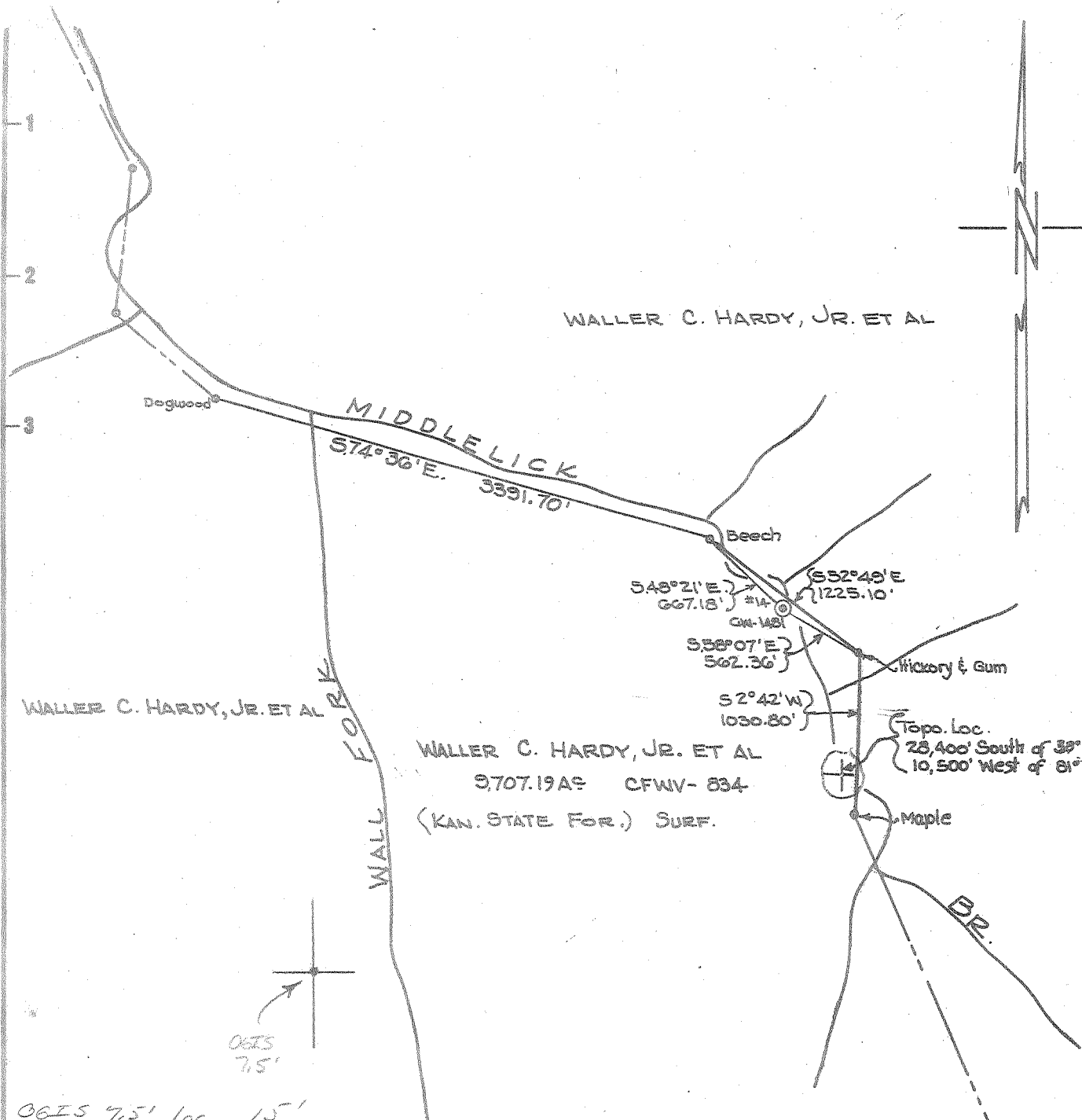


Latitude 38° 20'

Longitude 81° 35'

WALLER C. HARDY, JR. ET AL



WALLER C. HARDY, JR. ET AL

WALLER C. HARDY, JR. ET AL
9707.19 AC CFWV- 834
(KAN. STATE FOR.) SURF.

Topo. Loc.
28,400' South of 38°20'
10,500' West of 81°35'

OGIS
7.5'

OGIS 7.5' Loc 15'
 38°17'30" 2575 5.455
 81°35' 2.03W 2.080
 ock

U.S.G.S. - "704" - ELEVATION 703.6 KAN. STATE FOR. -
 AT MAIN GATE OF : 7.7 MI. SOUTH OF CHARLESTON ;
 17' NORTH & OF ROAD TO FOREST - CONCRETE
 POST - STANDARD TABLET STAMPED 18 JJS 1955 "704"

5.49 S
 2.03 W.
 8.5C (J-5-)

2.03W
 5.505

THE ACCURACY OF THIS SURVEY IS WITHIN THE LIMITS PRESCRIBED BY THE OIL AND GAS DIVISION OF THE DEPARTMENT OF MINES.
 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 6 OF THE RULES AND REGULATIONS OF THE OIL AND GAS SECTION OF THE MINING LAWS OF WEST VIRGINIA.

