

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47-069-00218 County OHIO District RICHLAND  
Quad WHEELING Pad Name EDWARD NICHOLS PAD Field/Pool Name PANHANDLE  
Farm name NICHOLS, EDWARD & JUDITH Well Number EDWARD NICHOLS OHI 6H  
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4439024.801 Easting 531512.542  
Landing Point of Curve Northing 4438703.523 Easting 531341.571  
Bottom Hole Northing 4436699.621 Easting 532309.267

Elevation (ft) 1310.4 GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
SOBM

Date permit issued 04/19/2017 Date drilling commenced 08/06/2017 Date drilling ceased 10/06/2017  
Date completion activities began 11/24/2017 Date completion activities ceased 01/19/2018  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

RECEIVED  
Office of Oil and Gas

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

MAR 21 2018

Freshwater depth(s) ft 401 Open mine(s) (Y/N) depths N WV Department of Environmental Protection  
Salt water depth(s) ft 684 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 562 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:

Reviewed by

*[Signature]* 5-10-18

API 47-069 - 00218 Farm name NICHOLS, EDWARD & JUDITH Well number EDWARD NICHOLS OHI 6H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	26	20	126	NEW	J-55/94#		Y
Surface	17.5	13.375	636	NEW	J-55/54.50#	467.8';550.7'	Y, 30 BBLs
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	2038	NEW	J-55/36#		Y
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	14225	NEW	HCP-110/20#		Y
Tubing		2.375	6640	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	561	15.6	1.20	673.2	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A		15.6	1.18		SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	880/1674	15.6	1.21/1.19	1064.8/1992.06	SURFACE	24
Tubing							

Drillers TD (ft) 14225 Loggers TD (ft) 14225  
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5480

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

SURFACE: 7 CENTRALIZERS - EVERY THIRD JOINT OF CASING  
 INTERMEDIATE: 24 CENTRALIZERS - EVERY THIRD JOINT OF CASING  
 PRODUCTION: 181 CENTRALIZERS - EVERY THIRD JOINT FROM SURFACE TO TOP OF CURVE, THEN EVERY JOINT UNTIL TD

RECEIVED  
Office of Oil and Gas

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

MAR 21 2018  
WV Department of Environmental Protection

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_







**EDWARD NICHOLS OHI 6H  
PERFORATION SUMMARY  
ATTACHMENT 1**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	11/4/2017	14,032	14,104	33
2	11/24/2017	13,927	13,999	33
3	11/24/2017	13,822	13,894	33
4	11/24/2017	13,717	13,789	33
5	11/24/2017	13,612	13,684	33
6	11/25/2017	13,507	13,579	33
7	11/25/2017	13,402	13,476	33
8	11/25/2017	13,297	13,369	33
9	11/26/2017	13,191	13,264	33
10	11/26/2017	13,087	13,159	33
11	11/26/2017	12,977	13,054	33
12	11/26/2017	12,877	12,949	33
13	11/27/2017	12,772	12,844	33
14	11/27/2017	12,667	12,743	33
15	11/27/2017	12,562	12,634	33
16	11/28/2017	12,457	12,534	33
17	11/28/2017	12,352	12,424	33
18	11/29/2017	12,247	12,319	33
19	11/29/2017	12,142	12,214	33
20	11/29/2017	12,037	12,109	33
21	11/29/2017	11,932	12,004	33
22	11/30/2017	11,827	11,896	33
23	11/30/2017	11,722	11,794	33
24	11/30/2017	11,617	11,689	33
25	11/30/2017	11,512	11,584	33
26	11/30/2017	11,412	11,479	33
27	12/1/2017	11,302	11,374	33
28	12/1/2017	11,197	11,269	33
29	12/1/2017	11,092	11,164	33
30	12/1/2017	10,987	11,059	33
31	12/1/2017	10,882	10,954	33
32	12/2/2017	10,777	10,849	33
33	12/2/2017	10,672	10,744	33
34	12/4/2017	10,567	10,639	33
35	12/4/2017	10,462	10,534	33
36	12/4/2017	10,357	10,429	33
37	12/5/2017	10,252	10,324	33
38	12/5/2017	10,147	10,221	33
39	12/5/2017	10,042	10,114	33
40	12/5/2017	9,937	10,005	33
41	12/7/2017	9,832	9,904	33
42	12/7/2017	9,727	9,799	33

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
OH Department of  
Environmental Protection

EDWARD NICHOLS OHI 6H  
PERFORATION SUMMARY  
ATTACHMENT 1

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
43	12/7/2017	9,622	9,694	33
44	12/8/2017	9,517	9,589	33
45	12/8/2017	9,412	9,484	33
46	12/8/2017	9,303	9,379	33
47	12/9/2017	9,202	9,274	33
48	12/10/2017	9,097	9,169	33
49	12/10/2017	8,992	9,063	33
50	12/10/2017	8,887	8,959	33
51	12/11/2017	8,782	8,854	33
52	12/11/2017	8,677	8,749	33
53	12/11/2017	8,570	8,644	33
54	12/11/2017	8,467	8,542	33
55	12/12/2017	8,362	8,434	33
56	12/12/2017	8,252	8,329	33
57	12/13/2017	8,152	8,221	33
58	12/13/2017	8,047	8,119	33
59	12/13/2017	7,942	8,014	33
60	12/13/2017	7,837	7,909	33
61	12/14/2017	7,729	7,804	33
62	12/14/2017	7,627	7,703	33
63	12/15/2017	7,522	7,594	33
64	12/15/2017	7,417	7,489	33
65	12/15/2017	7,312	7,384	33
66	12/16/2017	7,208	7,279	33

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of  
Environmental Protection



**EDWARD NICHOLS OHI 6H  
STIMULATION SUMMARY  
ATTACHMENT 2**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
1	11/24/2017	89	7,853	8,324	4,171	378,580	6,611	
2	11/24/2017	91	7,667	8,091	4,375	376,130	5,969	
3	11/24/2017	89	8,075	8,431	4,516	376,240	5,910	
4	11/24/2017	90	7,801	7,975	4,581	376,220	5,946	
5	11/25/2017	90	7,790	8,035	4,888	375,900	7,067	
6	11/25/2017	89	8,113	8,548	4,702	378,350	5,902	
7	11/25/2017	88	7,984	8,431	4,992	373,035	5,851	
8	11/25/2017	90	7,998	8,446	4,933	379,340	5,843	
9	11/26/2017	89	7,694	8,225	4,864	385,920	5,975	
10	11/26/2017	89	7,856	8,970	4,881	375,900	5,541	
11	11/26/2017	90	7,850	8,405	4,955	376,560	5,838	
12	11/27/2017	89	8,121	8,625	4,684	373,060	5,907	
13	11/27/2017	88	8,164	8,741	4,770	376,520	5,712	
14	11/27/2017	90	7,792	8,448	4,941	376,360	5,733	
15	11/28/2017	89	8,114	8,870	4,789	371,980	5,853	
16	11/28/2017	89	7,809	8,323	5,098	375,910	5,693	
17	11/28/2017	86	7,748	8,817	4,791	377,960	5,761	
18	11/29/2017	87	7,812	8,673	4,669	373,880	5,733	
19	11/29/2017	90	7,476	8,494	5,066	375,820	5,601	
20	11/29/2017	91	7,631	8,092	4,696	374,260	5,862	
21	11/29/2017	90	7,597	8,353	4,665	380,420	5,849	
22	11/30/2017	89	7,624	7,954	4,849	376,200	5,772	
23	11/30/2017	88	7,212	7,650	4,842	376,250	5,579	
24	11/30/2017	89	7,539	8,057	4,768	375,420	5,517	
25	11/30/2017	87	7,582	8,262	4,799	379,440	5,748	
26	12/1/2017	90	7,680	8,356	4,580	373,420	5,790	
27	12/1/2017	82	7,013	7,646	4,737	375,800	5,538	
28	12/1/2017	89	7,502	8,001	4,826	373,510	5,619	
29	12/1/2017	89	7,650	8,226	4,888	374,610	5,548	
30	12/1/2017	92	7,522	8,229	4,715	372,540	5,728	
31	12/2/2017	90	7,354	8,243	4,651	375,980	5,667	
32	12/2/2017	87	7,325	8,608	4,670	375,740	5,903	
33	12/4/2017	90	7,219	8,273	4,698	376,190	5,439	
34	12/4/2017	90	7,482	8,164	4,802	376,885	5,392	
35	12/4/2017	90	7,550	8,081	4,697	377,420	5,613	
36	12/5/2017	90	7,423	7,987	4,656	376,185	5,649	
37	12/5/2017	90	7,278	8,232	5,020	376,230	5,583	
38	12/5/2017	89	7,166	8,020	5,020	375,850	5,471	
39	12/5/2017	91	7,432	7,886	4,770	376,010	5,380	
40	12/7/2017	90	7,118	8,077	4,626	375,380	5,300	
41	12/7/2017	90	7,261	7,988	4,579	376,600	5,348	
42	12/7/2017	90	7,309	7,872	4,722	375,230	5,333	
43	12/8/2017	69	7,788	8,773	4,515	377,620	8,020	
44	12/8/2017	90	7,067	8,182	4,591	375,990	5,286	
45	12/8/2017	89	7,312	8,168	4,742	376,130	5,287	
46	12/9/2017	89	7,322	7,753	4,819	376,030	5,374	
47	12/10/2017	88	7,101	7,511	4,940	374,690	5,319	
48	12/10/2017	89	7,277	7,660	4,643	375,260	5,258	
49	12/10/2017	90	7,217	8,177	4,951	373,820	5,247	

