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Drillout Procedure

MIP 5H
Monongalia County
West Virginia
API: 47-061-01699
AFE: 100334-604

November 18, 2015

Ian Costello – Completions Engineer

Overview

Datum Points	
Latitude (NAD83):	39.601833
Longitude (NAD83):	-79.976152
Elevation:	1,058
Depth Reference (RKB - GL) (ft):	22.5
Csg Tally Marker Joint Depth (ft):	6,530.76 / 9,002.72
Marker Joint Length (ft):	10 / 19.87

Wellbore Tubulars						
Casing	**Hole Size (in)**	**Casing Size (in)**	**Casing Grade**	**Lb / Ft**	**I.D. (in)**	**Setting Depth (ft)**
Conductor	24	20	NA	-	19.25	50
Surface	17-1/2	13-3/8	J-55	54.5	12.615	493
Intermediate	12-1/4	9-5/8	J-55	40	8.835	1,781
Production	8-3/4	5-1/2	P-110	20	4.778	14,438

Wellbore Geometry		
Location	**Measured Depth**	**Vertical Depth**
KOP	6,472	6,472
10˚	6,602	6,600
20˚	6,750	6,740
30˚	6,900	6,875
40˚	7,000	6,955
50˚	7,100	7,025
60˚	7,250	7,100
70˚	7,400	7,170
80˚	8,550	7,485
LP	8,963	7,530
TD	14,454	7,530

Relevant Tubular Properties									
Tubular	**ID (in)**	**Connection**	**Lb / Ft**	**Burst Pressure (psi)**	**Collapse Pressure (psi)**	**Yield Strength (lbs)**	**Max Torque (ft-lbs)**	**Capacity (Bbls/Ft)**	**Displacement (Bbls/Ft)**
5-1/2 P110 Csg	4.778	GeoConn /BTC	20	12,640	NA	NA	NA	.0222	NA
2-3/8 J-55 Tbg	1.995	T&C EUE/8RD	4.7	7,700	8,100	71,370	1,610	.00387	.00171
2-3/8 P-110 Tbg	1.995	T&C EUE/8RD	4.7	15,400	16,130	143,470	2,980	.00387	.00171
2-3/8 P-110 Tbg	1.867	PH6	5.95	22,500	20,060	105,000	3,375	.00339	.00217

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Pressure Information	
Last Recorded Pressure (psi)	3,000
Date/Time	November 07, 2015 – 01:30

Final Production Tubing BHA	
X – Profile	7,125' KB (55 degrees)
EOT	8,415' KB (77 degres)

Plug Information	
Plug Manufacturer	Schlumberger
Plug Model	Diamondback
Total Plug Count	31

Northeast Natural Energy Primary Contacts

Completions
Ian Costello – Completions Engineer – icostello@nne-llc.com – (304) 610-9764
Jay Hewitt – Drilling Manager – jhewitt@nne-llc.com – (304) 382-1825
Zack Arnold – GM Operations – zarnold@nne-llc.com – (304) 203-8059
Ryan Warner – Production Engineer – rwarner@nne-llc.com – (304) 777-3287

Water Operations / Construction
Chris Patterson – Water Operations/Staff Landman – cpatterson@nne-llc.com – (304) 203-7034
Mike Shreve – Construction Coordinator – mshreve@nne-llc.com – (304) 918-3050

Regulatory
Hollie Medley – Regulatory Coordinator – hmedley@nne-llc.com - (304) 241-5752 x 7108
Brett Loflin – VP Regulatory – bloflin@nne-llc.com - (304) 414-7063

Emergency / Compliance
Refer to Site Safety Plan for emergency protocols and contact information
Gayne Knitowski – Regional WV DEP Inspector – gayne.j.knitowski@wv.gov – (304)-546-8171
Joe McCourt – Northern WV DEP Supervisor – joseph.a.mccourt@wv.gov – (304)-380-2476
Michael Fortney – MECCA 911 / Emergency Planner – mfortney@mecca911.org – 304-598-0301
WV DEP Pollution and Emergency Spills – 1-800-642-3072 (For Emergency Use Only)
Monongalia County Emergency Services - Dial 911 (For Emergency Use Only)

Third Party Participants

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Key Vendors

Service Rig – Stone Well Service

Downhole Tools / Service – Hybrid Tool Solutions

BOPs / Handling Tools – Weatherford

Pumps & Swivel – Weatherford

Wellhead Equipment / Service – Cameron

Flowback – Schlumberger Production Testing

Roustabout Services – Starrets Well Service

Chemicals – Mt. Supply

Waste Management – Max Environmental

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Operational Procedures

Introduction

Northeast Natural Energy is dedicated to developing a safe and healthy working environment for all employees and contractors through the combination of engineering design, practicality, and a hands on approach. Furthermore, NNE is committed to protecting our natural environment and maintains a strong anti-pollution and spill prevention program in all areas where it conducts business. The objective of this procedure is to act as a guide to execute the completion of the well while following all of these core values.

Safety

1. Pre-job safety meetings are to be held at the beginning of each shift and prior to any changes in operating conditions/procedures during a shift throughout the course of all operations.
2. All crews on location must have the same relief times to provide an accurate head count on location and uniform hand-over procedures and directions.
3. During simultaneous operations, make sure that all parties performing work on the pad attend safety meetings and their presence is documented.
4. PJSM topics should encompass NNE core values, **stop work authority**, PPE requirements, muster areas, specific site concerns, notification processes, and specific operational concerns.
5. During PJSM, discuss NNE JSA and distribute for signature amongst all crew members. JSA must be completed relative to specific job hazards for operation.
6. NNE JSA does not replace contractor JSA. Each contractor JSA must be signed off on and collected by NNE supervisor before work may commence.
7. Any non-transient visitor to the pad not present for initial safety meeting, must report to company man upon arrival for sign-in on NNE JSA and briefing of site hazards. Non-transient visitors are defined as anyone that will leave a ten foot perimeter of their vehicle or may come within one-hundred feet of wellhead, production, or operating equipment.
8. A daily environmental inspection is required by supervisors and a NNE Environmental Checklist must be completed detailing inspection. When two supervisors are splitting oversight of an operation, the daytime supervisor is responsible for inspection/completion of such forms.
9. If an environmental/safety incident or near miss occurs, notify the NNE supervisor immediately and follow guidelines in provided Site Safety Plan for response. Complete incident report for documentation of the incident, and send to office for review.
10. All safety information, forms, JSAs, environmental checklists, and incident reports must be contained in a folder, separated daily, and turned in to NNE supervisor at the end of operations.
11. Make note of all safety meetings and incidents in daily reports.

Pre-Equipment Move & Move-In-Rig-Up (MIRU)

1. Obtain well permit and site safety plan for all wells on pad from NNE supervisor. Maintain accessible copies throughout all completion operations on pad.
2. Make sure paper copies of pad design, reclamation plans, and active permits are in place in the mailbox.
3. Ensure NNE safety / PPE signage is installed and visible at pad entrance.
4. RDMO frac and wireline equipment.

