

Permit #: 20016 Date Issued: 6-7-82
 County: Atchison Date Cancelled: _____
 CONFIDENTIAL UNTIL: _____ Date Plugged: 6-29-82

COMMENTS:

Shipped 9-24-82

OGC FORMS	Date Received
1	
2	
3	6-7-82
3i	
4	6-7-82
4i	
5	
6	
7	7-19-82
8	
11	
12	
Misc. Form 2	

	TYPE	ID #	Date Received
Logs	<i>Grain's Section</i>		
Samples	chip	✓	
	core		
	water		
Analyses	core		

Additional Submitted Data: *Report*

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

APPLICATION TO DRILL DEEPEN PLUG BACK

for an oil well or gas well

NAME OF COMPANY OR OPERATOR Brandt Production Company, Inc. DATE 6-2-82
1200 Douglas Building
104 South Broadway Wichita Kansas, 67202
Address City State

DESCRIPTION OF WELL AND LEASE			
Name of lease <u>Salmon</u>	Well number <u>1</u>	Elevation (ground) <u>1020'</u>	
WELL LOCATION (give footage from section lines) <u>1980</u> ft. from (N) <input checked="" type="checkbox"/> sec. line <u>1980</u> ft. from (E) <input checked="" type="checkbox"/> sec. line			
WELL LOCATION Section <u>24</u> Township <u>64N</u> Range <u>39W</u>			County <u>Atchison</u>
Nearest distance from proposed location to property or lease line: <u>660</u> feet		Distance from proposed location to nearest drilling, completed or applied for well on the same lease: <u>None</u> feet	
Proposed depth <u>3210'</u>	Drilling contractor, name & address <u>Brandt Drilling Company, Inc.</u> <u>1200 Douglas Building</u> <u>Wichita, Ks. 67202</u>	Rotary or Cable Tools <u>Rotary</u>	Approx. date work will start <u>June 25, 1982</u>
Number of acres in lease <u>240</u>		Number of wells on lease, including this well, completed in or drilling to this reservoir: <u>None</u> Number of abandoned wells on lease: <u>None</u>	
If lease, purchased with one or more wells drilled, from whom purchased: Name _____ Address _____			No. of Wells: producing _____ injection _____ inactive _____ abandoned _____
Status of Bond Single Well <input type="checkbox"/> Amt. _____ Blanket Bond <input checked="" type="checkbox"/> Amt. <u>\$40,000.00</u>			<input type="checkbox"/> ON FILE <input checked="" type="checkbox"/> ATTACHED
Remarks: (If this is an application to deepen or plug back, briefly describe work to be done, giving present producing zone and expected new producing zone) use back of form if needed.			
Proposed casing program:		Approved casing -- To be filled in by State Geologist	
amt. <u>275'</u>	size <u>8-5/8"</u>	wt./ft. <u>24#</u>	cem. <u>275 Sx.</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
I, the undersigned, state that I am the <u>President</u> of the <u>Brandt Production Company, Inc.</u> and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.			
Signature <u>Earl O. Brandt</u>			

Permit Number: #20016
Approval Date: 6/7/82
Approved By: Wallace B. Hunt

- Drillers log required
- E-logs required if run
- Core analysis required if run
- Drill stem test info. required if run
- Samples required
- Samples not required

Note: This Permit not transferable to any other person or to any other location.

RECEIVED

WATER SAMPLES REQUIRED @

Remit two copies to: Missouri Oil and Gas Council
P.O. Box 250 Rolla, Mo. 65401
One will be returned for driller's signature

JUN 07 1982

MO. OIL & GAS COUNCIL

Approval of this permit by the Oil and Gas Council does not constitute endorsement of the geologic merits of the proposed well nor endorsement of the qualifications of the permittee.

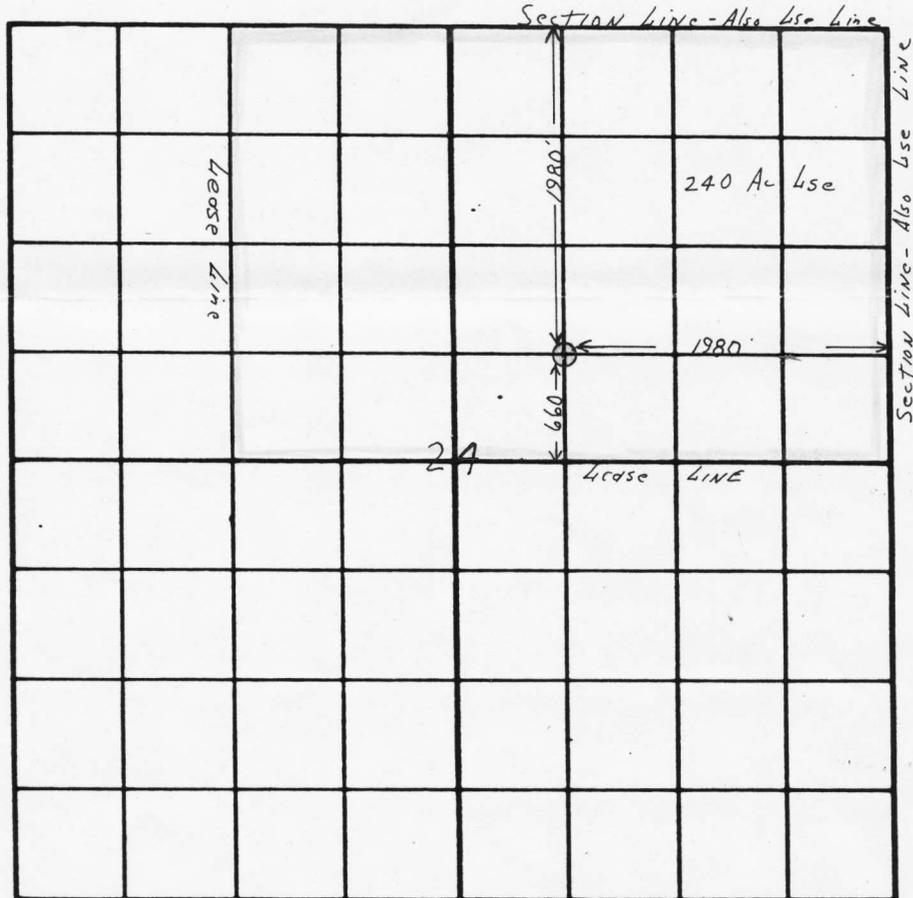
Owner: BRANDT PRODUCTION COMPANY, INC.

