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WV GEOLOGICAL SURVEY  
MORGANTOWN, WV



**Antero Resources**  
Lewis Unit 2H  
Harrison County West Virginia  
Northing: 14243770.38  
Easting: 1790628.61  
Original Wellpath

**WELL DETAILS:** Lewis Unit 2H

±E/W	0.0	±N/S	0.0	Ground Level:	1386.0	Latitude	37° 17' 52.81" N	Longitude	80° 50' 56.11" W	Spot
±E/W	0.0	±N/S	0.0	Wellhead:	1790628.139	Latitude	37° 17' 52.81" N	Longitude	80° 50' 56.11" W	

**PROJECT DETAILS:** Harrison County West Virginia

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: Zone 17N (84 W to 78 W)  
System Datum: Mean Sea Level

**REFERENCE INFORMATION**  
Well Name: Lewis Unit 2H  
Well ID: 14243770.38  
Well Path: Original Wellpath  
Well Status: Active  
Well Type: Oil/Gas  
Well Depth: 7147.7  
Wellhead: 1790628.139  
Wellhead Elevation: 1386.0  
Wellhead Coordinates: 80° 50' 56.11" W, 37° 17' 52.81" N

**Scientific Drilling**

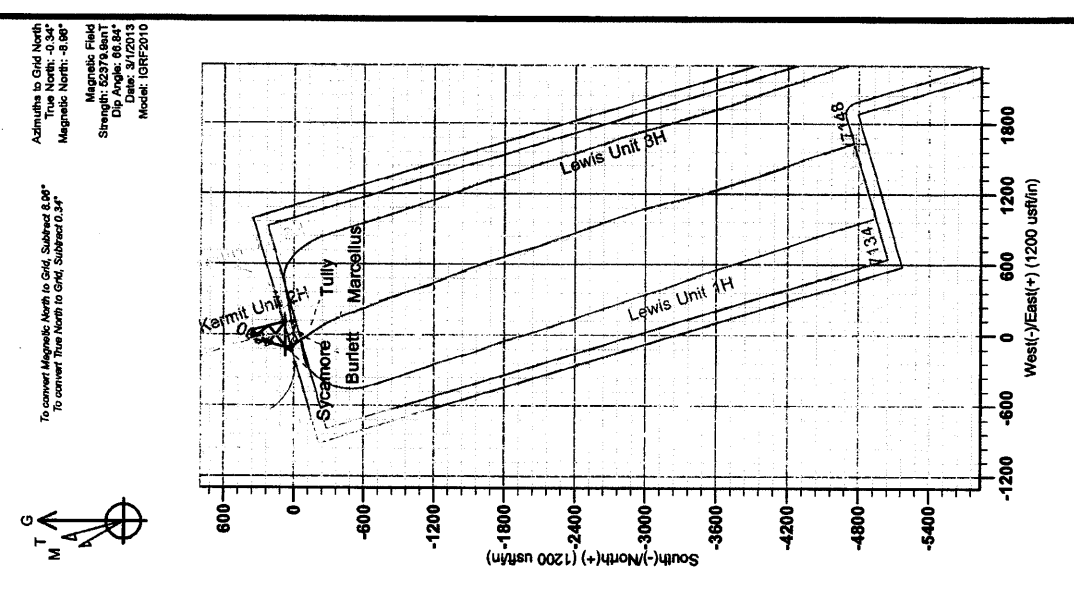
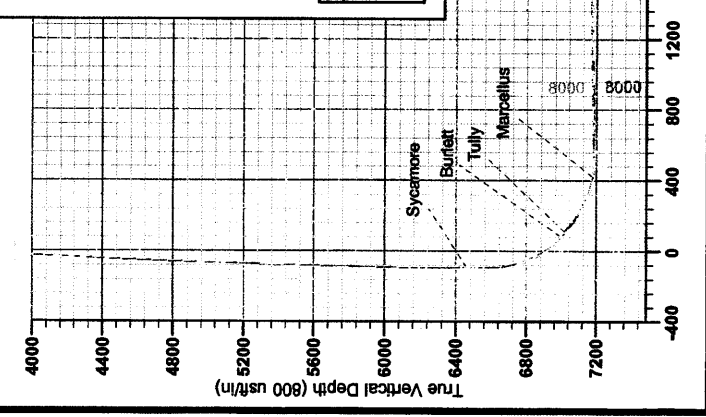
Genie Lightfoot  
Scientific Drilling  
421 South Eagle Lane  
Oklahoma City Oklahoma  
405-787-3663