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5. Install containment to site that surrounds all equipment and non-fresh water vessels. Containment systems must be designed to hold 110% of the volume of the largest storage vessel contained.
6. Hold PJSM and operational review.
7. Ensure gas monitoring system is in place. If gas/condensate is expected during drillout then RU separator and flare stack.
8. MIRU WOR. Ensure rig is centered over well.
9. NU 10K BOP stack on the existing LMV per the attached design. Torque flange bolts to specification using new ring groove gaskets at each connection. Ensure annular element is of natural type rubber and new.
10. Spot (2) four-station hydraulic closing units to function BOP equipment at a minimum of 50' away from the well. The annular is to be connected solely to a single closing unit. Ensure accumulators are stamped with a third party inspection within the previous six months. Ensure fire retardant hydraulic lines are utilized.
11. RU reverse unit, lines, and flowback equipment.
12. Bleed any pressure on well down to 0 psi through flowback equipment. Perform a thirty minute negative test on the kill plugs in the well. Notify NNE supervisor if build up is found to occur.
13. Retorque LMV to specification with 0 psi on the well.
14. Spot and fill (3) 500 Bbl working tanks with approved drillout fluid (brine). Check with NNE supervisor for required fluid density. Batch treat the tanks with biocide at 0.25 gpt. Roll tanks using circulating pump to evenly disperse treatment.
15. Spot and fill (1) 500 Bbl working tank with fresh water.
16. Spot pipe racks. Unload and rack 2-3/8" 4.7# P110 8RD, 2-3/8" 4.7# J55 8RD, and 2-3/8" 5.95# P110 PH6 workstring.

Drillout

1. Perform accumulator drawdown test on each closing unit. Document the results of the test. Pressure test blind rams against LMV to 5,000 psi.
2. Open both tubing spools valves in cellar and bleed off any pressure. PU and install tubing hanger in tubing head. Secure lock down pins. Tubing spools valves are to remain open throughout entire BOP testing procedure. Function test all BOP elements. Pressure test pipe rams and flowback equipment to 5,000 psi. Pressure test annular preventer to 3,000 psi. All valves, lines, and equipment that have the potential to be exposed to pressure during operations must pass a 5 min low / 30 min high test.
3. Before baking out pins, visually verify that wellhead service provider has shut and fully re-opened both tubing spool valves to ensure there is no trapped pressure. Remove all unnecessary personnel from the work area and floor. Get an accurate mark for landing joint, retract pins, and lay down tubing hanger. Ensure landing joint and hanger are accessible. Ensure lock-down pins are fully backed out during drillout.
4. RIH with tubing as follows (Confirm BHA w/ Hybrid Tools Supervisor):
    a. 4" Sealed Bearing Bit
    b. 3-1/8" Motor
    c. Disconnect tool with float (disconnects with wireline re-entry guide on bottom)
    d. XN profile nipple
    e. 1 Joint - 2-3/8", 4.70#, P-110 production tubing

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f. X profile nipple with a tested Hybrid tool in place
g. Designed # of joints - 2-3/8”, 4.70#, P-110 production tubing
h. X Profile Nipple in Vertical
i. Designed # of joints - 2-3/8”, 4.70#, P-110 production tubing
j. R profile nipple with changeover threads from 2-3/8” 8RD pin to 2-3/8” PH-6 box with tested Hybrid tool in place.
k. 2-3/8”, 5.95#, P-110 PH-6 workstring to R Nipple
l. R Profile Nipple in Vertical at PBTD
m. 2-3/8”, 5.95#, P-110 PH-6 workstring to surface

5. Drill out composite frac/bridge plugs and cleanout to PBTD. Maintain 3 Bbl-In / 3 Bbl-Out circulation during drillout. Circulate a 10 Bbl linear gel sweep with each plug. Circulate FR, graphite, and/or Pipe-on-Pipe as needed. If excessive gas is continually coming to surface, proceed with safe shut-down to RU separator and flare for drillouts.
6. With the bit on bottom, initiate cleanup cycle with 10 Bbl gel sweep. Drop 9/16” ball into drill string and pump to bottom. Seat ball, pressure up, and pump off bit/sub exposing wireline re-entry guide on bottom of string.
7. Increase pump rate to 4 BPM, or as high as pressure allows, and circulate 2x bottoms up while maxing out rotation at safe torque limit and reciprocating pipe. Maintain Bbl-In/Bbl-Out balance during cleanup cycle.
8. Pump tubing volume to R profile with hybrid tool in place with fresh water to displace drillout fluid.
9. TOOH to R profile with hybrid tool in place.
10. Install TIW valve on top of R profile. NU bleed off tool and check for flow to confirm negative test of lower float. Remove TIW valve, R nipple with hybrid tool in place and 2-3/8” 8-round collar.
11. TIH w/ 2-3/8” 4.7# J55 8RD to designed depth.
12. Circulate full tubing volume with fresh water to clean out any debris from newly installed tubing.
13. Install tubing hanger with BPV onto production string and land with previously marked landing joint in the tubing head. Secure lock down pins, ensure fully seated by measuring each lock down pin. Pull test hanger to 10K lbs.
14. Bleed off pressure above the tubing hanger and perform thirty minute negative test.
15. Confirm no pressure built up above tubing hanger, break out landing joint, SI well, and ND BOPs leaving LMV on well.

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Flowback Procedure

1. Drillout remaining wells on pad.
2. Hold PJSM. Ensure a Gas Monitoring System is in use and any unnecessary surface equipment is shut down.
3. Remove LMV from well, after ensuring no pressure exists above the hanger.
4. NU Production Tree. Pressure test void to 10,000 psi for 30 minutes. If documentation was not provided for bench testing of production tree in the shop, it must be shell tested on-site to 5,000 psi for 30 minutes.
5. Lubricate BPV from tubing hanger.
6. With the aid of a man-lift and safety harness, install hybrid tool lubricator on top of the swab valve on the production tree.
7. Rig up hard iron from the hybrid tool lubricator to the pump and flowback choke manifold. The flowback choke manifold should remain rigged up to gas buster tank.

8. Close LMV and pressure test production tree, lubricator, and hard iron to pump and choke manifold.
9. After successful pressure test, pump tubing volume with desired fluid based on SICP and pressure limitation of equipment.
10. Drop ball and pump fluid until ball seats.
11. Slowly build pressure (do not exceed pressure rating of equipment) to desired level to shear the Hybrid Tool.
12. Open choke and allow tool to flowback at 2.5 BPM. If tool is released you will have a constant flow to tank. If pressure bleeds off the tool has not sheared and you will need repeat the process.
13. After tool is released, the shut down the pump and any unnecessary surface equipment. (Step 12 will be utilized if gas is encountered during flowback operations).
14. If you start to receive an excessive amount gas during flowback of the Hybrid Tool, shut in flowback manifold and pump down tubing. Pump hybrid tool down until the hybrid seats in the XN and hold 500psi over well pressure. Then pump down the annulus to the end of tubing +20 bbls, clearing any gas from the annulus and away from the tubing. While maintaining a pump rate of 2 BPM, open choke and flowback tool at 2 BPM. Maintain 2 Bbls-In/ 2 Bbls-Out during flowback.
15. While tool is flowing back listen for Hybrid Tool at the production tree. When you hear the Hybrid Tool hit the lubricator close BMV and TMV. Bleed off hard iron, lubricator and wellhead.
16. Retrieve Hybrid Tool from lubricator and RD lubricator.
17. Set protective concrete barriers around each side of the wellhead.
18. Secure and lock production tree and tubing spool valves.
19. Turn keys over to well to NNE supervisor.

