occ m gr sbang-sbrd, w srt, occ fri, mod calc mtx cmt, arg-slty, calc, occ fr \emptyset , NSOFC.
58-78% SHALE - yel gy, gn, rdbrn-orng, sft-frm, sbblky-sbfis, occ splty, calc, sl slty-sdy, NSOFC.
10-20% SILTSTONE - buff-tan, lt-m gy, gybrn-brn, sft-hd, arg, occ sme vf sd, calc, n-p \emptyset , occ brn dif dd o stn, NFOC.
- 4,600 - 4,700 20-30% SANDSTONE - wh-clr, lt gy-lt brn, sft-hd, vf-m gr, sbang-sbrd, mod w srt, occ arg-slty, occ fri, sme fr-exc \emptyset , occ lt brn o stn, tr wk yelgn flor, tr bri yelgn stmg-dif cut, gen NSOFC.
10-30% SILTSTONE - buff-brn, lt-m gy, sft-hd, arg, occ v sdy, n \emptyset , occ tr dd o stn, NFOC.
Tr-10% LIMESTONE - buff-lt brn, frm-hd, vf-micxln, micrite, arg-slty, sl dol, n \emptyset , tr dd o stn, NFOC.
50% SHALE - var col, sft-frm, sbblky-sbfis, calc, occ slty, NSOFC.
- 4,700 - 4,740 10% SANDSTONE - clr lt gy, lt brn, sft-frm, f gr sbang, w srt, n-sl arg-slty, n-sl arg-slty, n-sl calc, fr exc \emptyset , lt brn dif o stn, exc bri yel dif flor, stng yelgn stmg-dif cut.
Tr-10% LIMESTONE - wh-crm brn, sft-frm, occ hd, micxln, micrite, n-sl arg, occ sl dol, n-tr intxln \emptyset , occ fr lt gybrn dif o stn, exc yelgn diff flor, wk yelgn-blgn stmg-stng dif cut.
30% SILTSTONE - brn lt-m gy yel var col, frm-hd, arg, occ v sdy, sl calc, tt, occ sme g lt-m brn dif dd o stn, NFOC.
50-60% SHALE - var col, sft-frm, sbblky, occ slty, sme v calc, NSOFC.
- 4,740 - 4,760 10% SANDSTONE - lt brn, lt gy, clr-wh, sft-hd, vf-f gr, mod-w srt, occ v arg-slty, calc mtx cmt, occ qtztc, tt, sme fr-exc \emptyset , sme lt brn dif-ptchy o stn, sme fr-exc yelgn dif-ptchy flor, wk stmg-dif cut.
20% SILTSTONE - lt-m gy, rdbrn-brn, frm-hd, arg sme sdy, sl calc, occ sil, tt, occ tr dd o stn, NFOC.
70% SHALE - yel gy-gn rdbrn-orng buff-tan, sft-frm, occ slty, occ sdy, mod calc, tr dk brn strk dd o stn, NFOC.

LITHOLOGY (Cont.)

- 4,760 - 4,780 70% SANDSTONE - lt gy-wh, occ clr, frm-hd, f gr w srt, arg-slty, calc mtx cmt, p intgr \emptyset , n-tr lt gy o stn, occ fr yelgn flor, v wk dul yel dif-resid cut.
Tr LIMESTONE - wh-crm, micrite, n arg, occ sl slty, sl dol, n \emptyset , NSOFC.
28% SHALE - var col, sft, gen a/a.
- 4,780 - 4,800 50% SANDSTONE - clr, lt gy, occ wh, frm-hd, vf-f gr, sbang-sbrd, mod w srt, arg-slty, calc mtx cmt, gen n \emptyset , occ sme fr-g intgr \emptyset , occ fr lt gy dif o stn, occ tr yelgn ptchy flor, NC.
10% SILTSTONE - lt-m gy gybrn, frm-hd, arg, occ sdy, sl calc, tt, tr dd o stn, NFOC.
40% SHALE - rdbrn-orng, yel, gy-gn, sft-frm, sbblky-fis, occ slty, calc, NSOFC.
- 4,800 - 4,900 10-30% SANDSTONE - clr, lt gy, occ lt brn, frm-hd, vf-f gr w srt, slty-arg, calc mtx cmt, gen tt, p intgr \emptyset , n-tr dd o stn, NFOC.
10-30% SILTSTONE - lt gy-gygn, occ lt gybrn, frm-hd, arg, occ sdy, sl calc, tt, occ tr mnl flor, NSOC.
48-68% SHALE - var col, sft-frm, a/a.
Tr LIMESTONE - lt-m gy brn-buff, frm-hd, micxln-cooltc, micrite, arg, sl dol, n-vp intxln \emptyset , NSOFC.
- 4,900 - 4,960 10-40% SILTSTONE - gy-gygn, gybrn-brn-buff, frm-hd, arg, occ sdy, sl-mod calc, tt occ strk-ptchy tar, NFOC.
10% SANDSTONE - wh-lt gy clr, frm-hd, vf-f gr cons w srt, sl slty, arg, n-sl calc, n-vp \emptyset , occ tr dd o stn, NFOC.
- 4,960 - 5,000 20-40% SILTSTONE - lt-m gy, gybrn-brn-buff, sft-frm, arg, occ sdy, sl-mod dol, NSOFC.
45-55% SHALE - var col, sft, sbblky-fis, occ v slty, sl sdy, calc, NSOFC.
Tr-20% SANDSTONE - lt brn, lt gy-clr, frm-hd, vf-f gr, mod w srt, slty-arg, sl calc mtx cmt, occ qtztc, n-fr \emptyset , occ dif o stn, NF, occ wk dif-resid cut, gen NSOFC.
Tr-20% LIMESTONE - lt brn-tan-buff, occ gy, frm-hd, crp-micxln, micrite, occ ool, arg, occ sl dol, n \emptyset , NSOC, sme dul yel mnl flor.

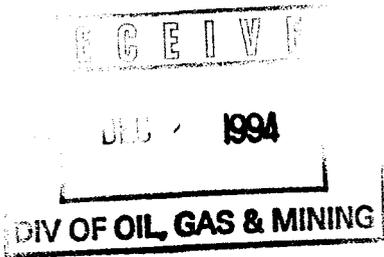
LITHOLOGY (Cont.)

- 5,000 - 5,100 Tr-10% SANDSTONE - brn lt gy-gybrn, sft-hd, vf-f gr mod w srt, arg-slty, sl calc, occ fr \emptyset , tr brn dif o stn, occ dul yelgn flor, tr wk dif yel gn cut.
20-30% SILTSTONE - gy-gybrn-dk brn, frm-hd, arg, occ mod sdy, occ sil, tt, n-vp \emptyset , fr brn dd o stn, NFOC.
35-60% SHALE - var col, sft, sbblky-fis, occ splty, occ slty, calc, tr tar specs, NFOC.
10-25% LIMESTONE - buff-tan-brn-gybrn, occ clr, frm-hd, crp-micxln, micrite, arg, dol, n \emptyset , sme ool/calc mtx cmt, tr fr dd o stn, occ mnl flor, n cut.
- 5,100 - 5,120 10% LIMESTONE - tan-buff m gybrn, frm-hd, micrite, a/a.
20% SILTSTONE - brn-tan gybrn, arg, occ sl sdy, sl calc, occ sil, tt, fr dd o stn, NFOC.
70% SHALE - var col, sbblky-splty, calc, occ sl slty, tr tar specs, NFOC.
- 5,120 - 5,220 Tr-10% SANDSTONE - gy, gybrn, lt brn, occ clr, frm-hd, f gr, sil-qtztc, sl-mod arg, gen n-vp \emptyset , n-tr dd o stn, NFOC.
55-60% SHALE - gy-gn, buff-brn yel orng, sft-frm, sbblky-sbfis, occ splty, calc, sl-mod slty, occ sme vf sd, NSOFC.
10-15% LIMESTONE - brn-gybrn, frm-hd, micxln, micrite, arg occ slty, sl dol, n intxln \emptyset , occ fr dd o stn, NFOC.
20-25% SILTSTONE - gy-gybrn-brn, occ buff, sft-frm, arg, sme v sdy, sl calc, sil, tt, sme fr dd o stn, NFOC.
- 5,220 - 5,230 10% SANDSTONE - clr smky gy, frm-hd, vf-f gr cons sbrd -rd, mod w srt, occ fri, sl calc, sme sil mtx cmt, occ f-m gr uncons sbang, NSOFC.
20% SILTSTONE - gy-gybrn-buff, sft-frm, arg, occ v sdy, sl calc, occ sil-qtztc, tt, n \emptyset , occ blk-brn tar strk-spec, NFOC.
70% SHALE - rdbrn-orng, gy-gn, tan-yel, sft-frm, sbblky-sbfis, occ slty, sme vf sd, calc, NSOFC.
- 5,230 - 5,270 Shaker down for repair - no samples.
- 5,270 - 5,300 20-30% SANDSTONE - clr-wh, lt gy-occ lt brn, hd, vf-m gr, cons, p srt, sme calc mtx cmt, occ sil, arg-slty, occ fri, sme fr-exc \emptyset , tr brn dif o stn, bri yel dif flor, stng-wk stmg-dif cut.
50-60% SHALE - var col, sft, sbblky-fis, slty, occ sdy, calc, NSOFC.

LITHOLOGY (Cont.)

- 5,300 - 5,380 50-70% SHALE - var col, sft-frm, gen a/a.
Tr-10% LIMESTONE - lt brn-buff, micxln, micrite, arg,
n intxln \emptyset , tr-p brn dd o stn, occ dul gol mnrl flor,
n cut.
10-20% SANDSTONE - wh-clr, occ lt brn, vf-f gr cons,
mod w srt, sl arg-slty, occ sil-qtztc, sl calc, sme
fr-exc \emptyset , occ fr-g lt brn dif o stn, occ fr ptchy-dif
dul gol flor, occ sme stng stmg-dif cut, gen NSOFC.
10-25% SILTSTONE - gy-gybrn, occ var col, sft-frm,
arg, occ v sdy, sl-mod calc, occ sil, gen tt, tr gy-
gybrn dd o stn, NFOC.
- 5,380 - 5,420 20% SILTSTONE - gy-gybrn, tan-yelbrn-buff, sft-frm,
arg sme sdy, sl-mod calc, NSOFC.
Tr LIMESTONE - gy-gybrn, frm-hd, micxln, micrite, arg,
n \emptyset , NSOFC.
68-78% SHALE - var col, sft, sbblky-fis occ splty,
calc, sl-mod slty, occ sdy, NSOFC.
- 5,420 - 5,440 20% SILTSTONE - gy-gybrn, sft-frm, arg, occ v sdy,
n-sl calc, sme tar specs, NFOC.
80% SHALE - var col, gygn, yel, orng, rdbrn-brn, sft,
gen a/a.
- 5,440 - 5,460 10% SANDSTONE - gy-gybrn, brn-clr, vf-f gr, cons p srt,
sme calc mtx cmt, occ sil cmt, occ qtztc, p \emptyset , occ
fr dif brn o stn-tar, sme dul yelgn flor, v wk dif cut.
10% LIMESTONE - gy brn-gy, brn-buff, crm, crp-micxln,
n \emptyset , fr brn-gybrn dd o stn, tr dul yel mnrl flor, n cut.
20% SILTSTONE - gy-gybrn-yelbrn, arg sme sdy, sl calc,
n-p \emptyset , fr dd o stn, NFOC.
60% SHALE - var col, sft, sbblky-fis, splty, n-mod
slty, occ sdy, calc, NSOFC.
- 5,460 - 5,480 15% SANDSTONE - clr, lt brn, wh, hd, vf-f gr, cons, p
srt, n-sl arg, n-sl slty, n-sl calc, occ qtztc, gen
p \emptyset , tr lt brn dd o stn, fr yel gn flor, n cut, occ
f-m gr uncons rd-sbrd.
Tr LIMESTONE - gy-gybrn, micrite, arg, sl dol, n \emptyset ,
NSOFC.
20% SILTSTONE - gen a/a.
63% SHALE - var col, sft, sbblky-fis splty, occ slty-
sl sdy, calc, NSOFC.

COMPLETION DATA FOR WELLS WITHIN 1/2 MILE RADIUS OF INJECTION WELLS



Completion Information

Wellbore Diagrams

Spud Date: 3/30/64
 TD Date: 4/19/64
 Completion Date: 7/7/64
 IPP: 216 BO, 108 MCF, 105 BW

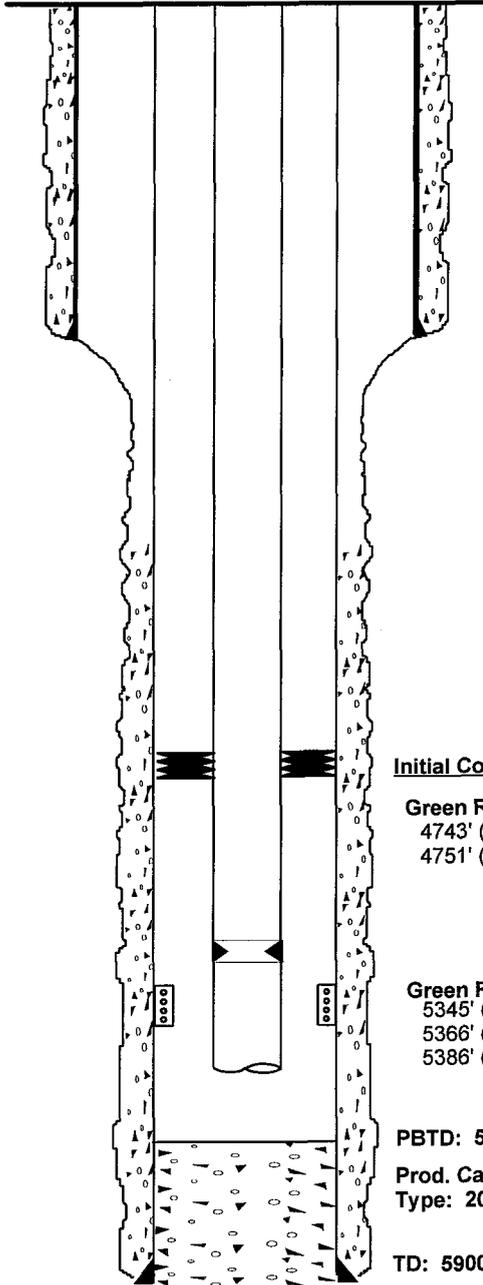
Pearl Broadhurst #4
 Walker Hollow Field
 SW SE Sec9-T7S-R23#
 760' FSL, 1980' FEL
 Elevation: 5180' GL, 5192' KB
 Uintah County, Utah

Tubing Record

KB.....	12.00'
1 - 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....	31.73'
1 - 2-7/8", 6.5#, J-55, EUE, 8rd pup jt.....	10.05'
141 jts 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....	4627.26'
1 - 7" x 2-7/8" TAC.....	2.80'
21 - 2-7/8" x 2.5" SN.....	1.10'
1 - 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....	32.95'
1 - notched collar.....	0.60'
<hr/>	
End of tubing.....	5410.41'

Rod Record

- 1.5" x 22' polished rod
- 1 - 7/8" x 6' pony
- 1 - 7/8" x 4' pony
- 69 - 7/8" scraped rods
- 144 - 3/4" rods
- 2.5" x 1.25" x 15' RHAC



Initial Completion

Green River "H" ←
 4743' (1 spf)
 4751' (1 spf)

Stimulation

Frac
 500 gal. 15% mud acid
 10,000# 10/20 sand
 6,000# Resin, 2000# balls
 67 BPM @ 2300#

Secondary Completion(9/25/84)

5270'-5274' (3 spf)
 5344'-5346' (3 spf)
 5364'-5368' (3 spf)
 5383'-5388' (3 spf)

Acidized each interval w/
 50/50 mix 15% HCl & Xylene

Green River "K" ←
 5345' (1 spf)
 5366' (1 spf)
 5386' (1 spf)

Frac
 500 gal. 15% mud acid
 10,000# 10/20 sand
 8,000# Resin-ball mix
 52.5 BPM @ 1900#, ISI: 1400#

Tertiary Completion (2/22/94)

4741'-4748' (4 spf)
 4747'-4756' (4 spf)

PBTD: 5486' KB

Prod. Casing @ 5534'
 Type: 20#, 23#

TD: 5900' KB

Core #1: 4661'-4713'
 Core #2: 4713'-4765'
 Core #3: 5269'-5313'
 Core #4: 5313'-5365'
 Core #5: 5365'-5417'

Pearl Broadhurst #14
 Walker Hollow Field
 SE NE Sec9-T7S-R23E
 1980' FNL, 659' FEL
 Elevation: 5110' GL, 5122' KB
 Uintah County, WY

Spud Date: 3/21/81
 TD Date: 4/7/81
 Completion Date: 6/10/81

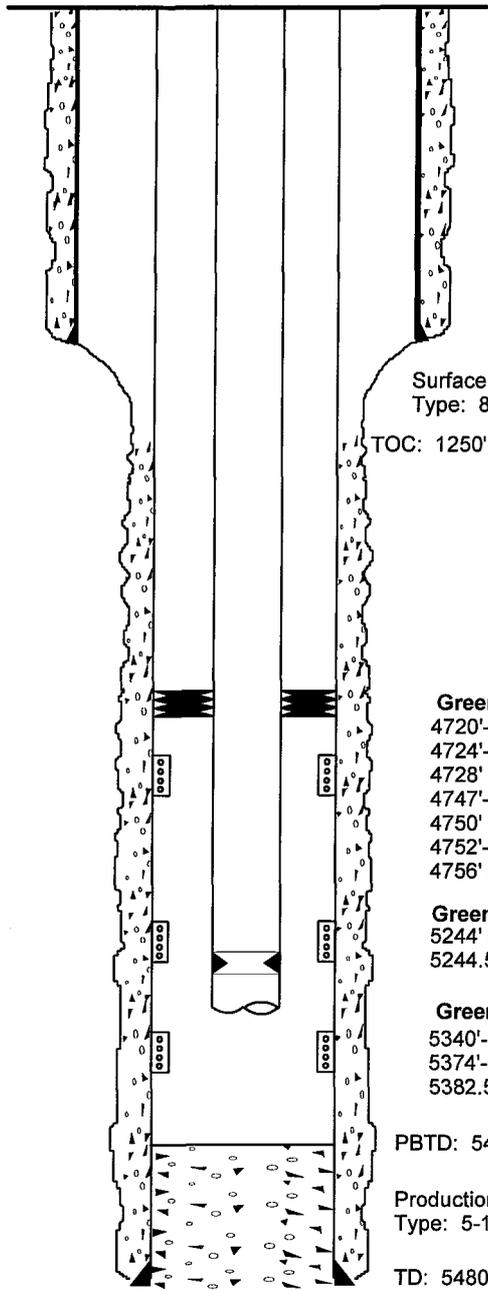
Tubing Record
 KB.....13.00'
 143 jts 2-7/8", 6.5#, EUE, J-55, 8rd coated tbg.....4513.37'
 1 - 5.5" x 2.5" TAC.....2.80'
 21 jts 2-7/8", 6.5#, EUE, J-55, 8rd coated tbg.....629.49'
 1 - 2-7/8" x 2.5" SN.....1.10'
 5 jts 2-7/8", 6.5#, EUE, J-55, 8rd coated tbg.....159.90'
 1 - notched collar.....0.60'

End of tubing.....5320.26'

Rod Record
 1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 97 - 7/8" scraped rods
 108 - 3/4" rods
 1 - 3/4" x 2' pony
 2.5" x 1.75" x 12' x 13' x 16' RHAC

Initial Completion
 Perfd & Treated "H", "J", "K" as shown

Workover History
 Reperfd "H" 4719'-4730' (4 spf) & 4745'-4762' (4 spf). Acidized w/ 500 gal. Xylene & 1500 gal. 7.5% MSR-100



Surface Casing @ 497'
 Type: 8-5/8", 24#

TOC: 1250' KB

Green River "H" ← Broke Formation
 4720'-4722' (1 spf) ← 750 gal. 7.5% HCl, ISI: 1000#
 4724'-4726' (1 spf) ← Frac ("H" sand)
 4728' (1 spf) ← 10,000 gal. Super "E" pad
 4747'-4748' (1 spf) ← 25,000 gal. Super "E"
 4750' (1 spf) ← 55,000# 20/40
 4752'-4754' (1 spf) ← 24,000# 10/20
 4756' (1 spf) ← 33 BPM @ 3000#, ISI: 750#

Green River "J" ← Broke Formation
 5244' (1 spf) ← 300 gal. 7.5% HCl, ISI: 1700#
 5244.5' (1 spf) ← Frac ("J" & "K" sand)

Green River "K" ← Broke Formation
 5340'-5342' (1 spf) ← 500 gal. 7.5% HCl, ISI: 1000#
 5374'-5378' (1 spf) ← 10,000 gal. Super "E" pad
 5382.5' (1 spf) ← 22,000 gal. Super "E" fluid
 55,000# 20/40
 24,000# 10/20
 33 BPM @ 3000#, ISI: 750#

PBD: 5438' KB

Production Casing @ 5480' KB
 Type: 5-1/2", 14#

TD: 5480' KB

DST #1: Green River 3444'-3520'
 15-45-60-60
 IF: 84# FF: 139#
 ISI: 1250# FSI: 1204#

DST #2: Green River "H" 4714'-4736'
 15-30-60-120
 IF: 84# FF: 131#
 ISI: 1468# FSI: 1665#

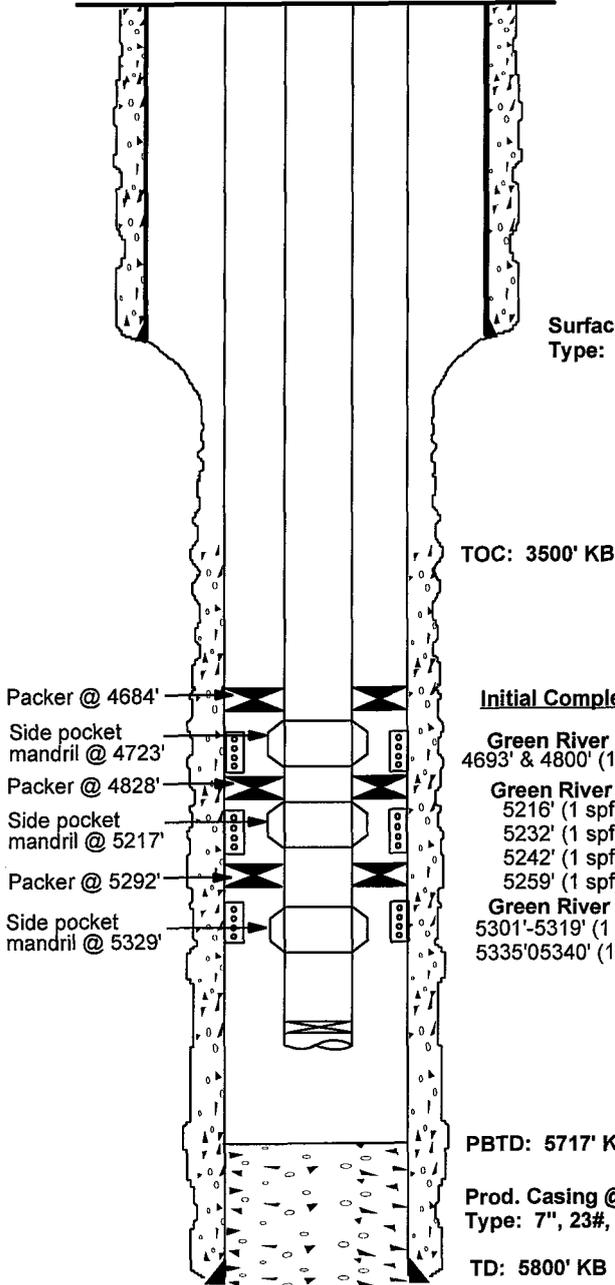
Spud Date: 12/16/63
 TD Date: 1/3/64
 Completion Date: 1/19/64

Pearl Broadhurst #2
 Walker Hollow Field
 C SW NW Sec10-T7S-R23E
 2140' FNL, 500' FWL
 Elevation: 5110' GL, 5121' KB
 Uintah County, Utah

Initial Completion
 Perf'd & treated "H", "J", & "K" as shown.

Workover History
 9/8/75: Squeezed 4693' & 4800'.
 12/17/84: Reperf'd "H", "J", & "K" zones, as shown
 4/10/85: Began water injection.
 2/4/94: Injecting wtr @ 333 BPD @ 1750#. Treated w/ 500 gal. Xylene & 1250 gal. 15% HCl. Injection @ 592 BPD @ 1750#.

Tubing Record
 2-7/8", 6.5#, J-55, EUE, 8rd tbg to top of 1st packer (4684')
 1st side pocket mandril @ 4723'
 2nd packer @ 4828'
 2nd pocket mandril @ 5217'
 3rd packer @ 5292'
 3rd side pocket mandril @ 5329'
 Standing valve @ 5397'



Surface casing @ 516'
 Type: 10-3/4", 32.75#

TOC: 3500' KB

Packer @ 4684'
 Side pocket mandril @ 4723'
 Packer @ 4828'
 Side pocket mandril @ 5217'
 Packer @ 5292'
 Side pocket mandril @ 5329'

<u>Initial Completion</u>	<u>Stimulation</u>
Green River "H" ← 4693' & 4800' (1 spf)	500 gal. mud acid 20,000# 10/20 sand
Green River "J" ← 5216' (1 spf) 5232' (1 spf) 5242' (1 spf) 5259' (1 spf)	500 gal. mud acid 20,000# 10/20 sand
Green River "K" ← 5301'-5319' (1 spf) 5335'-5340' (1 spf)	500 gal. mud acid 15,000# 10/20 sand

<u>Secondary Completion</u>	<u>Stimulation</u>
Green River "H" ← 4691'-4695' (4 spf) 4720'-4728' (4 spf)	1 bbl acid / foot @ 5 BPM
Green River "J" ← 5234'-5238' (4 spf) 5240'-5246' (4 spf) 5256'-5262' (4 spf)	
Green River "K" ← 5298'-5302' (4 spf) 5317'-5321' (4 spf) 5334'-5338' (4 spf) 5340'-5346' (4 spf)	

PBT: 5717' KB

Prod. Casing @ 5798'
 Type: 7", 23#, 20#

TD: 5800' KB

DST #1: 4604'-4634'
 IF: 32# FF: 46#
 ISI: 1605# FSI: 768#

STATE : UTAH
 COUNTY : Uintah
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DD

OPERATOR : PAN AMERICAN PETROLEUM
 WELL : 2 USA-BROADHURST
 API NO : 43-047-15693-00 00

TMP : 75 RGE : 23E
 SEC : 10
 SPOT : SW NW
 FOOTAGE : 2140 FNL 500 FHL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: EXETER DRUG

SPUD: 12 16 1963 COMP: 03 13 1964 GROUND ELEV: 5110 GR TD: DTD 5800
 REF. ELEV : 5121 KB PB 5717
 FM ID WASATCH

CASING: 10 3 4 @ 515 W 375 2 @ 5798 W 360

TUBING: 2 3 8 AT 4382

INITIAL POTENTIAL: IPP 143 BOPD 135 BW
 GREEN RIVER PERF JET W 5 FT 4693-5340 GROSS
 PERF 4693-4693 4800-4800 5216-5216 5232-5232
 PERF 5242-5242 5259-5259 5301-5301 5319-5319
 PERF 5335-5335 5340-5340
 SOFR 4693-5340
 MA 4693-5340
 HOIL 4693-5340
 USED HOT OIL TREATMENT SEVERAL TIMES

TOPS: FORMATION DEPTH SUBSEA
 LOG GREEN RIVER 2762 2359
 LOG WASATCH 5728 -607

FORMATION TESTS: DST 01 4604- 4634 652GRRV
 REC 15 FT M
 FINAL OP 1 H IFP 30 FFP 44 BHT 102 F
 ISIP 1570 45 M FSIP 744 1 H IHP 2355 FHP 2341
 MUD RECOVERY HAD OIL FLECKS

PRODUCTION TESTS: PT 01 GREEN RIVER PERF JET W 5 FT 5301-5340 GROSS
 PERF 5301-5319 5335-5340
 MA 5301-5340 500 GALS
 FRAC 5301-5340 810 BBLs
 TR PR 5500-1200
 SOFR 5301-5340 20000 GALS 20000 LBS SAND
 RATE 42 B/MIN STAGES 4 3 SETS 6 BALLS
 TREATING PRESS 3400-3100, ISIP 1100
 PT 02 GREEN RIVER PERF JET W 5 FT 5216-5259 GROSS
 PERF 5216-5216 5232-5232 5242-5242 5259-5259

ACID 5216-5259 500 GALS FBRKP 4600
 TR PR 4600-1800
 SOFR 5216-5259 20000 GALS 20000 LBS SAND FBRKP 1100
 RATE 39 B/MIN
 AFTER SOFR 5216-5259 ISIP 1700, SIP 15 MIN 1300
 SIP 30 MIN 1000

PT 03 GREEN RIVER PERF JET W 5 FT 4693-4800 GROSS
 PERF 4693-4693 4800-4800
 MA 4693-4800 500 GALS
 FRAC 4693-4800 12 BBLs FBRKP 1900
 SOFR 4693-4800 15000 GALS 15000 LBS SAND
 RATE 29 B/MIN TR PR 3200-3100
 FLUSHED W/190 BBLs MAX PRESS 3200, MIN PRESS 2500
 INJ RATE 26.9 BPM, ISIP 1300, SIP 15 MINS 1000

PT 10 PTP 254 BOPD 77 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 11 PTP 81 BOPD CUT 20% 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 12 PTP 32 BO 10 HRS
 GREEN RIVER PERF 4693-5340 GROSS
 HOIL 4693-5340 48 BBLs
 HOT OIL

PT 04 PTP 136 BO 22 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 13 PTP 172 BOPD 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS
 HOIL 4693-5340 64 BBLs
 HOT OIL

PT 05 PTP 161 BOPD 228 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS
 HOIL 4693-5340 70 BBLs
 HOT OIL

PT 14 PTP 106 BO 201 BW 21 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 06 PTP 194 BOPD 228 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS
 HOIL 4693-5340 80 BBLs
 HOT OIL
 TREATER TEMP 190 DEG, WELLHEAD FLOWLINE TEMP 140 DEG
 TRACES OIL PUMP TEMP 150 DEG

PT 15 PTP 163 BOPD 189 BW 21 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 16 PTP 170 BOPD 146 BW 3 HRS
 GREEN RIVER PERF 4693-5340 GROSS

PT 07 PTP 279 BOPD 200 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS

IL AV IE
 GRSL

PT 08 PTP 362 BOPD 140 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS

K08469 K08470

PT 09 PTP 252 BOPD 200 BW 24 HRS
 GREEN RIVER PERF 4693-5340 GROSS

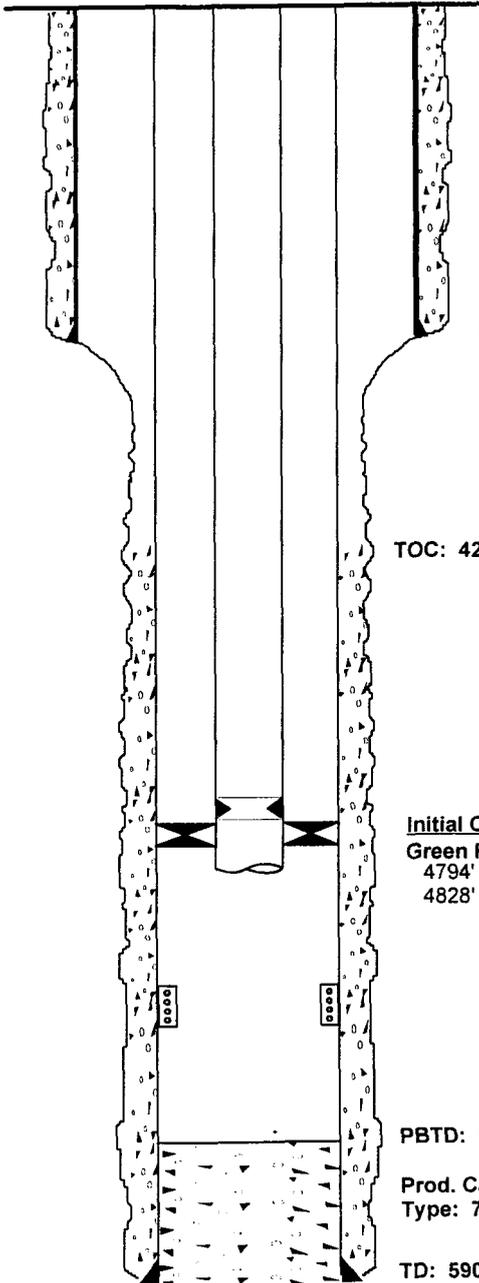
Pearl Broadhurst #5

Walker Hollow Field
 SW SW Sec10-T7S-R23E
 743' FSL, 564' FWL
 Elevation: 5278' GL, 5290' KB
 Uintah County, Utah
 Injection Well

Spud Date: 4/26/64
 TD Date: 5/17/64
 Completion Date: 5/26/64

Tubing Record

KB.....	12.00'
Stretch.....	2.60'
151 jts 2-7/8", 6.5#, J-55, EUE tbg.....	4876.72'
1 - 2-7/8" SN.....	1.10'
1 - Baker Lok-Set pkr.....	4.00'
1 - 2-7/8", EUE coupling.....	0.45'
<hr/>	
End of tubing.....	4896.87'



Surface Casing @ 494'
 Type: 10-3/4", 32.75# H40

TOC: 4228' KB

Initial Completion
 Green River "H"
 4794' (1 spf)
 4828' (1 spf)

Stimulation
 500 gal. MCA
 10,000# 10/20 sand
 8,000# Resin & walnut hulls
 IP: 52 BO

PBTD: 5467' KB

Prod. Casing @ 5570' KB
 Type: 7", 20#, 23#

TD: 5907' KB

STATE : UTAH
 COUNTY : Uintah
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DO

OPERATOR: PAN AMERICAN PETROLEUM
 WELL: 5 USA PEARL BROADHRST

TWP: 75 RGE: 23E
 SEC: 10
 SPOT: SW SW
 FOOTAGE: 743 FSL 564 FWL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: EXETER

SPUD: 04/26/1964 COMP: 06/26/1964 GROUND ELEV: 5278 GR TD: DTD 5907
 REF. ELEV: 5290 RB PB 5481
 FM TD WASATCH

CASING: 10 3/4 @ 494 W/ 353 7 @ 5567 W/ 360

TUBING: 2 7/8 AT 4873

INITIAL POTENTIAL: IPP 52 BOPD
 GREEN RIVER PERF JET W/ 5 FT 4794-4828 GROSS
 PERF 4794-4794 4828-4828
 MA 4794-4828 500 GALS
 TP 2000-450
 SWFR 4794-4828 18840 GALS 10000 LBS SAND

TOPS: FORMATION DEPTH SUBSEA

LOG GREEN RIVER 2877 2413

PRODUCTION TESTS: PT 01 PTP 36 BOPD 24 HRS
 GREEN RIVER PERF JET W/ 5 FT 4794-4828 GROSS
 PERF 4794-4794 4828-4828
 MA 4794-4828 500 GALS
 TP 2000-450
 SWFR 4794-4828 18840 GALS 10000 LBS SAND
 RATE 7 B/MIN ADDTV WLNT TP 2250-2300
 FRAC 4794-4828 25 BBLS
 RATE 1.5 B/MIN TP 850

PT 02 PTP 155 BOPD 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 03 PTP 146 BOPD 0 BW 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 04 PTP 190 BOPD 0 BW 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 05 PTP 165 BOPD 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 06 PTP 73 BO 12 HRS

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GREEN RIVER PERF 4794-4828 GROSS

PT 07 PTP 108 BO 20 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 08 PTP 144 BOPD 31 BW 19 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 09 PTP 144 BO 31 BW 19 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 10 PTP 150 BO 17 BW 19 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 11 PTP 234 BO 19 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 12 PTP 307 BOPD 34 BW 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 13 PTP 44 BO CUT 10% 10 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 14 PTP 140 BOPD 20 BW 19 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 15 PTP 118 BOPD 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 16 PTP 57 BOPD 1 BW 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 17 PTP 50 BOPD 0 BW 24 HRS
 GREEN RIVER PERF 4794-4828 GROSS

PT 18 PTP 37 BOPD
 GREEN RIVER PERF 4794-4828 GROSS

STATE : UTAH
 COUNTY: JINTAH
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DO

OPERATOR: PAN AMERICAN PETROLEUM
 WELL: 5 USA PEARL BROADHRST
 API NO: 43-047-15695-00 00

TWP: 7S RGE: 23E
 SEC: 10
 SPOT: SW SW
 FOOTAGE: 743 FSL 564 FWL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: EXETER

CORES:

CORE 01 4725-4777 REC 50.00FT GREEN RIVER DIMD
 5 SS, VFG, SHALY, POOR PORO
 11 SH, GREY
 7 1/2 SS, VFG, FAIR PORO, LIGHT BROWN OSTN
 22 1/2 SH, GREY W/SILT INTERBDD
 1 SS, VFG, POOR PORO, MOTTLED BROWN OSTN
 3 SH, GREY-GREEN

CORE 02 4777-4829 REC 52.00FT GREEN RIVER DIMD
 5 SH, GREY-GREEN, THIN LENSES OF TAN LAM
 2 LM, TAN, SCATTERED DARK BROWN OSTN
 3 SS, VFG-FG, ABUNDANT GREEN SH LAMS & INCLUSIONS
 MOTTLED TO FAIRLY EVEN BROWN OSTN
 2 1/2 SS, MG, GOOD PORO, SOLID DARK BROWN OIL SAT
 6 SS, VFG-FG, ABUNDANT GREEN SH INCLUSIONS & LAMS
 MOTTLED TO SOLID BROWN OIL SAT
 24 1/2 SILT & SH, INTERBDD
 5 SS, VFG-FG, FAIR PORO, BROWN OSTN
 1 SS, VFG-CG, CONG, NO SHOW
 3 SH, GREY

CORE 03 5310-5360 REC 49.00FT GREEN RIVER DIMD
 15 SS, VFG-MG, SOME CG, FAIR-GOOD PORO, SCATTERED
 DARK GREY SH LAMS /6 INCHES DARK SH 5318-5318 1 1/2
 18 SILT & SH INTERBDD
 9 SH, DARK GREY W/BROWN CAST
 7 SILT, LIGHT GREY & DARK GREY SH LAM

CORE 04 5360-5412 REC 48.00FT GREEN RIVER DIMD
 12 SH, GREY-GREY GREEN, INTERBDD W/LIGHT GREY SILT
 4 1/2 SS, VFG, ABUNDANT SH LAMS, POOR PORO, MOTTLED-
 SOLID BROWN OSTN
 4 1/2 SILT, LIGHT GREY, CALC, DARK GREY SH STREAKS
 SPOTTED BROWN OSTN IN BOTTOM FT
 2 SS, VFG, POOR-FAIR PORO, SOLID BROWN OSTN
 9 1/2 SILT & GREY SH
 3 SS, VFG, FAIR PORO, SOLID BROWN OIL SAT
 5 SS, VFG, ABUNDANT SH LAM & INCLUSIONS MOTTLED-
 FAIRLY EVEN BROWN OSTN, POOR-FAIR PORO

3 1/2 SILT, LIGHT GREY W/SH LAMS
 1 SS, VFG, SHALY, POOR PORO, MOTTLED BROWN OSTN
 3 SILT W/DARK GREY SH LAMS

CORE 05 5412-5462 REC 35.00FT GREEN RIVER DIMD
 3 SH, DARK GREY
 2 SS, VFG, SHALY, POOR PORO, UNEVEN BROWN OSTN
 2 1/2 SS, VFG, FAIR PORO, SOLID BROWN OSTN
 2 1/2 SS, VFG, ABUNDANT SH LAMS, POOR PORO, UNEVEN
 BROWN OSTN
 7 SILT, LIGHT GREY & DARK GREY SH LAMS
 5 SH, DARK GREY
 13 SS, LIGHT GREY, VFG-FG, BECOMING CG & CONG AT BASE
 ABUNDANCE OF CLAY

LOG TYPES: IE GRSL

PI REFERENCE #: K08503

DRILLING SHOWS:
 4392-4408 GREEN RI O&G 4414-4428 GREEN RI
 4725-4777 GREEN RI OSTN 4777-4829 GREEN RI
 5360-5412 GREEN RI OSTN
 5412-5462 GREEN RI OSTN

HOLE DEVIATION: 2880 000.50 5850 001.50

Pearl Broadhurst #1

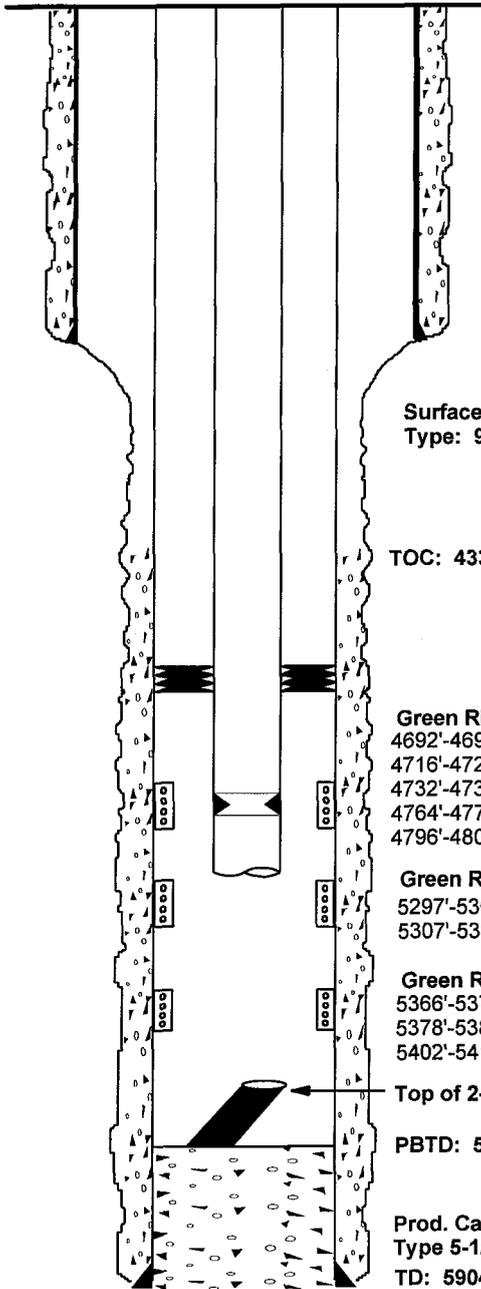
Walker Hollow Field
 NE SE Sec9-T7S-R23E
 2130' FSL, 575' FWL
 Elevation: 5184' GL, 5197' KB
 Uintah County, Utah

Spud Date: 10/23/63
 TD Date: 11/17/63
 Completion Date: 12/27/63

Initial Completion

*Perf'd 5371'-5407' (gross) as shown. Acidized w/ 500 gal. mud acid & frac w/ 15,000 gal. #5 burner fluid & 15,000# 10/20, 27.6 BPM @ 3850#, ISI: 1900#.
 *Perf'd 5300'-5308' (gross) as shown. Acidized w/ 500 gal. mud acid & frac w/ 10,000 gal. #5 burner fluid & 10,000# 10/20, 30.8 BPM @ 3750#, ISI: NA.
 *Perf'd 4770'-4800' (gross) as shown. Acidized w/ 500 gal. mud acid & frac w/ 15,000 gal. #5 burner fluid & 15,000# 10/20, 38.6 BPM @ 3800#, ISI: 1400#.
 *Put well on production; IPP: 881 BOPD, 440 MCFPD, 27 BWPD.

