

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

API 47-051-01882 County MARSHALL District LIBERTY
Quad LITTLETON(SH)-WILEYVILLE(BH) Pad Name SHAWN HARLAN-MSH-PAD1 Field/Pool Name VICTORY FIELD WET
Farm name SCOTT L. HARLAN AND SHAWN HARLAN Well Number SHAWN HARLAN MSH 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 4,398,287.637 Easting 532,286.071
Landing Point of Curve Northing 4,398,540.920 Easting 532,469.025
Bottom Hole Northing 4,399,461.330 Easting 531,484.421

Elevation (ft) 1390.6' 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 10/27/2016 Date drilling commenced 11/20/2016 Date drilling ceased 01/04/2017
Date completion activities began 4/21/2017 Date completion activities ceased 5/13/2017
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 319' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 750' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1107' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED

NAME: [Signature]
DATE: 8/28/17

Reviewed by: [Signature]
09/15/2017

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API 47- 051 - 01882 Farm name SCOTT L. HARLAN AND SHAWN HARLAN Well number SHAWN HARLAN MSH 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	24	20	126	NEW	J-55/94#		Y
Surface	17.5	13.375	594	NEW	J-55/54.5#		Y; 20 BBLS RETURNED
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	2668	NEW	J-55/36#		Y: 63 BBLS RETURNED
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	12059	NEW	HCP-110/20#		Y
Tubing		2.375	7512	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	44	15.60			SURFACE	24
Surface	CLASS A	520	15.60	1.19	618.8	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	1103	16.00	1.12	1235.36	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	875/1095	15.60	1.22/1.19	1067.5/1303.05	SURFACE	24
Tubing							

Drillers TD (ft) 12059' Loggers TD (ft) 12059'
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure _____

Kick off depth (ft) 6525'

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

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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 _____

SHAWN HARLAN MSH 5H
PERF SUMMARY

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	4/22/2017	11,831	11,973	42
2	4/22/2017	11,579	11,770	42
3	4/22/2017	11,327	11,518	36
4	4/22/2017	11,075	11,266	36
5	4/22/2017	10,823	11,014	36
6	4/23/2017	10,571	10,762	36
7	4/23/2017	10,319	10,510	36
8	4/23/2017	10,067	10,258	36
9	4/24/2017	9,815	10,006	36
10	4/24/2017	9,563	9,754	36
11	4/24/2017	9,311	9,502	36
12	4/24/2017	9,059	9,250	36
13	4/25/2017	8,807	8,998	36
14	4/25/2017	8,555	8,746	36
15	4/25/2017	8,303	8,494	36
16	4/26/2017	8,051	8,242	36
17	4/26/2017	7,799	7,990	36
18	4/26/2017	7,547	7,738	36

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SHAWN HARLAN MSH SH
FRAC STAGE SUMMARY

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 bbbls	Amount of nitrogen/other
1	4/22/2017	95	7,981	8,605	4,373	500,340	8,263	
2	4/22/2017	94	8,015	8,396	4,875	505,320	7,602	
3	4/22/2017	89	7,855	8,344	4,356	500,480	6,992	
4	4/22/2017	90	8,150	8,399	4,774	499,280	7,259	
5	4/22/2017	87	7,903	8,620	4,142	503,140	8,733	
6	4/23/2017	87	7,502	8,095	4,163	487,380	4,974	
7	4/23/2017	91	7,666	8,478	4,074	496,120	4,891	
8	4/23/2017	83	7,939	9,491	4,592	494,440	11,442	
9	4/24/2017	83	8,109	8,541	4,361	493,140	6,112	
10	4/24/2017	81	8,036	8,607	4,204	502,640	6,787	
11	4/24/2017	88	7,862	8,317	4,451	499,600	6,529	
12	4/24/2017	89	7,463	8,640	4,648	495,440	6,052	
13	4/25/2017	75	8,032	8,748	4,885	340,360	8,569	
14	4/25/2017	88	7,613	7,925	4,569	493,680	6,354	
15	4/25/2017	90	8,414	8,919	4,167	501,320	8,173	
16	4/25/2017	87	7,733	8,528	3,803	498,080	6,431	
17	4/26/2017	67	8,162	8,834	4,530	496,480	9,019	
18	4/26/2017	89	7,463	7,883	4,536	480,640	6,362	