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Northeast Natural Energy LLC -MIP 5H- Completed Perforation Log

Well:	MIP 5H	**Casing Tally Marker Jt Location (ft):**	6,530
API:	47-061-01699	**CCL Marker Jt Location (ft):**	6,497
County:	Monongalia	**Top Perforation (ft):**	6,513
State:	West Virginia	**Bottom Perforation (ft):**	15,583
Datum (RKB-GL) (ft):	22.5	**Total Completed Interval (ft):**	9,070
PBTD (ft):	16,000	**Top Kill Plug Location (ft):**	6,513
Depth Correction (CCL-Tally) (ft):		**Bottom Kill Plug Location (ft):**	6,607

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Corrected depth below includes wireline depth adjusment for marker joint tie-in.

Stage	Plug Depth	Cluster 1 Top	Cluster 1 Bottom	Cluster 2 Top	Cluster 2 Bottom	Cluster 3 Top	Cluster 3 Bottom	Cluster 4 Top	Cluster 4 Bottom	Cluster 5 Top	Cluster 5 Bottom	Cluster 6 Top	Cluster 6 Bottom	Cluster 7 Top	Cluster 7 Bottom
1		14,226	14,228	14,206	14,208	14,186	14,188								
*Corrected Depth**															
2	14,167	14,146	14,148	14,107	14,109	14,067	14,069	14,028	14,030	13,988	13,990				
*Corrected Depth**															
3	13,969	13,948	13,950	13,909	13,911	13,869	13,871	13,830	13,832	13,790	13,792				
*Corrected Depth**															
4	13,771	13,750	13,752	13,711	13,713	13,671	13,673	13,632	13,634	13,592	13,594				
*Corrected Depth**															
5	13,575	13,552	13,554	13,513	13,515	13,473	13,475	13,438	13,440	13,394	13,396				
*Corrected Depth**															
6	13,375	13,354	13,356	13,315	13,317	13,275	13,277	13,236	13,238	13,201	13,203				
*Corrected Depth**															
7	13,177	13,156	13,158	13,117	13,119	13,077	13,079	13,038	13,040	12,998	13,000				
*Corrected Depth**															
8	12,979	12,958	12,960	12,919	12,921	12,883	12,885	12,840	12,842	12,800	12,802				
*Corrected Depth**															
9	12,781	12,760	12,762	12,721	12,723	12,681	12,683	12,642	12,644	12,602	12,604				
*Corrected Depth**															
10	15,583	12,562	12,564	12,523	12,525	12,483	12,485	12,444	12,446	12,404	12,406				
*Corrected Depth**															
11	12,385	12,364	12,366	12,325	12,327	12,285	12,287	12,246	12,248	12,206	12,208				
*Corrected Depth**															
12	12,187	12,166	12,168	12,127	12,129	12,087	12,089	12,048	12,050	12,008	12,010				
*Corrected Depth**															
13	11,989	11,968	11,970	11,929	11,931	11,889	11,891	11,850	11,852	11,810	11,812				
*Corrected Depth**															
14	11,791	11,770	11,772	11,731	11,733	11,691	11,693	11,652	11,654	11,612	11,614				
*Corrected Depth**															
15	11,593	11,572	11,574	11,533	11,535	11,493	11,495	11,454	11,456	11,414	11,416				
*Corrected Depth**															
16	11,395	11,374	11,376	11,335	11,337	11,295	11,297	11,256	11,258	11,216	11,218				
*Corrected Depth**															
17	11,197	11,176	11,178	11,134	11,136	11,091	11,093	11,058	11,060	11,018	11,020				
*Corrected Depth**															
18	10,999	10,978	10,980	10,939	10,941	10,899	10,901	10,860	10,862	10,820	10,822				
*Corrected Depth**															
19	10,801	10,780	10,782	10,741	10,743	10,701	10,703	10,662	10,664	10,622	10,624				
*Corrected Depth**															
20	10,603	10,582	10,584	10,537	10,539	10,506	10,508	10,464	10,466	10,424	10,426				
*Corrected Depth**															
21	10,405	10,384	10,386	10,345	10,347	10,305	10,307	10,266	10,268	10,224	10,226				
*Corrected Depth**															
22	10,207	10,186	10,188	10,152	10,154	10,107	10,109	10,068	10,070	10,028	10,030				
*Corrected Depth**															
23	10,009	9,988	9,990	9,945	9,947	9,915	9,917	9,870	9,872	9,830	9,832				
*Corrected Depth**															
24	9,811	9,790	9,792	9,751	9,753	9,711	9,713	9,672	9,674	9,640	9,642				
*Corrected Depth**															
25	9,613	9,592	9,594	9,553	9,555	9,513	9,515	9,474	9,476	9,434	9,436				
*Corrected Depth**															
26	9,415	9,394	9,396	9,350	9,352	9,315	9,317	9,276	9,278	9,236	9,238				
*Corrected Depth**															
27	9,210	9,196	9,186	9,157	9,159	9,117	9,119	9,076	9,078	9,040	9,042				
*Corrected Depth**															
28	9,019	8,998	9,000	8,959	8,961	8,919	8,921	8,877	8,879	8,840	8,842				
*Corrected Depth**															
29	8,821	8,800	8,802	8,761	8,763	8,721	8,723	8,682	8,684	8,642	8,644				
*Corrected Depth**															
30	8,623	8,594	8,596	8,563	8,565	8,523	8,525	8,484	8,486	8,444	8,446				
*Corrected Depth**															
31	6,607														
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32	6,513														
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Northeast Natural MIP 5H Survey 0ft to 14454ft MD

(Def Survey)

