

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/15/2017
Job End Date:	5/27/2017
State:	Texas
County:	Winkler
API Number:	42-495-33782-00-00
Operator Name:	Forge Energy, LLC
Well Name and Number:	UL 20 Flathead #2H
Latitude:	31.71580000
Longitude:	-103.28919400
Datum:	NAD27
Federal Well:	YES
Indian Well:	NO
True Vertical Depth:	19,466
Total Base Water Volume (gal):	16,185,246
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	Forge Energy, LLC	Carrier Fluid					
			Water	7732-18-5	100.00000	90.86834	
BR-6	C&J Well Services	Gel Breakers					
				Listed Below			

TX Specific 100 mesh Sand	C&J Well Services	Sand - Bulk - Texas					
				Listed Below			
ICA-1	C&J Well Services	Iron Control Additives					
				Listed Below			
TX Specific 40/70 mesh Sand	C&J Well Services	Sand - Bulk - Texas					
				Listed Below			
GA-7F	C&J Well Services	Gelling Agents					
				Listed Below			
FR-14	C&J Well Services	Friction Reducer					
				Listed Below			
BR-1	C&J Well Services	Gel Breakers					
				Listed Below			
HC-15	C&J Well Services	Bulk Acid					
				Listed Below			
SU-3	C&J Well Services	Surfactants & Foamers					
				Listed Below			
CS-5	C&J Well Services	Clay Control Additives					

				Listed Below			
CI-3	C&J Well Services	Acid Corrosion Inhibitors					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline Silica, quartz	14808-60-7	99.90000	5.40431	
			Crystalline Silica, quartz	14808-60-7	99.90000	2.43737	
			Water	7732-18-5	85.00000	0.81372	
			Hydrochloric Acid	7647-01-0	15.00000	0.14360	
			Water	7732-18-5	70.00000	0.09690	
			Proprietary	7732-18-5	80.00000	0.06195	
			Aluminum Oxide	1344-28-1	1.10000	0.05951	
			Isopropanol	67-63-0	30.00000	0.04153	
			Polyamine Polyethers	Proprietary	30.00000	0.04153	
			Water	7732-18-5	40.00000	0.03712	
			Distillates (Petroleum), Hydrotreated Light	64742-47-8	30.00000	0.02784	
			Aluminum Oxide	1344-28-1	1.10000	0.02684	
			Copolymer	Proprietary	25.00000	0.02320	
			Organic Polyol	Proprietary	13.00000	0.01800	
			Calcium Chloride	10043-52-4	20.00000	0.01549	
			Nonionic Alkoxylate	Proprietary	10.00000	0.01384	
			Citrus Terpenes	68647-72-3	5.00000	0.00692	
			Surfactant 2	Proprietary	5.00000	0.00692	
			Water	7732-18-5	60.00000	0.00658	
			Trisodium Nitrilotriacetate	5064-31-3	50.00000	0.00548	
			Iron Oxide	1309-37-1	0.10000	0.00541	
			Titanium Oxide	13463-67-7	0.10000	0.00541	
			Proprietary Surfactant Blend	Proprietary	5.00000	0.00464	

			Alcohols, C11-14-iso-, C13-rich ethoxylated	69011-36-5	5.00000	0.00464	
			Iron Oxide	1309-37-1	0.10000	0.00244	
			Titanium Oxide	13463-67-7	0.10000	0.00244	
			Ethylene Glycol	107-21-1	40.00000	0.00143	
			Proprietary	Proprietary	1.50000	0.00116	
			Guar Gum	9000-30-0	60.00000	0.00075	
			CJENERGY-Hydrocarbon-00013	64742-47-8	60.00000	0.00075	
			Dimethylformamide	68-12-2	20.00000	0.00072	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00054	
			2-Butoxyethanol	111-76-2	15.00000	0.00054	
			Cinnamaldehyde	104-55-2	15.00000	0.00054	
			Ammonium Persulfate	7727-54-0	100.00000	0.00030	
			Nonyphenol (branched), ethoxylated	127087-87-0	5.00000	0.00018	
			1-DECANOL	112-30-1	5.00000	0.00018	
			Surfactant 1	Proprietary	0.10000	0.00014	
			Acrylamide as residual	79-06-1	0.10000	0.00009	
			Isopropyl Alcohol	67-63-0	2.50000	0.00009	
			Triethyl Phosphate	78-40-0	2.50000	0.00009	
			1-OCTANOL	111-87-5	2.50000	0.00009	
			Isopropanol	67-63-0	0.10000	0.00008	
			Sodium Perborate, Tetrahydrate	10486-00-7	100.00000	0.00007	
			Bentonite Clay	68953-58-2	5.00000	0.00006	
			Ethoxylated Alcohols	68002-97-1	100.00000	0.00006	
			Proprietary	Proprietary	100.00000		

* 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%

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)