

Hydraulic Fracturing Fluid Product Component Information

Job Start Date:	3/10/2015
Job End Date:	4/10/2015
Area:	Roper Gulf Shire
State:	Northern Territory
Operator Name:	Pangaea (NT) Pty Ltd
Well Name and Number:	Birdum Creek-1
Longitude:	15° 37' 49.81" S
Latitude:	133° 08' 37.23" E
Datum:	GDA MGA 94, Z53S
True Vertical Depth:	1802.0-1812.1mRT (Perfs.)
Total base Water Volume (kl):	541.36
Total Base Non Water Volume (kl):	563.25

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	
Water	Customer Supplied*	Carrier	Water	7732-18-5	100.00%	0.90000		
Acetic Acid	Halliburton	Buffer	Acetic Acid	64-19-7	30-60%	0.00012		
BC-140C	Halliburton	Crosslinker	Monoethanolamine borate	26038-87-9	30-60%	-	Not used	
BE-7™	Halliburton	Biocide	Sodium hypochlorite	7681-52-9	10-30%	-	Not used	
			Sodium hydroxide	1310-73-2	0-2%	-	Not used	
BE-9	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	81741-28-8	50-10%	0.00003		
Caustic Soda Liquid - 50%	Halliburton	Buffer	Sodium hydroxide	1310-73-2	30-60%	-	Not used	
DCA-14004	Halliburton	Acid Neutralization	Sodium carbonate	497-19-8	60-100%	-	Used for neutralization of equipment. Not pumped into well.	
DCA-16001	Halliburton	Clay Control	Contains no hazardous substances	Mixture	60-100%	0.00136		
DCA-17004	Halliburton	Corrosion Inhibitor	Contains no hazardous substances	Mixture	60-100%	0.00001		
DCA-23001	Halliburton	Friction Reducer	Sodium chloride	7647-14-5	60-100%	0.00017		
DCA-25003	Halliburton	Gelling agent	Contains no hazardous substances	Mixture	60-100%	-	Not used	
DCA-25005	Halliburton	Gelling agent	Contains no hazardous substances	Mixture	60-100%	-	Not used	
DCA-30001	Halliburton	Scale Inhibitor	Sodium polyacrylate	9003-04-7	10-30%	-	Not used	
			Sodium bisulfite	7631-90-5	1-5%	-	Not used	
FE-2	Halliburton	Iron Control	Citric acid	77-92-9	60-100%	0.00007		
Fluorescein Dye	Halliburton	Tracer	Sodium fluorescein	518-47-8	60-100%	0.00001		
GBW-30 Breaker	Halliburton	Gel breaker	Hemicellulase enzyme	9012-54-8	10-30%	-	Not used	
Hydrochloric Acid 10-30%	Halliburton	Acid source	Hydrochloric acid	7647-01-0	10-30%	0.00158		
KCL Potassium Chloride	Halliburton	Clay Control	Potassium chloride	7447-40-7	60-100%	-	Not used	
Sand - Premium Brown	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	60-100%	0.06483		
Sand - Premium White	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	60-100%	-	Not used	
SuperFlo 2000	Halliburton	Surfactant	Terpene hydrocarbon by-products	68956-56-9	10-30%	0.00002		
			Methanol	67-56-1	5-10%	0.00001		
			Coco diethanolamide	Proprietary	5-10%	0.00001		
			Quaternary ammonium compounds, benzyl-C12-18					
			alkyldimethyl, chlorides	68391-01-5	5-10%	0.00001		
			Nonylphenol ethoxylate	Proprietary	5-10%	0.00001		
			Linanol	Proprietary	1-5%	0.00001		
			2,6 Octadien-1-ol, 3,7-dimethyl-, (2Z)-	106-25-2	1-5%	0.00001		
			2,6 Octadien-1-ol, 3,7-dimethyl-, (2E)-	106-24-1	1-5%	0.00001		
			Citronellol	106-22-9	1-5%	0.00001		
Isopropanol	67-63-0	1-5%	0.00001					
CarboNRTTM	Carbo Ceramics	Proppant	Silicon Dioxide (amorphous as glass)	7631-86-9	5-35%	0.00531		
			Mullite	1302-93-8	60-85%	0.01858		
			Silica Crystalline-Cristobalite	13364-46-1	0-20%	0.00265		

* 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%