

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/15/2014
Job End Date:	7/15/2014
State:	Ohio
County:	Summit
API Number:	34-153-23162-00-00
Operator Name:	Discovery Oil and Gas, LLC
Well Name and Number:	Goodview Park Unit 1-D
Longitude:	-81.45170000
Latitude:	41.06738000
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	4,439
Total Base Water Volume (gal):	98,380
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Discovery Oil & Gas	Water					
			Water	7732-18-5	100.00000	90.29271	
PA Specific 20/40 mesh Sand	Nabors Completion and Production Services	Sand - Bulk - Pennsylvania					
			Crystalline Silica, quartz	14808-60-7	99.90000	7.69562	
			Aluminum Oxide	1344-28-1	1.10000	0.08474	
			Titanium Oxide	13463-67-7	0.10000	0.00770	
			Iron Oxide	1309-37-1	0.10000	0.00770	
PA Specific 100 mesh Sand	Nabors Completion and Production Services	Sand - Bulk - Pennsylvania					
			Crystalline Silica, quartz	14808-60-7	99.90000	1.09937	
			Aluminum Oxide	1344-28-1	1.10000	0.01211	
			Iron Oxide	1309-37-1	0.10000	0.00110	
			Titanium Oxide	13463-67-7	0.10000	0.00110	
Iron Acid 3M (12.6%-18.0%)	Nabors Completion and Production Services	Acid Blends					
			20° Baume Hydrochloric Acid	7647-01-0	100.00000	0.33041	

Iron Acid 3M (12.6%-18.0%)	Nabors Completion and Production Services	Acid Blends					
			Water	7732-18-5	100.00000	0.32386	
Super-Flo RPM	Nabors Completion and Production Services	Surfactants & Foamers					
			Proprietary	Proprietary	40.00000	0.02203	
			N-Methyl Pyrrolidone	872-50-4	30.00000	0.01653	
			Isopropanol	67-63-0	20.00000	0.01102	
			Proprietary	Proprietary	20.00000	0.01102	
			D-Limonene	5989-27-5	20.00000	0.01102	
WFR-3B	Nabors Completion and Production Services	Friction Reducer					
			Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8	30.00000	0.03398	
			Ethoxylated alcohols	68002-97-1	15.00000	0.01699	
			Ethoxylated oleylamine	26635-93-8	5.00000	0.00566	
Super GREEN SOLV	Nabors Completion and Production Services	Paraffin & Scale Additives					
			BTEX Free Aliphatic Hydrocarbon	64742-96-7	100.00000	0.04139	
IC-100L	Nabors Completion and Production Services	Iron Control Additives					
			Citric Acid Anhydrous	77-92-9	50.00000	0.01413	
Iron Acid 3M (12.6%-18.0%)	Nabors Completion and Production Services	Acid Blends					
			Citric Acid	77-92-9	100.00000	0.00654	
BioClear 1000	Nabors Completion and Production Services	Biocides					
			2,2-Dibromo-3-nitrilo-propionamide (DBNPA)	10222-01-2	100.00000	0.00154	
Acid Inhibitor 2 (AI-2)	Nabors Completion and Production Services	Acid Corrosion Inhibitors					
			Isopropyl Alcohol	67-63-0	40.00000	0.00036	
			Glycol Ethers	111-46-6	40.00000	0.00036	
			Propargyl Alcohol	107-19-7	40.00000	0.00036	
			Ethoxylated Nonylphenol	68412-54-4	13.00000	0.00012	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00009	
Breaker FR	Nabors Completion and Production Services	Gel Breakers					
			Aliphatic Acid	Proprietary	20.00000	0.00044	
			ferrous sulfate	7782-63-0	20.00000	0.00044	

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

Other Ingredients	Nabors Completion and Production Services	Other Ingredients					
			Water	7732-18-5	40.00000	0.04531	
			Anionic Polyacrylamide	910644-97-2	40.00000	0.04531	
			Water	7732-18-5	40.00000	0.02203	
			Propylene glycol	57-55-6	15.00000	0.01699	
			Water	7732-18-5	50.00000	0.01413	
			Proprietary	Proprietary	25.00000	0.01377	
			Proprietary	Proprietary	10.00000	0.00551	
			Proprietary	Proprietary	2.00000	0.00227	
			Glycerin	56-81-5	55.00000	0.00122	
			Demineralized Water	7732-18-5	50.00000	0.00111	
			anionic copolymer	Proprietary	20.00000	0.00044	
			Water	7732-18-5	48.00000	0.00044	
			2-Butoxyethanol	111-76-2	13.00000	0.00012	
			Dioxane	123-91-1	1.00000	0.00001	

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

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

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

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