



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, March 30, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for VIOLET COSS BRK 6H
47-009-00240-00-00

SWN PRODUCTION COMPANY, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: VIOLET COSS BRK 6H
Farm Name: LINDA COEN (LIFE ESTATE-VIOLET L COSS
U.S. WELL NUMBER: 47-009-00240-00-00
Horizontal 6A: New Drill
Date Modification Issued: 3/30/2020

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47-009 -
OPERATOR WELL NO. Violet Coss BRK 6H
Well Pad Name: Violet Coss BRK

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: SWN Production Co., LLC 494512924 009-Brook 01-Buffal 620-Steubenville
Operator ID County District Quadrangle

2) Operator's Well Number: Violet Coss BRK 6H Well Pad Name: Violet Coss BRK

3) Farm Name/Surface Owner: Linda Coen (Life Estate-Violet L. Coss) Public Road Access: Coss Road

4) Elevation, current ground: 1173' Elevation, proposed post-construction: 1173'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Down-Dip Well to the South, Target Top TVD- 5626', Target Base TVD- 5688', Anticipated Thickness- 62', Associated Pressure- 3827

8) Proposed Total Vertical Depth: 5875'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 23,110'

11) Proposed Horizontal Leg Length: 15646.69'

12) Approximate Fresh Water Strata Depths: 334'

13) Method to Determine Fresh Water Depths: Deepest Nearby Springs

14) Approximate Saltwater Depths: 507' Princeton High Salinity Sandstone & Salinity Profile Calculation(Violet Coss BRK 6H API 47-009-00146)

15) Approximate Coal Seam Depths: 209'

16) Approximate Depth to Possible Void (coal mine, karst, other): Possible Void 209'

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

(a) If Yes, provide Mine Info: Name: _____

Depth: _____

Seam: _____

Owner: _____

WW-6B
(04/15)

API NO. 47-009 -
OPERATOR WELL NO. Violet Coss BRK BH
Well Pad Name: Violet Coss BRK

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	H-40	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	H-40	48#	388'	388'	382 sx/CTS
Coal	See	Surface	Casing				
Intermediate	9 5/8"	New	J-55	36#	1630'	1630'	635 sx/CTS
Production	5 1/2"	New	HCP-110	20#	23110'	23110'	<small>Max 2750/Tot 40125x100 P505 INCH</small>
Tubing							
Liners							

Handwritten note: 22530

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	633	Class A	1.19/50% Excess
Coal	See	Surface	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/50% Excess
Production	5 1/2"	8 3/4"	0.361	12360	9500	Class A	1.20/50% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and stimulate any potential zones between and including the Benson to Marcellus. **If we should encounter a void place basket above and below void area- balance cement to bottom of void and grout from basket to surface or run external casing packer/cementing stage tool above void interval and perform 2 stage cementing operation dependent upon depth of void. Run casing not less than 20' below void nor more than 75' below void. (*if freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts.)

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. The well is produced through surface facilities consisting of high pressure production units, horizontal separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 100 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 7.09

22) Area to be disturbed for well pad only, less access road (acres): 5.91

23) Describe centralizer placement for each casing string:

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

24) Describe all cement additives associated with each cement type:

See Attachment ***

25) Proposed borehole conditioning procedures:

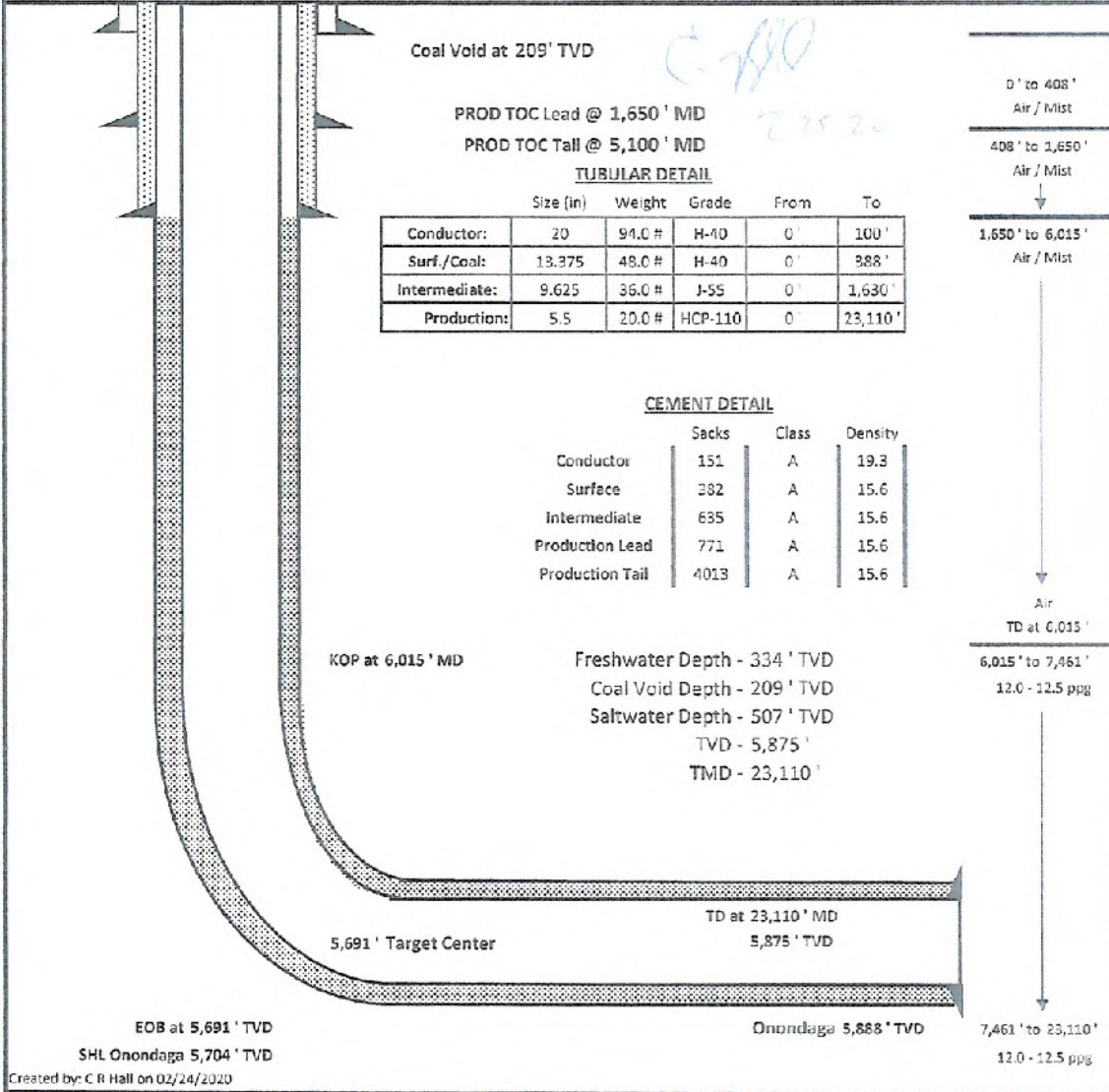
All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

*Note: Attach additional sheets as needed.

