

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

API 47 - 061 - 01920 County Monongalia District Clay
Quad Grant Town Pad Name Sullivan Field/Pool Name _____
Farm name Alan Sullivan Well Number 9H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia St. E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4385289.1 Easting 566679.0
Landing Point of Curve Northing 4385036.3 Easting 566080.5
Bottom Hole Northing 4388347.1 Easting 564109.5

Elevation (ft) 1,476' 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)
Synthetic Based Mud - Horizontal Section: BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE),
M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUM

Date permit issued 12/19/2022 Date drilling commenced 2/7/2023 Date drilling ceased 2/25/2023
Date completion activities began 8/29/2023 Date completion activities ceased 10/5/2023
Verbal plugging (Y/N) NA Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 914' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2,402' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 894' - 914' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

02/23/2024

API 47-061 - 01920 Farm name Alan Sullivan Well number 9H

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	30"	24"	128'	N		NA	
Surface	17-1/2"	13-3/8"	1,413'	N	54.5	NA	Y, 24 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,498'	N	36	NA	Y, 4 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	21,820'	N	20	NA	Y
Tubing							
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	4,500 PSI Grout						48
Surface	Class A + 2%	850	15.6	1.14	965	CTS	8
Coal							
Intermediate 1	Class A + 1%	990	15.6	1.13	1,116	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	4,565	14.5	1.13	4,743		48
Tubing							

Drillers TD (ft) 21,813' Loggers TD (ft) 21,783'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure _____

Kick off depth (ft) 7,148'

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: Bow spring centralizers every 3rd joint or approximately 120'
Intermediate: Bow spring centralizers every 3rd joint or approximately 120'
Production: Rigid body centralizers placed at a minimum of every other joint (~80') from TD to surface

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 _____

Sullivan Completion Lithology

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/silt	0	175	Sand/silt
Sand/red shale	175	280	sand with reddish shale
sandstone/shale	280	620	sandstone/shale
Washington coal	530	534	coal
siltstone/sandstone	534	607	
Waynesburg coal	607	614	Waynesburg coal
sandstone/limestone	614	680	sandstone/limestone
siltstone/sandstone	680	715	siltstone/sandstone
sandstone/siltstone	715	750	sandstone/siltstone
Limestone/sandstone/shale	750	767	Limestone/sandstone/shale
Sewickley coal	767	774	Sewickley coal
Limestone	774	893	Limestone
Pittsburgh coal	894	914	Pittsburgh coal
Limestone/siltstone	915	1220	Limestone/siltstone
sandstone/siltstone	1450	1960	sandstone/siltstone
Red Rock/siltstone/limestone	1960	2100	Red Rock/siltstone/limestone
Little Lime	2100	2156	Little Lime
Big Lime	2156	2280	Big Lime
Big Injun	2280	2410	Big Injun
Sand/silt	2410	2790	Sand/silt
Gantz	2790	2800	Gantz
Sand/shale	2800	3040	Sand/shale
Red Rock/siltstone	3040	3135	Red Rock/siltstone
siltstone/sandstone	3135	7393	siltstone/sandstone
Middlesex	7393	7610	Middlesex
Burkett	7610	7793	Burkett
Geneseo	7793	7846	Geneseo
Tully	7846	7905	Tully
Hamilton	7905	8035	Hamilton
Marcellus	8035	TD	Marcellus