New Location
 Drill Deeper
 Abandonment

Company CITIES SERVICE OIL COMPANY
 Address Box 873 CHARLESTON, W.VA.
 Farm WALLER C. HARDY, JR. ET AL
 Tract 1 Acres 9707.19 Lease No. CFWV 834
 Well (Farm) No. 14 Serial No. GW-1481
 Elevation (Spirit Level) 892.34'
 Quadrangle CHARLESTON-B 5547 W201
 County KANAWHA District LOUDON
 Engineer Woodell Moore
 Engineer's Registration No. 2113
 File No. _____ Drawing No. W-7-64
 Date 27 FEB. 64 Scale 1" = 1000'

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

WELL LOCATION MAP
 FILE NO. KAN-1997

+ Denotes location of well on United States Topographic Maps, scale 1 to 62500 latitude and longitude lines being represented by border lines as shown.
 - Denotes one inch spaces on border line of original tracing.

Samples 0-1391, 1456-3089 Shell 23-Top Deep Well 6-6-3089
 Hand CORES 1386-1452



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION 8

Rotary
Spudder
Cable Tools
Storage

Quadrangle Charleston 8 SW

Permit No. Kan-1997

WELL RECORD

Oil or Gas Well Gas
(KIND.)

Company Cities Service Oil Company
Address P. O. Box 873, Charleston 23, W. Va.
Farm Waller C. Hardy, Jr., et al Acres 9707.19
Location (waters) Middlelick Branch
Well No. 14 - GW-1481 Elev. 892.34'
District Loudon County Kanawha
The surface of tract is owned in fee by Dept. of Natural Resources
State 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 4-6-64
Drilling completed 9-18-64
Date Shot not shot From _____ To _____
With _____
Open Flow /10ths Water in _____ Inch
/10ths Merc. in _____ Inch
Volume 119,000 Cu. Ft.
Rock Pressure _____ lbs. _____ hrs.
Oil _____ bbls., 1st 24 hrs.
WELL ACIDIZED see attached sheet
WELL FRACTURED Not fraced

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			Kind of Packer
16			<u>Anchor</u>
13 <u>3/8" 48#</u>	<u>31'</u>	<u>31'</u>	Size of <u>4-1/2"</u>
10 <u>3/4" 32#</u>	<u>502'</u>	<u>502'</u>	Depth set <u>5,260'</u>
8 <u>1/2" 24#</u>	<u>1285'</u>	<u>1285'</u>	Perf. top _____
7" 22#	<u>4672'</u>	<u>4672'</u>	Perf. bottom _____
4-1/2" 11.6#	<u>5347'</u>	<u>5347'</u>	Perf. top _____
3 <u>3/8" 4-6#</u>	<u>5309'</u>	<u>5309'</u>	Perf. bottom _____
Liners Used <u>with cage</u>			

CASING CEMENTED _____ SIZE _____ No. Ft. _____ Date _____
see attached sheet

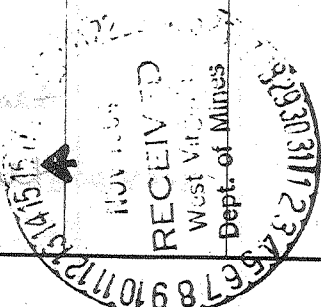
COAL WAS ENCOUNTERED AT none FEET _____ INCHES
_____ FEET _____ INCHES FEET _____ INCHES
_____ FEET _____ INCHES FEET _____ INCHES

RESULT AFTER TREATMENT 7,838 MCF (Newburg Sand)

ROCK PRESSURE AFTER TREATMENT 2070# 4 days

Fresh Water 30'-35' 50' Feet Salt Water 571' 640' 5130' Feet

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Surface			0	20			
Slate			20	25			
Sand			25	58	F. water	30-35'	2 blrs/hr.
Slate			58	124	F. water	50'	hole full
Sand			124	134			
Slate			134	164			
Sand			164	190			
Slate			190	200			
Sand			200	205			
Slate			205	225			
Sand			225	272			
Slate			272	285			
Sand			285	291			
Slate and Shells			291	325			
Sand			325	346			
Slate			346	370			
Sand			370	414			
Slate			414	431			
Lime			431	450			
Sand			450	494			
Slate			494	502			
Lime			502	514			
Sand			514	690	S. water	571'	2-10"blr/hr.
Slate			690	700	S. water	640'	hole full
Sand			700	752			
Lime			752	790			
Sand			790	797			