5/18/85: Reperfed existing perfs and added 4692'-5380' (gross) as shown. Acidized all perfs w/ 1 bbl 15% HCl



Surface casing @ 502' KB
 Type: 9-5/8", 36#

TOC: 4334' KB (CBL)

Green River "H"
 4692'-4698' (3 spf)
 4716'-4722' (4 spf)
 4732'-4734' (3 spf)
 4764'-4778' (4 spf)
 4796'-4802' (4 spf)

Green River "J"
 5297'-5301' (4 spf)
 5307'-5310' (4 spf)

Green River "K"
 5366'-5372' (4 spf)
 5378'-5380' (4 spf)
 5402'-5412' (4 spf)

Top of 2-3/8" Hydril tbg @ 5594'

PBDT: 5775'

Prod. Casing @ 5898'
 Type 5-1/2", 14#, 15.5#, J-55
 TD: 5904' KB

Tubing Record

KB.....13.00'
 150 jts 2-7/8", EUE, 8rd, J-55 coated tbg.....4688.94'
 1 - 5.5" x 2.5" TAC.....2.80'
 24 jts 2-7/8", EUE, 8rd, J-55 coated tbg.....732.18'
 1 - SN.....1.10'
 1 jts 2-7/8", EUE, 8rd, J-55 coated tbg.....30.33'
 1 - notched collar.....0.60'

 End of tubing.....5468.95'

Rod Record

1.5" x 22' polished rod
 1 - 4' x 7/8" pony
 1 - 8' x 7/8" pony
 87 - 7/8" scraped rods
 133 - 3/4" plain rods
 1 - 2' x 3/4" pony
 2.5" x 1.5" x 12' x 12.5' x 15' RHAC

DST #1: 4712'-4725'
 IF: 98# FF: 447#
 ISI: 1701# FSI: 1701#

DST#5: 5293'-5308'
 IF: 76# FF: 175#
 ISI: 2126# FSI: 2050#

DST #2: 4752'-4767'
 IF: 284# FF: 523#
 ISI: 1886# FSI: 1678#

DST #6: 5360'-5370'
 IF: 33# FF: 98#
 ISI: 2148# FSI: 2104#

DST #3: 4783'-4800'
 IF: 33# FF: 76#
 ISI: 1865# FSI: 1657#

DST #7: 5383'-5409'
 IF: 142# FF: 360#
 ISI: 2170# FSI: 2083#

DST #4: 5266'-5283'
 IF: 22# FF: 33#
 ISI: 1145# FSI: 622#

Core #1: 4793'-4812.5'
 Core #2: 5084'-5094'
 Core #3: 5273'-5283'

STATE : UTAH
 COUNTY : JINTAH
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DD
 FINAL STATUS: OIL
 CONTRACTOR: MANNING

OPERATOR: PAN AMERICAN PET
 WELL: 1 USA-BROADHURST
 API NO: 43-047-15692-00 00

TWP: 7S RGE: 23E
 SEC: 9
 SPOT: NE SE
 FOOTAGE: 2130 FSL 575 FE.
 FULL SECTION

SPUD: 10 22 1963 COMP: 12 26 1963 GROUND ELEV: 5184 BR
 REF. ELEV : 5195 BR

TD: DTD 5902
 LTD 5904
 PB 5850
 FM TD WASATCH

CASING: 9 5 8 @ 502 W 302 5 1 2 @ 5898 W 360
 INITIAL POTENTIAL: IP: 881 BOPD 440 MCFD 27 BW
 GREEN RIVER PERF JET W/ 2 FT 5407-5407
 GREEN RIVER PERF JET W/ 1 FT 5371-5371
 GREEN RIVER PERF JET W/ 4 FT 5300-5308 GROSS
 GREEN RIVER PERF JET W/ 2 FT 4770-4770
 GREEN RIVER PERF JET W/ 2 FT 4800-4800
 PERF 5300-5300 5308-5308
 MA 5371-5407
 SOFR 5371-5407
 MA 5300-5308
 SOFR 5300-5308
 SOFR 4770-4800
 GOR 500

TOPS:	FORMATION	DEPTH	SUBSEA
LOG	GREEN RIVER	2847	2348
LOG	WASATCH	5828	-633

FORMATION TESTS: DST 01 4706- 4715 652GRRV
 GAS TS IN 8 M
 GAS TS IN 15 M AT 992 MCFD
 GAS TS IN 45 M AT 1398 MCFD
 GAS TS IN 1 H AT 1468 MCFD
 GAS TS IN 1 H 15 M AT 1497 MCFD
 REC 3 FT M
 INIT OP 0 H 3 M
 FINAL OP 1 H 30 M IFP 98 FFP 477 BHT 105 F
 ISIP 1701 30 M FSIP 1701 1 H IHP 2322 FHP 2322
 DST 02 4752- 4767 652GRRV
 GAS TS IN 35 M AT 19 MCFD 142 CK
 GAS TS IN 13 M AT 18 MCFD 14 CK
 GAS TS IN 17 M AT 17 MCFD 14 CK

REC 5 FT M 2426 FT GCD
 INIT OP 0 H 3 M
 FINAL OP 1 H 15 M IFP 284 FFP 523 BHT 105 F
 ISIP 1886 30 M FSIP 1678 1 H IHP 2333 FHP 2333
 DST 03 STRD 4783 4800 652GRRV
 REC 415 FT M&GCD 5 FT WCM
 INIT OP 0 H 3 M
 FINAL OP 1 H IFP 33 FFP 76 BHT 108 F
 ISIP 1865 45 M FSIP 1657 1 H IHP 2301 FHP 2301
 STRONG BLOW THROUGH
 DST 04 5266- 5283 652GRRV
 REC 35 FT 0 54 FT M
 INIT OP 0 H 5 M
 FINAL OP 1 H IFP 22 FFP 33 BHT 111 F
 ISIP 1145 45 M FSIP 622 1 H IHP 2573 FHP 2573
 STRONG BLOW DECR TO FAIR IN 10 MINS
 DST 05 5293- 5308 652GRRV
 GAS TS IN 8 M
 GAS TS IN 11 M AT 33 MCFD
 GAS TS IN 21 M AT 38 MCFD
 GAS TS IN 36 M AT 124 MCFD
 REC 752 FT GCD 90 FT SMC GCD
 INIT OP 0 H 5 M
 FINAL OP 1 H IFP 76 FFP 175
 ISIP 2126 30 M FSIP 2150 1 H IHP 2540 FHP 2540
 DST 06 5360- 5370 652GRRV
 GAS TS IN 25 M TSTM
 REC 620 FT HGCD 10 FT OCM
 INIT OP 0 H 5 M
 FINAL OP 1 H IFP 33 FFP 98
 ISIP 2148 30 M FSIP 2104 1 H IHP 2628 FHP 2628
 DST 07 5383- 5409 652GRRV
 GAS TS IN 2 M
 GAS TS IN 9 M AT 17 MCFD

STATE : UTAH
 COUNTY : Uintah
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DD

OPERATOR : PAN AMERICAN PET
 WELL : 1 USA-BROADHURST
 API NO : 43-047-15692-00 00

TWP : 7S RGE : 23E
 SEC : 9
 SPOT : NE SE
 FOOTAGE : 2130 FSL 975 FEET
 FULL SECTION

FINAL STATUS : OIL
 CONTRACTOR : MANNING

GAS IS IN 14 M AT 29 MCFD
 GAS IS IN 34 M AT 11 MCFD
 GAS IS IN 54 M AT 11 MCFD
 REC 1140 FT SGCD 2 FT M
 INIT OP 0 H 5 M
 FINAL OP 1 H 1FP 142 FFP 360 BHT 118 F
 ISIP 2170 30 M F5IP 2083 1 H IHP 2550 IHP 2650

- PT 01 GREEN RIVER PERF JET W 2 FT 5407 5407
 GREEN RIVER PERF JET W 1 FT 5371 5371
 MA 5371-5407 500 GALS FBRKP 3500
 SOFR 5371-5407 15000 GALS 15000 LBS SAND
 RATE 28 B/MIN ADDTV ADM STAGES 3 15 BALLS
 USED 1 UNIT RADIOACTIVE POWDER TO LAST 1000 GALS
 IN EACH STAGE, ISIP 1900
- PT 02 GREEN RIVER PERF JET W 4 FT 5300-5308 GROSS
 PERF 5300-5300 5308-5308
 MA 5300-5308 500 GALS
 FRAC 5300-5308 FBRKP 4700
 BD 4700-1900
 SOFR 5300-5300 16500 GALS 10000 LBS SAND
 RATE 37 B/MIN ADDTV ADM STAGES 2 5 BALLS
 LAST 1000 GALS OF EACH STAGE CONTAINED
 1 UNIT OF RADIOACTIVE POWDER
- PT 03 GREEN RIVER PERF JET W 2 FT 4770 4770
 GREEN RIVER PERF JET W 1 FT 4800 4800
 MA 4770-4800 500 GALS
 SOFR 4770-4800 15840 GALS 15000 LBS SAND
 RATE 39 B/MIN ADDTV ADM STAGES 3 USED 1 BALLS
 ISIP 1400
- PT 04 PTP 396 BO 23 HRS
 GREEN RIVER PERF 4770 5407 GROSS
- PT 05 PTP 422 BO 7 HRS
 GREEN RIVER PERF 4770 5407 GROSS

- PT 06 PTP 582 BO 23 HRS
 GREEN RIVER PERF 4770 5407 GROSS
- PT 07 PTP 30 BOPH 64 64 CK 1 HRS
 GREEN RIVER PERF 4770 5407 GROSS
 TP 600
- PT 08 PTP 400 BOPD 21 64 CK 24 HRS
 GREEN RIVER PERF 4770 5407 GROSS
 TP 175
- PT 09 PTP 335 BOPD 64 64 CK 24 HRS
 GREEN RIVER PERF 4770-5407 GROSS
 100 LBS PRESS ON WELLHEAD
- PT 10 PTP 396 BOPD 64 64 CK 24 HRS
 GREEN RIVER PERF 4770-5407 GROSS
 100 LBS BACK PRESS ON TBG
- PT 11 PTP 860 BOPD 35 64 CK 24 HRS
 GREEN RIVER PERF 4770-5407 GROSS
 HOIL 4770-5407
 TOOK 2000 LBS TO PUMP HOT OIL DOWN ANNULUS
 CUT CK TO 35/64 FOR 4 HRS, 20/64 CK FOR 2 HRS
- PT 12 PTF 600 BOPD 24 HRS
 GREEN RIVER PERF 4770-5407 GROSS
 TP 275
 FLOWED 19 HRS ON 20/64 CK, 5 HRS ON 16/64 CK
 TREATER TEMP 210 DEG
- PT 13 PTF 857 BOPD 24 HRS
 GREEN RIVER PERF 4770-5407 GROSS
 FLOWED 12 HRS ON 20/64 CK, 5 HRS ON OPEN CK
 7 HRS ON 37/64 CK

CORE 01 4793-4813 REC 19.50FT GREEN RIVER DIMD
 1 SS, TAN-GREY, VFG, FAIR-POOR SORTING, SLI ARG
 FAIR-GOOD PORO, LIGHT & DARK BROWN OSTN, YELLOW

- FLUOR, GOOD CUT
- 1 SS, GREY, FG, SLI CONG, POOR SORTING, BLACK
 CHERT & SH FRAG, SUBANG-SUBROUND, GOOD
 PORO, LIGHT BROWN OSTN, FLUOR & CUT
- 1 SS, FG CG, POOR SORTING, SUBANG, CONG IN
 PART, SPOTTY PP DARK BROWN OSTN
- 1 SS, FG-MG, CONG AS ABOVE, GOOD PORO, IRREG
 BROWN OSTN
- 1 SH, GREEN & SILT GREY-GREEN W/THIN SS LAM, VFG,
 TO CONG, ARG, EVEN BROWN OSTN
- 2 SH, GREY, SILT, GREY-GREEN W/SS, GREEN, VFG
 ARG, NO SHOW
- 1 SS, GREEN-GREY, VFG, ARG, VERY CALC, QTZ W/
 SH & SILT AS ABOVE, INTERBDD
- 1 SS, AS ABOVE, MORE SH & SILT
- 1 SS, AS ABOVE, MORE SH
- 2 SS, GREY GREEN, SILTY-MG, VERY ARG, HARD
 TIGHT, NO SHOW
- 1 SS, AS ABOVE, MORE SHALY
- 2 SS, GREY-GREEN, VFG-SILTY, HARD, TITE, CALC
 NO SHOW
- 1 SS, SH, SILT, AS ABOVE, HARD, TITE, NO SHOW
- 1 SS, SH, SILT, AS ABOVE W/SIX INCHES SS, AS ABOVE
 1/2 SH, DARK GREEN, HARD, RARE FISH SCALES
 1/2 COQUINA, TAN, OSTRACODAL, CONG & QTZ
 SH FRAG
- 1 1/2 SS, WHITE, MG-CG, CONG, SUBANG-SUB
 ROUNDED, VERY POOR SORTING, CLEAR QTZ & BLACK
 CHERT, HARD, TITE W/CALC ENT FILLED PORES, NO SHOW

- CARB PLANT FRAG
- 1 1/2 SS, WHITE, VFG-SILTY, ARG, THIN LAM
 SH, CARB, HARD, TITE, ABUNDANT PLANT FRAG
 1/2 SH, DARK GREY, CARB PLANT FRAG, W/SS, AS
 ABOVE, INTERLAM
- 2 SS, AS ABOVE, W/ABUNDANT FOSS PLANTS
- 1 1/2 SH, DARK GREY, HARD, CARB

- CORE 03 5273-5283 REC 10.00FT GREEN RIVER DIMD
- 1 SS, GREY, VFG-FG, SUBANG, POORLY SORTED
 FAIR PORO, CLAY SPOTS, GOOD BROWN STAIN, BRIGHT
 YELLOW FLUOR, GOOD CUT
- 2 1/2 SILT, GREY, ARG, SANDY, CALC, HARD, TITE
 NO SHOW W/THIN GREY SH LAMS & CROSS LAMS
- 1 1/2 SS, GREY, VFG-SILT, GREY-GREEN, ARG, HARD
 TITE, CARB, SUBANG, POOR SORTING, BEDDING
 PLANES, POOR PORO, NO SHOW, W/SH LAMS, GREEN
- 3 1/2 SS, GREY-GREEN, VFG-SILT, ARG, CALC, HARD
 TITE, NO SHOW W/SH & SILT INTERBDD, CARB PLANT FRAG
 1/2 SILT, WHITE, VFG, ARG, VERY CALC, HARD, TITE
 NO SHOW, W/THIN SILT & SH INTERBDD
- 1 SH, GREY-GREEN, SS AS ABOVE, LAM, NO SHOW

IL AV MF
 IE MLAT GRSL

K07460

4706-4719 GREEN RI GAS 4752-4767 GREEN RI
 4793-4813 GREEN RI OSTN 5283-5293 GREEN RI
 5266-5283 GREEN RI OIL 5293-5308 GREEN RI
 5360-5370 GREEN RI O&G 5383-5409 GREEN RI

- CORE 02 5084-5094 REC 10.00FT GREEN RIVER DIMD
- 1/2 SH, GREEN-GREY W/SS INTERBDD, GREY, VFG-SILT
 ARG, HARD, TITE, NO SHOW
- 1/2 SS, WHITE, VFG-SILTY, HARD, TIGHT, INTERBDD
 W/SH
- 1 SS, GREEN, VFG-SILT, ARG, HARD, TIGHT, NO SHOW
- 1 SS, WHITE, VFG, CLAYEY, CALC, TITE, NO SHOW
- 2 1/2 SS, GREY, VFG-SILTY, HARD, TITE, NO SHOW
 W/SH INTERBDD, GREY, BEDS UP TO ONE INCH, ABUNDANT

Spud Date: 6/8/80
 TD Date: 6/24/80
 Completion Date: 9/5/80

Pearl Broadhurst #6
 Walker Hollow Field
 NE SW Sec9-T7S-R23E
 2404' FSL, 2062' FWL
 Elevation: 5103' GL, 5115' KB
 Uintah County, Utah

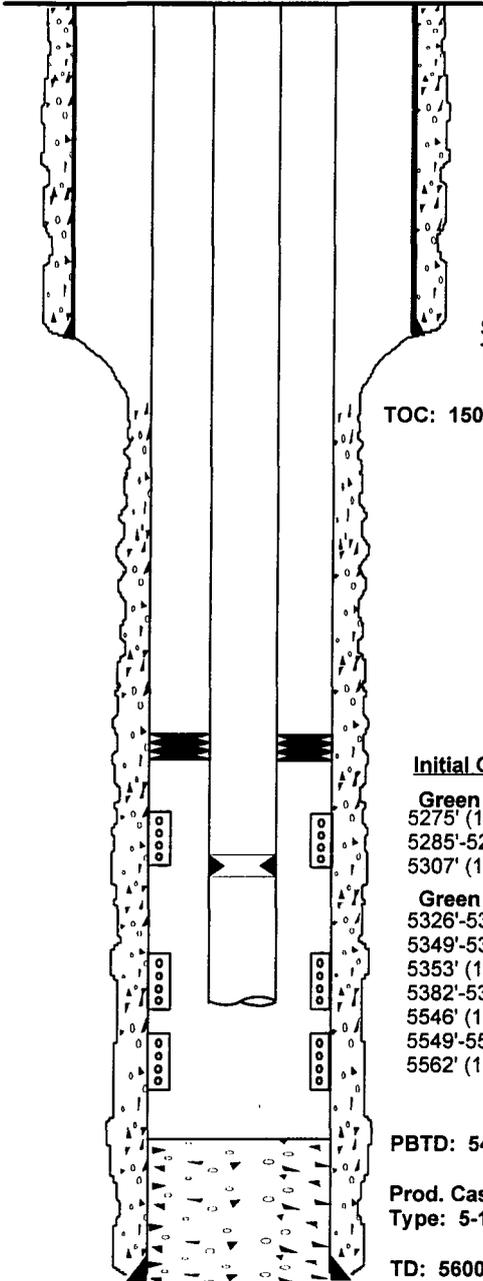
Tubing Record

KB.....12.00'
 167 jts 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....5212.74'
 1 - 5.5" x 2.5" TAC.....2.85'
 4 jts 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....122.98'
 1 - 2.5" SN.....1.00'
 1 jt 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....31.44'
 1 - 2-7/8" EUE mule pin.....14.71'

End of tubing.....5397.72'

Rod Record

1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 1 - 7/8" x 4' pony
 1 - 7/8" x 6' pony
 1 - 7/8" x 8' pony
 76 - 7/8" scraped rods
 135 - 3/4" plain rods
 2.5" x 1.5" x 12' x 13' x 16' RHAC pump



Surface Casing @ 445'
 Type: 8-5/8", 24#

TOC: 1505' KB

Initial Completion

Green River "J"
 5275' (1 spf)
 5285'-5288' (1 spf)
 5307' (1 spf)

Broke Formation
 500 gal. MSR-100
 *Water Productive
 *Perfs Squeezed

Green River "K"
 5326'-5329' (1 spf)
 5349'-5350' (1 spf)
 5353' (1 spf)
 5382'-5384' (1 spf)
 5546' (1 spf)
 5549'-5550' (1 spf)
 5562' (1 spf)

Broke Formation ← IPP: 94 BO, 241 BW
 500 gal. 7.5% MSR-100

Frac
 47,500 gal. Super "k-1" pad
 27,000# 20/40 sand
 45,000# 10/20 sand
 34 BPM @ 3400#, ISI: 1850#

PBTD: 5485' KB

Prod. Casing @ 5600' KB
 Type: 5-1/2", 14#, 15.5#

TD: 5600' KB

DST #1: Green River "I" 4965'-5005'
 15-45-60-120
 IF: 457# FF: 1004#
 ISI: 2460# FSI: 2097#

STATE : UTAH
 COUNTY : UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DO

OPERATOR : ENERGY RESERVES GROUP
 WELL : 6 BROADHURST

TWP : 7S RGE : 23E
 SEC : 9
 SPOT : NE NE SW
 FOOTAGE : 2404 FSL 2062 FWH
 FULL SECTION

FINAL STATUS : OIL
 CONTRACTOR : DREILING 5

SPUD : 05 16 1 30 COMP : 09 05 1980 GROUND ELEV : 5103 GR
 REF. ELEV : 5116 KB TD : DTD 5600
 PB 5485
 FM TO GREEN RIVER

CASING : 8 5 8 @ 445 W 435 5 1 2 @ 5600 W 1280

INITIAL POTENTIAL : IPP 94 BOPD 241 BW 24 HRS
 GREEN RIVER PERF W 1 FT 5275-5384 GROSS
 PERF 5275-5275 5285-5288 5307-5307 5326-5329
 PERF 5349-5349 5353-5353 5382-5384
 ACID 5275-5384 1000 GALS
 7 1/2% MSR & MCR
 SEFR 5275-5384 47500 GALS 72000 LBS SAND
 10/20, 20/40 SD
 GTY 33.0

TOPS : FORMATION DEPTH SUBSEA

LOG UINTA 0 5116
 LOG GREEN RIVER 2809 2307

FORMATION TESTS : DST 01 4965- 5005 652GRRV
 REC 180 FT GCM 2353 FT GCW 1825 CC W
 REC 1 CFT G
 INIT OP 0 H 15 M IFP 65 FFP 457
 FINAL OP 1 H IFP 476 FFP 1004 BHT 118 F
 ISIP 2060 45 M FSIP 2097 2 H IHP 2446 FHP 2418

PRODUCTION TESTS : PT 01 GREEN RIVER PERF W 1/2 FT 5546-5562 GROSS
 PERF 5546-5546 5549-5549 5550-5550 5562-5562
 SQZD 5546-5562
 SQZD W/50 SX

LOG TYPES : NEC DNC ILDL
 DN AV DI-FDC
 CNDL BHC-ACS CDL
 FMF

PI REFERENCE #: K06299 K06300

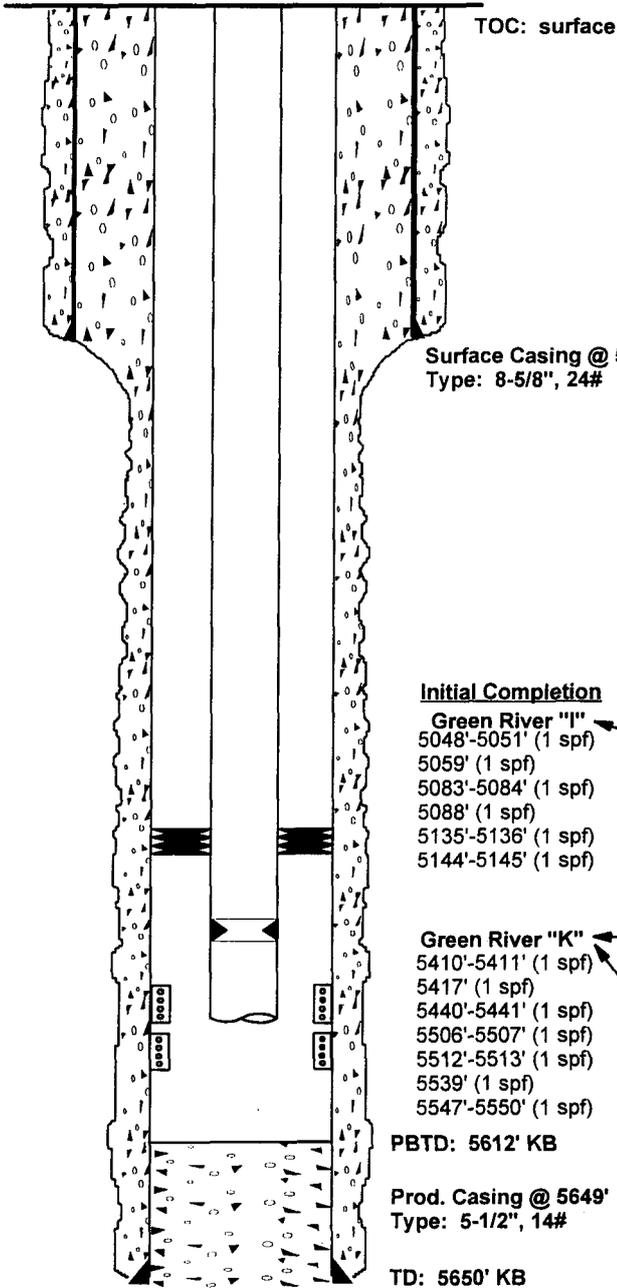
Spud Date: 9/17/80
 TD Date: 10/7/80
 Completion Date: 2/4/81

Pearl Broadhurst #7
 Walker Hollow Field
 SW SW Sec9-T7S-R23E
 879' FWL, 723' FSL
 Elevation: 5282' GL, 5295' KB
 Uintah County, WY

Tubing Record
 KB.....13.00'
 169 jts 2-7/8", J-55, EUE, 8rd, 6.5# coated tbg....5230.08'
 1 - 5.5" x 2.5" TAC.....2.80'
 5 jts 2-7/8", J-55, EUE, 8rd, 6.5# coated tbg.....156.49'
 1 - 2.5" SN.....1.60'
 2 jts 2-7/8", J-55, EUE, 8rd, 6.5# coated tbg.....62.79'
 1 - notched collar.....0.60'

 End of tubing.....5467.36'

Rod Record
 1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 3 - 7/8" x 4' ponies
 1 - 7/8" x 6' pony
 88 - 7/8" scraped rods
 129 - 3/4" plain rods
 1 - 3/4" x 2' pony
 2.5" x 1.5" x 10' x 12' x 15' RHAC pump



Initial Completion
 Green River "I"
 5048'-5051' (1 spf) ← Perfs Squeezed Water Productive
 5059' (1 spf)
 5083'-5084' (1 spf)
 5088' (1 spf)
 5135'-5136' (1 spf)
 5144'-5145' (1 spf)

Green River "K" ← Broke Formation ← IPP: 76 BO, 13 BW
 5410'-5411' (1 spf) ← 1000 gal. 7.5% MSR
 5417' (1 spf) ← 5 BPM @ 4500#, ISI: 1000#
 5440'-5441' (1 spf)
 5506'-5507' (1 spf)
 5512'-5513' (1 spf) ← Frac
 5539' (1 spf) ← 8,000 gal. Super "K-1" pad
 5547'-5550' (1 spf) ← 24,200 gal. Super "K-1" fluid
 29,250# 20/40 sand
 14,100# 10/20
 No rates

GEO-COM (TM)

PAGE 1

STATE : UTAH
 COUNTY: UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DD

OPERATOR: ENERGY RESERVES GROUP
 WELL : 7 BROADHURST
 API NO: 43-047-30730-00 00

TWP: 35 RGE: 23E
 SEC: 1
 SPOT: NE SW SW
 FOOTAGE: 23 FSL 879 FWL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: NOT RPTD

SPUD: 09 17 1980

COMP: 02 04 1981

REF. ELEV : 5295 *8

TD: 010 5650
FM TD GREEN RIVER

CASING: 8 5 8 @ 514 W 400 5 1 2 @ 5649 W 1200

INITIAL POTENTIAL: IPP 76 BOPD 13 BW
 GREEN RIVER PERF W/ 1-FT 5410-5550 GROSS
 PERF 5410-5411 5417-5417 5440-5441 5506-5507
 PERF 5512-5513 5539-5539 5547-5550
 ACID 5410-5550
 SGFR 5410-5550

TOPS:	FORMATION	DEPTH	SUBSEA
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LOG	UINTA	0	5295
LOG	GREEN RIVER	2953	2342

PRODUCTION TESTS: PT 01 PTS 102 BO 14 HRS
 GREEN RIVER PERF W/ 1-FT 5410-5550 GROSS
 PERF 5410-5411 5417-5417 5440-5441 5506-5507
 PERF 5512-5513 5539-5539 5547-5550
 ACID 5410-5550 1000 GALS
 7 1/2 MCR
 SGFR 5410-5550 32200 GALS 43350 LBS SAND
 10:20

LOG TYPES: NEC DNC ILD
 AV DI-FDC TDL
 DEN-C-NEU

PI REFERENCE #: K07301

Pearl Broadhurst #10

Walker Hollow Field
 NW SE Sec9-T7SR23E
 2029' FSL, 1819' FEL
 Elevation: 5118' GL, 5130' KB
 Uintah County, Utah
 Well Presently SI

Spud Date: 1/1/81
 TD Date: 1/16/81
 Completion Date: 3/17/81

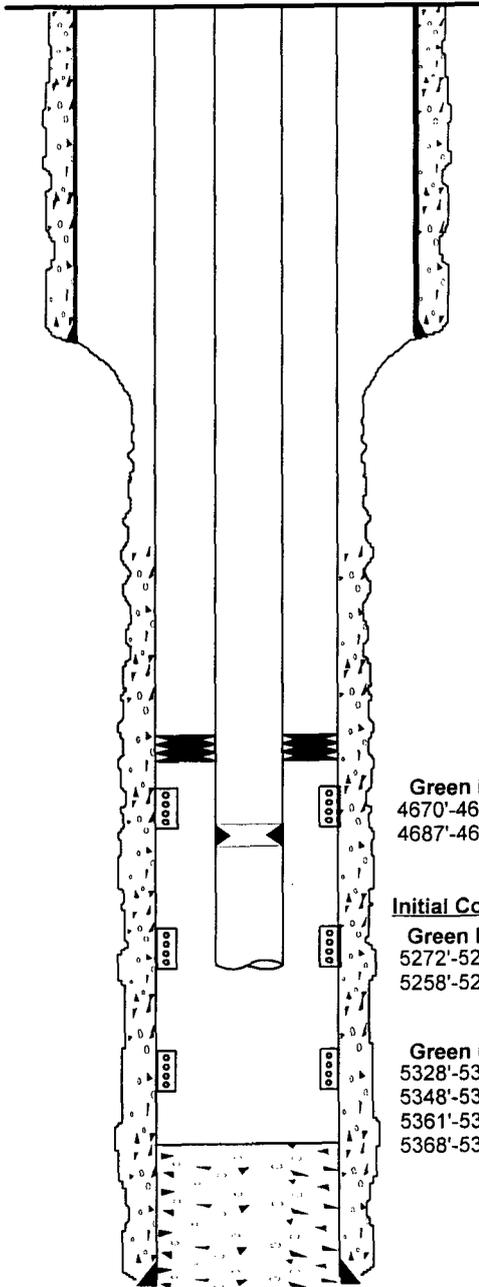
Tubing Record

1 - 2-7/8", J-55, 8rd, 6.5#, EUE coated tbg sub.....10.00'
 142 jts 2-7/8", J-55, 8rd, 6.5#, EUE, coated tbg...4577.73'
 1 - 5.5" x 2.5" TAC.....2.80'
 19 jts 2-7/8", J-55, 8rd, 6.5#, EUE, coated tbg.....617.93'
 1 - SN.....1.60'
 1 jt 2-7/8", J-55, 8rd, 6.5#, EUE coated tbg.....32.43'
 1 - notched collar.....0.60'

End of tubing.....5243.09'

Rod Record

1.5" x 22' polished rod
 87 - 7/8" scraped rods
 121 - 3/4" plain rods
 2.5" x 1.5" x 12' x 15.5' RHAC pump



Broke Formation
 750 gal. 7.5% MRA

Frac
 30,000 gal. Super "E" fluid
 17,000# 20/40
 27,000# 10/20
 15 BPM @ 1400#
 IP: 70 BO, 194 BW

Green River "H"
 4670'-4674' (2 spf)
 4687'-4692' (2 spf)

Initial Completion ("J" & "K" sands)

Green River "J"
 5272'-5274' (1 spf)
 5258'-5260' (1 spf)

Broke Formation
 500 gal. 7.5% HCl
 4 BPM @ 2000#, ISI: 1100#

Green River "K" (squeezed)
 5328'-5330' (1 spf)
 5348'-5350' (1 spf)
 5361'-5363' (1 spf)
 5368'-5370' (1 spf)

Frac
 9,000 gal. Super "E" pad
 18,000 gal. Super "E" fluid
 28,000# 20/40 sand
 15,000# 10/20
 17 BPM @ 2800#, ISI: 1870#

GEO-COM (TM)

PAGE 1

STATE : UTAH
COUNTY : KANE
FIELD : WALKER HOLLOW
CLASS : INITIAL - D FINAL - DO

OPERATOR : ENERGY RESERVES GROUP
WELL : 10 BROADHURST PEARL

API NO: 43-047-30839-00 00

TWP: 7S RGE: 13E
SEC: 9
SPOT: NE NW SE
FOOTAGE: 2029 FSL 1819 FEL
FULL SECTION

FINAL STATUS: OIL
CONTRACTOR: MGF 65

SPUD: 01 01 1981

COMP: 04 08 1981

GROUND ELEV: 5118 GR
REF. ELEV : 5130 KB

TD: 010 5550
FM 11 GREEN RIVER

CASING: 8 5 8 @ 470 W 360 S 1 2 @ 5542 W 875

INITIAL POTENTIAL: IPP 13 BOPD 25 BW
GREEN RIVER PERF 5258-5274
NATURAL

TOPS:	FORMATION	DEPTH	SUBSEA
LOG	GREEN RIVER	2799	2331

PRODUCTION TESTS:	PT 01	PT 02	PT 03
	GREEN RIVER PERF 5258-5370 GROSS PERF 5258-5274 5328-5370 SQZD 5328-5370	PTP 14 80 30 BW GREEN RIVER PERF 5258-5274	PTP 12 80 35 BW GREEN RIVER PERF 5258-5274

LOG TYPES:	ILD	GR	AVC
	DN	DISF	NFD
	BHCS		

PI REFERENCE #: K08391 K08392

Spud Date: 2/9/81
 TD Date: 2/24/81
 Completion Date: 5/7/81

Pearl Broadhurst #12

Walker Hollow Field
 NW NW Sec10-T7S-R23E
 661' FNL, 559' FWL
 Elevation: 5142' GL, 5155' KB
 Uintah County, Utah

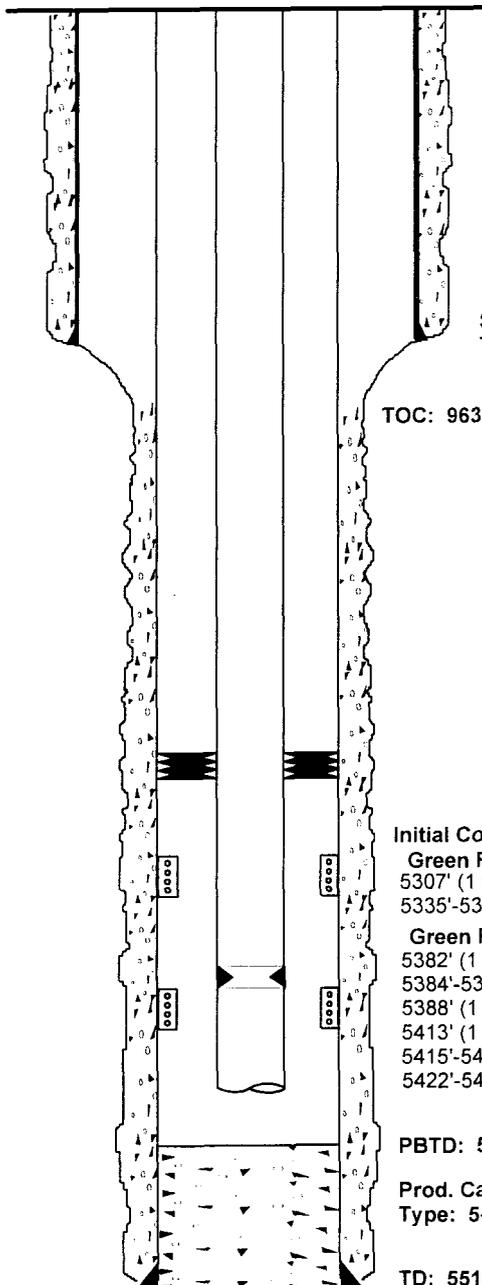
Tubing Record

KB.....13.00'
 148 jts 2-7/8", EUE, 6.5#, 8rd, J-55 coated tbg.....4727.88'
 1 - 5-1/2" x 2-1/2" TAC.....2.75'
 20 jts 2-7/8", EUE, 6.5#, 8rd, J-55 coated tbg.....656.93'
 1 - 2.5" SN.....1.08'
 1 jt 2-7/8", EUE, 6.5#, 8rd, J-55 coated tbg.....30.65'
 1 - 2-7/8" notched collar w/ X-bar.....0.40'

