

Hydraulic Fracturing Fluid Product Disclosure - STATE 36-10-67 1H CHESAPEAKE

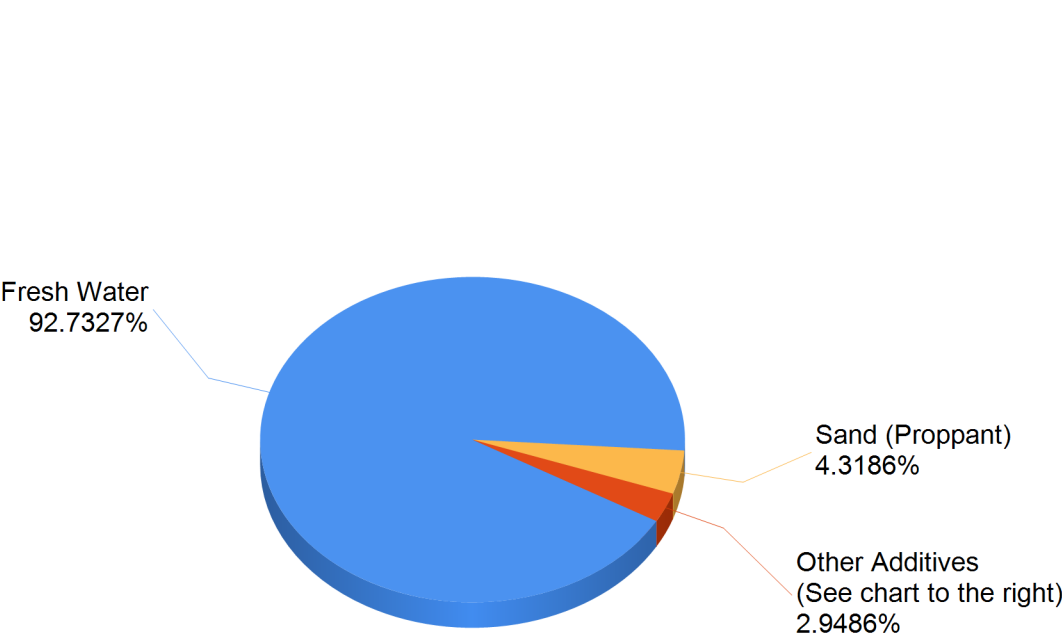


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|---|----------------|----------------------------|------------|---------------------------------------|------------|
| API # | 0512331598 | County | WELD | Fracture Date | 8/11/2011 |
| Surface Casing Depth (ft) | 1339.8 | State | COLORADO | Proppant Mass Pumped (lbs) | 2,870,844 |
| True Vertical Depth of Well (ft) | 8,518.6 | Longitude | -104.84559 | Water Volume Pumped (gals) | 2,788,674 |
| Play | NIOBRARA SHALE | Latitude | 40.79688 | Frac Fluid Volume Total (gals) | 3,007,216 |
| Well Type | HORIZONTAL | Lat/Long Projection | NAD27 | Total Fluid Mass Pumped (lbs) | 26,972,959 |