Southwestern Energy Company

Proposed Drilling Program

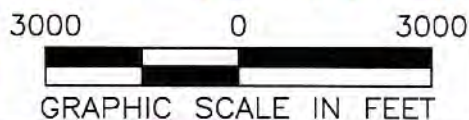
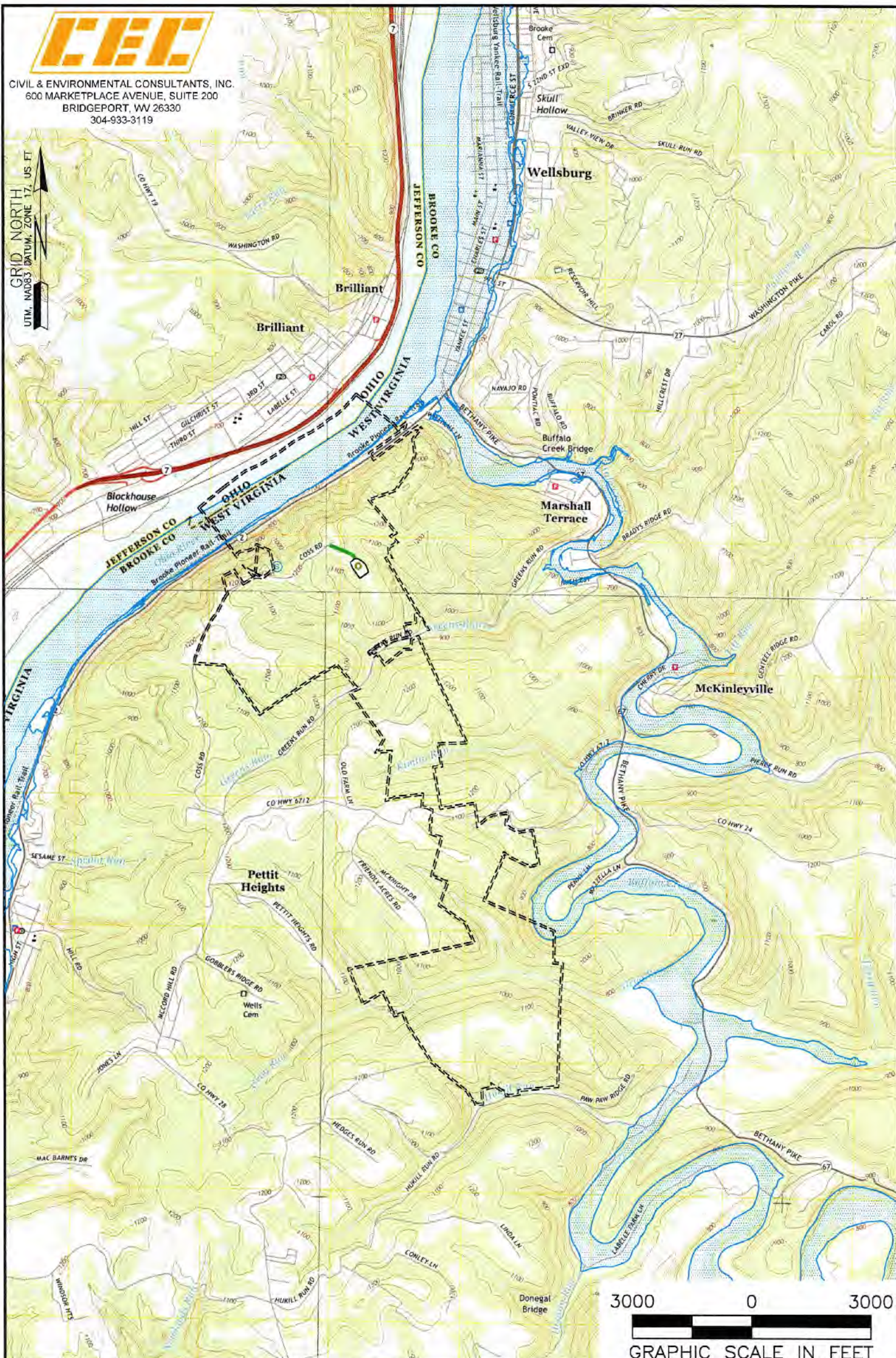
Well: VIOLET COSS BRK 6 Re-entry Rig: TBD
 Field: PANHANDLE FIELD \ Prospect: PANHANDLE
 County: BROOKE State: WV
 SHL: 40.2518 Latitude -80.6221 Longitude
 BHL: 40.2185 Latitude -80.6049 Longitude
 KB Elev: 1,199 ft MSL KB: 26 ft AGL GL Elev: 1,173 ft MSL





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

GRID NORTH
 UTM, NAD83 DATUM, ZONE 17, US FT



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.
3. 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

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: VIOLET COSS BRK	WELL # 6H	SERIAL # XXXX
ADDRESS: 1300 FORT PIERPONT DRIVE, STE 201 MORGANTOWN, WV 26508	COUNTY - CODE BROOKE - 009	DISTRICT; BUFFALO	
SURFACE OWNER: LINDA COEN (LIFE ESTATE-VIOLET L COSS)	USGS 7 1/2 QUADRANGLE MAP NAME STUEBENVILLE EAST, WV		

Longitude: 80°35'00"

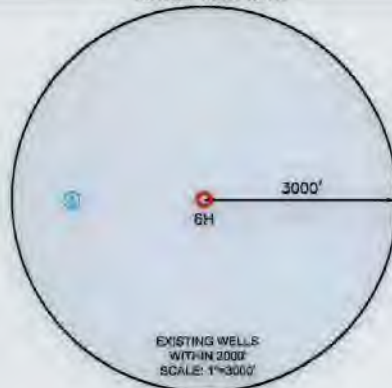
SURFACE HOLE 10816'

Longitude: 80°35'00"

BOTTOM HOLE 6012'



CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
600 MARKETPLACE AVENUE, SUITE 200
BRIDGEPORT, WV 26350
304-933-3119



GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT



Table with 5 rows: SURFACE HOLE LOCATION (SHL), LANDING POINT (LPL), TURNING POINT 1 (TP 1), TURNING POINT 2 (TP 2), BOTTOM HOLE LOCATION (BHL). Each row lists UTM coordinates (Northings and Eastings).

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 2,068 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.

3000 0 3000



GRAPHIC SCALE IN FEET

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



COMPANY: SWN Production Company, LLC

Form with fields: (+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS, WVDEP OFFICE OF OIL & GAS, MINIMUM DEGREE OF ACCURACY: 1/200, PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT), OPERATOR'S WELL #: 6H, API WELL #: 47 009 00240, STATE COUNTY PERMIT

Form with fields: WELL TYPE: OIL, WASTE DISPOSAL, PRODUCTION, DEEP, GAS, LIQUID INJECTION, STORAGE, SHALLOW, WATERSHED: UPPER OHIO WHEELING, DISTRICT: BUFFALO, COUNTY: BROOKE, SURFACE OWNER: LINDA COEN, OIL & GAS ROYALTY OWNER: VIOLET L COSS, DRILL, DRILL DEEPER, REDRILL, FRACTURE OR STIMULATE, PLUG OFF OLD FORMATION, PERFORATE NEW FORMATION, CONVERT, PLUG & ABANDON, CLEAN OUT & REPLUG, OTHER CHANGE, TARGET FORMATION: MARCELLUS, ESTIMATED DEPTH: 5,875 TVD 23,110 TMD

Form with fields: WELL OPERATOR: SWN PRODUCTION COMPANY, LLC, ADDRESS: 1300 FORT PIERPONT DRIVE, STE 201, CITY: MORGANTOWN, STATE: WV, ZIP CODE: 26508, DESIGNATED AGENT: BRITTANY WOODY, ADDRESS: 1300 FORT PIERPONT DRIVE, STE 201, CITY: MORGANTOWN, STATE: WV, ZIP CODE: 26508

Form with fields: LEGEND: PROPOSED SURFACE HOLE / BOTTOM HOLE, EXISTING / PRODUCING WELLHEAD, LPL: LANDING POINT LOCATION, EXISTING WATER WELL, EXISTING SPRING, SURVEYED BOUNDARY, DRILLING UNIT, LEASE BOUNDARY, PROPOSED PATH, REVISIONS, DATE: 11-18-2019, DRAWN BY: K.E.S., SCALE: 1" = 3000', DRAWING NO: 172-287, WELL LOCATION PLAT



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

WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS			
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	EVERETT ALAN COEN, LORRIE ELLEN WOOLWINE, MELINDA WOOLWINE, MICHAEL TODD COEN (S&R)	3-B32-25	224.303
2	HFS LIMITED LIABILITY COMPANY	3-B27-12	67.95
3	WEST VIRGINIA DEPARTMENT OF HIGHWAYS	3-B27-11	
4	BROOKE CO. RT. 2		
5	CAMPBELL TRANSPORTATION COMPANY, INC.	3-B27-10	12.48
6	STATE OF WEST VIRGINIA		
7	HFS LIMITED LIABILITY COMPANY	3-B32-24	2.00
8	HFS LIMITED LIABILITY COMPANY	3-B32-23	2.00
9	COSS ROAD FARM, LLC	3-B31-114	183.23
10	GREEN RUN ROAD		
11	CAROLYN SUE WALNOHA	3-B32-17	4.00
12	MARY CATHERINE WALNOHA	3-B32-18	2.00
13	JOSEPH G. VINDERMAN, JR., JERRY VINDERMAN, DAVID G. VINDERMAN AND LINDA J.R. VINDERMAN, ARNOLD VINDERMAN, LAWRENCE VINDERMAN, GEORGE VINDERMAN, THERESA MCQUILLAN	3-B32-13	43.38
14	MASLO FARMS, LLC	3-B32-19	59.66
15	RALPH G. JOHNSTON; ROBERT JOHNSTON; KENNETH D. JOHNSTON, DANIEL JOHNSTON, ET AL.	3-B32-180	39.862
16	JACK M. KLAGES, SR	3-B32-140.1	5.90
17	MC CORD HILL ROAD		
18	CITY OF WELLISBURG COMBINE WATER AND SEWER BOARD	3-B32-140.2	89.58
19	SCHIAPPA AND COMPANY INC	3-B37-22	145.963
20	SCHIAPPA AND COMPANY INC	3-B37-23	90.91
21	DEBRA F. CYPHERT; MATTHEW H. FAIR; SUSAN BRUFFY, RICHARD HENTHORN	3-B37-91	93.93
22	DEBRA F. CYPHERT; MATTHEW H. FAIR; SUSAN BRUFFY, RICHARD HENTHORN	3-B37-88	59.95