RECEIVED  
Office of Oil and Gas  
**MAR 21 2018**  
WV Department of  
Environmental Protection

**EDWARD NICHOLS OHI 6H  
STIMULATION SUMMARY  
ATTACHMENT 2**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
50	12/10/2017	89	7,151	7,543	4,712	377,120	5,243	
51	12/11/2017	89	7,088	7,996	4,813	373,360	5,087	
52	12/11/2017	90	7,250	8,001	4,676	376,420	5,235	
53	12/11/2017	89	7,298	7,571	4,755	375,190	5,228	
54	12/12/2017	88	7,355	7,640	4,664	376,985	5,195	
55	12/12/2017	89	6,999	7,432	4,777	378,280	5,297	
56	12/13/2017	88	7,171	7,432	4,717	375,155	5,164	
57	12/13/2017	90	7,075	7,591	4,962	373,060	5,158	
58	12/13/2017	90	7,002	7,447	5,061	374,340	5,208	
59	12/13/2017	89	7,308	7,592	4,824	374,890	5,169	
60	12/14/2017	91	7,140	8,161	4,730	375,280	5,175	
61	12/14/2017	90	7,009	7,643	5,070	379,760	5,175	
62	12/14/2017	87	7,063	7,558	4,723	377,840	5,311	
63	12/15/2017	91	6,988	8,497	4,794	379,060	5,057	
64	12/15/2017	89	7,187	8,957	4,676	379,260	5,144	
65	12/15/2017	88	7,129	8,102	4,542	378,385	5,116	
66	12/16/2017	88	6,961	8,025	4,790	374,400	5,079	

RECEIVED  
Office of Oil and Gas

MAR 21 2018

WV Department of  
Environmental Protection



**EDWARD NICHOLS OHI 6H**  
**API: 47-069-00218**  
**ATTACHMENT 3**

<b>LITHOLOGY/FORMATION</b>	<b>TOP DEPTH, MD (FT)</b>	<b>TOP DEPTH, TVD (FT)</b>	<b>BOTTOM DEPTH, MD (FT)</b>	<b>BOTTOM DEPTH, TVD (FT)</b>	<b>QUANTITY AND TYPE OF FLUID</b>
<b>Base of Fresh Water</b>	N.A.	N.A.	401.00	401.00	
<b>Top of Salt Water</b>	684.00	684.00	N.A.	N.A.	
<b>Pittsburgh Coal</b>	562.00	562.00	569.00	569.00	
<b>Big Injun (ss)</b>	1719.00	1719.00	1901.00	1901.00	
<b>Berea (siltstone)</b>	2245.00	2245.00	5749.00	5627.00	
<b>Rhinestreet (shale)</b>	5749.00	5627.00	6040.00	5884.00	
<b>Cashaqua (shale)</b>	6040.00	5884.00	6113.00	5941.00	
<b>Middlesex (shale)</b>	6113.00	5941.00	6209.00	6010.00	
<b>Burket (shale)</b>	6209.00	6010.00	6239.00	6030.00	
<b>Tully (ls)</b>	6239.00	6030.00	6319.00	6080.00	
<b>Mahantango (shale)</b>	6319.00	6080.00	6592.00	6199.00	
<b>Marcellus (shale)</b>	6592.00	6199.00	N.A.	N.A.	GAS

RECEIVED  
Office of Oil and Gas

MAR 21 2018

WV Department of  
Environmental Protection

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/24/2017
Job End Date:	12/18/2017
State:	West Virginia
County:	Ohio
API Number:	47-069-00218-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Edward Nichols OHI 6H
Latitude:	40.10092800
Longitude:	-80.63028100
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,307
Total Base Water Volume (gal):	16,321,512
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Southwestern Energy	Carrier/Base Fluid					
Sand	J.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	16.09276	
WFRA-2000	J.S. Well Services, LLC	Friction Reducer					
			Water	7732-18-5	87.40000	0.95477	
			Hydrogen Chloride	7647-01-0	17.50000	0.22198	
			Water	7732-18-5	60.00000	0.04574	
			2-Propanoic acid, polymer with 2-propanamide	29003-06-9	30.00000	0.02287	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01875	
BIOC11139A	Nalco Champion	Anti-Bacterial Agent					
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00704	
			Glutaraldehyde	111-30-8	10.00000	0.00235	
			Ethanol	64-17-5	5.00000	0.00092	

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of Environmental Protection

SCAL16486A	Nalco Champion	Scale Inhibitor						
		Ethylene Glycol	107-21-1		30.00000		0.00189	
		Amine Triphosphate	Proprietary		30.00000		0.00169	
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors						
		Ethylene Glycol	107-21-1		40.00000		0.00031	
		Cinnamaldehyde	104-55-2		20.00000		0.00011	
		Formic acid	64-18-6		20.00000		0.00011	
		Butyl cellosolve	111-76-2		20.00000		0.00010	
		Polyether	60828-78-6		10.00000		0.00005	
		Acetophenone,thiourea,formaldehyde polymer	68527-49-1		5.00000		0.00003	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.								

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of  
Environmental Protection



**5D Survey Report**

---

**SOUTHWESTERN ENERGY**

**Field Name:** *SOUTHWESTERN\_OHIO CO, WV UTM NAD 83 (17N)*  
**Site Name:** *Edward Nichols Pad*  
**Well Name:** *Edward Nichols OHI 6H*  
**Survey:** *Definitive survey*

---

4 October 2017

RECEIVED  
Office of Oil and Gas

MAR 21 2018

WV Department of  
Environmental Protection**Weatherford®**



Southwestern Energy

Edward Nichols OHI 6H  
Ohio County, WV  
SCD 41

Plan vs Actual



Weatherford

Plan Data for Edward Nichols OHI 6H

Field: SOUTHWESTERN\_OHIO\_CO, WV UTM NAD 83 (17N)  
Vertical Reference Datum (VRD): Mean Sea Level  
Projected Coordinate System: NAD83 / UTM zone 17N

Unit: USfeet

Site: Edward Nichols Pad  
Company Name: SOUTHWESTERN ENERGY  
Northing: 14563684.96USft Latitude: 40.100885°  
Easting: 1743804.84USft Longitude: -80.630283°  
North Reference: Grid Grid Convergence: 0.24°  
Elevation Above VRD: 1310.00USft

Slot: Edward Nichols OHI 6H

Position:  
Offset is from Site centre  
+N/-S: 15.57USft Northing: 14563700.54USft Latitude: 40.100928°  
+E/-W: 0.54USft Easting: 1743804.38USft Longitude: -80.630281°  
Elevation Above VRD: 1310.00USft

Well: Edward Nichols OHI 6H

Type: Main-Well  
File Number:

Plan Folder: P2 Plan: P2:V1

Vertical Section: Position offset of origin from Slot centre:  
+N/-S: 0.03USft Azimuth: 161.12°