Lease Name: SALMON County: ATCHISON

1980 feet from N section line and 1980 feet from E section line of Sec. 24, Twp. 64 N., Range 39 W
(N)-(S) (E)-(W)



SCALE
1" = 1000'



64
N

REMARKS: _____

#20016

INSTRUCTIONS

On the above plat, show distance of the proposed well from the two nearest section lines, the nearest lease line, and from the nearest well on the same lease completed in or drilling to the same reservoir. Do not confuse survey lines with lease lines. See rule 10 CSR 50-2.030 for survey requirements. Lease lines must be marked.

This is to Certify that I have executed a survey to accurately locate oil and gas wells in accordance with 10 CSR 50-2.030 and that the results are correctly shown on the above plat.

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Remit two copies to: Missouri Oil and Gas Council
P.O. Box 250, Rolla, MO 65401

One will be returned.

MO. OIL & GAS COUNCIL
R. E. Moser

Registered Land Surveyor

6-2-82



PLUGGING RECORD

Owner Brandt Production Company, Inc.		Address 1200 Douglas Building 104 S. Broadway Wichita, KS. 67202			
Name of Lease Salmon		Well No. 1	Permit Number (OGC-3 or OGC-3I number) 20016		
Location of Well 150' S.W. of Cen-SW-NE		Sec-Twp-Rng or Block & Survey 24-64N-39W		County Atchison	
Application to drill this well was filed in name of Brandt Production Company, Inc.		Has this well ever produced oil or gas? No.	Character of well at completion (initial production) Oil (bbls/day) Gas (MCF/day)		Dry? Yes
Date Abandoned 6-29-82	Total depth 3354'	Amount well producing prior to abandonment Oil (bbls/day) Gas (MCF/day)		Water (bbls/day)	
Name of each formation containing oil or gas. Indicate which formation open to well bore at time of abandonment.		Fluid content of each formation		Depth interval of each formation	Size, kind, & depth of plugs used. Indicate zones squeeze cemented, giving amount cement.
Size pipe	Put in well (ft)	Pulled out (ft)	Left in well (ft)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
8-5/8"	278'	None	278'	None	
Was well filled with mud-laden fluid? Yes		Indicate deepest formation containing fresh water. Surface Gravels			
NAMES AND ADDRESSES OF ADJACENT LEASE OPERATORS OR OWNERS OF THE SURFACE					
Name LEASE OWNER:		Address		Direction from this well:	
Brandt Oil Company		1200 Douglas Bldg., 104 S. Broadway Wichita, KS. 67202			
NOTE: Brandt Oil Company is the "parent company" of Brandt Production Company, Inc.; Brandt Oil Company owns all offset oil & gas leases (including the Salmon).					
Method of disposal of mud pit contents: Jet off, allow to dry & cover with top soil					
Use reverse side for additional detail. (See Plugging Method on next page)					
File this form in duplicate with ; NOTE: This form filed in duplicate on 7-13-82 w/Missouri O&G Council, POBox 250					
CERTIFICATE: I, the undersigned, state that I am the President of the Brandt Production Company, Inc. Rolla, MO 65401					
(Company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct, and complete to the best of my knowledge.					
RECEIVED				Signature Earl O. Brandt	
JUL 19 1982					

Remit two copies to: Missouri Oil and Gas Council
P.O. Box 250, Rolla, MO 65401

MO. OIL & GAS COUNCIL

One will be returned.

3/12/82



BRANDT PRODUCTION COMPANY, INC.
1200 DOUGLAS BUILDING WICHITA, KANSAS 67202

•PHONE (316) 267-4335

June 30, 1982

GEOLOGICAL REPORT
BRANDT PRODUCTION COMPANY, INC.
#1 SALMON
150' SW OF C-SW-NE SEC. 24-64N-39W
ATCHISON COUNTY, MISSOURI

The following is my Geological Report covering the Brandt Production Company, Inc. #1 Salmon located 150' SW of the C-SW-NE Sec. 24-64N-39W, Atchison County, Missouri. This rank wildcat test was under Geological supervision from 600 feet to total depth. Samples were examined from 250 feet to total depth. There were no drill stem tests or cores taken. A set of samples have been placed on file at the Missouri Department of Natural Resources, Rolla, Missouri. A Gamma Neutron Guard Log was run from 0 feet to total depth.