 End of tubing.....5432.69'

Rod Record

1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 81 - 7/8" scraped rods
 134 - 3/4" plain rods
 2.5" x 1.5" x 15' RHAC pump



Surface Casing @ 504'
 Type: 8-5/8", 24#

TOC: 963'

Initial Completion ("J" & "K" sands)

Green River "J" (Squeezed)

5307' (1 spf)
 5335'-5336' (1 spf)

Green River "K"

5382' (1 spf)
 5384'-5385' (1 spf)
 5388' (1 spf)
 5413' (1 spf)
 5415'-5417' (1 spf)
 5422'-5423' (1 spf)

PBD: 5477' KB

Prod. Casing @ 5510'

Type: 5-1/2", 14#

TD: 5510' KB

Stimulation ("J" & "K" sands)

Broke Formation

1000 gal. 7.5% HCl
 5 BPM @ 1700#, ISI: 1100#

Frac

10,000 gal. Super "K-1" pad
 33,000 gal. Super "K-1" fluid
 55,000# 20/40 sand
 24,000# 10/20 sand
 41 BPM @ 3000#, ISI: 1500#

GEO-COM (TM)

STATE : UTAH
COUNTY : UINTAH
FIELD : WALKER HOLLOW
CLASS : INITIAL - D FINAL - DD

OPERATOR : ENERGY RESERVES GROUP
WELL : 12 BROADHURST PEARL
API NO : 43-047-30841-00 00

TWP : 7S RGE : 23E
SEC : 10
SPOT : SW NW NW
FOOTAGE : 721 FNL 579 FM
FULL SECTION

FINAL STATUS : OIL
CONTRACTOR : MGF

SPUD : 02 09 1981

COMP : 05 11 1981

GROUND ELEV : 5142 GR
REF. ELEV : 5155 KB

TD : DTD 5510
FM TD GREEN RIVER

CASING : 8 5 8 @ 504 W 375 5 1 2 @ 5510 W 165

INITIAL POTENTIAL : IPP 134 BOPD 6 BW
GREEN RIVER PERF 5382-5423 GROSS
PERF 5382-5382 5384-5385 5388-5388 5413-5413
PERF 5415-5417 5422-5423
ACID 5382-5423 1000 GALS
7 1 2%
FRAC 5382-5423 43000 GALS
EMUL

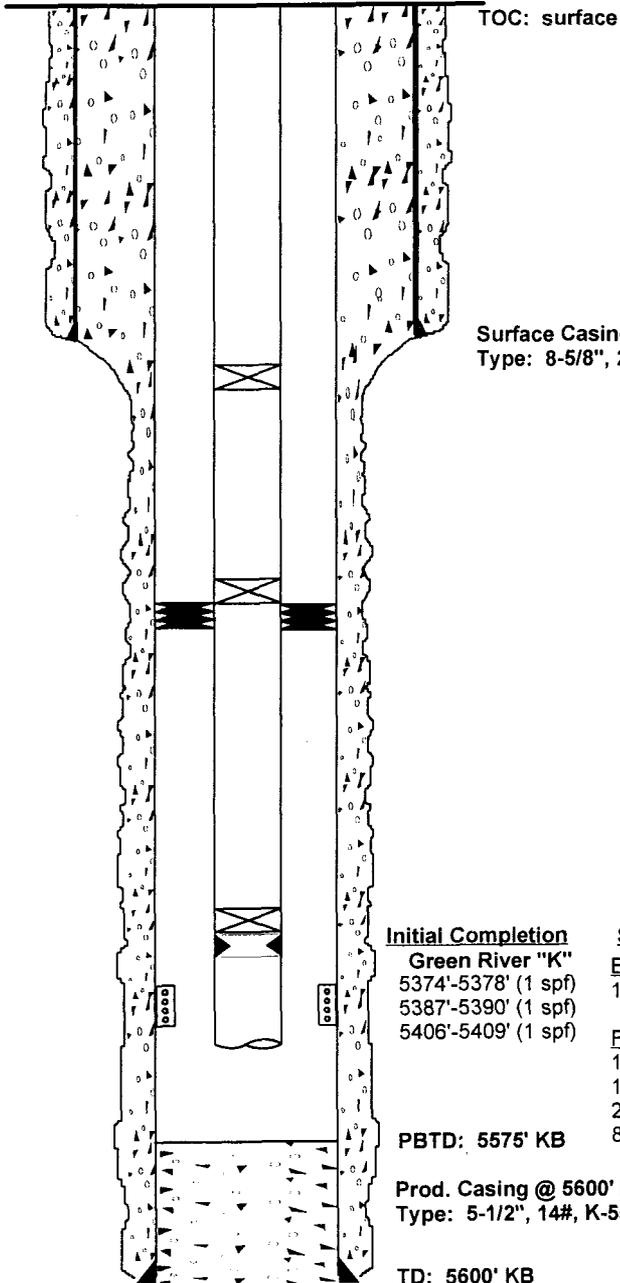
TOPS:	FORMATION	DEPTH	SUBSEA
LOG	UINTA	0	5155
LOG	GREEN RIVER	2830	2325

LOG TYPES:	AVC	MEC	AV	BHCS	GR	DNC	DISF	DN	ILD	NFD

PI REFERENCE #: K08392

Pearl Broadhurst #13

Walker Hollow Field
 NE NE Sec9-T7S-R23E
 592' FNL, 713' FEL
 Elevation: 5118' GL, 5131' KB
 Uintah County, Utah



TOC: surface

Surface Casing @ 491'
 Type: 8-5/8", 24#, K-55

Initial Completion

Green River "K"
 5374'-5378' (1 spf)
 5387'-5390' (1 spf)
 5406'-5409' (1 spf)

PBTD: 5575' KB

Prod. Casing @ 5600' KB
 Type: 5-1/2", 14#, K-55

TD: 5600' KB

Stimulation

Broke Formation
 1000 gal. 7.5% MSR

Frac

1000 gal. 7.5% MSR followed by:
 10,000 gal. Super "K-1" pad
 25,000 gal. Super "K-1" fluid w/ 55,000# 20/40
 8,000 gal. Super "K-1" fluid w/ 24,000# 10/20

Secondary Completion

Reperf'd "K" and added 5417'-5420 (3 spf)
 Perf'd "J" 4776'-4786' (3 spf)
 Acidized each 1 ft interval w/ 1bbl 15% HCl

Tubing Record

78 jts 2-7/8", EUE, 8rd, 6.5#, J-55 tbg.....2374.31'
 1 - new lock to 8rd x-over.....1.00'
 74 jts new lock tbg.....2326.24'
 1 - 8rd to new lock x-over.....1.00'
 1 - 5.5" TAC.....2.80'
 1 - new lock to 8rd x-over.....1.00'
 25 jts new lock tbg.....721.30'
 1 - new lock to EUE x-over.....1.00'
 1 - 2-7/8" SN.....1.00'
 2 jts 2-7/8", EUE, 8rd, 6.5#, J-55 tbg.....62.92'
 1 - notched collar.....0.60'

End of tubing.....5493.17'

Rod Record

1.5" x 22' polished rod
 87 - 7/8" scraped rods
 127 - 3/4" plain rods
 1 - 3/4" x 2' pony
 2.5" x 1.5" x 12' x 14' x 16' RHAC pump

STATE : UTAH
 COUNTY: UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DD

OPERATOR: ENERGY RESERVES GROUP
 WELL: 13 BROADHURST PEARL
 API NO: 43-047-30842-00 00

TWP: 7S RGE: 10E
 SEC: 9
 SPOT: NW NE NE
 FOOTAGE: 592 FNL 713 FEET
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: MGF

SPUD: 01 21 1981 COMP: 04 30 1981 GROUND ELEV: 5118 GR
 REF. ELEV : 5131 KB TD: DTD 5480
 FM TD GREEN RIVER

CASING: 8 5 8 @ 491 W 360 5 1 2 @ 5480 W 1203

INITIAL POTENTIAL: IPP 100 BOPD 3 BW
 GREEN RIVER PERF W: 1 FT 5374-5409 GROSS
 PERF 5374-5378 5387-5390 5406-5409
 ACID 5374-5409
 SGFR 5374-5409

TOPS: FORMATION DEPTH SUBSEA

LOG	UINTA	0	5131
LOG	GREEN RIVER	2814	2317

PRODUCTION TESTS: PT 01 PTP 165 BO 6 BW
 GREEN RIVER PERF W: 1/FT 5374-5409 GROSS
 PERF 5374-5378 5387-5390 5406-5409
 ACID 5374-5409 1000 GALS
 SGFR 5374-5409 45000 GALS 79000 LBS SAND

LOG TYPES: NEC DNC ILD
 AV DI-FOC DEN-GRN
 BHC-ACS

PI REFERENCE #: D03462 D03463

Pearl Broadhurst #15

Walker Hollow Field
 SE SE Sec9-T7S-R23E
 552' FSL, 555' FEL
 Elevation: 5182' GL, 5195' KB
 Uintah County, Utah

Spud Date: 4/11/81
 TD Date: 4/26/81
 Completion Date: 7/21/81

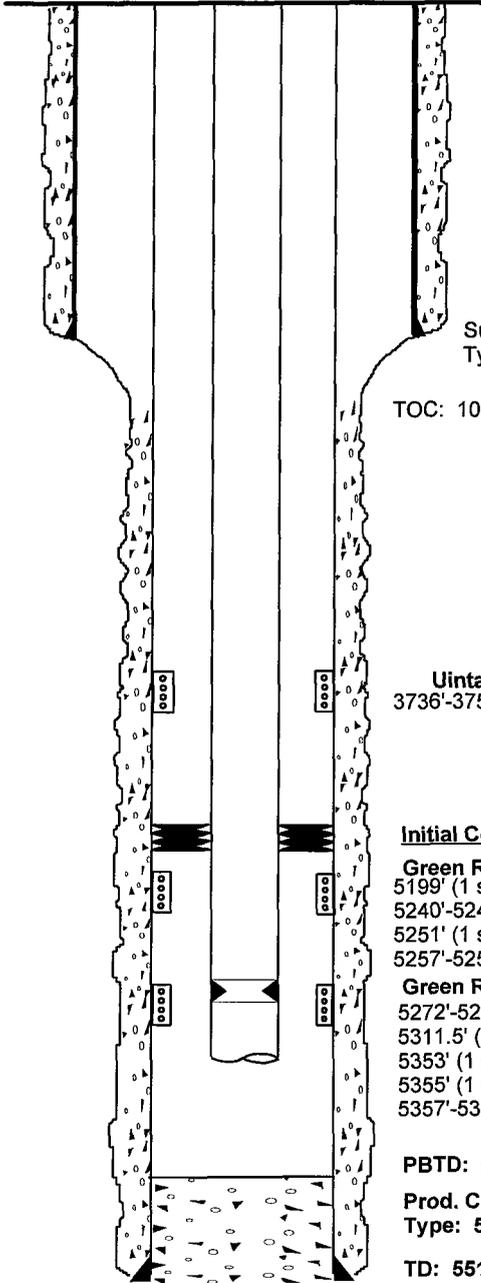
Tubing Record

KB.....	13.00'
163 jts 2-7/8", EUE, J-55, 8rd coated tbg.....	5197.01'
1 - 5.5" x 2.5" TAC.....	2.80'
4 jts 2-7/8", EUE, J-55, 8rd coated tbg.....	127.78'
1 - SN.....	1.10'
1 jt 2-7/8, EUE, J-55, 8rd perf sub.....	6.10'
1 jt 2-7/8", EUE, J-55, 8rd coated tbg.....	32.36'
<hr/>	
End of tubing.....	5380.18'

- 1.5" x 22' polished rod
- 1 - 7/8" x 4' pony
- 2 - 7/8" x 6' ponies
- 86 - 7/8" scraped rods
- 126 3/4" plain rods
- 1 - 3/4" x 2' pony
- 2.5" x 1.75" x 16' RHAC pump

Workover History

3/2/94: Perf'd & treated Uintah sand as shown



Surface Casing @ 497'
 Type: 8-5/8", 24#

TOC: 1000' KB

Uintah
 3736'-3754' (4 spf)

Stimulation

Broke Formation
 500 gal. Xylene, 750 gal. 7.5% MSR
 5 BPM @ 1600#, ISI: 630#

Initial Completion

- Green River "J"
- 5199' (1 spf)
- 5240'-5241' (1 spf)
- 5251' (1 spf)
- 5257'-5259' (1 spf)
- Green River "K"
- 5272'-5273' (1 spf)
- 5311.5' (1 spf)
- 5353' (1 spf)
- 5355' (1 spf)
- 5357'-5358' (1 spf)

Stimulation

Broke Formation ("J" & "K" sands)
 1000 gal. 7.5% MSR-100
 8 BPM @ 2500#, ISI: 800#

Frac

10,000 gal. Strata-Frac II pad
 38,000 gal. Strata-Frac II fluid
 56,000# 20/40 sand
 33,000# 10/20 sand
 23 BPM @ 5400#

PBD: 5463'

Prod. Casing @ 5503'
 Type: 5-1/2", 14#

TD: 5517' KB

GEO-COM (TM)

PAGE 1

STATE : UTAH
 COUNTY : UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DO

OPERATOR: ENERGY RESERVES GROUP
 WELL: 15 BROADHURST
 API NO: 43-047-30901-00 00

TWP: 7S RGE: 23E
 SEC: 9
 SPOT: SE SE SE
 FOOTAGE: 552 FSL 555 FEL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: MGF

SPUD: 04-11-1981

COMP: 07-21-1981

GROUND ELEV: 5182 GR
 REF. ELEV : 5195 KB

TD: DTD 5517
 PB 5463
 FM TO GREEN RIVER

CASING: 8 5/8 @ 497 W/ 365 5 1 2 @ 5503 W/ 1320

INITIAL POTENTIAL: IPP 53 BOPD 6 BW
 GREEN RIVER PERF 5199-5358 GROSS
 PERF 5199-5199 5240-5241 5251-5251 5257-5259
 PERF 5272-5273 5311-5311 5353-5353 5355-5355
 PERF 5357-5357 5358-5358
 ACID 5199-5358
 SEFR 5199-5358

TOPS:	FORMATION	DEPTH	SUBSEA
LOG	UINTA	0	5195
LOG	GREEN RIVER	2800	2395

PRODUCTION TESTS: PT 01 PTP 93 BO 33 BW
 GREEN RIVER PERF W/ 1-FT 5199-5358 GROSS
 PERF 5199-5199 5240-5241 5251-5251 5257-5259
 PERF 5272-5273 5311-5311 5353-5355 5357-5358
 ACID 5199-5358 1000 GALS
 7 1/2% MSR-100/
 SEFR 5199-5358 48000 GALS 92000 LBS SAND

LOG TYPES: DEN-GRN BHC-ACS DI-FOC

PI REFERENCE #: K09108

Spud Date: 4/30/81
 TD Date: 5/15/81
 Completion Date: 10/5/81

Pearl Broadhurst #16

Walker Hollow Field
 NW SW Sec9-T7S-R23E
 1977' FSL, 662' FWL
 Elevation: 5181' GL, 5194' KB
 Uintah County, Utah

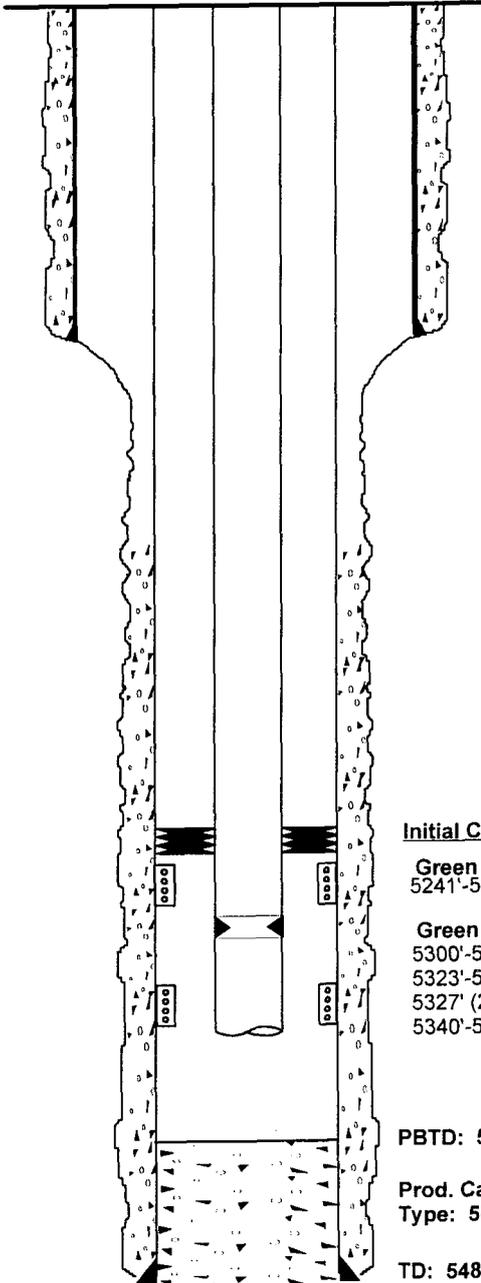
Tubing Record

164 jts 2-7/8", J-55, 8rd, 6.5#, EUE coated tbg.....5166.18'
 1 - 5-1/2" x 2-1/2" TAC.....2.78'
 5 jts 2-7/8", J-55, 8rd, 6.5#, EUE coated tbg.....156.36'
 1 - SN.....1.10'
 1 jt 2-7/8", J-55, 8rd, 6.5#, EUE coated tbg.....31.55'
 1 - notched collar.....0.44'

End of tubing.....5358.41'

Rod Record

1 - 7/8" x 2' pony
 85 - 7/8" scraped rods
 127 - 3/4" slick rods
 1 - 3/4" x 2' pony
 2.5" x 1.75" x 15' pump



Surface Casing @ 500' KB
 Type: 8-5/8", 24#

Initial Completion

Green River "J"
 5241'-5244' (1 spf)

Green River "K"
 5300'-5302' (2 spf)
 5323'-5324' (2 spf)
 5327' (2 spf)
 5340'-5343' (2 spf)

Stimulation ("J" & "K" sands)

Broke Formation
 750 gal. 7.5% HCl

Frac
 43,000 gal. Super "E"
 55,000# 20/40 sand
 24,000# 10/20 sand

Stimulation ("K" sand)
 1300 gal. 7.5% HCl

PBTD: 5447' KB

Prod. Casing @ 5486' KB
 Type: 5-1/2", 14#

TD: 5487' KB

GEO-COM (TM)

PAGE 1

STATE : UTAH
 COUNTY : UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DD

OPERATOR : ENERGY RESERVES GROUP
 WELL : 16 BROADHURST
 API NO : 43-047-30903-00 00

TWP : 7S RGE : 23E
 SEC : 10
 SPOT : SE NW SW
 FOOTAGE : 1977 FSL 662 FWL
 FULL SECTION

FINAL STATUS: DIL
 CONTRACTOR: NOT RPTD

SPUD: 04/30/1981

COMP: 09/27/1981

GROUND ELEV: 5181 GR
 REF. ELEV : 5194 KB

TD: DTD 5487
 PB 5447
 FM TO GREEN RIVER

CASING: 8 5/8 @ 500 W/ 365 5 1/2 @ 5486 W/ 1180

INITIAL POTENTIAL: IPP 13 BOPD 19 BW
 GREEN RIVER PERF 5241-5343 GROSS
 PERF 5241-5244 5300-5343
 ACID 5241-5343
 SEFR 5241-5343

TOPS: FORMATION DEPTH SUBSEA

LOG UINTA 0 5194
 LOG GREEN RIVER 2780 2414

PRODUCTION TESTS: PT 01 PTP 14 BO 102 BW
 GREEN RIVER PERF 5241-5343 GROSS
 PERF 5241-5244 5300-5343
 ACID 5241-5343 750 GALS
 ADDTV HCL 7 1/2%
 SEFR 5241-5343 43000 GALS 79000 LBS SAND
 SEFR W/55000# 20/40 SD, 24000# 10/20 SD

PT 02 PTP 8 BO 33 BW
 GREEN RIVER PERF 5241-5343 GROSS

PT 03 PTP 16 BO 40 BW
 GREEN RIVER PERF W/ 1/FT 5241-5343 GROSS

LOG TYPES: NEC DN ILD
 AV DI-FOC DEN-GRN
 BHC-ACS

PI REFERENCE #: D03823

Spud Date: 5/21/81
 TD Date: 6/3/81
 Completion Date: 7/30/81

Pearl Broadhurst #18

Walker Hollow Field
 NW NE Sec9-T7S-R23E
 581' FNL, 2042' FEL
 Elevation: 5078' GL, 5091' KB
 Uintah County, Utah

Tubing Record

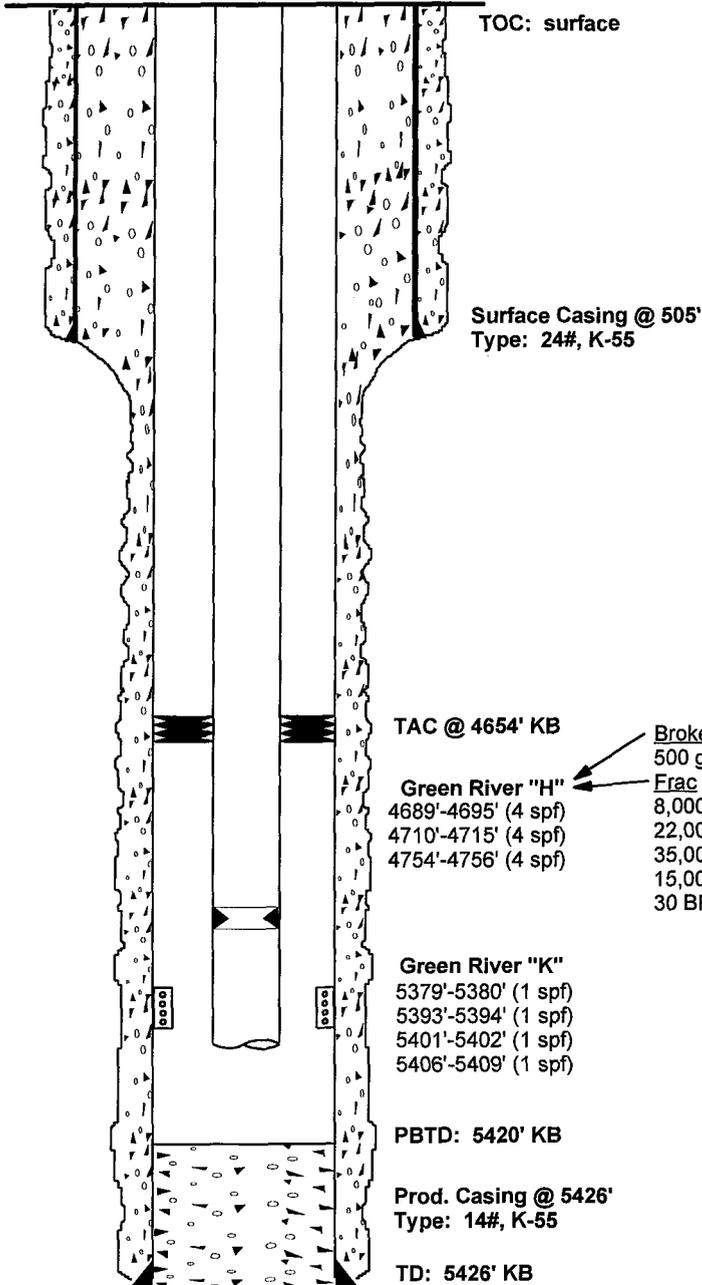
146 jts 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....4651.25'
 1 - 2-7/8" x 5.5" TAC.....2.75'
 22 jts - 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....701.94'
 1 - cup type SN.....1.10'
 1 - 2-7/8", 6.5#, J-55, EUE, 8rd coated tbg.....30.20'

End of tubing.....5387.24'
 KB.....13.00'

5400.24'

Rod Record

1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 1 - 7/8" x 4' pony
 79 - 7/8" scraped rods
 134 - 3/4" rods
 2.5" x 1.5" x 12' x 14' x 16' RHAC



Broke Formation
 500 gal. 7.5% HCl, ISI: 4500#
Frac
 8,000 gal. Super "K" pad
 22,000 gal. Super "K" fluid
 35,000# 20/40
 15,000# 10/20
 30 BPM @ 2800#, ISI: 1700#

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PAGE 1

STATE : UTAH
 COUNTY : Uintah
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DD

OPERATOR : ENERGY RESERVES GROUP
 WELL : 18 BROADHURST

API NO: 43-047-30939-00 00

TWP : 7S RGE : 23E
 SEC : 9
 SPOT : NW NW NE
 FOOTAGE : 581 FNL 2042 FEET
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: MGF DRLG 65

SPUD: 05 22 1981 COMP: 07 30 1981 GROUND ELEV: 5078 GR TD: DTD 5426
 REF. ELEV : 5091 KB PB 5420
 FM TD GREEN RIVER

CASING: 8 5 8 @ 505 W 365 5 1 2 @ 5426 W 1500

INITIAL POTENTIAL: IPP 86 BOPD 2 BW
 GREEN RIVER PERF W 1 FT 5379-5409 GROSS
 PERF 5379-5380 5393-5394 5401-5402 5406-5409
 ACID 5379-5409
 SGFR 5379-5409
 @ 5426 FT BHT 111 F
 GTY 28.0

TOPS: FORMATION DEPTH SUBSEA

LOG	UINTA	0	5091
LOG	GREEN RIVER	2807	2284

PRODUCTION TESTS: PT 01 PTP 230 BO 5 BW 24 HRS
 GREEN RIVER PERF W 1 FT 5379-5409 GROSS
 PERF 5379-5380 5393-5394 5401-5402 5406-5409
 ACID 5379-5409 500 GALS
 ADDTV HCL 1 2% HCL
 SGFR 5379-5409 30000 GALS 50000 LBS SAND
 FRACT W/35000# 20'40 SD,, 15000# 10'20 SD

LOG TYPES: ILDL NEC DNC
 AV DEN-GRN BHC-ACS
 DI-FOC

PI REFERENCE #: D00128 D00129 D00128

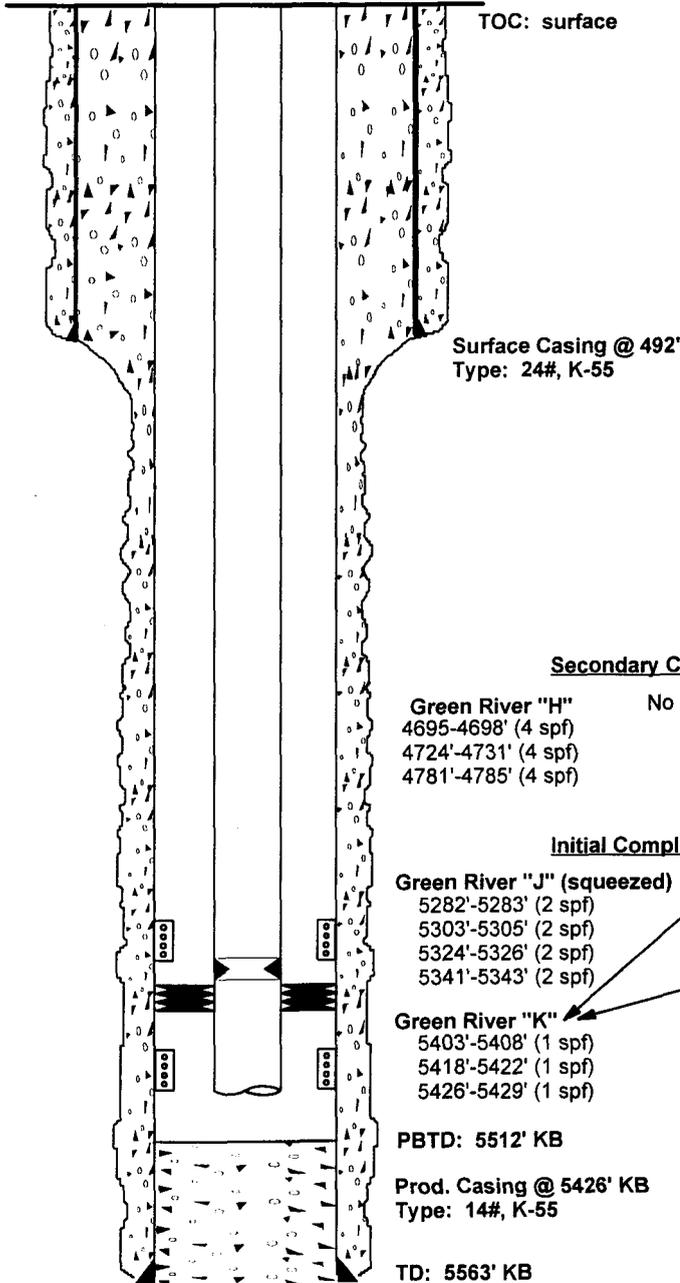
Spud Date: 8/27/81
 TD Date:
 Completion Date: 11/11/81

Pearl Broadhurst #20
 Walker Hollow Field
 SE NW Sec9-T7S-R23E
 1980' FNL, 1978' FWL
 Elevation: 5124' GL, 5137' KB
 Uintah County, Utah

Tubing Record
 KB.....13.00'
 174 jts 2-7/8", 6.5#, EUE, 8rd, J-55 coated tbg.....5351.22'
 1 - 2-7/8" cup type SN.....1.10'
 1 - 2-7/8" x 5-1/2" tubing achor.....2.75'
 2 jts 2-7/8", 6.5#, EUE, 8rd, J-55 coated tbg.....60.65'

 End of tubing.....5428.72'

Rod Record
 1.5" x 22' polished rod
 1 - 7/8" x 2' pony
 1 - 7/8" x 6' pony
 97 - 7/8" scraped rods
 116 - 3/4" plain rods
 1 - 3/4" x 2' pony
 2.5" x 1.75" x 12' x 14' x 16' RHAC pump



Secondary Completion ("H" perfs)

Green River "H" No Stimulation
 4695-4698' (4 spf)
 4724'-4731' (4 spf)
 4781'-4785' (4 spf)

Initial Completion ("J" & "K" perfs)

Green River "J" (squeezed)
 5282'-5283' (2 spf)
 5303'-5305' (2 spf)
 5324'-5326' (2 spf)
 5341'-5343' (2 spf)

Green River "K"
 5403'-5408' (1 spf)
 5418'-5422' (1 spf)
 5426'-5429' (1 spf)

Broke Formation ("K")
 750 gal. 7.5% MSR-100
 ISI: 1200#

Frac
 8,000 gal. Super "K-1" pad
 22,000 gal. Super "K-1" fluid
 35,000# 20/40 sand
 13,100# 10/20 sand
 15 BPM @ 5000#, ISI: 2000#

PBTD: 5512' KB

Prod. Casing @ 5426' KB
 Type: 14#, K-55

TD: 5563' KB

STATE : UTAH
 COUNTY : UINTAH
 FIELD : WALKER HOLLOW
 CLASS : INITIAL - D FINAL - DD

OPERATOR : ENERGY RESERVES GROUP
 WELL : 20 BROADHURST

API NO: 43-047-30941-00 00

TWP: 7S RGE: 23E
 SEC: 9
 SPOT: SE NW
 FOOTAGE: 1980 FNL 1978 FNL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: NOT RPTD

SPUD: 08/27 1981 COMP: 11/11 1981 GROUND ELEV: 5124 AR
 REF. ELEV : 5137 AB TD: BID 5563
 PB 5523
 FM TO GREEN RIVER

CASING: 8 5/8 @ 492 W 365 5 1 2 @ 5563 W 770

INITIAL POTENTIAL: IPP 104 BOPD 173 BW
 GREEN RIVER PERF W 1 FT 5403-5443
 FRAC 5403-5443
 DETAILS NOT RPTD
 GTY 28.5

TOPS: FORMATION DEPTH SUBSEA

LOG	FORMATION	DEPTH	SUBSEA
LOG	UINTA	0	5137
LOG	GREEN RIVER	2852	2285

PRODUCTION TESTS: PT 01 PTP 101 BO 257 BW
 GREEN RIVER PERF W 2/FT 5282-5429 GROSS
 PERF 5282-5283 5303-5305 5324-5326 5341-5343
 PERF 5403-5408 5418-5422 5426-5429
 ACID 5282-5429 750 GALS
 MSR ACID
 SGFR 5282-5429 30000 GALS 48000 LBS SAND
 SQZD 5282-5343

LOG TYPES: DN NE ILD
 AV DI-FDC DEN-GRN
 BHC-ACS

PI REFERENCE #: D09273 D09274

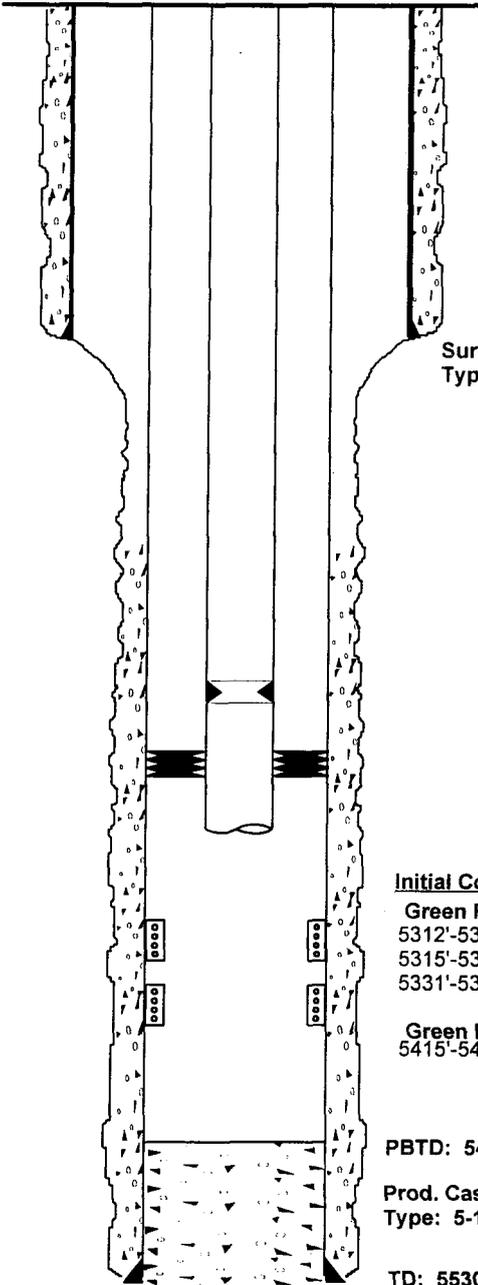
Spud Date: 8/17/81
 TD Date: 8/23/81
 Completion Date: 10/8/81

Pearl Broadhurst #21
 Walker Hollow Field
 NE SE Sec9-T7S-R23E
 753' FSL, 1993' FWL
 Elevation: 5181' GL, 5193' KB
 Uintah County, Utah

Tubing Record
 158 jts 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....5096.65'
 1 - 5-1/2" x 2-1/2" TAC.....2.80'
 6 jts - 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....195.45'
 1 - SN.....1.10'
 1 jt 2-7/8", EUE, 8rd, 6.5#, J-55 coated tbg.....32.26'
 1 - Notched collar w/ pin.....0.60'

End of tubing.....5096.65'

Rod Record
 1.5" x 22' polished rod
 3 - 7/8" x 4' pony
 1 - 7/8" x 8' pony
 86 - 7/8" scraper rods
 124 - 3/4" plain rods
 1 - 3/4" x 2' pony
 2.5" x 1.75" x 12' x 13' x 16' RHAC pump



Surface Casing @ 500' KB
 Type: 8-5/8", 24#, K-55

Initial Completion

Green River "J"
 5312'-5313' (1 spf)
 5315'-5316' (1 spf)
 5331'-5334' (1 spf)

Green River "K"
 5415'-5419' (1 spf)

Stimulation ("J" & "K" sands)

Broke Formation
 750 gal. 7.5% "Spearhead" acid

Frac
 43,000 gal. Super "K"
 55,000# 20/40
 24,000# 10/20
 33 BPM @ 3000#

PBTD: 5490' KB

Prod. Casing @ 5530' KB
 Type: 5-1/2", 14#, K-55

TD: 5530' KB

STATE : UTAH
 COUNTY : Uintah
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DD

OPERATOR : PAN AMERICAN PETROLEUM
 WELL : 3 USA BROADHURST
 API NO : 43-047-16505-00 00

TMP : 75 RGE : 23E
 SEC : 9
 SPOT : SW NE
 FOOTAGE : 2055 FNL 2205 FEL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: EXETER DRUG

SPUD : 01 06 1964 COMP : 04-10-1964 GROUND ELEV : 5084 GR
 REF. ELEV : 5095 RB TD : DTD 5900
 LTD 5902
 PB 5840
 FM TD WASATCH

CASING : 10 3 4 @ 513 W 400 7 @ 5902 W 430

TUBING : 2 3 8

INITIAL POTENTIAL : IPP 105 BOPD 303 BW
 GREEN RIVER PERF JET W. 5 FT 4680-5379 GROSS
 PERF 4680-4680 4728-4728 4769-4769 5346-5346
 PERF 5379-5379
 SOFR 4680-5379

TOPS : FORMATION DEPTH SUBSEA

LOG GREEN RIVER 2790 2305
 LOG WASATCH 5816 -721

FORMATION TESTS : DST 01 STRD 4660- 4685 652GRRV MISRUN

PRODUCTION TESTS : PT 01 GREEN RIVER PERF JET W/ 5/FT 5346-5379 GROSS
 PERF 5346-5346 5379-5379
 MA 5346-5379 500 GALS
 RATE 5 B/MIN TR PR 3000
 SOFR 5346-5379 20840 GALS 2000 LBS SAND
 RATE 34 B/MIN ADDTV ADD2 TR PR 3000-3300
 USED 5 BALL SEALERS-DISPLACED FRACT W/217
 BBLs CALC WTR AT 33.5 BPM-3400 PSI
 ISIP 1350, SIP /20 MIN/ 1150

PT 02 PTS 0 BO
 GREEN RIVER PERF JET W/ 5/FT 4680-4769 GROSS
 PERF 4680-4680 4728-4728 4769-4769
 MA 4680-4769 500 GALS
 RATE 9 B/MIN TR PR 3400
 SOFR 4680-4769 20840 GALS 20000 LBS SAND
 RATE 47 B/MIN STAGES 3 TR PR 2000-2650
 DROPPED 5 BALLS IN 2 STAGES-DISPLACED W 190
 BBLs CALC WTR: ISIP 1000, SIP /10 MIN/ 900

SIP /1 HR/ 750

PT 03 PTP 106 BO 310 BW 21 HRS
 GREEN RIVER PERF 4680-5379 GROSS

PT 04 PTP 71 BOPD 268 BW 24 HRS
 GREEN RIVER PERF 4680-5379 GROSS

PT 05 PTP 71 BOPD 192 BW 24 HRS
 GREEN RIVER PERF 4680-5379 GROSS

PT 06 PTP 96 BO 145 BW 22 HRS
 GREEN RIVER PERF 4680-5379 GROSS

PT 07 PTP 99 BOPD 233 BW 24 HRS
 GREEN RIVER PERF 4680-5379 GROSS

CORES :

CORE 01 4633-4685 REC 52.00FT GREEN RIVER DIMD
 22 SS, VFG, GREY, THIN SH STREAKS, SCATTERED PORD
 SPOTTY FLUOR
 7 SH, DARK GREY W/BROWN OIL SH LAM
 16 SS, FG, FAIR P&P, FAIR MOTTLED-SOLID OSTN
 GOOD YELLOW FLUOR
 7 SH, DARK GREY W/SS LAM