Model: Field Strength: Dip: Date:  
bggm2017 52366(nT) -8.79° 67.17° 2017-09-27

Plan Data for Edward Nichols OHI 6H

Plan Point Information:

Dogleg	MD Inc	Az	TVD	+N/-S	+E/-W	VSec	DLS	ToolFace	Comments
(°)	(USft)	(°)	(USft)	(USft)	(USft)	(USft)	(DLSU)	(°)	(°)
	4765.00	17.20	259.68	4688.24	-105.72	-541.78	-75.26	0.98	305.0 Last WFT SVY
	5498.26	17.20	259.68	5388.72	-144.56	-755.10	-107.53	0.00	0.0 Curve KOP 7% DLS
	6416.88	60.00	159.78	6137.42	-589.92	-750.80	315.25	7.00	251.2 Build/Turn 9° DLS
	6745.74	89.15	154.40	6224.00	-878.25	-627.79	627.88	9.00	349.0 Landing Point
	14243.08	89.15	154.40	6335.00	-7638.69	2611.70	8072.86	0.00	0.0 PBHL ENH

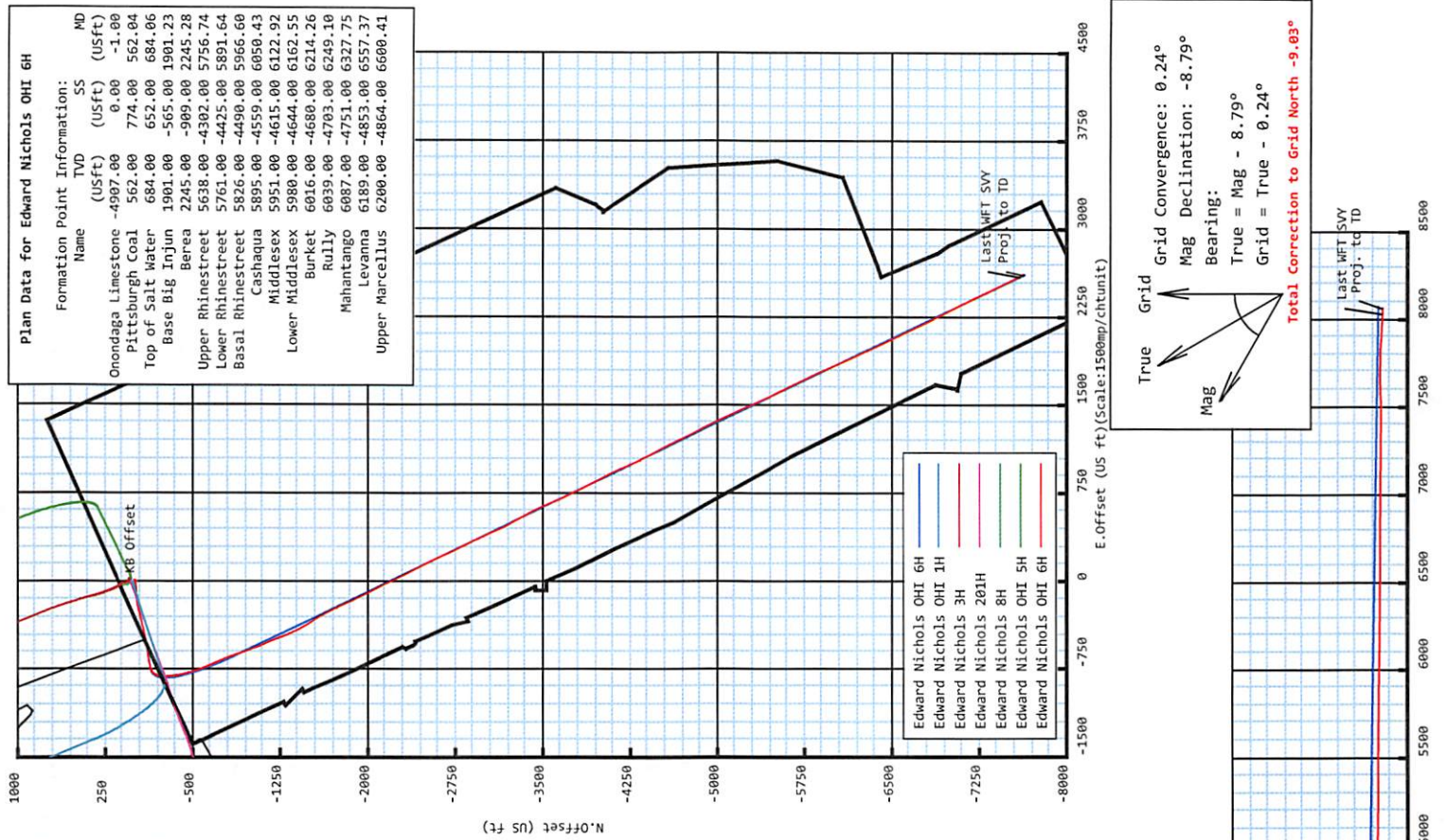
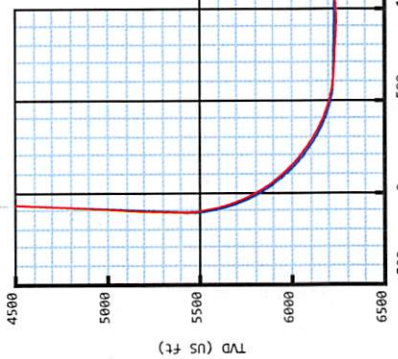
Target Set Information:

Name: Edward Nichols OHI 6H

Name	TVD	+N/-S	+E/-W	Northing	Easting	Lat	Long
(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	(°)	(°)
LP ENH	6224.00	-736.56	-695.69	14562963.98	1743108.69	40.098913	-80.632780
PBHL ENH	6335.00	-7638.69	2611.70	14556061.85	17466416.08	40.079921	-80.621058

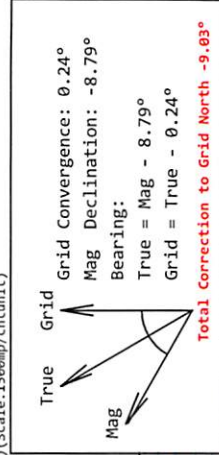
RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of  
Environmental Protection

KB: 1336'  
GL: 1310'



Formation Point Information:

Name	TVD	SS	MD
(USft)	(USft)	(USft)	(USft)
Onondaga Limestone	-4997.00	0.00	-1.00
Pittsburgh Coal	562.00	774.00	562.00
Top of Salt Water	684.00	652.00	684.00
Base Big Injun	1901.00	-565.00	1901.23
Berea	2245.00	-909.00	2245.28
Upper Rhinestreet	5638.00	-4302.00	5756.74
Lower Rhinestreet	5761.00	-4425.00	5891.64
Basal Rhinestreet	5826.00	-4490.00	5966.60
Cashaqua	5895.00	-4559.00	6050.43
Middlesex	5951.00	-4615.00	6122.92
Lower Middlesex	5980.00	-4644.00	6162.55
Burket	6016.00	-4680.00	6214.26
Rully	6039.00	-4703.00	6249.10
Mahantango	6087.00	-4751.00	6327.75
Levanna	6189.00	-4853.00	6557.37
Upper Marcellus	6200.00	-4864.00	6600.41



Last WFT SVY  
Proj. to TD

VS (US ft) (Bearing: 161.12° Scale: 1000USft/in)



## Edward Nichols OHI 6H

<b>Field Name:</b>	<b>Map Units:</b> US ft <b>Vertical Reference Datum (VRD):</b> Mean Sea Level <b>Projected Coordinate System:</b> NAD83 / UTM zone 17N <b>Comment:</b>	<b>Company Name:</b> SOUTHWESTERN ENERGY
SOUTHWESTER N_OHIO CO, WV UTM NAD 83 (17N)		

<b>Site:</b>	<b>Units:</b> US ft <b>Position:</b> <b>Elevation above MSL:</b> 1310.00 US ft <b>Comment:</b>	<b>North Reference:</b> Grid <b>Northing:</b> 14563684.97 US ft <b>Easting:</b> 1743803.84 US ft	<b>Convergence Angle:</b> 0.24 <b>Latitude:</b> 40.100885 <b>Longitude:</b> -80.630283
Edward Nichols Pad			

