

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	8/27/2012
State:	TEXAS
County:	ANDREWS
API Number:	4200344349
Operator Name:	CHESAPEAKE
Well Name and Number:	UNIVERSITY 8-9 5
Longitude:	-102.339147
Latitude:	32.379475
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	11,248
Total Water Volume (gal)*:	975,492

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
Fresh Water		Carrier/Base Fluid				84.47826%	
10.1 - 15 HCL	FTS INTERNATIONAL	Acid	Water	007732-18-5	85.00%	1.43099%	
			Hydrochloric Acid	007647-01-0	15.00%	0.25253%	
FE-100L	FTS INTERNATIONAL	Iron Control Agent	Citric Acid	000077-92-9	55.00%	0.00304%	
CI-150	FTS INTERNATIONAL	Corrosion Inhibitor	Isopropanol (Isopropyl Alcohol, Propan-2-ol)	000067-63-0	60.00%	0.00255%	
			Proprietary Organic Amine Resin Salt	TRADE SECRET	30.00%	0.00128%	
			Dimethyl Formamide	000068-12-2	10.00%	0.00043%	
			Proprietary Aromatic Aldehyde	TRADE SECRET	10.00%	0.00043%	
			Proprietary Quaternary Ammonium Compound	TRADE SECRET	10.00%	0.00043%	
MC C-6471	MULTI-CHEM	Corrosion Inhibitor	Methanol (Methyl Alcohol)	000067-56-1	13.00%	0.00124%	
			2-Butoxyethanol (Ethylene Glycol Monobutyl Ether)	000111-76-2	6.00%	0.00057%	
			Quaternary Ammonium Chloride	061789-71-1	5.00%	0.00048%	
			Thioglycolic Acid	000068-11-1	2.00%	0.00019%	
Northern White Sand		Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	11.49301%	
Super LC		Proppant - Resin Coated	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	97.00%	1.73035%	
			Phenol/Formaldehyde Resin	009003-35-4	5.00%	0.08919%	

HVG01 (TURQUOISE-1 BULK)	FTS INTERNATI ONAL	Gelling Agent	Petroleum Distillate Hydrotreated Light	064742-47-8	55.00%	0.16304%	
			Guar Gum	009000-30-0	50.00%	0.14822%	
			Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	2.00%	0.00593%	
			Surfactant	068439-51-0	2.00%	0.00593%	
BXL02 Borate XL	FTS INTERNATI ONAL	Cross Linker	Sodium Metaborate Tetrahydrate	010555-76-7	25.00%	0.03430%	
			Boric Acid	010043-35-3	15.00%	0.02058%	
			Potassium Hydroxide	001310-58-3	12.00%	0.01646%	
B10 (HIGH PH BUFFER)	FTS INTERNATI ONAL	pH Adjusting Agent	Potassium Carbonate	000584-08-7	48.00%	0.02780%	
			Potassium Hydroxide	001310-58-3	20.00%	0.01158%	
APB01 (AMMONIUM PERSUFATE BREAKER)	FTS INTERNATI ONAL	Breaker	Ammonium Persulfate	007727-54-0	100.00%	0.00180%	
LEB-300	FTS INTERNATI ONAL	Breaker	No Hazardous Components	NONE		0.00000%	
MC B 8642 WS	MULTI-CHE M	Anti-Bacterial Agent	Glutaraldehyde (Pentanediol)	000111-30-8	60.00%	0.02212%	
			Quaternary Ammonium Compound	068424-85-1	10.00%	0.00369%	
			Ethanol	000064-17-5	1.00%	0.00037%	
MC S-2510T (WS)	MULTI-CHE M	Scale Inhibitor	Ethylene Glycol	000107-21-1	60.00%	0.00646%	
			Sodium Hydroxide	001310-73-2	5.00%	0.00054%	

Additional Ingredients Not Listed on MSDS							
Super LC		Proppant - Resin Coated	Non-MSDS Components Not Provided by Supplier	NOT PROVIDED			
APB01 (AMMONIUM PERSUFATE BREAKER), B10 (HIGH PH BUFFER), BXL02 Borate XL, CI-150, FE-100L, LEB-300	FTS INTERNATI ONAL	Breaker, Corrosion Inhibitor, Cross Linker, Iron Control Agent, pH Adjusting Agent	Proprietary Breaker (APB01) Additive	TRADE SECRET			
			Proprietary Corrosion Inhibitor Additive (CI-150)	TRADE SECRET			
			Proprietary Enzyme	TRADE SECRET			
			Sodium Chloride	007647-14-5			
			Water	007732-18-5			
MC B 8642 WS, MC C-6471, MC S-2510T (WS)	MULTI-CHE M	Anti-Bacterial Agent, Corrosion Inhibitor, Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1			
			Neutralized Polycarboxylic Acid	TRADE SECRET			
			Quaternary Ammonium Compound	PROPRIETARY			
			Isopropanol	000067-63-0			
			Ethanolamine	000141-43-5			
			Water	007732-18-5			

* 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%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.

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

