

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	6/28/2012
State:	California
County:	Ventura
API Number:	04-111-22146
Operator Name:	SENECA RESOURCES CORP
Well Name and Number:	Oak Flat 2-31
Longitude:	-118.90900812
Latitude:	34.470693879
Long/Lat Projection:	NAD83
Production Type:	Oil
True Vertical Depth (TVD):	4,385
Total Water Volume (gal)*:	344,682

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
Lease Water	Operator				100.00%	76.97096%	Density = 8.330
SAND - PREMIUM - 20/40	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	22.42687%	
CLA-WEB™	Halliburton	Additive	Ammonium salt	Confidential Business Information	50.00%	0.02026%	
MO-67	Halliburton	pH Control Additive	Sodium hydroxide	1310-73-2	30.00%	0.01922%	
CLA-STA FS ADDITIVE	Halliburton	Clay Stabilizer	Ammonium chloride	12125-02-9	30.00%	0.02178%	
BC-140	Halliburton	Crosslinker	Ethylene glycol	107-21-1	30.00%	0.02051%	
			Monoethanolamine borate	26038-87-9	60.00%	0.04102%	
LGC-36 UC	Halliburton	Liquid Gel Concentrate	Guar gum	9000-30-0	60.00%	0.19317%	
			Naphtha, hydrotreated heavy	64742-48-9	60.00%	0.19317%	
FE-1A ACIDIZING	Halliburton	Additive	Acetic acid	64-19-7	60.00%	0.01153%	

COMPOSITION						
FDP-S1047-12	Halliburton	Surfactant	Acetic anhydride	108-24-7	100.00%	0.01922%
			Methanol	67-56-1	100.00%	0.04024%
			Sulfonate	Confidential Business Information	10.00%	0.00402%
BE-3S BACTERICIDE	Halliburton	Biocide	2,2 Dibromo-3-nitrilopropionamide	10222-01-2	100.00%	0.00113%
			2-Monobromo-3-nitrilopropionamide	1113-55-9	5.00%	0.00006%
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.01123%
GBW-30 BREAKER	Halliburton	Breaker	Hemicellulase enzyme	9012-54-8	15.00%	0.00047%
			Carbohydrates	Confidential Business Information	95.00%	0.00295%
			Ingredients Listed Below This Line Are Part of the Fluid Composition Provided by Halliburton Which Do Not Appear On the Material Safety Data Sheets (MSDS)			
			Amine Salts	Confidential Business Information		
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			Bis-quaternary Methacrylamide Monomer	Confidential Business Information		
			Crystalline silica, quartz	14808-60-7		
			Fatty alcohol polyglycol ether surfactant	9043-30-5		
			Polyquaternary Amine Salt	Confidential Business Information		
			Quaternary Amine	Confidential Business Information		
			Quaternary Amine	Confidential Business Information		
			Quaternary Amine	Confidential Business Information		
			Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl, salts with bentonite	68953-58-2		
			Sodium Chloride	7647-14-5		
			Sodium sulfate	7757-82-6		
			Water	7732-18-5		

* 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%

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

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