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Well Name: SHAWN HARLAN MSH 5H

47051018820000

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	N. A.	N. A.	319.00	319.00	
Top of Salt Water	750.00	750.00	N. A.	N. A.	
Pittsburgh Coal	1107.00	1106.76	1116.00	1115.71	
Big Injun (ss)	2400.00	2386.00	2520.00	2504.00	
Berea (siltstone)	2879.00	2855.00	2925.00	2900.99	
Rhinestreet (shale)	6579.45	6507.69	6899.12	6815.63	
Cashaqua (shale)	6899.12	6815.63	7037.31	6933.93	
Middlesex (shale)	7037.31	6933.93	7168.75	7027.27	
Burket (shale)	7168.75	7027.27	7208.08	7050.61	
Tully (ls)	7208.08	7050.61	7254.14	7075.44	
Mahantango (shale)	7254.14	7075.44	7564.02	7173.45	
Marcellus (shale)	7564.02	7173.45	N. A.	N. A.	GAS

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/21/2017
Job End Date:	4/26/2017
State:	West Virginia
County:	Marshall
API Number:	47-051-01882-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Shawn Harlan 5H
Latitude:	39.73386700
Longitude:	-80.62322300
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,181
Total Base Water Volume (gal):	5,426,133
Total Base Non Water Volume:	0



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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	SWN	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	82.66412	None
Sand (Proppant)	Keane	Proppant					
			Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	16.04296	None
Hydrochloric Acid (15%)	Keane	Acidizing					
			Water	7732-18-5	85.00000	0.99009	None
			Hydrochloric Acid	7647-01-0	15.00000	0.17472	None
KFR-17	Keane	Friction Reducer					
			Distillates (petroleum), hydrotreated light	64742-47-8	45.00000	0.05454	None
			ethanediol	107-21-1	10.00000	0.01212	None
			Fatty alcohols ethoxylated	Proprietary	2.00000	0.00242	None
			Alcohols, C12-16, ethoxylated	68213-24-1	2.00000	0.00242	None
KFEAC-30	Keane	Iron Control					
			acetic acid	64-19-7	60.00000	0.00294	None
			Citric acid	77-92-9	40.00000	0.00196	None
KAI-16	Keane	Acid Inhibitor					
			isopropanol	67-63-0	60.00000	0.00120	None

			Ethoxylated Fatty Alcohol	Proprietary	30.00000	0.00060	None
			Ethoxylated Alcohol	Proprietary	10.00000	0.00020	None
			Aromatic aldehyde	Proprietary	10.00000	0.00020	None
			Alkoxylated fatty amine	Proprietary	5.00000	0.00010	None
			Methanol	67-56-1	1.00000	0.00002	None
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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	85.00000	0.99009	
			ethanediol	107-21-1	10.00000	0.01212	
			Fatty alcohols ethoxylated	Proprietary	2.00000	0.00242	
			Alcohols, C12-16, ethoxylated	68213-24-1	2.00000	0.00242	
			Citric acid	77-92-9	40.00000	0.00196	
			Ethoxylated Fatty Alcohol	Proprietary	30.00000	0.00060	
			Ethoxylated Alcohol	Proprietary	10.00000	0.00020	
			Aromatic aldehyde	Proprietary	10.00000	0.00020	
			Alkoxylated fatty amine	Proprietary	5.00000	0.00010	
			Methanol	67-56-1	1.00000	0.00002	
			Water	7732-18-5	92.50000		
			Oxyalkylated alcohol	Proprietary	5.00000		
			ammonium chloride	12125-02-9	5.00000		

* 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)

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SURFACE HOLE

11,216'

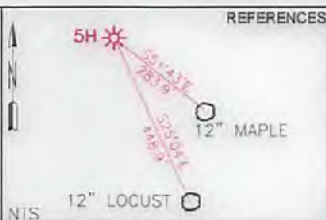
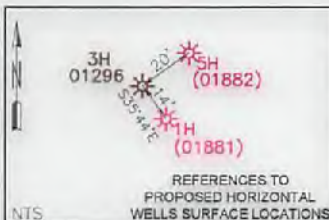
Latitude: 39°45'00"

BOTTOM HOLE

2,115'

JACKSON SURVEYING INC.