CORE 02 4685-4736 REC 51.00FT GREEN RIVER DIMD
 8 SH, GREY
 4 LM, SANDY, GREY, GOOD P&P, MOTTLED STAIN
 3 SS, TITE, NO SHOW
 1 SS, BROWN STAIN, FAIR P&P
 2 LM, DENSE, NO SHOW
 4 SH
 3 SILT, GRADING TO SS, SOME STAINING
 1 SH
 2 LM, DARK BROWN, GOOD OSTN
 1 SS, HARD, TITE, NO SHOW
 7 SS, CONG, FAIR-EXCELLENT P&P, DARK OSTN
 3 SILT, NO SHOW
 3 SS W/MOTTLED BROWN OSTN

4 SILT, GREY, NO SHOW

CORE 03 4736-4787 REC 51.00FT GREEN RIVER DIMD
 5 SILT, SH, NO SHOW
 3 SS, FG, FAIR-GOOD P&P, SPOTTY FLUOR, LOOKS WET
 3 SILT, LIGHT GREY, NO SHOW
 5 SS, FG-MG, GOOD P&P, DARK BROWN OIL SAT
 3 SILT, LIGHT GREY, NO SHOW
 9 SS, FG-MG, POOR-FAIR P&P, DULL YELLOW
 FLUOR, HAIRLINE VERT FRACT IN UPPER 4 FT
 DARK BROWN OSTN ON FRACT PLANE, 6 INCHES
 4760-60 1/2 MOTTLED-SOLID OIL SAT
 5 SILT, LIGHT GREY
 1 SS, FG, FAIR-GOOD P&P, LOOKS WET
 4 SILT, NO SHOW
 4 SS, FG W/ABUNDANT DARK SH LAM, NO SHOW
 9 SILT, LIGHT GREY, NO SHOW

CORE 04 4787-4838 REC 51.00FT GREEN RIVER DIMD
 8 SH
 5 SS, WET, NO SHOW
 4 SILT & SH, NO SHOW
 3 SS, WET, NO SHOW
 1 SH
 7 SS, WET, NO SHOW
 5 SH
 8 SS, FAIR P&P, WET, NO SHOW
 10 SILT & SH, INTERBDD, NO SHOWS

CORE 05 5185-5236 REC 51.00FT GREEN RIVER DIMD
 2 SS, GREY-GREEN, NO SHOW
 5 SILT, NO SHOW
 13.5 SS, NO SHOW
 9 SH
 5 SS, NO SHOW
 1.5 SH & SILT
 2 SS, NO SHOW
 1 SILT
 2 SS, NO SHOW

STATE : UTAH
COUNTY: Uintah
FIELD : RED WASH
CLASS : INITIAL - D FINAL - DD
FINAL STATUS: OIL
CONTRACTOR: EXETER DRLG

GEO-COM (TM)

OPERATOR: PAN AMERICAN PETROLEUM
WELL: 3 USA BROADHURST
API NO: 43-047-16505-00 00

CONTINUED PAGE 2

TMP: 5 RGE: 23E
SEC: 9
SPOT: SW NE
FOOTAGE: 2055 FNL 2205 FEL
FULL SECTION

10 SILT & SH, INTERBDD
CORE 06 5236-5288 REC 52.00FT GREEN RIVER DIMD
2 LM, NO SHOW
14 SS, NO SHOW
12 SH & SILT, NO SHOW
5 SS, UNEVEN-SOLID BROWN OSTN
1 SH
13 SS W/SH LAM, SOLID BROWN OSTN
1 SS & SH, REWORKED
4 SS, NO SHOW
CORE 07 5288-5340 REC 52.00FT GREEN RIVER DIMD
2 SS, NO SHOW
5 SILT, NO SHOW
3 SS, NO SHOW
21 SILT & SH, INTERBDD
2 SS, NO SHOW
16 SH & SILT, INTERBDD
4 SS, GOOD DARK BROWN OSTN
CORE 08 5340-5389 REC 44.00FT GREEN RIVER DIMD
5 SS, SCATTERED-SOLID DARK BROWN OSTN
15 SILT, NO SHOW
7 SS & SH LAM, NO SHOW
3 SILT, NO SHOW
9 SS, GOOD DARK BROWN OIL SAT BECOMING SCATTERED
IN LOWER 2 FT
5 SILT, GOOD BROWN OSTN 5380 1/2-81 1/2

LOG TYPES:

IL AV DM3
IE GRSL

PI REFERENCE #:

K08469

DRILLING SHOWS:

4633-4655	GREEN RI SFLU 4655-4662	GREEN RI
4662-4678	GREEN RI GFLU 4662-4678	GREEN RI
4707-4710	GREEN RI OSTN 4711-4713	GREEN RI
4714-4721	GREEN RI OSTN 4724-4727	GREEN RI
4741-4744	GREEN RI SFLU 4741-4744	GREEN RI
4747-4752	GREEN RI OIL 4755-4764	GREEN RI
4755-4764	GREEN RI SFLU 4760-4760	GREEN RI
4769-4770	GREEN RI WET 4795-4800	GREEN RI
4804-4807	GREEN RI WET 4808-4815	GREEN RI
4820-4828	GREEN RI WET 5264-5269	GREEN RI
5270-5283	GREEN RI OSTN 5336-5345	GREEN RI
5370-5379	GREEN RI OSTN 5380-5382	GREEN RI

STATE : UTAH
 COUNTY : UINTAH
 FIELD : RED WASH
 CLASS : INITIAL - D FINAL - DO

OPERATOR : CHEVRON USA
 WELL : 189 41-168 RED WASH UNIT
 API NO: 43-047-15292-00 00

TWP : 7S RGE : 23E
 SEC : 16
 SPOT : NW NE NE
 FOOTAGE : 635 FNL 685 FEL
 FULL SECTION

FINAL STATUS: OIL
 CONTRACTOR: KERR-MCGEE

SPUD: 04/24/1964 COMP: 06/26/1964 GROUND ELEV: 5206 GR TD: DTD 5401
 REF. ELEV : 5219 KB PB 5371
 FM TD GREEN RIVER

CASING: 10 3/4 @ 232 W/ 165 5 1 2 @ 5390 W/ 261

INITIAL POTENTIAL: IPP 51 BOPD 45 BW
 GREEN RIVER PERF JET W/ 4/FT 5233-5342 GROSS
 GREEN RIVER PERF JET W/ 4/FT 4707-4768 GROSS
 PERF 5233-5233 5301-5301 5317-5317 5342-5342
 PERF 4707-4707 4756-4756 4768-4768
 MA 5342-5342 100 GALS
 TP 4000-NO BD
 FRAC 5317-5317
 RATE 6 B/MIN
 FRAC 5301-5301
 RATE 6 B/MIN
 FRAC 5233-5233
 RATE 6 B/MIN
 SOFR 5233-5342 12000 GALS 8000 LBS SAND
 SOFR 5233-5342 2000 LBS GLSS
 RATE 27 B/MIN TP 2850-2700
 OFR 4756-4768 2500 GALS 500 LBS GLSS
 RATE 4 B/MIN ADDTV ADOM TP 1950
 OFR 4707-4707 2500 GALS 200 LBS GLSS
 RATE 11 B/MIN ADDTV ADOM TP 5000-5050

TOPS: FORMATION DEPTH SUBSEA

LOG	FORMATION	DEPTH	SUBSEA
LOG	GREEN RIVER	2780	2439

LOG TYPES: IE MICL

PI REFERENCE #: K07913 K07914

SPUD: 12/14/1967 COMP: 12/21/1967 GROUND ELEV: 5206 GR TD: DTD 5401
 REF. ELEV : 5218 KB OTD 5401
 FM TD GREEN RIVER

CASING: 5 1/2 @ 5390 W/ 261
 5 1/2 CSG PREVIOUSLY IN PLACE

INITIAL POTENTIAL: IPF 1140 MCFD
 GREEN RIVER PERF W/ 2/FT 4663-4667
 NATURAL

LOG TYPES: NE PLPD AV

ATTACHMENT R649-5-2 (2.12)

PUBLIC NOTICE AFFIDAVIT

NOTICE OF APPLICATION FOR FLUID INJECTION WELL PERMIT

United Meridian Petroleum Corporation, 410 17th Street, Suite 1400, Denver, Colorado, 80202 (303) 573-5100, is applying to the State of Utah Department of Natural Resources, Division of Oil, Gas and Mining, for a permit to inject fluid into a formation which is productive of oil and gas for enhanced oil recovery.

The applicant proposes to inject fluid into the Green River "H" zone, in Well Numbers 4 and 14 of the Pearl Broadhurst Lease. The proposed injection wells are located 2 miles North-Northwest of Red Wash, in the Walker Hollow Field in Uintah County. Fluid will be injected into the strata in the sub-surface depth interval from 4700 feet to 4800 feet.

Legal Authority: The Oil and Gas Conservation General Rules: R649-5-3, "Noticing and Approval of Injection Wells"

Requests for a public hearing from persons who can show they would be adversely affected, or requests for further information concerning any aspect of the application should be submitted in writing, within fifteen days of publication of this notice to: State of Utah Board of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah, 84180-1203. Telephone number (801) 538-5340.

Notice was published in the Salt Lake Tribune and the Vernal Express newspapers.

We will send in a copy of the affidavits when the papers send them.

ATTACHMENT R649-5-4

AQUIFER EXEMPTION

AQUIFER EXEMPTION

General Atlantic Resources Inc., is requesting an aquifer exemption for the #4 & #14 wells in Walker Hollow Field because the intended injection zone meets the following criteria:

1) The target injection zone for the Pearl Broadhurst wells #4 & #14, are not utilized as USDW sources for any person or entity in the area of review.

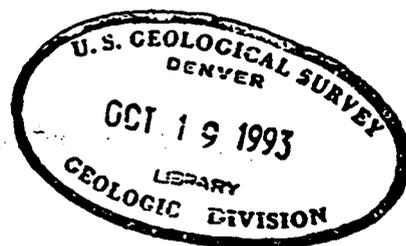
2) The overall TDS content for the Green River "H" zone ranges from a maximum of 17035.18 mg/l to a minimum of 873.66 mg/l, and has an average of 21,464.55 mg/l for this zone for the entire Uinta Basin. (P.310, Gwynn. 1992) The Formation Evaluation Summary Log produced by Schlumberger shows an average TDS content for the "H"4 zone from 4719'-4730' as 6400 mg/l and the "H"5 zone from 4745'-4762' as 5500 mg/l TDS.

3) The Green River "H" zone is a hydrocarbon bearing formation.

Please refer to the attached article for more detail of the intended injection zone.

Hydrocarbon and Mineral Resources of the Uinta Basin, Utah and Colorado

Utah Geological Association Guidebook 20



Thomas D. Fouch, Vito F. Nuccio, and Thomas C. Chidsey, Jr.
Editors

*Utah Geological Association
P.O. Box 11334
Salt Lake City, Utah 84147*

1992 Field Symposium

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THE OIL WELL SALINE-WATER RESOURCES OF THE UINTA BASIN, UTAH: THEIR CHARACTER AND DISTRIBUTION

J. Wallace Gwynn¹

ABSTRACT

The Uinta structural and topographic basin, located in northeastern Utah, contains many of the state's major oil and gas fields. During the production of liquid and gaseous hydrocarbons from these fields, water of varying salinities is normally co-produced.

The cumulative production of saline water from these fields, through December 1990, is approximately 1.346 billion barrels. It is produced mainly from reservoirs in the Green River and Wasatch Formations in the oil fields of Duchesne and Uintah Counties. The water/oil ratio within these two counties is increasing over time. This is due to normal encroachment of formation water into the oil and gas reservoirs and increased use of water-flood production techniques.

Four methods are used to dispose of most of the co-produced saline water. These include regulated surface discharge; reinjection back into the ground during water flood or enhanced oil-recovery projects; reinjection into salt-water disposal wells; and disposal into large, open, salt-water evaporation pits.

Uinta Basin oil well saline waters vary in total dissolved solids (salinity) and chemistry both vertically and laterally within individual formations, and throughout the basin. The six major ions (or ion-pairs) present in the saline water include sodium (plus potassium), magnesium, calcium, chloride, sulfate and bicarbonate (plus carbonate). Each of the six ions appears to vary independently throughout the basin. Areas where the saline water contains low sulfate, magnesium and calcium, and high sodium and chloride, are coincident with the basin's major oil fields. Depending on economic factors, potentially-valuable mineral salts or saturated brines could be produced from these saline waters through the processes of solar evaporation and salt precipitation.

INTRODUCTION

Utah's production of oil and gas comes mainly from fields in the eastern half of the state, within the Colorado Plateau and Rocky Mountains physiographic provinces. Figure 1 shows the three major physiographic provinces in Utah, the thirteen counties in which crude oil and gas are found and/or produced, and the Uinta structural basin study area.

Water, which is commonly saline in nature, is frequently encountered during exploration drilling for liquid and gaseous hydrocarbons. During commercial hydrocarbon production, saline water is normally co-produced, and in many cases, its volume exceeds that of the oil. Now, saline water is co-produced in more than 75 percent of the active oil and gas fields within the state (Utah Division of Oil, Gas and Mining, December issues 1984-1990).

The salinity and chemical composition of co-produced saline water are variable. Salinity is a measure

of the quantity of dissolved salt(s) per unit volume (mg/l). Chemical composition is a comparison of the relative abundances of the various dissolved ions. Sodium (Na^+), potassium (K^+), magnesium (Mg^{+2}), calcium (Ca^{+2}), chloride (Cl^-), sulfate (SO_4^{-2}), bicarbonate (HCO_3^-) and carbonate (CO_3^{-2}) are the most common ions.

Variations in the chemical composition or ion ratios of saline water are due to several factors. These factors include the chemical composition of the connate waters trapped within the sediments at the time of deposition, and the composition of descending meteoric waters recharged at the surface. Variations are further dependent upon the many subsurface chemical and bacteriological interactions that take place between water and its confining rock and sediments. They also vary during the mixing of dissimilar saline waters.

After saline water is co-produced with, and then separated from the hydrocarbons, it must be disposed of in a proper and acceptable manner. This saline water may, however, represent a valuable resource rather than a disposal problem.

¹Utah Geological Survey, 2363 South Foothill Drive, Salt Lake City, Utah 84019-1491

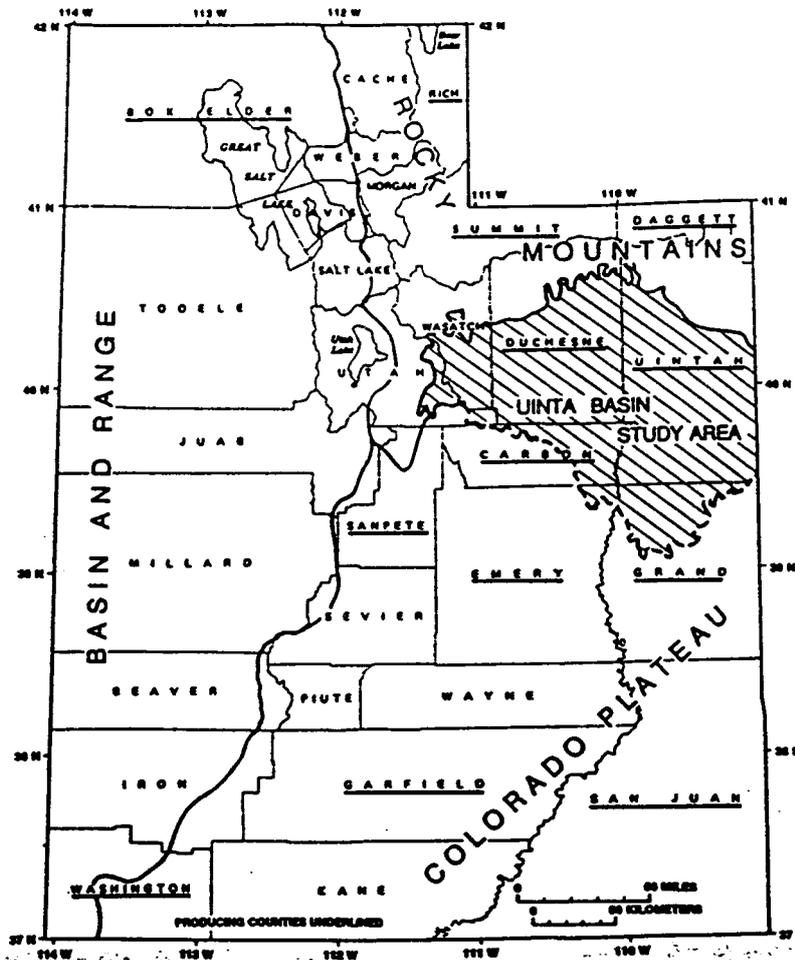


Figure 1. Utah's major physiographic provinces, the thirteen counties in which oil and/or gas are found, and the Uinta structural basin study area.

This report: (1) describes the geologic setting and stratigraphy of the Uinta Basin, (2) describes the compilation of a ground-water/oil well saline-water chemical data base, (3) discusses the quantity and disposition of co-produced saline waters, (4) characterizes the salinity, chemistry and the vertical and lateral variations of these waters, and (5) addresses the potential economic uses of the saline waters.

GENERAL GEOLOGY OF THE UINTA BASIN

Geologic setting and history

The Uinta Basin is a broad, elongate, east-west trending, asymmetrical structure, located in northeastern Utah and northwestern Colorado. It lies within the northern part of the Colorado Plateau physiographic province. The portion of the basin within Utah, which is underlain by Tertiary rocks, covers an area of about 8,700 square miles (22,500 square km). Surface eleva-

tions range from about 5,000 ft (1,500 m) near Ouray to nearly 9,500 ft (2,900 m) along the southern rim.

The Uinta Basin is both a structural and a topographic basin. Its structural axis is displaced to the north of the topographic axis, and lies almost at the foot of the east-west trending Uinta Mountains which form its northern boundary. The rim of the Tavaputs Plateau forms the southern boundary of the basin; and the Wasatch Mountains the western boundary. The Douglas Creek arch, located in western Colorado, forms the eastern boundary.

The Uinta Basin began to develop in Latest Cretaceous time with the deposition of the North Horn Formation. The main tectonic factors in its development were the rise of the Uinta Mountains block and the simultaneous subsidence of the synclinal axis of the basin (Osmond, 1964). Nearly 10,000 ft (3,000 m) of lower Tertiary lacustrine, fluvial, and volcanic sedimentary rocks fill the basin. Details of the subsurface interfingering within the basin, and of the origin and

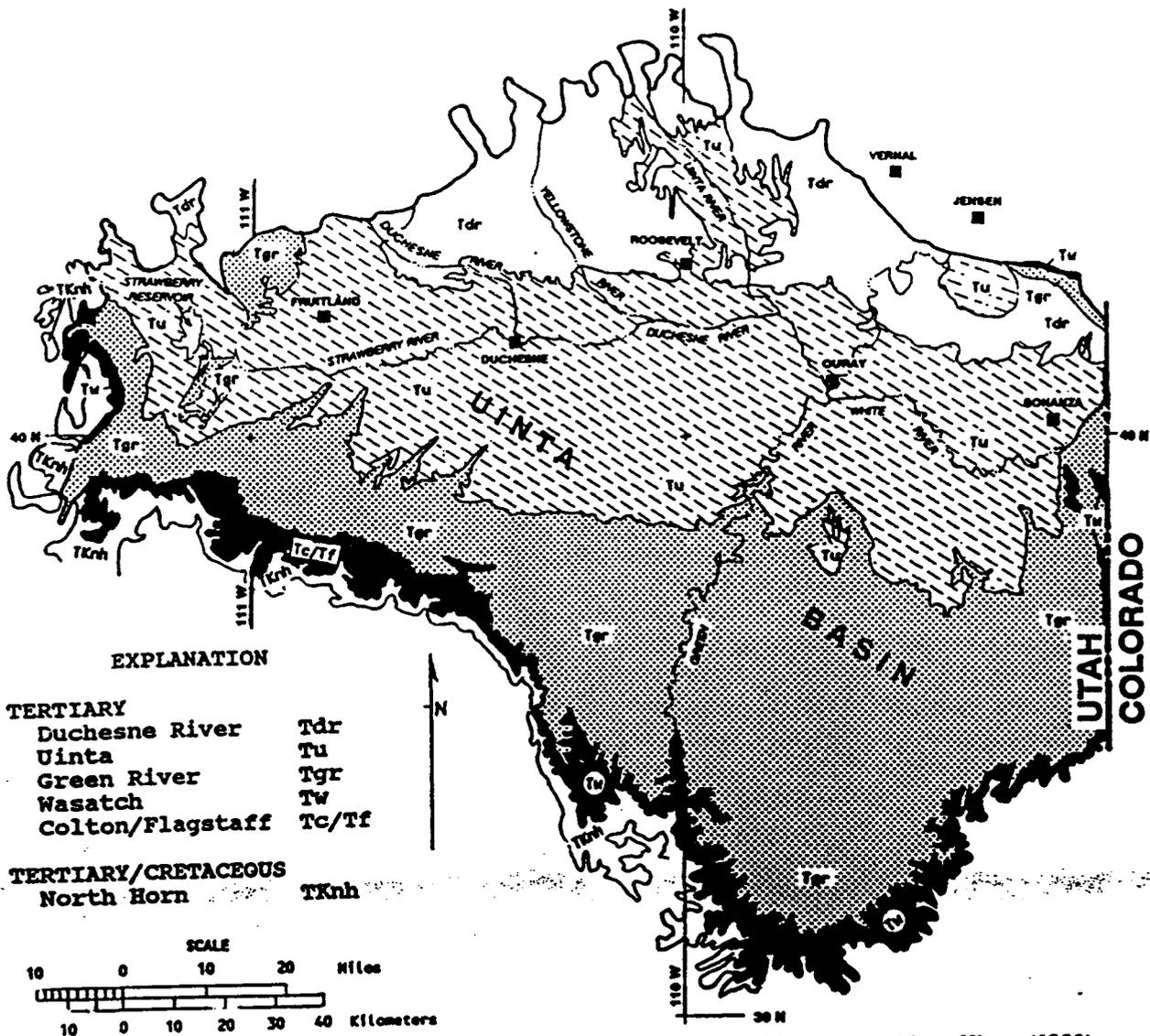


Figure 2. Generalized geologic map of the Uinta structural basin. Map modified from Hintze (1980).

evolution of Lake Uinta are described by Johnson (1985), and by Ryder and others (1976).

Stratigraphy

The stratigraphic sequence of rocks within the Uinta Basin, from oldest to youngest, includes the Cretaceous and Tertiary North Horn Formation, and the Paleocene and Eocene Wasatch, Colton and Green River Formations. It also contains the Eocene Uinta Formation and the Eocene and Oligocene Duchesne River Formation. All these formations are widely exposed in the study area (Fig. 2). However, the Paleocene and Eocene Flagstaff Member of the Green River Formation is mainly exposed in Price Canyon, and in the Emma and Whitmore Park areas.

Fouch (1975) classified the facies or environments-of-deposition of the five main Tertiary forma-

tions in the basin, and characterized their rock types as follows. The Wasatch (Colton), Uinta and Duchesne River Formations all are alluvial facies. They typically contain sandstone, conglomerate, and red to gray claystone of alluvial fan, high mudflat, lower deltaic plain and paludal marsh origin. The Flagstaff Member of the Green River Formation and other portions of the Green River Formation are marginal lacustrine facies. The rocks in this facies are represented by sandstone, gray-green claystone and carbonates of deltaic, interdeltic and lake-margin carbonate. The remaining portion of the Green River Formation is an open lacustrine facies. Rock belonging to this facies are represented by gray and brown claystone and mud-supported carbonate of nearshore and offshore open lacustrine origin. Fouch (1975) notes that the marginal lacustrine facies contains the primary reservoir rocks in the major oil and gas fields of the Uinta Basin.

Formation name changes and reassignments of lithologic units were made in the lower part of the Tertiary System in the southern portion of the basin (Fouch, 1976). The names Wasatch Formation (not Colton Formation) and Flagstaff Limestone will be used in this report to maintain continuity with the formation names used on most drilling- and brine-analysis records.

SALINE-WATER DATA BASE DEVELOPMENT

Sources of chemical analyses

The major sources of chemical data for oil well production and other waters include the following: Utah Geological Survey (UGS) and U.S. Geological Survey (USGS) data files; Celsius Energy Company files; and Utah Division of Oil, Gas and Mining files. Other sources included: The University of Oklahoma (Geological Information Systems), Woodward-Clyde Consultants (1982), Hanshaw and Gilman (1969), and other contributions from private sources.

Most of the chemical data collected and used in this report represent saline water from producing oil and gas wells and from wildcat wells. Others are from shallow water wells and springs. The chemical data are part of a state-wide, UGS database containing the chemical composition of oil-well saline and other waters. Because of the varied sources of the water analyses, and uncertainty about the sample collection and analytical methods used, the degree of accuracy is unknown, and not assumed to be uniform. The data are interpreted with these uncertainties in mind.

Charge-balance screening

Chemical analyses were collected, compiled and entered into the UGS computer system. The software used was Reflex, version 2.0 by Borland, Inc. The data were then subjected to a charge-balance screening procedure before being used in interpretive studies. This screening procedure involved the following steps:

- (1) Analyses complete in Na^+ , Mg^{+2} , Ca^{+2} , Cl^- , SO_4^{-2} and HCO_3^- , were selected for inclusion in the data base. Analyses also containing K^+ and CO_3^{-2} were used as well.
- (2) The milliequivalents (MEQ) of each major ion (Na^+ , Mg^{+2} , K^+ , Ca^{+2} , Cl^- , SO_4^{-2} , HCO_3^- and CO_3^{-2}) were calculated by dividing the milligrams-per-liter of each ion by its appropriate equivalent-weight value. These values are 22.989, 12.156, 39.102,

20.040, 35.453, 48.029, 61.017 and 30.004 respectively.

- (3) The sum of the anion-milliequivalents (Cl^- , SO_4^{-2} , HCO_3^- and CO_3^{-2}) were then subtracted from the sum of the cation-milliequivalents (Na^+ , K^+ , Mg^{+2} and Ca^{+2}). The difference between the two values is the charge-imbalance.
- (4) Analyses having a charge-imbalance greater than 11 MEQ, either positive or negative, were discarded.

The total dissolved solids (TDS) values are the sum of the concentrations of the eight ions, reported in milligrams-per-liter.

GEOGRAPHICAL AND GEOLOGIC DISTRIBUTION OF OIL WELL AND OTHER WATERS

Geographic distribution

The 1,533 chemical analyses within the data base are from six of the seven counties in the Uinta Basin. The distribution of these analyses by county, is as follows: Carbon 24, Duchesne 712, Emery 3, Grand 34, Uintah 743, and Wasatch 17.

These analyses represent co-produced water from 33 oil and gas fields within four counties. The number of fields in each county, or shared with another county, is as follows: Carbon 2, Duchesne 12, Grand 1, and Uintah 20. In addition, many analyses represent wildcat wells, or shallow water-wells and springs.

Geologic Distribution

The 1,533 chemical analyses represent waters from six Tertiary formations in the basin. These analyses are distributed among six formations as follows: Browns Park 5, Duchesne River 47, Uinta 85, Green River 952, Wasatch 426, and the Flagstaff Limestone 18. Insufficient information is available to separate analyses from the Green River Formation into its individual members, or to subdivide analyses from the Uinta Formation.

QUANTITY AND RATE OF OIL WELL SALINE-WATER PRODUCTION

Quantity of co-produced saline water

The greatest quantities of co-produced saline water are from Uintah and Duchesne Counties. They account for more than 99.9 percent of the cumulative

Table 1. Cumulative production, through December 1990, of oil, gas and co-produced water from counties within the Uinta Basin. Data taken from Utah Division of Oil, Gas and Mining (December issues, 1984 through 1990).

COUNTY	OIL (Barrels)	GAS (Mcf)	WATER (Barrels)
CARBON*	142,949	5,205,656	4,234
DUCHESNE	210,168,843	319,604,517	273,989,457
EMERY	0	0	0
GRAND*	76,417	173,659,546	318,712
UINTAH	166,860,561	668,934,508	1,072,087,669
UTAH	0	0	0
WASATCH	0	0	0

Source: Utah Division of Oil, Gas and Mining
(December issues, 1984 through 1990).

* Includes only production from within the Uinta Basin boundary.

1.346 billion barrels that have been produced in the Uinta Basin through December 1990 (Utah Division of Oil, Gas and Mining, December issues 1984-1990). A summary, by county, of the cumulative production of oil, gas and co-produced saline water through December 1990, is shown in Table 1. The 1.346 billion-barrels of saline-water production includes that coming from within the outlined boundary of the Uinta Basin and the the Ashley Valley field, just north of the basin boundary fault near the town of Vernal, in Uintah County.

Rate of saline water production

The rate at which saline water is co-produced with oil and gas varies between wells, fields and counties. Part of the co-production rate is dependent upon the consumer-demand for hydrocarbon products. An increase in the demand for hydrocarbons results in an increase in the co-production of saline water. The co-production rate is also dependent upon the water/oil ratio of these fluids which changes with locality, over time due to different or changing hydrologic and geologic conditions within the hydrocarbon reservoirs.

The annual production rates, from 1984 through 1990, of oil and water in Duchesne and Uintah Counties, and the water/oil ratios for these areas, are shown in Figure 3. The graphs for Duchesne County suggest that overall production of oil is decreasing slightly and that the water/oil ratio is increasing. A similar but more subtle trend is seen in the production of oil from Uintah

County, but the water/oil ratio is increasing at a lower rate. G.L. Hunt (Utah Division of Oil, Gas and Mining, written commun., 1991) suggests that the apparent, excessive water/oil ratio seen in Uintah County is due to two factors: (1) the large volumes of relatively fresh water produced and discharged in the Ashley Valley field, and (2) much of the water production in Uintah County comes from gas wells.

The trend of an increasing water/oil ratio suggests greater costs for hydrocarbon producers in the future. These increased costs will include the production, handling, processing, and the appropriate disposal of greater volumes of saline water.

DISPOSAL OF CO-PRODUCED PRODUCTS

Disposal of co-produced saline waters

During 1989, some 72,774,305 barrels of saline water were co-produced in Duchesne and Uintah Counties. The disposition of this saline water is shown in Table 2, taken from Hill (1990). The four "largest-volume" disposal methods now employed in the Uinta Basin are surface discharge, water-flood injection, salt-water disposal wells, and disposal pits. Descriptions of these methods are as follows.

NPDES surface discharge. Co-produced water can be discharged to the surface only with special National Pollutant Discharge Elimination System (NPDES) or UPDES (Utah) permits and only if such

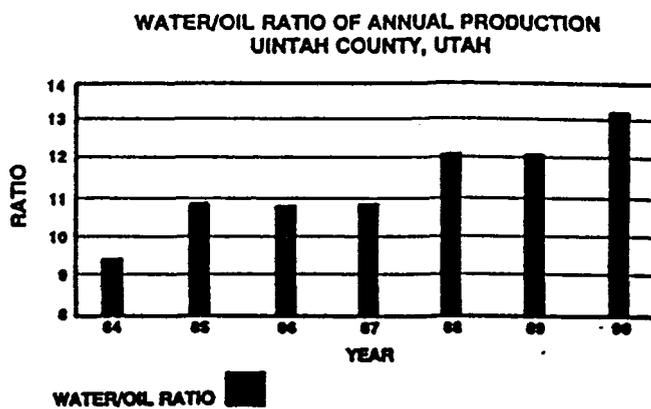
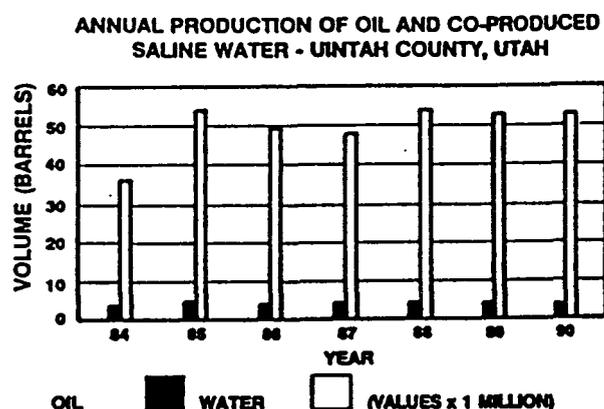
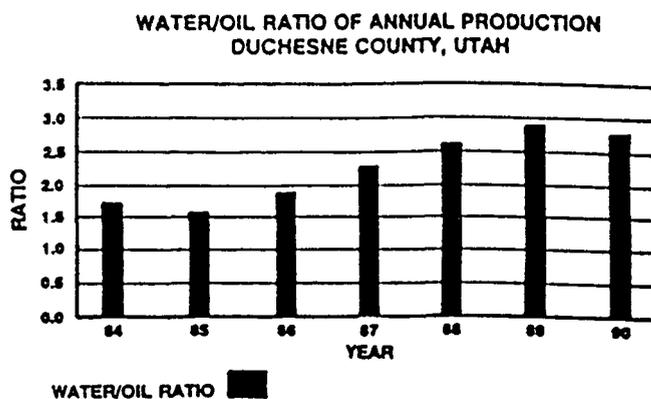
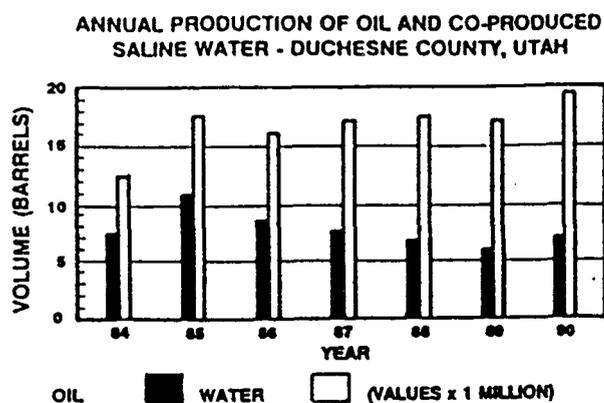


Figure 3. Annual production of oil and co-produced saline waters, and the water/oil ratios for 1984-1990, Duchesne and Uintah Counties, Utah. Data from Utah Division of Oil, Gas and Mining (December issues 1984 through 1990).

discharge meets certain federal requirements. The discharged water must be put to a beneficial use (agriculture, stock watering, etc.). It must contain less than 3,500 mg/l total dissolved solids or be diluted to or below this level by less saline water. Water chemistry, particularly sodium chloride content, is considered of major importance (S. McNeal, Utah Department of Health, oral commun., 1990). In Utah, the State Health Department (UDOH, 1988) regulates surface discharge through NPDES rules, and grants discharge permits on a case-by-case basis. Surface discharge (see Table 2) is now only being done in the Ashley Valley field (located just outside the boundary of the Uinta Basin), Uintah County (L. Morton, Utah Department of Health, oral commun., 1990).

Waterflood injection. Waterflood injection, one of the petroleum industry's main secondary oil-recovery techniques, involves reinjecting co-produced water back into the same or another oil-producing formation. The reintroduction of saline and fresh water helps to maintain reservoir pressure and move the remaining oil towards producing wells. During 1989, there were seven waterflood injection projects in the Uinta Basin (Fig. 4); one in Duchesne County, and six in Uintah County (Jarvis, 1989). These combined

projects injected an average volume of 86,856 barrels of saline water (plus makeup water) per day back into the Green River Formation.

Several precautions are taken during water flood operations to insure that the reinjected saline water is comparable to, or less saline than the natural water in the host formation. Injected and indigenous water must also be chemically compatible. Geologic conditions must be such that the injected saline water will remain confined within the host aquifer, and will not adversely affect the ground water in other aquifers. The mechanical and hydraulic integrity of the injection well must also be adequate. For example, saline water must not leak out of corroded well casings into fresh-water aquifers. The Utah Division of Oil, Gas and Mining and the U.S. Environmental Protection Agency regulate waterflood operations.

Salt-water disposal wells. Saline water is disposed of by simply reinjecting it into an approved zone or aquifer through salt-water disposal (SWD) wells. This disposal process is the third most commonly used technique in the Uinta Basin. During 1989, 21 active salt-water disposal wells in Duchesne County, and three in Uintah County injected a total of 14.95 million barrels of saline water (Fig. 5). Thirteen saline-water

Table 2. Disposition of co-produced brine in Duchesne and Uintah Counties, Utah. Data taken from Hill (1990).

METHOD OF DISPOSAL	DUCHEсне COUNTY		UINTAH COUNTY	
	VOLUME (Barrels)	% TOTAL	VOLUME (Barrels)	% TOTAL
Disposal Wells	14,907,412	86.18	43,876	0.08
Waterflood Injection	0	0.00	25,689,420	48.29
Disposal Pits	1,713,135	6.768	512,115	0.96
On site pits	3,005	0.02	281	<0.01
Drilling/Workover	237,359	1.37	0	0.00
NPDES Surface Discharge	0	0.00	26,743,450	50.27
Storage Tanks	0	0.00	0	0.00
Not Reported	976,294	5.64	206,631	0.39

Source: Hill (1990)

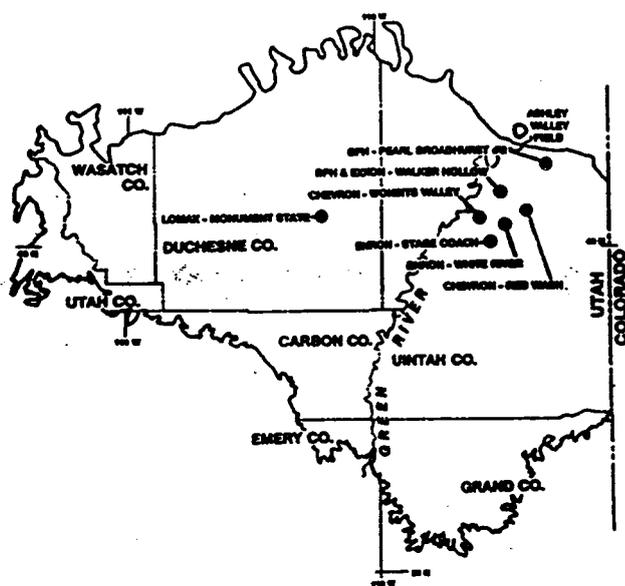


Figure 4. Locations of the seven water flood injection projects within the Uinta Basin. (G.L. Hunt, Utah Division of Oil, Gas and Mining, written commun., 1990).

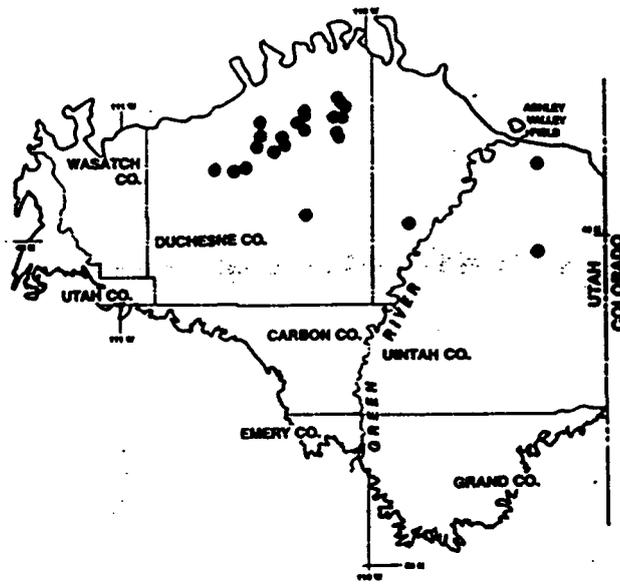


Figure 5. Locations of the twenty-four saline-water disposal wells, Duchesne and Uintah Counties, Utah. Data from Jarvis (1989).

wells injected 9.6 million barrels into the Duchesne River Formation; and two injected 1.6 million barrels into the Uinta Formation. An additional eight wells injected 3.7 million barrels into the Green River Formation, and one well injected .015 million barrels into the Mesaverde Group (Jarvis, 1989).