(over)

Formation	Color	Hard or Soft	Top δ	Bottom	Oil, Gas or Water	Depth Found	Remarks
Lime			797	810			
Sand			810	925			
Lime			925	948			
Sand			948	1083			
Slate and Red Rock			1083	1088			
Lime			1088	1117			
Slate			1117	1123			
Lime			1123	1138			
Sand			1138	1155			
Lime			1155	1188			
Slate			1188	1192			
Little Lime			1192	1210			
Slate			1210	1212			
Big Lime			1212	1403	1391'DLM=1386'SLM		
Big Injun Sand			1403	1431	CORES 1386-1452		
Slate and Shells			1431	1834			
Brown Shale			1834	1861			
Lime			1861	1872			
Slate and Shells			1872	1885			
Lime			1885	1947			
Slate and Shells			1947	3060			
Brown Shale			3060	3163			
Lime			3163	3180			
Slate and Shells			3180	3365			
Brown Shale			3365	3700			
Slate			3700	3975			
Lime			3975	3990			
Slate			3990	4110			
Lime			4110	4135			
Brown Shale			4135	4408			
Slate			4408	4442			
Brown Shale			4442	4478			
Corniferous Lime			4478	4594			
Oriskany Sand			4594	4626			
Lime			4626	4655			
Sand			4655	4693	S. water	5130'	hole full
Lime			4693	5291	5187'DLM=5196'SLM		
Total depth-----				5291'Schl. Meas=5301'DLM			
Plugged back depth-----				5282'			
Schlumberger Log shows:							
Big Lime			1161	1403	Temperature Log showed Gas:		
Big Injun			1403	1431		1331'	
Berea			1848	1852		1398'	
Corniferous Lime			4484	4582		1764'	
Oriskany Sand			4582	4592		4585-92'	
Helderberg Lime			4592	4781	H ₂ S Gas	5124'	119MCF
Newburg Sand			5260	5278	Core bled oil & gas at	1390-1391, 5'	
					and oil at	1402-03'	
					Oil	4582'	show

See attached sheet for additional information.

Date....., 19.....

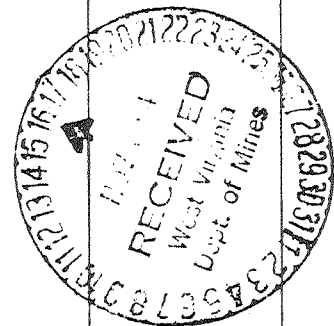
APPROVED....., Owner

By..... (Title)

Ken-1997

Formation	Color	Hard or Soft	Top 8A	Bottom	Oil, Gas or Water	Depth Found	Remarks
Additional information on GW-1481, W. C. Hardy, Jr., et al #14							
CASING RECORD							
4-17-64							Ran 10-3/4" casing at 498' DLM with shoe-set in 20' red mud.
5-15-64							Ran 8-5/8" casing with shoe at 1275' DLM - set in 20' red mud.
7-29-64							Ran 7" casing at 4634' SLM. Plug to 4630'. - Parmco Anchor Packer set at 4507' - R/L nipple at 4,335' - cemented with 30 sacks.
9-25-64							Ran 4-1/2" casing at T. D. Guide Shoe on bottom. Centralizers on 1st, 4th and 7th joints. Insert in top of bottom joint (5' joint) 4 -- 1/2" holes in 5' joint. Anchor Packer set at 5,260', R/L nipple at 4,738'. Pumped in 250 gallons (40 sacks) mud base cement. Plug to 5,284'
CORING RECORD							
5-22-64 to 5-24-64							Cored 1386' to 1454' Big Lime and Big Injun. Show oil in core 1402.1' and 1403'
9-13-64 to 9-15-64							Cored 5231' to 5301' DLM-- 5221' to 5291' Schlumberger Meas. (Newburg 5260-5278')

9-18-64							Schlumberger Ran Logs: Induction, Density, Gamma Ray, Neutron, Temperature and Caliper.
9-30-64							Ran McCullough Bond Log
10-1-64							Perforated Newburg Section 5260-78' with 4 shots/foot.
9-20-64							Ran 1st drill stem test 5260-68'
9-22-64							Reconditioned mud
9-23-64							Ran 2nd drill stem test 5268' to T. D.
ACIDIZED NEWBURG 10-2-64							
Ran 2" tubing to 5,278'. Displaced mud with fresh water. Pumped 1,000 gallons MCA into Newburg Perforations at 1,000# Maximum Pressure - 1 bbl/minute.							
Final open flow 10-9-64 <u>7,838 MCF.</u>							



Date November 13, 19 64

APPROVED Cities Service Oil Company, Owner
 By W. S. Moore, Division Sup't
 (Title)