**LEGEND**

- ✱ Lewis Unit 1H, Original Wellpath, Original Wellpath V0
- Kermit Unit 3H, Original Wellpath, Original Wellpath V0
- Lewis Unit 2H, Original Wellpath, Plan 4 V0
- ⊖ Kermit Unit 2H, Original Wellpath, Original Wellpath V0
- ◇ Kermit Unit 1H, Original Wellpath, Original Wellpath V0
- △ Lewis Unit 3H, Original Wellpath, Original Wellpath V0
- ▣ Original Wellpath

**Well Location Coordinates (NAD 83)**

Name	SHL Lewis Unit 2H	TVD	7147.7	±N/S	-4785.5	±E/W	1790628.139	Latitude	37° 17' 52.81" N	Longitude	80° 50' 56.11" W
	Actual BHL Lewis Unit 2H		7147.7		-4785.5		1790628.139		37° 17' 52.81" N		80° 50' 56.11" W
	BHL (UTM meters)		646796.36		4341728.41		646796.36		4341728.41		646796.36
	BHL (UTM meters)		646281.61		4342722.21		646281.61		4342722.21		646281.61



Admiralty to Grid North  
True North - 0.00"  
Magnetic North - 0.00"  
Magnetic Field  
Strength: 52379.8nT  
Dip Angle: 66.84°  
Date: 2013  
Model: IGRF2010

To convert Magnetic North to Grid, Subtract 0.00"  
To convert True North to Grid, Subtract 0.00"

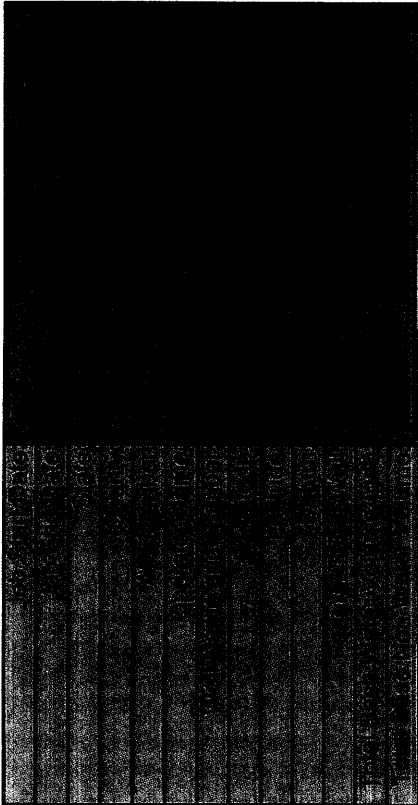
Vertical Section at 161.16° (800 usf/m)

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Hydraulic Fracturing Fluid Product Component Information Disclosure



Hydraulic Fracturing Fluid Composition:

Fracture Name	Well Name	Well ID	Chemical Abstract Service Number (CAS#)	Concentration (% w/w)	Concentration (% w/w)
Water	Water				
ANTERO RESOURCES					
Water	Water		7732-18-5	100.00000	90.28316
WV Specific 40/70 mesh Sand	Sand - Bulk - West Virginia				
Nabors Completion and Production Services					
Crystalline Silica, quartz			14808-60-7	99.90000	5.33981
Aluminum Oxide			1344-28-1	1.10000	0.05880
Titanium Oxide			13463-67-7	0.10000	0.00535
Iron Oxide			1309-37-1	0.10000	0.00535
WV Specific 20/40 mesh Sand	Sand - Bulk - West Virginia				
Nabors Completion and Production Services					
Crystalline Silica, quartz			14808-60-7	99.90000	2.80490
Aluminum Oxide			1344-28-1	1.10000	0.03089
Titanium Oxide			13463-67-7	0.10000	0.00281
Iron Oxide			1309-37-1	0.10000	0.00281
WV Specific 100 mesh Sand	Sand - Bulk - West Virginia				
Nabors Completion and Production Services					
Crystalline Silica, quartz			14808-60-7	99.90000	1.23331
Aluminum Oxide			1344-28-1	1.10000	0.01366
Iron Oxide			1309-37-1	0.10000	0.00124

