WR-35
Rev. 8/23/13

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

API 47 - 009 - 00190 County BROOKE District BUFFALO
Quad BETHANY Pad Name ALAN H. DEGARMO PAD Field/Pool Name PANHANDLE FIELD WET
Farm name ALAN H. DEGARMO & MARY DEGARMO Well Number ALAN H. DEGARMO BRK 5H
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 4,4555,197.262 Easting 536,394.767
Landing Point of Curve Northing 4,455,320.105 Easting 536,548.886
Bottom Hole Northing 4,457,101.890 Easting 535,653.697

Elevation (ft) 1204 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 5/31/2017 Date drilling commenced 10/02/2017 Date drilling ceased 11/02/2017
Date completion activities began 01/08/2018 Date completion activities ceased 3/01/2018
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 212 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 428 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 271 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: SB 6/11/18

Reviewed
C. Bel 6/11/18

WR-35
Rev. 8/23/13

API 47- 009 - 00190 Farm name ALAN H. DEGARMO & MARY DEGARMO Well number ALAN H. DEGARMO BRK 5H

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	345	NEW	J-55/54.50#	159.7 & 201.5	Y
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1688	NEW	J-55/36#		Y, 38 BBLS
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	12772	NEW	HCP-110/20#		Y
Tubing		2.375	6468	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^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	486	15.60	1.19	578.34	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	656	15.60	1.19	780.64	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2311	15.60	1.19	2750.09	SURFACE	24
Tubing							

Drillers TD (ft) 12772 Loggers TD (ft) 12772
Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
Plug back procedure N/A

Kick off depth (ft) 5035

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

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

WR-35
Rev. 8/23/13

API 47- 009 - 00190 Farm name ALAN H. DEGARMO & MARY DEGARMO Well number ALAN H. DEGARMO BRK 5H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHMENT	1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations 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 (units)
		SEE	ATTACHMENT	2				

Please insert additional pages as applicable.

WR-35
Rev. 8/23/13

API 47- 009 - 00190 Farm name ALAN H. DEGARMO & MARY DEGARMO Well number ALAN H. DEGARMO BRK 5H

PRODUCING FORMATION(S)	DEPTHS			
MARCELLUS	5886	TVD	6198	MD

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown □ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface 917 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	5,877 mcfpd	696 bpd	_____ bpd	499 bpd	□ Estimated □ Orifice □ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
	SEE	ATTACHMENT	3		

Please insert additional pages as applicable.

Drilling Contractor SWN DRILLING COMPANY
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

Logging Company WEATHERFORD
Address 2000 ST. JAMES PLACE City HOUSTON State TX Zip 77056

Cementing Company SCHLUMBERGER WELL SERVICES
Address 1080 US HWY 33 EAST City WESTON State WV Zip 26452

Stimulating Company HALLIBURTON ENERGY SERVICES
Address 5146 ELK RIVER ROAD City BLUE CREEK State WV Zip 25026

Please insert additional pages as applicable.

Completed by BOBBY WILLIS Telephone 832-796-2884
Signature _____ Title REGULATORY ANALYST Date 5/15/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

ALAN H DEGARMO BRK 5H

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	1/30/2018	12,560	12,672	42
2	1/11/2018	12,416	12,528	42
3	1/12/2018	12,272	12,384	42
4	1/18/2018	12,128	12,240	42
5	1/19/2018	11,984	12,096	42
6	1/19/2018	11,840	11,952	42
7	1/19/2018	11,696	11,808	42
8	1/20/2018	11,552	11,664	42
9	1/20/2018	11,408	11,520	42
10	1/20/2018	11,264	11,376	42
11	1/20/2018	11,120	11,232	42
12	1/21/2018	10,976	11,088	42
13	1/21/2018	10,832	10,944	42
14	1/22/2018	10,688	10,800	42
15	1/23/2018	10,544	10,654	42
16	1/24/2018	10,400	10,512	42
17	1/24/2018	10,256	10,368	42
18	1/25/2018	10,112	10,224	42
19	1/26/2018	9,968	10,080	42
20	1/27/2018	9,824	9,934	42
21	1/27/2018	9,680	9,792	42
22	1/28/2018	9,536	9,648	42
23	1/28/2018	9,392	9,504	42
24	1/29/2018	9,248	9,360	42
25	1/30/2018	9,104	9,216	42
26	1/30/2018	8,960	9,072	42
27	1/31/2018	8,816	8,928	42
28	2/1/2018	8,672	8,784	42
29	2/2/2018	8,528	8,640	42
30	2/2/2018	8,384	8,496	42
31	2/3/2018	8,240	8,352	42
32	2/3/2018	8,096	8,208	42
33	2/4/2018	7,952	8,064	42
34	2/5/2018	7,808	7,915	42
35	2/5/2018	7,664	7,776	42
36	2/5/2018	7,520	7,632	42
37	2/6/2018	7,376	7,488	42
38	2/6/2018	7,228	7,344	42
39	2/7/2018	7,088	7,200	42
40	2/9/2018	6,944	7,054	42
41	2/9/2018	6,800	6,910	42
42	2/9/2018	6,656	6,766	42
43	2/10/2018	6,512	6,624	42

ALAN H DEGARMO BRK 5H
ATTACHMENT 2
STIM REPORT

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	1/11/2018	98	7,776	8,103	3,817	484,700	8,138	
2	1/11/2018	98	7,819	8,148	4,057	505,420	8,002	
3	1/18/2018	94	7,758	8,947	4,388	517,540	7,861	
4	1/19/2018	94	7,571	7,935	4,186	517,980	7,617	
5	1/19/2018	92	7,680	9,673	5,852	474,400	7,361	
6	1/19/2018	89	6,950	8,699	4,597	476,140	7,428	
7	1/19/2018	99	7,568	8,182	4,334	502,580	6,816	
8	1/20/2018	90	7,997	9,084	3,701	504,660	7,822	
9	1/20/2018	100	7,435	9,073	4,666	507,740	6,973	
10	1/20/2018	97	7,617	8,210	4,265	509,840	6,994	
11	1/21/2018	97	7,383	7,849	4,148	520,940	6,760	
12	1/21/2018	92	7,309	8,362	4,230	502,430	7,041	
13	1/22/2018	96	7,677	8,622	4,708	510,800	7,149	
14	1/23/2018	98	7,466	8,771	4,509	517,450	6,892	
15	1/24/2018	88	7,047	7,747	4,413	495,140	7,344	
16	1/24/2018	95	6,747	7,086	4,186	504,960	7,428	
17	1/25/2018	97	7,330	8,135	4,499	503,120	7,718	
18	1/26/2018	97	7,564	8,823	4,508	501,900	7,503	
19	1/27/2018	93	7,101	7,732	4,215	501,520	6,896	
20	1/27/2018	97	7,240	7,871	4,533	503,080	6,787	
21	1/28/2018	101	7,306	8,099	4,594	503,300	7,120	
22	1/28/2018	100	7,328	8,479	4,404	492,860	7,448	
23	1/29/2018	98	7,468	8,325	4,452	497,720	6,888	
24	1/29/2018	97	7,182	8,880	4,116	506,040	7,881	
25	1/30/2018	96	7,751	9,082	3,895	497,700	7,526	
26	1/31/2018	98	7,508	8,770	4,511	509,460	7,418	
27	2/1/2018	97	7,776	8,769	4,293	500,840	7,317	
28	2/2/2018	99	7,345	7,804	3,990	506,760	7,641	
29	2/2/2018	99	7,084	7,807	4,554	494,720	6,779	
30	2/3/2018	99	7,592	8,556	4,009	503,580	7,340	
31	2/3/2018	100	7,004	7,959	4,053	506,660	7,474	
32	2/4/2018	101	7,148	7,678	4,020	509,900	7,432	
33	2/4/2018	100	7,187	8,096	4,234	515,140	7,258	
34	2/5/2018	100	6,848	7,104	4,311	525,060	7,368	
35	2/5/2018	100	6,839	8,216	3,927	502,100	6,716	
36	2/6/2018	99	6,758	7,448	4,418	499,560	7,078	
37	2/6/2018	99	6,875	7,823	3,966	500,480	7,153	
38	2/7/2018	99	6,877	7,366	4,176	494,200	7,036	
39	2/9/2018	98	6,434	7,133	3,554	511,720	6,793	
40	2/9/2018	99	7,079	7,703	4,345	493,770	7,027	
41	2/9/2018	98	6,948	7,845	4,466	512,520	6,925	
42	2/10/2018	99	6,399	7,942	4,608	502,820	6,654	
43	2/10/2018	99	6,742	7,247	4,242	494,620	5,957	