<b>Slot:</b>	<b>Position (Relative to Site Centre)</b>		
Edward Nichols OHI 6H	<b>+N/-S:</b> 15.57 US ft	<b>Northing:</b> 14563700.54 US ft	<b>Latitude:</b> 40.100928
	<b>+E/-W:</b> 0.54 US ft	<b>Easting:</b> 1743804.38 US ft	<b>Longitude:</b> -80.630281
	<b>Elevation above MSL:</b> 1310.00 US ft		
	<b>Comment:</b>		

<b>Well:</b>	<b>Type:</b> Main well <b>File Number:</b> <b>Closure Distance:</b> 8063.9 US ft <b>Vertical Section: Position of Origin (Relative to Slot centre)</b> <b>+N/-S:</b> 0.03 US ft	<b>UWI:</b> <b>Comment:</b> <b>Closure Azimuth:</b> 161.09° <b>+E/-W:</b> 0.00 US ft	<b>Az:</b> 161.12°
Edward Nichols OHI 6H			

RECEIVED  
 Office of Oil and Gas  
 MAR 21 2018  
 WV Department of  
 Environmental Protection

<b>Drill floor: Survey Name: Definitive Survey</b>			
<b>Rig Height (Well TVD Reference):</b> 26.00 US ft	<b>Elevation above MSL:</b> 1336.00 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°

<b>Survey Name: Definitive Survey</b>				
<b>Date:</b> 06/Jul/2017	<b>Survey Tool:</b> See Survey Tool Ranges below.	<b>Comment:</b>	<b>Company:</b>	
<b>Magnetic Model:</b>				
<b>Model Name:</b> bggm2017	<b>Date:</b> 27/Sep/2017	<b>Field Strength:</b> 52366.8 nT	<b>Declination:</b> -8.79°	<b>Dip:</b> 67.17°
<b>Tie Point:</b>				
<b>MD:</b> 0.00 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°	<b>TVD:</b> 0.00 US ft	<b>North Offset:</b> 0.00 US ft
				<b>East Offset:</b> 0.00 US ft

Survey Tool Ranges:			
Name	Start MD (USft)	End MD (USft)	Source Survey
MFAC_US_V2	0.00	417.00	WFT MWD_01-MFAC
MFAC_US_V2	417.00	1958.00	WFT MWD_02-MFAC
MWD	1958.00	4765.00	WFT MWD_02-MWD
MWD	4765.00	14225.00	WFT MWD_03

Wellpath created using minimum curvature.



## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (%/100US ft)	Comment
0.00	0.00	0.00	0.00	0.03	0.00	0.00	40.100928	-80.630281	0.00	
26.00	0.00	0.00	26.00	0.03	0.00	0.00	40.100928	-80.630281	0.00	KB Offset
154.00	0.21	135.76	154.00	0.24	-0.17	0.16	40.100927	-80.630280	0.16	
242.00	0.34	137.16	242.00	0.62	-0.48	0.45	40.100926	-80.630279	0.15	
329.00	0.30	96.80	329.00	0.96	-0.69	0.86	40.100926	-80.630278	0.26	
417.00	0.71	79.65	416.99	1.14	-0.62	1.62	40.100926	-80.630275	0.49	
562.04	0.55	98.57	562.03	1.59	-0.56	3.19	40.100926	-80.630269	0.18	Pittsburgh Coal :
683.00	0.49	121.64	682.98	2.26	-0.92	4.21	40.100925	-80.630266	0.18	
684.06	0.49	121.44	684.04	2.27	-0.93	4.22	40.100925	-80.630266	0.18	Top of Salt Water :
771.00	0.58	107.14	770.98	2.81	-1.25	4.96	40.100924	-80.630263	0.18	
859.00	0.59	116.36	858.97	3.40	-1.58	5.79	40.100923	-80.630260	0.11	
946.00	0.58	116.46	945.97	4.03	-1.98	6.58	40.100922	-80.630257	0.01	
1033.00	0.45	123.31	1032.96	4.61	-2.36	7.26	40.100921	-80.630255	0.17	
1121.00	0.31	144.25	1120.96	5.11	-2.74	7.69	40.100920	-80.630253	0.22	
1210.00	0.28	158.88	1209.96	5.56	-3.14	7.91	40.100919	-80.630253	0.09	
1298.00	0.48	163.17	1297.96	6.14	-3.70	8.09	40.100917	-80.630252	0.23	
1385.00	0.50	168.05	1384.96	6.88	-4.42	8.28	40.100915	-80.630251	0.05	
1472.00	0.52	177.08	1471.95	7.64	-5.18	8.38	40.100913	-80.630251	0.10	
1561.00	0.54	183.01	1560.95	8.42	-6.00	8.38	40.100911	-80.630251	0.07	
1649.00	0.51	200.32	1648.94	9.10	-6.79	8.22	40.100909	-80.630252	0.18	
1737.00	0.53	206.29	1736.94	9.70	-7.52	7.90	40.100907	-80.630253	0.07	
1824.00	0.57	210.65	1823.94	10.26	-8.25	7.50	40.100905	-80.630254	0.07	
1901.23	0.61	203.60	1901.17	10.81	-8.96	7.14	40.100903	-80.630255	0.11	Base Big Injun :
1911.00	0.62	202.78	1910.93	10.89	-9.06	7.10	40.100903	-80.630256	0.11	
1958.00	0.72	205.33	1957.93	11.29	-9.56	6.87	40.100901	-80.630256	0.22	
2085.00	0.66	210.40	2084.92	12.34	-10.91	6.16	40.100898	-80.630259	0.07	
2174.00	0.54	226.59	2173.92	12.85	-11.64	5.60	40.100896	-80.630261	0.23	
2245.28	0.49	229.70	2245.19	13.10	-12.07	5.12	40.100894	-80.630263	0.08	Berea :
2262.00	0.48	230.52	2261.91	13.15	-12.16	5.01	40.100894	-80.630263	0.08	
2349.00	0.45	239.95	2348.91	13.35	-12.56	4.44	40.100893	-80.630265	0.09	
2436.00	0.47	242.58	2435.91	13.47	-12.90	3.82	40.100892	-80.630267	0.03	
2524.00	1.80	265.24	2523.89	13.18	-13.18	2.13	40.100891	-80.630273	1.57	
2614.00	3.82	269.22	2613.77	11.91	-13.34	-2.28	40.100891	-80.630289	2.25	
2701.00	5.21	268.63	2700.50	9.82	-13.47	-9.13	40.100891	-80.630314	1.60	
2788.00	7.23	267.90	2786.99	7.05	-13.77	-18.55	40.100890	-80.630347	2.32	
2876.00	8.22	267.06	2874.19	3.72	-14.29	-30.37	40.100889	-80.630390	1.13	
2965.00	9.89	263.68	2962.07	0.31	-15.46	-44.32	40.100886	-80.630440	1.97	
3051.00	11.16	264.09	3046.63	-3.16	-17.13	-59.94	40.100881	-80.630495	1.48	
3139.00	13.27	266.26	3132.63	-7.71	-18.67	-78.49	40.100877	-80.630562	2.45	
3227.00	14.00	265.28	3218.15	-12.95	-20.20	-99.17	40.100873	-80.630636	2.51	
3315.00	16.21	265.09	3303.10	-18.52	-22.13	-122.02	40.100868	-80.630718	0.97	
3403.00	17.06	265.21	3387.42	-24.63	-24.26	-147.13	40.100863	-80.630807	0.90	
3490.00	17.25	262.62	3470.55	-30.31	-26.98	-172.64	40.100856	-80.630899	0.71	
3577.00	17.51	260.73	3553.58	-35.07	-30.74	-198.35	40.100846	-80.630991	0.89	
3665.00	17.90	258.51	3637.41	-39.02	-35.57	-224.66	40.100833	-80.631085	0.84	
3752.00	17.68	256.22	3720.25	-41.91	-41.38	-250.60	40.100817	-80.631178	0.87	
3841.00	17.10	254.52	3805.18	-43.89	-48.09	-276.33	40.100799	-80.631270	1.04	
3929.00	16.21	255.31	3889.49	-45.55	-54.66	-300.68	40.100781	-80.631357	0.37	
4017.00	15.92	255.81	3974.05	-47.44	-60.73	-324.27	40.100765	-80.631441	1.10	
4106.00	16.90	256.06	4059.43	-49.55	-66.84	-348.66	40.100748	-80.631529	0.43	
4193.00	17.27	256.12	4142.59	-51.76	-72.99	-373.47	40.100732	-80.631617	0.55	
4281.00	16.84	256.88	4226.72	-54.18	-79.01	-398.56	40.100715	-80.631707	0.83	
4369.00	17.49	257.98	4310.80	-57.04	-84.66	-423.91	40.100700	-80.631798	1.09	
4457.00	18.41	258.84	4394.51	-60.49	-90.11	-450.48	40.100685	-80.631893	0.89	
4545.00	17.70	259.90	4478.18	-64.39	-95.14	-477.28	40.100672	-80.631989	0.58	
4633.00	17.35	261.15	4562.10	-68.72	-99.51	-503.42	40.100660	-80.632083	0.46	
4721.00	16.95	260.87	4646.18	-73.18	-103.56	-529.05	40.100649	-80.632174		