Report Date:	September 14, 2015 - 08:56 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Northeast Natural	**Vertical Section Azimuth:**	333.925 ° (Grid North)
Field:	WV Monongalia County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Northeast Natural MIP Pad / MIP 5H	**TVD Reference Datum:**	KB
Well:	MIP 5H	**TVD Reference Elevation:**	1082.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	1058.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	-9.547 °
Survey Name:	Northeast Natural MIP 5H Gyro+MWD 0ft to update	**Total Gravity Field Strength:**	999.3447mgn (9.80665 Based)
Survey Date:	September 01, 2015	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	234.035 ° / 7624.484 ft / 6.535 / 1.013	**Total Magnetic Field Strength:**	52526.702 nT
Coordinate Reference System:	NAD83 West Virginia State Plane, Northern Zone, US Feet	**Magnetic Dip Angle:**	66.855 °
Location Lat / Long:	N 39° 36' 6.60052", W 79° 58' 34.14611"	**Declination Date:**	September 01, 2015
Location Grid N/E Y/X:	N 401674.900 ftUS, E 1834336.900 ftUS	**Magnetic Declination Model:**	HDGM 2015
CRS Grid Convergence Angle:	-0.3037 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99994083	**Grid Convergence Used:**	-0.3037 °
Version / Patch:	2.7.1043.0	**Total Corr Mag North->Grid North:**	-9.2432 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1082.00	0.00	0.00	0.00	N/A	N/A	N/A	401674.90	1834336.90	N 39 36 6.60	W 79 58 34.15	0.00
	112.00	0.13	151.38	112.00	-970.00	-0.13	-0.11	0.06	0.12	0.12	0.00	401674.79	1834336.96	N 39 36 6.60	W 79 58 34.15	0.00
	212.00	0.63	245.88	212.00	-870.00	-0.22	-0.44	-0.39	0.65	0.50	94.50	401674.46	1834336.51	N 39 36 6.60	W 79 58 34.15	0.00
	312.00	0.78	245.30	311.99	-770.01	-0.19	-0.94	-1.51	0.15	0.15	-0.58	401673.96	1834335.39	N 39 36 6.59	W 79 58 34.17	0.26
	412.00	0.31	261.33	411.99	-670.01	-0.09	-1.27	-2.39	0.49	-0.47	16.03	401673.63	1834334.51	N 39 36 6.59	W 79 58 34.18	0.61
	512.00	0.57	228.56	511.98	-570.02	-0.14	-1.64	-3.03	0.35	0.26	-32.77	401673.26	1834333.87	N 39 36 6.58	W 79 58 34.18	0.81
	612.00	0.69	186.40	611.98	-470.02	-0.78	-2.57	-3.47	0.47	0.12	-42.16	401672.33	1834333.43	N 39 36 6.57	W 79 58 34.19	1.02
	712.00	0.67	173.43	711.97	-370.03	-1.84	-3.75	-3.47	0.15	-0.02	-12.97	401671.15	1834333.43	N 39 36 6.56	W 79 58 34.19	1.15
	812.00	0.50	186.46	811.96	-270.04	-2.76	-4.76	-3.46	0.21	-0.17	13.03	401670.14	1834333.44	N 39 36 6.55	W 79 58 34.19	1.25
	912.00	0.51	174.01	911.96	-170.04	-3.54	-5.64	-3.46	0.11	0.01	-12.45	401669.26	1834333.44	N 39 36 6.54	W 79 58 34.19	1.32
	1012.00	0.34	187.36	1011.96	-70.04	-4.21	-6.37	-3.45	0.20	-0.17	13.35	401668.53	1834333.45	N 39 36 6.54	W 79 58 34.19	1.39
	1112.00	0.16	134.34	1111.96	29.96	-4.59	-6.77	-3.39	0.28	-0.18	-53.02	401668.13	1834333.51	N 39 36 6.53	W 79 58 34.19	1.45
	1212.00	0.14	169.49	1211.96	129.96	-4.84	-6.98	-3.27	0.09	-0.02	35.15	401667.92	1834333.63	N 39 36 6.53	W 79 58 34.19	1.48
	1312.00	0.16	249.25	1311.96	229.96	-4.94	-7.15	-3.37	0.19	0.02	79.76	401667.75	1834333.53	N 39 36 6.53	W 79 58 34.19	1.51
	1412.00	0.47	251.24	1411.96	329.96	-4.88	-7.33	-3.89	0.31	0.31	1.99	401667.57	1834333.01	N 39 36 6.53	W 79 58 34.20	1.58
	1512.00	0.48	265.14	1511.95	429.95	-4.67	-7.50	-4.70	0.12	0.01	13.90	401667.40	1834332.20	N 39 36 6.53	W 79 58 34.21	1.62
	1612.00	0.57	234.31	1611.95	529.95	-4.60	-7.83	-5.52	0.29	0.09	-30.83	401667.07	1834331.38	N 39 36 6.52	W 79 58 34.22	1.69
	1712.00	0.34	194.27	1711.94	629.94	-4.91	-8.41	-6.00	0.38	-0.23	-40.04	401666.49	1834330.90	N 39 36 6.52	W 79 58 34.22	1.75
	1812.00	0.18	193.17	1811.94	729.94	-5.26	-8.85	-6.11	0.16	-0.16	-1.10	401666.05	1834330.79	N 39 36 6.51	W 79 58 34.22	1.78
	1912.00	0.35	100.89	1911.94	829.94	-5.57	-9.06	-5.84	0.40	0.17	-92.28	401665.84	1834331.06	N 39 36 6.51	W 79 58 34.22	1.83
	2012.00	0.23	83.42	2011.94	929.94	-5.82	-9.09	-5.34	0.15	-0.12	-17.47	401665.81	1834331.56	N 39 36 6.51	W 79 58 34.21	1.86
	2112.00	0.36	2.23	2111.94	1029.94	-5.61	-8.75	-5.13	0.40	0.13	-81.19	401666.15	1834331.77	N 39 36 6.51	W 79 58 34.21	1.91
	2212.00	0.50	314.64	2211.94	1129.94	-4.92	-8.13	-5.43	0.37	0.14	-47.59	401666.77	1834331.47	N 39 36 6.52	W 79 58 34.21	1.95
	2312.00	0.79	259.17	2311.93	1229.93	-4.33	-7.96	-6.42	0.65	0.29	-55.47	401666.94	1834330.48	N 39 36 6.52	W 79 58 34.23	2.03