The same care and restrictions apply to the disposal of saline water into SWD wells as into waterflood/enhanced recovery wells. The Utah Division of Oil, Gas and Mining and the U.S. Environmental

Protection Agency also regulate the reinjection of saline water into SWD wells.

Salt water disposal pits. Some saline water is discharged into large pits and allowed to evaporate, rather than being reinjected back into the reservoir or aquifer. The Utah Division of Oil, Gas and Mining (Utah Board of Oil, Gas and Mining, 1987) regulates the construction and operation of such pits. Disposal pits must be pre-approved and then constructed in such a manner that the contained saline waters cannot con-

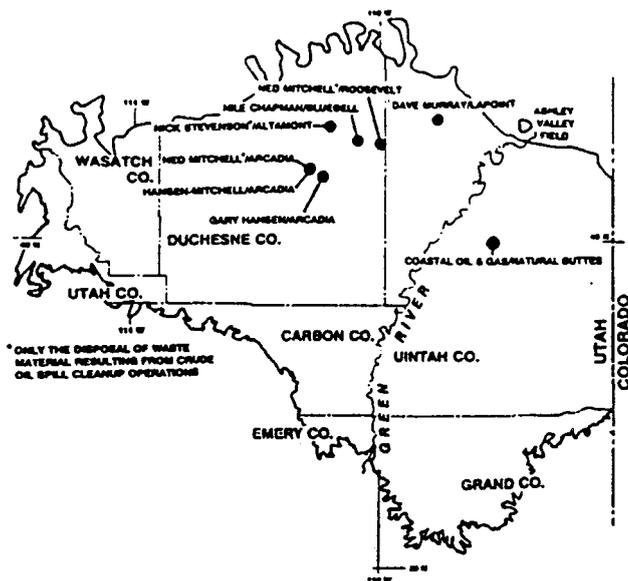


Figure 6. Locations of the eight saline-water disposal pits in Duchesne and Uintah Counties, Utah. (G.L. Hunt, Utah Division of Oil, Gas and mining, written commun., 1990).

taminate surface or subsurface waters. They must be constructed in geologically stable areas, and provisions must be made to remove and properly dispose of salts which may precipitate as the water evaporates. During 1989, a total of 16,852,250 barrels of saline water were pumped into eight disposal pits in the basin (Fig. 6); 11.7 million barrels in Duchesne County, and 5.1 million barrels in Uintah County (Hill, 1990).

Disposal of co-produced gases

Co-produced saline water sometimes contains toxic gases such as hydrogen sulfide. In most instances, the disposal of oil-well saline water by reinjection is done in such a manner that these gases are not released from the water to the atmosphere. If such gas-containing saline waters are discharged into open evaporation ponds for disposal, however, they will degas to the atmosphere over a short period of time. The Utah Division of Environmental Health, Bureau of Air Quality (1987) regulates the discharge of toxic gases to the atmosphere. It must also approve all mitigation measures.

CHARACTERIZATION OF UINTA BASIN SALINE WATER

Resistivity versus concentration of dissolved solids

Members of the petroleum industry and others measure the electrical resistivity of oil-well saline

waters on a routine basis with geophysical logs to calculate hydrocarbon saturations. Resistivity measurements are also a convenient measure of water salinity. A composite log-log plot of resistivity values versus salinity (TDS) for all Tertiary formations in the Uinta Basin is shown in Figure 7. It shows that as salinity increases, resistivity decreases. The linear-regression equation for a best-fit curve to the data (Wm. Case, Utah Geological Survey, oral commun., 1990) is given as follows:

$$\ln \text{TDS} = -0.967 (\ln \text{resistivity}) + 9.035$$

where TDS = total dissolved solids in milligrams/liter and resistivity is in ohm-meters. Most data-base resistivity measurements were reported at either 68 or 77 degrees F. Corrections between the two temperatures were not made since values were relatively close and there was not significant difference in the resistivity-total dissolved solids plot.

Formation-specific depth-interval changes in salinity and ion concentrations

The salinity and chemical composition of the water from oil and gas wells change both vertically and laterally throughout the Uinta Basin and within a given formation. Graphs showing salinity and individual-ion concentrations plotted against depth were used to determine the elevations where the chemical composition of formation water changed notably. Based on the observed breaks, each formation was divided into several elevation intervals, with each interval representing a different type of formation water.

Appendix A gives the elevation-interval breakdowns assigned to each formation, and the number of chemical analyses represented by each plot. It further gives the maximum, minimum and average values for the calculated total dissolved solids, and the milliequivalent-percents of each ion in the cation and anion groupings and the average pH. The actual sample elevations, and water resistivities are also given. The milliequivalent-percents total to 100 percent in

The chemical composition of the saline water is illustrated on paired triangular plots (Fig. 8), for each formation-specific elevation interval. One plot shows the milliequivalent-cation percents (total to 100 percent), and the other the milliequivalent-anion percents (total to 100 percent). The index maps show the geographic locations of the interval-specific sampling sites represented by each set of triangular plots. Each point on the map represents the average of all analyses from within a given section of a township. Figures 8-a through 8-p show the triangular plots and sample-location maps for the sixteen formation-specific

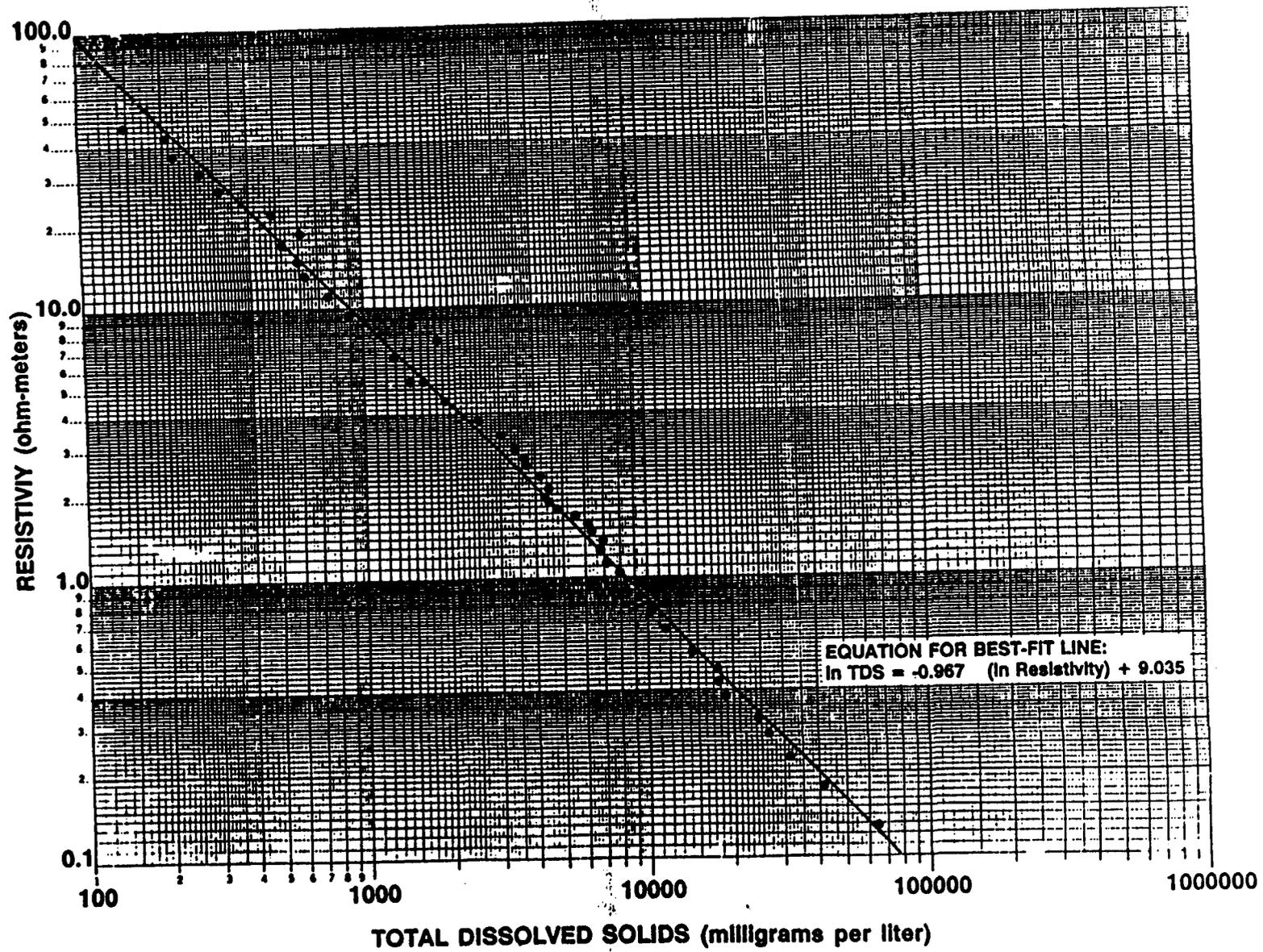
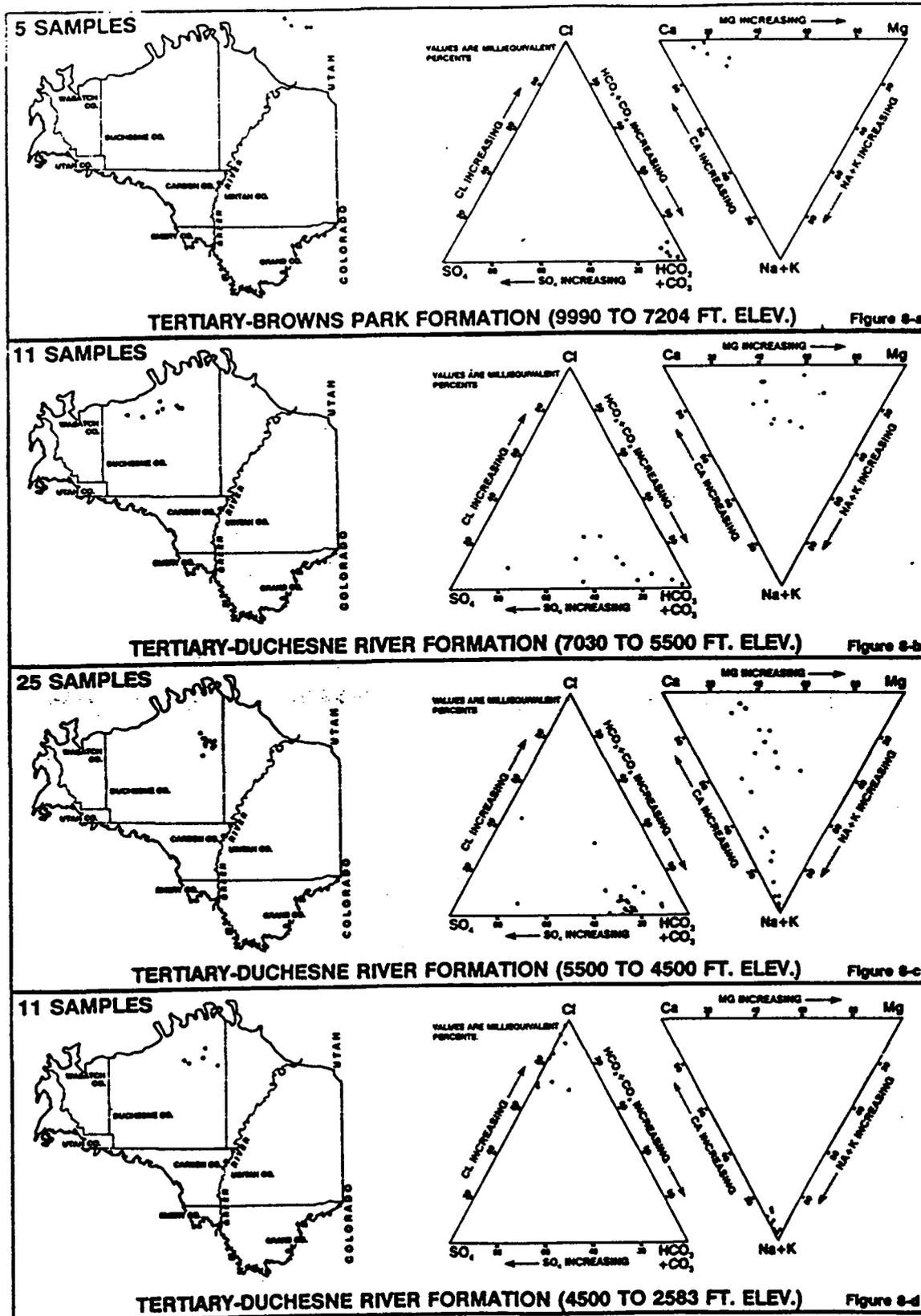
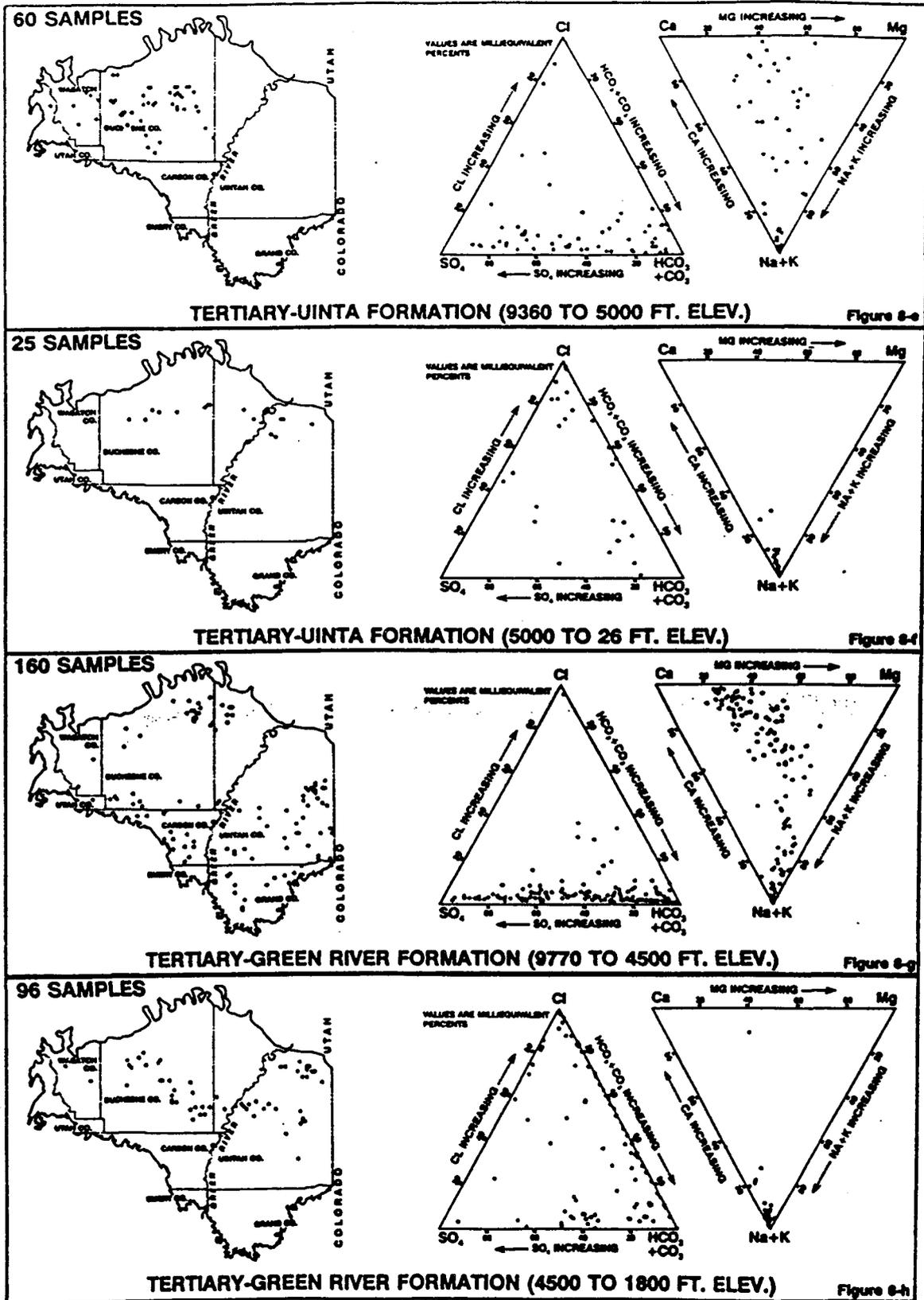


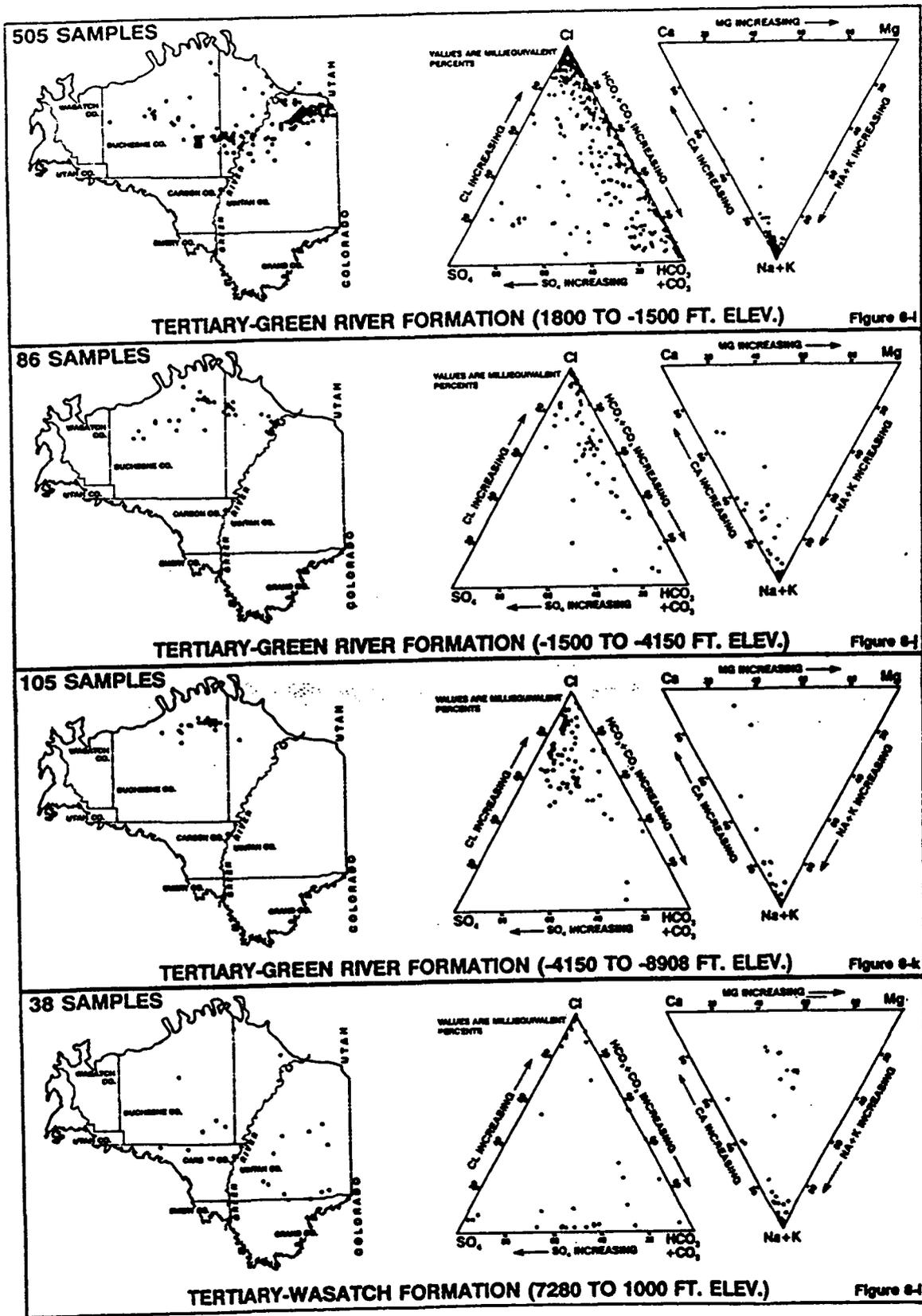
Figure 7. Plot of resistivity (ohm-meters) versus total dissolved solids (mg/l) for all Tertiary oil-well saline-water samples in the Uinta Basin. Resistivities in data base are reported at 68 or 77 degrees F.



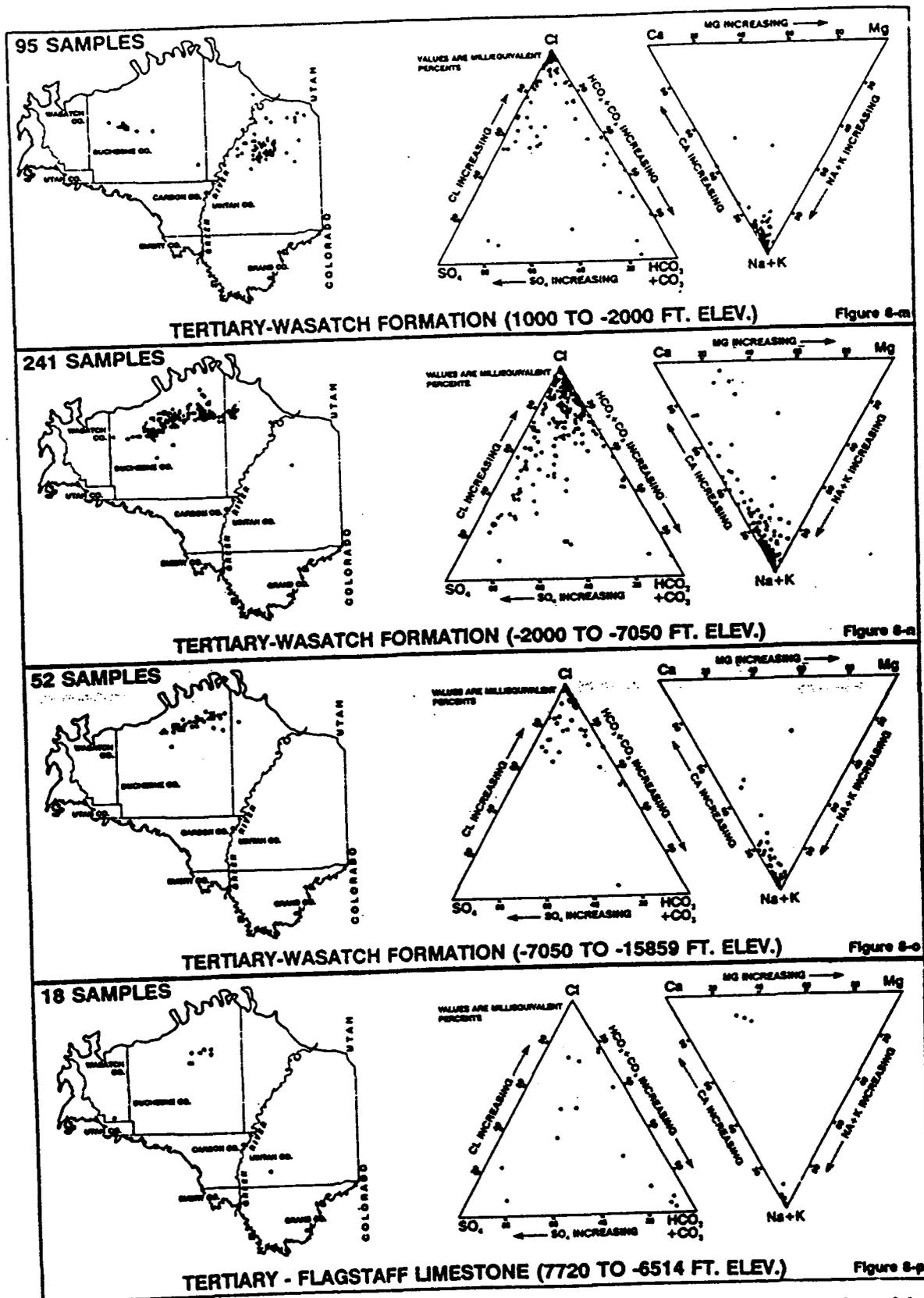
Figures 8-a through 8-d. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-e through 8-h. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-i through 8-l. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.



Figures 8-m through 8-p. Sample-location index maps and triangular saline-water chemistry plots for four of the sixteen formation-specific depth intervals.

intervals. Table 3 gives a summary of the saline-water chemistry for each depth interval, plus comments.

Vertical transitions in saline-water chemistry

The depth variation of TDS and each of the six ions was determined for each formation. This was done by averaging all values (TDS for example), within successive 500-ft (150-m) elevation-intervals, and plotting the averaged values against elevation. In a general analysis of the formation plots, three vertical zones, an upper, middle, and lower, were noted for the Uinta Basin as a whole.

Upper Zone. The upper zone extends from the surface down to an average sample elevation of about 6,750 ft (2,050 m) above sea level; the average sample depth is 11.5 ft (3.5 m) below the surface. The chemistry and salinity of this zone represent mainly water from springs and a few shallow water wells. The salinity in this zone is usually less than 1,000 mg/l, and averages 695 mg/l.

The milliequivalent-cation percents for calcium and magnesium fall within the 20 to 60 percent range, and average 50.5 and 32.1 percent respectively. Sodium (plus potassium) fall within the 0 to 40 percent range, and average 17.4 percent. The milliequivalent-anion percent for bicarbonate (plus carbonate) fall in the 40 to 90 percent range, and average 71.9 percent. Sulfate falls within the 0 to 60 percent range, averaging 24.7 percent; and chloride falls in the 0 to 20 percent range, averaging 3.4 percent.

Middle Zone. The middle zone falls within an average sample-elevation range of 6,750 ft (2,057 m) to 4,464 ft (1,361 m). The saline water comes from an average depth of 265 ft (81 m) and represents some springs, but mainly shallow water wells. This zone is an interval of transition from upper-zone salinity (less than 1,000 mg/l) and chemistry to those of the deeper more-saline waters. Within this zone, salinity averages 2,948 mg/l.

Of the cations, calcium averages 18.2 percent, magnesium 17.5 percent; and sodium (plus potassium) average 64.3 percent. Of the anions, chloride averages 10.8 percent, sulfate 38.1 percent and bicarbonate (plus carbonate) average 51.1 percent.

Lower Zone. The third zone falls below an average sample elevation of 4,464 ft (1,361 m) and represents the deep oil-well production waters, some of which are brines. Samples come from an average depth of 7,213 ft (2,199 m). The salinity in this zone ranges from 5,000 to nearly 40,000 mg/l, with an average of 19,666 mg/l. The cations remain relatively stable. Magnesium and calcium fall within the 0 to 20

percent range, and average 1.8 percent and 5.1 percent respectively. Sodium remains greater than 80 percent, averaging 93.1 percent. The anions, on the other hand, tend to fluctuate over a much greater range. Chloride ranges from 30 to 100 percent, averaging 64.7 percent; sulfate from 0 to 50 percent, averaging 10.2 percent, and bicarbonate (plus carbonate) from 0 to 60 percent, averaging 25.1 percent.

Chemical trends laterally within the Uinta Basin

The average salinity and chemical composition of co-produced saline waters within the Uinta Basin vary laterally. Although common trends are noted between salinity and chemistry, each appears to change independently.

Seven iso-block illustrations (Fig. 9-a through g) were prepared, one for total dissolved solids, and one for each of the six ions or ion-pairs. These figures represent an average of all samples, irrespective of depth or host formation. The individual ions within the cation and anion groups are given in milliequivalent percents. The iso-block illustrations were constructed as follows.

(1) All data points for calculated total dissolved solids, for example, were displayed as an east-west panel through the length of the basin. From this graphical display, groupings of data were identified which were separated by natural breaks.

(2) All the data in each of the east-west panel groupings were then displayed as north-south panels across the width of the basin. From these graphical displays, sub-groupings of data were identified, which again were separated by natural breaks. Thus the basin was divided into several sub-groups or rectangles of variable size characterized by similar or unique data.

(3) The average value of all samples within each sub-group or block was calculated, assigned to a numerical, pattern-value interval, and displayed on the map. The above-described process was then repeated for each of the six ions or ion-pairs, creating the seven groupings or iso-block diagrams shown in Figures 9-a through 9-g.

In nearly all cases, these figures suggest apparent salinity and chemical zonations within the basin. These zonations represent the gross vertical and horizontal dimensions of the basin. They may be heavily influenced or biased by sample population, the lithology dominating the facies of the interval, and by the chemistry at a given depth. They may represent the lateral changes found within a given stratigraphic- or elevation-interval.

Table 3. Summary of Tertiary formation depth-interval brine chemistry in the Uinta structural basin data base.

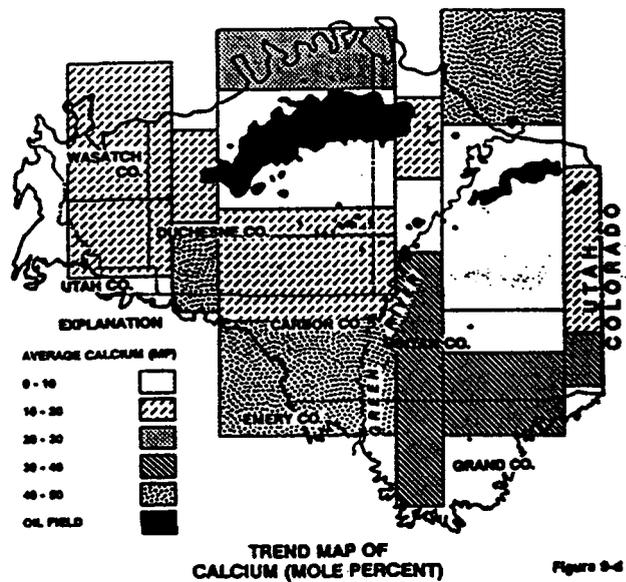
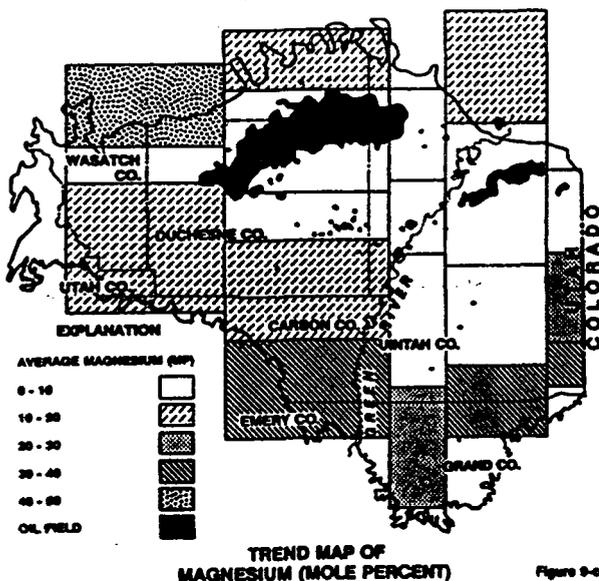
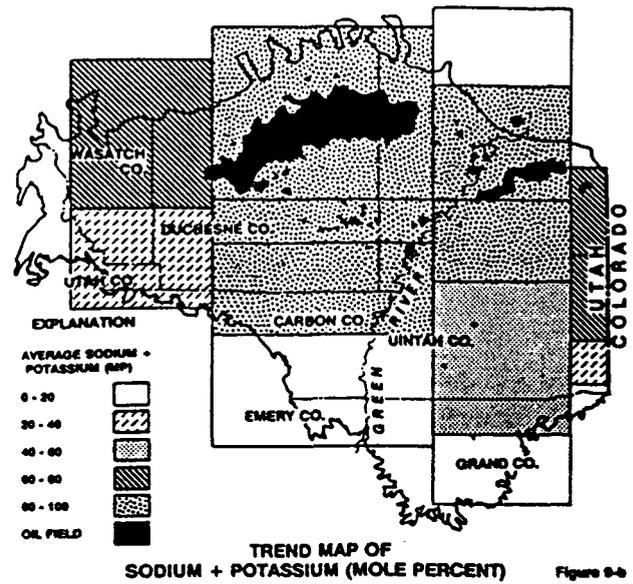
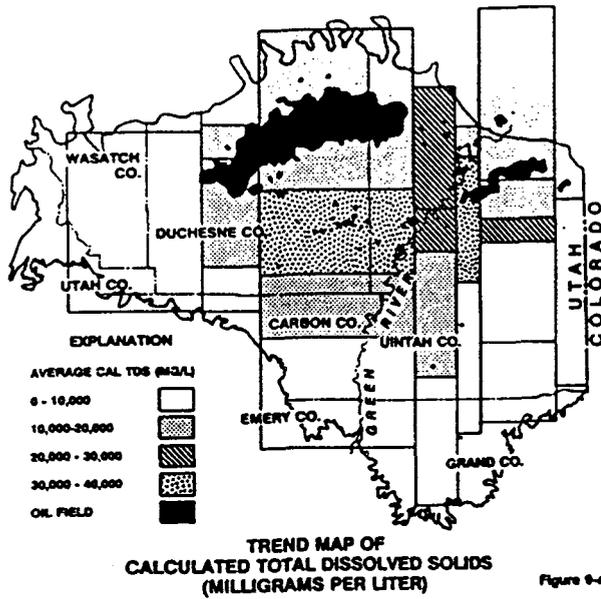
FORMATION	ELEVATION INTERVAL (FT)	CATION WATER TYPE	ANION WATER TYPE	COMMENTS
BROWNS PARK	All Elevations	Ca	HCO ₃	Located to northeast of study area
DUCHESNE RIVER	7,030-5,000 5,000-4,500 4,500-2,583	Ca = Mg > Na Ca > Mg, variable Na (10-95%) Na + K	HCO ₃ > SO ₄ > Cl HCO ₃ Cl >> SO ₄ , low HCO ₃	Transition from Ca = Mg to Na, and HCO ₃ > SO ₄ to Cl > SO ₄ at depth
UINTA	9,360-5,000 5,000-26	Ca = Mg; variable Na (5-100%) Na >> Mg + Ca	SO ₄ -HCO ₃ >> Cl Cl-HCO ₃ > SO ₄	Transition to all Na; transition from HCO ₃ > SO ₄ towards Cl with depth.
GREEN RIVER	9,770-4,500 4,500-1,800 1,800-(1,500) (1,500)-(4,150) (4,150)-(8,908)	Ca = Mg; variable Na (5-100%) Na >> Ca = Mg Na >>> Ca > Mg Na >>> Ca > Mg Na >> Ca > Mg	HCO ₃ -SO ₄ , low Cl Cl-HCO ₃ > SO ₄ Cl-HCO ₃ > SO ₄ Cl-HCO ₃ > SO ₄ Cl > HCO ₃ >> SO ₄	Transition from Na > Ca > Mg to Na > Ca. Mixture of SO ₄ -HCO ₃ changing to mixture of Cl-HCO ₃ ; with subordinate SO ₄ changing to Cl dominant system.

Table 3 (continued)

FORMATION	ELEVATION INTERVAL (FT)	CATION WATER TYPE	ANION-WATER TYPE	COMMENTS
WASATCH	7,280-1,000 1,000-(2,000) (2,000)-(7,050) (7,050)-(15,859)	Ca=Mg; variable Na (20-100%) Na>> Ca>Mg Na-Ca; low Mg Na>>Ca	SO4-HCO3 or Cl Cl>SO4=HCO3 Cl-SO4; low HCO3 Cl>>SO4-HCO3	Transition from a mixed to Na dominant system. Transition from SO4-HCO3-Cl mixture to Cl>>HCO3=SO4 to Cl-SO4 mixture to Cl dominant system
FLAGSTAFF LIMESTONE	Scattered	Na>Ca	HCO3>Cl>SO4	None

SYMBOL EXPLANATION

- >Greater than
- +Approximately equal values
- (7050)Indicates subsea-level elevation
- <Less than
-Transition or join between two ions
- Na represents Na+K; HCO3 represents HCO3+CO3



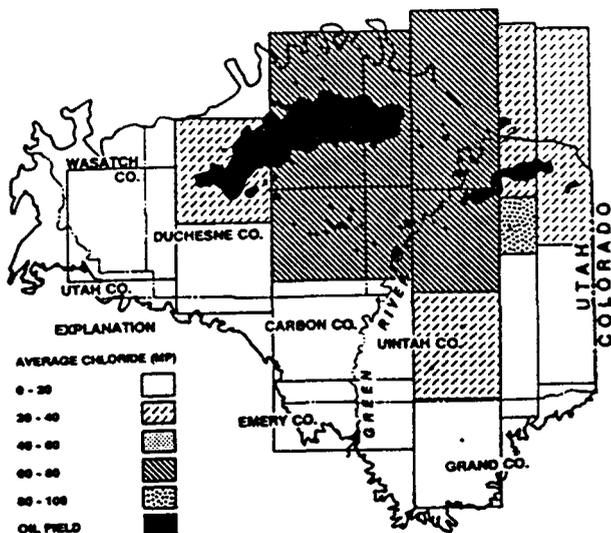
Figures 9-a through 9-d. Trend-maps showing iso-blocks of saline-water TDS and ion concentrations, and the location of oil fields within the Uinta structural basin.

TDS shows a zonation which decreases outward from the central portion of the basin; chloride follows a similar pattern. Sulfate decreases away from the southeastern portion of the basin, while bicarbonate (plus carbonate) generally decrease towards the center. Sodium (plus potassium) decreases outward from a large central-to-eastern portion of the basin. Both magnesium and calcium decrease inward towards a low-concentration arcuate zone which extends through the major oil fields.

It is interesting to note the close associations between co-produced saline-water chemistry and the location of the major oil fields. The most notable

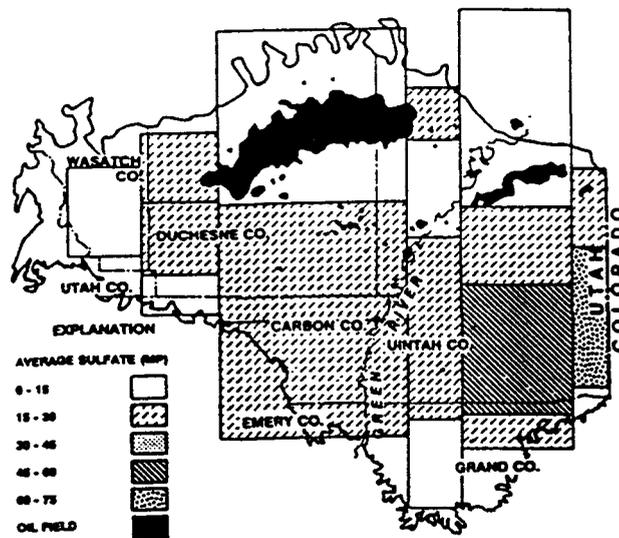
associations are the coincidence of areas of low sulfate, magnesium and calcium, low to moderate bicarbonate (plus carbonate), and of high sodium, within the oil field locations.

It is not the intent of this paper to define or determine the specific processes or mechanisms responsible for the apparent zonation or changes in brine chemistry within the Uinta Basin. These changes may be due, however, to several processes, especially rock-water interactions. White (1965) suggests that many characteristics of saline waters of sedimentary rocks are best explained by the theory that fine-grained sediments are semipermeable membranes. These mem-



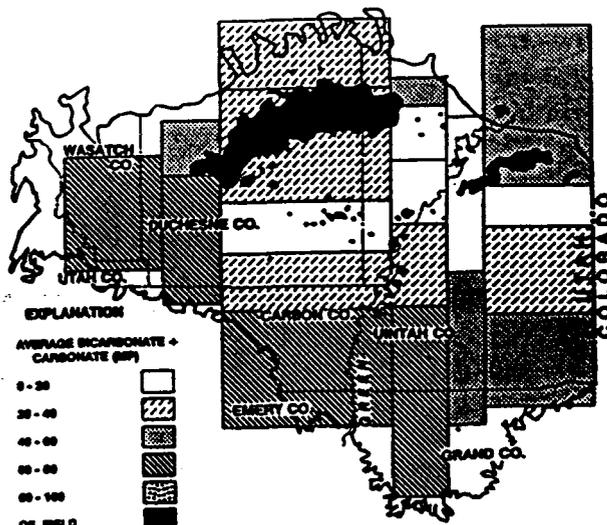
TREND MAP OF CHLORIDE (MOLE PERCENT)

Figure 9-e



TREND MAP OF SULFATE (MOLE PERCENT)

Figure 9-f



TREND MAP OF BICARBONATE + CARBONATE (MOLE PERCENT)

Figure 9-g

Figures 9-e through 9-g. Trend-maps showing iso-blocks of saline-water TDS and ion concentrations, and the location of oil fields within the Uinta structural basin.

branes permit the selective passage of some ions but to a lesser extent, others. Mechanisms discussed by Eugster and Jones (1979), "....include mineral precipitation, selective dissolution of efflorescent crusts and sediment coatings, sorption on active surfaces, degassing, and redox reactions." Hardie and Eugster (1970) conclude "....that the observed compositional diversity of natural brines can be accounted for entirely by the differences in inflow water composition, coupled with evaporative concentration and precipitation of calcite, a hydroxy silicate such as sepiolite, and gypsum." Temperature, residence time and flow paths also play

in important part in the formation and evolution of saline waters.