swn
Southwestern Energy®

Well Name: **Alan H Degarmo BRK 5H** 47009001900000

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	0.00	0.00	212.00	212.00	
Top of Salt Water	428.00	428.00	NA	NA	
Pittsburgh Coal	271.00	271.00	NA	NA	
Pottsville (ss)	420.00	420.00	499.00	499.00	
Mauch Chunk (shale)	501.00	501.00	1279.00	1279.00	
Raven Cliff (ss)	755.00	755.00	951.00	951.00	
Maxton (ss)	1144.00	1144.00	1205.00	1205.00	
Greenbriar (ls)	1279.00	1279.00	1458.00	1458.00	
Big Injun (ss)	1458.00	1458.00	1601.00	1601.00	
Berea (siltstone)	1948.00	1948.00	1999.00	1999.00	
Rhinestreet (shale)	5614.00	5517.00	5698.00	5589.00	
Cashaqua (shale)	5698.00	5589.00	5755.00	5637.00	
Middlesex (shale)	5755.00	5637.00	5835.00	5699.00	
Burket (shale)	5835.00	5699.00	5856.00	5714.00	
Tully (ls)	5856.00	5714.00	5942.00	5772.00	
Mahantango (shale)	5942.00	5772.00	6198.00	5886.00	
Marcellus (shale)	6198.00	5886.00	NA	NA	GAS

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/11/2018
Job End Date:	2/10/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00197-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Alan H DeGarmo BRK 5H
Latitude:	40.24642047
Longitude:	-80.57228869
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,879
Total Base Water Volume (gal):	12,939,618
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	83.01372	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.44618	

SCAL16486A	NALCO	Scale Inhibitor					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
FDP-S1176-15	Halliburton	Friction Reducer					
				Listed Below			
HAI-150E	Halliburton	Corrosion Inhibitor					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
Hydrochloric Acid	Halliburton	Solvent					
				Listed Below			
BIOC11219A	NALCO	Biocide					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	16.47888	
			Hydrochloric acid	7647-01-0	15.00000	0.05947	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02485	
			Methanol	67-56-1	60.00000	0.01353	
			Polyacrylate	Proprietary	30.00000	0.01284	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01201	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01201	
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00676	
			Glutaraldehyde	111-30-8	10.00000	0.00225	
			Castor oil, ethoxylated	61791-12-6	5.00000	0.00214	
			Sobitan, mono-9-octadececenoate, (Z)	1338-43-8	5.00000	0.00214	
			9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00214	
			Ammonium chloride	12125-02-9	5.00000	0.00214	
			Sodium chloride	7647-14-5	5.00000	0.00214	
			Ethylene Glycol	107-21-1	30.00000	0.00157	
			Amine Triphosphate	Proprietary	30.00000	0.00157	
			Sodium Phosphate	7632-05-5	30.00000	0.00157	
			Non-hazardous food substance	Proprietary	100.00000	0.00030	

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)

SWN Production Company, LLC
P O Box 12359
Spring, Texas 77391-2359
www.swn.com

Via Federal Express

May 15, 2018

State of West Virginia
Department of Environmental Protection
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

RE: SWN Production Company, LLC
Operator ID: 494512924
Regulatory Filings: WR-34 & WR-35

To Whom It May Concern:

Please find enclosed forms WR-34 Discharge Monitoring Report and WR-35 Well Operator's Report of Well Work for the Alan H. Degarmo BRK 1H (API 47-009-00193) and Alan H. Degarmo BRK 5H (API 47-009-00190).

If you have any questions or require additional information, please contact me via email at bobby_willis@swn.com or telephone at (832) 796-2884.

Sincerely,

Bobby Willis
Regulatory Analyst
SW Appalachia Division

RECEIVED
Office of Oil and Gas
MAY 16 2018
WV Department of
Environmental Protection

/bw
Encl.

Southwestern Energy

Alan H Degarmo BRK 5H

Brooke Co, WV

SDC 40

Plan vs Actual

Plan Data for Alan H Degarmo BRK 5H

Plan Point Information:

DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	VSec (USft)	DLS (DLSU)	Toolface (°)	Comments
0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.0	
26.00	0.00	0.00	26.00	-0.00	0.00	0.00	0.00	0.0	KB Offset
600.00	0.00	0.00	600.00	-0.00	0.00	0.00	0.00	0.0	Nudge KOP
850.00	5.00	340.00	849.68	10.24	-3.73	10.90	2.00	340.0	Build/Turn
1570.23	11.00	104.12	1565.70	23.04	52.47	2.50	2.00	140.6	Hold
5073.00	11.00	104.12	5004.11	-140.02	700.63	-383.96	0.00	0.0	Curve KOP 7° DLS
6178.31	70.00	333.34	5871.66	379.89	545.57	156.83	7.00	226.8	Build/Turn 9° DLS
6408.73	90.74	333.17	5910.00	581.65	443.89	381.71	9.00	359.5	Landing Point
12782.18	90.74	333.17	5828.00	6268.72	-2432.11	6723.99	0.00	0.0	PBHL AHD5H

Target Set Information:

Name: Alan H Degarmo BRK 5H

Position offsets from Slot centre

Name	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	Lat (°)	Long (°)
LP AHD5H	5910.00	426.09	522.56	14617185.86	1760344.45	40.247596	-80.570209
PBHL AHD5H	5828.00	6268.72	-2432.11	14623028.49	1757389.78	40.263679	-80.580698

Plan Data for Alan H Degarmo BRK 5H

Field: SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)

Map Unit: USFt Vertical Reference Datum (VRD):

Projected Coordinate System: NAD83 / UTM zone 17N

Site: Alan H Degarmo Pad

Unit: USFeet TVD Reference:

Company Name: SOUTHWESTERN ENERGY

Position: Northing: 14616754.85USft Latitude: 40.246420°

Easting: 1759766.13USft Longitude: -80.572289°

North Reference: Grid Grid Convergence: 0.28°

Elevation Above VRD: 1204.00USft

Slot: Alan H Degarmo BRK 5H

Position:

Offset is from Site centre

+N/-S: 4.92USft Northing: 14616759.77USft Latitude: 40.246433°

+E/-W: 55.76USft Easting: 1759821.89USft Longitude: -80.572089°

Elevation Above VRD: 1204.00USft

Well: Alan H Degarmo BRK 5H

Type: Main-Well

File Number:

Plan Folder: P1 Plan: P1:V3

Vertical Section: Position offset of origin from Slot centre:

+N/-S: -0.00USft Azimuth: 338.79°

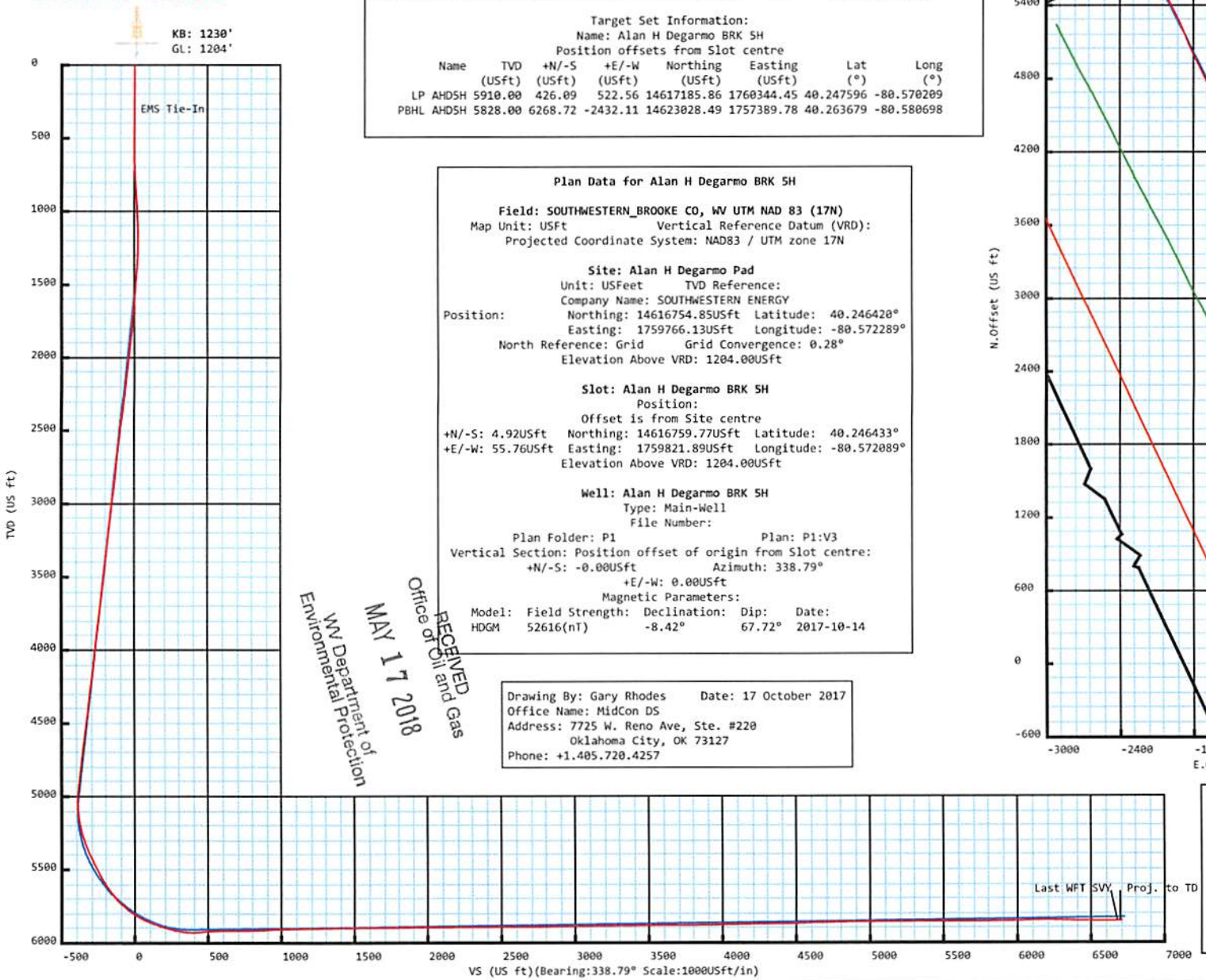
+E/-W: 0.00USft

Magnetic Parameters:

Model:	Field Strength:	Declination:	Dip:	Date:
HDGM	52616(nT)	-8.42°	67.72°	2017-10-14

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

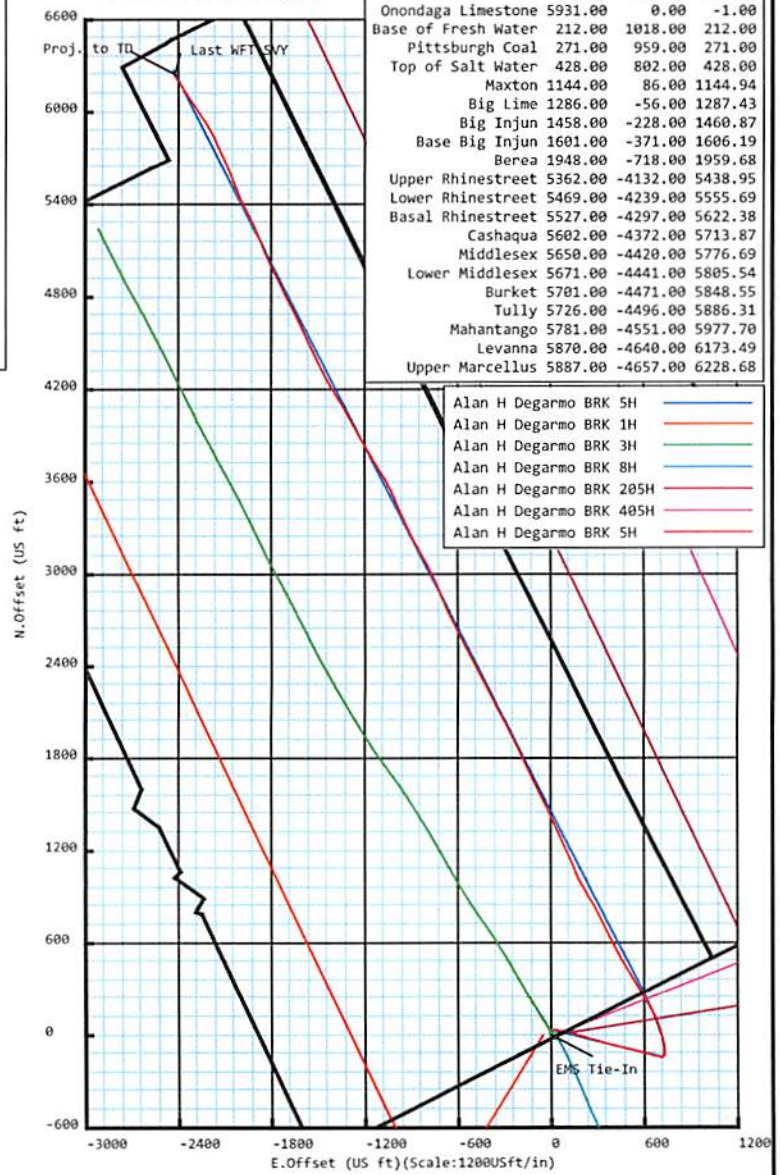
Drawing By: Gary Rhodes Date: 17 October 2017
Office Name: MidCon DS
Address: 7725 W. Reno Ave, Ste. #220
Oklahoma City, OK 73127
Phone: +1.405.720.4257

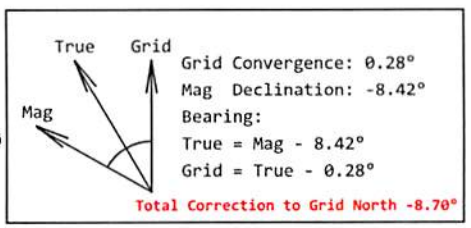


Plan Data for Alan H Degarmo BRK 5H

Formation Point Information:

Name	TVD (USft)	SS (USft)	MD (USft)
Onondaga Limestone	5931.00	0.00	-1.00
Base of Fresh Water	212.00	1018.00	212.00
Pittsburgh Coal	271.00	959.00	271.00
Top of Salt Water	428.00	802.00	428.00
Maxton	1144.00	86.00	1144.94
Big Lime	1286.00	-56.00	1287.43
Big Injun	1458.00	-228.00	1460.87
Base Big Injun	1601.00	-371.00	1606.19
Berea	1948.00	-718.00	1959.68
Upper Rhinestreet	5362.00	-4132.00	5438.95
Lower Rhinestreet	5469.00	-4239.00	5555.69
Basal Rhinestreet	5527.00	-4297.00	5622.38
Cashaqua	5602.00	-4372.00	5713.87
Middlesex	5650.00	-4420.00	5776.69
Lower Middlesex	5671.00	-4441.00	5805.54
Burket	5701.00	-4471.00	5848.55
Tully	5726.00	-4496.00	5886.31
Mahantango	5781.00	-4551.00	5977.70
Levanna	5870.00	-4640.00	6173.49
Upper Marcellus	5887.00	-4657.00	6228.68





Southwestern Energy®

5D Survey Report

SOUTHWESTERN ENERGY

Field Name: *SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)*
Site Name: *Alan H Degarmo Pad*
Well Name: *Alan H Degarmo BRK 5H*
Survey: *Definitive survey*