	2412.00	0.76	265.01	2411.92	1329.92	-3.91	-8.14	-7.75	0.08	-0.03	5.84	401666.76	1834329.15	N 39 36 6.52	W 79 58 34.24	2.07
	2512.00	0.84	271.49	2511.91	1429.91	-3.33	-8.18	-9.15	0.12	0.08	6.48	401666.72	1834327.75	N 39 36 6.52	W 79 58 34.26	2.11
	2612.00	0.76	270.24	2611.90	1529.90	-2.70	-8.16	-10.54	0.08	-0.08	-1.25	401666.74	1834326.36	N 39 36 6.52	W 79 58 34.28	2.15
	2712.00	0.81	273.10	2711.89	1629.89	-2.06	-8.12	-11.91	0.06	0.05	2.86	401666.78	1834324.99	N 39 36 6.52	W 79 58 34.30	2.18
	2812.00	1.03	273.06	2811.88	1729.88	-1.28	-8.03	-13.52	0.22	0.22	-0.04	401666.87	1834323.38	N 39 36 6.52	W 79 58 34.32	2.22
	2912.00	1.19	265.99	2911.86	1829.86	-0.45	-8.06	-15.45	0.21	0.16	-7.07	401666.84	1834321.45	N 39 36 6.52	W 79 58 34.34	2.27
	3012.00	1.43	275.17	3011.84	1929.84	0.59	-8.02	-17.73	0.32	0.24	9.18	401666.88	1834319.17	N 39 36 6.52	W 79 58 34.37	2.33
	3112.00	1.11	286.79	3111.81	2029.81	1.90	-7.63	-19.90	0.41	-0.32	11.62	401667.27	1834317.00	N 39 36 6.52	W 79 58 34.40	2.38
	3212.00	1.05	283.78	3211.79	2129.79	3.14	-7.13	-21.72	0.08	-0.06	-3.01	401667.77	1834315.19	N 39 36 6.53	W 79 58 34.42	2.42
	3312.00	1.34	289.97	3311.77	2229.77	4.57	-6.51	-23.70	0.32	0.29	6.19	401668.39	1834313.20	N 39 36 6.53	W 79 58 34.45	2.46
	3412.00	1.48	284.98	3411.74	2329.74	6.26	-5.78	-26.05	0.19	0.14	-4.99	401669.12	1834310.85	N 39 36 6.54	W 79 58 34.48	2.50
	3512.00	1.68	289.55	3511.70	2429.70	8.16	-4.95	-28.68	0.24	0.20	4.57	401669.95	1834308.22	N 39 36 6.55	W 79 58 34.51	2.54
	3612.00	1.22	287.80	3611.67	2529.67	9.94	-4.14	-31.07	0.46	-0.46	-1.75	401670.76	1834305.83	N 39 36 6.56	W 79 58 34.54	2.59
	3712.00	1.66	278.88	3711.64	2629.64	11.51	-3.59	-33.52	0.49	0.44	-8.92	401671.31	1834303.38	N 39 36 6.56	W 79 58 34.57	2.64
	3812.00	1.61	279.08	3811.60	2729.60	13.15	-3.14	-36.34	0.05	-0.05	0.20	401671.76	1834300.56	N 39 36 6.57	W 79 58 34.61	2.67
	3912.00	1.70	282.12	3911.56	2829.56	14.87	-2.61	-39.17	0.13	0.09	3.04	401672.29	1834297.73	N 39 36 6.57	W 79 58 34.65	2.70
	4012.00	1.39	290.99	4011.52	2929.52	16.68	-1.86	-41.76	0.39	-0.31	8.87	401673.04	1834295.15	N 39 36 6.58	W 79 58 34.68	2.74
	4112.00	1.42	294.63	4111.49	3029.49	18.53	-0.91	-44.02	0.09	0.03	3.64	401673.99	1834292.89	N 39 36 6.59	W 79 58 34.71	2.76
	4212.00	1.62	289.84	4211.46	3129.46	20.50	0.08	-46.47	0.24	0.20	-4.79	401674.98	1834290.43	N 39 36 6.60	W 79 58 34.74	2.79
	4312.00	1.53	286.12	4311.42	3229.42	22.41	0.93	-49.08	0.14	-0.09	-3.72	401675.83	1834287.82	N 39 36 6.61	W 79 58 34.77	2.82
	4412.00	1.93	301.26	4411.37	3329.37	24.73	2.18	-51.81	0.60	0.40	15.14	401677.08	1834285.10	N 39 36 6.62	W 79 58 34.81	2.86
	4512.00	1.96	302.54	4511.32	3429.32	27.61	3.97	-54.69	0.05	0.03	1.28	401678.87	1834282.22	N 39 36 6.64	W 79 58 34.85	2.89
	4612.00	1.93	302.15	4611.26	3529.26	30.50	5.79	-57.55	0.03	-0.03	-0.39	401680.69	1834279.35	N 39 36 6.65	W 79 58 34.88	2.91
	4712.00	2.10	298.56	4711.20	3629.20	33.42	7.56	-60.59	0.21	0.17	-3.59	401682.46	1834276.31	N 39 36 6.67	W 79 58 34.92	2.94
	4812.00	2.01	297.91	4811.13	3729.13	36.33	9.26	-63.75	0.09	-0.09	-0.65	401684.16	1834273.16	N 39 36 6.69	W 79 58 34.96	2.97
	4912.00	2.05	298.35	4911.07	3829.07	39.21	10.93	-66.87	0.04	0.04	0.44	401685.83	1834270.03	N 39 36 6.71	W 79 58 35.00	2.99
	5012.00	2.84	298.95	5010.98	3928.98	42.69	12.97	-70.61	0.79	0.79	0.60	401687.87	1834266.29	N 39 36 6.73	W 79 58 35.05	3.04
	5112.00	2.59	305.48	5110.87	4028.87	46.71	15.49	-74.62	0.40	-0.25	6.53	401690.38	1834262.28	N 39 36 6.75	W 79 58 35.10	3.07
	5212.00	2.18	304.14	5210.78	4128.78	50.35	17.86	-78.04	0.41	-0.41	-1.34	401692.76	1834258.87	N 39 36 6.77	W 79 58 35.14	3.11
	5312.00	1.69	303.10	5310.72	4228.72	53.26	19.74	-80.85	0.49	-0.49	-1.04	401694.64	1834256.06	N 39 36 6.79	W 79 58 35.18	3.14
	5412.00	1.14	312.23	5410.69	4328.69	55.45	21.21	-82.82	0.59	-0.55	9.13	401696.11	1834254.09	N 39 36 6.81	W 79 58 35.21	3.17
	5512.00	1.04	327.61	5510.67	4428.67	57.28	22.65	-84.04	0.31	-0.10	15.38	401697.54	1834252.86	N 39 36 6.82	W 79 58 35.22	3.18
	5612.00	0.69	356.40	5610.66	4528.66	58.74	24.01	-84.56	0.55	-0.35	28.79	401698.91	1834252.34	N 39 36 6.83	W 79 58 35.23	3.21
	5712.00	0.47	42.87	5710.66	4628.66	59.44	24.91	-84.32	0.50	-0.22	46.47	401699.81	1834252.58	N 39 36 6.84	W 79 58 35.23	3.22