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



REFERENCES	NUMBER	DIRECTION	DISTANCE
	L1	N61°51'26\"/>	
	L2	S24°01'35\"/>	
	L3	N34°50'30\"/>	

ROYALTY OWNERS FOR (1):
JANET E. WILBUR A/K/A JANET T. WILBUR, A/K/A JANET E. TEAGARDEN WILBUR, DAVID A. TEAGARDEN, EVA T. STALKER (EVA T. STALKER, TRUSTEE OF THE EVA T. STALKER TRUST, DATED DECEMBER 28, 1989), JEANNE G. DECLUE (THE JEANNE GOVRO DE CLUE, REVOCABLE LIVING TRUST UDT JULY 9, 2001), STEPHEN E. JUSTMAN, HAYHURST COMPANY (CHESTNUT HOLDINGS, INC.), JACK HAMMERS, PAUL HAMMERS, TWILA ORA WHIPKEY (TWILA ORA WHIPKEY TRUST DATED 8/25/1999, WESBANCO BANK WHEELING, TRUSTEE), TONI JO MASON, ERICA M. MASON, O.E. BURGE (ONWARD E. BURGE, SARAH L. BURGE AND STEPHEN W. BURGE, TRUSTEES OF THE ONWARD E. BURGE TRUST DATED JUNE 21, 2010 & SARAH L. BURGE, ONWARD E. BURGE AND STEPHEN W. BURGE, TRUSTEES OF THE SARAH L. BURGE TRUST DATED JUNE 21, 2010), A.L. EVANS AND RACHEL EVANS, (DONNA K. ALLEN, MARY LOU KITTELBERGER, DEBRA A. LUKAVEC AND JOHN D. LUKAVEC, NANCY JO BLOCK, CHAD E. LONGFELLOW, HOLLY A. LONGFELLOW, TRACY L. BARNBY, LLOYD R. EVANS, GLORIA STINE, ROBERT W. CUBBAGE, CLIFFORD CUBBAGE, ROBERT W. CUBBAGE, KAREN CUBBAGE, DALE E. WORKMAN, SANDRA E. RUSH, ERMA NELDA JEFFERSON, LAURA K. BAKER, DEBORAH A. COLLINS, PATTY D. JEFFERSON, JOYCE L. LAMB, STACY L. LYONS CARLA CARSWELL DAVIS, MEL TODD CARSWELL, JENNIFER CARSWELL BRIERE, FRANK K. BONACICH, JR., JEAN J. MEIER, HOWARD RAY FURBEE, ROBERT DALE FURBEE, GOROTHY EVANS, ELLEN G. KIRKERIDE, DARLENE KAY ALBORN, MARLENE FAY WAGMILLER, ELMER DEAN EVANS, JACK HAMMERS, PAUL HAMMERS, TWILA ORA WHIPKEY TRUST DATED 8/25/1999, WESBANCO BANK WHEELING, TRUSTEE, TONI JO MASON, ERICA MASON, O.E. BURGE AND SARAH LOU BURGE, H/W AND STEPHEN BURGE, CHESTNUT HOLDINGS).

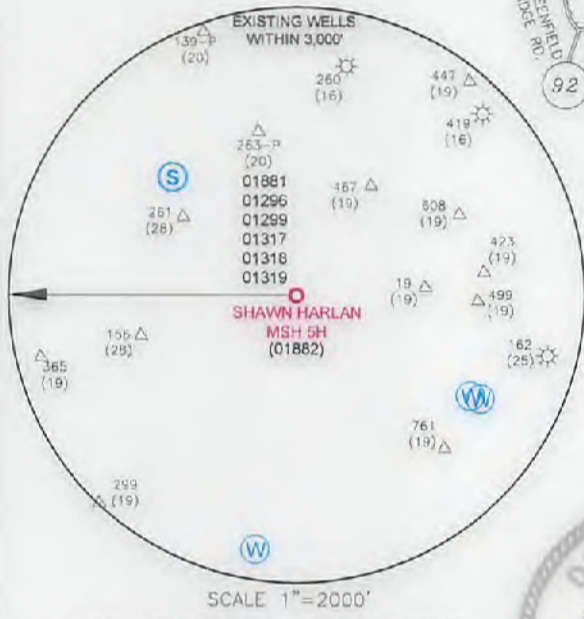
SURFACE HOLE LOCATION (SHL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,287.604 EASTING: 532,286.091
"LANDING POINT" LOCATION (LPL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,548.080 EASTING: 532,464.591
BOTTOM HOLE LOCATION (BHL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,399,467.048 EASTING: 531,481.423

SURFACE HOLE LOCATION (SHL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,287.637 EASTING: 532,286.071
"LANDING POINT" LOCATION (LPL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,549.920 EASTING: 532,469.025
BOTTOM HOLE LOCATION (BHL):	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,399,461.330 EASTING: 531,484.421

GRID NORTH
UTM, NAD83 DATUM, ZONE 17, U.S. FT.