8 November 2017

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

Weatherford®

Alan H Degarmo BRK 5H

Field Name: SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)

Map Units: US ft **Company Name:** SOUTHWESTERN ENERGY

Vertical Reference Datum (VRD):

Projected Coordinate System: NAD83 / UTM zone 17N

Comment:

Site: Alan H Degarmo Pad

Units: US ft **North Reference:** Grid **Convergence Angle:** 0.28

Position: **Northing:** 14616754.85 US ft **Latitude:** 40.246420
Easting: 1759766.13 US ft **Longitude:** -80.572289

Elevation above Field Reference: 1204.00 US ft

Comment:

Slot: Alan H Degarmo BRK 5H

Position (Relative to Site Centre)

+N/-S: 4.92 US ft **Northing:** 14616759.77 US ft **Latitude:** 40.246433
+E/-W: 55.76 US ft **Easting:** 1759821.89 US ft **Longitude:** -80.572089

Elevation above Field Reference: 1204.00 US ft

Comment:

Well: Alan H Degarmo BRK 5H

Type: Main well **UWI:**

File Number: **Comment:**

Closure Distance: 6704.95US ft **Closure Azimuth:** 338.74°

Vertical Section: Position of Origin (Relative to Slot centre)

+N/-S: -0.00 US ft **+E/-W:** 0.00 US ft **Az:** 338.79°

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

Drill floor: Survey Name: Definitive Survey

Rig Height (Drill Floor): 26.00US ft **Elevation above Field Reference:** 1230.00US ft **Inclination:** 0.00° **Azimuth:** 0.00°

Survey Name: Definitive Survey

Date: 13/Oct/2017 **Survey Tool:** *See Survey Tool Ranges below.* **Comment:** **Company:**

Magnetic Model:

Model Name: HDGM **Date:** 14/Oct/2017 **Field Strength:** 52616.0nT **Declination:** -8.42° **Dip:** 67.72°

Tie Point:

MD: 0.00 US ft **Inclination:** 0.00° **Azimuth:** 0.00° **TVD:** 0.00 US ft **North Offset:** -0.00 US ft **East Offset:** 0.00 US ft

Survey Tool Ranges:

Name	Start MD(USFt)	End MD(USFt)	Source Survey
EMS	0.00	324.00	EMS
MWD	324.00	595.00	WFT MWD_01-1
MFAC_US_V2	595.00	685.00	WFT MWD_01-MFAC-1
MWD	685.00	1242.00	WFT MWD_01-2
MFAC_US_V2	1242.00	1334.00	WFT MWD_01-MFAC-2
MWD	1334.00	1427.00	WFT MWD_01-3
MFAC_US_V2	1427.00	1626.00	WFT MWD_01-MFAC-3
MWD	1626.00	6217.00	WFT MWD_02
MWD	6217.00	12058.00	WFT MWD_03

5D Survey Report

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
MWD	12058.00	12772.00	WFT MWD_04

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)

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	0.00	-0.00	0.00	40.246433	-80.572089	0.00	
175.00	0.50	96.61	175.00	-0.36	-0.09	0.76	40.246433	-80.572086	0.29	
212.00	0.46	100.89	212.00	-0.51	-0.13	1.06	40.246433	-80.572085	0.15	Base of Fresh Water :
264.00	0.40	108.41	264.00	-0.74	-0.23	1.44	40.246433	-80.572084	0.15	
271.00	0.42	104.02	271.00	-0.77	-0.24	1.49	40.246432	-80.572083	0.51	Pittsburgh Coal :
324.00	0.60	81.31	323.99	-0.94	-0.25	1.95	40.246432	-80.572082	0.51	EMS Tie-In
414.00	0.81	96.07	413.99	-1.33	-0.25	3.05	40.246432	-80.572078	0.31	
428.01	0.82	96.83	428.00	-1.42	-0.27	3.24	40.246432	-80.572077	0.11	Top of Salt Water :
504.00	0.88	100.62	503.98	-1.99	-0.44	4.36	40.246432	-80.572073	0.11	
595.00	0.72	36.93	594.97	-2.05	-0.11	5.39	40.246433	-80.572069	0.94	
685.00	2.39	352.04	684.93	0.07	2.20	5.47	40.246439	-80.572069	2.16	
778.00	4.18	348.09	777.78	5.30	7.44	4.50	40.246454	-80.572073	1.94	
870.00	4.01	356.63	869.54	11.68	13.93	3.62	40.246471	-80.572076	0.69	
963.00	3.73	20.34	962.34	17.04	20.01	4.48	40.246488	-80.572072	1.73	
1056.00	4.52	37.21	1055.10	21.22	25.77	7.75	40.246504	-80.572061	1.55	
1145.17	4.47	52.30	1144.00	24.05	30.69	12.63	40.246517	-80.572043	1.32	Maxton :
1149.00	4.48	52.95	1147.82	24.13	30.87	12.86	40.246518	-80.572042	1.32	
1242.00	4.33	76.99	1240.55	24.62	33.85	19.18	40.246526	-80.572019	1.98	
1287.59	4.66	90.44	1286.00	23.69	34.23	22.71	40.246527	-80.572007	2.42	Big Lime :
1334.00	5.22	101.77	1332.24	21.85	33.78	26.66	40.246526	-80.571993	2.42	
1427.00	6.86	104.98	1424.72	16.27	31.48	36.17	40.246519	-80.571959	1.80	
1460.54	7.58	102.99	1458.00	13.84	30.47	40.26	40.246516	-80.571944	2.28	Big Injun :
1520.00	8.88	100.27	1516.84	9.24	28.77	48.60	40.246512	-80.571914	2.28	
1605.43	10.92	96.61	1601.00	2.02	26.66	63.13	40.246506	-80.571862	2.50	Base Big Injun :
1613.00	11.10	96.35	1608.43	1.35	26.50	64.56	40.246505	-80.571857	2.50	
1626.00	11.40	96.10	1621.18	0.18	26.22	67.09	40.246504	-80.571848	2.34	
1734.00	11.48	96.70	1727.03	-9.75	23.83	88.37	40.246497	-80.571772	0.13	
1827.00	11.50	100.14	1818.17	-18.90	21.12	106.69	40.246490	-80.571706	0.74	
1920.00	11.47	106.64	1909.31	-29.40	16.84	124.68	40.246478	-80.571642	1.39	
1959.47	11.40	106.21	1948.00	-34.17	14.63	132.18	40.246472	-80.571615	0.28	Berea :
2012.00	11.31	105.62	1999.50	-40.42	11.79	142.13	40.246464	-80.571579	0.28	
2105.00	10.51	109.92	2090.82	-51.46	6.45	158.89	40.246449	-80.571519	1.23	
2198.00	10.21	109.94	2182.30	-62.46	0.75	174.61	40.246433	-80.571463	0.32	
2291.00	10.00	108.74	2273.86	-73.07	-4.66	190.00	40.246418	-80.571408	0.32	
2383.00	11.10	108.12	2364.30	-83.81	-9.98	205.99	40.246403	-80.571351	1.20	
2476.00	11.18	107.72	2455.55	-95.15	-15.51	223.08	40.246388	-80.571290	0.12	
2569.00	10.94	106.36	2546.82	-106.19	-20.74	240.14	40.246373	-80.571229	0.38	
2662.00	10.51	104.38	2638.20	-116.51	-25.33	256.82	40.246360	-80.571169	0.61	
2754.00	10.19	103.08	2728.70	-125.98	-29.26	272.88	40.246349	-80.571111	0.43	
2847.00	10.71	105.30	2820.16	-135.75	-33.40	289.23	40.246338	-80.571053	0.71	
2940.00	10.49	106.78	2911.57	-146.10	-38.12	305.67	40.246324	-80.570994	0.38	
3033.00	11.15	106.73	3002.92	-156.84	-43.15	322.38	40.246310	-80.570934	0.71	
3125.00	10.93	107.24	3093.22	-167.73	-48.30	339.23	40.246296	-80.570874	0.26	
3218.00	10.10	106.98	3184.65	-178.26	-53.30	355.45	40.246282	-80.570816	0.89	
3310.00	10.87	104.35	3275.12	-188.29	-57.80	371.57	40.246270	-80.570758	0.99	
3403.00	10.68	103.91	3366.48	-198.34	-62.05	388.43	40.246258	-80.570698	0.22	
3496.00	11.20	104.67	3457.79	-208.59	-66.41	405.54	40.246245	-80.570637	0.58	
3589.00	10.84	104.84	3549.07	-219.03	-70.93	422.73	40.246233	-80.570575	0.39	
3681.00	10.97	105.34	3639.41	-229.34	-75.46	439.53	40.246220	-80.570515	0.17	