	5812.00	0.47	53.15	5810.65	4728.65	59.67	25.46	-83.72	0.08	0.00	10.28	401700.36	1834253.19	N 39 36 6.85	W 79 58 35.22	3.23
	5912.00	0.49	68.14	5910.65	4828.65	59.71	25.87	-82.99	0.13	0.02	14.99	401700.76	1834253.91	N 39 36 6.85	W 79 58 35.21	3.24
	6012.00	0.43	67.58	6010.65	4928.65	59.66	26.17	-82.25	0.06	-0.06	-0.56	401701.07	1834254.66	N 39 36 6.85	W 79 58 35.20	3.24
	6112.00	0.22	10.79	6110.65	5028.65	59.79	26.50	-81.86	0.36	-0.21	-56.79	401701.40	1834255.04	N 39 36 6.86	W 79 58 35.19	3.25
	6212.00	0.31	5.98	6210.64	5128.64	60.17	26.96	-81.80	0.09	0.09	-4.81	401701.86	1834255.11	N 39 36 6.86	W 79 58 35.19	3.26
	6312.00	0.33	334.78	6310.64	5228.64	60.69	27.49	-81.89	0.17	0.02	-31.20	401702.39	1834255.01	N 39 36 6.87	W 79 58 35.19	3.26
	6412.00	0.25	318.77	6410.64	5328.64	61.19	27.91	-82.16	0.11	-0.08	-16.01	401702.81	1834254.74	N 39 36 6.87	W 79 58 35.20	3.27
Final Gyro	6472.00	0.62	270.77	6470.64	5388.64	61.46	28.02	-82.57	0.82	0.62	-80.00	401702.91	1834254.33	N 39 36 6.87	W 79 58 35.20	3.28
	6513.00	0.70	324.08	6511.64	5429.64	61.80	28.22	-82.94	1.45	0.20	130.02	401703.12	1834253.96	N 39 36 6.88	W 79 58 35.21	3.30
	6558.00	4.31	14.24	6556.59	5474.59	63.37	30.08	-82.69	8.66	8.02	111.47	401704.98	1834254.22	N 39 36 6.89	W 79 58 35.20	3.39
	6607.00	9.23	17.31	6605.23	5523.23	67.63	35.62	-81.06	10.06	10.04	6.27	401710.52	1834255.84	N 39 36 6.95	W 79 58 35.18	3.50
	6702.00	16.71	22.13	6697.75	5615.75	82.29	55.58	-73.64	7.95	7.87	5.07	401730.47	1834263.26	N 39 36 7.15	W 79 58 35.09	3.68
	6797.00	23.74	15.08	6786.85	5704.85	105.82	86.74	-63.51	7.82	7.40	-7.42	401761.63	1834273.40	N 39 36 7.45	W 79 58 34.96	3.86
	6890.00	32.18	14.26	6868.92	5786.92	138.86	128.89	-52.52	9.08	9.08	-0.88	401803.78	1834284.39	N 39 36 7.87	W 79 58 34.83	4.04
	6984.00	41.94	18.51	6943.85	5861.85	180.42	183.08	-36.34	10.73	10.38	4.52	401857.97	1834300.57	N 39 36 8.41	W 79 58 34.62	4.22
	7078.00	50.30	15.76	7008.96	5926.96	229.82	247.79	-16.50	9.14	8.89	-2.93	401922.67	1834320.40	N 39 36 9.05	W 79 58 34.37	4.37
	7173.00	59.97	12.10	7063.21	5981.21	289.54	323.37	2.09	10.66	10.18	-3.85	401998.25	1834338.99	N 39 36 9.80	W 79 58 34.14	4.53
	7268.00	66.92	14.11	7105.66	6023.66	355.34	406.07	21.39	7.56	7.32	2.12	402080.94	1834358.29	N 39 36 10.61	W 79 58 33.90	4.65
	7362.00	67.97	12.64	7141.71	6059.71	422.37	490.52	41.47	1.83	1.12	-1.56	402165.39	1834378.36	N 39 36 11.45	W 79 58 33.65	4.73
	7456.00	69.91	11.02	7175.49	6093.49	491.58	576.37	59.44	2.62	2.06	-1.72	402251.24	1834396.34	N 39 36 12.30	W 79 58 33.43	4.80
	7550.00	72.28	10.95	7205.95	6123.95	562.54	663.66	76.38	2.52	2.52	-0.07	402338.52	1834413.28	N 39 36 13.16	W 79 58 33.22	4.87
	7644.00	72.28	10.99	7234.56	6152.56	634.01	751.57	93.42	0.04	0.00	0.04	402426.42	1834430.32	N 39 36 14.03	W 79 58 33.00	4.92
	7739.00	73.25	11.46	7262.70	6180.70	706.18	840.57	111.09	1.13	1.02	0.49	402515.41	1834447.98	N 39 36 14.91	W 79 58 32.78	4.98
	7833.00	73.42	11.56	7289.66	6207.66	777.55	928.81	129.06	0.21	0.18	0.11	402603.65	1834465.95	N 39 36 15.79	W 79 58 32.56	5.02
	7927.00	73.34	11.23	7316.55	6234.55	849.03	1017.10	146.85	0.35	-0.09	-0.35	402691.94	1834483.74	N 39 36 16.66	W 79 58 32.34	5.06
	8021.00	73.34	11.20	7343.50	6261.50	920.68	1105.44	164.37	0.03	0.00	-0.03	402780.27	1834501.26	N 39 36 17.53	W 79 58 32.12	5.10
	8116.00	73.51	10.82	7370.60	6288.60	993.32	1194.81	181.76	0.42	0.18	-0.40	402869.64	1834518.64	N 39 36 18.42	W 79 58 31.90	5.14
	8210.00	73.16	8.25	7397.56	6315.56	1066.52	1283.61	196.67	2.65	-0.37	-2.73	402958.44	1834533.56	N 39 36 19.30	W 79 58 31.72	5.18
	8304.00	73.25	8.04	7424.72	6342.72	1140.93	1372.70	209.42	0.23	0.10	-0.22	403047.51	1834546.31	N 39 36 20.18	W 79 58 31.56	5.21
	8399.00	76.33	3.57	7449.65	6367.65	1218.76	1463.86	218.66	5.58	3.24	-4.71	403138.67	1834555.55	N 39 36 21.08	W 79 58 31.45	5.26
	8494.00	80.11	355.53	7469.07	6387.07	1302.54	1556.76	217.89	9.19	3.98	-8.46	403231.56	1834554.78	N 39 36 22.00	W 79 58 31.47	5.33
	8589.00	79.76	350.29	7485.69	6403.69	1390.96	1649.55	206.35	5.44	-0.37	-5.52	403324.35	1834543.24	N 39 36 22.91	W 79 58 31.62	5.37
	8684.00	80.11	344.11	7502.31	6420.31	1481.95	1740.71	185.64	6.42	0.37	-6.51	403415.51	1834522.52	N 39 36 23.81	W 79 58 31.89	5.42
	8778.00	81.51	338.37	7517.33	6435.33	1573.94	1828.53	155.80	6.21	1.49	-6.11	403503.32	1834492.69	N 39 36 24.68	W 79 58 32.28	5.47