OPERATOR: BRANDT PRODUCTION COMPANY, INC.
CONTRACTOR: BRANDT DRILLING CO., INC.
LOCATION: 150' SW OF C-SW-NE 24-64N-39W
ELEVATION: 1044' Gr.; 1050' KB
DRILLING COMMENCED: JUNE 22, 1982
DRILLING COMPLETED: JUNE 29, 1982
SURFACE CASING: 8-5/8" SET AT 278' WITH 175 SACKS CEMENT.
DRILL STEM TESTS: NONE
ELECTRIC SURVEYS: GAMMA-NEUTRONGUARD/CALIPER
RESULTS: DRY AND ABANDONED

LOG TOPS

Topeka	218	(+832)
Deer Creek	266	(+784)
Tecumseh Shale	308	(+742)
Queen Hill	355	(+695)
Heebner	413	(+637)
Lansing	585	(+465)
Base Kansas City	908	(+142)
Cherokee Shale	1047	(+3)
Cherokee Sand	1188-1199	(-138)
Cherokee Sand	1242-1315	(-192)
Cherokee Sand	1377-1388	(-327)

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LOG TOPS (Continued)

Cherokee Sand (Tarkio)	. 1440-1582 . . .	(-390)
Cherokee Sand	1718-1726 . . .	(-668)
Cherokee Sand	1742-1763 . . .	(-692)
Cherokee Sand	1820-1839 . . .	(-770)
Cherokee Sand	1842-1876 . . .	(-792)
Cherokee Sand	1897-1928 . . .	(-847)
Mississippian	1931	(-881)
Kinderhook	2134	(-1084)
Hunton	2331	(-1281)
Maquoketa Shale	2846	(-1796)
Viola (Fernvale)	2858	(-1808)
Viola (Trenton)	2911	(-1861)
Simpson Shale	3221	(-2171)
Simpson Dolomite	3227	(-2177)
Simpson Sand	3305	(-2255)
Arbuckle	3324	(-2274)
Rotary Total Depth	3348	(-2298)
Log Total Depth	3349	(-2299)

ZONES OF INTEREST:

Cherokee Sandstones:

The Cherokee Section consisted of a series of well-developed lenticular sands of varying thickness, ranging from 8 to 143 feet. There were 9 individual sand bodies comprising a total of 353 feet of total sand. The following is a brief description of these Sands:

- 1188-1199 Sand, tan gray, fine medium subangular, very friable, slightly calcareous, fair to good porosity. No show.
- 1242-1315 Sand and calcarenite, rusty brown to gray, fine to medium, very friable, slightly calcareous, excellent porosity. No show.
Note: Sand carries a reddish tan stain that might be mistaken for oil stain. This discoloration may be due to a reddish brown ferruginous shale, which makes up the matrix of the cementing material. There were no shows of oil or gas, no fluorescence, no odor detected in the wet samples.
- 1377-1388 Sand, buff to gray, fine-grained, very friable, calcareous, bearing a few dark shale inclusions. Fair to good porosity. No show.
- 1440-1582 Sand, coarse to very coarse, subangular to subrounded, mostly clear to frosted. Very friable much unconsolidated sand. Good to excellent porosity. No show. No odor. No fluorescence.

Cherokee Sandstones: (Continued)

- Lower part of Sand body consisted of good porous friable sands and some thin varied shales. Circulated at 1483'
- 1718-1726 Sand, fine to medium, gray, silty to quartzitic, poor porosity. No show.
- 1742-1763 Sand, gray, fine to medium, clear subrounded, friable, fair to good porosity. No show.
- 1820-1839 Sand, white to gray, mostly fine, some medium clear frosted subangular subrounded, very friable, unconsolidated, excellent porosity. No show.
- 1842-1876 Sand, white to gray, clear frosted, fine to medium, subangular to subrounded, very friable, unconsolidated, excellent porosity. No show.
- 1897-1928 Sand, white to gray, clear frosted, rounded, unconsolidated, very fine to occasionally medium, excellent porosity. No show. Circulated at 1910'.

Hunton Dolomite 2331 (-1281)

- 2331-2391 Dolomite, tan to brown, mealy, chalky to fine crystalline streaks, white chert, poor porosity. No show.
- 2461-2469 Dolomite, tan to brown, mostly granular to sucrosic, occasionally crystalline, scattered, fair to good inter-granular porosity. No show.
- 2654-2846 This entire interval consists of dolomite, gray to tan, granular to fine, medium crystalline, fair to good zones of inter-crystalline vuggy and occasionally rhombic porosity. Porosity increased from 2750 feet to 2846 feet. No show.

Viola (Fernvale) 2858 (-1808)

- 2858-2911 Entire interval consisted of dolomite, tan to gray, granular, gritty, slightly shaley. No porosity. No show.

Viola (Trenton) 2911 (-1861)

2914-2923 Dolomite, gray to steel gray, coarse crystalline, very good inter-crystalline and rhombic and occasionally vuggy porosity. No show. Circulated at 2928'.

