

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	2012-09-17
State:	California
County:	Kern
API Number:	0403043599
Operator Name:	VINTAGE PETROLEUM LLC EBUSINESS
Well Name and Number:	RD1 82-15H
Longitude:	-119.474804
Latitude:	35.585704
Long/Lat Projection:	NAD83
Production Type:	Oil
True Vertical Depth (TVD):	7,683
Total Water Volume (gal)*:	206,566

## 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
6% KCL Water	Operator				100.00%	77.01106%	Density = 8.650
SAND - PREMIUM BROWN	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	21.55356%	
MO-67	Halliburton	pH Control Additive	Sodium hydroxide	1310-73-2	30.00%	0.02266%	
BA-40L BUFFERING AGENT	Halliburton	Buffer	Potassium carbonate	584-08-7	60.00%	0.01128%	
LoSurf-300M	Halliburton				100.00%	0.00000%	Not Found in DB
VICON NF BREAKER	Halliburton	Breaker	Chlorous acid, sodium salt	7758-19-2	10.00%	0.01493%	
			Sodium chloride	7647-14-5	30.00%	0.04479%	
FR-66	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00%	0.00228%	
CL-28M	Halliburton	Crosslinker	Crystalline silica, quartz	14808-60-7	5.00%	0.00464%	

## CROSSLINKER

			Borate salts	Confidential Business Information	60.00%	0.05566%
LGC-36 UC	Halliburton	Liquid Gel Concentrate	Guar gum	9000-30-0	60.00%	0.25065%
			Naphtha, hydrotreated heavy	64742-48-9	60.00%	0.25065%
EXPEDITE 225 COMPONENT A	Halliburton	Resin	Epoxy resin	Confidential Business Information	100.00%	0.24773%
			Butyl glycidyl ether	2426-08-6	30.00%	0.07432%
			Butyl lactate	138-22-7	10.00%	0.02477%
EXPEDITE 225 COMPONENT B	Halliburton	Hardener	Methanol	67-56-1	60.00%	0.13815%
			Modified cycloaliphatic amine adduct	Mixture	60.00%	0.13815%
			Phosphate ester	Confidential Business Information	10.00%	0.02302%
MUSOL A SOLVENT	Halliburton	Solvent	Oxylated alcohol	Confidential Business Information	30.00%	0.03680%
			Ethylene glycol monobutyl ether	111-76-2	100.00%	0.12268%
CAT-3WB	Halliburton	Activator	EDTA/Copper chelate	Confidential Business Information	30.00%	0.01980%
			Methanol	67-56-1	30.00%	0.01980%
BE-3S BACTERICIDE	Halliburton	Biocide	2,2 Dibromo-3-nitrilopropionamide	10222-01-2	100.00%	0.00052%
			2-Monobromo-3-nitrilopropionamide	1113-55-9	5.00%	0.00003%
K-38	Halliburton	Crosslinker	Disodium octaborate tetrahydrate	12008-41-2	100.00%	0.00409%
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.00237%
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		
			Ammonium chloride	12125-02-9		
			Crystalline silica, quartz	14808-60-7		
			Ethylenediamine	107-15-3		
			Fatty alcohol polyglycol ether surfactant	9043-30-5		
			Inorganic mineral	Proprietary		
			Organo Amino Silane	Confidential Business Information		
			Phosphoric acid	7664-38-2		
			Polyacrylamide Copolymer	Confidential Business Information		
			Polymer	Proprietary		
			Quaternary Amine	Confidential Business Information		

	Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl, salts with bentonite	68953-58-2
	Siloxanes and silicones, dimethyl,	63148-52-7
	Sodium chloride	7647-14-5
	Sodium sulfate	7757-82-6
	Sorbitan monooleate polyoxyethylene derivative	9005-65-6
	Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8
	Tall oil acid diethanolamide	68155-20-4
	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)