Sullivan 9H Stimulation Report

Stage Number	Report Date	ISIP (psi)	Breakdown Pressure (psi)	Avg Treating Pressure (psi)	Avg Treating Rate (BPM)	Pad Volume (bbls)	Total Clean Fluid (Bbls)	Total Proppant Amount (lbs)	Flush Volume (bbls)
1	8/29/2023	4,798	8,234	9,061	94	48	7,139	300,200	533
2	8/30/2023	5,222	6,488	9,009	90	74	44,650	457,900	486
3	8/31/2023	4,977	6,699	9,204	94	39	9,698	455,100	404
4	9/1/2023	5,053	6,994	9,257	93	11	9,737	457,300	504
5	9/1/2023	5,225	5,202	9,541	94	42	9,501	455,600	428
6	9/2/2023	5,510	7,351	9,236	94	39	9,520	455,800	468
7	9/3/2023	5,450	7,006	9,580	93	42	9,522	455,900	466
8	9/3/2023	5,286	7,723	9,555	94	27	9,460	455,400	454
9	9/4/2023	5,275	7,370	9,658	93	29	9,506	456,000	451
10	9/5/2023	5,283	7,736	9,527	92	26	9,562	455,700	439
11	9/5/2023	5,421	7,030	9,495	94	20	9,539	456,100	444
12	9/6/2023	5,655	6,831	9,591	92	47	9,169	455,500	443
13	9/7/2023	5,522	6,476	9,643	93	37	9,412	456,800	423
14	9/8/2023	5,305	5,997	9,456	94	27	9,392	455,700	422
15	9/8/2023	5,806	6,762	9,351	94	37	9,108	455,300	426
16	9/9/2023	5,179	6,628	9,369	92	35	8,700	455,500	408
17	9/9/2023	5,684	7,501	9,226	94	14	8,485	454,500	417
18	9/10/2023	5,120	6,946	9,276	93	28	8,561	455,800	403
19	9/11/2023	5,152	4,489	9,338	94	20	9,028	456,300	397
20	9/11/2023	5,929	4,329	9,186	94	4	8,955	452,800	404
21	9/12/2023	5,478	6,587	9,263	93	29	8,544	455,700	389
22	9/12/2023	6,089	6,742	9,306	93	11	8,534	454,800	395
23	9/13/2023	6,063	7,657	9,655	92	29	7,989	456,800	378
24	9/14/2023	5,902	7,319	9,510	93	47	9,121	455,200	432
25	9/14/2023	5,575	7,123	9,597	93	11	8,647	456,724	428
26	9/15/2023	5,958	7,549	9,519	90	8	8,663	455,000	378
27	9/15/2023	5,604	7,628	9,351	94	26	8,393	455,100	371
28	9/16/2023	5,653	7,202	9,364	94	14	8,596	456,000	409
29	9/16/2023	6,094	6,679	9,037	94	33	8,639	454,900	431
30	9/17/2023	5,048	6,224	8,966	94	9	8,570	455,900	360
31	9/18/2023	5,803	7,661	9,259	94	19	8,374	454,900	355
32	9/18/2023	5,036	6,647	9,205	94	6	8,555	455,800	353
33	9/19/2023	5,437	7,072	9,111	94	32	8,303	415,850	347
34	9/19/2023	6,095	7,128	8,990	94	38	8,618	455,200	342
35	9/20/2023	5,680	7,147	9,202	94	6	8,248	455,500	352
36	9/20/2023	5,278	7,659	9,283	94	13	8,545	454,800	386
37	9/21/2023	5,765	7,178	8,838	94	4	8,282	455,300	350
38	9/22/2023	5,641	6,993	8,355	94	29	8,373	456,500	314
39	9/22/2023	5,641	6,990	8,538	94	28	8,363	456,000	309
40	9/23/2023	5,390	7,517	8,575	94	19	8,174	455,900	325
41	9/23/2023	5,772	6,872	8,439	95	29	8,391	456,600	299
42	9/24/2023	5,866	6,442	8,817	94	5	8,324	455,600	329
43	9/25/2023	5,343	6,910	8,651	94	31	8,412	455,347	298
44	9/25/2023	5,641	5,818	8,502	95	46	8,352	456,800	284
45	9/26/2023	5,328	7,276	8,690	94	31	8,115	455,400	292