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	8873.00	86.92	330.48	7526.92	6444.92	1668.35	1913.68	115.02	10.03	5.69	-8.31	403588.46	1834451.91	N 39 36 25.52	W 79 58 32.81	5.52
	8967.00	94.70	327.66	7525.59	6443.59	1761.92	1994.23	66.75	8.80	8.28	-3.00	403669.01	1834403.65	N 39 36 26.31	W 79 58 33.43	5.57
	9062.00	91.89	324.69	7520.13	6438.13	1855.87	2073.00	13.96	4.30	-2.96	-3.13	403747.78	1834350.86	N 39 36 27.09	W 79 58 34.11	5.61
	9157.00	92.24	326.01	7516.71	6434.71	1949.75	2151.10	-40.01	1.44	0.37	1.39	403825.87	1834296.89	N 39 36 27.86	W 79 58 34.80	5.63
	9251.00	93.74	325.94	7511.80	6429.80	2042.72	2228.90	-92.54	1.60	1.60	-0.07	403903.66	1834244.37	N 39 36 28.62	W 79 58 35.48	5.66
	9346.00	92.33	324.57	7506.77	6424.77	2136.49	2306.85	-146.60	2.07	-1.48	-1.44	403981.61	1834190.31	N 39 36 29.39	W 79 58 36.18	5.69
	9441.00	93.47	322.71	7501.97	6419.97	2229.84	2383.25	-202.85	2.29	1.20	-1.96	404058.00	1834134.06	N 39 36 30.14	W 79 58 36.90	5.71
	9536.00	94.44	325.63	7495.41	6413.41	2323.23	2460.08	-258.32	3.23	1.02	3.07	404134.83	1834078.59	N 39 36 30.90	W 79 58 37.61	5.74
	9631.00	90.66	324.23	7491.19	6409.19	2416.95	2537.74	-312.84	4.24	-3.98	-1.47	404212.48	1834024.08	N 39 36 31.66	W 79 58 38.32	5.77
	9725.00	91.36	325.84	7489.53	6407.53	2509.81	2614.75	-366.70	1.87	0.74	1.71	404289.49	1833970.22	N 39 36 32.42	W 79 58 39.01	5.79
	9820.00	91.98	324.62	7486.76	6404.76	2603.67	2692.76	-420.85	1.44	0.65	-1.28	404367.49	1833916.07	N 39 36 33.19	W 79 58 39.71	5.82
	9915.00	92.51	325.76	7483.04	6401.04	2697.50	2770.70	-475.04	1.32	0.56	1.20	404445.43	1833861.89	N 39 36 33.96	W 79 58 40.40	5.84
	10010.00	92.77	324.23	7478.66	6396.66	2791.24	2848.43	-529.48	1.63	0.27	-1.61	404523.15	1833807.45	N 39 36 34.72	W 79 58 41.10	5.86
	10105.00	92.59	325.57	7474.22	6392.22	2884.96	2926.06	-584.04	1.42	-0.19	1.41	404600.78	1833752.89	N 39 36 35.49	W 79 58 41.81	5.88
	10200.00	92.42	324.50	7470.07	6388.07	2978.73	3003.84	-638.43	1.14	-0.18	-1.13	404678.56	1833698.50	N 39 36 36.25	W 79 58 42.51	5.90
	10295.00	91.45	322.11	7466.86	6384.86	3072.04	3079.96	-695.17	2.71	-1.02	-2.52	404754.67	1833641.78	N 39 36 37.00	W 79 58 43.24	5.92
	10390.00	91.89	322.70	7464.09	6382.09	3165.09	3155.20	-753.10	0.77	0.46	0.62	404829.91	1833583.85	N 39 36 37.74	W 79 58 43.98	5.94
	10485.00	90.92	321.58	7461.76	6379.76	3258.05	3230.18	-811.38	1.56	-1.02	-1.18	404904.88	1833525.57	N 39 36 38.48	W 79 58 44.73	5.96
	10580.00	92.51	323.86	7458.92	6376.92	3351.19	3305.73	-868.89	2.93	1.67	2.40	404980.43	1833468.06	N 39 36 39.22	W 79 58 45.47	5.98
	10675.00	90.84	321.81	7456.14	6374.14	3444.37	3381.40	-926.26	2.78	-1.76	-2.16	405056.09	1833410.70	N 39 36 39.97	W 79 58 46.21	6.00
	10770.00	91.01	323.59	7454.61	6372.61	3537.54	3456.95	-983.82	1.88	0.18	1.87	405131.64	1833353.14	N 39 36 40.71	W 79 58 46.95	6.02
	10864.00	91.10	324.47	7452.88	6370.88	3630.12	3533.02	-1039.02	0.94	0.10	0.94	405207.70	1833297.95	N 39 36 41.46	W 79 58 47.66	6.03
	10959.00	91.01	322.94	7451.13	6369.13	3723.60	3609.57	-1095.24	1.61	-0.09	-1.61	405284.25	1833241.73	N 39 36 42.22	W 79 58 48.38	6.05
	11053.00	90.66	322.56	7449.76	6367.76	3815.80	3684.39	-1152.13	0.55	-0.37	-0.40	405359.06	1833184.84	N 39 36 42.95	W 79 58 49.12	6.07
	11147.00	89.08	325.19	7449.97	6367.97	3908.35	3760.30	-1207.54	3.26	-1.68	2.80	405434.97	1833129.43	N 39 36 43.70	W 79 58 49.83	6.09
	11241.00	89.87	323.35	7450.83	6368.83	4001.01	3836.60	-1262.43	2.13	0.84	-1.96	405511.27	1833074.55	N 39 36 44.45	W 79 58 50.54	6.10
	11336.00	89.87	323.39	7451.05	6369.05	4094.40	3912.84	-1319.11	0.04	0.00	0.04	405587.50	1833017.87	N 39 36 45.20	W 79 58 51.27	6.12
	11430.00	89.87	323.18	7451.26	6369.26	4186.79	3988.19	-1375.31	0.22	0.00	-0.22	405662.85	1832961.68	N 39 36 45.94	W 79 58 51.99	6.13
	11525.00	89.78	324.42	7451.55	6369.55	4280.30	4064.85	-1431.41	1.31	-0.09	1.31	405739.50	1832905.57	N 39 36 46.70	W 79 58 52.71	6.15
	11620.00	90.13	322.61	7451.63	6369.63	4373.74	4141.23	-1487.90	1.94	0.37	-1.91	405815.88	1832849.09	N 39 36 47.45	W 79 58 53.44	6.16
	11715.00	89.87	323.62	7451.63	6369.63	4467.05	4217.21	-1544.92	1.10	-0.27	1.06	405891.86	1832792.07	N 39 36 48.20	W 79 58 54.17	6.18
	11809.00	89.78	324.24	7451.91	6369.91	4559.62	4293.19	-1600.26	0.67	-0.10	0.66	405967.83	1832736.73	N 39 36 48.95	W 79 58 54.88	6.19
	11904.00	90.22	323.58	7451.91	6369.91	4653.17	4369.96	-1656.22	0.83	0.46	-0.69	406044.59	1832680.78	N 39 36 49.70	W 79 58 55.60	6.20
	11999.00	90.04	322.96	7451.70	6369.70	4746.53	4446.10	-1713.04	0.68	-0.19	-0.65	406120.73	1832623.97	N 39 36 50.45	W 79 58 56.34	6.22
	12094.00	89.08	326.43	7452.43	6370.43	4840.29	4523.61	-1767.93	3.79	-1.01	3.65	406198.24	1832569.08	N 39 36 51.21	W 79 58 57.04	6.24
	12188.00	89.43	324.91	7453.65	6371.65	4933.30	4601.23	-1820.94	1.66	0.37	-1.62	406275.85	1832516.08	N 39 36 51.98	W 79 58 57.73	6.25
	12283.00	89.52	324.64	7454.52	6372.52	5027.09	4678.83	-1875.73	0.30	0.09	-0.28	406353.44	1832461.29	N 39 36 52.74	W 79 58 58.43	6.26
	12377.00	89.25	325.30	7455.53	6373.53	5119.94	4755.80	-1929.68	0.76	-0.29	0.70	406430.41	1832407.34	N 39 36 53.50	W 79 58 59.13	6.27
	12472.00	89.43	324.86	7456.62	6374.62	5213.80	4833.69	-1984.06	0.50	0.19	-0.46	406508.29	1832352.96	N 39 36 54.27	W 79 58 59.83	6.29
	12566.00	89.69	325.60	7457.35	6375.35	5306.72	4910.90	-2037.66	0.83	0.28	0.79	406585.50	1832299.36	N 39 36 55.03	W 79 59 0.52	6.30
	12661.00	89.34	324.66	7458.15	6376.15	5400.59	4988.84	-2091.97	1.06	-0.37	-0.99	406663.44	1832245.05	N 39 36 55.79	W 79 59 1.22	6.31
	12755.00	89.87	323.45	7458.80	6376.80	5493.20	5064.94	-2147.15	1.41	0.56	-1.29	406739.53	1832189.88	N 39 36 56.54	W 79 59 1.93	6.32
	12850.00	89.43	325.13	7459.38	6377.38	5586.85	5142.07	-2202.60	1.83	-0.46	1.77	406816.66	1832134.44	N 39 36 57.30	W 79 59 2.64	6.34
	12945.00	89.25	325.39	7460.47	6378.47	5680.76	5220.13	-2256.73	0.33	-0.19	0.27	406894.71	1832080.31	N 39 36 58.07	W 79 59 3.34	6.35
	13038.00	88.81	326.24	7462.05	6380.05	5772.82	5297.05	-2308.98	1.03	-0.47	0.91	406971.63	1832028.07	N 39 36 58.83	W 79 59 4.01	6.36
	13133.00	90.04	327.09	7463.00	6381.00	5867.05	5376.42	-2361.18	1.57	1.29	0.89	407050.99	1831975.87	N 39 36 59.61	W 79 59 4.68	6.37
	13228.00	89.87	324.73	7463.07	6381.07	5961.12	5455.09	-2414.42	2.49	-0.18	-2.48	407129.65	1831922.63	N 39 37 0.38	W 79 59 5.37	6.39
	13323.00	90.22	323.54	7463.00	6381.00	6054.73	5532.07	-2470.08	1.31	0.37	-1.25	407206.63	1831866.97	N 39 37 1.14	W 79 59 6.08	6.40
	13417.00	89.78	323.26	7463.00	6381.00	6147.15	5607.54	-2526.12	0.55	-0.47	-0.30	407282.09	1831810.93	N 39 37 1.89	W 79 59 6.81	6.41
	13511.00	89.87	323.30	7463.29	6381.29	6239.53	5682.88	-2582.32	0.10	0.10	0.04	407357.44	1831754.73	N 39 37 2.63	W 79 59 7.53	6.42
	13606.00	89.78	323.77	7463.58	6381.58	6332.97	5759.28	-2638.79	0.50	-0.09	0.49	407433.83	1831698.28	N 39 37 3.38	W 79 59 8.26	6.43
	13701.00	89.96	323.90	7463.79	6381.79	6426.50	5835.98	-2694.85	0.23	0.19	0.14	407510.52	1831642.22	N 39 37 4.13	W 79 59 8.98	6.44
	13796.00	89.69	323.93	7464.08	6382.08	6520.06	5912.75	-2750.80	0.29	-0.28	0.03	407587.29	1831586.27	N 39 37 4.89	W 79 59 9.70	6.45
	13890.00	90.40	324.58	7464.01	6382.01	6612.72	5989.04	-2805.71	1.02	0.76	0.69	407663.58	1831531.36	N 39 37 5.64	W 79 59 10.40	6.46
	13985.00	90.66	323.14	7463.13	6381.13	6706.25	6065.76	-2861.74	1.54	0.27	-1.52	407740.29	1831475.34	N 39 37 6.40	W 79 59 11.13	6.47
	14079.00	91.45	324.45	7461.40	6379.40	6798.77	6141.59	-2917.25	1.63	0.84	1.39	407816.12	1831419.83	N 39 37 7.14	W 79 59 11.84	6.48
	14173.00	91.28	320.82	7459.16	6377.16	6890.91	6216.27	-2974.27	3.86	-0.18	-3.86	407890.79	1831362.81	N 39 37 7.88	W 79 59 12.57	6.50
	14268.00	91.01	322.12	7457.26	6375.26	6983.65	6290.57	-3033.43	1.40	-0.28	1.37	407965.08	1831303.65	N 39 37 8.61	W 79 59 13.34	6.51
	14363.00	91.36	324.52	7455.30	6373.30	7077.00	6366.74	-3090.17	2.55	0.37	2.53	408041.25	1831246.92	N 39 37 9.36	W 79 59 14.07	6.52
Last MWD Survey	14416.00	91.80	320.99	7453.83	6371.83	7128.97	6408.90	-3122.23	6.71	0.83	-6.66	408083.41	1831214.87	N 39 37 9.77	W 79 59 14.48	6.53
Proj to TD	14454.00	91.80	320.99	7452.64	6370.64	7165.98	6438.42	-3146.13	0.00	0.00	0.00	408112.92	1831190.96	N 39 37 10.06	W 79 59 14.79	6.53

