

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/13/2018
Job End Date:	7/27/2018
State:	Texas
County:	Crockett
API Number:	42-105-42381-00-00
Operator Name:	Approach Resources
Well Name and Number:	University 42 2119 HB
Latitude:	30.91310000
Longitude:	-101.14980000
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,946
Total Base Water Volume (gal):	13,137,768
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	Operator	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	70.31521	None
Hydrochloric Acid (15%)	Cooper Natural	Acidizing					
			Water	7732-18-5	74.00000	8.49397	None
			Hydrochloric Acid	7647-01-0	26.00000	2.98437	None
NanoActiv	Nissan Chemical	Nano Activ					
			Water	7732-18-5	64.00000	6.03542	None
			Amorphus Silica	7631-86-9	19.00000	1.79177	None
			Ethylene glycol	107-21-1	9.00000	0.84873	None
			Proprietary	Proprietary	4.00000	0.37721	None
			Proprietary	Proprietary	4.00000	0.37721	None
Sand (100 Mesh Proppant)	ProFrac	Proppant					
			Crystalline Silica (quartz)	14808-60-7	100.00000	5.27083	None
Sand (40/70 White Proppant)	ProFrac	Proppant					
			Crystalline Silica (quartz)	14808-60-7	100.00000	3.29347	None
LD-7645 (Surfactant)	Multi-Chem	Surfactant					

			Alcohols, C10-16, ethoxylated	68002-97-1	30.00000	0.02184	None
			Polyoxylated fatty amine salt	61791-26-2	5.00000	0.00364	None
LD-2125 (FR)	Multi-Chem	Friction Reducer					
			Proprietary	Proprietary	100.00000	0.01609	None
LD-2100 (FR)	Multi-Chem	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.00724	None
			Ethoxylated alcohols	Proprietary	5.00000	0.00121	None
			Amide	Proprietary	5.00000	0.00121	None
			Ammonium Chloride	12125-02-9	5.00000	0.00121	None
LD-6375	Multi-Chem	Clay Stabilizer					
			Sodium chloride	7647-14-5	30.00000	0.00866	None
			Sodium formate	141-53-7	5.00000	0.00144	None
MC B-8614 (Bio-cide)	Multi-Chem	Biocide					
			Glutaraldehyde	111-30-8	30.00000	0.00816	None
			Quaternary ammonium compounds,benzyl-C-12 16-alkyldimethyl, chlorides	68424-85-1	5.00000	0.00136	None
LD-4175 (Breaker)	Multi-Chem	Breaker					
			Ammonium persulfate	7727-54-0	30.00000	0.00510	None
LD-6250 (Clay Stab)	Multi-Chem	Clay Stabilizer					
			Polydimethyl diallyl ammonium chloride	26062-79-3	30.00000	0.00228	None
			Methanol	67-56-1	30.00000	0.00228	None
LD-7750 (Scale Inhibitor)	Multi-Chem	Scale Inhibitor					
			Methanol	67-56-1	10.00000	0.00181	None
			Phosphonic Acid Salt	Proprietary	5.00000	0.00091	None

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 Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	74.00000	8.49397	
			Amorphous Silica	7631-86-9	19.00000	1.79177	
			Ethylene glycol	107-21-1	9.00000	0.84873	
			Proprietary	Proprietary	4.00000	0.37721	
			Proprietary	Proprietary	4.00000	0.37721	
			Sodium chloride	7647-14-5	30.00000	0.00866	
			Polyoxylated fatty amine salt	61791-26-2	5.00000	0.00364	
			Polydimethyl diallyl ammonium chloride	26062-79-3	30.00000	0.00228	
			Quaternary ammonium compounds,benzyl-C-12 16-alkyldimethyl, chlorides	68424-85-1	5.00000	0.00136	
			Ammonium Chloride	12125-02-9	5.00000	0.00121	
			Ethoxylated alcohols	Proprietary	5.00000	0.00121	
			Amide	Proprietary	5.00000	0.00121	
			Phosphonic Acid Salt	Proprietary	5.00000	0.00091	

\* 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)