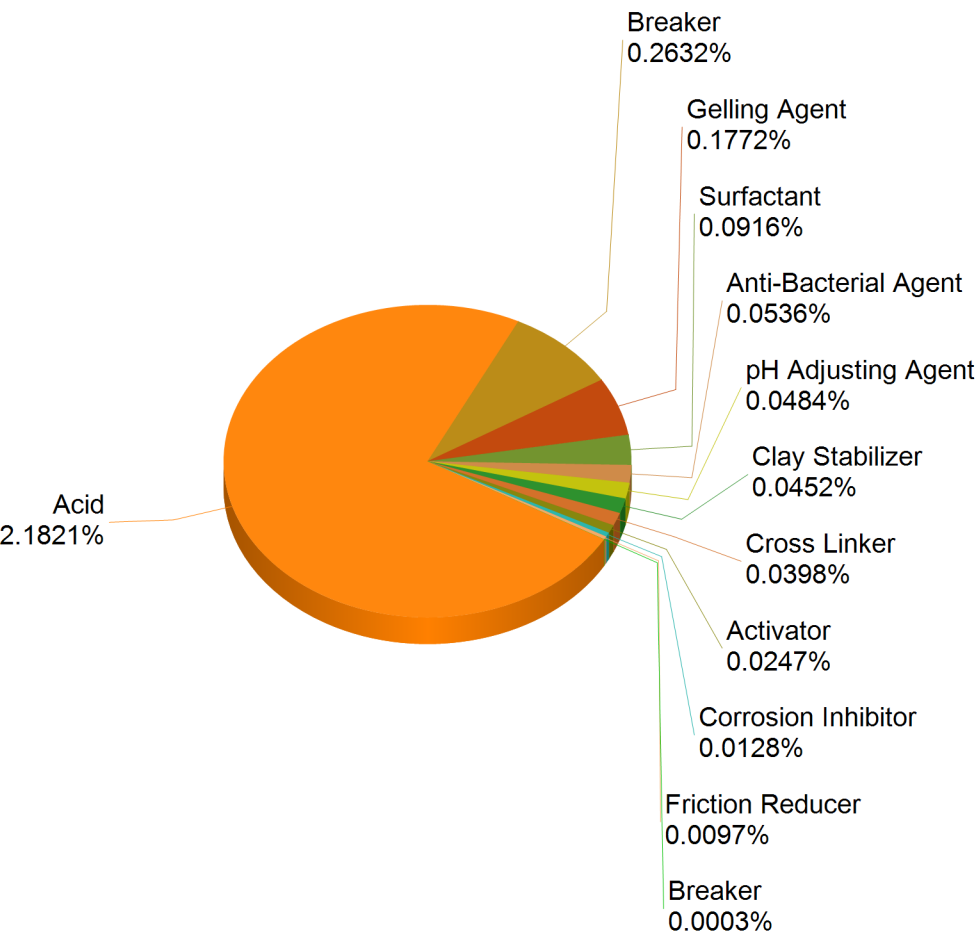
| Product Type | Purpose | Downhole Result | Other Common Uses | Product Name | Total Volume Used in Well | Overall % by Total Volume |
|--|---|---|---|-----------------------|---------------------------|---------------------------|
| Water | Expand fracture and deliver sand | Some stays in formation while remainder returns with natural formation water as "produced water" (actual amounts returned vary from well to well) | Landscaping, manufacturing | Fresh Water | 2,788,674 | 92.7327 % |
| Sand (Proppant) | Allows the fractures to remain open so the gas can escape | Stays in formation, embedded in fractures (used to "prop" fractures open) | Drinking water filtration, play sand, concrete and brick mortar | Sand (Proppant) | 129,871 | 4.3186 % |
| Acid Package Hydrochloric Acid Corrosion Inhibitor Iron Control | Helps dissolve minerals and initiate cracks in the rock | Reacts with minerals present in the formation to create salts, water, and carbon dioxide. | Swimming pool chemical and cleaner | HCL HYDROCHLORIC ACID | 65,621 | 2.1821 % |
| | Prevents the corrosion of the pipe | Bonds to metal surfaces (pipe) downhole. Any remaining product not bonded is broken down by micro-organisms and consumed or returned in produced water. | Used in pharmaceuticals, acrylic fibers and plastics | HAI-404 | 384 | 0.0128 % |
| Breaker | Allows a delayed break down the gel | Reacts with the "crosslinker" and "gel" once in the formation making it easier for the fluid to flow to the borehole. Reaction produces ammonia and sulfate salts which are returned in produced water. | Used in hair coloring, as a disinfectant, and in the manufacture of common household plastics | VICON NF BREAKER | 7,915 | 0.2632 % |