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	DANIEL P. LOMBARDI	3-B27K-211	6.62
B	NORMA JEAN LILLY, WIDOW	3-B27-17	45.72
C	GERTRUDE LOUISE MCSHANE ROBIE & PATRICK J. MCSHANE, TRUSTEE	3-B32-29	84.79
D	TONY J. CASTILLO; RICHARD R. OSTRANDER (S)	3-B32-28	20.83
E	TONY J. CASTILLO; RICHARD R. OSTRANDER (S)	3-B32-27	10
F	JAMES SCOTT GEAR	3-B32-26	3.11
G	WILLIAM & CAROLYN WALNOHA (S)	3-B32-14	1.34
H	JOHN PORTER & BRIGITTE ROGERS (S)	3-B32-15	0.568
I	DOROTHY L. STEVENS	3-B32-16	2.09
J	RUTH BERNADINE HART	3-B32-22.01	0.262
K	WALNOHA WILLIAM RUSSELL; HART RUTH; THARP MARY FRANC	3-B32-22	0.244
L	WILLIAM RUSSELL WALNOHA	3-B32-22.02	0.259
M	PENNY HAMILTON	3-B32-12	0.5
N	PENNY HAMILTON	3-B32-11	8.5
O	SCHIAPPA AND COMPANY INC.	3-B32-9	232.6
P	LILLIAN L MCCORD EST (S)	3-B32-185	38.42
Q	CHARLES M. & BARBARA J. TREDWAY	3-B32-186	3.0
R	ROBERT G. TREDWAY JR.	3-B32-188	42.01
S	KAREN L. REINACHER	3-B32-187	2.00
T	DONALD C. BURKHART	3-B32-191	7.24
U	JOSEPH P. LIZON III & ERIC REBECCA NIXON (S)	3-B32-192	19.40
V	CITY OF WELLISBURG COMBINE WATER AND SEWER BOARD	3-B32-192.2	0.619
W	REBECCA UHLY	3-B32-139	27.805
X	KEVIN R. & SANDRA A. COLLINS (S)	3-B32-130	24.04
Y	KEVIN & BRIDGET KOSUT	3-B37-42	34.259
Z	JAMIE OHLER	3-B37-43	29.00
AA	MARK A. CHRISTMAN	3-B37-45	110.58
BB	WILLIAM E. & HAZEL E. JOHNSTON	3-B37-50	166.50
CC	ROBERT O. BONE	3-B37-81	81.99
DD	VEMURI HOME & GARDEN, LLC	3-B37-82	1.00
EE	BRIAN K. & GINA M. HANEY (SURV)	3-B37-77	50.75
FF	LINDA REEVES GREATHOUSE, VICKI HAMILTON	3-B37-87	322.84
GG	ROBERT BONE	3-B37-89	0.78

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
HH	JESSICA ANN KOREN AND ROBERT BONE	3-B37-90	2.014
II	CHRISTOPHER SCOTT MILLER	3-B37-94	24.20
JJ	KENIN CHUMNEY	3-B37-93	5.91
KK	DONALD G. CONAWAY	3-B37-92	3.97
LL	WAYNE ALLEN RICHMOND	3-B37-96	19.67
MM	VICKIE C. & SHEENA R. LOUGHERY (S)	3-B37-103	40.00
NN	RALPH JR & CAROL J. WALNOHA	3-B37-34	6.787
OO	RALPH JR & CAROL J. WALNOHA	3-B37-33	0.80
PP	JAMES W. & LISA GIBSON (S)	3-B37-28	4.06
QQ	HARLEY J. LEMASTERS	3-B37-21	31.17
RR	THOMAS & CAROLYN CARBASHO (S)	3-B37-16	7.29
SS	THOMAS & CAROLYN CARBASHO (S)	3-B37-15	5.00
TT	JAMES W. & DENISE L. MYERS (S)	3-B37-14	5.00
UU	HARLEY J. LEMASTERS	3-B37-13	33.54
VV	BOYD NILA; MCCORD CLINTON; JOHN JOHN; REBA; JONES CA	3-B32-146	29.057
WW	NILA MCCORD BOYD	3-B32-142	5.09
XX	KENNETH D. JOHNSTON	3-B32-141	4.91
YY	KENNETH D. JOHNSTON	3-B32-184	3.85
ZZ	ROBERT A. JOHNSTON, RALPH G. JOHNSTON, JOYCE A. BRADY, BRIAN W. JOHNSTON, DANIEL L. JOHNSTON, KENNETH D. JOHNSTON	3-B32-179	1.17
AAA	LILLIAN L MCCORD	3-B32-178	0.709
BBB	MICHAEL & MELISSA BILAK	3-B32-174	21.83
CCC	MASLO FARMS LLC A PENNSYLVANIA LLC	3-B32-20	78.86
DDD	CHARLES D. BLACKBURN	3-B32-21	10.00
EEE	KEITH R. FRANCIS	3-B31-113	26.33
FFF	THOMAS & PAULINE SALEM	3-B31-138	7.73
GGG	RODGER & CONNIE SUMMERS	3-B31-137	11.35
HHH	JERRY C. & ANGEL L. MCCLELLAND	3-B31-136	9.18
III	CURTIS R. & DONNA J. BARONIO (S)	3-B31-135	7.32
JJJ	RONALD C. PARKS	3-B31-134	8.15
KKK	ROBERT J. SR. & MARGARET E. STEWART (S)	3-B31-133	7.88
LLL	ROBERT J. SR. & MARGARET E. STEWART (S)	3-B31-132	7.39
MMM	RAY WALNOHA	3-B31-115	9.27
NNN	AUDREY L. HOLDEN	3-B31-116	0.736
OOO	BARBARA A. TAYLOR	3-B31-117	5.0
PPP	COSS ROAD FARM, LLC	3-B31-118	17.18
QQQ	COSS ROAD FARM, LLC	3-B31-119	5.35
RRR	EDWARD MACIAK	3-B31-120	1.37
SSS	JAMES L. & SONDR A. ELLIOTT	3-B31-121	5.48
TTT	HFS LIMITED LIABILITY COMPANY	3-B31-1	23.87
UUU	CAMPBELL TRANSPORTATION COMPANY INC.	3-B27-8	0.41
VVV	GREG PROVENZANO	3-B27-9	0.09
WWW	JESSICA ANN KOREN & ROBERT BONE	3-B37-90.1	0.119

API WELL #: **47 009**
STATE COUNTY PERMIT

REVISIONS:	COMPANY:		
	OPERATOR'S		
	WELL #:	VIOLET COSS BRK	DATE: 11-18-2019
	DISTRICT:	6H	DRAWN BY: K.E.S.
	COUNTY:	BUFFALO	SCALE: N/A
	STATE:	BROOKE	DRAWING NO: 172-287
		WV	WELL LOCATION PLAT 2

EXHIBIT A

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, LLC, as Operator

Violet Coss BRK 6H

Brooke County, West Virginia

Tract	Tax Parcel	Lessor	Lessee	Royalty	Book/Page
1	3-B32-25	Violet L. Coss, a widow	Chesapeake Appalachia, LLC	18%	11/678
			SWN Production Company, LLC		30/480
2	3-B27-12	HFS Limited Liability Company	Chesapeake Appalachia, LLC	18%	15/394
			SWN Production Company, LLC		30/480
3	3-B27-11	HFS Limited Liability Company SWN Production Company, LLC (Company owned minerals)	Chesapeake Appalachia, LLC	18%	15/394
			SWN Production Company, LLC		30/480
					396/555
4	Brooke County Route 2	RIGHT OF WAY ONLY			
5	3-B27-10	Campbell Transportation Company, Inc.	SWN Production Company, LLC	18%	54/206
		SWN Production Company, LLC (Company owned minerals)			396/555
6	Ohio River	State of West Virginia, Department of Commerce, Division of Natural Resources	SWN Production Company, LLC	20%	See Attached Lease
7	3-B32-24	HFS Limited Liability Company	Chesapeake Appalachia, LLC	18%	15/394
			SWN Production Company, LLC		30/480
8	3-B32-23	Robert D Walsh	Chesapeake Appalachia, LLC	18%	28/654
			SWN Production Company, LLC		30/480
		Peter A Kirby	Chesapeake Appalachia, LLC	18%	27/427
			SWN Production Company, LLC		30/480
		Patricia B Brown and William G Brown	Chesapeake Appalachia, LLC	18%	27/602
			SWN Production Company, LLC		30/480
		C. Reith Patterson Jr	Chesapeake Appalachia, LLC	18%	27/596
			SWN Production Company, LLC		30/480
Carl T and Vilma Walsh	Chesapeake Appalachia, LLC	18%	28/705		
	SWN Production Company, LLC		30/480		
9	3-B31-114	Edward C and Susan Zatta	Chesapeake Appalachia, LLC	18%	11/791
			SWN Production Company, LLC		30/480
		Susan Zatta, a married woman	Great Lakes Energy Partners, LLC Range Resources-Appalachia, LLC	15.5%	9/868 10/159