3027-3046 Dolomite, gray to steel gray to medium brown, coarse crystalline and slightly rhombic, good inter-crystalline, vuggy and rhombic porosity. No show.

Simpson Sand 3305 (-2255)

3305-3322 Sand, white, fine to medium, clear frosted, subrounded, very friable, slightly pyritic at top, fair porosity. No show. Circulated at 3315'.

Arbuckle Dolomite 3324 (-2274)

3324-3328 Dolomite, tan to brown, fine sucrosic. Poor to fair porosity.

3328-3340 Dolomite, tan to brown, medium, coarse crystalline, some siliceous, some rhombic, good to very good rhombic and vuggy porosity. No show. Circulated at 3325' and at 3348'.

SUMMARY:

The captioned test, a rank wildcat venture, was drilled to a total depth of 3348 feet, a 25-foot penetration into the Arbuckle Dolomite. There were no shows of hydrocarbons detected anywhere during the drilling of this test.

Structurally, the test ran approximately regional. At the top of the Lansing, the #1 Salmon was 26 feet high with respect to the nearest control well; namely, the #1 Bowman, located in the NE-NE-SE Sec. 24-64N-39W. At the top of the Mississippian, the #1 Salmon was approximately flat with this test. The nearest pre-Mississippian control was located approximately 10 miles away. It would appear that the #1 Salmon ran approximately regional on these lower beds. On top of the Arbuckle, it was 26 feet high to the abandoned Currie Field, approximately 10 miles southwest. It was 62 feet low to the Tarkio Field, 5 miles to the northwest and approximately 92 feet low to the nearest control to the northeast. In the final analysis, as a result of this structural position, the #1 Salmon failed to provide any showings of hydrocarbons anywhere in the section.

Geological Report
Brandt Production Company, Inc.
#1 Salmon, 150' SW of C-SW-NE 24-64N-39W
Atchison County, Missouri

Page 5

There were very favorable zones of porosity developed throughout the section, at least suggesting that good reservoir beds persist in this portion of the Forest City Basin. Given the proper structural and entrapment conditions, oil fields of sizable magnitude yielding favorable reserves can be expected in this area. I feel that it can be safely postulated that favorable reserves will be ultimately discovered in the Cherokee Sandstones of this portion of Northwestern Missouri.

In view of the foregoing information, plus the absence of any hydrocarbon shows, the decision was made to abandon the #1 Salmon. The hole was plugged according to the requirements of the Missouri Oil & Gas Council on June 30, 1982.

Respectfully submitted,


EARL O. BRANDT
Registered Professional Geologist



EOB:vfy

RE: BRANDT PRODUCTION COMPANY, INC. #1 SALMON 150' SW OF C-SW-NE 24-64N-39W
 ATCHISON CO., MISSOURI

ELEVATION: 1050 KB

DETAIL OF FORMATIONS PENETRATED

Formation	Top	Bottom	Description (See * below)
	0	218	Glacial Drift
	218	308	Lime
	308	341	Shale
	341	413	Lime
Heebner	413	417	Shale Black, Carbonaceous
	417	435	Lime
	435	585	Shale & Silty Shale
Lansing	585	908	Lime, crystalline
	908	1047	Shale, Sandy Shale/Lime Streaks
Cherokee	1047	1050	Shale
	1050	1188	Shales, Silty
	1188	1199	Sand
	1199	1242	Shale
	1242	1315	Sand
	1315	1377	Shale
	1377	1388	Sand
	1388	1440	Shale
	1440	1582	Sand
	1582	1718	Sandy Shales
	1718	1726	Sand
	1726	1742	Shale
	1742	1763	Sand
	1763	1820	Sandy Shales
	1820	1839	Sand
	1839	1842	Shale
	1842	1876	Sand
	1876	1897	Shale
	1897	1931	Sand
Mississippian	1931	2134	Dolomite & Lime
Kinderhook	2134	2233	
	2233	2331	Shaley Dolomite
Hunton	2331	2846	Dolomite
Maquoketa	2846	2858	Shales, dolomitic
Fernvale	2858	2911	Dolomite
Trenton	2911	3221	Dolomite
Simpson	3221	3227	Green Shale
	3227	3305	Dolomite & Sandy Dolomite
Simpson Sand	3305	3324	Sand
Arbuckle	3324	3348	Dolomite, crystalline
		3348	Rotary Total Depth

SURFACE PIPE:

8-5/8" Set at 278' with 175
 Sacks Cement (Cement Circulated)

PLUGGING DATA:

Plug & 20 Sacks Cement @ 2850'
 Plug & 20 Sacks Cement @ 2330'
 Plug & 20 Sacks Cement @ 1930'
 Plug & 10 Sacks Cement @ 278'
 Base of Surface
 2 Sacks Cement in Rat Hole

Plugged by Brandt Drilling Co., Inc.

*Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well if available

This Well Completion or Recompletion report and well log shall be filed with the Missouri State Geologist not later than 30 days after project completion.

