

- Fracture Before 6/5/27
- New Location
- Drill Deeper
- Redrill
- Abandonment

I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by Paragraph 5 of the Rules and Regulations of the Oil and Gas Section of the Mining Laws of West Virginia.

The accuracy of this survey is within the limits and as prescribed in paragraph 5 by the Oil and Gas Division of the Department of Mines Regulations.

PROVEN ELEVATION USGS "807"

Company CITIES SERVICE OIL COMPANY  
 Address BOX 873 CHARLESTON, W. VA.  
 Farm WALLER C. HARDY, JR. ET AL  
 Tract 4 Acres 9707.19 Lease No. 1-11-47-00834  
 Well (Farm) No. A-22 Serial No. GN-1595  
 Elevation (Spirit Level) 293.75  
 Quadrangle CHARLESTON - SW  
 County KANAWHA District LOUDON  
 Engineer Wardell S. Moore  
 Engineer's Registration No. 2113  
 File No. \_\_\_\_\_ Drawing No. W-12-66  
 Date 11 AUG 66 Scale 1" = 1000'

STATE OF WEST VIRGINIA  
 DEPARTMENT OF MINES  
 OIL AND GAS DIVISION  
 CHARLESTON

**WELL LOCATION MAP**  
 FILE NO. KAN-2079

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500 latitude and longitude lines being represented by border lines as shown.

- Denotes one inch spaces on border line of original tracing.

0615 7.5' Loc 15'  
 38° 17' 30" 2.61 S 5.49 E  
 81° 40' .94 W .94 W  
 Sd

Deep Well (Newburg)



STATE OF WEST VIRGINIA  
DEPARTMENT OF MINES  
OIL AND GAS DIVISION

Rotary   
Spudder   
Cable Tools   
Storage

Quadrangle Charleston  
Permit No. KAN-2079

WELL RECORD

Oil or Gas Well Gas  
(KIND)

Company Cities Service Oil Company  
Address Box 873, Charleston, W. Va. 25323  
Farm Waller C. Hardy, Jr., et al Acres 9707.19  
Location (waters) Polly Hollow  
Well No. 'A' #22, GW-1595 Elev 993.75'  
District Loudon County Kanawha  
The surface of tract is owned in fee by State of W. Va. - Dep't of Natural Resources  
636 Capital Bldg. Address Charleston, W. Va.  
Mineral rights are owned by W. C. Hardy, Jr., et al  
5100 2nd Avenue Address Vienna, W. Va.  
Drilling commenced 9-9-66  
Drilling completed 11-3-66  
Date Shot not shot From To  
With

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			Kind of Packer
16			<u>none</u>
13 3/8" 48#	<u>40'</u>	<u>40'</u>	Size of
10			Depth set
8 5/8" 32#	<u>1707'</u>	<u>1707'</u>	Perf. top
6 5/8" 24#			Perf. bottom
5 3/16"			Perf. top
4 1/2" 11.6#	<u>5498'</u>	<u>5498'</u>	Perf. bottom
3			Perf. top
2 3/8" 4.7#	<u>5445'</u>	<u>5445'</u>	Perf. bottom
Liners Used			

Open Flow /10ths Water in \_\_\_\_\_ Inch  
/10ths Merc. in \_\_\_\_\_ Inch  
Volume \_\_\_\_\_ Cu. Ft.  
Rock Pressure \_\_\_\_\_ lbs. \_\_\_\_\_ hrs.  
Oil \_\_\_\_\_ bbls., 1st 24 hrs.  
WELL ACIDIZED (DETAILS) see att. sheet  
WELL FRACTURED (DETAILS) see att. sheet

Attach copy of cementing record.  
CASING CEMENTED \_\_\_\_\_ SIZE \_\_\_\_\_ No. Ft. \_\_\_\_\_ Date \_\_\_\_\_  
Amount of cement used (bags) see reverse side  
Name of Service Co. \_\_\_\_\_  
COAL WAS ENCOUNTERED AT 62 FEET 60 INCHES  
72 FEET 36 INCHES 810 FEET 60 INCHES  
1115 FEET 48 INCHES \_\_\_\_\_ FEET \_\_\_\_\_ INCHES

RESULT AFTER TREATMENT (Initial open Flow or bbls.) 1,055 MCF (Newberg)  
ROCK PRESSURE AFTER TREATMENT 42 HOURS 1990#  
Fresh Water 49' 185' Feet Salt Water \_\_\_\_\_ Feet  
Producing Sand Newberg Sand Depth 5406-5424' (per electric logs)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Surface soil			0	36			
Sand			36	62	F. water	49'	
Coal			62	67			
Shale			67	72			
Coal			72	75			
Shale			75	85			
Sand			85	138			
Sand and Shale			138	148			
Shale			148	160			
Sand and Shale			160	240	F. water	185'	increasing
Sand			240	265			
Sand and Shale			265	345			
Shale			345	570			
Sand and Shale			570	599			
Sand			599	700			
Shale			700	800			
Sand			800	810			
Coal			810	815			
Sand			815	875			
Shale			875	935			
Sand and Shale			935	960			
Sand			960	1115			
Coal			1115	1119			
Sand - Salt			1119	1412			
Lime - Biglime			1412	1631			
Big Injun Sand - 365			1631	1647			