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)

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
3774.00	11.75	104.57	3730.59	-240.14	-80.19	457.23	40.246207	-80.570452	0.85	
3867.00	11.26	104.02	3821.72	-250.91	-84.77	475.20	40.246194	-80.570387	0.54	
3960.00	10.24	101.66	3913.09	-260.64	-88.64	492.11	40.246183	-80.570327	1.19	
4052.00	10.94	100.08	4003.52	-269.61	-91.82	508.71	40.246174	-80.570267	0.82	
4145.00	12.20	102.50	4094.63	-279.64	-95.49	527.00	40.246164	-80.570202	1.45	
4238.00	12.42	106.53	4185.49	-291.22	-100.46	546.18	40.246150	-80.570133	0.95	
4330.00	11.73	106.28	4275.45	-302.96	-105.90	564.64	40.246135	-80.570067	0.75	
4423.00	10.73	104.58	4366.67	-313.78	-110.73	582.09	40.246121	-80.570005	1.13	
4516.00	11.84	105.78	4457.87	-324.58	-115.50	599.65	40.246108	-80.569942	1.22	
4609.00	12.30	106.16	4548.82	-336.33	-120.86	618.35	40.246093	-80.569875	0.50	
4701.00	11.88	105.66	4638.78	-347.96	-126.14	636.88	40.246078	-80.569809	0.47	
4794.00	11.50	104.98	4729.85	-359.18	-131.12	655.05	40.246064	-80.569744	0.43	
4887.00	11.24	104.30	4821.02	-369.92	-135.75	672.79	40.246051	-80.569680	0.31	
4980.00	11.06	103.33	4912.27	-380.24	-140.05	690.25	40.246039	-80.569618	0.28	
5026.00	10.73	101.53	4957.44	-385.05	-141.92	698.74	40.246034	-80.569587	1.03	
5072.00	8.89	87.08	5002.77	-388.49	-142.60	706.49	40.246032	-80.569560	6.65	
5119.00	9.07	65.56	5049.21	-389.42	-140.88	713.49	40.246037	-80.569534	7.12	
5165.00	9.50	45.01	5094.62	-387.68	-136.69	719.48	40.246048	-80.569513	7.23	
5211.00	10.77	24.68	5139.91	-383.16	-130.10	723.96	40.246066	-80.569497	8.20	
5257.00	12.65	10.51	5184.96	-375.88	-121.24	726.67	40.246091	-80.569487	7.44	
5304.00	14.89	0.66	5230.62	-365.89	-110.14	727.68	40.246121	-80.569483	6.88	
5350.00	17.61	355.95	5274.78	-353.76	-97.29	727.26	40.246156	-80.569484	6.57	
5396.00	20.42	353.43	5318.26	-339.34	-82.37	725.85	40.246197	-80.569489	6.36	
5443.00	22.77	350.66	5361.96	-322.50	-65.25	723.43	40.246244	-80.569497	5.45	
5443.04	22.77	350.66	5362.00	-322.49	-65.23	723.43	40.246244	-80.569497	4.17	Upper Rhinestreet :
5489.00	24.36	347.97	5404.12	-304.42	-47.19	720.01	40.246294	-80.569509	4.17	
5535.00	25.23	348.36	5445.88	-285.39	-28.30	716.06	40.246346	-80.569523	1.92	
5560.66	26.26	347.85	5469.00	-274.39	-17.40	713.76	40.246376	-80.569531	4.09	Lower Rhinestreet :
5568.00	26.55	347.71	5475.57	-271.17	-14.21	713.07	40.246385	-80.569534	4.09	
5614.00	28.00	345.79	5516.46	-250.29	6.31	708.23	40.246441	-80.569551	3.69	
5625.96	28.46	345.27	5527.00	-244.67	11.79	706.81	40.246456	-80.569556	4.36	Basal Rhinestreet :
5661.00	29.82	343.84	5557.60	-227.70	28.23	702.27	40.246501	-80.569572	4.36	
5707.00	32.79	341.71	5596.90	-203.86	51.04	695.17	40.246564	-80.569597	6.89	
5713.08	33.16	341.44	5602.00	-200.55	54.18	694.13	40.246573	-80.569600	6.58	Cashaqua :
5753.00	35.62	339.81	5634.94	-178.02	75.45	686.64	40.246631	-80.569627	6.58	
5771.70	37.09	338.85	5650.00	-166.94	85.82	682.72	40.246660	-80.569641	8.46	Middlesex :
5798.41	39.21	337.58	5671.00	-150.44	101.14	676.60	40.246702	-80.569662	8.46	Lower Middlesex :
5799.00	39.26	337.55	5671.46	-150.07	101.48	676.45	40.246703	-80.569663	8.46	
5838.02	42.33	334.86	5701.00	-124.60	124.80	666.15	40.246767	-80.569699	9.07	Burket :
5846.00	42.97	334.35	5706.87	-119.21	129.68	663.84	40.246780	-80.569708	9.07	
5872.69	45.41	332.74	5726.00	-100.69	146.33	655.54	40.246826	-80.569737	10.07	Tully :
5892.00	47.19	331.65	5739.34	-86.82	158.68	649.03	40.246860	-80.569760	10.07	
5939.00	50.79	330.40	5770.18	-51.69	189.69	631.84	40.246946	-80.569821	7.92	
5956.47	52.69	330.08	5781.00	-38.13	201.60	625.03	40.246978	-80.569845	10.98	Mahantango :
5985.00	55.80	329.59	5797.66	-15.26	221.62	613.40	40.247034	-80.569887	10.98	
6031.00	60.46	329.98	5821.95	23.31	255.37	593.75	40.247127	-80.569957	10.16	
6078.00	64.48	329.13	5843.67	64.44	291.29	572.63	40.247225	-80.570032	8.70	
6124.00	68.40	328.91	5862.05	105.99	327.43	550.93	40.247325	-80.570109	8.53	
6146.41	70.06	328.90	5870.00	126.63	345.37	540.10	40.247374	-80.570147	7.39	Levanna :
6170.00	71.80	328.89	5877.70	148.59	364.46	528.59	40.247427	-80.570188	7.39	
6200.76	73.03	329.24	5887.00	177.49	389.61	513.52	40.247496	-80.570242	4.15	Upper Marcellus :
6217.00	73.68	329.43	5891.65	192.84	403.00	505.58	40.247533	-80.570270	4.15	
6263.00	74.64	330.30	5904.20	236.55	441.27	483.37	40.247638	-80.570349	2.77	
6310.00	77.31	330.85	5915.59	281.68	480.98	460.97	40.247748	-80.570429	5.79	
6356.00	82.46	331.39	5923.67	326.54	520.62	439.10	40.247857	-80.570506	11.26	

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)