POTENTIAL ECONOMIC USES OF OIL WELL PRODUCTION WATER

Millions of barrels of co-produced saline water are reinjected back into the ground annually, and represent large quantities of potentially valuable dissolved salts and trace elements. Through the process of solar evaporation in surface-ponding facilities, these salts might be recovered. The most common potential salt is sodium chloride or halite. In areas where the co-

produced water contains high sulfate concentrations, sodium sulfate might be recovered. Where sulfate is low and magnesium and potassium are high, potassium chloride (sylvite) or potassium-magnesium chloride (carnallite) might be produced. A computer program, such as *The Salt Norm* (Bodine and Jones, 1986), can be used to predict the salts that will precipitate during evaporation of a saline water of known chemistry. If valuable trace elements are present, they might be removed by solvent-extraction or ion-exchange processes.

The economic recovery of these salts depends on the total salinity, chemical composition of the saline waters, and the resulting salt/brine phase relationships. It also depends on the quantity of saline water that is available for solar evaporation and on transportation distances, processing and other production-related costs.

Areas suitable for the solar evaporation of saline water must meet certain criteria. These include large, relatively-flat areas with high-clay or low-permeability ground, minimal geologic hazards, and low risk for surface and ground-water contamination. Rapid summer evaporation rates and adequate wind are both necessary for a successful solar-evaporation project.

CONCLUSIONS

As shown in Table 1, over 1.346 billion barrels of co-produced oil well saline water have been produced, most of which have been reinjected back into the earth. Saline waters vary in salinity and chemistry both vertically and laterally within individual formations, and within the basin as a whole. The six main ions or ion-pairs that are present in the saline waters include sodium (plus potassium), magnesium, calcium, chloride, sulfate and bicarbonate (plus carbonate). Each appears to vary independently. Areas which contain low sulfate, magnesium and sulfate, and high sodium are coincident with the basin's major oil fields. Potentially valuable mineral salts could be extracted from these saline waters under favorable economic conditions.

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Appendix A. Summary data for all Tertiary formations within the Uinta structural basin, Utah.

FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO4	MEQP HCO3	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
BROWNS PARK 9,990 TO 7,204 5 SAMPLES	MAX	-	458.69	8.20	7.36	95.83	12.19	24.87	83.98	9,990	83.88
	MIN	-	88.32	1.69	2.47	68.90	1.80	12.33	66.03	7,204	18.66
	AVG	-	287.06	4.32	5.04	90.63	6.66	18.73	74.59	8,147	36.81
DUCHESNE RIVER 7,030 TO 5,500 11 SAMPLES	MAX	-	1,391.02	23.17	71.15	95.89	28.35	61.14	54.89	7,030	15.94
	MIN	-	537.43	1.49	2.61	19.38	4.83	29.20	25.96	5,915	4.31
	AVG	-	905.90	10.08	27.38	62.53	16.42	40.89	42.68	6,358	10.35
DUCHESNE RIVER 5,500 TO 4,500 25 SAMPLES	MAX	-	142,205.90	97.75	69.24	86.88	98.37	40.45	66.15	5,361	33.33
	MIN	-	2,743.00	0.00	2.21	0.02	5.33	0.05	1.22	4,529	0.08
	AVG	-	6,289.67	10.86	24.78	64.35	55.57	16.37	28.05	5,017	18.54
DUCHESNE RIVER 4,500 TO 2,583 11 SAMPLES	MAX	-	142,205.70	97.76	28.42	15.57	96.47	4.25	10.03	3,659	136.00
	MIN	-	7480.19	68.38	2.21	0.02	85.70	0.31	1.70	2,583	0.08
	AVG	8.09	42,307.80	79.10	17.87	3.01	91.09	2.37	6.52	3,139	12.71
UINTA 9,360 TO 5,000 60 SAMPLES	MAX	-	9,760.41	87.59	84.57	92.22	100.00	62.08	59.42	9,360	2890.00
	MIN	-	146.27	0.26	0.16	2.92	2.50	0.00	0.00	5,110	0.27
	AVG	8.28	2157.57	11.17	36.93	51.88	61.78	18.22	19.97	6,093	56.03
UINTA 5,000 TO 26 25 SAMPLES	MAX	-	73,014.79	97.43	52.53	81.66	99.95	11.55	20.89	4,895	18.21
	MIN	-	441.33	1.51	0.00	1.89	69.61	0.01	0.00	26	0.13
	AVG	7.97	9,918.10	50.49	17.45	32.05	93.09	2.18	4.71	3,503	3.977
GREEN RIVER 9,770 TO 4,500 160 SAMPLES	MAX	-	24,379	95.53	94.09	98.58	99.71	59.98	74.37	9,770	52.63
	MIN	-	180.58	0.00	0.00	3.60	2.16	0.00	0.17	4,580	0.43
	AVG	8.25	1,641.37	4.83	34.76	60.40	41.49	25.11	33.38	6,711	13.614

T.D. Fouch, V. F. Nuccio, and T.C. Chiksey, Jr., eds.

APPENDIX A (continued)

FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO4	MEQP HCO3	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
GREEN RIVER 4,500 TO 1,800 96 SAMPLES	MAX	-	204,150.76	98.11	990.31	97.34	100.00	36.30	53.35	4,475	17.27
	MIN	-	417.09	0.00	0.00	0.30	10.33	0.00	0.00	1,800	0.04
	AVG	8.48	19,742.91	39.78	14.70	45.51	95.41	1.45	3.12	2,866	2.50
GREEN RIVER 1,800 TO -1,500 505 SAMPLES	MAX	-	170,853.18	99.81	71.28	99.70	100.00	25.54	56.19	1,800	10.9
	MIN	-	873.66	0.16	0.00	0.18	27.97	0.00	0.00	-1,497	0.08
	AVG	8.60	21,464.55	59.08	6.40	34.50	96.84	1.00	2.15	265	1.03
GREEN RIVER -1,500 TO -4,150 86 SAMPLES	MAX	-	179,035.88	99.67	40.48	83.91	100.00	21.26	61.25	-1,511	19.12
	MIN	-	399.52	6.02	0.01	0.03	30.52	0.00	0.00	3,947	0.06
	AVG	8.13	24,722.06	70.68	7.26	22.05	91.89	1.88	6.21	-2,751	1.00
GREEN RIVER -4,150 TO -8,908 105 SAMPLES	MAX	-	56,771.96	98.23	49.84	70.08	99.70	29.26	65.12	-4,271	31.90
	MIN	-	298.79	4.25	0.00	1.36	8.03	0.00	0.13	-8,908	0.15
	AVG	7.93	20,152.13	69.40	17.14	13.45	94.83	1.35	3.80	-5,019	1.20
WASATCH 7,280 TO 1,000 36 SAMPLES	MAX	-	59,653.18	98.81	92.36	91.45	99.70	43.09	53.61	7,280	61.66
	MIN	-	82.07	1.72	0.18	0.25	16.80	0.09	0.19	1,040	0.10
	AVG	8.17	13,295.33	38.85	28.17	32.96	68.71	13.91	17.37	3,968	6.09
WASATCH 1,000 TO -2,000 95 SAMPLES	MAX	-	105,019.66	99.66	72.94	83.78	99.88	28.27	42.04	956	20.00
	MIN	-	589.25	2.01	0.00	0.00	44.86	0.00	0.01	-1,740	0.10
	AVG	7.91	22,255.32	76.80	10.17	13.02	91.77	2.40	5.81	-4,483	0.79
WASATCH -2,000 TO -7,050 241 SAMPLES	MAX	-	155,088.5	99.20	72.55	90.27	99.89	39.31	71.06	-2,007	42.00
	MIN	-	205.54	9.07	0.00	0.07	4.27	0.00	0.09	-6,987	0.06
	AVG	9.18	12,306.05	74.38	12.91	12.68	86.49	3.05	10.44	-4,821	0.97

APPENDIX A (continued)

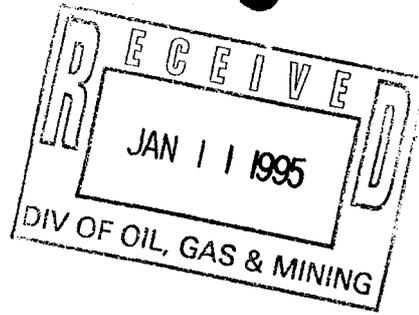
FORMATION/ ELEV. INTERVAL/ NO. SAMPLES	VALUE LEVEL	pH	CAL TDS	MEQP Cl	MEQP SO ₄	MEQP HCO ₃	MEQP Na+K	MEQP Mg	MEQP Ca	ACTUAL SAMPLE ELEV	RES. OHM- METERS
WASATCH -7,050 TO -15,859 52 SAMPLES	MAX	-	86,796.83	99.60	27.67	67.66	99.45	42.93	40.38	-7,080	14.20
	MIN	-	953.16	4.56	0.00	0.14	25.28	0.02	0.35	-15,859	0.10
	AVG	7.77	15,785.94	83.42	5.72	10.85	87.31	3.62	9.05	-8,518	1.04
FLAGSTAFF LS 7,720 TO -6,514 18 SAMPLES	MAX	-	11,694.99	76.75	75.84	90.32	99.63	30.56	65.12	7,720	16.67
	MIN	-	556.09	2.43	1.13	7.35	9.50	0.06	0.29	-6,514	0.80
	AVG	8.80	5,266.99	35.10	24.50	40.39	82.14	5.57	12.27	-99.44	4.21

EXPLANATION OF TABLE

ELEVATION INTERVAL Selected stratigraphic interval
(mean sea level) within formation.

MEQP Milliequivalent-percent
HCO₃ Represents HCO₃ + CO₃
-6,514 Elevation below sea level

UMC Petroleum Corporation



January 9, 1995

Mr. Daniel Jarvis
State of Utah Natural Resources
Oil, Gas and Mining
Underground Injection Control Program
Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Walker Hollow Field Injection Permit Public Notices.

Dear Daniel,

Enclosed are copies of the public notices and signed affidavit for the subject project in Uintah County.

If you Have any Questions or need additional Information, I can be reached at (303) 573-4721.

Sincerely,

United Meridian Petroleum Corporation
Operations Department

A handwritten signature in black ink, appearing to read "Scott M. Webb". The signature is fluid and cursive, with a large initial "S" and "W".

Scott M. Webb
Regulatory Coordinator

Offset Operators

Chevron, USA
100 Chevron Road
Rangely, Co 81648

Exxon Company, USA
1000 S., 1400 E.
P.O. Box 1850
Vernal, UT 84078

Luff Exploration Company
1580 Lincoln Street, Suite 850
Denver, CO 80203

Surface Owner

Bureau of Land Management
324 South State, Suite 301
Salt Lake City, UT 84111

The above person or persons received a Notice of Application for Fluid Injection for the proposed injection wells. This notice was also published in the Vernal Express 12/24/94 , and the Salt Lake Tribune on 12/23/94.

Signature *Scott M. Webb*
Scott M. Webb Regulatory Coordinator UMC North

Date 1/9/95

State of Colorado, County of Denver,

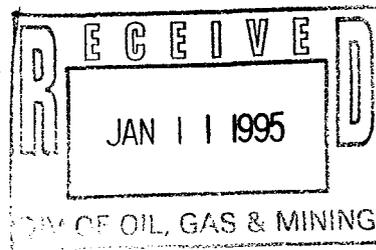
Before me, A. L. SHIPMAN, a Notary Public in and for the said County and State, this day personally appeared SCOTT M. WEBB, who being employed by United Meridian Corporation, states that the above statements contained are true and correct. Subscribed in my presence and sworn to before me

this 9th day of JANUARY, 1995

A. L. Shipman
Notary Public

My Commission Expires 1-13-95

UMC Petroleum Corporation



January 9, 1995

State of Utah Natural Resources
Underground Injection Control Program
Triad Center, Suite 350
Salt Lake City, UT 84180-5340

Attention: Dan Jarvis

RE: Walker Hollow Field Class II Injection Permit.

Dear Dan,

Enclosed is the additional information you requested in our telephone conversation the morning of January 9, 1995.

Let me know if you need anything else.

Sincerely,

United Meridian Corporation

A handwritten signature in black ink, appearing to read "Scott M. Webb".

Scott M. Webb
Regulatory Coordinator

Offset Operators

Chevron, USA
100 Chevron Road
Rangely, Co 81648

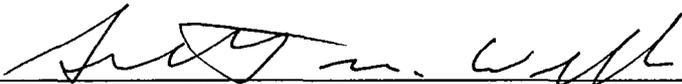
Exxon Company, USA
1000 South, 1400 East
P.O. Box 1850
Vernal, UT 84078

Luff Exploration Company
1580 Lincoln Street, Suite 850
Denver, CO 80203

Surface Owner

Bureau of Land Management
324 South State, Suite 301
Salt Lake City, UT 84111

The above person or persons received a Notice of Application for Fluid Injection for the proposed injection wells. This notice was also published in the Vernal Express 12/24/94 , and the Salt Lake Tribune on 12/23/94.

Signature 
Scott M. Webb Regulatory Coordinator UMC North

Date 1/9/95

NOTICE OF APPLICATION FOR FLUID INJECTION WELL PERMIT

United Meridian Petroleum Corporation, 410 17th Street, Suite 1400, Denver, Colorado, 80202 (303) 573-5100, is applying to the State of Utah Department of Natural Resources, Division of Oil, Gas and Mining, for a permit to inject fluid into a formation which is productive of oil and gas for enhanced oil recovery.

The applicant proposes to inject fluid into the Green River "H" zone, in Well Numbers 4 and 14 of the Pearl Broadhurst Lease. The proposed injection wells are located 2 miles North-Northwest of Red Wash, in the Walker Hollow Field in Uintah County. Fluid will be injected into the strata in the sub-surface depth interval from 4700 feet to 4800 feet.

Legal Authority: The Oil and Gas Conservation General Rules: R649-5-3, "Noticing and Approval of Injection Wells"

Requests for a public hearing from persons who can show they would be adversely affected, or requests for further information concerning any aspect of the application should be submitted in writing, within fifteen days of publication of this notice to: State of Utah Board of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah, 84180-1203. Telephone number (801) 538-5340.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION VIII
 999 18th STREET - SUITE 500
 DENVER, COLORADO 80202-2466

**UNDERGROUND INJECTION CONTROL
 DRAFT AQUIFER EXEMPTION**

*GENERAL ATLANTIC RESOURCES, INC.
 PEARL BROADHURST #14
 WALKER HOLLOW FIELD*

LOCATION: 1980 FNL, 659 FEL
 SECTION 9, TOWNSHIP 7S, RANGE 23E
 Uintah County, UTAH

EPA PERMIT NO. UT2752-04231

In compliance with provisions of the Safe Drinking Water Act, as amended, (42 USC 300f-300j-9, commonly known as the SDWA) and attendant regulations incorporated by the U. S. Environmental Protection Agency (EPA) under Title 40 of the Code of Federal Regulations (CFR), the following formations within the listed depths are proposed for aquifer exemptions for a radial distance of 1/4 mile from the well's location (as described above):

AQUIFER EXEMPTION PROPOSAL(S)			
FORMATION NAME	TOP (ft)	BASE (ft)	TDS (mg/l)
GREEN RIVER "H" 4	4719	4730	3700
GREEN RIVER "H" 5	4751	4762	3700

This aquifer exemption is granted in conjunction with an Underground Injection Control permit issued for the injection of Class II fluids.

This Aquifer Exemption has no expiration date.

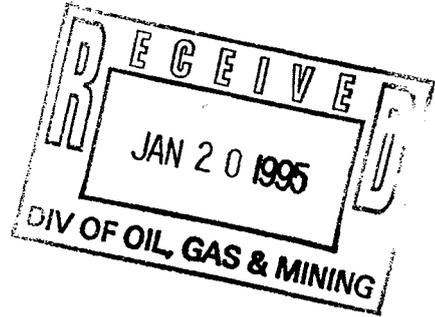
The effective date of this exemption is _____.

_____ Date

DRAFT

 Max H. Dodson
 Director
 Water Management Division

UMC Petroleum Corporation



January 6, 1995

Mr. Daniel Jarvis
State of Utah Natural Resources
Oil and Gas Division
Underground Injection Control Program
Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Walker Hollow Field Injection Permit Public Notices.
Salt Lake Tribune and the Vernal Express.

Dear Daniel,

Enclosed are copies of the public notices and signed affidavits for the subject project in Uintah County.

If you Have any Questions or need additional Information, I can be reached at (303) 573-4721.

Sincerely,

United Meridian Petroleum Corporation
Operations Department

A handwritten signature in cursive script, appearing to read "Scott M. Webb".

Scott M. Webb
Regulatory Coordinator

143 SOUTH MAIN ST.
P.O. BOX 45838
SALT LAKE CITY, UTAH 84145
FED. TAX I.D. # 87-0217663

Newspaper Agency Corporation
The Salt Lake Tribune (NA) DESERET NEWS

CUSTOMER'S
COPY

LEGAL ADVERTISING INVOICE

CUSTOMER NAME AND ADDRESS	ACCOUNT NUMBER	BILLING DATE
UNITED MERIDIAN PETROLEUM CORPORATION 410 17TH ST, #1400 DENVER, CO 80202	LE-5734721	12/24/94
FOR BILLING INFORMATION CALL (801) 237-2822		

RECEIVED
JAN 20 1995
DIV OF OIL, GAS & MINING

AFFIDAVIT OF PUBLICATION

AS NEWSPAPER AGENCY CORPORATION LEGAL BOOKKEEPER, I CERTIFY THAT THE ATTACHED
ADVERTISEMENT OF NOTICE OF APPLICATION FOR FLUID INJECTION WELL FOR
UNITED MERIDIAN WAS PUBLISHED BY THE NEWSPAPER AGENCY
CORPORATION, AGENT FOR THE SALT LAKE TRIBUNE AND DESERET NEWS, DAILY NEWSPAPERS
PRINTED IN THE ENGLISH LANGUAGE WITH GENERAL CIRCULATION IN UTAH, AND PUBLISHED
IN SALT LAKE CITY, SALT LAKE COUNTY IN THE STATE OF UTAH.

PUBLISHED ON DEC 23 1994
SIGNATURE [Signature]
DATE 12/24/94

ACCOUNT NAME			TELEPHONE
UNITED MERIDIAN			303-573-4721
SCHEDULE			AD NUMBER
DEC 23 1994			CD820160
CUST. REF. NO.	CAPTION		MISC. CHARGES
NOTICE OF APPL.	NOTICE OF APPLICATION FOR FLUID INJECTION WELL		.00
SIZE	TIMES	RATE	AD CHARGE
48 LINES 1 COLUMN	1	1.41	67.68
DUE AND PAYABLE ON RECEIPT OF THIS INVOICE			TOTAL AMOUNT DUE 67.68

THANK YOU FOR USING LEGAL ADVERTISING.

PLEASE RETURN THIS PORTION WITH YOUR PAYMENT IN THE ENCLOSED ENVELOPE **LEGAL ADVERTISING** ADV06-NT

ACCOUNT NUMBER	AD NUMBER	BILLING DATE	PAYABLE AMOUNT
LE-5734721	CD820160	12/24/94	Per [Signature] 67.68

LEGAL ADVERTISING

MAKE CHECKS PAYABLE TO:
NEWSPAPER AGENCY CORPORATION

PLEASE REMIT TO:
NEWSPAPER AGENCY CORPORATION
P.O. BOX 45838
SALT LAKE CITY, UTAH 84145-0838

UNITED MERIDIAN
PETROLEUM CORPORATION
410 17TH ST, #1400
DENVER, CO 80202

PLEASE REMOVE THIS STUB

**NOTICE OF APPLICATION FOR
FLUID INJECTION WELL PERMIT**

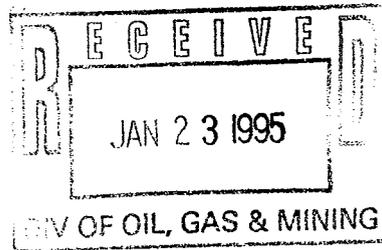
United Meridian Petroleum Corporation, 410 17th Street, Suite 1400, Denver, Colorado 80202, (303) 573-5100, is applying to the State of Utah Department of Natural Resources, Division of Oil, Gas, and Mining, for a permit to inject fluid into a formation which is productive of oil and gas for enhanced oil recovery.

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Legal Authority: The Oil and Gas Conservation General Rules: R649-5-3, "Noticing and Approval of Injection Wells"

Requests for a public hearing from persons who can show they would be adversely affected, or requests for further information concerning any aspect of the applications should be submitted in writing, within fifteen days of publication of this notice to: State of Utah Board of Oil, Gas and Mining, 355 West North Temple, 3 Trade Center, Suite 350, Salt Lake City, Utah 84180-1203. Telephone number (801) 538-5340.
CD820160

UMC Petroleum Corporation



January 20, 1995

State of Utah Natural Resources
Oil, Gas and Mining
Underground Injection Control Program
#3 Triad Center, Suite 350
Salt Lake City, UT 84180-5340

Attention: Dan Jarvis

RE: Walker Hollow Field Class II Injection Permit.

Dear Dan,

Enclosed is a copy of the public notice published in the Vernal Express.

If you have any questions or need additional information, I can be reached at (303) 573-4721.

Sincerely,

United Meridian Corporation

A handwritten signature in cursive script, appearing to read "Scott M. Webb".

Scott M. Webb
Regulatory Coordinator

RECEIVED
JAN 23 1995
DIV OF OIL, GAS & MINING

PROOF OF PUBLICATION

STATE OF UTAH,

{ ss.

County of Uintah

NOTICE OF APPLICATION FOR FLUID INJECTION WELL PERMIT

United Meridian Petroleum Corporation, 410 17th Street, Suite 1400, Denver, Colorado, 80202 (303) 573-5100, is applying to the State of Utah Department of Natural Resources, Division of Oil, Gas and Mining, for a permit to inject fluid into a formation which is productive of oil and gas for enhanced oil recovery. The applicant proposes to inject fluid into the Green River "H" zone, in Well Numbers 4 and 14 of the Pearl Broadhurst Lease. The proposed injection wells are located 2 miles North-Northwest of Red Wash, in the Walker Hollow Field in Uintah County. Fluid will be injected into the strata in the sub-surface depth interval from 4700 feet to 4800 feet.

Legal Authority: The Oil and Gas Conservation General Rules; R649-5-3, "Noticing and Approval of Injection Wells."

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Published in the Vernal Express December 21, 1994.

I, Judy Arbgast, begin duly sworn, depose and say, that I am the Business Manager of The Vernal Express, a weekly newspaper of general circulation, published each week at Vernal, Utah, that the notice attached hereto was published in said newspaper

for 1 publications,

the first publication having been made on

the 21st day of December, 1994 and the

last on the 21st day of December, 1994,

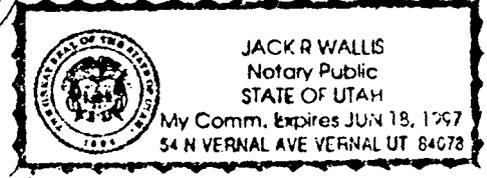
that

said notice was published in the regular and entire issue of every number of the paper during the period and times of publication, and the same was published in the newspaper proper and not in a supplement.

By Judy Arbgast Manager

Subscribed and sworn to before me, this 21st day of December A.D. 1994.

Jack R. Wallis Notary Public, Residence, Vernal, Utah





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)

February 10, 1995

UMC Petroleum Corporation
410 Building
410 17th Street, Suite 1400
Denver, Colorado 80202

Re: Pearl Broadhurst #4 and #14 Wells, Section 9, Township 7 South, Range 23 East, Uintah County, Utah

Gentlemen:

Pursuant to Utah Admin. Code R649-5-3-3, the Division of Oil, Gas and Mining (the "Division") issues its administrative approval for conversion of the referenced wells to Class II injection wells. Accordingly, the following stipulations shall apply for full compliance with this approval:

1. Compliance with all applicable requirements for the operation, maintenance and reporting for Underground Injection Control ("UIC") Class II injection wells pursuant to Utah Admin. Code R649-1 et seq.
2. Conformance with all conditions and requirements of the complete application submitted by UMC Petroleum Company.

Enclosed with this letter is the Underground Injection Control Permit for this well. If you have any questions regarding this approval or the necessary requirements, please contact Dan Jarvis at this office.

Sincerely,

R.J. Firth
Associate Director

cc: Tom Pike, Environmental Protection Agency
Bureau of Land Management, Vernal





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)

UNDERGROUND INJECTION CONTROL PERMIT

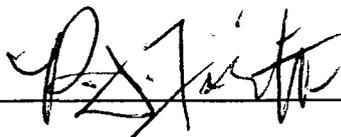
Cause No. UIC-157

Operator: UMC Petroleum Company
Wells: Pearl Broadhurst #4 and #14
Location: Section 9 Township 7 South, Range 23 East,
Duchesne County
API No.: 43-047-15694 and 43-047-30904
Well Type: Enhanced Recovery (waterflood)

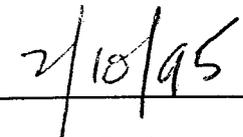
Stipulations of Permit Approval

1. Approval for conversion to Injection Well issued on February 10, 1995.
2. Maximum Allowable Injection Pressure: 1200 psig
3. Maximum Allowable Injection Rate: 1000 barrels of water per day
4. Injection Interval: 4700 feet to 4800 feet (Green River Formation)

Approved by:



R.J. Firth
Associate Director, Oil and Gas



Date



STATE OF UTAH
DIVISION OF OIL, GAS AND MINING
 355 West North Temple, 3 Triad, Suite 350, Salt Lake City, UT 84180-1203

MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

APRIL LAHNUM
 GENERAL ATLANTIC RES INC
 410 17TH ST STE 1400
 DENVER CO 80202

UTAH ACCOUNT NUMBER: N0910

REPORT PERIOD (MONTH/YEAR): 12 / 94

AMENDED REPORT (Highlight Changes)

Well Name			Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location				OIL(BBL)	GAS(MCF)	WATER(BBL)
✓ USA PEARL BROADHURST #1								
4304715692	00225	07S 23E 9	GRRV					
✓ USA PEARL BROADHURST #4								
4304715694	00225	07S 23E 9	GRRV					
✓ BROADHURST #8								
4304730696	00225	07S 23E 10	GRRV					
✓ BROADHURST #6								
4304730705	00225	07S 23E 9	GRRV					
✓ BROADHURST #7								
4304730730	00225	07S 23E 9	GRRV					
✓ BROADHURST #9								
4304730787	00225	07S 23E 10	GRRV					
✓ PEARL BROADHURST 10								
4304730839	00225	07S 23E 9	GRRV					
✓ PEARL BROADHURST 11								
4304730840	00225	07S 23E 10	GRRV					
✓ PEARL BROADHURST #12								
4304730841	00225	07S 23E 10	GRRV					
✓ PEARL BROADHURST #13								
4304730842	00225	07S 23E 9	GRRV					
✓ BROADHURST #15								
4304730901	00225	07S 23E 9	GRRV					
✓ BROADHURST #16								
4304730903	00225	07S 23E 10	GRRV					
✓ BROADHURST #14								
4304730904	00225	07S 23E 9	GRRV					
TOTALS								

COMMENTS: _____

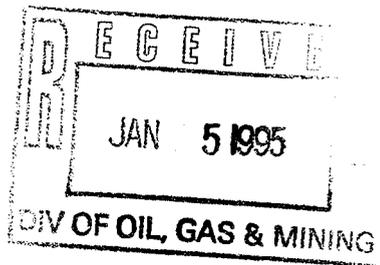
I hereby certify that this report is true and complete to the best of my knowledge.

Date: _____

Name and Signature: _____

Telephone Number: _____

UMC Petroleum Corporation



January 23, 1995

State of Utah
Division of Oil, Gas and Mining
3 Triad Center, #350
Salt Lake City, Utah 84180-1203

Re: Change of Operator

Gentlemen,

On November 15, 1994, General Atlantic Resources, Inc. merged into UMC Petroleum Corporation. Enclosed please find a copy of the certificate of merger as well as State of Utah Form 9 with an attachment listing all wells and their locations.

UMC Petroleum Corporation will be operating these wells effective January 1, 1995. If there are any questions or you require additional information, please contact the undersigned at (303) 573-4732.

Sincerely,

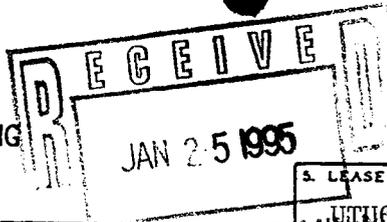
UMC PETROLEUM CORPORATION


April J.M. Lahnum
Production Technician

ajml

{LETTERS/utah}

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING



5. LEASE DESIGNATION & SERIAL NO.
UT1002651A

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 <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		7. UNIT AGREEMENT NAME	
2. NAME OF OPERATOR UMC Petroleum Corporation		8. FARM OR LEASE NAME USA Pearl Broadhurst	
3. ADDRESS OF OPERATOR 410 17th Street, Suite 1400, Denver, CO 80202		9. WELL NO. (see attached exhibit A)	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface (see attached exhibit A) At proposed prod. zone Sections 9 and 10, T7S, R23E		10. FIELD AND POOL, OR WILDCAT Green River	
14. API NO. (see att. exhibit A)		15. ELEVATIONS (Show whether DF, RT, GR, etc.)	
		12. COUNTY Uintah	13. STATE UT
		11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA Sec 9 & 10, T7S, R23E	

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>
(Other) <input type="checkbox"/>	

SUBSEQUENT REPORT OF:

WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
(Other) <u>Change of Operator</u> <input checked="" type="checkbox"/>	
(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

APPROX. DATE WORK WILL START _____

DATE OF COMPLETION _____

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

* Must be accompanied by a cement verification report.

On November 15, 1994, General Atlantic Resources, Inc. merged into UMC Petroleum Corporation. (See enclosed certificate of merger.)

UMC Petroleum Corporation will begin operating the referenced lease on January 1, 1995.

Bond coverage for lease activities is being provided by UMC Petroleum Corporation under their nationwide bond, BLM bond number B01843.

18. I hereby certify that the foregoing is true and correct
 SIGNED April J.M. Lahnum TITLE Production Technician DATE January 20, 1995
 (This space for Federal or State office use)

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

GENERAL ATLANTIC RESOURCES, INC. - Well Location Report
 Report Date: 01-18-1995 - Page 1
 Reporting Field WALKER HOLLOW

EXHIBIT "A"

Utah Production	PRAMS I.D.	Company Identification #	State I.D.#	API Number	Lease Name/Number	Formation	Qtr/Qtr	Sec.	Twp.	Rge	County	Operator
<u>WALKER HOLLOW Field</u>												
PEARL BROADHURST #1	PEARL1	UT-017-01-001	00225	43-047-15692-00	UTU02651A	GREEN RIVER	NESE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #10	PEARL10	UT-017-01-009	00225	43-047-30839-00	UTU02651A	GREEN RIVER	NWSW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #11	PEARL11	UT-017-01-010	00225	43-047-30840-00	UTU02651A	GREEN RIVER	NWNE	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #12	PEARL12	UT-017-01-011	00225	43-047-30841-00	UTU02651A	GREEN RIVER	NWNW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #13	PEARL13	UT-017-01-012	00225	43-047-30842-00	UTU02651A	GREEN RIVER	NENE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #14	PEARL14	UT-017-01-013	00225	43-047-30904-00	UTU02651A	GREEN RIVER	SENE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #15	PEARL15	UT-017-01-014	00225	43-047-30901-00	UTU02651A	GREEN RIVER	SESE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #16	PEARL16	UT-017-01-015	00225	43-047-30903-00	UTU02651A	GREEN RIVER	NWSW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #17	PEARL17	UT-017-01-016	00225	43-047-30905-00	UTU02651A	GREEN RIVER	SENW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #18	PEARL18	UT-017-01-017	00225	43-047-30939-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #19	PEARL19	UT-017-01-018	00225	43-047-30940-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E	UINTAH	GARI-BHP
✓ PEARL BROADHURST #2 (wtw)	PEARL2	UT-017-01-002	00225	43-047-15693-00	UTU02651A	GREEN RIVER	SWNW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #20	PEARL20	UT-017-01-019	00225	43-047-30941-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #21	PEARL21	UT-017-01-020	00225	43-047-30942-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #22	PEARL22	UT-017-01-021	00225	43-047-31025-00	UTU02651A	GREEN RIVER	SESW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #4	PEARL4	UT-017-01-003	00225	43-047-15694-00	UTU02651A	GREEN RIVER	SWSE	9	7S	23E	UINTAH	GARI-BHP
✓ PEARL BROADHURST #5 (wtw)	PEARL5A	UT-017-01-004	00225	43-047-15695-00	UTU02651A	GREEN RIVER	SWSW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #6	PEARL6	UT-017-01-005	00225	43-047-30705-00	UTU02651A	GREEN RIVER	NESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #7	PEARL7	UT-017-01-006	00225	43-047-30730-00	UTU02651A	GREEN RIVER	SWSW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #8	PEARL8	UT-017-01-007	00225	43-047-30696-00	UTU02651A	GREEN RIVER	NESW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #9	PEARL9	UT-017-01-008	00225	43-047-30787-00	UTU02651A	GREEN RIVER	NENW	10	7S	23E	UINTAH	GARI-BHP

State of Delaware
Office of the Secretary of State PAGE 1

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"GENERAL ATLANTIC RESOURCES, INC.", A DELAWARE CORPORATION, WITH AND INTO "UMC PETROLEUM CORPORATION" UNDER THE NAME OF "UMC PETROLEUM CORPORATION", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE FIFTEENTH DAY OF NOVEMBER, A.D. 1994, AT 11:10 O'CLOCK A.M.



Edward J. Freel

Edward J. Freel, Secretary of State

AUTHENTICATION:

DATE: 7306080

11-17-94

2257442 8100M

944221473

CERTIFICATE OF MERGER

OF

**GENERAL ATLANTIC RESOURCES, INC.,
A DELAWARE CORPORATION**

AND

**UMC PETROLEUM CORPORATION,
A DELAWARE CORPORATION**

UMC Petroleum Corporation, a Delaware corporation, certifies that:

1. Constituent Corporations. The constituent business corporations participating in the merger herein certified are:

(a) General Atlantic Resources, Inc., which is incorporated under the laws of the State of Delaware; and

(b) UMC Petroleum Corporation, which is incorporated under the laws of the State of Delaware.

2. Approval of Agreement and Plan of Merger. An Agreement and Plan of Merger dated as of August 9, 1994 ("Agreement and Plan of Merger"), has been approved, adopted, certified, executed and acknowledged by each of the aforesaid constituent corporations in accordance with the provisions of Section 251 of the General Corporation Law of the State of Delaware.

3. Surviving Corporation. The surviving corporation (the "Surviving Corporation") in the merger herein certified is UMC Petroleum Corporation, a Delaware corporation.

4. Certificate of Incorporation. The certificate of incorporation of UMC Petroleum Corporation, a Delaware corporation, shall be the certificate of incorporation of the Surviving Corporation, except that Article 4 thereof is hereby amended and restated in its entirety as follows:

1. Authorized Shares. The total authorized capital stock of the corporation shall consist of Common Stock. The aggregate number of shares of Common Stock that the corporation shall have authority to issue is three thousand (3,000) with the par value of one cent (\$.01) per share.

5. Agreement and Plan of Merger on File. The executed Agreement and Plan of Merger is on file at the principal place of business of the Surviving Corporation, the address

of which as of the date hereof is as follows:

1201 Louisiana Street
Suite 1400
Houston, Texas 77002

6. Copies of Agreement and Plan of Merger. A copy of the Agreement and Plan of Merger will be furnished by the Surviving Corporation, on request and without cost, to any stockholder of any of the aforesaid constituent corporations.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Merger on behalf of UMC Petroleum Corporation on this 15th day of November, 1994.

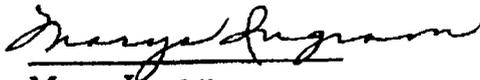
UMC PETROLEUM CORPORATION, a Delaware corporation

By:
Name:
Title:


John B. Brock
President and Chief Executive Officer

Attest:

By:
Name:
Title:

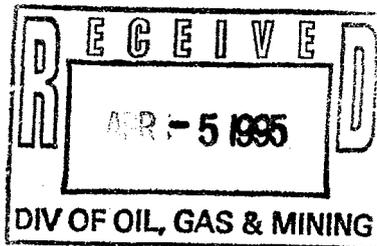

Marya Ingram
Corporate Secretary

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, Utah 84145-0155

IN REPLY REFER TO:
3100
U-02651A et al
(UT-923)



MAR 24 1995

NOTICE

UMC Petroleum Corporation	:	Oil and Gas
1201 Louisiana, Suite 1400	:	U-02651A, U-51411,
Houston, Texas 77002-5603	:	U-55626, U-58530

Merger Recognized

Acceptable evidence has been filed in this office concerning the merger of General Atlantic Resources, Inc. into UMC Petroleum Corporation with UMC Petroleum Corporation being the surviving entity.

For our purposes, the merger is recognized effective November 15, 1994.

The oil and gas lease files identified above have been noted as to the merger. We are notifying the Minerals Management Service and all applicable Bureau of Land Management offices of the change by a copy of this notice.

A rider to UMC's bond (BLM Bond No. NM1773) assuming the liability accrued under General's bond (BLM Bond No. CO1023) was accepted effective March 7, 1995, the date the rider was filed.

/s/ ROBERT LOPEZ

Chief, Branch of Mineral
Leasing Adjudication

bc: Vernal District Office
Moab District Office
MMS—Data Management Division, MS 3113, P.O. Box 5860, Denver, CO 80217
UT-922 (Teresa Thompson)
Lisha Cordova, State of Utah, Division of Oil, Gas, and Mining, 3 Triad Center,
Suite 350, Salt Lake City, Utah 84189-1204

DOGMT

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

SUBMIT IN TRIPLICATE

1. Type of Well
 Oil Well Gas Well Other

2. Name of Operator
 UMC Petroleum Corporation

3. Address and Telephone No.
 410 17th Street, Suite 1400, Denver, CO 80202 (303) 573-5100

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

RECEIVED
MAR 29 1995

5. Lease Designation and Serial No.
 UTU02651A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.
 Pearl Broadhurst

9. API Well No.
 (see attachment)

10. Field and Pool, or Exploratory Area
 Walker Hollow

11. County or Parish, State
 Uintah, UT

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

TYPE OF SUBMISSION	TYPE OF ACTION
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input checked="" 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>Change of Operator</u>
	<input 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.)

On November 15, 1994, General Atlantic Resources, Inc. merged with UMC Petroleum Corporation (See enclosed certificate of merger.)

Bond coverage pursuant to 43 CFR 3104 for lease activities is being provided by UMC Petroleum Corporation under their nationwide bond, B01843. They will be responsible for compliance under the lease terms and conditions for that portion of the lease associated with this notice.