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of  
Environmental Protection

## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N. Offset (US ft)	E. Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
4765.00	17.20	259.68	4688.24	-75.23	-105.74	-541.78	40.100643	-80.632220	0.98	
4907.00	17.34	260.30	4823.84	-81.73	-113.07	-583.29	40.100624	-80.632368	0.16	
5002.00	17.32	260.82	4914.53	-86.38	-117.71	-611.21	40.100611	-80.632468	0.16	
5098.00	17.53	261.30	5006.13	-91.34	-122.18	-639.61	40.100599	-80.632570	0.27	
5193.00	17.85	262.20	5096.63	-96.67	-126.32	-668.17	40.100588	-80.632672	0.44	
5290.00	17.15	258.28	5189.15	-101.31	-131.24	-696.91	40.100575	-80.632775	1.41	
5386.00	16.72	258.02	5280.98	-104.73	-136.98	-724.28	40.100560	-80.632873	0.45	
5482.00	17.17	256.98	5372.82	-107.83	-143.04	-751.59	40.100543	-80.632971	0.57	
5530.00	17.23	245.39	5418.68	-107.85	-147.60	-764.96	40.100531	-80.633019	7.13	
5578.00	17.11	231.61	5464.56	-104.78	-154.95	-776.96	40.100511	-80.633062	8.46	
5626.00	17.48	218.98	5510.41	-98.58	-164.94	-787.04	40.100484	-80.633098	7.85	
5674.00	17.91	210.01	5556.15	-89.89	-176.94	-795.26	40.100451	-80.633127	5.74	
5722.00	19.35	202.02	5601.64	-79.03	-190.70	-801.94	40.100413	-80.633151	6.10	
5758.11	20.90	196.55	5635.54	-69.26	-202.43	-806.02	40.100381	-80.633166	6.75	Upper Rhinstreet :
5769.00	21.40	195.06	5645.70	-66.03	-206.21	-807.09	40.100371	-80.633170	6.75	
5817.00	23.62	187.82	5690.05	-50.16	-224.19	-810.67	40.100321	-80.633183	7.39	
5864.00	25.79	183.66	5732.75	-32.31	-243.73	-812.61	40.100268	-80.633190	5.91	
5893.59	27.25	181.51	5759.23	-20.01	-256.93	-813.20	40.100231	-80.633193	5.90	Lower Rhinstreet :
5912.00	28.17	180.28	5775.52	-11.96	-265.48	-813.33	40.100208	-80.633193	5.90	
5959.00	30.27	177.94	5816.54	9.87	-288.42	-812.96	40.100145	-80.633192	5.09	
5968.50	30.95	177.47	5824.71	14.50	-293.25	-812.76	40.100132	-80.633192	7.56	Basal Rhinstreet :
6007.00	33.71	175.76	5857.25	34.34	-313.80	-811.54	40.100075	-80.633188	7.56	
6052.40	36.62	172.95	5894.36	59.79	-339.81	-808.94	40.100004	-80.633179	7.32	Cashaqua :
6054.00	36.72	172.86	5895.65	60.73	-340.76	-808.82	40.100001	-80.633178	7.32	
6102.00	40.94	170.27	5933.03	90.32	-370.51	-804.38	40.099919	-80.633163	9.42	
6126.08	42.34	168.87	5951.03	106.14	-386.25	-801.48	40.099876	-80.633153	6.98	Middlesex :
6151.00	43.80	167.49	5969.23	123.03	-402.90	-797.99	40.099830	-80.633140	6.98	
6166.61	44.53	167.07	5980.43	133.84	-413.51	-795.60	40.099801	-80.633132	5.05	Lower Middlesex :
6199.00	46.05	166.22	6003.22	156.75	-435.90	-790.28	40.099740	-80.633113	5.05	
6219.03	47.19	165.66	6016.97	171.26	-450.02	-786.74	40.099701	-80.633101	6.05	Burket :
6246.00	48.73	164.93	6035.03	191.24	-469.40	-781.65	40.099648	-80.633083	6.05	
6254.12	49.41	164.58	6040.35	197.36	-475.32	-780.04	40.099631	-80.633077	9.02	Rully :
6294.00	52.79	162.98	6065.39	228.36	-505.11	-771.36	40.099549	-80.633047	9.02	
6334.64	55.19	161.68	6089.29	261.22	-536.43	-761.38	40.099463	-80.633011	6.44	Mahantango :
6342.00	55.62	161.45	6093.47	267.28	-542.17	-759.46	40.099447	-80.633005	6.44	
6390.00	59.06	159.06	6119.37	307.67	-580.19	-745.80	40.099343	-80.632956	8.30	
6438.00	62.37	157.31	6142.84	349.47	-619.05	-730.24	40.099236	-80.632901	7.59	
6486.00	66.55	156.11	6163.54	392.64	-658.82	-713.11	40.099127	-80.632841	9.00	
6534.00	70.25	156.11	6181.20	437.10	-699.62	-695.04	40.099014	-80.632777	7.71	
6575.99	72.87	156.74	6194.48	476.79	-736.12	-679.11	40.098914	-80.632720	6.41	Levanna :
6582.00	73.25	156.83	6196.23	482.53	-741.41	-676.84	40.098899	-80.632712	6.41	Office of Oil and Gas
6618.39	75.33	157.30	6206.08	517.46	-773.66	-663.20	40.098811	-80.632664	5.85	Upper Marcellus :
6631.00	76.05	157.46	6209.20	529.66	-784.95	-658.49	40.098780	-80.632647	5.85	
6679.00	80.71	159.52	6218.87	576.61	-828.67	-641.27	40.098659	-80.632586	10.58	
6726.00	85.06	160.98	6224.69	623.23	-872.56	-625.52	40.098539	-80.632531	9.75	
6823.00	86.61	160.52	6231.73	719.97	-963.89	-593.62	40.098288	-80.632418	1.67	
6919.00	87.53	159.65	6236.64	815.83	-1054.03	-560.96	40.098040	-80.632302	1.32	
7015.00	87.53	153.94	6240.78	911.42	-1142.14	-523.19	40.097797	-80.632169	5.94	
7112.00	94.44	160.59	6239.11	1008.08	-1231.49	-485.74	40.097551	-80.632036	9.88	
7208.00	90.62	156.98	6234.88	1103.87	-1320.86	-451.05	40.097306	-80.631913	5.47	
7304.00	87.96	152.72	6236.07	1199.26	-1407.73	-410.26	40.097067	-80.631769	5.23	
7400.00	88.46	148.11	6239.07	1293.52	-1491.15	-362.90	40.096837	-80.631601	4.83	
7495.00	87.72	148.02	6242.23	1386.01	-1571.72	-312.68	40.096615	-80.631422	0.78	
7591.00	87.84	152.02	6245.95	1480.12	-1654.80	-264.76	40.096386	-80.631252	4.17	
7687.00	88.22	155.24	6249.25	1575.23	-1740.75	-222.15	40.096150	-80.631101	3.38	



## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (%/100US ft)	Comment
7783.00	88.27	155.90	6252.19	1670.74	-1828.11	-182.46	40.095910	-80.630960	0.69	
7879.00	88.03	153.44	6255.29	1766.07	-1914.83	-141.42	40.095671	-80.630815	2.57	
7975.00	88.58	153.14	6258.13	1861.14	-2000.55	-98.29	40.095435	-80.630662	0.65	
8071.00	88.15	153.57	6260.87	1956.22	-2086.32	-55.25	40.095199	-80.630509	0.63	
8168.00	88.46	153.83	6263.74	2052.36	-2173.24	-12.29	40.094960	-80.630357	0.42	
8264.00	88.33	154.37	6266.43	2147.61	-2259.56	29.62	40.094722	-80.630209	0.58	
8360.00	87.84	153.79	6269.64	2242.83	-2345.86	71.56	40.094485	-80.630060	0.79	
8456.00	88.03	152.46	6273.10	2337.83	-2431.43	114.93	40.094249	-80.629906	1.40	
8552.00	87.91	154.41	6276.50	2432.90	-2517.24	157.83	40.094013	-80.629754	2.03	
8608.71	88.12	154.42	6278.46	2489.20	-2568.36	182.31	40.093873	-80.629667	0.38	Onondaga Limestone :
8648.00	88.27	154.43	6279.70	2528.20	-2603.78	199.26	40.093775	-80.629607	0.38	
8744.00	88.21	156.07	6282.65	2623.64	-2690.92	239.43	40.093535	-80.629465	1.71	
8841.00	88.09	154.13	6285.78	2720.05	-2778.85	280.25	40.093294	-80.629320	2.00	
8937.00	88.40	152.52	6288.72	2815.12	-2864.59	323.33	40.093058	-80.629167	1.71	
9033.00	91.54	155.80	6288.77	2910.39	-2950.97	365.16	40.092820	-80.629019	4.73	
9129.00	87.29	155.09	6289.75	3005.89	-3038.26	405.04	40.092580	-80.628878	4.49	
9225.00	88.89	156.06	6292.95	3101.38	-3125.62	444.71	40.092339	-80.628737	1.95	
9322.00	88.46	152.59	6295.19	3197.66	-3213.00	486.72	40.092099	-80.628588	3.60	
9418.00	88.40	152.13	6297.82	3292.50	-3298.01	531.24	40.091865	-80.628430	0.48	
9514.00	88.46	151.10	6300.45	3387.15	-3382.44	576.86	40.091633	-80.628269	1.07	
9610.00	88.64	155.95	6302.88	3482.25	-3468.32	619.63	40.091396	-80.628117	5.05	
9706.00	88.77	156.64	6305.05	3577.88	-3556.20	658.22	40.091155	-80.627980	0.73	
9802.00	88.77	155.36	6307.11	3673.48	-3643.87	697.25	40.090913	-80.627842	1.33	
9898.00	88.77	155.13	6309.17	3768.95	-3731.03	737.44	40.090673	-80.627700	0.24	
9994.00	88.64	153.21	6311.34	3864.22	-3817.42	779.26	40.090436	-80.627551	2.00	
10090.00	88.77	153.48	6313.51	3959.31	-3903.19	822.31	40.090200	-80.627399	0.31	
10187.00	88.52	152.46	6315.81	4055.30	-3989.57	866.38	40.089962	-80.627243	1.08	
10283.00	89.01	153.25	6317.88	4150.28	-4074.98	910.17	40.089727	-80.627087	0.97	
10379.00	89.26	155.48	6319.33	4245.60	-4161.51	951.70	40.089489	-80.626940	2.34	
10475.00	89.26	157.02	6320.57	4341.24	-4249.37	990.36	40.089247	-80.626803	1.60	
10572.00	89.01	153.85	6322.03	4437.74	-4337.57	1030.67	40.089005	-80.626660	3.28	
10667.00	89.32	152.98	6323.42	4531.87	-4422.52	1073.18	40.088771	-80.626510	0.97	
10764.00	89.14	152.20	6324.72	4627.79	-4508.62	1117.83	40.088534	-80.626351	0.83	
10860.00	89.20	153.22	6326.11	4722.74	-4593.92	1161.84	40.088299	-80.626195	1.06	
10956.00	89.26	155.30	6327.40	4818.04	-4680.38	1203.53	40.088061	-80.626047	2.17	
11053.00	89.38	154.55	6328.55	4914.47	-4768.24	1244.63	40.087819	-80.625902	0.78	
11149.00	88.89	153.26	6330.00	5009.70	-4854.44	1286.85	40.087582	-80.625752	1.44	
11245.00	88.95	153.53	6331.81	5104.81	-4940.26	1329.84	40.087346	-80.625600	0.29	
11342.00	89.75	154.49	6332.91	5201.05	-5027.44	1372.34	40.087106	-80.625449	1.29	
11438.00	89.75	154.34	6333.33	5296.40	-5114.03	1413.80	40.086868	-80.625302	0.16	
11533.00	89.63	156.05	6333.84	5390.88	-5200.26	1453.65	40.086631	-80.625161	1.80	
11629.00	89.45	155.37	6334.61	5486.45	-5287.76	1493.14	40.086390	-80.625021	0.73	
11725.00	89.69	156.00	6335.33	5582.02	-5375.24	1532.67	40.086149	-80.624881	0.70	
11822.00	89.51	155.28	6336.01	5678.57	-5463.60	1572.68	40.085906	-80.624739	0.77	
11918.00	89.51	153.20	6336.83	5773.87	-5550.05	1614.39	40.085668	-80.624592	2.17	
12015.00	89.20	154.31	6337.92	5870.06	-5637.04	1657.28	40.085429	-80.624440	1.19	
12111.00	89.20	154.50	6339.27	5965.40	-5723.62	1698.75	40.085191	-80.624293	0.20	
12207.00	89.32	154.74	6340.50	6060.77	-5810.34	1739.90	40.084952	-80.624147	0.28	
12304.00	89.38	154.84	6341.61	6157.17	-5898.10	1781.21	40.084710	-80.624000	0.12	
12400.00	89.32	156.77	6342.69	6252.75	-5985.65	1820.55	40.084470	-80.623861	2.01	
12496.00	89.38	154.94	6343.78	6348.33	-6073.25	1859.82	40.084229	-80.623722	1.91	
12593.00	89.63	155.06	6344.62	6444.78	-6161.16	1900.81	40.083987	-80.623577	0.29	
12688.00	89.63	155.17	6345.24	6539.25	-6247.33	1940.78	40.083750	-80.623435	0.12	
12784.00	89.69	154.82	6345.80	6634.70	-6334.33	1981.36	40.083510	-80.623292	0.37	
12881.00	89.82	155.02	6346.22	6731.14	-6422.19	2022.48	40.083268	-80.623146	0.25	
12977.00	89.75	154.13	6346.58	6826.51	-6508.89	2063.69	40.083030	-80.623000	0.93	
13074.00	89.63	154.15	6347.10	6922.79	-6596.17	2106.00	40.082790	-80.622850	0.13	
13170.00	89.69	154.87	6347.67	7018.15	-6682.83	2147.31	40.082551	-80.622704	0.75	

RECEIVED  
Office of Oil and Gas

MAR 21 2018

WV Department of  
Environmental Protection



## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
13266.00	89.51	154.57	6348.34	7113.55	-6769.63	2188.31	40.082312	-80.622558	0.36	
13363.00	89.51	152.53	6349.17	7209.69	-6856.47	2231.51	40.082073	-80.622405	2.10	
13459.00	89.57	152.87	6349.94	7304.66	-6941.77	2275.54	40.081839	-80.622249	0.36	
13555.00	89.94	153.41	6350.36	7399.72	-7027.42	2318.91	40.081603	-80.622095	0.68	
13651.00	89.88	153.78	6350.51	7494.90	-7113.40	2361.60	40.081366	-80.621944	0.39	
13747.00	93.21	154.08	6347.92	7590.09	-7199.59	2403.77	40.081129	-80.621795	3.48	
13844.00	89.08	153.99	6345.98	7686.31	-7286.76	2446.22	40.080889	-80.621644	4.26	
13940.00	89.20	154.67	6347.42	7781.63	-7373.28	2487.80	40.080651	-80.621497	0.72	
14036.00	86.79	154.19	6350.78	7876.91	-7459.81	2529.21	40.080413	-80.621350	2.56	
14132.00	87.16	153.43	6355.85	7972.00	-7545.84	2571.52	40.080176	-80.621200	0.88	
14202.00	87.23	152.52	6359.27	8041.21	-7608.12	2603.29	40.080005	-80.621087	1.30	Last WFT SVY
14225.00	87.23	152.52	6360.38	8063.92	-7628.50	2613.89	40.079949	-80.621050	0.00	Proj. to TD