WFR-3B	Nabors Completion and Production Services	Friction Reducer	Titanium Oxide	13463-67-7	0.10000	0.00124
			Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8	50.00000	0.02975
			Ethoxylated alcohols	68551-12-2	15.00000	0.00892
			Ethoxylated cetylamine	26635-93-8	5.00000	0.00298
LSG-100L	Nabors Completion and Production Services	Gelling Agents				
			Petroleum Distillates	64742-47-8	70.00000	0.03905
HCl Acid (12.5%-18.0%)	Nabors Completion and Production Services	Bulk Acid				
			Hydrogen Chloride	7647-01-0	18.00000	0.03096
OB-2	Nabors Completion and Production Services	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00937
			Silica, crystalline quartz	7631-86-9	10.00000	0.00094
KR-153SL	Nabors Completion and Production Services	Biocides				
			Polyethylene-Glycol	25322-68-3	50.00000	0.00556
			2,2-dibromo-3-nitropropanamide	10222-01-2	20.00000	0.00224
Super GREEN SOLV	Nabors Completion and Production Services	Paraffin & Scale Additives				
			BTEX Free Aliphatic Hydrocarbon	64742-96-7	100.00000	0.00580
EB-4L	Nabors Completion and Production Services	Gel Breakers				
			Cellulase enzyme	Proprietary	100.00000	0.00044
			Sugar	57-50-1	100.00000	0.00044
			Demulsifier Base	Proprietary	100.00000	0.00044
			Water	7732-18-5	100.00000	0.00044
			Breaker Component	Proprietary	100.00000	0.00044
			Ethylene Glycol	107-21-1	40.00000	0.00018
Acid Inhibitor 2 (AI-2)	Nabors Completion and Production Services	Acid Corrosion Inhibitors				
			Isopropyl Alcohol	67-63-0	40.00000	0.00013
			Glycol Ethers	111-46-6	40.00000	0.00013
			Propargyl Alcohol	107-19-7	40.00000	0.00013
			Ethoxylated Nonylphenol	38412-54-4	13.00000	0.00004
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00003

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

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Other Ingredients	Nabors Completion and Production Services	Other Ingredients					
		Water	7732-18-5		87.50000	0.15050	
		guar gum	9000-30-0		50.00000	0.02790	
		Water	7732-18-5		40.00000	0.02380	
		Polyacrylamide	57-55-6		40.00000	0.02380	
		Water	7732-18-5		60.00000	0.00902	
		Water	7732-18-5		80.00000	0.00895	
		Propylene glycol	57-55-6		15.00000	0.00892	
		Proprietary	Proprietary		50.00000	0.00752	
		Proprietary	Proprietary		15.00000	0.00226	
		Proprietary	Proprietary		15.00000	0.00226	
		Proprietary	Proprietary		15.00000	0.00226	
		vinylidene chloride-methyl acrylate copolymer	25038-72-6		20.00000	0.00187	
		Crystalline Silica (in the form of quartz)	14808-60-7		2.00000	0.00112	
		Surfactant	38439-51-0		2.00000	0.00112	
		Microparticle	Proprietary		1.00000	0.00060	
		Water	7732-18-5		48.00000	0.00016	
		2-Butoxyethanol	111-76-2		13.00000	0.00004	
		Dioxane	123-91-1		1.00000	0.00000	
		Organophylic Clay	38953-58-2				

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

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

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 19.10.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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