JUL 19 1982

MO. OIL & GAS COUNCIL



BRANDT PRODUCTION COMPANY, INC.
1200 DOUGLAS BUILDING WICHITA, KANSAS 67202

•PHONE (316) 267-4335

June 30, 1982

DRILLING TIME
BRANDT PRODUCTION COMPANY, INC. #1 SALMON
C-SW-NE SEC. 24-64N-39W
ATCHISON COUNTY, MISSOURI

280-290	1-1-1-2½-3½	3-1-1-1-1
300	2-½-½-2-2	4-3-2-1-1
300- 10	1-?-?-?-1	½-½-1-2-1
20	1-1-1-½-1½	½-½-1-1-1
30	2-1-1-½-2½	1-2-1-2-½
40	1-1-1-½-1	1-½-¼-¼-¼
50	¼-¼-1¼-½-½	1-1-1-1½-½
60	½-1-1-1-1	1-1-½-½-1
70	1-½-1-1½-1	2-1-1-1-1
80	1-½-½-1-½	½-½-½-½-½
90	½-2½-2-2-1	½-½-1-2-3
00	2-2-2-3-3	2-2-1-1-2
400- 10	1-2-1-2-2	2-1-2-1-1
20	2-2-3-2-1	½-½-1-1-4
30	2-1-1-1-1	1-1-1-1-½
40	½-½-½-1-3	3-3-2-1-1
50	1-1-1-1-1½	1½-2-2-1-1
60	1-1-1-1-½	½-1-1-½-½
70	1-½-½-½-½	½-½-1-½-½
80	½-½-½-½-½	½-½-½-½-½
90	½-½-½-½-1	½-½-½-½-1
00	½-½-1-½-½	1-1-1-½-½
500- 10	2-1-2-2-2	1-1-1-1-1
20	1-1-1-1-1	1-1-1-1-1
30	2-½-½-1-1	1-2-1-2-2
40	3-2-2-1-2	1-1-2-2-2
50	1-3-2-3-2	1-1-½-½-1
60	1-1-½-½-½	½-½-½-1-½
70	½-½-½-½-½	½-½-½-½-¼
80	½-½-1-½-¼	¼-1-¼-3/4-1/2
90	1-½-½-½-½	1-½-½-3½-3½
00	3-3-½-½-1	½-½-1-½-½
600- 10	1-1-1-2-1	2-3-1½-1½
20	½-1-3-2-1	3-2-3-2-3
30	2-2½-2½-2-1	½-½-1-1-½
40	½-1½-2½-2-1	1-1-1-1-1
50	1-1-½-½-½	½-½-½-½-½
60	½-½-½-½-1	½-½-½-½-1
70	1½-1-1-½-1	1-1-½-½-½
80	1-½-½-1-1	1-1-1-1-1
90	1-1-1½-1½-2	2-2-2-2-2
00	2½-2-2½-1-1	1-1-1-1-1

Kelly short, D.T. not recorded for 301, 302 or 303

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DRILLING TIME
 BRANDT PRODUCTION COMPANY, INC.
 #1 SALMON, C-SW-NE 24-64N-39W
 ATCHISON COUNTY, MISSOURI

700-	10	1-1-1-1-1	1-2-2- $\frac{1}{2}$ - $\frac{1}{4}$
	20	$\frac{1}{4}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $1\frac{1}{4}$ -1	1-1- $1\frac{1}{2}$ - $3\frac{1}{2}$ -2
	30	1-1-1-2-2	1-1-1- $\frac{1}{2}$ - $\frac{1}{2}$
	40	1-1- $\frac{1}{2}$ -1- $\frac{1}{4}$	$\frac{3}{4}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -2- $2\frac{1}{2}$
	50	$2\frac{1}{2}$ -2-2-1-1	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -1
	60	$\frac{1}{2}$ - $\frac{1}{2}$ -1-2-1	1-1-2-1-1
	70	1-1-2-2-1	$\frac{1}{2}$ - $\frac{1}{2}$ -1-1-1
	80	$\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$ -1	1-1-2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$
	90	1-2-2 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2	1 $\frac{1}{2}$ -2 $\frac{1}{2}$ -2-1-1
	00	$\frac{1}{4}$ -3/4- $\frac{1}{2}$ -1-1	2-2-3-2-2

800-	10	1-1-1-2-1	2-2-2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$
	20	2-1-2-2-2	2-1-1- $\frac{1}{2}$ - $\frac{1}{2}$
	30	1-1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ -1-1- $\frac{1}{2}$ - $\frac{1}{2}$
	40	2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -1-1	1 $\frac{1}{2}$ -1-1 $\frac{1}{2}$ -2-2
	50	2-2-2-1-2	1-1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2-1
	60	1 $\frac{1}{2}$ - $\frac{1}{2}$ -1- $\frac{1}{2}$ -1 $\frac{1}{2}$	1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$
	70	1-2-1- $\frac{1}{2}$ - $\frac{1}{2}$	1- $\frac{1}{2}$ - $\frac{1}{2}$ -2-2
	80	2-1 $\frac{1}{2}$ -2-2-1 $\frac{1}{2}$	2-2-1-1- $\frac{1}{2}$
	90	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -1-1	$\frac{1}{2}$ - $\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$
	00	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -2	2-2-3-2-2