EXHIBIT A

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, LLC, as Operator

Violet Coss BRK 6H

Brooke County, West Virginia

			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
10	Green Run Road	RIGHT OF WAY ONLY			
11	3-B32-17	Carolyn Sue Walnoha	Chesapeake Appalachia, LLC	18%	20/778
			SWN Production Company, LLC		30/480
12	3-B32-18	Mary Catherine Walnoha	Chesapeake Appalachia, LLC	18%	20/783
			SWN Production Company, LLC		30/480
13	3-B32-13	David Gerald Viderman Jr. and Geneva Mae Viderman	Great Lakes Energy Partners, LLC	12.5%	10/73
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
		Dennis Frank McQuillan and Theresa McQuillan	Great Lakes Energy Partners, LLC	12.5%	10/106
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
		Arnold Phillip Viderman Sr and Artie Ella Jane Viderman	Great Lakes Energy Partners, LLC	12.5%	10/112
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
		George Viderman and Karen Viderman	Great Lakes Energy Partners, LLC	12.5%	10/130
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
		Lawrence Carl Viderman Sr. and Barbara Cecelia Viderman	Great Lakes Energy Partners, LLC	12.5%	10/140
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
		Jerry Viderman and Glenda Viderman	Great Lakes Energy Partners, LLC	12.5%	10/280
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480

EXHIBIT A

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, LLC, as Operator

Violet Coss BRK 6H

Brooke County, West Virginia

		Joseph H. Viderman, Jr.	Great Lakes Energy Partners, LLC	12.5%	10/283
			Range Resources-Appalachia, LLC		10/159
			Chesapeake Appalachia, LLC		10/552
			SWN Production Company, LLC		30/480
14	3-B32-19	Harley J. Lemasters and Rebecca K. Lemasters	Chesapeake Appalachia, LLC	18%	14/399
			SWN Production Company, LLC		30/480
15	3-B32-180	Ina Grace Walker, a widow	Chesapeake Appalachia, LLC	18%	18/254
			SWN Production Company, LLC		30/480
		James C. Ditty, a widower	Chesapeake Appalachia, LLC	18%	18/265
			SWN Production Company, LLC		30/480
		Joyce A and Ralph A Brady	Chesapeake Appalachia, LLC	18%	29/792
			SWN Production Company, LLC		31/152
		Robert A and Janice K Johnston	Chesapeake Appalachia, LLC	18%	30/20
			SWN Production Company, LLC		31/296
		Daniel L and Cathy J Johnston	Chesapeake Appalachia, LLC	18%	30/13
			SWN Production Company, LLC		31/296
		Brian W Johnston	Chesapeake Appalachia, LLC	18%	30/7
			SWN Production Company, LLC		31/296
		Ralph G and Tracy A Johnston	Chesapeake Appalachia, LLC	18%	30/1
			SWN Production Company, LLC		31/152
		Kenneth D Johnston	Chesapeake Appalachia, LLC	18%	30/26
			SWN Production Company, LLC		31/288
16	3-B32-140.1	Jack M. Klages, Sr.	Chesapeake Appalachia, LLC	18%	17/417
			SWN Production Company, LLC		30/480
17	McCord Hill Road	RIGHT OF WAY ONLY			
18	3-B32-140.2	Edward C. Zatta and Susan Zatta	Chesapeake Appalachia, LLC	18%	11/785
			SWN Production Company, LLC		30/480
19	3-B37-22	Schiappa and Company, Inc.	Chesapeake Appalachia, LLC	12.5%	10/468
			SWN Production Company, LLC		30/480
20	3-B37-23	Susan Bruffy	Chesapeake Appalachia, LLC	18.0%	17/266
			SWN Production Company, LLC		30/480
		Debra Cyphert and Robert Cyphert	Chesapeake Appalachia, LLC	18.0%	17/284
			SWN Production Company, LLC		30/480
		Matthew Fair	Chesapeake Appalachia, LLC	18.0%	17/278

EXHIBIT A

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, LLC, as Operator

Violet Coss BRK 6H

Brooke County, West Virginia

		Dianne Courtright	SWN Production Company, LLC Chesapeake Appalachia, LLC	18.0%	30/480 17/272
			SWN Production Company, LLC		30/480
21	3-B37-91	Susan Bruffy	Chesapeake Appalachia, LLC	18.0%	17/266
		Debra Cyphert and Robert Cyphert	SWN Production Company, LLC Chesapeake Appalachia, LLC	18.0%	30/480 17/284
			SWN Production Company, LLC		30/480
		Matthew Fair	Chesapeake Appalachia, LLC	18.0%	17/278
		Dianne Courtright	SWN Production Company, LLC Chesapeake Appalachia, LLC	18.0%	30/480 17/272
			SWN Production Company, LLC		30/480
22	B37-88	Susan Bruffy	Chesapeake Appalachia, LLC	18.0%	17/266
		Debra Cyphert and Robert Cyphert	SWN Production Company, LLC Chesapeake Appalachia, LLC	18.0%	30/480 17/284
			SWN Production Company, LLC		30/480
		Matthew Fair	Chesapeake Appalachia, LLC	18.0%	17/278
		Dianne Courtright	SWN Production Company, LLC Chesapeake Appalachia, LLC	18.0%	30/480 17/272
			SWN Production Company, LLC		30/480

Tract Area/Acreage: Ohio River and Cross, Short and Buffalo Creeks – 463.4 acres (MM 74-77)
Well/Tract Name: Robert Bone BRK 205H, et al
District/County: Cross Creek and Buffalo Districts, Brooke County; and Richland District, Ohio County
Lease Number: OG-19-I/05-1960

THE STATE OF WEST VIRGINIA OIL AND GAS LEASE
NO SURFACE USE
(4 YEAR PAID UP LEASE)

This Oil and Gas Lease Agreement dated and effective the 4th day of November, 2019, by and between the **STATE OF WEST VIRGINIA, DEPARTMENT OF COMMERCE, DIVISION OF NATURAL RESOURCES**, 324 Fourth Avenue, South Charleston, West Virginia, 25303, **Lessor**, and **SWN PRODUCTION COMPANY, LLC**, a Texas limited liability company, 10000 Energy Drive, Spring, Texas 77389, **Lessee**.

UNDER AND PURSUANT TO THE PROVISIONS OF THE CONSTITUTION AND LAWS OF THE STATE OF WEST VIRGINIA RELATING TO LEASING PUBLIC LANDS BELONGING TO THE STATE OF WEST VIRGINIA, **WITNESSETH:**

1. Grant of Lease. That for and in consideration of **One Million One Hundred Fifty-Eight Thousand Five Hundred Dollars (\$1,158,500.00)** [being the bonus of Two Thousand Five Hundred Dollars (\$2,500.00) per acre (463.4 acres)] paid by Lessee to Lessor, the receipt of which is hereby acknowledged, the royalties to be paid, and the covenants, obligation, stipulations and conditions to be observed and performed as herein set forth, Lessor does hereby demise, lease and let unto the Lessee the following described tracts or parcels of land for the sole purpose and with the exclusive right of exploring, drilling, completing, operating for, and producing oil, gas and other liquid or gaseous hydrocarbons, including, but not limited to, any and all natural gas liquids such as butane, ethane, isobutane, natural gasolines, pentanes, propane, and similar liquids or byproducts produced in association with the oil or gas (the "Granted Minerals") in or underlying the Leased Premises, situate in Richland District, Ohio County, and Cross Creek District and Buffalo District, Brooke County, West Virginia, and being more particularly described as follows:

Tract 1: The minerals underlying that portion of the Ohio River from the ordinary low water mark on each side of the said river, starting at Latitude 40.2710991, Longitude -80.6179962 and ending at Latitude 40.2406006, Longitude -80.6517029, and being a point within Mile Marker 74 to a point within Mile Marker 77, as more fully shown on Exhibit "A" attached hereto, and containing **433 acres**, more or less.

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Tract 2: The minerals underlying that portion of Cross Creek from the ordinary low water mark on each side of the said creek, starting at Latitude 40.3073006, Longitude -80.6000977 and ending at Latitude 40.3055992, Longitude -80.5948029, as more fully shown on Exhibit "A" attached hereto, and containing **6.4 acres**, more or less.

Tract 3: The minerals underlying that portion of Buffalo Creek from the ordinary low water mark on each side of the said creek, starting at Latitude 40.2644997, Longitude -80.6154022 and ending at Latitude 40.2571983, Longitude -80.5997009, as more fully shown on Exhibit "A" attached hereto, and containing **19 acres**, more or less.

Tract 4: The minerals underlying that portion of Short Creek from the ordinary low water mark on each side of the said creek, starting at Latitude 40.1833, Longitude -80.6772995 and ending at Latitude 40.1834984, Longitude -80.6692963, as more fully shown on Exhibit "A" attached hereto, and containing **5 acres**, more or less.

The total Leased Premises (Tracts 1, 2, 3 and 4) being **463.4 acres**, more or less.