Deep Well

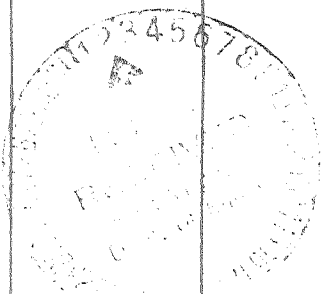
Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Shale and Red Rock		Moistening	1647	1665			
Sandy Lime			1665	1690			
Shale			1690	2100			
Lime and Shale			2100	2125			
Shale			2125	4640			
Onondaga Lime			4640	4725			
Oriskany Sand			4725	4785			
Sandy Lime			4785	4805			
Sand			4805	4830			
Sand and Shale			4830	4850			
Chert - Dolomite			4850	4935			
Sand and Shale			4935	5200			
Lime and Shale			5200	5329			
Dolomite			5329	5410			
Newberg Sand			5410	5415			
Sand & Shale w/ Dolomite		McKenzie	5415	5465			
Total depth-----				5465' Drillers' T. D.			
				5464' Schlumberger's T. D.			
Plugged back total depth-----				5455'			
<u>Electric Logs show</u>							
Big Injun Sand			1639	1675			
Onondaga Lime			4634	4728			
Oriskany Sand			4728	4741			
Newberg Sand			5406	5424			
<u>CASING RECORD</u>							
9-12-66	Set 13-3/8" 48# H-40 new casing at 40'. Cemented with 50 sacks regular cement with 3% Calcium Chloride.						
9-20-66	Set and cemented 9-5/8" 32.3# H-40 new casing at 1690' with 160 sacks regular cement with 2% Calcium Chloride blended with friction reducer and lost circulation material. Pumped 90 bbls. gel ahead of cement with lost circulation material. Centralizers at 1659', 1536' and 1389'						
10-8-66	Set and cemented 4-1/2" 11.6# J-55 new casing with Whirler Guide Shoe at 5,463' K. B. M. Scratchers on 12' centers 5465', to 5213'. Flexible fill up collar insert at 5,455'. Centralizers at 5464', 5430', 5395', 5294', 5195', 5096', 5000', 4902', 4806', 4709', 4613', 4516' and 4420'. Pumped 5 bbls. water, 500 gallons mud flush and 5 bbls. water ahead of 200 sacks 50-50 Pozmix, 300 gallons Latex cement. Displaced with 87-1/2 bbls. water. Treating pressure 1100#.						
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11-3-66	Perforated 4-1/2" casing 4 shots per foot 5411-5414' and 5416-5419' - total 26 shots.						
	see additional information on attached sheet						

Date \_\_\_\_\_, 19\_\_

APPROVED \_\_\_\_\_, Owner

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

Formation	Color	Hard or Soft	Top 19A	Bottom	Oil, Gas or Water	Depth Found	Remarks
<b>ADDITIONAL INFORMATION ON HARDY "A" #22</b>							
9-20-66							Depth 1690'. Ran Birdwell Gamma Ray, Density, Proximity and guard log.
10-7-66							Ran Schlumberger Gamma Ray, Caliper, Density and Induction Logs.
11-3-66							Ran McCullough Gamma Ray Correlation Log, Cement Bond Log and Collar Locator Log.
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10-3-66							Cut Core #1 5387-5411' - cut and recovered 24'
10-5-66							Cut Core #2 5411-5441' - cut and recovered 30'. Average coring 61 min/ft.
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11-4-66							Ran 2" upset tubing to 5434'. Spotted 500 gallons MCA and 1,000 gallons regular 15% acid and started to pump into Newberg Sand. Pumping 7 bbls/min. at 5,000#. Pumped 750 gallons acid into formation.
11-5-66							Pulled 2" tubing and pumped acid into formation at 5400#. Fraced Newberg Sand with 13,000# 20-40 sand in 16,500 gallons gelled water. Maximum treating pressure 5400#, average treating pressure 5300#. Initial shut in pressure 4500#. Average injection rate 15 bpm. Used 550 bbls. total fluid.
11-7-66							Ran 2" EUE tubing to 5402'.
11-14-66							42 hour shut in pressure tubing 1990# - annulus 1990#. Blew 7 hours FOF 1,055 MCF (Newberg)



Date December 1, 19 66

APPROVED Cities Service Oil Company, Owner

By L. D. Todd, District Superintendent  
(Title)