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
6402.00	87.04	332.09	5927.88	371.99	560.96	417.42	40.247968	-80.570583	10.07	
6433.00	91.17	332.98	5928.36	402.80	588.45	403.13	40.248044	-80.570634	13.63	
6495.00	95.50	333.87	5924.76	464.40	643.80	375.45	40.248196	-80.570732	7.13	
6588.00	92.16	334.06	5918.54	556.85	727.16	334.72	40.248426	-80.570877	3.60	
6680.00	89.94	332.89	5916.86	648.44	809.46	293.65	40.248652	-80.571022	2.73	
6773.00	90.74	329.24	5916.31	740.57	890.83	248.66	40.248876	-80.571182	4.02	
6866.00	91.54	329.24	5914.46	832.26	970.73	201.11	40.249096	-80.571351	0.86	
6959.00	93.14	338.53	5910.65	924.74	1054.07	160.25	40.249326	-80.571496	10.13	
7051.00	91.79	336.14	5906.69	1016.62	1138.88	124.83	40.249559	-80.571622	2.98	
7144.00	90.80	335.63	5904.59	1109.47	1223.74	86.84	40.249792	-80.571756	1.20	
7237.00	90.86	337.25	5903.24	1202.38	1308.98	49.68	40.250027	-80.571888	1.74	
7330.00	90.99	334.92	5901.74	1295.26	1393.97	11.98	40.250261	-80.572022	2.51	
7422.00	90.80	334.25	5900.31	1387.00	1477.06	-27.49	40.250490	-80.572162	0.76	
7515.00	90.43	334.78	5899.31	1479.73	1561.01	-67.51	40.250721	-80.572304	0.69	
7608.00	90.43	334.31	5898.61	1572.47	1644.98	-107.48	40.250952	-80.572446	0.51	
7701.00	90.43	334.22	5897.91	1665.18	1728.75	-147.86	40.251182	-80.572589	0.10	
7793.00	90.56	334.43	5897.12	1756.90	1811.66	-187.72	40.251410	-80.572730	0.27	
7886.00	90.49	334.52	5896.27	1849.63	1895.58	-227.79	40.251641	-80.572872	0.12	
7979.00	91.48	333.64	5894.67	1942.30	1979.21	-268.43	40.251872	-80.573017	1.42	
8071.00	89.51	332.28	5893.87	2033.81	2061.15	-310.25	40.252097	-80.573165	2.60	
8164.00	90.18	332.61	5894.12	2126.24	2143.60	-353.28	40.252324	-80.573318	0.80	
8257.00	90.62	332.41	5893.47	2218.68	2226.09	-396.20	40.252551	-80.573470	0.52	
8349.00	90.43	332.75	5892.63	2310.13	2307.75	-438.57	40.252776	-80.573621	0.42	
8442.00	90.37	332.32	5891.98	2402.58	2390.27	-481.46	40.253003	-80.573773	0.47	
8534.00	90.56	332.78	5891.23	2494.03	2471.91	-523.87	40.253228	-80.573924	0.54	
8627.00	90.31	332.69	5890.53	2586.50	2554.57	-566.47	40.253456	-80.574075	0.29	
8720.00	90.06	334.05	5890.23	2679.09	2637.71	-608.15	40.253684	-80.574223	1.49	
8812.00	89.88	334.03	5890.28	2770.77	2720.42	-648.43	40.253912	-80.574366	0.20	
8905.00	90.62	336.53	5889.87	2863.59	2804.89	-687.31	40.254144	-80.574504	2.80	
8998.00	90.62	338.20	5888.86	2956.55	2890.72	-723.10	40.254381	-80.574630	1.80	
9091.00	90.80	337.23	5887.71	3049.52	2976.77	-758.37	40.254617	-80.574755	1.06	
9183.00	90.80	331.33	5886.43	3141.19	3059.61	-798.27	40.254845	-80.574897	6.41	
9276.00	90.74	330.26	5885.18	3233.27	3140.78	-843.64	40.255069	-80.575058	1.15	
9369.00	90.56	332.70	5884.12	3325.50	3222.48	-888.04	40.255294	-80.575216	2.63	
9461.00	90.62	334.93	5883.17	3417.15	3305.03	-928.63	40.255521	-80.575360	2.42	
9554.00	90.74	336.00	5882.07	3509.98	3389.62	-967.25	40.255754	-80.575497	1.16	
9647.00	90.71	337.73	5880.89	3602.92	3475.14	-1003.78	40.255989	-80.575626	1.86	
9739.00	89.82	333.81	5880.47	3694.77	3559.01	-1041.53	40.256220	-80.575760	4.37	
9832.00	90.62	329.13	5880.11	3786.98	3640.70	-1085.94	40.256445	-80.575918	5.11	
9925.00	90.56	328.42	5879.15	3878.56	3720.22	-1134.15	40.256664	-80.576089	0.77	
10017.00	91.41	331.20	5877.57	3969.41	3799.72	-1180.40	40.256883	-80.576254	3.16	
10110.00	90.79	331.38	5875.79	4061.59	3881.27	-1225.06	40.257107	-80.576412	0.69	
10203.00	90.93	330.85	5874.39	4153.75	3962.69	-1269.98	40.257331	-80.576572	0.59	
10296.00	91.23	331.40	5872.64	4245.90	4044.11	-1314.89	40.257556	-80.576732	0.67	
10388.00	90.80	329.17	5871.01	4336.87	4124.00	-1360.48	40.257776	-80.576894	2.47	
10481.00	90.80	328.26	5869.71	4428.42	4203.47	-1408.77	40.257994	-80.577065	0.98	
10574.00	92.47	332.79	5867.05	4520.39	4284.37	-1454.50	40.258217	-80.577228	5.19	
10667.00	91.42	333.45	5863.90	4612.88	4367.28	-1496.52	40.258445	-80.577377	1.33	
10760.00	91.48	335.09	5861.54	4705.55	4451.03	-1536.88	40.258676	-80.577520	1.76	
10852.00	90.92	335.64	5859.62	4797.37	4534.63	-1575.22	40.258906	-80.577656	0.85	
10945.00	90.44	334.73	5858.51	4890.18	4619.04	-1614.25	40.259138	-80.577795	1.11	
11038.00	90.55	333.18	5857.71	4982.84	4702.59	-1655.08	40.259368	-80.577940	1.67	
11131.00	90.43	333.72	5856.91	5075.43	4785.78	-1696.65	40.259597	-80.578087	0.59	
11223.00	90.06	334.56	5856.52	5167.12	4868.56	-1736.77	40.259825	-80.578230	1.00	
11316.00	90.43	334.44	5856.12	5259.86	4952.50	-1776.81	40.260056	-80.578372	0.42	
11409.00	90.74	334.19	5855.17	5352.57	5036.31	-1817.12	40.260287	-80.578515	0.43	
11501.00	90.12	337.27	5854.48	5444.43	5120.17	-1854.93	40.260518	-80.578649	3.41	
11594.00	89.81	337.61	5854.54	5537.40	5206.05	-1890.60	40.260754	-80.578775	0.49	
11687.00	90.26	334.02	5854.48	5630.26	5290.87	-1928.70	40.260987	-80.578910	3.89	

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)