Lessor Represents and warrants to Lessee that the West Virginia Division of Natural Resources is the proper agency or instrumentality of the State of West Virginia to enter into this Lease for the purpose of leasing the Granted Minerals and the Leased Premises to Lessee on the terms set forth herein, and that the Director of the West Virginia Division of Natural Resources is vested with the full legal authority and is duly authorized to execute this Lease on behalf of the Lessor and the State of West Virginia.

2. Limitations on the Grant of Lease.

(a) **Surface Activities Prohibited.** This Lease does not include, and specifically prohibits and excludes, the right to enter upon the surface of the lands set out herein, if any, to conduct exploration for drilling, and production and marketing activities of any kind associated with the Granted Minerals, and any other activities by Lessee, its representatives, employees, contractors, agents, and affiliates, including, but not limited to, the construction of pits, impoundments, and/or pipelines or gathering lines on the Leased Premises.

(b) **No Storage.** Lessee may not use the Leased Premises, or any part thereof, for gas, oil, hydrocarbons, or brine storage purposes.

(c) **Use of Surface or Subsurface Water.** Lessee shall not use the surface waters or the groundwaters located within the Leased Premises and shall not diminish or impair the riparian rights, consumptive or non-consumptive water rights or groundwater of the State of West Virginia within or adjoining the Leased Premises, or any private riparian landowner adjoining the Leased Premises within said State.

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(d) **Navigational Servitude.** Lessee shall not perform any work, construction, production or other related activities on the bed, banks or shores of the Ohio River and/or any other waterway of the state below the high-water mark thereof. Lessee shall not in any way hinder or impair the navigational servitude of the United States of America or the public rights of navigation or floatage on the Ohio River and/or any other navigable or floatable waterway of the state.

(e) **Reserved Rights of Lessor.** Lessor reserves all rights not granted in this Lease, and specifically excepts all minerals, other than the Granted Minerals, including, but not limited to, geothermal energy, salt, brine, coal and coalbed methane.

3. **Term.** (a) This Lease shall remain in force for a term of **Four (4) years** from the date hereof ("Primary Term"), and as long thereafter as Granted Minerals are produced from the Leased Premises or on acreage pooled therewith, or drilling operations are continued as hereinafter provided.

(b) If, at the expiration of the Primary Term of this Lease, Granted Minerals are not being produced on the Leased Premises or on acreage pooled therewith, but Lessee is then engaged in drilling or re-working operations thereon, then this Lease shall continue in force for so long as operations are being continuously prosecuted on the Leased Premises or on acreage pooled therewith ("Operations"). Operations shall be considered to be continuously prosecuted if not more than One Hundred Twenty (120) consecutive days shall elapse between the completion or abandonment of one well and the beginning of operations for the drilling of a subsequent well.

(c) If, after discovery of Granted Minerals on the Leased Premises or on acreage pooled therewith, the production thereof should cease for any reason after the Primary Term, this Lease shall not terminate if Lessee commences additional drilling or re-working operations within One Hundred Twenty (120) days from the date of cessation of production or from the date of completion of a dry hole.

(d) If Granted Minerals shall be discovered and produced as a result of such operations set out above on or after the expiration of the Primary Term of this Lease, then this Lease shall continue in force and effect for so long as Granted Minerals are produced from the Leased Premises or on acreage pooled therewith.

4. **Facilities Development.**

(a) All development and production activities and facilities shall be constructed on adjoining and/or other lands, and not on the Leased Premises or islands within the Ohio River and other state waterways, except to the extent that horizontal well laterals are located underneath the bed, banks and shores of the same. Such development and production activities and facilities shall be above and outside the high-water mark of the Ohio River and other state waterways.

(b) Notwithstanding any other provision set forth in this Lease Agreement, including without limitation the provisions of paragraph 2 and 4(a) above, this Lease Agreement does not prohibit Lessee, its representatives, employees, contractors, agents and affiliates from constructing and operating an intake to withdraw water pursuant to authorization from a riparian landowner and in compliance with any applicable regulatory requirements.

5. **Unitization.** Lessee may pool, consolidate, or unitize portions of the Leased Premises, as to hydrocarbon bearing geologic formations, in order to constitute a unit for the purpose of exploring for and producing Granted Minerals. The unit shall:

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(a) Be comprised of lands contiguous to the Leased Premises and/or lands in the immediate vicinity of the Leased Premises; and

(b) Not exceed Six Hundred Forty (**640**) acres: Provided, that the unit may, with the written consent of Lessor, be larger, but no greater than One Thousand Two Hundred and Eighty (**1,280**) acres, which consent of Lessor shall not be unreasonably withheld, if the unit, in comparison to a unit of Six Hundred Forty (640) acres, shall provide for the greater development of the Granted Minerals in compliance with the diligent development and protection from drainage requirements of this Lease.

Once a unit is formed, the unit may not be reformed, re-pooled, altered, amended or changed in any manner without the prior written consent of Lessor, which consent shall not be unreasonably withheld.

6. Pugh Clause-Horizontal and Vertical. As to acreage of the Leased Premises which is not in production in paying quantities and is not included within a properly constituted and publicly recorded production unit at the expiration of the Primary Term, as extended hereunder, this Lease shall automatically terminate, and be of no further force or effect.

Further, and to the extent Lessee has established production in paying quantities beyond the expiration of the Primary Term on the Leased Premises or lands pooled or unitized therewith, the Lease shall terminate, on a production unit-by-production unit basis, as to all depths, formations, horizons and zones lying at least One Hundred (100') feet below the deepest producing formation or horizon on the Leased Premises or any lands pooled therewith, as determined by reference to the deepest producing formation or horizon in each respective production unit.

Thereafter, this Lease shall continue in full force and effect for all depths, formations, horizons and zones lying above the depth of One Hundred (100') feet below the deepest producing formation or horizon of a particular production unit as to all acreage located within that particular production unit.

Upon the drilling and completion of a well within a production unit containing at least a portion of the Leased Premises, Lessee shall file a declaration of pooling and unitization within a reasonable time in the records of the Office of the Clerk of the County Commission of the county in which the applicable Granted Minerals are situated.

7. Royalty.

(a) **Delivery and Payment.** Lessee shall pay and deliver or cause to be delivered to the Lessor, or its successors, nominees, agents, or assigns, at no cost to Lessor, a royalty equal to **Twenty Percent (20%) or One-Fifth of Eight Eighths (1/5th of 8/8ths)** of the Gross Proceeds realized by Lessee, or any Affiliate of Lessee, from the sale of the Granted Minerals, produced and sold from the Leased Premises.

i. **Gross Proceeds.** "Gross Proceeds" means the total monies and other consideration accruing to Lessee for the disposition of the Granted Minerals and/or any other marketable by-products, including condensate, produced from the Leased Premises. Gross Proceeds shall be calculated based on the total gross volume of Granted Minerals produced and sold, exclusive of production and post-production costs and severance taxes or other taxes of any nature.

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ii. **Affiliate of Lessee.** "Affiliate of Lessee" means any person, corporation, firm, or other entity in which Lessee, or any parent company, subsidiary or affiliate of Lessee, owns an interest of Five Percent (5%) or more, whether by stock ownership, or otherwise, or over which Lessee, or any parent company or affiliate of Lessee, exercises any degree of control, directly or indirectly, by ownership, interlocking directorate, or in any other manner, and any corporation, firm or other entity which owns any interest in Lessee, whether by stock ownership or otherwise, or which exercises any degree of control directly or indirectly, over Lessee, by stock ownership, interlocking directorate, or any other manner.

(b) **Due Dates of Royalty.** Lessee shall pay Lessor all royalties that become due under this Lease within One Hundred Twenty (120) days after the first day of the month following the month during which a well commences production into a pipeline for sale of such production. Thereafter, all royalties shall be paid to Lessor on or before the last day of the third month following the month of production or within Ninety (90) days after the first day of the month following, whichever is longer.

(c) **Automatic Termination for Non-Payment of Royalty.** If the royalty payments are not paid within the time prescribed in paragraph 7(b) of this Lease, then Lessor will provide Lessee written notice of nonpayment of royalty in accordance with this Lease. If Lessee fails to pay Lessor the royalty due and owing to Lessor within Thirty (30) days from Lessee's receipt of such notice, then this Lease will automatically terminate. Inaccurate royalty payments shall not be governed by the provisions of paragraph 7 of this Lease, but shall be resolved in good faith between Lessor and Lessee in a timely manner.

(d) **Production & Post-Production Costs.** Neither Lessee, nor any Affiliate of Lessee, may reduce Lessor's royalty for any post-production expense, including, but not limited to, pipelines, surface facilities, telemetry, gathering, dehydration, transportation, fractionation, compression, manufacturing, processing, treating, or marketing of the Granted Minerals, or any severance or other taxes of any nature paid on the production thereof. Royalties under this Lease shall be based on the total proceeds of sale of the Granted Minerals, exclusive of any and all production and/or post-production costs.

8. Method of Payment. All rents, royalties, bonuses, or other payments accruing and/or owing from Lessee to Lessor under this Lease shall be made or tendered as follows:

- (a) By certified or cashier check delivered in accordance with this Lease; or
- (b) By direct deposit or wire transfer to the credit of Lessor, as provided in writing by Lessor to Lessee by a separate instrument delivered contemporaneously with this Lease.