BOTTOM HOLE
SURFACE HOLE
LONGITUDE 80°-37'-30"
LONGITUDE 80°-35'-00"

5,677'



SCALE 1"=2000'



NOTES ON SURVEY
1. NO DWELLINGS OR AGRICULTURAL BUILDINGS GREATER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
3. ALL WELLS WITHIN 500' OF THE HORIZONTAL LEG ARE SHOWN ON THIS PLAT BASED UPON INFORMATION TAKEN FROM DEP MAPPING, WELL PLATS AND AERIAL PHOTOS.
4. COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.

PLAT SCALE 1"=2000'

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

COMPANY: **SWN** Production Company, LLC

OPERATOR'S WELL #: **5H**

API WELL #: **47 051 01882**

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 SURVEY SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)

SHAWN HARLAN MSH

OPERATOR'S WELL #: 5H

API WELL #: 47 051 01882

STATE COUNTY PERMIT

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

WATERSHED: LAUREL RUN OF UPPER OHIO SOUTH ELEVATION: 1390.6'

DISTRICT: LIBERTY COUNTY: MARSHALL QUADRANGLE: LITTLETON(SH)-WILEYVILLE(BH)

SURFACE OWNER: SCOTT L. HARLAN AND SHAWN HARLAN ACREAGE: 126.15

OIL & GAS ROYALTY OWNER: SEE NOTE 5 ACREAGE: 126.15

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: 7,185' TVD 12,059' TMD

09/15/2017

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

LEGEND: PROPOSED SURFACE HOLE / BOTTOM HOLE EXISTING / PRODUCING WELLHEAD LPLX LANDING POINT LOCATION EXISTING WATER WELL EXISTING SPRING

— SURVEYED BOUNDARY — DRILLING UNIT — LEASE BOUNDARY — ASDRILLED PATH — PROPOSED PATH

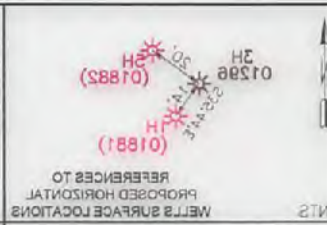
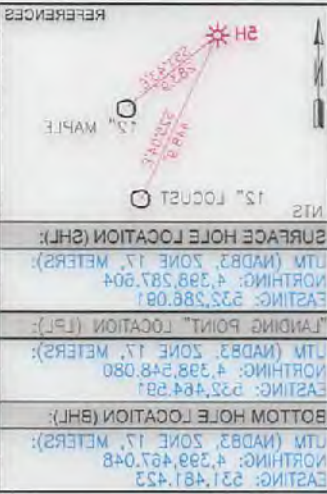
REVISIONS: DATE: 04-20-2017

DRAWN BY: N. MANO
SCALE: 1" = 2000'
DRAWING NO:
WELL LOCATION PLAT

INC.
P.O. Box 1480
677 W. Main St.
Clarksburg, WV 26302
304-828-8881

Latitude: 39.45200"
Longitude: 80.32000"
Longitude 80.31-30"
Longitude 80.32-00"
SURFACE HOLE