Survey Type: Non-Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	24.000	Act Stns	17.500	13.375	SLB_NSG+MSHOT-Depth Only	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to update
	1	24.000	530.000	Act Stns	17.500	13.375	SLB_NSG+MSHOT	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to
	1	530.000	1770.000	Act Stns	12.250	9.625	SLB_NSG+MSHOT	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to
	1	1770.000	6472.000	Act Stns	8.750	5.500	SLB_NSG+MSHOT	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to
	1	6472.000	14416.000	Act Stns	8.500	5.500	SLB_MWD-STD	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to
	1	14416.000	14454.000	Act Stns	8.500	5.500	SLB_BLIND+TREND	Original Borehole / Northeast Natural MIP 5H Gyro+MWD 0ft to

northeast
NATURAL ENERGY

MIP PAD

DIRECTIONS TO SITE

Latitude: 39.602203, Longitude: -79.976624

From I-79, take the Westover exit (152) in Morgantown, WV. If coming from the North, take a left off of the exit. If coming from the South, take a right off of the exit. You will now be traveling North on US-19/Fairmont Rd. Travel on US-19 for approximately 1-1.5 miles. After this, you will come to a stop light next to a bus garage, and across from Centra Bank. Take a right at the light onto Dupont Rd. Travel on Dupont Rd. for approximately 1-1.5 miles until you come to a 4-way stop. Travel straight through the 4-way stop. You will now be inside the Morgantown Industrial Park. Travel to the end of the industrial park. The access road will be on the right, and the well site is located on the hill.