9. Information, Metering, Lessor's Rights to Audit. Upon request, Lessee shall furnish to Lessor copies of title opinions covering the Leased Premises; copies of filings made by Lessee with the Department of Environmental Protection related to the Leased Premises; copies of daily drilling reports, gauge tickets, sales receipts, division orders, or amounts of gross production; copies of gas contracts or any other agreements pursuant to which Lessee will sell, use, transfer, process, or dispose of the Granted Minerals produced from the Leased Premises; and/or any other information related to the production and sales of the Granted Minerals.

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Lessee shall meter gas deriving from the Leased Premises at the wellhead in accordance with West Virginia law. Lessor shall, on an annual basis, upon reasonable prior written notice to Lessee, have the right to audit the books, accounts, contracts, records and data of Lessee pertaining to the development and sale of the Granted Minerals.

10. Annual Report, Quarterly Royalty Statement. Lessee shall give Lessor an annual report on production volumes and sales prices on the anniversary date of this Lease, unless otherwise requested by Lessor.

Lessee shall give Lessor a quarterly report, either on the check stub of a royalty payment or on an attachment to or enclosure with a royalty payment, that includes:

(a) The lease, property, or well names and the well identification numbers on which royalties are being paid;

(b) The month and year during which the sales occurred for which payment is being made;

(c) The total production from the well or wells expressed as the number of barrels of oil or the total amount of gas in million cubic feet (MCF) and the volume of any other Granted Minerals, condensate, or other constituents therein which were sold;

(d) The price per barrel of oil and per MCF of gas sold; and

(e) The name, address, and telephone number of a contact person where the Lessor may obtain information about royalty payments made by the Lessee hereunder.

11. Shut-In Royalty. If a well has been completed that is capable of production in paying quantities and has been temporarily shut-in for lack of a market, then Lessee shall pay Lessor annually, on or before Ninety (90) days of such shut-in event, the sum of One Hundred (\$100.00) Dollars per acre for the first year, and Two Hundred Fifty (\$250.00) Dollars per acre for the year thereafter on the ensuing anniversary.

In no event may Lessee maintain this Lease by payment of shut-in royalties beyond a continuous two-year period. This Lease shall terminate automatically on the first day following the second anniversary date of the initial shut-in royalty payment.

Additionally, in no event may Lessee maintain this Lease by payment of shut-in royalties beyond a cumulative three-year period during which all production of Granted Minerals was shut-in. This Lease shall terminate automatically on the first day following the date that all production of Granted Minerals has been shut-in for a cumulative period of Three (3) years.

12. Notice of Intent to Drill and Complete. Lessee shall supply Lessor prior written notice of Lessee's intention to drill at least Fourteen (14) calendar days prior to the spudding of a well associated with producing the Granted Minerals. Lessee shall also supply Lessor with a copy of Lessee's completion report of such well or wells within Thirty (30) days of completion.

13. Diligence, Duty to Drill Offset Wells. Lessee shall conduct its drilling operations hereunder utilizing best industry practices in existence at the time of such drilling, and shall otherwise conduct its operations in a good and workmanlike manner as a reasonably prudent operator would under the same or similar circumstances until all drilling and producing operations are completed, or until such time as the final well is plugged and abandoned.

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Additionally, if Granted Minerals are discovered on or in the Leased Premises, the Lessee shall further develop and produce the Leased Premises as a reasonable and prudent operator would and exercise all due diligence in drilling additional well(s) as may be necessary to fully develop the Leased Premises. Lessee shall protect the Granted Minerals in and under the Leased Premises from drainage by wells on adjoining or nearby tracts or lease, including those held by Lessee or any Affiliate of Lessee.

Neither the rentals, royalties, nor any other consideration set forth under this Lease shall relieve Lessee of its obligation to reasonably develop and produce the Leased Premises and to reasonably protect the Granted Minerals in and under the Leased Premises from drainage or other damage.

14. Waste Prohibited, Damage. Lessee shall not commit, or cause to be committed, waste, damage, or pollution to the Leased Premises. Lessee shall take all reasonable steps to prevent its Operations from causing or contributing to soil erosion, or to the injury of terraces, grades, embankments, other soil or structures on the Leased Premises. Lessee shall not pollute the surface or subterranean waters of the Leased Premises, or any reservoirs, springs, streams, irrigation ditches, stock ponds or other wells on the Leased Premises. Lessee shall not decrease the fertility of the soil, damage any crops, grasses, timber or pastures on the Leased Premises, and shall not harm or injure any animals, fish or livestock on or in the Leased Premises. Lessee shall not damage any buildings, roads, structures or other improvements on the Leased Premises. Lessee shall preserve the Leased Premises, and upon the termination of this Lease, promptly surrender and return the Leased Premises to the Lessor in the same condition, or substantially similar condition, as the Leased Premises were in prior to Lessee taking possession of the Leased Premises. Lessee shall compensate Lessor, its successors or assigns, for damages caused by Lessee to any being or thing which is the subject of this provision.

15. Well Plugging. Before abandoning a well associated with this Lease, Lessee shall securely plug and abandon such well in accordance with the rules and regulations of the West Virginia Department of Environmental Protection, and the laws of the State of West Virginia and any other governmental agency having jurisdiction.

16. Record Management. The Lessee shall keep an accurate record of all drilling operations that include the Leased Premises, including, but not limited to the following: a log of each well drilled as duly sworn to by the contractor or driller; original gas sales contracts with amendments; gas balancing agreements and schedules; information concerning litigation, settlement agreements or other agreements relating to sales and pricing of the Granted Minerals.

17. Ratification. No instrument executed by Lessor shall be effective to constitute a ratification, renewal, extension or amendment of this Lease unless such instrument is clearly titled to indicate its purpose and intent.

18. Compliance with Applicable Law. This Lease shall be subject to the Constitution and laws of the State of West Virginia, and the rules and regulations of the West Virginia Division of Natural Resources and the West Virginia Department of Environmental Protection now or hereafter in force, all of which are made a part and condition of this Lease: Provided, that no law, rule or regulation enacted, passed or made after the execution of this Lease that affects the lease

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term, the royalty rate or payment, or the assignment of Lease, shall operate to alter the terms and conditions of this Lease. Lessee agrees to comply in all respects with the laws, rules and regulations of the State of West Virginia and the United States of America.

19. Insurance. A company licensed by the West Virginia Insurance Commission to do business in the state of West Virginia shall underwrite all policies required by this Lease.

Lessee and/or any person or entity acting on Lessee's behalf under this Lease, shall maintain at all times during which this Lease remains in force and effect, workers compensation and employer's liability insurance, commercial general liability and umbrella liability insurance, business, auto and umbrella liability insurance, and environmental liability insurance in the amount of at least Twenty-Five Million Dollars (\$25,000,000.00), combined single limit. The insurance policies, except workers compensation and employer's liability insurance, shall name Lessor as an additional insured with regard to the Leased Premises, and shall reflect that the insurer has waived any right of subrogation against the Lessor.

The policies, declaration pages and certificates of insurance shall be delivered to Lessor within Thirty (30) days of the execution of this Lease, and upon each renewal of said insurance policies.

20. Bonding. Within Thirty (30) days of the execution of this Lease, Lessee shall post a surety bond in favor of the Lessor in an amount of Two Hundred Thousand Dollars (\$200,000.00) to secure the payment of all sums due and performance of all obligations arising under this Lease.

21. Assignment. The rights and estate of Lessee, or any permitted assignee or transferee of Lessee hereunder, may not be assigned or otherwise transferred, in whole or in part, without the prior written consent of Lessor, which consent shall not be unreasonably withheld.

In the event Lessee proposes to assign or transfer this Lease, the Lessee shall give Lessor written notice of its intent to assign or transfer its interest in the Lease, and shall specify the type of assignment or transfer contemplated, the identity and contact information of the proposed assignee or transferee, and the timeframe of the proposed assignment or transfer ("Transfer Notice").

Upon delivery of a Transfer Notice to the Lessor, Lessor shall have Fifteen (15) days to either: (a) consent to the proposed assignment or transfer by delivering its written consent to Lessee; or (b) in its reasonable discretion, withhold its consent to the proposed assignment or transfer by delivering written notice to Lessee that it is withholding its consent and specifying the reasons therefor.

If Lessor fails to respond to a Transfer Notice within the Fifteen (15) day period, then Lessor shall be deemed to have approved the assignment or transfer outlined in the Transfer Notice, and to have consented to such assignment or transfer in the same manner as if it would have delivered its written consent to Lessee.

22. Default. Any of the following shall be deemed a default of this Lease:

(a) Failure of Lessee to timely make royalty payments or any other required payments to Lessor under this Lease.

(b) If a creditor of Lessee, its agents and/or assigns, takes action to execute, garnish or attach Lessee's assets that include the Leased Premises: Provided, that this provision does not impair Lessee's ability to mortgage its interests in the Granted Minerals or the Leased Premises.