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Stage Number	Report Date	ISIP (psi)	Breakdown Pressure (psi)	Avg Treating Pressure (psi)	Avg Treating Rate (BPM)	Pad Volume (bbls)	Total Clean Fluid (Bbls)	Total Proppant Amount (lbs)	Flush Volume (bbls)
46	9/27/2023	5,154	7,329	8,453	94	31	8,087	456,500	261
47	9/27/2023	4,290	7,455	8,800	94	83	8,340	415,100	284
48	9/28/2023	5,311	7,396	8,506	94	31	8,172	456,200	270
49	9/28/2023	5,231	7,477	8,427	95	20	8,238	455,000	337
50	9/29/2023	5,280	7,245	8,272	94	25	8,263	454,700	364
51	9/29/2023	6,473	6,416	8,258	95	26	7,986	456,700	249
52	9/30/2023	5,652	7,223	8,148	94	33	7,929	456,400	248
53	9/30/2023	5,470	7,550	8,112	95	21	8,333	456,600	246
54	10/1/2023	5,461	6,919	7,782	94	28	8,137	455,200	214
55	10/1/2023	5,422	7,434	7,847	94	34	8,207	456,500	238
56	10/2/2023	5,389	7,289	7,786	94	9	8,042	454,800	277
57	10/2/2023	5,207	7,669	7,693	94	26	7,982	456,700	229
58	10/3/2023	5,182	5,043	7,683	94	7	8,124	454,800	284
59	10/3/2023	5,218	6,447	7,478	94	22	8,173	456,300	219
60	10/4/2023	5,050	7,111	7,524	94	27	8,121	455,200	276
61	10/4/2023	5,621	6,420	7,496	94	23	8,021	455,200	231
62	10/4/2023	5,183	7,234	7,255	93	26	8,108	452,000	208
63	10/5/2023	5,148	6,275	7,173	93	71	8,189	456,200	253
64	10/5/2023	4,920	6,623	7,337	94	12	7,992	454,900	248
65	10/5/2023	4,983	7,203	7,585	94	20	8,013	454,900	238
66	10/5/2023	5,029	7,079	7,314	94	20	8,008	455,300	235
67	10/5/2023	5,037	8,699	7,489	94	15	8,007	455,500	259

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Sullivan 9H
Perforation Report

Stage Number	Report Date	Total Shots	Cluster 1 Top TD	Cluster 5 Bottom TD
1	8/29/2023	40		21,713
2	8/30/2023	40	21,669	21,510
3	8/31/2023	40	21,467	21,308
4	9/1/2023	40	21,265	21,106
5	9/1/2023	40	21,063	20,904
6	9/2/2023	40	20,861	20,702
7	9/3/2023	40	20,660	20,500
8	9/3/2023	40	20,458	20,298
9	9/4/2023	40	20,256	20,096
10	9/5/2023	40	20,054	19,894
11	9/5/2023	40	19,852	19,693
12	9/6/2023	40	19,650	19,491
13	9/7/2023	40	19,448	19,289
14	9/8/2023	40	19,246	19,087
15	9/8/2023	40	19,044	18,885
16	9/9/2023	40	18,843	18,683
17	9/9/2023	40	18,641	18,481
18	9/10/2023	40	18,439	18,279
19	9/11/2023	40	18,237	18,077
20	9/11/2023	40	18,035	17,876
21	9/12/2023	40	17,833	17,674
22	9/12/2023	40	17,631	17,472
23	9/13/2023	40	17,429	17,270
24	9/14/2023	40	17,227	17,068
25	9/14/2023	40	17,026	16,866
26	9/15/2023	40	16,824	16,664
27	9/15/2023	40	16,622	16,462
28	9/16/2023	40	16,420	16,260
29	9/16/2023	40	16,218	16,058
30	9/17/2023	40	16,016	15,857
31	9/18/2023	40	15,814	15,655
32	9/18/2023	40	15,612	15,453
33	9/19/2023	40	15,410	15,251
34	9/19/2023	40	15,209	15,049
35	9/20/2023	40	15,007	14,847
36	9/20/2023	40	14,805	14,645
37	9/21/2023	40	14,603	14,443
38	9/22/2023	40	14,401	14,241
39	9/22/2023	40	14,199	14,040
40	9/23/2023	40	13,997	13,838
41	9/23/2023	40	13,795	13,636
42	9/24/2023	40	13,593	13,434
43	9/25/2023	40	13,392	13,232
44	9/25/2023	40	13,190	13,030
45	9/26/2023	40	12,988	12,828
46	9/27/2023	40	12,786	12,626
47	9/27/2023	40	12,584	12,424

