

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	11/30/2011
Province:	BC
Region:	Altares
Well Number:	26296
Operator Name:	Canadian Natural Resources Limited
Well Name:	CNRL HZ ALTARES B- 093-I/094-B-01
Longitude:	-122.020740
Latitude:	56.143492
Long/Lat Projection:	NAD83
Production Type:	Undefined
True Vertical Depth (TVD):	4,800
Total Water Volume (m3)*:	12,553

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
HCl Acid; Slickwater	Talisman	Base Fluid; Antifoam Agent; Bactericide; Breaker; Chelating Agent; Corrosion Inhibitor; Friction Reducer; Gelling Agent; Hydrochloric Acid; Resin Coated Proppant; Rheology Modifier; Sand, Scale Inhibitor; Surfactant	Water (Includes Mix Water Supplied by Client)		100.00%	91.49068%	
HCl Acid; Slickwater	Schlumberger	Base Fluid; Antifoam Agent; Bactericide; Breaker; Chelating Agent; Corrosion Inhibitor; Friction Reducer; Gelling Agent; Hydrochloric Acid; Resin Coated Proppant; Rheology Modifier; Sand, Scale Inhibitor; Surfactant	Crystalline silica		92.08%	7.83573%	
			Crystalline silica	14808-60-7	3.44%	0.29238%	
			Hydrochloric Acid	7647-01-0	0.82%	0.06980%	
			Distillates (petroleum), hydrotreated light	64742-47-8	0.41%	0.03513%	
			Fatty acid amidoalkyl betaine		0.08%	0.00667%	
			Sodium salt of aliphatic amine acid		0.06%	0.00529%	
			Ethane-1,2-diol	107-21-1	0.05%	0.00459%	
			Alcohol ethoxylate C-10/16 with 6.5 EO	68002-97-1	0.05%	0.00439%	
			Propan-2-ol	67-63-0	0.04%	0.00339%	
			Diatomaceous earth, calcined	91053-39-3	0.03%	0.00219%	
			Methanol	67-56-1	0.02%	0.00162%	
			Aliphatic alcohols, ethoxylated #1		0.01%	0.00098%	
			Aliphatic acids		0.01%	0.00098%	
			Sodium chloride	7647-14-5	0.01%	0.00077%	

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			Calcium chloride	10043-52-4	0.01%	0.00077%	
			Sodium hydroxide (impurity)	1310-73-2	0.01%	0.00044%	
			Magnesium nitrate	10377-60-3	0.00%	0.00037%	
			5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	0.00%	0.00037%	
			Prop-2-yn-1-ol	107-19-7	0.00%	0.00033%	
			Ethoxylated alcohols #2		0.00%	0.00024%	
			Ethoxylated alcohols		0.00%	0.00024%	
			Sulfonated polystyrene		0.00%	0.00023%	
			2-Methyl-4-isothiazolin-3-one	2682-20-4	0.00%	0.00018%	
			Magnesium chloride	7786-30-3	0.00%	0.00018%	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	0.00%	0.00009%	
			Crystalline silica: Quartz (SiO ₂)	14808-60-7	0.00%	0.00004%	
			Crystalline silica: cristobalite	14464-46-1	0.00%	0.00004%	

* 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%

Information provided in this form with respect to ingredients in the fracturing fluid is consistent with the Material Safety Data Sheet (MSDS) information. The operator has completed this form with the information provided by the supplier. The operator cannot provide any of the supplier's proprietary information, trade secrets or confidential business information.