| | | | | OptiKleen-WF | 8 | 0.0003 % |
| Gelling Agent | Thickens the water in order to suspend the sand | Combines with the "breaker" in the formation thus making it much easier for the fluid to flow to the borehole and return in produced water. | Cosmetics, baked goods, ice cream, toothpaste, sauces, and salad dressings | WG-18 | 5,328 | 0.1772 % |
| Surfactant | Used to increase the viscosity of the fracture fluid | Generally returned with produced water, but in some formations may enter the gas stream and return in the produced natural gas. | Used in glass cleaner, multi-surface cleansers, antiperspirant, deodorants and hair-color | LOSURF-300D | 2,756 | 0.0916 % |
| Anti-Bacterial Agent | Eliminates bacteria in the water that produces corrosive by-products | Reacts with micro-organisms that may be present in the treatment fluid and formation. These micro-organisms break down the product with a small amount of the product returning in produced water. | Disinfectant; sterilizer for medical and dental equipment | BE-7 | 1,613 | 0.0536 % |
| pH Adjusting Agent | Maintains the effectiveness of other components, such as crosslinkers | Reacts with acidic agents in the treatment fluid to maintain a neutral (non-acidic, non-alkaline) pH. Reaction results in mineral salts, water and carbon dioxide which is returned in produced water. | Used in laundry detergents, soap, water softener and dish washer detergents | BA-20 | 1,455 | 0.0484 % |
| Clay Stabilizer | Creates a brine carrier fluid | Reacts with clays in the formation through a sodium - potassium ion exchange. Reaction results in sodium chloride (table salt) which is returned in produced water. | Used in low-sodium table salt substitute, medicines, and IV fluids | CLA-WEB | 1,360 | 0.0452 % |