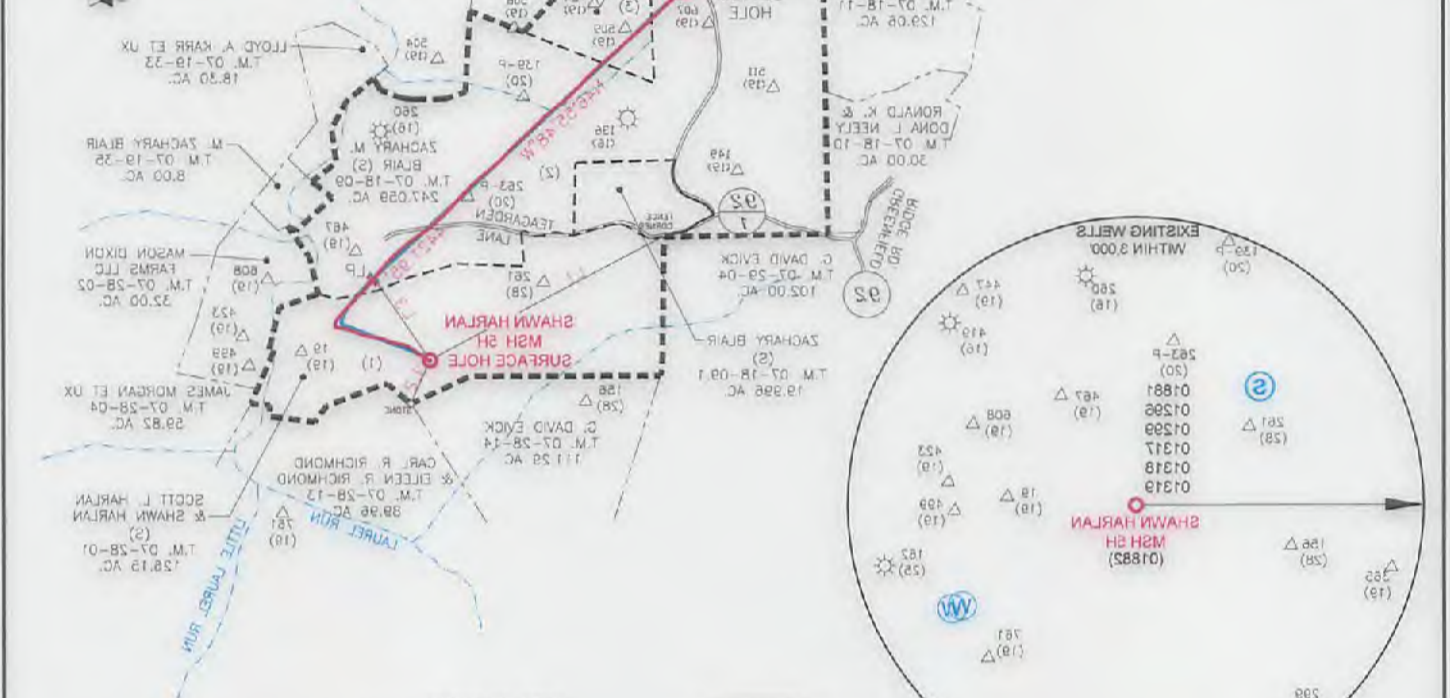
Table with 3 columns: NUMBER, DIRECTION, DISTANCE. Contains survey data points.



VERTICAL SCALE 80.32-00"
VERTICAL SCALE 80.31-30"
SURFACE HOLE

Table with 2 columns: LOCATION (SHL), UTM (NAD83, ZONE 17, METERS). Lists coordinates for surface hole locations.

GRID NORTH
UTM WAVELENGTH: 125.00 METERS



NOTES ON SURVEY
1. NO DWELLINGS OR AGRICULTURAL BUILDINGS GREATER THAN 2.500 SQUARE FEET WITHIN 825 FEET OF PROPOSED CENTER OF PAD.
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PLAT SCALE 1" = 2000'
Production Company, LLC
SWM
Production Company, LLC

Table with 2 columns: FIELD DATA (API WELL #, OPERATOR'S WELL #, SH) and OFFICE DATA (ELEVATION, SOURCE OF GRADE GPS, PROVEN SURVEY, ACCURACY, DEGREE OF).

Table with 2 columns: WELL TYPE (Oil, Gas, etc.) and SURFACE HOLE INFORMATION (Watershed, District, County, etc.).

Table with 2 columns: WELL OPERATOR (SWM Production Company, LLC) and SURFACE HOLE INFORMATION (City, State, Zip Code, etc.).

LEGEND: SURVEYED BOUNDARY, PROPOSED SURFACE HOLE / BOTTOM HOLE, EXISTING / PRODUCING WELLS, L.P.L., LANDING POINT LOCATION, EXISTING WATER WELL, EXISTING SPRING.

09/15/2017