900-	10	1-1-1-2-3	3-3-3-2-3
	20	2-1-1- $\frac{1}{2}$ - $\frac{1}{2}$	1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -1
	30	1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -1	1- $\frac{1}{2}$ - $\frac{1}{2}$ -1-1
	40	$2\frac{1}{2}$ -1-1 $\frac{1}{2}$ -1-2	1-1-2-1-1
	50	1-1-1-1-1	1-1-1-1-2
	60	1-1-1-1-1	1-1-1-1-1
	70	1-1-2-1-2	1-4-3-3-1
	80	1-2-3-2-2	2-2-4-2-1
	90	2-2-1-1-1	2-1-1-2-1
	00	1-1-1-1-2	2-1-1-1-1

1000-	10	1-2-2-2-1	1-2-1-1-1
	20	2-1-1-1-2	2-1-1-1-1
	30	1-1-1-1-2	2-2-3-3-5
	40	4-2-1-1-1	1-1-1-1-1
	50	3-1-2-1-2	1-1-1-3-2
	60	1-1-1-1-1	2-2-2-1- $\frac{1}{2}$
	70	$\frac{1}{2}$ -1-2-1-1	1-2-1-2-2
	80	2-2-1-1-2	1-2-1-1-1
	90	1-1-1-1-1	1-1-1-2-1
	00	2-2-2-1-2	2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2-1

1100-	10	2-1-2-1-1	1-1-2-1-1
	20	1-1-1-1-1	3-1-2-2-2
	30	$\frac{1}{2}$ - $\frac{1}{2}$ -1-1- $\frac{1}{2}$	$\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$ -1
	40	1-1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -	1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$
	50	1-1-1-1-1	1-2-1-1-1
	60	1- $\frac{1}{2}$ -1- $\frac{1}{2}$ -1	1-1-1-1-1
	70	2-1-2-1-1	2-1-1-1-2
	80	1-2-1-1-1	1-1-1-1-1
	90	1-1-1-2-1	1-1-1-2-2
	00	1-2-1-1-1	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$

DRILLING TIME
 BRANDT PRODUCTION COMPANY, INC.
 #1 SALMON, C-SW-NE 24-64N-39W
 ATCHISON COUNTY, MISSOURI

1700-10	1-1-1-1-1	1-1-1-1-1
20	1-1-1-1-1	1-1-1-1-2
30	1-1-1-2-2	1-1-2-1-1
40	1-1-1-2-1	1-1- $\frac{1}{2}$ -1-1
50	$\frac{1}{2}$ - $\frac{1}{2}$ -1-1-1	1-1-1-1- $\frac{1}{2}$
60	$\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$ -1	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -1
70	1-1-1- $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$
80	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	1-1-1-1-2
90	1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2-2-1	2-2-1-2-2
00	2-2-2-2-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -1-1-1 $\frac{1}{2}$ -1
1800-10	1-1-1-1-1	1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -1-2-2
20	1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2	1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2-1-1 $\frac{1}{2}$
30	1-1 $\frac{1}{2}$ -1-1-1	1-1-1 $\frac{1}{2}$ -1- $\frac{1}{2}$
40	1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ - $\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$
50	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	1-2-1-2-1
60	1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	1-1
70	1 minute from 1858 to 1865'; 1 minute from 1866 to 1869;	
80	1 minute 1869 to 1872'; 1 min. 1870 to 1875; 1 $\frac{1}{2}$ min. 1875 to 1882	
90	1-1 $\frac{1}{2}$ -1 $\frac{1}{2}$	1-1-1-1-1 Circ. for Samples 15" @ 1882
00	1-1-2-1-1	1-1-1-1-1
1900-10	1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -1	1-1/3-1/3-1/3-1/3
20	1/3-1/3-1/3-1/3-1/3	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$
30	3 minutes 1919' to 1930'	
40	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -2	1-2-2-2-2
50	3-2-3-3-2	3-3-3-3-2
60	3-3-3-3-3	3-4-3-3-2
70	2-3-3-3-3	3-2-4-3-4
80	3-2-4-4-4	6-6-5-6-5
90	5-4-3-3-2	3-3-3-3-3
00	2-2-2-2-1	2-3-4-4-4
2000-10	4-4-4-4-4	4-3-4-4-4
20	3-3-3-2-4	3-3-4-3-2
30	3-2-5-4-2	3-3-2-2-3
40	3-2-3-2-3	3-3-3-3-2
50	2-3-2-4-4	3-3-4-3-3
60	3-2-2-3-2	3-3-4-3-4
70	2-3-1-1-2	1-2-2-2-1
80	2-3-3-2-2	2-3-2-2-3
90	2-3-3-2-2	2-2-3-3-2
00	3-3-3-2-3	3-3-4-3-3
2100-10	3-3-3-4-3	3-2-3-2-2
20	2-2-2-3-3	4-3-4-4-4
30	4-4-5-5-6	6-6-4-4-5
40	4-5-5-5-5	5-3-4-5-4
50	4-4-3-3-4	3-2-3-2-2
60	3-2-3-2-3	3-3-3-3-3
70	3-3-3-4-3	3-2-1-3-2
80	2-2-2-2-2	2-2-2-2-3
90	3-3-3-3-3	3-3-3-3-3
00	3-2-3-3-3	3-3-3-3-2