RECEIVED  
Office of Oil and Gas  
MAR 21 2018  
WV Department of  
Environmental Protection

**JACKSON SURVEYING INC.**

P.O. Box 1460  
677 W. Main St.  
Clarksburg, WV 26302  
304-623-5851

<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,439,024.803 EASTING: 531,512.638
<b>LANDING POINT (LPL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,438,800.290 EASTING: 531,300.591
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,436,696.516 EASTING: 532,308.686

Latitude: 40°05'00" BH

BOTTOM HOLE 10,554'

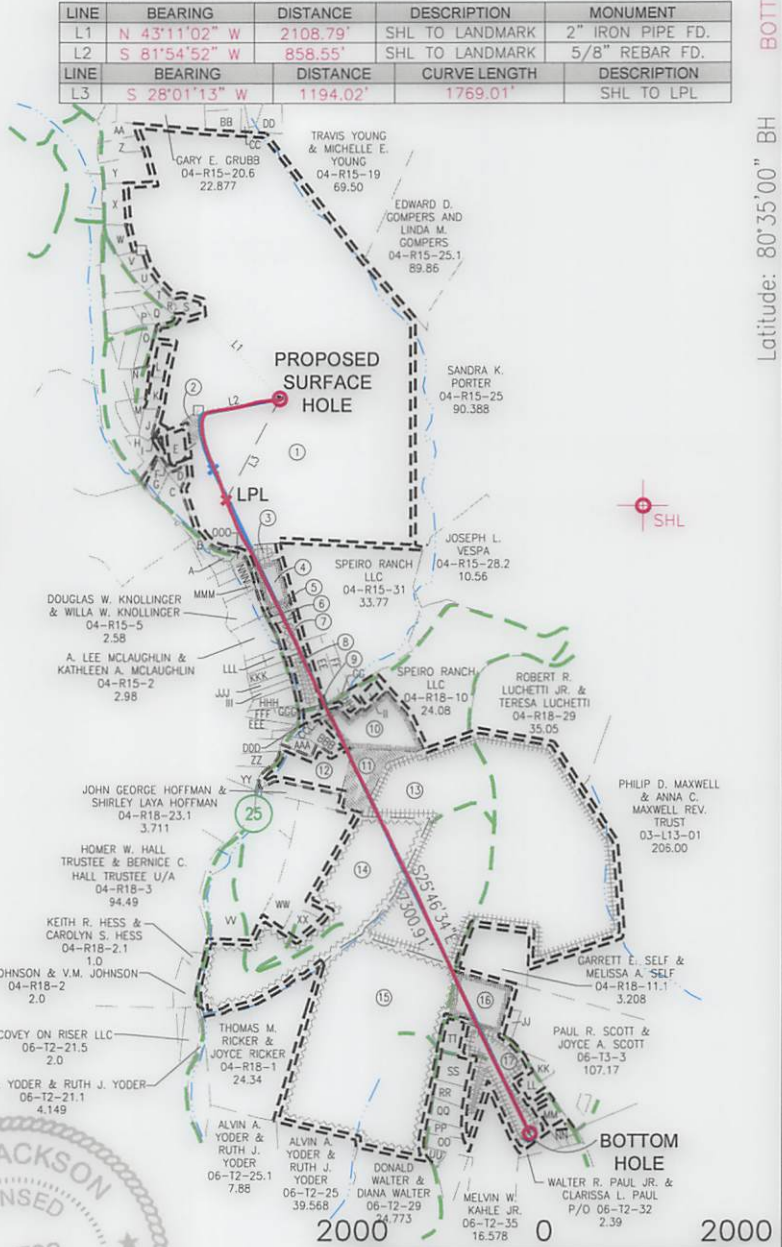
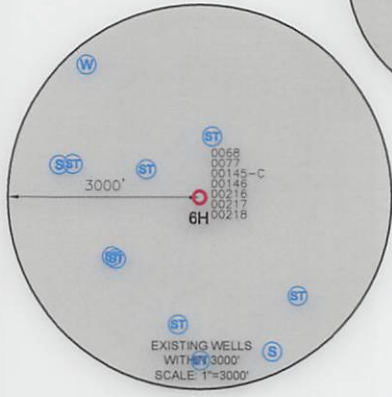
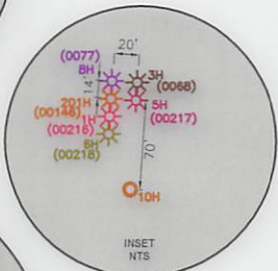
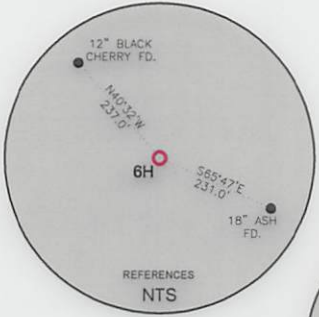
<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,439,024.801 EASTING: 531,512.542
<b>LANDING POINT (LPL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,438,703.523 EASTING: 531,341.571
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,436,699.621 EASTING: 532,309.267



Latitude: 80°35'00" BH  
Latitude: 80°37'30" SH

BOTTOM HOLE 1232'  
SURFACE HOLE 8769'

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 43°11'02" W	2108.79'	SHL TO LANDMARK	2" IRON PIPE FD.
L2	S 81°54'52" W	858.55'	SHL TO LANDMARK	5/8" REBAR FD.
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 28°01'13" W	1194.02'	1769.01'	SHL TO LPL



**WELL RESTRICTIONS**

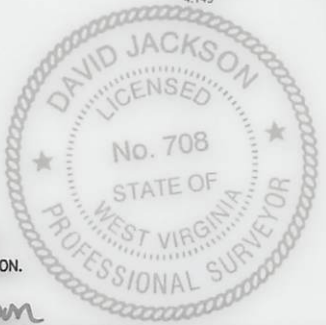
- NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
- NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
- WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
- PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
- NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

**NOTES ON SURVEY**

- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 708 *David L. Jackson*



GRAPHIC SCALE IN FEET

COMPANY: **SWN** Production Company, LLC

EDWARDS NICHOLS OHI
OPERATOR'S WELL #: 6H
API WELL #: 47 069 00218
STATE COUNTY PERMIT

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: PETERS RUN OF LITTLE WHEELING CREEK ELEVATION: 1310.4'

DISTRICT: RICHLAND COUNTY: OHIO QUADRANGLE: WHEELING (SH), VALLEY GROVE (BH)

SURFACE OWNER: EDWARD NICHOLS & JUDITH NICHOLS ACREAGE: ±240.064

OIL & GAS ROYALTY OWNER: EDWARD NICHOLS & JUDITH NICHOLS ACREAGE: ±240.064

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY) ASDRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,360 TVD 14,225 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: DEE SOUTHALL

ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300

CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

<b>LEGEND:</b>	— SURVEYED BOUNDARY	— DRILLING UNIT	— DATE: 02-08-2018
○ PROPOSED SURFACE HOLE / BOTTOM HOLE	— LEASE BOUNDARY	— ASDRILLED PATH	— DRAWN BY: N. MANO
★ EXISTING / PRODUCING WELLHEAD	— PROPOSED PATH	—	— SCALE: 1" = 2000'
LPL★ LANDING POINT LOCATION			— DRAWING NO:
⊙ EXISTING WATER WELL			— WELL LOCATION PLAT
⊕ EXISTING SPRING			