Attachment lists all wells associated with the referenced agreement number, their location, and API well numbers.

RECEIVED
GENERAL DISTRICT
ENG. WPB 3/29/95
APR 07 1995
E.S.
DIV OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
 Signed April J.M. Lahnum Title Production Technician Date March 15, 1995

NOTED

Approved by _____ Title _____ Date APR 06 1995
 Conditions of approval, if any:

State I.D.#	API Number	Lease Name/Number	Formation	Qtr/Qtr	Sec.	Twp.	Rge	County
Utah Production								
<u>WALKER HOLLOW Field</u>								
PEARL BROADHURST #1	00225	43-047-15692-00	UTU02651A	GREEN RIVER	NESE	9	7S	23E UINTAH
PEARL BROADHURST #10	00225	43-047-30839-00	UTU02651A	GREEN RIVER	NWSW	9	7S	23E UINTAH
PEARL BROADHURST #11	00225	43-047-30840-00	UTU02651A	GREEN RIVER	NWNE	10	7S	23E UINTAH
PEARL BROADHURST #12	00225	43-047-30841-00	UTU02651A	GREEN RIVER	NWNW	10	7S	23E UINTAH
PEARL BROADHURST #13	00225	43-047-30842-00	UTU02651A	GREEN RIVER	NENE	9	7S	23E UINTAH
PEARL BROADHURST #14	00225	43-047-30904-00	UTU02651A	GREEN RIVER	SENE	9	7S	23E UINTAH
PEARL BROADHURST #15	00225	43-047-30901-00	UTU02651A	GREEN RIVER	SESE	9	7S	23E UINTAH
PEARL BROADHURST #16	00225	43-047-30903-00	UTU02651A	GREEN RIVER	NWSW	10	7S	23E UINTAH
PEARL BROADHURST #17	00225	43-047-30905-00	UTU02651A	GREEN RIVER	SENE	10	7S	23E UINTAH
PEARL BROADHURST #18	00225	43-047-30939-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E UINTAH
PEARL BROADHURST #19	00225	43-047-30940-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E UINTAH
PEARL BROADHURST #2	00225	43-047-15693-00	UTU02651A	GREEN RIVER	SNNW	10	7S	23E UINTAH
PEARL BROADHURST #20	00225	43-047-30941-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E UINTAH
PEARL BROADHURST #21	00225	43-047-30942-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E UINTAH
PEARL BROADHURST #22	00225	43-047-31025-00	UTU02651A	GREEN RIVER	SESW	10	7S	23E UINTAH
PEARL BROADHURST #4	00225	43-047-15694-00	UTU02651A	GREEN RIVER	SWSE	9	7S	23E UINTAH
PEARL BROADHURST #5	00225	43-047-15695-00	UTU02651A	GREEN RIVER	SWSW	10	7S	23E UINTAH
PEARL BROADHURST #6	00225	43-047-30705-00	UTU02651A	GREEN RIVER	NESW	9	7S	23E UINTAH
PEARL BROADHURST #7	00225	43-047-30730-00	UTU02651A	GREEN RIVER	SWSW	9	7S	23E UINTAH
PEARL BROADHURST #8	00225	43-047-30696-00	UTU02651A	GREEN RIVER	NESW	10	7S	23E UINTAH
PEARL BROADHURST #9	00225	43-047-30787-00	UTU02651A	GREEN RIVER	NENW	10	7S	23E UINTAH

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:

1- EE GIL
2-LWP 7-SJ
3- DT 8-PL
4-VLC 9-FILE
5-RJF
6-LWP

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

- Change of Operator (MERGER) Designation of Agent
 Designation of Operator Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 11-15-94)

TO (new operator)	<u>UMC PETROLEUM CORPORATION</u>	FROM (former operator)	<u>GENERAL ATLANTIC RES INC</u>
(address)	<u>410 17TH ST STE 1400</u>	(address)	<u>410 17TH ST STE 1400</u>
	<u>DENVER CO 80202</u>		<u>DENVER CO 80202</u>
	<u>APRIL LAHNUM (915)683-3003</u>		<u>APRIL LAHNUM</u>
phone	<u>(303) 573-5100</u>	phone	<u>(303) 573-5100</u>
account no.	<u>N9215</u>	account no.	<u>N 0910</u>

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

Name: <u>**SEE ATTACHED**</u>	API: <u>4304730904</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

OPERATOR CHANGE DOCUMENTATION

1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). *(Rec'd 1-25-95)*
2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). *(Rec'd 1-25-95)*
3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: #152682. *(# 6/91)*
4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.
5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. *(4-6-95)*
6. Cardex file has been updated for each well listed above. *4-18-95*
7. Well file labels have been updated for each well listed above. *4-18-95*
8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. *(4-6-95)*
9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) no (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

- 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- 2. A copy of this form has been placed in the new and former operators' bond files.
- 3. The former operator has requested a release of liability from their bond (yes/no) no. Today's date 4/18/95 1995. If yes, division response was made by letter dated 19 .

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- 1. (Rule R615-2-10) The former operator/lessee of any fee lease well listed above has been notified by letter dated 4/18/95 1995, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- 2. Copies of documents have been sent to State Lands for changes involving State leases.

FILMING

- 1. All attachments to this form have been microfilmed. Date: May 2 1995.

FILING

- 1. Copies of all attachments to this form have been filed in each well file.
- 2. The original of this form and the original attachments have been filed in the Operator Change file.

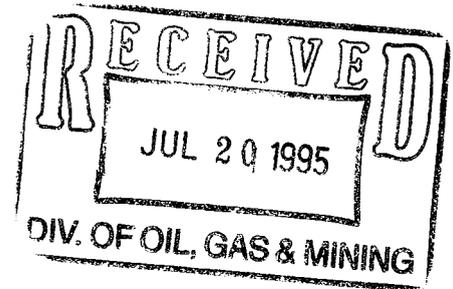
COMMENTS

950131 Reg. UIC F5 (27 wells).

9502 Trust Lands Admin. "accepted merger".

950324 Btm/54 Aprv. e.H. 11-15-94.

UMC Petroleum Corporation



July 18, 1995

Mr. Dan Jarvis
State of Utah Natural Resources
Oil, Gas and Mining
Underground Injection Control Program
#3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RE: Surface Injection Pressure. Walker Hollow Field, Uintah
County. Pearl Broadhurst Lease, Wells #4 & #14.
Cause # UIC-157.

Dear Dan,

Enclosed in triplicate are the completed form 1b's for the subject wells, requesting an increase in the surface operating injection pressure. Included with the state forms is past correspondence between your office and Energy Reserves Group, Inc., concerning the request for an injection pressure increase for the Pearl Broadhurst #2 and #5.

The current rate allowed by the State permit is 1200 psi. We would like to be able to utilize a maximum pressure of 2420 psi, after the reservoir pressures up. According to the data the State provided Energy Reserves Group, Inc., 3000 psi would be 99 percent of the calculated fracturing pressure for the #2 and #5 wells that are injecting under the same conditions into the same zones/depths. The State allowed a safety factor of 20 percent and granted a maximum pressure increase to 2420 psi. The #2 and #5 injection wells have been injecting at an average of 2200 psi for 10 years without any adverse effects.

If you have any questions or need additional information, I can be reached at (303) 573-4721. Thank you for your time in this matter.

Sincerely,

UMC Petroleum Corporation
Operations Department

A handwritten signature in cursive script, appearing to read "Scott M. Webb".

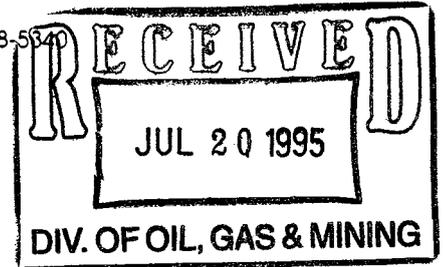
Scott M. Webb
Regulatory Coordinator



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



August 19, 1985

Energy Reserves Group, Inc.
P.O. Box 3280
Casper, Wyoming 82602-3280

Attn: Bobby Patrick

Dear Mr. Patrick:

RE: Injection Pressure Increase, USA Pearl Broadhurst #2, T7S,R23E,
Section 10, Uintah County, Utah

The requested surface injection pressure of 2420 psi for the above referenced well is hereby approved.

Sincerely,

Cleon B. Feight
Cleon B. Feight
UIC Manager

GH/mfp
0156U-33



STATE OF UTAH
NATURAL RESOURCES & ENERGY
Oil, Gas & Mining

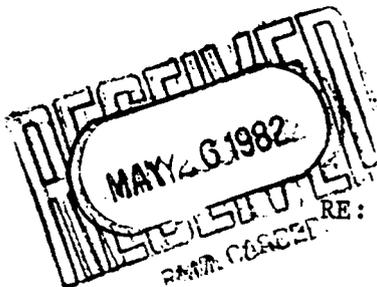
4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

W.F.
John
W.F.
Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Cleon B. Feight, Division Director

May 21, 1982

Energy Reserves Group, Inc.
P.O. Box 3280
Casper, Wyoming 82602

Attn: Lance Neiberger



RE: Surface Injection Pressure
USA Pearl Broadhurst #5
Uintah County, Utah

Gentlemen:

In regards to your letter of May 13, 1982, in which you requested an injection pressure of 3000 psig, the Division denies your request. It is Division policy to allow a safety factor of approximately 20 percent below the fracturing pressure, or .75 psi/ft frac gradient, whichever applies. Your figure of 3000 psig is 99 percent of the calculated fracturing pressure.

Permission is hereby granted from this office for a maximum injection pressure of 2420 psig which allows a safety factor of approximately 20 percent, neglecting the small change in friction loss.

If you have any questions, please call.

Sincerely,

DIVISION OF OIL, GAS & MINING

GILBERT L. HUNT
UIC GEOLOGIST

cc: Ron Firth, Chief Petroleum Engineer, DOGM

GLH:dc

Energy Reserves Group, Inc.
P.O. Box 3280
Casper, Wyoming 82602
Phone 307 265 7331



May 13, 1982

State of Utah
Natural Resources & Energy
4241 State Office Building
Salt Lake City, Utah 84114

Attention: Mr. G.L. Hunt

Subject: Surface Injection Pressure
USA Pearl Broadhurst #5
Uintah County, Utah

Mr. Hunt:

Regarding our telephone conversation of Monday May 10, 1982 I am requesting an increase in our surface injection pressure at the above mentioned well. Attached is a summary of bottomhole pressures required to fracture the J and K zones of the Green River formation. Three wells were used to come up with a bottomhole parting pressure of 5230 psig or a fracture gradient of .97. These data were taken from three actual hydraulic fractures in the subject zones. These values are on the conservative side because the increased weight and improved friction characteristics of the frac fluid were not taken into account. Using these data a surface injection pressure of 3025 psig would be required to fracture the formation. We are presently limited to 1450 psig.

Although we hope we will not need to approach 3000 psi surface pressure to inject water, past history indicates it may be necessary. I am requesting approval to inject at 3000 psig.



Page 2

Your prompt attention to this matter would be appreciated since the formation is already starting to pressure up on us. As previously requested we will supply the division with seven days of water-oil production data in addition to the monthly reports.

If you have any questions regarding this information please don't hesitate to call.

Sincerely,
ENERGY RESERVES GROUP, INC.

A handwritten signature in cursive script, appearing to read "Lance R. Neiberger".

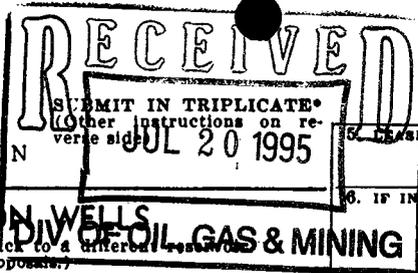
Lance R. Neiberger
District Engineer
Rocky Mountain District

cc: Lee McLean
Bobby Patrick
Well File

LRN:er1

Attachment

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION



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.)
DIVISION OF OIL, GAS & MINING

1. OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER Injection Well		7. UNIT AGREEMENT NAME Walker Hollow Unit
2. NAME OF OPERATOR UMC Petroleum Corporation		8. FARM OR LEASE NAME Pearl Braodhurst
3. ADDRESS OF OPERATOR 410 17th Street, Suite 1400, Denver, CO 80202		9. WELL NO. 14
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface SENE Section 9-T7S-R23E 1980' FNL & 659' FEL		10. FIELD AND POOL, OR WILDCAT Walker Hollow
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 9-T7S-R23E
14. PERMIT NO. UIC-157	15. ELEVATIONS (Show whether DF, RT, OR, etc.) GL 5110' KB 5123'	12. COUNTY OR PARISH Uintah
		13. STATE UT

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

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

Requesting to increase maximum injection pressure from 1200 psi, to 2420 psi. 2420 psi has been calculated to be 80% of the calculated Fracturing pressure. See attachments.

APPROVED BY THE STATE
OF UTAH DIVISION OF
OIL, GAS, AND MINING
DATE: 8-15-95
BY: [Signature]

18. I hereby certify that the foregoing is true and correct
SIGNED [Signature] TITLE Regulatory Coordinator DATE 7/18/95

(This space for Federal or State office use)

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

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER Injection well		5. LEASE DESIGNATION AND SERIAL NO.
2. NAME OF OPERATOR UMC Petroleum Corporation		6. IF INDIAN, ALLOTTEE OR TRIBE NAME
3. ADDRESS OF OPERATOR 410 17th Street, Suite 1400, Denver, CO 80202		7. UNIT AGREEMENT NAME Walker Hollow Unit
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface SENE Section 9-T7S-R23E 1980' FNL & 659' FEL		8. FARM OR LEASE NAME Pearl Broadhurst
14. PERMIT NO. 43-047-30001 IC 157		9. WELL NO. 14
15. ELEVATIONS (Show whether DF, RT, GR, etc.) GL 5110' KB 5123'		10. FIELD AND POOL, OR WILDCAT Green River J-K
16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 9-T7S-R23E
NOTICE OF INTENTION TO: TEST WATER SHUT-OFF <input type="checkbox"/> PULL OR ALTER CASING <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> MULTIPLE COMPLETE <input type="checkbox"/> SHOOT OR ACIDIZE <input type="checkbox"/> ABANDON* <input type="checkbox"/> REPAIR WELL <input checked="" type="checkbox"/> CHANGE PLANS <input type="checkbox"/> (Other) <input type="checkbox"/>		12. COUNTY OR PARISH 13. STATE Uintah UT

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data			
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input checked="" 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.)*

The subject well was shut-in on 1/18/96 due to discovery of pressure in the annulus between the casing and the tubing string. The pressure on the backside builds and holds, indicating a leak in the tubing or packer, not the casing.

UMC would like to re-enter and pull the packer and tubing string for repair or replacement. Upon completion of the work a Mechanical Integrity Test would be performed according to regulations and witnessed by BLM personnel out of Vernal.

UIC State permit #UIC 157.

APPROVED BY THE STATE
 OF UTAH DIVISION OF
 OIL, GAS, AND MINING
 DATE: 1-22-96
 BY: [Signature]

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

SIGNED: [Signature] TITLE Regulatory Coordinator DATE 1/18/96

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

* notify DOGM 24 hrs prior to testing.

*See Instructions on Reverse Side

UMC Petroleum Corporation

JAN 22 1996

January 18, 1996

Mr. Gil Hunt
State of Utah Natural Resources
Division of Oil, Gas and Mining
UIC Group
#3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

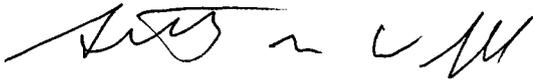
RE: Walker Hollow Field, Uintah County.
Pearl Broadhurst Lease, Well #14.
SENE Section 9-T7S-R23E Cause # UIC-157.

Dear Mr. Hunt,

Enclosed the original and two copies of the completed form 1b's for the subject well, requesting permission to re-enter and repair the tubing or packer. Our field personnel discovered pressure on the backside of the well this AM so we shut it in. The pressure held at the same rate as the surface injection pressure, so we are convinced that the loss of integrity is in the tubing or packer.

If you have any questions or need additional information, I can be reached at (303) 573-4721. Thank you for your time in this matter.

Sincerely,



Scott M. Webb
Regulatory Coordinator



UMC Petroleum Corporation

FEB 4 1996

January 31, 1996

Mr. Gil Hunt
State of Utah Natural Resources
Division of Oil, Gas and Mining
UIC Group
#3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RE: Walker Hollow Field, Uintah County.
Pearl Broadhurst Lease, Well #14.
SENE Section 9-T7S-R23E Cause # UIC-157.
43-047-30904

Dear Mr. Hunt,

Enclosed the original and two copies of the completed form 1b's and a copy of the BLM pressure test report for the subject well. The well was returned to injection on 1/24/96. The MIT Test was witnessed by Mr. James Sparger of the Vernal BLM.

If you have any questions or need additional information, I can be reached at (303) 573-4721. Thank you for your time in this matter.

Sincerely,



Scott M. Webb
Regulatory Coordinator

OIL & GAS CONSERVATION COMMISSION

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 type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER EUR Injection well</p> <p>2. NAME OF OPERATOR UMC Petroleum Corporation</p> <p>3. ADDRESS OF OPERATOR 410 17th Street, Suite 1400, Denver, CO 80202</p> <p>4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 1980' FNL & 659' FEL SENE Sec. 9-T7S-R23E</p> <p>14. PERMIT NO. 43-047-30904 UIC157</p>		<p>5. LEASE DESIGNATION AND SERIAL NO.</p> <p>6. IF INDIAN, ALLOTTEE OR TRIBE NAME</p> <p>7. UNIT AGREEMENT NAME Walker Hollow Unit</p> <p>8. FARM OR LEASE NAME Pearl Broadhurst</p> <p>9. WELL NO. 14</p> <p>10. FIELD AND POOL, OR WILDCAT Green River</p> <p>11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 9-T7S-R23E</p> <p>12. COUNTY OR PARISH Uintah</p> <p>13. STATE UT</p>	
<p>15. ELEVATIONS (Show whether DV, RT, OR, etc.) GL 5110' KB 5123'</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 checked="" 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 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.)*

The P. Broadhurst injection well was returned to operation on 1/24/96.

The following repairs were made to the tubing and packer to re-gain mechanical integrity:

- 1) MIRU Western Well Service pull tubing and packer.
- 2) Replace seals on packer and run tubing back into hole, tubing was torqued to 1850 #'s (every connection).
- 3) Packer set @ 4670'.
- 4) RU hot oiler, circulated 100 bbls packer fluid down tubing with 25 gallons 4428 scale inhibitor.
- 5) Land tubing on slips with 12,000 # tension.
- 6) Pressure test annulus to 1000 psi, held OK.
- 7) rig down hot oiler and re-plumb.

MIT witnessed by James Sparger of Vernal BLM Office. (see attached results on attached BLM report.)

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

SIGNED [Signature] TITLE Regulatory Coordinator DATE 1/31/96

(This space for Federal or State office use)

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



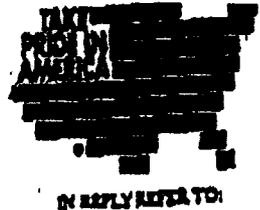
United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Vernal District Office
170 South 800 East
Vernal, Utah 84078

Phone (801) 789-1352

FAX (801) 789-3654



MECHANICAL INTEGRITY PRESSURE TEST CASING/TUBING ANNULUS

Lease No. U-02651-A
 Company Name: UMC Petroleum Corp. Date: 1-24-96
 Well Name: Broadhurst #14 Permit No. _____
 Field Name: WALTER Hollow County: Uintah
 Well Location: SENE Sec 9 T 7s R 23E
 Well Type: BWD ER 2H Other: _____
 Type of Packer: 5 1/2" Ultralock TK-2 coated Total Depth: 5480' KB
 Packer Set at (depth): 4670.03 FT
 Surface Casing Size: 8 5/8" 24" From: 0 FT to 497' KB FT
 Casing Size: 5 1/2" 14" From: 0 FT to 5480' KB FT
 Tubing Size: 2 7/8" 6.5" Tubing Pressure during Test: 560 psig
 Time of Day: 0800 am pm
 Fluid in Annulus: Water

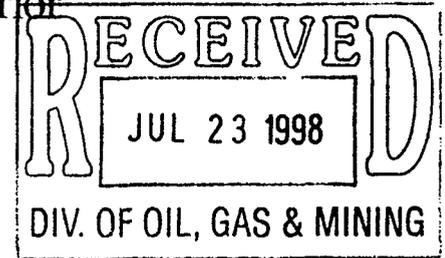
	Test #1	Test #2
0 Min:	<u>560</u> psig	_____ psig
5	_____ psig	_____ psig
10	_____ psig	_____ psig
15	<u>625</u> psig	_____ psig
20	_____ psig	_____ psig
25	_____ psig	_____ psig
30	<u>670</u> psig	_____ psig
35	_____ psig	_____ psig
40	_____ psig	_____ psig
45	<u>700</u> psig	_____ psig
50	_____ psig	_____ psig
55	_____ psig	_____ psig
60	<u>705</u> psig	_____ psig

Test Conducted by: UMC Pump - Cats
 Inspected by: JAMES SPONGER



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155



In Reply Refer To:
3100
U-02651A et al
(UT-932)

JUL 21 1998

NOTICE

Ocean Energy, Inc.	:	Oil and Gas: U-02651A, U-
1201 Louisiana, Suite 1400	:	U-09712A, U-020691A, U-8894A,
Houston, TX 77002-5603	:	U-8895A, U-8897A, U-40401, U-64058
(713) 654-9110		

Merger Recognized

Acceptable evidence has been filed in this office concerning the merger of UMC Petroleum Corporation into Ocean Energy, Inc. with Ocean Energy, Inc. being the surviving entity.

For our purposes, the merger is recognized effective May 15, 1998, the effective date set by the New Mexico State Office.

The oil and gas lease files identified above have been noted as to the merger. The list was compiled from your list of leases, and a list of leases obtained from our Automated Land and Mineral Record System (ALMRS). We have not abstracted the lease files to determine if the entity affected by the merger holds an interest in the leases identified nor have we attempted to identify leases where the entity is the operator on the ground maintaining no vested record title or operating rights interests. We are notifying the Minerals Management Service and all applicable Bureau of Land Management offices of the change by a copy of this notice. If additional documentation for changes of operator are required by our Field Offices, you will be contacted by them.

By recognition of the merger, the principal is automatically changed by operation of law from UMC Petroleum Corporation to Ocean Energy, Inc. on Bond No. BO1843 (BLM Bond No. NM1773). A rider amending the principal's name from UMC Petroleum Corporation to Ocean Energy, Inc. has been filed in the New Mexico State Office, examined, and found to be satisfactory.

ROBERT LOPEZ

Robert Lopez
Group Leader,
Minerals Adjudication Group

cc: Moab District Office
Vernal Field Office
MMS-Reference Data Branch, MS 3130, P.O. Box 5860, Denver, CO 80217
State of Utah, DOGM, Attn: Lisha Cordova (Ste. 1210) P.O. Box 145801, SLC, UT 84114

```

07/31/98          D E T A I L   W E L L   D A T A          menu: opt 00
api num:  4304730904   prod zone: GRRV          sec   twnshp   range   qr-qr
entity:   225      :           9       7.0   S     23.0 E   SENE
well name: PEARL BROADHURST 14
operator:  N9215 : UMC PETROLEUM CORPORATION          meridian: S
field:     700      : WALKER HOLLOW
confidential flag:      confidential expires:          alt addr flag:
      * * * application to drill, deepen, or plug back * * *
lease number:  U-02651-A          lease type: 1          well type:      OW
surface loc:   1980 FNL 0659 FEL  unit name:
prod zone loc: 1980 FNL 0659 FEL  depth:      5600      proposed zone:
elevation:    5110' GR          apd date:   810313   auth code:
* * completion information * *   date recd:  810629   la/pa date:
spud date:    810321          compl date: 810610   total depth: 5480'
producing intervals: 4720-5383'
bottom hole:   1980 FNL 0659 FEL  first prod: 810610   well status:   WIW
24hr oil:  94      24hr gas:      24hr water: 197      gas/oil ratio:
      * * well comments:          direction1:          api gravity:   28.00
870602 1986 CUM ADJ:930928 FR N0390 5/93:950406 FR N0910 11/94:960222 COMM
INJ 10/95:

```

```

opt: 21 api: 4304730904 zone:          date(yymm): 9600 enty          acct: P0379

```

OPERATOR CHANGE WORKSHEET

Routing	
1- FILE	6- EEC KR ✓
2- GLH	7-KAS ✓
3- DT	8-SI ✓
4-VLD CDW	9-FILE
5-JBB	

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

- Change of Operator (well sold) Designation of Agent
 Designation of Operator Operator Name Change Only

The operator of the well(s) listed below has changed, effective: 4-1-98 (MERGER)

TO: (new operator)	<u>OCEAN ENERGY INC</u>	FROM: (old operator)	<u>UMC PETROLEUM CORPORATION</u>
(address)	<u>PO BOX 549</u>	(address)	<u>PO BOX 549</u>
	<u>NEWCASTLE WY 82701-0549</u>		<u>NEWCASTLE WY 82701-0549</u>
	<u>Phone: (307) 746-4052</u>		<u>Phone: (307) 746-4052</u>
	<u>Account no. N3220 (7-31-98)</u>		<u>Account no. N9215</u>

WELL(S) attach additional page if needed:

Name: **SEE ATTACHED**	API: <u>43.047.3090A</u>	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____

OPERATOR CHANGE DOCUMENTATION

1. (r649-8-10) Sundry or other legal documentation has been received from the **FORMER** operator (attach to this form). (rec'd 9-3-98)
2. (r649-8-10) Sundry or other legal documentation has been received from the **NEW** operator (Attach to this form). (rec'd 9-3-98)
3. The **Department of Commerce** has been contacted if the new operator above is not currently operating any wells in Utah. Is the company **registered with the state?** (yes/no) _____ If yes, show company file number: Co 209299. (c.f. 3-23-98)
4. **FOR INDIAN AND FEDERAL WELLS ONLY.** The BLM has been contacted regarding this change. Make note of BLM status in comments section of this form. BLM approval of **Federal** and **Indian** well operator changes should ordinarily take place prior to the division's approval, and before the completion of **steps 5 through 9** below.
5. Changes have been entered in the **Oil and Gas Information System (3270)** for each well listed above. (7-31-98) * UIC Quattro E. DBASE
6. **Cardex** file has been updated for each well listed above. (8-3-98)
7. Well **file labels** have been updated for each well listed above. (8-3-98)
8. Changes have been included on the monthly "Operator, Address, and Account Changes" **memo** for distribution to Trust Lands, Sovereign Lands, UGS, Tax Commission, etc. (7-31-98)
9. A folder has been set up for the **Operator Change file**, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- Yes 1. (r649-8-7) **Entity assignments have been reviewed** for all wells listed above. Were entity changes made? (yes/no) no If entity assignments were changed, attach copies of Form 6, Entity Action Form.
- N/A/Yes 2. Trust Lands, Sovereign Lands, Tax Commission, etc., have been **notified** through normal procedures of entity changes.

BOND VERIFICATION - (FEE WELLS ONLY)

- N/A/Yes 1. (r649-3-1) The **NEW** operator of any fee lease well listed above has furnished a proper bond.
2. A **copy of this form** has been placed in the new and former operator's bond files.
3. The **FORMER** operator has requested a release of liability from their bond (yes/no) , as of today's date . If yes, division response was made to this request by letter dated .

LEASE INTEREST OWNER NOTIFICATION OF RESPONSIBILITY

- N/A/Yes 1. Copies of documents have been sent on to at Trust Lands for changes involving State leases, in order to remind that agency of their responsibility to review for proper bonding.
- N/A/Yes 2. (r649-2-10) The former operator of any fee lease wells listed above has been contacted and informed by letter dated 19 , of their responsibility to notify all interest owners of this change.

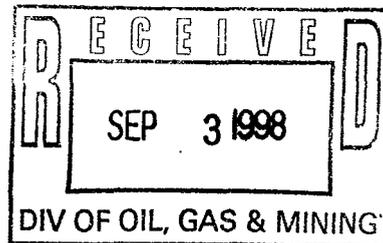
FILMING

- Yes 1. All attachments to this form have been **microfilmed**. Today's date: 12.8.98.

FILING

1. **Copies** of all attachments to this form have been filed in each **well file**.
2. The **original of this form**, and the **original attachments** are now being filed in the Operator Change file.

COMMENTS



TRANSFER OF AUTHORITY TO INJECT - UIC FORM 5

Well name and number: Pearl Broadhurst #14 Federal Lease # U-025651-A
Field or Unit name: Walker Hollow Field API no. 43-047-30904
Well location: QQ SENE section 9 township 7S range 23E county Uintah
Effective Date of Transfer: April 1, 1998

CURRENT OPERATOR

Transfer approved by:

Name Scott M. Webb Company UMC Petroleum Corporation
Signature [Signature] Address 410 17th St., STE 1400
Title Regulatory Coordinator Denver, CO. 80202
Date 9/2/98 Phone (303) 573-4721

Comments:

NEW OPERATOR

Transfer approved by:

Name Scott M. Webb Company Ocean Energy, Inc.
Signature [Signature] Address 410 17th St., STE 1400
Title Regulatory Coordinator Denver, CO 80202
Date 9/2/98 Phone (303) 573-4721

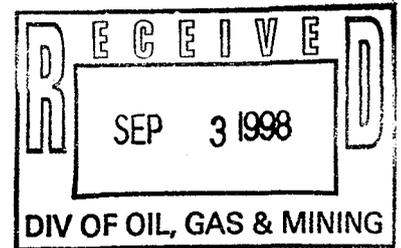
Comments:

(State use only)
Transfer approved by [Signature] Title Tech. Services Manager
Approval Date 9/9/98



September 2, 1998

Lisha Cordova
Utah Department of Natural Resources
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801



RE: Merger of UMC Petroleum Corporation and Ocean Energy, Inc.
Pearl Broadhurst #2, #4, #5 & #14.

Dear Ms. Cordova:

Effective April 1, 1998, UMC Petroleum Corporation merged with Ocean Energy, Inc. Effective June 30, 1998, all onshore wells were transferred to its wholly owned subsidiary, Ocean Energy Resources, Inc. Enclosed is the requested UIC Form 5's for the subject change of operation for the original merger and the subsequent re-organization in June 30 1998. All wells previously operated by UMC Petroleum in Utah are now operated by Ocean Energy Resources, Inc.

There has been no change in personnel with whom you are already familiar. Furthermore, the address for all notices, revenues and remittances, notifications and general correspondence remains the same:

Ocean Energy, Resources, Inc.
410 17th Street, Suite 1400
Denver, Colorado 80202

Please distribute this notice to any other applicable departments within your organization that should be aware of this change.

If you have any questions, please feel free to contact the undersigned at (303) 573-4721.

Sincerely,

Scott M. Webb
Regulatory Coordinator

UNITED STATES OF AMERICA
State of Louisiana

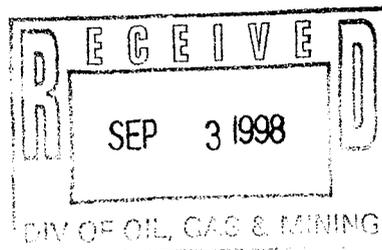


Box McKeithen

SECRETARY OF STATE

As Secretary of State, of the State of Louisiana, I do hereby Certify that

the annexed and following is a True and Correct copy of a Merger as shown by comparison with document filed and recorded in this Office on March 27, 1998.



In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on,

April 17 1998

Box McKeithen

CGR

Secretary of State



CERTIFICATE OF MERGER

of
UMC Petroleum Corporation, a Delaware corporation
into
Ocean Energy, Inc., a Louisiana corporation

Pursuant to Section 112 of the Louisiana Business Corporation Law (the "LBCL"), Ocean Energy, Inc., a Louisiana corporation ("OEI"), hereby adopts the following Certificate of Merger regarding the merger (the "Merger") of UMC Petroleum Corporation, a Delaware corporation ("UMCPC" and, together with OEI, the "Constituent Corporations"), with and into OEI, with OEI as the surviving corporation (the "Surviving Corporation").

1. Ocean Energy, Inc., a Louisiana corporation, and UMC Petroleum Corporation, a Delaware corporation, are the parties to the Merger.

2. The Agreement and Plan of Merger, dated March 27, 1998 (the "Merger Agreement"), has been approved, adopted, certified, executed and acknowledged by the Constituent Corporations in accordance with Section 112 of the LBCL.

3. The Merger is effective at 3:02 p.m., Central Standard Time, on March 27, 1998.

4. The name of the Surviving Corporation shall be Ocean Energy, Inc.

5. Article III of the Articles of Incorporation of Ocean Energy, Inc. is amended in connection with the Merger to increase the authorized capital of the Surviving Corporation and, as a result of the amendment, Article III shall be and read as follows: *The aggregate number of shares which the corporation shall have authority to issue is 3,000 shares without par value, all of which shares shall be of one class and shall be designated as Common Stock*. The Articles of Incorporation of the Surviving Corporation as amended by the amendment to Article III shall be its articles of incorporation.

6. The executed Merger Agreement is on file at the principal place of business of the Surviving Corporation, 1201 Louisiana, Suite 1400, Houston, Texas 77002.

7. A copy of the Merger Agreement will be furnished by the Surviving Corporation, on request and without cost, to any shareholder of UMC Petroleum Corporation or Ocean Energy, Inc., the parties to the Merger.

This Certificate of Merger is dated this 27th day of March, 1998.

OCEAN ENERGY, INC.

By: 

Name: Robert K. Reeves

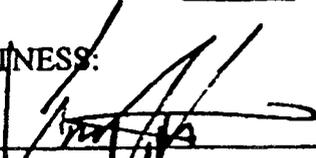
Title: Executive Vice President,
General Counsel and Secretary

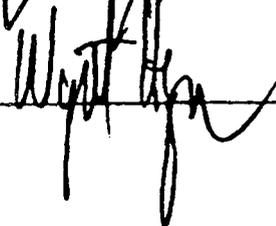
STATE OF TEXAS §
 §
COUNTY OF HARRIS §

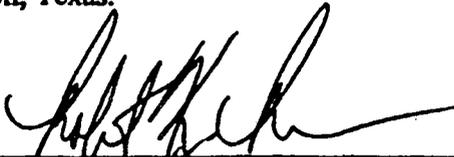
BEFORE ME, the undersigned authority, personally came and appeared Robert K. Reeves, who being duly sworn, declared and acknowledged before me that he is the Executive Vice President, General Counsel and Secretary of Ocean Energy, Inc., a Louisiana corporation, and acknowledged to me that he was authorized to and executed the foregoing Certificate of Merger of UMC Petroleum Corporation into Ocean Energy, Inc. in such capacity for the purposes therein expressed, and as his, and said corporation's free act and deed.

IN WITNESS WHEREOF, the said appearer, witnesses and I, notary, have hereunto affixed our hands on this 27th day of March, 1998 at Houston, Texas.

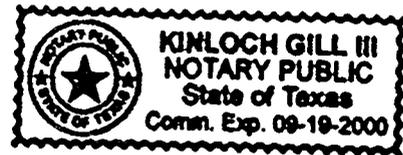
WITNESS:



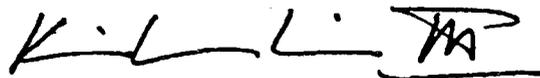




Robert K. Reeves



Notary Public in and for
the State of Texas



State of Delaware
Office of the Secretary of State

PAGE 1

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"UMC PETROLEUM CORPORATION", A DELAWARE CORPORATION,
WITH AND INTO "OCEAN ENERGY, INC." UNDER THE NAME OF "OCEAN ENERGY, INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF LOUISIANA, AS RECEIVED AND FILED IN THIS OFFICE THE TWENTY-SEVENTH DAY OF MARCH, A.D. 1998, AT 12:22 O'CLOCK P.M.



Handwritten signature of Edward J. Freel in cursive script.

Edward J. Freel, Secretary of State

2257442 8100M

981130659

AUTHENTICATION: 9012828

DATE: 04-06-98

CERTIFICATE OF MERGER

Merger of UMC Petroleum Corporation, a Delaware corporation
With and Into
Ocean Energy, Inc., a Louisiana corporation

Pursuant to the Provisions of Section 252 of the Delaware General Corporation Law, the undersigned certifies as follows concerning the merger (the "Merger") of UMC Petroleum Corporation, a Delaware corporation, with and into Ocean Energy, Inc., a Louisiana corporation (together with UMC Petroleum Corporation, the "Constituent Corporations"), with Ocean Energy, Inc. as the surviving corporation (the "Surviving Corporation").

1. The Agreement and Plan of Merger, dated March 27, 1998 (the "Merger Agreement"), has been approved, adopted, certified, executed and acknowledged by the Constituent Corporations in accordance with Section 252 of the Delaware General Corporation Law.

2. The Merger contemplated in the Merger Agreement and this Certificate of Merger will be effective at 3:02 p.m., Central Standard Time, on March 27, 1998.

3. The name of the Surviving Corporation shall be Ocean Energy, Inc.

4. Article III of the Articles of Incorporation of Ocean Energy, Inc. is amended in connection with the Merger to increase the authorized capital of the Surviving Corporation and, as a result of the amendment, Article III shall be and read as follows: *The aggregate number of shares which the corporation shall have authority to issue is 3,000 shares without par value, all of which shares shall be of one class and shall be designated as Common Stock.* The Articles of Incorporation of the Surviving Corporation as amended by the amendment to Article III shall be its articles of incorporation.

5. The executed Merger Agreement is on file at the principal place of business of the Surviving Corporation, 1201 Louisiana, Suite 1400, Houston, Texas 77002.

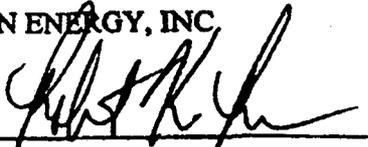
6. A copy of the Merger Agreement will be furnished by the Surviving Corporation, on request and without cost, to any stockholder of UMC Petroleum Corporation or Ocean Energy, Inc.

7. The Surviving Corporation may be served with process in the State of Delaware in any proceeding for enforcement of any obligation of the Constituent Corporations, as well as for enforcement of any obligation of the Surviving Corporation arising from the Merger, including any suit or other proceeding to enforce the right of any stockholder as determined in appraisal proceedings pursuant to the provisions of Section 262 of the Delaware General Corporation Law, and the Surviving Corporation does hereby irrevocably appoint the Secretary of State of

Delaware as its agent to accept service of process in any such suit or other proceedings. The address to which a copy of such process shall be mailed by the Secretary of State of Delaware is c/o Ocean Energy, Inc., 1201 Louisiana, Suite 1400, Houston, Texas 77002, Attention: Secretary, until the Surviving Corporation shall have hereafter designated in writing to the Secretary of State of Delaware a different address for such purpose.

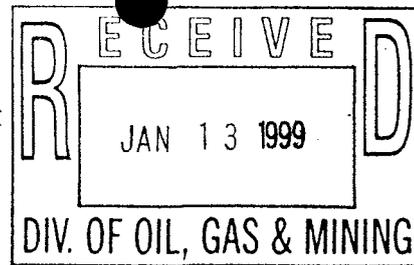
Dated this 27th day of March, 1998.

OCEAN ENERGY, INC

By: 

Name: Robert K. Reeves

Title: Executive Vice President,
General Counsel and Secretary



TRANSFER OF AUTHORITY TO INJECT - UIC FORM 5

Well name and number: USA Pearl Broadhurst #14 Fed Lease # U-025651-A
Field or Unit name: Walker Hollow Field API no. 43-047-30904
Well location: QQ SENE section 9 township 7S range 23E county Uintah
Effective Date of Transfer: 1/1/99

CURRENT OPERATOR

Transfer approved by:

Name Scott M. Webb Company Ocean Energy Resources, Inc.
Signature [Signature] Address 410 17th Street, Suite 1400
Title Regulatory Coordinator Denver, Colorado 80202
Date 1/5/99 Phone (303) 573-5100

Comments: Effective January 1, 1999
Change of Operation of well.