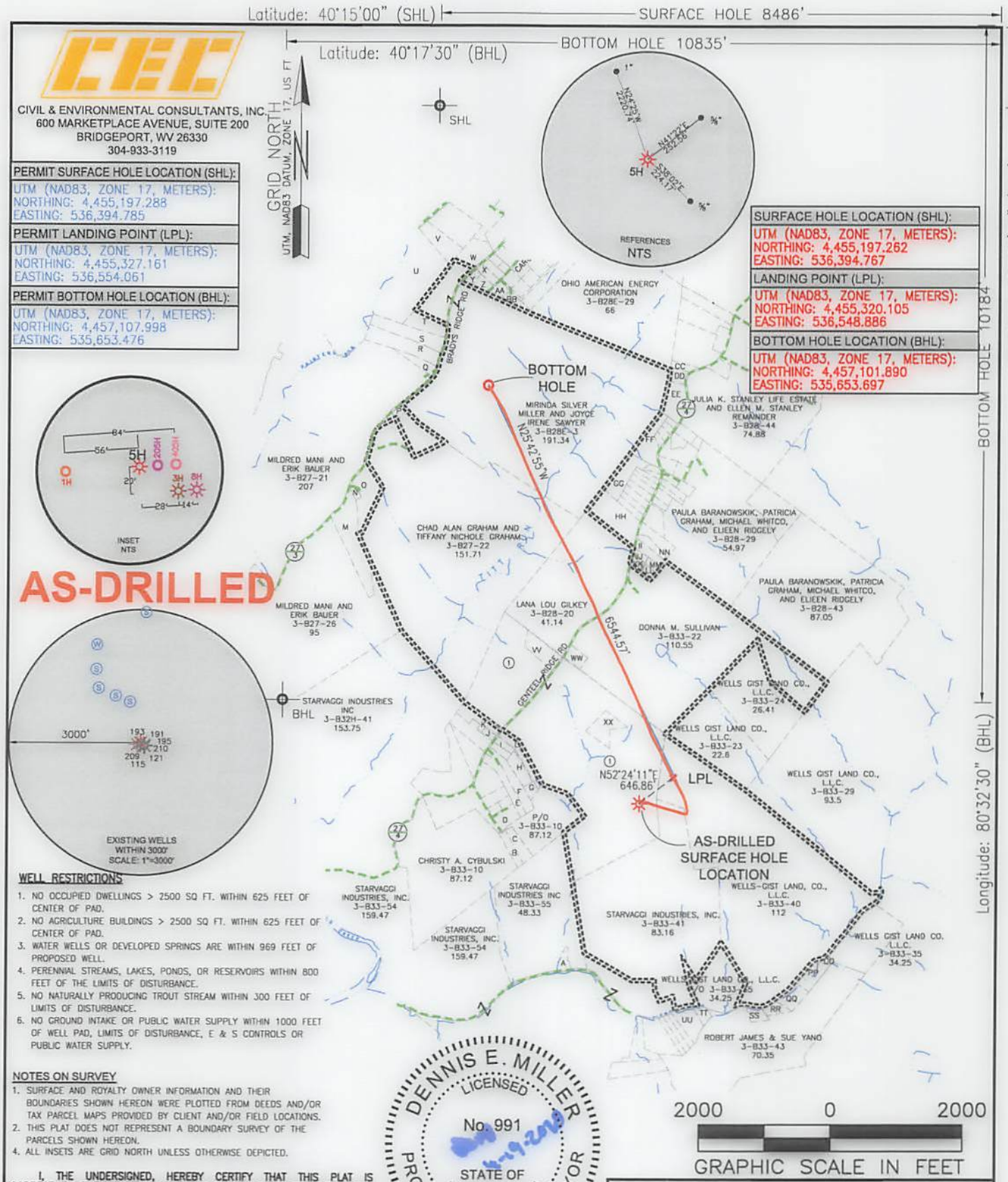
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
11780.00	89.75	332.37	5854.47	5722.81	5373.88	-1970.64	40.261216	-80.579059	1.86	
11872.00	90.86	336.73	5853.98	5814.54	5456.92	-2010.16	40.261444	-80.579200	4.89	
11965.00	90.68	339.29	5852.73	5907.51	5543.14	-2044.98	40.261681	-80.579323	2.76	
12058.00	91.05	337.23	5851.33	6000.49	5629.51	-2079.42	40.261919	-80.579445	2.25	
12151.00	91.91	334.01	5848.93	6093.30	5714.18	-2117.79	40.262152	-80.579581	3.58	
12243.00	91.11	337.31	5846.50	6185.12	5797.96	-2155.69	40.262383	-80.579715	3.69	
12336.00	87.54	330.70	5847.60	6277.72	5881.49	-2196.42	40.262613	-80.579860	8.08	
12429.00	88.89	325.97	5850.50	6369.11	5960.58	-2245.20	40.262830	-80.580034	5.29	
12522.00	89.45	326.85	5851.85	6459.93	6038.04	-2296.64	40.263044	-80.580217	1.12	
12614.00	90.00	326.55	5852.29	6549.89	6114.94	-2347.15	40.263256	-80.580396	0.68	
12707.00	90.37	328.15	5851.99	6641.03	6193.24	-2397.33	40.263471	-80.580575	1.77	
12749.00	90.80	328.35	5851.56	6682.32	6228.95	-2419.43	40.263570	-80.580653	1.13	Last WFT SVY
12772.00	91.05	328.47	5851.19	6704.94	6248.54	-2431.47	40.263624	-80.580696	1.21	Proj. to TD

RECEIVED
Office of Oil and Gas
MAY 17 2018
WV Department of
Environmental Protection

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
600 MARKETPLACE AVENUE, SUITE 200
BRIDGEPORT, WV 26330
304-933-3119

PERMIT SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,455,197.288 EASTING: 536,394.785
PERMIT LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,455,327.161 EASTING: 536,554.061
PERMIT BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,457,107.998 EASTING: 535,653.476

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,455,197.262 EASTING: 536,394.767
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,455,320.105 EASTING: 536,548.886
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,457,101.890 EASTING: 535,653.697



WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 969 FEET OF PROPOSED WELL.
4. PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 800 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. 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

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. 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. 991

DENNIS E. MILLER
LICENSED
No. 991
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

COMPANY: SWN Production Company, LLC — SWN Production Company™

(+) 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)

OPERATOR'S WELL #: ALAN H DEGARMO BRK 5H

API WELL #: 47 (STATE) 009 (COUNTY) 00190 (PERMIT)

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

WATERSHED: UPPER OHIO SOUTH
ELEVATION: 1204.0
DISTRICT: BUFFALO COUNTY: BROOKE
QUADRANGLE: BETHANY
SURFACE OWNER: ALAN H. DEGARMO & MARY KAY DEGARMO LIFE ESTATE ACREAGE: 140.97±
OIL & GAS ROYALTY OWNER: ALAN H. DEGARMO ACREAGE: 140.97±

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: 5851 TVD 12,772 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: P.O. BOX 1300
CITY: JANE LEW STATE: WV ZIP CODE: 26378

DESIGNATED AGENT: DEE SOUTHALL
ADDRESS: P.O. BOX 1300
CITY: JANE LEW STATE: WV ZIP CODE: 26378

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- EXISTING WATER WELL
- EXISTING SPRING
- SURVEYED BOUNDARY
- DRILLING UNIT
- LEASE BOUNDARY
- ASDRILLED PATH
- PROPOSED PATH

REVISIONS:

