

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	12/8/2012
State:	California
County:	Kern
API Number:	0403048681
Operator Name:	Occidental Of Elk Hills, Inc.
Well Name and Number:	88N-34R
Longitude:	-119.4847695
Latitude:	35.27043498
Long/Lat Projection:	NAD83
Production Type:	Oil
True Vertical Depth (TVD):	4,226
Total Water Volume (gal)*:	124,694

## 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
Brine (KCL)	Operator				100.00%	3.87219%	Density = 4.000
SAND - PREMIUM BROWN	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	94.32465%	
EXPEDITE 225 COMPONENT A	Halliburton	Resin	Epoxy resin	Confidential Business Information	100.00%	0.89609%	
			Butyl glycidyl ether	2426-08-6	30.00%	0.26883%	
			Butyl lactate	138-22-7	10.00%	0.08961%	
EXPEDITE 350 COMPONENT B	Halliburton	Hardener	4,4'-Diaminodiphenyl sulfone	80-08-0	60.00%	0.49444%	
			Glycol ether	Confidential Business Information	60.00%	0.49444%	
GBW-30 BREAKER	Halliburton	Breaker	Hemicellulase enzyme	9012-54-8	15.00%	0.00732%	
			Carbohydrates	Confidential Business Information	95.00%	0.04638%	

BE-3S BACTERICIDE	Halliburton	Biocide	2,2 Dibromo-3-nitrilopropionamide	10222-01-2	100.00%	0.02767%
			2-Monobromo-3-nitrilopropionamide	1113-55-9	5.00%	0.00138%
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.00651%
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)						
			Adipic acid, dimethyl ester	627-93-0		
			Dimethyl glutarate	1119-40-0		
			Ethylenediamine	107-15-3		
			Methanol	67-56-1		
			n-Beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane	1760-24-3		
			Phosphate ester	Confidential Business Information		
			Phosphoric acid	7664-38-2		
			Quaternary amine	Confidential Business Information		
			Siloxanes and silicones, di-Me, polymers with Me silsesquioxanes	68037-74-1		
			Sodium sulfate	7757-82-6		
			Succinic acid, dimethyl ester	106-65-0		

\* 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)