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(c) Failure of the Lessee to obtain any requisite "prior written consent" as set forth in this Lease.

(d) Failure of Lessee to maintain insurance and be bonded as set forth in this Lease.

(e) Shut-in of well exceeding the period set forth in this Lease.

23. Notice of Default or Breach. If Lessor considers that Lessee has failed to comply with its obligations under this Lease, whether expressed or implied, Lessor shall notify Lessee in writing stating the reasons Lessee has breached this Lease. Lessee shall have Thirty (30) days, after receipt of the notice, to cure the assertions by Lessor. If it is not practical to cure within the Thirty (30) days, then Lessee shall have Thirty (30) more days to commence curing, and shall diligently and continuously pursue to complete such cure.

If Lessee fails or refuses to cure the assertions by Lessor, or fails to respond in a meaningful fashion to Lessor's notice within the timeframes set forth above, or within a longer period of time if Lessee is in good faith continuously effectuating a cure, then this Lease shall automatically cease and terminate.

Upon such termination pursuant to this paragraph, Lessee agrees to:

(a) Immediately and unconditionally surrender possession of the Leased Premises, or that portion of the Leased Premises included in the notice; and

(b) Plug and abandon any producing or non-producing well(s).

24. Remedies for Default or Breach. Upon Lessee's failure to remedy any alleged breach of this Lease within the applicable cure period, Lessor shall be entitled to recover from Lessee any and all royalties, charges or claims of every kind and nature due, owing and/or arising out of this Lease, and to take immediate possession of the Leased Premises. If Lessor institutes proceedings to clear title or take possession of the Leased Premises, then Lessor shall be entitled to recover from Lessee its reasonable attorney fees, investigation costs, expert fees and any other reasonable costs or expenses related to such proceedings.

25. Surrender of Lease. If Lessee is not in default of any obligation due under this Lease, then Lessee may surrender the Leased Premises or any part thereof upon payment of all liabilities then accrued and due. Lessee must provide written notice delivered to Lessor Thirty (30) days prior to the effective date of the surrender. Lessee shall deliver to Lessor a recorded release of the surrendered area describing all depths, formations and horizons in and under the Leased Premises so released.

Lessee may not release any portion of the Leased Premises that is included in a pool or unit on which operations are being conducted.

26. No Warranty of Title.

(a) Lessor makes no representation of title or ownership, either expressed or implied, and further makes no warranty as to the actual or potential presence of Granted Minerals. Lessee represents it has performed all necessary due diligence regarding the title or ownership of the Granted Minerals and agrees to be bound by the quantum of acreage as set forth in the Legal Description set out herein.

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(b) Lessee shall notify Lessor of any adverse claim to the Leased Premises affecting title to all or a portion of the rights to develop the Granted Minerals, and Lessor may, with the approval of the Attorney General, enter into an escrow arrangement for the future rents and royalties accruing to such disputed portion of the Leased Premises under terms and conditions that the Attorney General feels proper to safeguard the rights and interest of the State of West Virginia.

(c) If an adverse claimant files suit against the State of West Virginia or against Lessee claiming title to all or a portion of the Granted Minerals, or if Lessee, after receiving notice of an adverse claim, institutes litigation in a court of competent jurisdiction to adjudicate the validity of the claim, the rents and royalties accruing to the litigated portion shall be placed in an escrow account until such time as the ownership of the disputed interest is determined by a court of competent jurisdiction.

(d) If a court of competent jurisdiction determines that Lessor does not have title to all or part of the Granted Minerals in the Leased Premises, the rentals, royalties and bonus thereafter accruing from any part as to which this Lease covers less than the full interest in such Granted Minerals, shall thereafter be paid only in the proportion which the interest therein, if any, covered by this Lease bears to the whole and undivided fee simple estate therein. Any sums of money paid pursuant to this Lease are not reimbursable to Lessee.

27. Indemnity. Unless caused by the negligence of Lessor, or any agent, servant, or employee of Lessor, Lessee shall defend, indemnify, protect and hold harmless Lessor and Lessor's heirs, successors, representatives, agents and/or assigns from and against any and all claims, demands, causes of action, liability, loss, damage or expense of any and every kind and nature, including without limitation costs, expenses, and attorneys' fees, for injury and death, or damage to persons or property, environmental damage to the surface, waterways, or subsurface estates of any person, firm, corporation or other entity arising out of, incidental to, or resulting from: (a) the operations or activities of Lessee or Lessee's servants, agents, employees, guests, licensees, invitees or independent contractors on or in the Leased Premises; (b) the exercise of any right granted under this Lease, and/or; (c) any obligations imposed under this Lease.

Any successor in interest of any rights of Lessee in this Lease shall likewise be obligated to defend and indemnify Lessor and Lessor's heirs, successors, representatives, agents and assigns in the same manner as the original Lessee.

28. Limitations on Drilling. From and after the effective date of this Lease, Lessee shall not commence construction of any new well pad that is intended to produce the Granted Minerals from the Leased Premises if such well pad would be located within Five Hundred Fifty feet (550') of any outside boundary of the tracts comprising the Leased Premises measured linearly from any point along said tract boundary to the midpoint of the secondary containment berm of a particular well pad.

Lessor and Lessee agree that the limitation on well pad construction and/or location set forth in this paragraph is intended to reduce any long-term, substantial interference with the public's use of the Leased Premises as it exists on the date of the Lease. Further, if Lessor determines, in its reasonable discretion after conducting a proper investigation, that the drilling activities of Lessee related to the production of the Granted Minerals from the Leased Premises have created a long-term, substantial interference with the public's use of the Leased Premises as aforesaid, then Lessor shall have the right to seek from Lessee additional measures or controls to mitigate such long-term substantial impairment caused by Lessee's drilling activities.

29. **Force Majeure.** If Lessee is prevented from complying with its obligations under this Lease, either expressed or implied, except payment of money, due to scarcity of or inability to obtain or use equipment or material, or by operations of Force Majeure, or any federal or state law, or any order, rule or regulation, then, while so prevented, Lessee's obligation to comply with this Lease shall be temporarily suspended, and Lessee shall not be liable in damages. This Lease shall be extended only so long as Lessee is prevented by any such cause from conducting operations on or in the Leased Premises: Provided, that in no event shall Lessee's performance be suspended as a result of Force Majeure, federal or state law, or any rule or regulation for a period in excess of two (2) consecutive years.

As used herein, "Force Majeure" means an act of god such as flood, fire, adverse weather conditions, war, sabotage, rebellion, insurrection, riot, strike or labor disputes, or such other causes not within Lessee's control. "Force Majeure" shall specifically exclude scarcity, cost or inability to obtain or use equipment, contracts, personnel, water or other materials.

30. **Further Assurances.** Each of the parties hereto shall, and shall cause its respective affiliates to, from time to time at the request of the other party, without any additional consideration, furnish the other party such further information or assurances, execute and deliver such additional documents, instruments and conveyances, and take such other actions and do such other things, as may be reasonably necessary in the opinion of counsel to the requesting party to carry out the provisions of this Lease.

In the event that Lessor is not the proper agency or instrumentality of the State of West Virginia to enter into this Lease, then Lessor shall cause all of the proper agencies or instrumentalities of the State of West Virginia, without any additional consideration, to join in this Lease, as Lessor, upon the same terms provided herein.

31. **Governing Law.** This Lease shall be governed by the laws of the State of West Virginia and any dispute arising out of this Lease shall be resolved in a West Virginia court of law having jurisdiction thereof.

32. **Notices and Payments.** All notices and payments which are permitted or required under this Lease shall be in writing and shall be deemed valid and received if delivered personally, or by registered or certified mail, return receipt requested, or by special carrier with signature required, to the Lessor and/or Lessee at the following addresses, unless otherwise agreed by the parties in a signed writing:

(a) **To Lessor:**

West Virginia Division of Natural Resources
Attn: Office of Land and Streams
324 Fourth Avenue, Room 200
South Charleston, West Virginia 25303

(b) **To Lessee:**

SWN Production Company, LLC
10000 Energy Drive
Spring, Texas 77389

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33. **Successors in Interest.** The Terms, conditions, covenants, obligations, considerations, or requirements of this Lease shall extend to and be binding upon the parties hereto, their heirs, successors, executors, administrators, and assigns, all of whom shall be jointly and severally liable.

34. **Severability.** Should any one or more of the provisions in this Lease become or be determined to be void or invalid, in whole or in part, the remainder of this Lease shall remain in full force and effect.

35. **Counterparts.** This Lease may be executed in any number of counterparts, and by different parties in separate counterparts, all of which shall be identical. Each such counterpart shall be deemed to be an original instrument, but all such counterparts together shall constitute one instrument.