DATE: 04-18-2017
DRAWN BY: K.E.S.
SCALE: 1" = 2000'
DRAWING NO: 164-764
WELL LOCATION PLAT

P:\2016\164-764\-SURVEY\DWG\ALAN H DEGARMO BRK 5H ASDRILLED 11-22-2017.DWG
THURSDAY APRIL 19 2018 09:14AM

PROPERTY NUMBER 2501166066
PAD ID 3001155492

AS-DRILLED

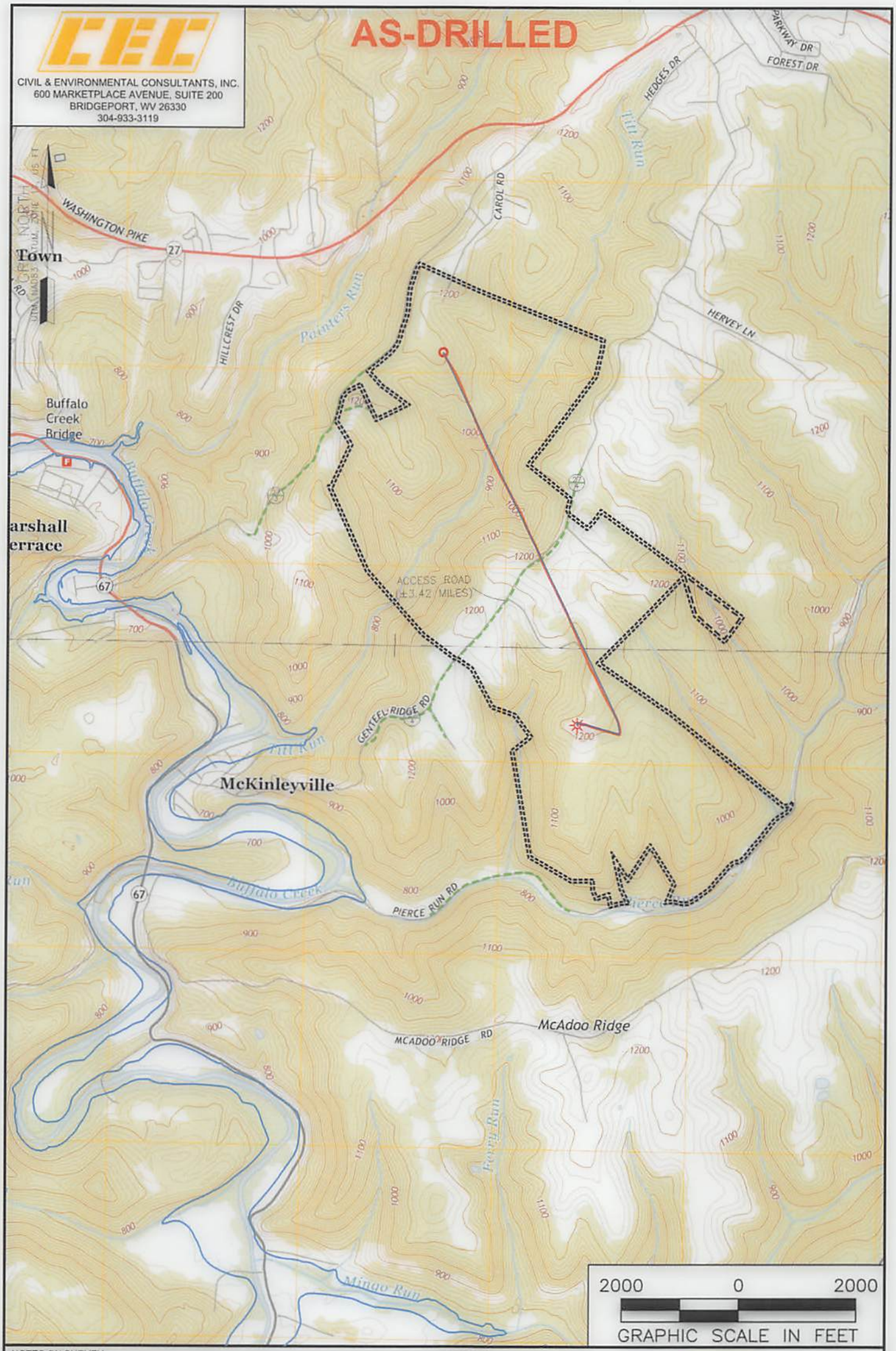
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
600 MARKETPLACE AVENUE, SUITE 200
BRIDGEPORT, WV 26330
304-933-3119

WELL BORE TABLE FOR SURFACE OWNERS			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	ALAN H. DEGARMO AND MARY KAY DEGARMO LIFE ESTATE	3-B33-20	140.97
2	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	GENTEEL RIDGE ROAD	1.68

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	CHARLES STEWART	3-B33-55.1	1.01
B	JEFFERY L. MARTINDILL	3-B33-9	1.6
C	RICHARD C. & BONNIE OLENICK	3-B33-8	1.4
D	EDWARD FRANK MARKER III & TERESA ANN MARKER	3-B33-11	1.68
E	JOHN WILLIAM & HELEN DARLENE MCGOWAN	3-B33-15	2.49
F	JOHN WILLIAM & HELEN DARLENE MCGOWAN	3-B33-16	2.50
G	ROBERT ANTILL JR. & CYNTHIA ANTILL	3-B33-17.2	1.053
H	LEONARD F. WOODS III & LISA MARIE WOODS	3-B33-17.1	2.0
I	ROBERT ANTILL JR. & CYNTHUIA ANTILL	3-B33-18	0.90
J	THOMAS M. & DEBORAH J. OLDAKER	3-B33-2	0.41
K	THOMAS M. & DEBORAH J. OLDAKER	3-B33-1	2.39
L	JOANN MYERS LIFE ESTATE & JAMES W. MYERS REMAINDER	3-B33-19	2.40
M	MICHEAL W. SOMON	3-B27-25	3.12
N	ANTHONY & KRYSTEN LONG	3-B27-24	0.68
O	LARRY B. & SHELLY ARACICH	3-B27-23	5.01
P	VERMURI HOME & GARDEN LLC.	3-B27-20	0.459
Q	DAVID E. & DEBORAH CRAWFORD	3-B27-19	1.60
R	DAVID E. & DEBORAH CRAWFORD	3-B27H-50	5.69
S	JAMES & KRISTIE FLOYD	3-B27H-49	5.03
T	MARY B. WILSON NORTHCRAFT	3-B27H-48	3.22
U	WILLIAM GEORGE ALLISON & CHERYL ANN ALLISON	3-B27H-48.1	18.49
V	ROBERT & LUANN SOMON	3-B28E-1	3.92
W	GEORGE & DEBORAH A STRAKA	3-B28E-2	3.46
X	RUSSELL D HERVEY	3-B28E-5	1.0
Y	JOEL LYNN ROGERS SR.	3-B28E-4	1.0
Z	JOEL LYNN ROGERS SR.	3-B28E-14	1.0
AA	CHAD E. ROGERS	3-B28E-15	1.0
BB	LARRY & JOAN NICHOLSON	3-B28E-16	1.13
CC	CALVIN STANLEY & LYNETTE STANLEY	3-B28-1	0.85
DD	CALVIN STANLEY & LYNETTE STANLEY	3-B28-2	1.15
EE	DANIEL STANLEY	3-B28-3	3.89
FF	JOHN & LUANNE SNYDER	3-B28-8	4.382
GG	JOHN & LUANNE SNYDER	3-B28-9	4.04
HH	LANA LOU GILKEY	3-B28-19	8.83
II	RYAN & CAROLYN BOOK	3-B28-25	1.60
JJ	ROBERT W & TAMMY L HOLMES	3-B28-24	0.5
KK	ALEXANDER & DONNA DIGHT	3-B28-21	0.74
LL	ALEXANDER & DONNA DIGHT	3-B28-22	0.67
MM	ALEXANDER & DONNA DIGHT	3-B28-23	0.66
NN	CHARLES & MADELIN MCGOWAN	3-B28-26	1.0
OO	TRUSTEES OF THE STONE CHAPEL CHURCH	3-B33-36	0.3
PP	JOH T & MARLENA L SMITH	3-B33-37	2.0
QQ	LEONA LAROCHE, LAWRENCE MCLAUGHLIN, & FLOYD HENNIS	3-B33-38	2.18
RR	LEONA LAROCHE, LAWRENCE MCLAUGHLIN, & FLOYD HENNIS	3-B33-39	1.1
SS	CHARLES & ETHEL RUSSELL	3-B33-42	1.0
TT	LISA MERIGO	3-B33-44	1.0
UU	AMY & NICKOLAS CROSS	3-B33-45	3.52
VV	KATHRYN DEGARMO	3-B33-20.1	2.50
WW	MARRY ANN CHARLTON & DAVID M. EDWARDS	3-B33-21	1.53
XX	PATRICK DEGARMO	3-B33-20.2	1.53

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #:	ALAN H DEGARMO BRK 5H	DATE: 04-18-2017
	DISTRICT: BUFFALO	COUNTY: BROOKE	STATE: WV
			DRAWN BY: K.E.S.
			SCALE: N/A
			DRAWING NO: 164-764
			WELL LOCATION PLAT 2

P:\2016\164-764\-SURVEY\DWG\ALAN H DEGARMO BRK 5H ASDRILLED 11-22-2017.DWG
THURSDAY APRIL 19 2018 09:15AM



NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH
- ASDRILLED PATH

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: ALAN H DEGARMO BRK	WELL # 5H	SERIAL # XXXX
ADDRESS: P.O. BOX 1300 JANE LEW, WV 26378	COUNTY - CODE BROOKE - 009	DISTRICT; BUFFALO	
SURFACE OWNER: ALAN H. DEGARMO & MARY KAY DEGARMO LIFE ESTATE	USGS 7 1/2 QUADRANGLE MAP NAME BETHANY, WV		

P:\2016\164-764\-SURVEY\DWG\ALAN H DEGARMO BRK 5H ASDRILLED 11-22-2017.DWG
THURSDAY APRIL 19 2018 09:13AM

PROPERTY NUMBER 2501166066
PAD ID 3001155492