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Stage Number	Report Date	Total Shots	Cluster 1 Top TD	Cluster 5 Bottom TD
48	9/28/2023	40	12,382	12,223
49	9/28/2023	40	12,180	12,021
50	9/29/2023	40	11,978	11,819
51	9/29/2023	40	11,776	11,617
52	9/30/2023	40	11,575	11,415
53	9/30/2023	40	11,373	11,213
54	10/1/2023	40	11,171	11,011
55	10/1/2023	40	10,969	10,809
56	10/2/2023	40	10,767	10,607
57	10/2/2023	40	10,565	10,406
58	10/3/2023	40	10,363	10,204
59	10/3/2023	40	10,161	10,002
60	10/4/2023	40	9,959	9,800
61	10/4/2023	40	9,758	9,598
62	10/4/2023	40	9,556	9,396
63	10/5/2023	40	9,354	9,194
64	10/5/2023	40	9,152	8,992
65	10/5/2023	40	8,950	8,790
66	10/5/2023	40	8,748	8,589
67	10/5/2023	40	8,546	8,387

02/23/2024

Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	08/29/2023
Job End Date:	10/05/2023
State:	West Virginia
County:	Monongalia
API Number:	47-061-01920-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Sullivan 9H
Latitude:	39.614761
Longitude:	-80.223199
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8212.68304347826
Total Base Water Volume (gal)*:	24169256
Total Base Non Water Volume:	0

Water Source	Percent
Groundwater, < 1000TDS	100.00%

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
CIA-12	Universal Pressure Pumping	Acid corrosion inhibitor					
Clearal 268	Chemstream	Biocide					
Hydrochloric Acid (7.5%)	Universal Pressure Pumping	Acidizing					
Other Chemical(s)	Listed Above	See Trade Name(s)					
Sand (100 Mesh Proppant)	Universal Pressure Pumping	Proppant					
Sand (40/70 White Proppant)	Universal Pressure Pumping	Proppant					
StimStream FR 9800	Chemstream	Friction Reducer					
StimStream SC 405	Chemstream	Scale Control					

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Water	Operator	Carrier Fluid					
Items above are Trade Names. Items below are the individual ingredients.							
			Water	7732-18-5	100.00000	86.69712	None
			Crystalline silica, quartz	14808-60-7	100.00000	11.77561	None
			Crystalline silica, quartz	14808-60-7	100.00000	1.27938	None
			Hydrochloric acid	7647-01-0	15.00000	0.02337	None
			Water	7732-18-5	80.00000	0.01764	
			Water	7732-18-5	70.00000	0.01451	
			Butene Homopolymer	9003-29-6	25.00000	0.01229	
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01229	None
			Glutaraldehyde	111-30-8	20.00000	0.00441	None
			Diethylenetriamine penta (methylene phosphonic acid) (DTPMP)	15827-60-8	10.00000	0.00207	
			2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1	10.00000	0.00207	None
			Citric Acid	77-92-9	10.00000	0.00207	
			alcohols, C12-18, ethoxylated	68213-23-0	3.00000	0.00148	
			Quaternary Ammonium Compounds	68424-85-1	3.00000	0.00066	
			Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00066	
			Ethanol	64-17-5	1.50000	0.00033	
			Ethylene glycol	107-21-1	45.00000	0.00007	None
			Glycol Ether EB	111-76-2	45.00000	0.00007	
			N,N-Dimethylformamide	68-12-2	20.00000	0.00003	
			Tar bases,quinoline derivs.,benzyl chloride-quaternized	72480-70-7	20.00000	0.00003	
			Water	7732-18-5	15.00000	0.00002	
			Cinnamaldehyde	104-55-2	10.00000	0.00002	
			Nonylphenol ethoxylated	127087-87-0	10.00000	0.00002	
			Alcohols, C6-12	68603-15-6	10.00000	0.00002	

