

Hydraulic Fracturing Fluid Data

Water Volume (Cubic Metres)	3291.1
Max mass % of Total HF Fluid	88.4
Proppant (kilograms)	322317.3
Max mass % of Total HF Fluid	8.6
% of Water Volume - recycled/produced water	21.8
% of Water Volume - fresh water	78.2
Max (mass %) Water + Proppant =	97

HF Fluid Primary Products

Product Trade Names in Fracturing Fluid	Product Purpose in Well	Supplier
Acetic acid	pH buffer	Halliburton Energy Services
CLLAU301	Cross-linker	Halliburton Energy Services
CLBEAU196	Gel breaker	Halliburton Energy Services
CLBXTAU121	High temp. gel breaker	Halliburton Energy Services
CLSAU352	Surfactant	Halliburton Energy Services
CLWGUAU421	Gelling agent	Halliburton Energy Services
DCA-13002	Gel breaker	Halliburton Energy Services
FRAC SAND	Proppant	Halliburton Energy Services
KCl	Salt	Halliburton Energy Services
Water	Base fluid	Halliburton Energy Services

HF Fluid Contingency Products

Product Trade Names in Fracturing Fluid	Product Purpose in Well	Supplier
CLLAU302	Delayed cross-linker	Halliburton Energy Services
CLLAU303	Delayed cross-linker	Halliburton Energy Services
DCA-14003	pH buffer	Halliburton Energy Services
Sodium chloride	Alternative salt	Halliburton Energy Services

HF Fluid Primary Constituents

Chemical Substance in Fracturing Fluid	Chemical Abstract Service Number (CAS Number)	Maximum Chemical substance Mass % in HF Fluid	Other common/household uses	Presumed Hazardous or Non-hazardous (EA/WFD)	Basis of Assessment
Acetic acid	64-19-7	0.0003	Vinegar	Non-hazardous	Environment Agency Guidance [#]
Aluminium sulfate	10043-01-3	0.0039	Food additive (acidity regulator)	Non-hazardous	Environment Agency Guidance [#]
Citric acid, triethyl ester	77-90-0	0.0078	Food additive (stabilizes foams)	Non-hazardous	Environment Agency Guidance [#]
Crystalline silica, quartz	14808-60-7	8.58	Sand	Non-hazardous	Balcombe HRA
Hemicellulase enzyme	9012-54-8	0.0001	Food additive (improves texture of low fat butter)	Non-hazardous	Environment Agency Guidance [#]
Maltodextrin	9050-36-6	0.0105	Food additive (sweetener)	Non-hazardous	Environment Agency Guidance [#]
Potassium chloride	7447-40-7	1.77	Detergent, Moisture Absorber, Ice Melting Product, Agricultural Fertilizer	Non-hazardous	Environment Agency Guidance [#]
Sodium carboxymethyl cellulose	9004-32-4	0.43	Food additive (coating)	Non-hazardous	Environment Agency Guidance [#]
Sodium lauryl sulfate	151-21-3	0.0011	Toothpaste, shampoo, bubble bath	Non-hazardous	Environment Agency Guidance [#]
Sodium persulfate	7775-27-1	0.0056	Detergent	Non-hazardous	Environment Agency Guidance [#]
Sorbitan, monododecanoate, poly (oxy-1,2-ethanediyl) derivs	9005-64-5	0.0020	Food additive (flavouring)	Non-hazardous	Environment Agency Guidance [#]
Sulfuric acid	7664-93-9	0.0010	Food additive (preservative)	Non-hazardous	Environment Agency Guidance [#]

HF Fluid Contingency Constituents

Chemical Substance in Fracturing Fluid	Chemical Abstract Service Number (CAS Number)	Maximum Chemical substance Mass % in HF Fluid	Other common/household uses	Presumed Hazardous or Non-hazardous (EA/WFD)	Basis of Assessment
Aluminium sulfate octahydrate	7784-31-8	0.0102	Water purification	Non-hazardous	Based on the assessment of aluminium sulfate.
Sodium bicarbonate	144-55-8	0.05	Food additive (leavening agent)	Non-hazardous	Balcombe HRA
Sodium chloride	7647-14-5	3.55	Food Grade Salt, Laundry Detergent, Aquarium Fish Medication, Ice Melting Product	Non-hazardous	Environment Agency Guidance [#]
Sodium gluconate	527-07-1	0.01	Food additive (preservative)	Non-hazardous	Environment Agency Guidance [#]
Sulfuric acid	7664-93-9	0.0004	Food additive (preservative)	Non-hazardous	Environment Agency Guidance [#]

[#] Assessed using Methodology for the determination of hazardous substances for the purposes of the Groundwater Daughter Directive (2006/118EC), issued by the Joint Agencies Groundwater Directive Advisory Group ("JAGDAG") comprising the Environment Agency, the Scottish Environment Protection Agency, and the Northern Ireland Environment Agency, the Department of Environment, Food & Rural Affairs, Welsh Assembly Government, the Environmental Protection Agency Ireland, Health Protection Agency and industry representatives.

Notes:

Water used may be any combination of recycled water, produced water or fresh water.

All chemical additive substance data is consistent with Safety Data Sheets.

Because maximum percentages are shown total of water, proppant and HF chemical substance components may be greater than 100%.