DRILLING TIME
 BRANDT PRODUCTION COMPANY, INC.
 #1 SALMON, C-SW-NE 24-64N-39W
 ATCHISON COUNTY, MISSOURI

2200-10	1-2-2-2-2	2-2-2-2-2	
20	2-2-3-3-3	3-3-4-3-3	
30	2-3-2-3-2	2-2-2-3-2	
40	2-2-2-2-2	2-2-2-5-4	
50	5-5-4-3-3	4-3-4-5-3	
60	4-4-4-4-4	4-4-5-4-3	
70	4-3-2-3-3	3-3-3-3-3	
80	3-4-4-4-4	5-4-3-5-3	
90	4-5-4-4-4	4-4-5-4-4	
00	4-3-3-3-3	3-3-3-4-3	Build Vis 40, Wt. 9.3 or less
2300-10	4-4-4-4-5	4-4-4-4-4	Vis. 36, Wt. 9.0 @ 2310'
20	3-4-4-3-4	4-4-4-4-4	
30	3-3-3-2-4	4-4-4-3-4	Vis. 32, Wt. 9.0 @ 2330'
40	4-4-3-4-4	5-5-3-4-5	
50	4-3-4-5-4	4-5-5-5-5	
60	5-5-6-6-4	5-6-4-4-5	Vis. 32, Wt. 9.1 @ 2352
70	5-5-6-7-5	6-5-5-6-6	
80	6-6-7-5-6	5-6-4-4-4	Vis. 35, Wt. 9.2 @ 2373
90	5-6-6-5-4	5-5-5-6-4	
00	4-5-4-5-5	5-3-2-3-4	Vis. 36, Wt. 8.9 @ 2392, Circ. @ 2400' 1 hr. for Samples
2400-10	3-3-3-2-4	4-7-8-10-8	
20	8-5-6-6-4	2-2-1-2-1	
30	3-2-2-3-5	6-6-4-7-7	
40	6-4-4-4-3	4-3-3sr-3-3	
50	3-3-4-3-2	4-2-3-3-5	
60	3-3-4-3-4	5-4-5-3-1	Vis. 49, Wt. 9.2 @ 2454
70	2-3-4-3-4	4-1½-3½-4-1	
80	3-1-1-3-5	2-1-3-3-5	Vis. 35, Wt. 9.1 @ 2480; LCM good; P.H. red hot
90	5-7-3-5-5	4-5-4-5-4	
00	5-3-2-4-4	3-4-5-6-3½	
2500-10	4½-4-5-5-4	3-7-7-7-5	Vis. 35, Wt. 9.1, PH 11, LCM good @2502
20	5-3-3-6-6	7-6-7-8-5	
30	4-4-3-3-2	3-3-4-3-4	Vis. 38, Wt. 9.2, LCM 6#, P.H. 9 @2528
40	3-3-3-4-3	4-3-3-2-4	
50	5-4-4-5-4	4-4-4-2-3	Vis. 37, Wt. 9.3, LCM 6#, P.H. 9 @2543
60	4-4-3-4-2	2-4-4-3-3	
70	3-3-2-3-4	3-3-2-2-2	
80	2-4-3-1-4	4-4-4-3-4	Vis. 38, Wt. 9.3, P.H. 9 @ 2575'
90	5-5-6-4-4	3-2-3-2-3	
00	3-3-6-6-6	6-6-6-5-5	
2600-10	3-3-3-2-2	2-3-2-2-2	Vis. 37, Wt. 9.3; P.H. 9 @ 2605'
20	3-4-5-4-7	7-6-7-6-7	
30	7-6-7-6-7	8-7-7-7-7	Vis. 37, Wt. 9.3; P.H. 9 @ 2628
40	5-8-5-5-5	6-7-7-9-6	
50	6-7-7-6-7	7-8-9-9-8	Vis. 35, Wt. 9.3, P.H. 9 @ 2645
60	6-5-7-6-8	7-7-6-8-7	
70	5-4-5-6-4	4-5-3-3-3	Vis. 41, Wt. 9.2 @ 2662
80	2½-5½-6½-5-4½	5-5-3-4-3	
90	5-5-6-4-5	4-3-5-4-3	Vis. 42, Wt. 9.2 @ 2689
00	5-4-3-5-5	3-3-2-2-2	