NEW OPERATOR

Transfer approved by:

Name Robert T. Kennedy Company Citation Oil & Gas Corp.
Signature [Signature] Address 8223 Willow Place South
Title V.P. Land Suite 250
Houston, Texas 77070-5623
Date 1-8-99 Phone (281) 469-9664

Comments: Effective January 1, 1999
Change of Operation of well.

(State use only)
Transfer approved by [Signature] Title Field Serv. Manager
Approval Date 6-21-99

From: <Margie_Herrmann@ut.blm.gov>
To: <nrogm.krisbeck@state.ut.us>
Date: Tue, Jun 1, 1999 11:18 AM
Subject: Change of Operator

Here goes again! Let me know if you receive it.
Thank you,
Margie

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION & SERIAL NO.
U-025651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
USA Pearl Broadhurst

9. WELL NO.
14

10. FIELD AND POOL, OR WILDCAT
Walker Hollow Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
9 -7S-R23E

12. COUNTY
Uintah

13. STATE
UT

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL GAS WELL OTHER Injection Well

2. NAME OF OPERATOR
Ocean Energy Resources, Inc.

3. ADDRESS OF OPERATOR
410 17th Street, Suite 1400, Denver, Colorado 80202

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.)
At surface 1980' FNL & 659' FEL SE NE
At proposed prod. zone

14. API NO. 43-041-30904

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

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

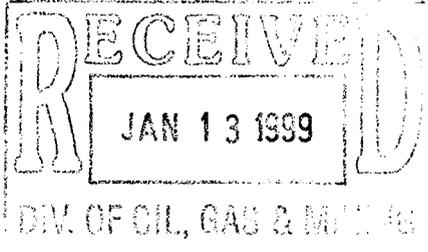
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	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 type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) Change Of Operator <input checked="" type="checkbox"/>	
(Other) <input type="checkbox"/>		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	
APPROX. DATE WORK WILL START _____		DATE OF COMPLETION _____	

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

Change of Operator: Effective Date January 1, 1999.* Must be accompanied by a cement verification report.

Former Operator: Ocean Energy, Resources, Inc. (303) 573-5100
410 17th Street, Suite 1400
Denver, Colorado 80202

New Operator: Citation Oil & Gas Corp. (281) 469-9664
8223 Willow Place South
Suite 250
Houston, Texas 77070-5623



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

SIGNED [Signature] TITLE Regulatory Coordinitor DATE 1/6/99

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:



United States Department of the Interior

BUREAU OF LAND MANAGEMENT Vernal Field Office

170 South 500 East Phone: (435) 781-4400
Vernal, Utah 84078-2799 Fax: (435) 781-4410

IN REPLY REFER TO:

3160
UT08300

February 17, 1999

Citation Oil & Gas Corporation
Attn: Sharon Ward
P O Box 690688
Houston, TX 77269-0688

Re: USA Pearl Broadhust Wells 1, 2, 4, 5, 6, 7,
8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,
20, 21, and 22
Sec. 9 & 10, T7S, R23E
Lease U-02651-A
Uintah County, Utah

Dear Ms. Ward:

This correspondence is in regard to the self-certification statement submitted requesting a change in operator for the referenced well. After a review by this office, the change in operator request is approved. Effective immediately, Citation Oil & Gas Corporation is responsible for all operations performed on the referenced well. All liability will now fall under your bond, BLM Bond No. MT0630, for all operations conducted on the referenced well on the leased land.

If you have any other questions concerning this matter, please contact Margie Herrmann or Pat Sutton of this office at (435) 781-4492.

Sincerely,

Howard B. Cleavinger II
Assistant Field Manager for

Minerals Resources

cc: Ocean Energy, Inc.
Amoco Production Co.
Utah Div. Oil, Gas & Mining

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

<p>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>		<p>5. LEASE DESIGNATION & SERIAL NO. U-025651-A</p>
<p>1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER Injection Well</p>		<p>6. IF INDIAN, ALLOTTEE OR TRIBE NAME</p>
<p>2. NAME OF OPERATOR Citation Oil & Gas Corp.</p>		<p>7. UNIT AGREEMENT NAME</p>
<p>3. ADDRESS OF OPERATOR 8223 Willow Place South, Suite 250, Houston, TX 77070-5623</p>		<p>8. FARM OR LEASE NAME USA Pearl Broadhurst</p>
<p>4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface 1980' FNL & 659' FEL SE NE At proposed prod. zone</p>		<p>9. WELL NO. 14</p>
<p>14. API NO. <u>43,047,30904</u></p>		<p>10. FIELD AND POOL, OR WILDCAT Walker Hollow Field</p>
<p>15. ELEVATIONS (Show whether DF, RT, GR, etc.)</p>		<p>11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 9-T7S-R23E</p>
<p>16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data</p>		<p>12. COUNTY Uintah</p>
<p>13. STATE UT</p>		

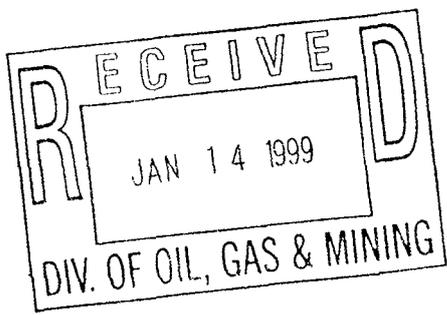
<p>NOTICE OF INTENTION TO:</p> <table style="width:100%;"> <tr> <td>TEST WATER SHUT-OFF <input type="checkbox"/></td> <td>PULL OR ALTER CASING <input type="checkbox"/></td> </tr> <tr> <td>FRACTURE TREAT <input type="checkbox"/></td> <td>MULTIPLE COMPLETE <input type="checkbox"/></td> </tr> <tr> <td>SHOOT OR ACIDIZE <input type="checkbox"/></td> <td>ABANDON <input type="checkbox"/></td> </tr> <tr> <td>REPAIR WELL <input type="checkbox"/></td> <td>CHANGE PLANS <input type="checkbox"/></td> </tr> <tr> <td>(Other) <input type="checkbox"/></td> <td></td> </tr> </table> <p>APPROX. DATE WORK WILL START _____</p>	TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON <input type="checkbox"/>	REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>		<p>SUBSEQUENT REPORT OF:</p> <table style="width:100%;"> <tr> <td>WATER SHUT-OFF <input type="checkbox"/></td> <td>REPAIRING WELL <input type="checkbox"/></td> </tr> <tr> <td>FRACTURE TREATMENT <input type="checkbox"/></td> <td>ALTERING CASING <input type="checkbox"/></td> </tr> <tr> <td>SHOOTING OR ACIDIZING <input type="checkbox"/></td> <td>ABANDONMENT* <input type="checkbox"/></td> </tr> <tr> <td colspan="2">(Other) <u>Change Of Operator</u> <input checked="" type="checkbox"/></td> </tr> </table> <p>(Note: Report results of multiple completion on Well Completion or Recombination Report and Log form.)</p> <p>DATE OF COMPLETION _____</p>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>	(Other) <u>Change Of Operator</u> <input checked="" type="checkbox"/>	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>																		
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>																		
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON <input type="checkbox"/>																		
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(Other) <input type="checkbox"/>																			
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SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>																		
(Other) <u>Change Of Operator</u> <input checked="" type="checkbox"/>																			

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.)

Change of Operator: Effective Date January 1, 1999.* Must be accompanied by a cement verification report.

Former Operator: Ocean Energy, Resources, Inc. (303) 573-5100
410 17th Street, Suite 1400
Denver, Colorado 80202

New Operator: Citation Oil & Gas Corp. (281) 469-9664
8223 Willow Place South
Suite 250
Houston, Texas 77070-5623



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

SIGNED Robert J. [Signature] TITLE Vice President Land DATE 1-8-99

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

OPERATOR CHANGE WORKSHEET

Routing:	
1-KDR ✓	6-KAS ✓
2-GLH ✓	7-SJ
3-JRB ✓	8-FILE
4-CDW ✓	
5-KDR ✓	T

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

- Change of Operator (well sold) Designation of Agent
 Designation of Operator Operator Name Change Only

The operator of the well(s) listed below has changed, effective: 1-1-99

TO: (new operator) CITATION OIL & GAS CORP **FROM:** (old operator) OCEAN ENERGY RESOURCES INC
 (address) 8223 WILLOW PL. SOUTH STE 250 (address) 410 17TH STREET STE 1400
HOUSTON, TX 77070-5623 DENVER, CO 80202

Phone: (281) 469-9664
 Account no. N0265

Phone: (303) 573-5100
 Account no. N3220

WELL(S) attach additional page if needed:

Name: <u>*SEE ATTACHED*</u>	API: <u>43,047,30904</u>	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____

OPERATOR CHANGE DOCUMENTATION

- KDR 1. (r649-8-10) Sundry or other legal documentation has been received from the **FORMER** operator (attach to this form). *(Rec'd 1.13.99)*
- KDR 2. (r649-8-10) Sundry or other legal documentation has been received from the **NEW** operator (Attach to this form). *(Rec'd 1.14.99)*
- N/A 3. The **Department of Commerce** has been contacted if the new operator above is not currently operating any wells in Utah. Is the company **registered with the state?** (yes/no) _____ If yes, show company file number: _____
- DR 4. **FOR INDIAN AND FEDERAL WELLS ONLY.** The BLM has been contacted regarding this change. Make note of BLM status in comments section of this form. BLM approval of **Federal** and **Indian** well operator changes should ordinarily take place prior to the division's approval, and before the completion of **steps 5 through 9** below. *(Rec'd 1.1.99)*
- KDR 5. Changes have been entered in the **Oil and Gas Information System** (3270) for each well listed above. *(1.10.99)*
- KDR 6. **Cardex** file has been updated for each well listed above.
- DR 7. Well **file labels** have been updated for each well listed above. *(*new filing system)*
- DR 8. Changes have been included on the monthly "Operator, Address, and Account Changes" **memo** for distribution to Trust Lands, Sovereign Lands, UGS, Tax Commission, etc. *1.10.99*
- DR 9. A folder has been set up for the **Operator Change file**, and a copy of this page has been placed there for reference during routing and processing of the original documents.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

5. Lease Designation and Serial Number:
UTU 02651A

6. If Indian, Allottee or Tribe Name:

7. Unit Agreement Name:

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, deepen existing wells, or to re-enter plugged and abandoned wells.
Use APPLICATION FOR PERMIT TO DRILL OR DEEPEN form for such proposals.

1. Type of Well:
OIL GAS OTHER:

2. Name of Operator
Citation Oil & Gas Corp.

3. Address and Telephone Number:
P.O. Box 690688, Houston, Texas 77269-0688 (281) 517-7194

4. Location of Well
Footages: **1980' FNL & 659' FEL**
County: **Uintah**
QQ, Sec., T., R., M.: **SE NE; Sec. 9, T7S, R23E**
State: **Utah**

8. Well Name and Number:
USA Pearl Broadhurst #14

9. API Well Number:
43-047-30904

10. Field and Pool, or Wildcat:
Walker Hollow Green River

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT (Submit in Duplicate)	SUBSEQUENT REPORT (Submit Original Form Only)
<input type="checkbox"/> Abandonment <input type="checkbox"/> Casing Repair <input type="checkbox"/> Change of Plans <input type="checkbox"/> Conversion to Injection <input type="checkbox"/> Fracture Treat <input type="checkbox"/> Multiple Completion <input type="checkbox"/> Other _____ <input type="checkbox"/> New Construction <input type="checkbox"/> Pull or Alter Casing <input type="checkbox"/> Recompletion <input type="checkbox"/> Shoot or Acidize <input type="checkbox"/> Vent or Flare <input type="checkbox"/> Water Shut-Off	<input type="checkbox"/> Abandonment* <input type="checkbox"/> Casing Repair <input type="checkbox"/> Change of Plans <input type="checkbox"/> Conversion to Injection <input type="checkbox"/> Fracture Treat <input checked="" type="checkbox"/> Other <u>Well Integrity</u> <input type="checkbox"/> New Construction <input type="checkbox"/> Pull or Alter Casing <input type="checkbox"/> Shoot or Acidize <input type="checkbox"/> Vent or Flare <input type="checkbox"/> Water Shut-Off
Approximate date work will start _____	Date of work completion <u>5/3/2004</u> Report results of Multiple Completions and Recompletions to different reservoirs on WELL COMPLETION OR RECOMPLETION AND LOG form * Must be accompanied by a cement verification report.

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)
Well was successfully MIT'd on 5/3/2004 - a copy of MIT is attached.

Accepted by the
Utah Division of
Oil, Gas and Mining
FOR RECORD ONLY

13. Name & Signature: Debra Harris Title: Prod./Regulatory Coord. Date: 5/21/2004

(This space for State use only)

Mechanical Integrity Test Casing or Annulus Pressure Test for Well

U.S. Environmental Protection Agency
Underground Injection Control Program, UIC Implementation Section, 8WM-DW
999 18th Street, Suite 500, Denver, CO 80202-2466
This form was printed on 02/10/2000.

EPA Witness: _____ Date 5/13/04
 Test conducted by: Robert Eye - Citation Oil & Gas
 Others present: Lynn Smith - Advantage Oilfield Service

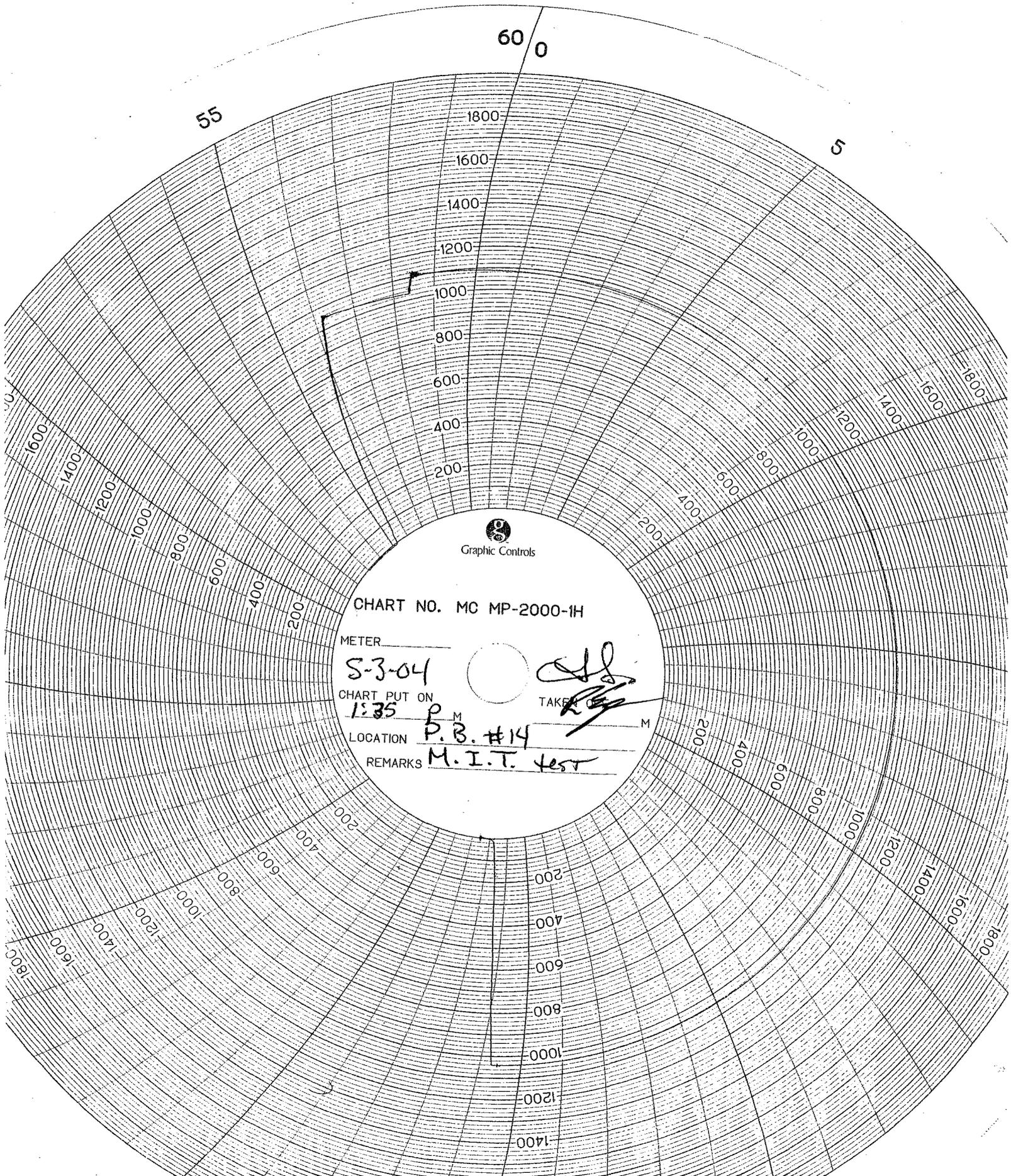
Pearl Broadhurst # 14 UTU / 02651-A
Walker Hollow Field
SE-1NE Sec 9 T 7S R 23E
Citation Oil & Gas Utah County Utah
43-047-30904

Is this a regularly scheduled test? Yes [] No
 Initial test for permit? [] Yes [] No
 Test after well rework? [] Yes [] No

Well injecting during test? NO [] YES 0 BPD

Initial casing/tubing annulus pressure 0 psig
 Does the annulus pressure build back up? [] Yes No

TUBING PRESSURE			
Initial	100 psig	psig	psig
End of Test	100 psig	psig	psig
CASING/TUBING ANNULUS PRESSURE			
Time	Test #1	Test #2	Test #3
0 min	1090 psig	psig	psig
5	1065		
10	1060		
15 min	1055		
20	1050		
25	1045		
30 min	1040		
Result (circle)	(Pass)	Fail	Pass
		Fail	Pass
			Fail



60 0

55

5

1800
1600
1400
1200
1000
800
600
400
200



Graphic Controls

CHART NO. MC MP-2000-1H

METER _____

S-3-04

CHART PUT ON

1:35

TAKER _____

LOCATION

P. B. #14

REMARKS

M. I. T. test

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

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>INJECTION</u>		5. LEASE DESIGNATION AND SERIAL NUMBER: FEDERAL UTU02651A
2. NAME OF OPERATOR: Citation Oil & Gas Corp.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
3. ADDRESS OF OPERATOR: P.O. Box 690688 CITY Houston STATE TX ZIP 77269-0688		7. UNIT or CA AGREEMENT NAME:
PHONE NUMBER: (281) 891-1576		8. WELL NAME and NUMBER: USA Pearl Broadhurst 14
4. LOCATION OF WELL FOOTAGES AT SURFACE: 1980 FNL & 759 FEL		9. API NUMBER: 4304730904
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: SENE 9 7S 23E		10. FIELD AND POOL, OR WILDCAT: Walker Hollow (Green River)
COUNTY: UINTAH		STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: _____	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
<input checked="" type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion: 4/27/2009	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input checked="" type="checkbox"/> OTHER: <u>Test Well for</u>
	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	<u>Mechanical Integrity</u>

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

This well was successfully tested for mechanical integrity 4/27/2009. A copy of EPA MIT Form is attached for your review.

**Accepted by the
Utah Division of
Oil, Gas and Mining
FOR RECORD ONLY**

NAME (PLEASE PRINT) <u>Debra Harris</u>	TITLE <u>Regulatory Compliance Coordinator</u>
SIGNATURE <u><i>Debra Harris</i></u>	DATE <u>4/29/2009</u>

(This space for State use only)

RECEIVED
MAY 04 2009

Mechanical Integrity Test

Casing or Annulus Pressure Mechanical Integrity Test

U S Environmental Protection Agency
Underground Injection Control Program
999 18th Street, Suite 500 Denver, CO 80202 2466

EPA Witness: _____ Date: 4/27/09^{1/143}
 Test conducted by: Jeff Oaks COG / Leroy Carmickle Big Red
 Others present: _____ APF 43-047-30904 80 084501

Well Name: <u>Pearl Broadhurst #14</u>	Type: <u>(ER)</u> SWD	Status: AC TA <u>(UC)</u>
Field: <u>Walker Hollow</u>		
Location: <u>SE/NE</u> Sec. <u>9</u> T <u>7</u> N <u>(S)</u> R <u>23</u> <u>(E)</u> W	County: <u>Utah</u>	State: <u>Ut</u>
Operator: _____		
Last MIT: <u>513104</u>	Maximum Allowable Pressure: <u>1212</u>	PSIG

Is this a regularly scheduled test? Yes No
 Initial test for permit? Yes No
 Test after well rework? Yes No
 Well injecting during test? Yes No If Yes, rate: _____ bpd

Pre-test casing/tubing annulus pressure: 0 psig

MIT DATA TABLE	Test #1	Test #2	Test #3
TUBING PRESSURE			
Initial Pressure	0 psig	psig	psig
End of test pressure	0 psig	psig	psig
CASING / TUBING ANNULUS PRESSURE			
0 minutes	1100 psig	psig	psig
5 minutes	1080 psig	psig	psig
10 minutes	1065 psig	psig	psig
15 minutes	1065 psig	psig	psig
20 minutes	1045 psig	psig	psig
25 minutes	1040 psig	psig	psig
30 minutes	1030 psig	psig	psig
<u>31</u> minutes	1030 psig	psig	psig
_____ minutes	psig	psig	psig
RESULT	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

Does the annulus pressure build back up after the test? Yes No

MECHANICAL INTEGRITY PRESSURE TEST

Additional comments for mechanical integrity pressure test, such as volume of fluid added to annulus and bled back at end of test, reason for failing test (casing head leak, tubing leak, other), etc.:

Signature of Witness:
Jeff Oaks COG
Leroy Carmickle Big Red

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

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

		5. LEASE DESIGNATION AND SERIAL NUMBER: UTU 026651A
		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME: Walker Hollow Unit
1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Injection Well</u>		8. WELL NAME and NUMBER: USA Pearl Broadhurst #14
2. NAME OF OPERATOR: Citation Oil & Gas Corp.		9. API NUMBER: 4304730904
3. ADDRESS OF OPERATOR: 14077 Cutten Rd. CITY Houston STATE TX ZIP 77069		10. FIELD AND POOL, OR WILDCAT: Walker Hollow (Green River)
4. LOCATION OF WELL FOOTAGES AT SURFACE: 1980' FNL & 759' FEL		COUNTY: Uintah
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: SENE 9 7S 23E		STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input checked="" type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: _____	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
<input type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion: _____	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input checked="" type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input checked="" type="checkbox"/> OTHER: <u>D/O CIBP and RTP</u>
	<input checked="" type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Citation Oil & Gas Corp. request authorization to drill out the CIBP and convert the referenced well to a producer per the attached well schematic and workover procedures.

COPY SENT TO OPERATOR

Date: 10-17-2013

Initials: KS

RECEIVED
OCT 14 2013
DIV. OF OIL, GAS & MINING

NAME (PLEASE PRINT) <u>Tami Troxel</u>	TITLE <u>Permitting Analyst</u>
SIGNATURE <u>Tami Troxel</u>	DATE <u>9/30/2013</u>

(This space for State use only)

Utah Division of
Oil, Gas and Mining

Federal Approval Of This
Action Is Necessary

Date: 10/16/2013

By: [Signature]

(See Instructions on Reverse Side)

(5/2000)

* Operator should sign up for and submit future Sundries via epermit

INSTRUCTIONS

This form shall be submitted by the operator to show the intention and/or completion of the following:

- miscellaneous work projects and actions for which other specific report forms do not exist;
- all other work and events as identified in section 11, Type of Action, or as required by the Utah Oil and Gas Conservation General Rules, including:
 - minor deepening of an existing well bore,
 - plugging back a well,
 - recompleting to a different producing formation within an existing well bore (intent only),
 - reperfing the current producing formation,
 - drilling a sidetrack to repair a well,
 - reporting monthly the status of each drilling well.

This form is not to be used for proposals to

- drill new wells,
- reenter previously plugged and abandoned wells,
- significantly deepen existing wells below their current bottom-hole depth,
- drill horizontal laterals from an existing well bore,
- drill hydrocarbon exploratory holes such as core samples and stratigraphic tests.

Use Form 3, Application for Permit to Drill (APD) for such proposals.

NOTICE OF INTENT - A notice of intention to do work on a well or to change plans previously approved shall be submitted in duplicate and must be received and approved by the division before the work is commenced. The operator is responsible for receipt of the notice by the division in ample time for proper consideration and action. In cases of emergency, the operator may obtain verbal approval to commence work. Within five days after receiving verbal approval, the operator shall submit a Sundry Notice describing the work and acknowledging the verbal approval.

SUBSEQUENT REPORT - A subsequent report shall be submitted to the division within 30 days of the completion of the outlined work. Specific details of the work performed should be provided, including dates, well depths, placement of plugs, etc.

WELL ABANDONMENT - Proposals to abandon a well and subsequent reports of abandonment should include reasons for the abandonment; data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, and method of parting of any casing, liner, or tubing pulled and the depth to top of any left in the hole; method of closing top of well; and date well site conditioned for final inspection looking to approval of the abandonment.

In addition to any Sundry Notice forms submitted, **Form 8, Well Completion or Recompletion Report and Log** must be submitted to the division to report the results of the following operations:

- completing or plugging a new well,
- reentering a previously plugged and abandoned well,
- significantly deepening an existing well bore below the current bottom-hole depth,
- drilling horizontal laterals from an existing well bore,
- drilling hydrocarbon exploratory holes such as core samples and stratigraphic tests,
- recompleting to a different producing formation.

Send to:

Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Phone: 801-538-5340

Fax: 801-359-3940

Pearl Broadhurst Unit #14
SENE S9 T7S R23E
Walker Hollow Unit
Uintah County, UT

Drill out CIBP and RTP

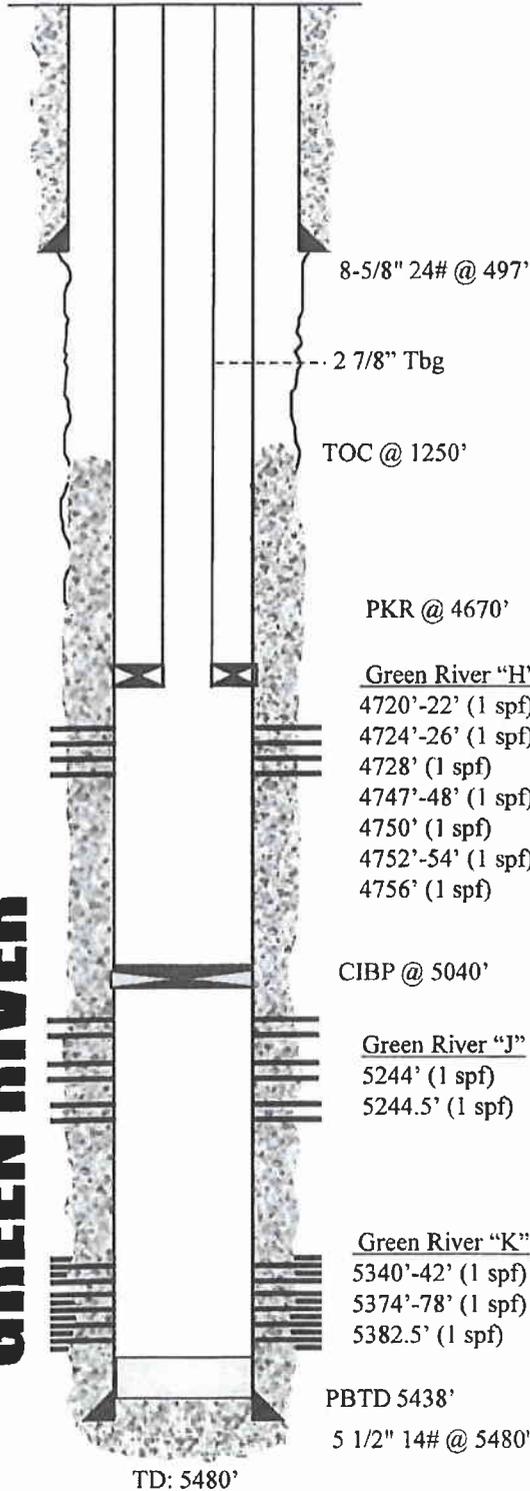
Procedure

- MIRU Workover rig.
- NDWH NUBOP
- Release packer, POOH. PU BHA
- RIH w/ drag bit, 2 – 3 1/2” drill collars, and 2 7/8” tubing.
- Tag CIBP @5040’ and begin drilling.
- Reverse cleanout to PBTD @ 5438’ using hot oiler and paraffin solvent as needed
- POOH, use care from 1500’ to surface and LD bit and drill collars.
- RIH w/packer, tubing, and set packer at 5040’
- RIH w/rod string and pump, set pump at approximately 5350’ MD. RDMO. RTP.
- Test production for 2-3 weeks to determine rates and future well status

CITATION OIL & GAS CORP.
WALKER HOLLOW PEARL BROADHURST #14 (SE/NE)
Sec. 9-T7S-R23E
1980'FNL,659'FEL
UINTAH CO., UTAH

KB: 13 FT
 GL: 5122 FT
 Status: SI

Qty	Description	Length	Depth
	K.B.	10	10
147	2 7/8", 6.5#, J-55,EUE tbg	4643.37	4653.37
1	2 7/8" 6.5# J-55 EUE sub	10	4663.37
21	2 7/8"box x 2 3/8" pin	0.4	4663.77
1	On-Off Tool w / F Nipple	2.65	4666.42
1	5 1/2" Ultra Loc TK-2 pkr	4.06	4670.48
	Stretch for tension	1.6	4672.08



CASING DETAIL			
Size	Weight	Grade	Depth
8-5/8"	24#		497
5-1/2"	14#		5480

PKR @ 4670'

Green River "H"
 4720'-22' (1 spf) reperf'd '94 @3spf
 4724'-26' (1 spf) from 4719-30'
 4728' (1 spf)
 4747'-48' (1 spf)
 4750' (1 spf)
 4752'-54' (1 spf) reperf'd '94 @3spf
 4756' (1 spf) from 4745-62'

CIBP @ 5040'

Green River "J"
 5244' (1 spf)
 5244.5' (1 spf)

Green River "K"
 5340'-42' (1 spf)
 5374'-78' (1 spf)
 5382.5' (1 spf)

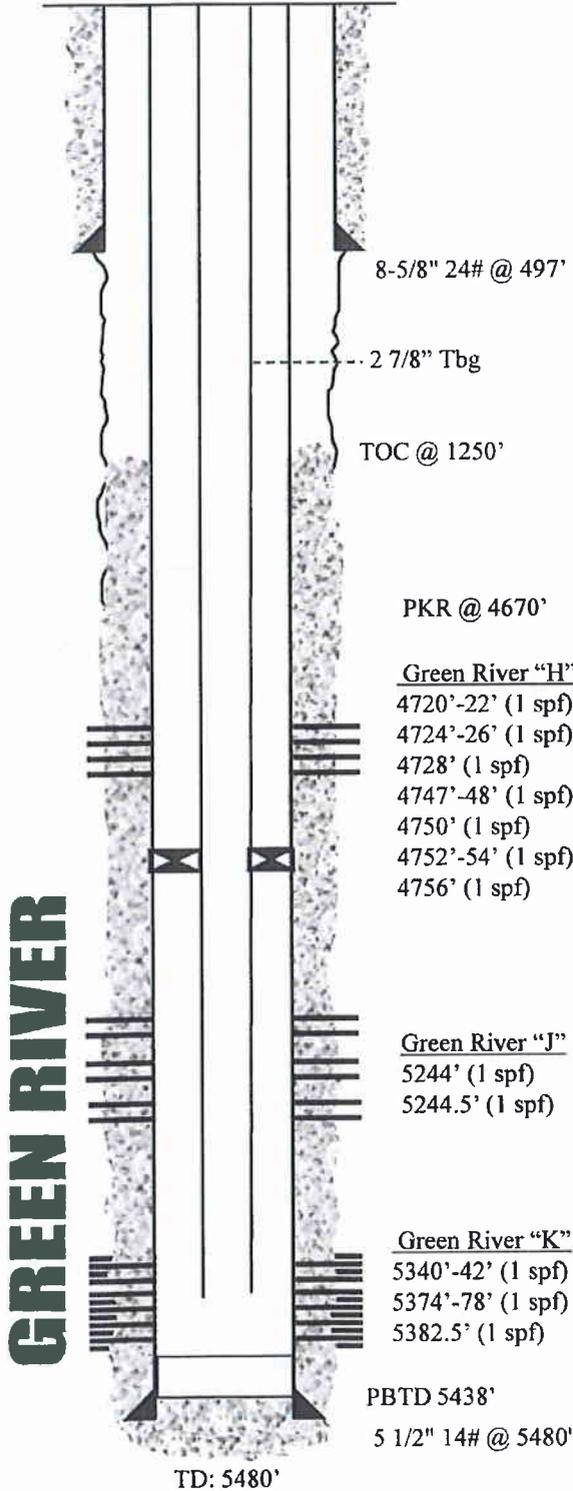
PBTD 5438'
 5 1/2" 14# @ 5480'

TD: 5480'

All depths KB unless noted.
 Updated: 8-4-06

CITATION OIL & GAS CORP.
WALKER HOLLOW PEARL BROADHURST #14 (SE/NE)
Sec. 9-T7S-R23E
1980'FNL,659'FEL
UINTAH CO., UTAH

KB: 13 FT
 GL: 5122 FT
 PROPOSED STATUS: GR Producer



CASING DETAIL			
Size	Weight	Grade	Depth
8-5/8"	24#		497
5-1/2"	14#		5480

TUBING DETAIL			
Qty	Description	Length	Depth
	K.B.	10	10
160	2 7/8", 6.5#, J-55, EUE tbg	5040	5050
1	2 7/8" 6.5# J-55 EUE sub	10	5060
1	2 7/8" box x 2 3/8" pin	0.4	5060.4
1	On-Off Tool w / F Nipple	2.65	5063.05
1	5 1/2" Ultra Loc TK-2 pkr	4.06	5067.11
9	2 7/8", 6.5#, J55 EUE tbg	283.5	5350.61
1	2 1/2" x 1 3/4" x 12x16		1
1	2 7/8 SN		1
1	2 7/8 notched collar		1

ROD DETAIL			
QTY	Desc	Length	Depth
1	polished	25	25
83	7/8"	2075	2100
125	3/4"	3125	5225
4	1"	100	5325

All depths KB unless noted.
 Updated: 9-24-13

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: UTU-02651-A
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME: PEARL BROADHURST
1. TYPE OF WELL Water Injection Well	8. WELL NAME and NUMBER: PEARL BROADHURST 14	
2. NAME OF OPERATOR: CITATION OIL & GAS CORP	9. API NUMBER: 43047309040000	
3. ADDRESS OF OPERATOR: 14077 Cutten Rd , Houston, TX, 77069	PHONE NUMBER: 281 891-1550 Ext	9. FIELD and POOL or WILDCAT: WALKER HOLLOW
4. LOCATION OF WELL FOOTAGES AT SURFACE: 1980 FNL 0659 FEL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SENE Section: 09 Township: 07.0S Range: 23.0E Meridian: S	COUNTY: UINTAH	
	STATE: UTAH	
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 4/6/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input checked="" type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc. MIRU. Tag CIBP @ 5040'. Drid out CIBP and cleaned out to PBTD 5438'. Set 2 7/8 tbg @ 5355' RDMO. RTP. Initial test 4 bopd 150 bwpd.		
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY April 22, 2014		OTHER: <input type="text" value="D/O CIBP"/>
NAME (PLEASE PRINT) Liana Ramirez	PHONE NUMBER 281 891-1590	TITLE Completion Analyst
SIGNATURE N/A	DATE 4/22/2014	

WALKER HOLLOW PEARL BROADHURST #14 (SE/NE)

Sec. 9-T7S-R23E

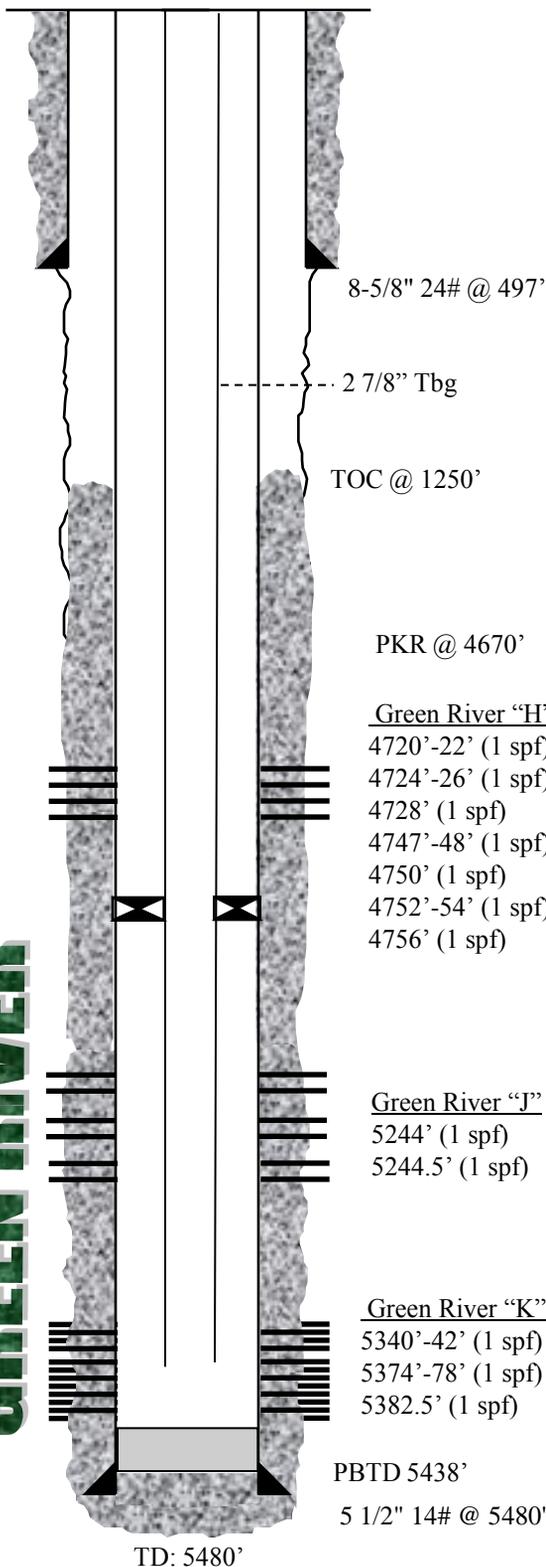
1980'FNL,659'FEL

UINTAH CO., UTAH

KB: 13 FT

GL: 5122 FT

STATUS: GR Producer



CASING DETAIL			
Size	Weight	Grade	Depth
8-5/8"	24#		497
5-1/2"	14#		5480

Qty	Description	Length	Depth
	K.B.	12	10
165	2 7/8", 6.5#, J-55,EUE tbg	5211.1	5221.1
1	7"x2 7/8" packer	7	5228.1
3	2 7/8", 6.5#, J-55,EUE tbg	92.22	5320.32
1	2 7/8" s/n	1.1	5321.42
1	2 7/8", 6.5#, J-55, w/NC	32.32	5353.74

ROD DETAIL			
QTY	Desc	Length	Depth
1	polished	25	25
4	ponies	20	45
76	1"	1900	1945
65	7/8"	1625	3570
42	3/4"	1050	4620
28	1"	700	5320

Green River "H"

4720'-22' (1 spf) reperf'd '94 @3spf
 4724'-26' (1 spf) from 4719-30'
 4728' (1 spf)
 4747'-48' (1 spf)
 4750' (1 spf)
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 4756' (1 spf) from 4745-62'

Green River "J"

5244' (1 spf)
 5244.5' (1 spf)

Green River "K"

5340'-42' (1 spf)
 5374'-78' (1 spf)
 5382.5' (1 spf)

PBTB 5438'

5 1/2" 14# @ 5480'

TD: 5480'

All depths KB unless noted.

Updated: 4-12-14