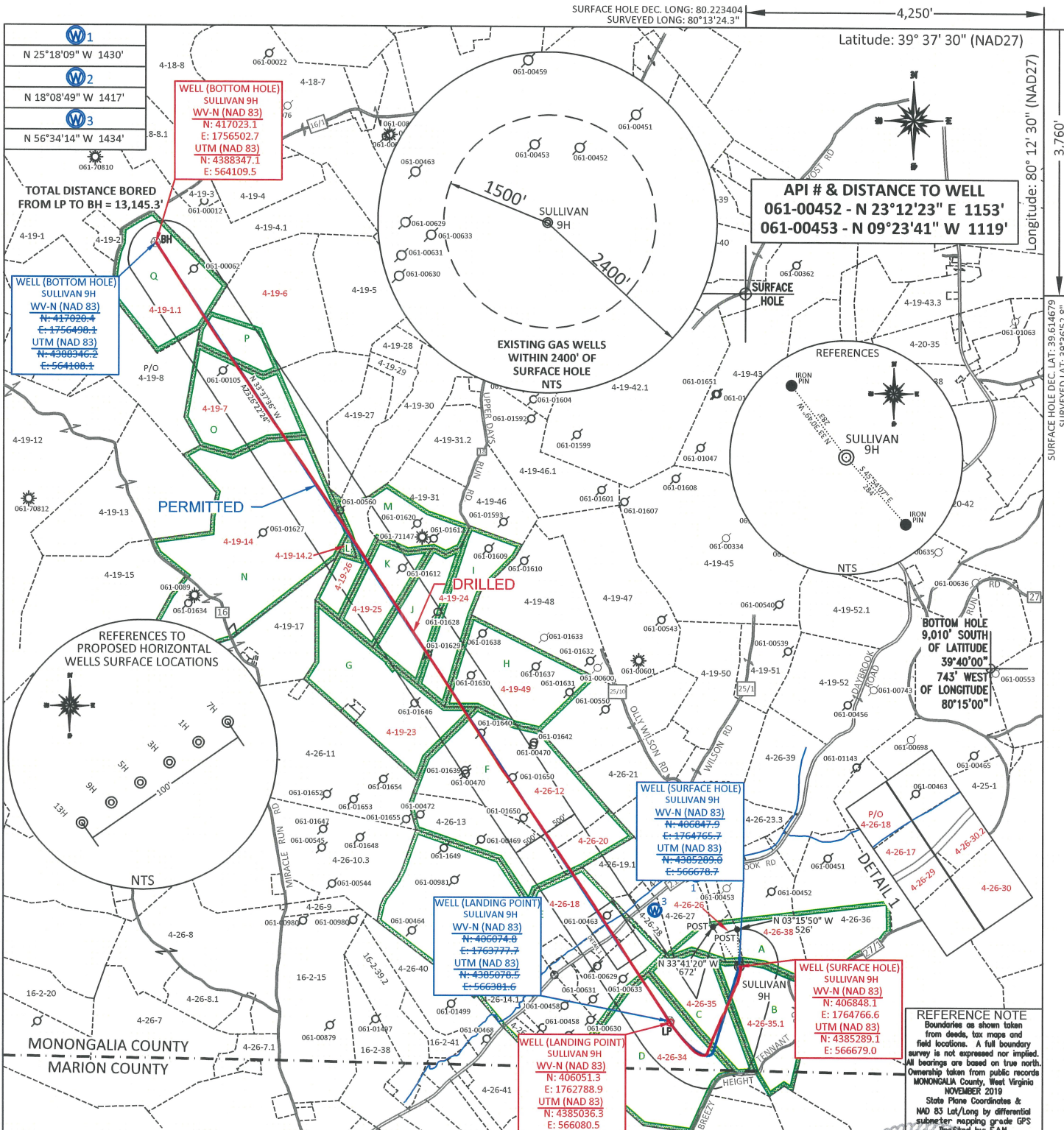
* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

