

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	2013-02-07
State:	California
County:	Ventura
API Number:	0411122171
Operator Name:	VINTAGE PETROLEUM LLC EBUSINESS
Well Name and Number:	Soundwave 1
Longitude:	-118.38
Latitude:	34.01
Long/Lat Projection:	NAD83
Production Type:	Oil
True Vertical Depth (TVD):	11,143
Total Water Volume (gal)*:	220,803

## 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
4% KCL Water	Operator				100.00%	82.87736%	Density = 8.540
HYDROCHLORIC ACID 10-30%	Halliburton	Solvent	Hydrochloric acid	7647-01-0	30.00%	1.96705%	Density = 8.951
SAND - PREMIUM WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	3.52580%	
PREMIUM PROP	Halliburton	Proppant	Crystalline silica, cristobalite	14464-46-1	5.00%	0.52825%	
			Sintered bauxite	1318-16-7	100.00%	10.56508%	
CL-28M CROSSLINKER	Halliburton	Crosslinker	Crystalline silica, quartz	14808-60-7	5.00%	0.00381%	
			Borate salts	Confidential Business Information	60.00%	0.04569%	
CAT-3 ACTIVATOR	Halliburton	Activator	EDTA/Copper chelate	Confidential Business Information	30.00%	0.04424%	
VICON NF	Halliburton	Breaker	Chlorous acid, sodium salt	7758-19-2	10.00%	0.02118%	

## BREAKER

			Sodium chloride	7647-14-5	30.00%	0.06354%
BA-40L BUFFERING AGENT	Halliburton	Buffer	Potassium carbonate	584-08-7	60.00%	0.12322%
FR-66	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00%	0.00815%
FDP-S1047-12	Halliburton	Surfactant	Methanol	67-56-1	60.00%	0.06115%
			Sulfonate	Confidential Business Information	5.00%	0.00510%
CAT-4	Halliburton	Activator	Diethylenetriamine	111-40-0	60.00%	0.01117%
K-38	Halliburton	Crosslinker	Disodium octaborate tetrahydrate	12008-41-2	100.00%	0.00440%
BE-3S BACTERICIDE	Halliburton	Biocide	2,2 Dibromo-3-nitrilopropionamide	10222-01-2	100.00%	0.00220%
			2-Monobromo-3-nitrilopropionamide	1113-55-9	5.00%	0.00011%
WG-35 GELLING AGENT	Halliburton	Gelling Agent	Guar gum	9000-30-0	100.00%	0.26964%
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)						
			Alcohols, C12-16, ethoxylated	68551-12-2		
			Aluminum oxide	1344-28-1		
			Aluminum silicate	1302-76-7		
			Ammonium chloride	12125-02-9		
			Crystalline silica, quartz	14808-60-7		
			Ethoxylated Nonylphenol	Confidential Business Information		
			Hydrochloric acid	7647-01-0		
			Inorganic mineral	Proprietary		
			Iron oxide	1309-37-1		
			Modified Bentonite	Confidential Business Information		
			Polyacrylamide Copolymer	Confidential Business Information		
			Polymer	Proprietary		
			Silica, amorphous - fumed	7631-86-9		
			Sodium chloride	7647-14-5		
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		
			Tall oil acid diethanolamide	68155-20-4		
			Titanium dioxide	13463-67-7		
			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)