**JACKSON SURVEYING  
INC.**

P.O. Box 1460  
677 W. Main St.  
Clarksburg, WV 26302  
304-623-5851

WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS			
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	EDWARD NICHOLS & JUDITH NICHOLS (S/R)	04-R15-16	240.064
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
2	BRIAN R. MENGEU & LISA M. MENGEU	04-R15-16.29	1.262
3	CRAIG E. STEPHAN & JENNIFER L. GILES	04-R15-10	1.74
4	JOHN R. ANDERS II	04-R15-04	3.24
5	SARAH A. MARTIN & ROBERT E. MARTIN	04-R15-03	0.58
6	SARAH A. MARTIN & ROBERT E. MARTIN	04-R15-03.1	0.55
7	ROBERT KREISBERG & MELINDA S. KREISBERG	04-R15-01	2.32
8	FREDERICK JAQUAY & JANET JAQUAY	04-R18-07	3.853
9	MARK R. EDDY & RENEE R. EDDY	04-R18-13	1.17
10	TOMMY J. TYLER JR, W J TYLER & ETHEL TYLER	04-R18-12	5.00
11	JOHN G. HOFFMAN & SHIRLEY LAYA HOFFMAN	04-R18-12.3	15.93
12	JOE HORVAT & RUTH ELIZABETH HORVAT	04-R18-22	5.193
13	WILSON B. MILLER & HELEN J. MILLER	04-R18-11	125.442
14	ROBERT HOFFMAN & BESSIE HOFFMAN	04-R18-27	42.00
15	MICHAEL A. KUTHY	06-T2-27	71.57
16	JANET C.W. SPARKS & WILLIAM SPARKS JR.	06-T2-31	7.85
17	WM C. GROVER & RACHEL D. GROVER	06-T2-32	19.59

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
AAA	KEVIN HESS & STACEE L. HESS	04-R18-22.2	1.007
BBB	RANDEE JAY COX & HEATHER M. COX	04-R18-22.1	1.03
CCC	JOE HORVAT & RUTH ELIZABETH HORVAT	04-R18-22	5.193
DDD	JOE HORVAT & RUTH ELIZABETH HORVAT	04-R18-13.2	0.01
EEE	DONALD T. THOMPSON & MELISSA A. THOMPSON	04-R18-19	1.02
FFF	DONALD T. THOMPSON & MELISSA A. THOMPSON	04-R18-18	1.12
GGG	TODD M. BOLINGER	04-R18-18.1	0.474
HHH	REBECCA J. MCKENNEN	04-R18-17	1.52
III	ROBERT J. MCCONNELL JR.	04-R18-15	0.70
JJJ	LISA M. NOLTE	04-R18-16	1.14
KKK	EDWARD D. LONG & G.M. LONG	04-R18-05	0.712
LLL	A. LEE MCLAUGHLIN & KATHLEEN A. MCLAUGHLIN	04-R18-06	0.517
MMM	GINA LYNN JONES MILLER	04-R15-08	0.178
NNN	RAYMOND CLOUSTON & HYDEE D. CLOUSTON	04-R15-07	1.761
OOO	LARRY TRANK & P. TRANK	04-R15-11	0.35



REVISIONS:	COMPANY:		 	
	OPERATOR'S		EDWARD NICHOLS OHI	
	WELL #:		6H	
	DISTRICT:	COUNTY:	STATE:	DATE: 02-08-2018
	RICHLAND	OHIO	WV	DRAWN BY: N. MANO
				SCALE: N/A
				DRAWING NO:
				WELL LOCATION PLAT 2



**JACKSON SURVEYING  
INC.**

P.O. Box 1460  
677 W. Main St.  
Clarksburg, WV 26302  
304-623-5851

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	LARRY TRANK & PATRICIA TRANK	04-R15-11.1	0.55
B	LARRY TRANK & PATRICIA TRANK	04-R15-16.17	0.62
C	ENEIDA K. BAKER	04-R15-16.15	2.16
D	ENEIDA K. BAKER	04-R15-16.28	0.576
E	CHRISTOPHER T. NORMAN	04-R15-16.25	1.21
F	ENEIDA K. BAKER	04-R15-16.30	0.232
G	ENEIDA K. BAKER	04-R15-16.16	1.09
H	JEFFREY W. PFISTER & JENNIFER J. PFISTER	04-R15-16.33	1.36
I	JEFFREY W. PFISTER & JENNIFER J. PFISTER	04-R15-16.34	0.419
J	RICHARD L. BRAK	04-R15-16.21	1.173
K	CECIL CHIPLINSKI & TAMMY K. CHIPLINSKI	04-R15-16.23	1.023
L	PATTY M. JEWETT & JAMES A. JEWETT	04-R15-16.24	1.01
M	LESLIE DAVID LEWIS	04-R15-16.22	1.484
N	GREGORY FUNARI & DEANNA L. FUNARI	04-R15-16.20	1.000
O	OLDGA V. RINE & DENISE E. RINE	04-R15-16.4	1.049
P	CHARLES L. HODGSON & K.P. HODGSON	04-R15-16.3	0.766
Q	EDWARD E. NICHOLS & MARJORIE C. NICHOLS	04-R15-16.18	1.91
R	EDWARD J. NICHOLS, MARJORIE C. NICHOLS & JUDY C. NICHOLS	04-R15-16.31	0.192
S	JUDITH C. NICHOLS	04-R15-16.32	0.953
T	EDWARD J. NICHOLS, MARJORIE C. NICHOLS & JUDY C. NICHOLS	04-R15-16.19	0.219
U	LAWRENCE D. BOLE & J.L. BOLE	04-R15-16.14	0.772
V	LAWRENCE R. DIXON & JAMES M. DIXON	04-R15-16.7	0.875
W	ANDREW S. GAUDINO	04-R15-18	1.37
X	TAMILA LYNN WADE, C/O TAMILA L. HIGLEY	04-R15-16.10	2.73
Y	BOARD OF COMMISSION OHIO COUNTY	04-R15-16.11	3.09
Z	LINDA H. ROSS	04-R15-16.12	1.62
AA	HAROLD L. PICKENS, DEBORAH A. MCCLELLAND	04-R15-16.13	1.59
BB	M & J CONSTRUCTION	04-R15-32.18	6.886
CC	WEST RENTALS INC.	04-R15-32	10.219
DD	RONALD WILLIAM KASSERMAN & ELIZABETH A. KASSERMAN	04-R15-32.10	1.932
EE	EDWARD M. PACK	04-R18-7.1	2.14
FF	RONALD A. CHILDERS	04-R18-08	1.43
GG	MARK R. EDDY & RENEE R EDDY	04-R18-13.1	0.10
HH	TOMMY J. TYLER JR. & TOMMY J. TYLER SR.	04-R18-12.1	0.5327
II	TOMMY J. TYLER JR. & W. J. TYLER & ETHEL TYLER	04-R18-12.2	0.58
JJ	KERRY A. MARSHALL JR. & DANIELLE M. PHILLIPS	06-T3-03.2	0.585
KK	RICHARD P. SCOTT & LEAH C. SCOTT	06-T3-03.1	0.752
LL	CARL E. GROVER & SONDR A. GROVER	06-T3-31	1.0
MM	JAMES J. KUTHY	06-T3-32	1.0
NN	WALTER PAUL JR., WALTER PAUL SR. & CLARISSA L. PAUL	06-T3-30	0.70
OO	MARY M. REICHENBACH	06-T2-33	1.5
PP	MARY M. REICHENBACH	06-T2-32.1	1.0
QQ	MARY M. REICHENBACH	06-T2-32.2	1.31
RR	MARY M. REICHENBACH	06-T2-32.3	1.31
SS	LAURA KRINER	06-T2-32.4	2.0
TT	RACHAEL D. COLEMAN & VINCENT S. COLEMAN	06-T2-32.5	1.20
UU	ROBERT A. ORUM	06-T2-34.1	0.528
VV	DALE E. HOFFMAN & SHIRLEY L. HOFFMAN HOFFMAN FAMILY TRUST	04-R18-27.1	13.28
WW	ERIC P. WEISENBORN	04-R18-27.5	10.00
XX	ERIC P. WEISENBORN	04-R18-23	1.45
YY	MARY BETH LAFOLLETT & KAYLA MARIE BRITTON	04-R18-21.3	2.80
ZZ	MARY BETH LAFOLLETT & KAYLA MARIE BRITTON	04-R18-20	2.90

REVISIONS:	COMPANY:	 		
	OPERATOR'S	EDWARD NICHOLS OHI		DATE: 02-08-2018
	WELL #:	6H		DRAWN BY: N. MANO
	DISTRICT:	COUNTY:	STATE:	SCALE: N/A
	RICHLAND	OHIO	WV	DRAWING NO:
				WELL LOCATION PLAT 3