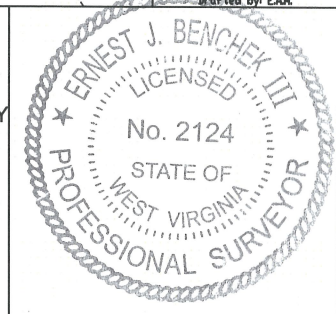
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

02/23/2024



FILE #: NNE20
 DRAWING #: 3047
 SCALE: PLAT: 1" = 2000'
TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 Signed: [Signature]
 L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304
 Well Type: Oil Waste Diposal Production Deep
 Gas Liquid Injection Storage Shallow
 WATERSHED: UPPER MONONGAHELA RIVER AS-BUILT ELEVATION: 1,476'
 COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: GRANT TOWN
 SURFACE OWNER: ALAN SULLIVAN ACREAGE: 870.94 +/-
 OIL & GAS ROYALTY OWNER: ALAN SULLIVAN ACREAGE: 25.870 **02/23/2024**
 LEASE NUMBERS: _____
 DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____
 TARGET FORMATION: MARCELLUS
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC DRILLED DEPTH: TVD: 8,200' TMD: 21,813'
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200 DESIGNATED AGENT: JOHN ADAMS
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

4-19-14	PENNY S QUICKLE
4-19-23	BOYD & MARY STARKEY ESTATE
4-26-35	RANDY LEE & TRINA TENNANT
4-26-34	SHIRLEY J NEELY, DEANNA M FRAZIER, DONNA J WALDEN & DARRIN NEELY
4-26-18	ROSE MARIE FLUHARTY
4-26-30	THOMAS R & LISA A LUZADER
4-26-38	ADAM CLAY DARRAH
4-26-30.2	WAYNE WHIPKEY
4-26-17	ROSE MARIE FLUHARTY
4-26-29	WAYNE WHIPKEY
4-19-14.2	PENNY S QUICKLE
4-19-26	CHARLES W MOORE; JASON T & KIRSTON KARSON (LIFE)
4-19-24	EDITH L DARRAH
4-19-25	SHIRLEY L MOORE ESTATE
4-19-49	ROCKY & CATHY J BARR
4-26-12	KENNETH W & RUTH E ALBERT
4-26-35.1	ALAN SULLIVAN
4-26-26	NNE MIDSTREAM LLC
4-26-20	KENNETH W & RUTH E ALBERT
4-19-6	JIMMY R & PAMELA K TENNANT; RAY & ROXANA CAHILL
4-19-7	STEPHEN R WILSON, ET AL
4-19-1.1	KEMBLE D TATE

LEASE INDEX			
A	WV-061-000160-001-ACT	I	WV-061-003931-001
B	WV-061-005448-002	J	WV-061-003931-011
C	WV-061-000160-001-ACT	K	WV-061-003931-002
D	WV-061-000165-001 - LA	L	WV-061-000160-001-ACT
E	WV-061-000160-001-ACT	M	WV-061-003931-011
F	WV-061-005998-001	N	WV-061-000160-001-ACT
G	WV-061-004797-039	O	WV-061-004792-004
H	WV-061-000160-001-ACT	P	WV-061-005788-001
		Q	WV-061-005876-002

02/23/2024

FILE #: <u>NEE20</u>	DATE: <u>FEBRUARY 5, 2024</u>
DRAWING #: <u>3047</u>	OPERATOR'S WELL #: <u>SULLIVAN 9H AS-DRILLED</u>
SCALE: <u>N/A</u>	API WELL #: <u>47</u> <u>61</u> <u>01920</u> STATE COUNTY PERMIT