| | | | | | | |
|------------------|--|---|---|-------|-------|----------|
| Cross Linker | Maintains fluid viscosity as temperature increases | Combines with the "breaker" in the formation to create salts that are returned in produced water. | Used in laundry detergents, hand soaps and cosmetics | CL-23 | 1,196 | 0.0398 % |
| Activator | Used to trigger a chemical reaction involving another additive (such as crosslinkers or breakers) or resin coated proppants (synthetic sands). | Undergoes chemical reaction downhole. Results in mineral salts, water and carbon dioxide which is returned in produced water. | Used in laundry detergents, soap, water softener and dish washer detergents | CAT-3 | 743 | 0.0247 % |
| Friction Reducer | "Slicks" the water to minimize friction | Remains in the formation where temperature and exposure to the "breaker" allows it to be broken down and consumed by naturally occurring micro-organisms. A small amount returns with produced water. | Used in cosmetics including hair, make-up, nail and skin products | FR-66 | 292 | 0.0097 % |

Hydraulic Fracturing Fluid Breakdown by Volume



Details for the Other Additives worth 2.9486% of Total Volume



Hydraulic Fracturing Fluid Product Component Information Disclosure - STATE 36-10-67 1H
CHESAPEAKE



| | | | | | |
|----------------------------------|----------------|---------------------|------------|--------------------------------|------------|
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| Supplier | Product Type | Product Name | Total Product Pumped (gals) | Total Product Mass (lbs) | Component Listed on MSDS | Chemical Abstract Service Number (CAS #) | MAXIMUM Component Concentration of Product (% by Mass) | MAXIMUM Component Mass Pumped (lbs) | MAXIMUM Component Concentration Pumped (% by Mass) | MAXIMUM Parts per Million (PPM) by Mass |
|--------------------------------|----------------------|-----------------------|-----------------------------|--------------------------|--|--|--|-------------------------------------|--|---|
| HALLIBURTON ENERGY SERVICES | Acid | HCL HYDROCHLORIC ACID | 65,621 | 591,770 | Water | 007732-18-5 | 85.00% | 503,005 | 1.86485% | 18,648 |
| | | | | | Hydrochloric Acid | 007647-01-0 | 15.00% | 88,766 | 0.32909% | 3,291 |
| | Gelling Agent | WG-18 | 5,328 | 57,831 | Guar Gum Derivative | N/A | 100.00% | 57,831 | 0.21440% | 2,144 |
| | Clay Stabilizer | CLA-WEB | 1,360 | 12,605 | Proprietary | N/A | 60.00% | 7,563 | 0.02804% | 280 |
| | pH Adjusting Agent | BA-20 | 1,455 | 13,364 | Ammonium Acetate | 000631-61-8 | 100.00% | 13,364 | 0.04955% | 495 |
| | | | | | Acetic acid | 000064-19-7 | 30.00% | 4,009 | 0.01486% | 149 |
| | Cross Linker | CL-23 | 1,196 | 11,784 | Zirconium Complex | N/A | 60.00% | 7,071 | 0.02621% | 262 |
| | | | | | Quaternary Ammonium Chloride (Ammonium Chloride) | 012125-02-9 | 27.00% | 3,182 | 0.01180% | 118 |
| | Activator | CAT-3 | 743 | 6,576 | EDTA/Copper chelate | N/A | 30.00% | 1,973 | 0.00731% | 73 |
| | Corrosion Inhibitor | HAI-404 | 384 | 3,142 | Aldehyde | N/A | 30.00% | 943 | 0.00349% | 35 |
| | | | | | Isopropanol (Isopropyl Alcohol, Propan-2-ol) | 000067-63-0 | 30.00% | 943 | 0.00349% | 35 |
| | | | | | Methanol (Methyl Alcohol) | 000067-56-1 | 30.00% | 943 | 0.00349% | 35 |
| | | | | | Chloromethylnaphthalene quinoline quaternary amine | 015619-48-4 | 10.00% | 314 | 0.00116% | 12 |
| | Anti-Bacterial Agent | BE-7 | 1,613 | 16,297 | Sodium Hypochlorite | 007681-52-9 | 30.00% | 4,889 | 0.01813% | 181 |
| | | | | | Sodium Hydroxide | 001310-73-2 | 5.00% | 815 | 0.00302% | 30 |
| | Friction Reducer | FR-66 | 292 | 2,584 | Petroleum Distillate Hydrotreated Light | 064742-47-8 | 30.00% | 775 | 0.00287% | 29 |

| | | | | | | | | | | |
|--------------------------------|------------|------------------|-------|--------|---|-------------|---------|--------|----------|-----|
| HALLIBURTON ENERGY SERVICES | Surfactant | LOSURF-300D | 2,756 | 20,711 | Ethanol | 000064-17-5 | 60.00% | 12,427 | 0.04607% | 461 |
| | | | | | Heavy Aromatic Naphtha (Naphtha, Petroleum Naphtha, Catalytic Reformed Naphtha, Heavy Paraffinic Distillate) | 064742-94-5 | 30.00% | 6,213 | 0.02304% | 230 |
| | | | | | Naphthalene | 000091-20-3 | 5.00% | 1,036 | 0.00384% | 38 |
| | | | | | Nonyl Phenol Poly Ethylene Glycol Ether Blend | 127087-87-0 | 5.00% | 1,036 | 0.00384% | 38 |
| | | | | | 1,2,4 Trimethylbenzene | 000095-63-6 | 1.00% | 207 | 0.00077% | 8 |
| | Breaker | OptiKleen-WF | 8 | 52 | Sodium perborate tetrahydrate | 010486-00-7 | 100.00% | 52 | 0.00019% | 2 |
| | | VICON NF BREAKER | 7,915 | 79,969 | Sodium Chloride | 007647-14-5 | 30.00% | 23,991 | 0.08894% | 889 |
| | | | | | Sodium Chlorite | 007758-19-2 | 10.00% | 7,997 | 0.02965% | 296 |

All component information listed was obtained from supplier Material Safety Data Sheets (MSDS). The Occupational Safety and Health Administration (OSHA) sets the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200 (i). As a result, the Operator does not have the legal authority to disclose any supplier "proprietary", "trade secret", or "confidential business information".