WITNESS the following signatures and seals:

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STATE OF WEST VIRGINIA
DEPARTMENT OF COMMERCE
DIVISION OF NATURAL RESOURCES

By: [Signature]
Director

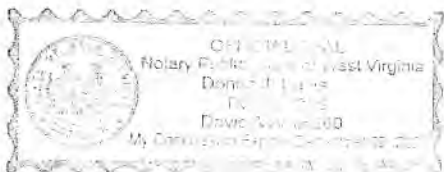
STATE OF WEST VIRGINIA
COUNTY OF Tucker ~~KANAWHA~~, To-wit:

I, Donna J Davis, a Notary Public in and for said County and State, do hereby certify that Stephen S. McDaniel, Director, who signed the writing hereto annexed, for the State of West Virginia, Department of Commerce, Division of Natural Resources, bearing date the 22nd day of November, 2019, has this day acknowledged the same before me in my said county to be the act and deed of said Division.

Given under my hand this 22 day of November, 2019.

My commission expires Dec 09, 2023.

[Seal]



[Signature]
Notary Public

SWN PRODUCTION COMPANY, LLC

By: [Signature]
Brett Massad
Land Director

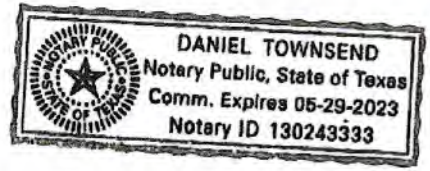
GN
p. 15

STATE OF Texas
COUNTY OF Harris, To-Wit:

I, Daniel Townsend, a Notary Public in and for said County and State,
do hereby certify that Brett Massad, its Land Director,
who signed the writing hereto annexed, for SWN PRODUCTION COMPANY, LLC, bearing date
the 4th day of November, 2019, has this day acknowledged the same before
me in my said county to be the act and deed of said Company.

Given under my hand this 4th day of November, 2019.
My commission expires May 29, 2023.

[Seal]



[Signature]
Notary Public

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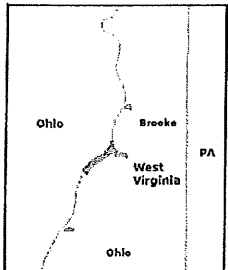
Prepared by: Office of Land & Streams
Division of Natural Resources
324 Fourth Avenue, Room 200
South Charleston, WV 25303

Using a form prepared by:
Larry W. George, Esq.
Special Assistant Attorney General
West Virginia Department of Commerce

Approved as to form this 21st day of
November, 2019.
Patrick Morrissey, Attorney General
By: [Signature]

Exhibit A

Ohio River And Navigable Creek Leasing



Index Location Point
 Ohio River Mile Marker
 Nominated River Tract
 Nominated Navigable Creek

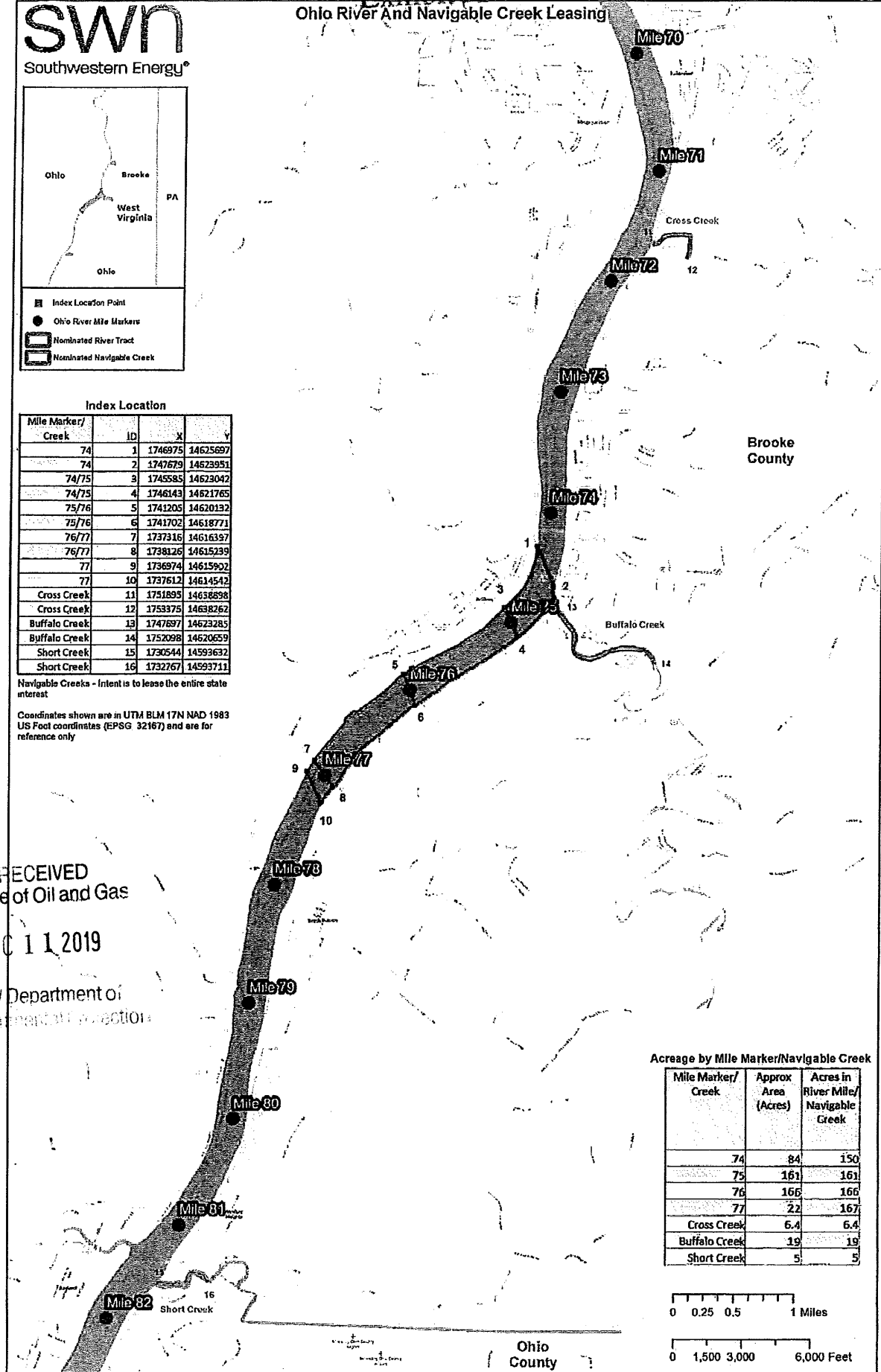
Index Location

Mile Marker/ Creek	ID	X	Y
74	1	1746975	14625697
74	2	1747679	14623951
74/75	3	1745585	14623042
74/75	4	1746143	14621765
75/76	5	1741205	14620132
75/76	6	1741702	14618771
76/77	7	1737316	14616397
76/77	8	1738126	14615239
77	9	1736974	14615902
77	10	1737612	14614542
Cross Creek	11	1751895	14638698
Cross Creek	12	1753375	14638262
Buffalo Creek	13	1747697	14623285
Buffalo Creek	14	1752098	14620659
Short Creek	15	1730544	14593632
Short Creek	16	1732767	14593711

Navigable Creeks - Intent is to lease the entire state interest

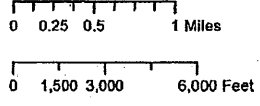
Coordinates shown are in UTM BLM 17N NAD 1983 US Foot coordinates (EPSG 32167) and are for reference only

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Acres by Mile Marker/Navigable Creek

Mile Marker/ Creek	Approx Area (Acres)	Acres in River Mile/ Navigable Creek
74	84	150
75	161	161
76	166	166
77	22	167
Cross Creek	6.4	6.4
Buffalo Creek	19	19
Short Creek	5	5



December 9, 2019

Ms. Laura Adkins
WV DEP Office of Oil & Gas
601 57th St., SE
Charleston, WV 25304

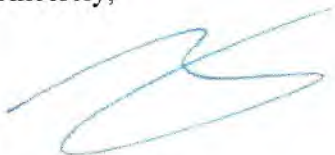
RE: SWN's proposed New Well: Violet Coss BRK 6H in Brooke County, West Virginia, Drilling under 67/2, Coss Road, Greens Run Road, and McCord Hill Road.

Dear Ms. Adkins:

SWN Production Company, LLC ("SWN") is applying for a drilling permit for the above referenced well. The State of West Virginia has raised some concern as to SWN's right to drill under 67/2, Coss Road, Greens Run Road, and McCord Hill Road. Please be advised that SWN has leased all mineral owners under said route as it relates to the above-referenced well and unit.

Thank you.

Sincerely,



Gary Nuckolls
Staff Landman
SWN Production Company, LLC

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Successors to the J.J. Arnold Company
 1018 Forest Hill Drive
 Lawrenceburg, KY 40342

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FEB 27 2020

MAIL & MORE-CMR
 MORGANTOWN, WV 26508

Linda Coen
 1801 Coss Ln
 Wellsburg, WV 26070

7019 2280 0002 2689 4112