DRILLING TIME

BRANDT PRODUCTION COMPANY, INC.
 #1 SALMON, C-SW-NE 24-64N-39W
 ATCHISON COUNTY, MISSOURI

2700-10	3-3-2-3-3	3-3-3-2-3	
20	4-2-3- $\frac{1}{2}$ -2 $\frac{1}{2}$	2-2-3-3-2 $\frac{1}{2}$	
30	2 $\frac{1}{2}$ -3-2-3-3	2-2-3-3-1 $\frac{1}{2}$	
40	1 $\frac{1}{2}$ -2 $\frac{1}{2}$ -1 $\frac{1}{2}$ -3-3	1-2-3-3-2	
50	2-1-3-4-4	4-3-2 $\frac{1}{2}$ -2 $\frac{1}{2}$ -3	
60	4-2-1-2-1	2-1-1-2-2	
70	2-1-1-2-1	2-3-3-3-3	
80	3-3-3-3-2	3-2-2-2-3	
90	2-4-3-3-3 $\frac{1}{2}$	1 $\frac{1}{2}$ -2-2-2-2	Vis.41, Wt. 9.3, LCM 6+ @2782'
00	3-2-3-2-3	2-3-3-4-3	
2800-10	3-3-3-3-4	3-3-4-3-3	Vis.41, Wt. 9.5, LCM 6; P.H.9@2805'
20	2-3-3-4-3	3-5-3-3-3	
30	2-3-2-3-2	3-4-2-3-3	
40	2-3-3-2-3	2-2-2-2-3	
50	2-2-2-2-3	2-3-3-3-5	Vis.40, Wt.9.2, LCM 6, PH 9@2843'
60	4-3-5-4-4	4-4-4-5-4	Vis.38, Wt. 9.4, LCM 6, PH9@2859'
70	4-4-4-5-5	6-5-5-5-6	
80	5-5-5-5-5	5-5-5-4-5	
90	5-5-5-6-5	6-6-6-6-6	Vis.39, Wt.9.4, LCM 6, PH 9@2889'
00	6-6-6-6-6	5-6-6-6-6	
2900-10	6-6-5-7-5	6-7-6-6-6	
20	6-5-5-3-5	5-5-5-4-3	
30	4-3-2-3-2	3-3-3-2-2	Vis.38, Wt.9.4, P.H.9 @2921;CFS wet & dry 15 min & 30 min. @ 2928'
40	3-2-5-5-4	4-4-3-4-4	
50	4-3-4-3-3	4-4-4-4-4	
60	4-4-4-4-4	4-4-4-4-4	Vis. 37, Wt. 9.2, P.H. 9 @ 2953'
70	5-4-5-4-4	5-4-4-5-4	
80	5-5-5-3-3	3-4-4-5-5	
90	4-5-5-5-5	6-5-5-5-5	Vis. 37, Wt. 9.4, P.H. 9 @ 2981'
00	6-5-5-5-5	6-5-5-5-5	
3000-10	5-5-5-6-5	4-3-5-4-4	Vis. 38, Wt. 9.2 @ 3003'
20	4-5-6-5-5	5-5-4-6-5	
30	5-5-5-5-5	5-5-3-3-3	Vis. 38, Wt. 9.4 @ 3023'
40	2-4-3-3-3 $\frac{1}{2}$	3 $\frac{1}{2}$ -3-3-2-3	
50	3-3-3-3-3	3-3-2-2-2	
60	3-4-4-4-5	4-4-4-3-3	Vis. 37, Wt. 9.4 @ 3055'
70	3-3-3-4-3	4-3-3-4-3	
80	4-4-3-3-5	6-6-6-5-5	
90	5-5-5-5-4	5-5-5-5-5	
00	5-5-5-5-6	6-4-5-5-3	
3100-10	3-2-3-3-3	5-5-5r-4-4	
20	5-5r-4r-4r-4r	5r-6r-5-4-5	Vis.38, Wt. 9.4 @ 3115'
30	5-4-3-4-4	3-3-2-4-3	
40	3-2-3-3-3	3-3-4-4-4	Vis. 38, Wt. 9.4 @ 3136'
50	4-5-4-5-5	6-5-6-4-5	
60	5-6-4-4-6	6-4-4-3-3	Vis. 38, Wt. 9.6 @ 3156'
70	4-3-3-3-3	4-3r-3-3-3	
80	4-4-3-3-4	3-3-4-5-4	
90	4-3-4-5-5	4-5-5r-3-3	Vis. 41, Wt. 9.6 @ 3186'
00	3-3-3-3-2	3-3-4-3-3	Vis. 42, Wt.9.6, PH9, LCM 6 @3197; CFS 15" & 30" @ 3200'

DRILLING TIME
 BRANDT PRODUCTION COMPANY, INC.
 #1 SALMON, C-SW-NE 24-64N-39W
 ATCHISON COUNTY, MISSOURI

PAGE 7

3200-10	3-3-3-4-3	6-4-5-5-4	
20	6-5-6-5-3	5-5-3-3-4	Vis. 40, Wt. 9.6 @ 3219'
30	3-2-3-3-3	4-6-6-6-5	
40	6-6-5-7-7	6-6-5-6-6	Vis.37, Wt. 9.4, PH 9 @ 3240'
50	7-6-6-6-6	7-6-6-6-4	
60	3-2-2½-2½-5	4-1-4-5-6	Vis.37, Wt.9.4 & CFS 15 & 30"@3254'
70	7-6-7-6-7	6-5-4-4-6	
80	6-6-6-7-7	7-6-3-4-4	Vis.37, Wt. 9.4 @ 3271'
90	6-5-4-3-6	6-4-3-4-4	Vis.37, Wt.9.4, CFS 15" & 30" @3290'
00	6-5-5-4-5	4-4-5-4-5	
3300-10	4-4-4-2-4	4-3-5-3-3	
20	2-1-1-1-1	½-½-½-1-1	Vis.37, Wt.9.4, CFS 15" & 30" @3315'
30	1-2-2-3-3	1-2-5-5-2	
40	3-2-3-3sr-3r	2-4-2vr-1-3	
50	5-4-5-4-5	5-6-7-5-4	CFS 15",30",45" @ 3341'
54	5-5r-3-4		Vis.40, Wt. 9.4 @ 3350'
3354'	Rotary Total Depth		