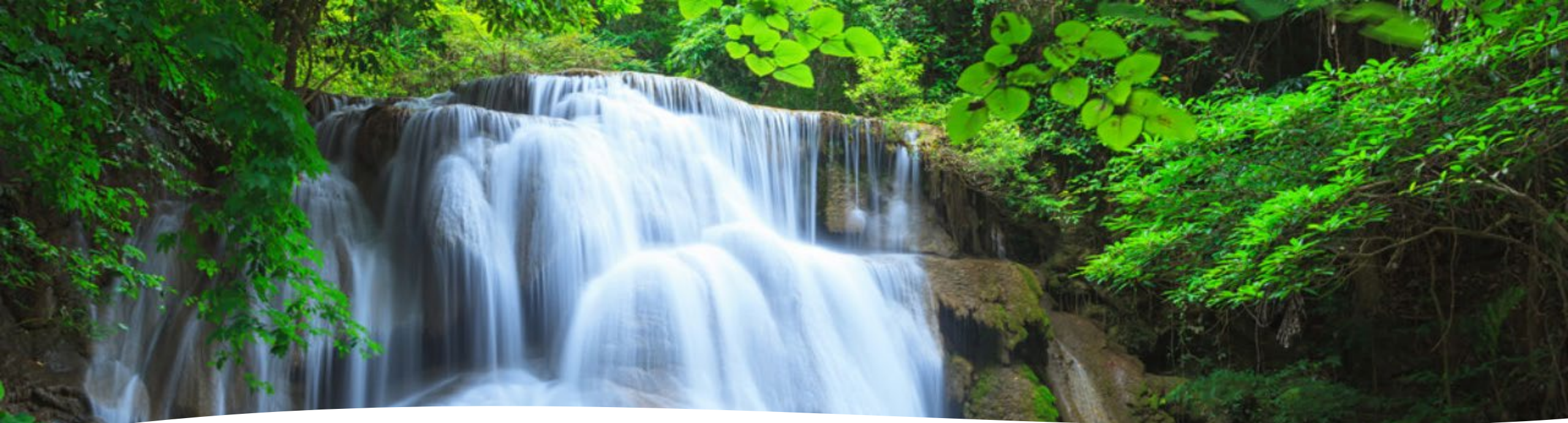




What's in Drilling Fluid?





Water

- 97% or more fresh water
- The fresher, the better
- Salt and hardness content
- As solids build up, additive concentrations decrease





Bentonite Clay

- Volcanic ash deposits
- Absorbs water, makes it thicker
- Amount added by weight
- Everyday uses: cattle feed, makeup, burn treatment



Soda Ash

- Added at rate of 0.18% by weight
- Treat out hardness, adjust pH
- Everyday uses: swimming pools, laundry/dishwasher detergents, bar soap



Organic Cellulosic Polymer

- Helps stabilize loose formations
- Aids in suspending, transporting cuttings
- Makes fluid thicker, more efficient
- Reduces water seeping into formation
- Used in foods: Xanthan gum, Guar gum, PAC Polymer



Surfactant (soap)

- Low-foaming soap keeps down-hole tooling clean; less stickiness
- Helps keep hole from packing off with cuttings that can cause IRs
- Everyday uses: Dawn detergent for cleaning ducks; dishwashing & carwash soaps



Amounts Used

LOW percentages by weight

Additive Brand/Product Name	Function	Total Weight (lbs. per 1000 gallon.)	Dosage Rate (lbs per 1000 gallon)	Maximum % by Weight	Usage
Fresh Water	Fluid base for mud	8340	8340	96	Hydrates bentonite and carries additives
AMC Gel	Viscosifier	8705	350	4.07	Added to water to form the fluid. Makes water thicken.
Dense Soda Ash	Water conditioner	8355	15	0.002	reduces hardness from water
Sandmaster	Suspension agent	8709	4	0.045	Aids in cuttings transport
FloPac	Filtrate control	8709	4	0.045	Reduces water loss to formation
ClayBreaker	Clay inhibitor	8713.5	8.4	0.096	Prevents clays from swelling
DCS Drilling Surfactant	Wetting agent	8713.5	8.4	0.096	Prevents clay from sticking
BallBuster	Thinner	8717.5	12.5	0.143	Reduces viscosity
Magma Fiber Fine	LCM	9205	500	5.43	Helps stop fluid loss
Super Swell Coarse	LCM	8735	30	0.343	Helps stop fluid loss
HDD Lube	Lubricant	8352	12	0.14	Lowers torque

NSF Certified

- Assurance of testing by independent certification organization
- Valued worldwide by consumers, manufacturers, retailers, regulatory agencies



Conclusion

- Drilling fluid is natural materials
- Products are certified safe
- HDD is environmental solution



Questions

Cory Baker

Chief Operating Officer

cory.baker@hardrockis.com



Don White

Owner

dcslfluids@sbcglobal.net

