Cradle-to-Grave H2O Management

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Frac water before and after being treated by the FracPure™ process.

Water supply is an enormous concern not only for natural gas companies involved in hydraulic fracturing (abbreviated as fracking), but also for government and environmental groups. Currently, the 4 to 6 million gallons of freshwater required for each natural gas well is drawn from rivers, lakes and streams. To further complicate matters, acquiring water rights is a time-consuming and costly process. Environmental impact studies must additionally be completed before well- or water-pumping permits can be issued, which can absorb up to two years of time.

Integrated Water Technologies believes that it has solved the fracking obstacles of both providing adequate freshwater supplies and wastewater disposal—fracking water and wastewater management—with its FracPure™ water treatment system. This cradle-to-grave solution both environmentally and cost-effectively generates reusable water and beneficial salt products.

The company has proven the effectiveness of FracPure-produced water remediation for the Pennsylvania Department of Environmental Protection by solving the problems of hydraulic fracturing water supply, handling and disposal, while eliminating long-term liabilities. As a matter of fact, John T. Hines, deputy secretary of the Office of Water Management says, “This is the first wastewater treatment system that has been successfully demonstrated for the treatment of Marcellus Shale frack wastewater.”

FracPure On-site Treatment

According to the company, the FracPure water treatment system removes all contaminants from frack water and returns 80 percent of flowback (translating into more than 1 million gallons per well) into pure water distillate for reuse on drilling

sites. The remaining 20 percent of the treated water is highly concentrated salt brine, which goes through testing to ensure it is contaminant-free.

At this point, the brine is high in chlorides and not yet ready for return to the environment. However, it can be safely transported to Integrated Water's crystallization plant for the final treatment phase.

More specifically, the steps involved in the FracPure process are:

Frack water testing—this determines wastewater processing rates.

Chemical precipitation—using a proprietary chemical treatment, a solid is formed that removes heavy metals or dissolved solids from the wastewater. The solids are dewatered and sent to a research laboratory to determine beneficial uses.

Filtration—purified water continues through multiple stages of filtration to remove organics and total suspended solids. The water is then sent to a concentrator.

Evaporation—the concentrator evaporates the brine down and yields purified distilled water for reuse on the drilling site, in addition to a greatly reduced salt brine that can be transported to the company's crystallization plant to be processed.

On-site testing—Integrated Water Technologies' testing labs ensure the concentrated brine meets standards for processing in its crystallization plant, and the distilled water exceeds EPA and all state regulatory groups' recognized drinking water standard of 500 PPM. In fact, FracPure™ processed water averages less than 100 PPM and is completely safe to return to the environment.

Crystallization and desalinization—the final stage of the FracPure process turns the concentrated salt brine into salt products and distilled water. The brine is then manipulated to increase the percentage of solids in the liquid. After multiple phases of treatment, the process creates 99.7 percent pure dry salts for water softening, 99.7 percent liquid salts for road de-icing and erosion control, as well as the aforementioned distilled water.

More on Integrated Water Benefits

According to the company, a typical natural gas drilling site returns 1.3 million gallons of contaminated flowback in the first two weeks of operation. Generally, all 1.3 million gallons would have to be transported to an off-site wastewater treatment plant where it would be diluted for discharge into the environment. Integrated Water Technologies President Anthony DiTommaso says, "It is unacceptable that in the world today the primary solution to water remediation is dilution."

In contrast, the FracPure process permits 1 million gallons to remain on-site as distilled water for reuse, eliminating about 200 incoming truck loads of freshwater for fracking. Moreover, it creates 300,000 gallons of highly concentrated salt brine, thus reducing disposal costs by 80 percent or 200 truckloads.

Over the next few years, the natural gas industry will require billions of gallons of freshwater—in the Marcellus Shale alone—for the hydraulic fracturing or drilling process. To that end, the FracPure mobile water treatment system can also create freshwater on-site from multiple other contaminated wastewater sources, such as wastewater treatment plants, sewage facilities, mining operation water effluent and other industrial wastewaters.

FracPure water management reduces water supply costs by creating new sources, trucking costs by 100 percent on-site treatment and recycling, and plant operation costs by creating commercially sold salt products. The company engineers centralized treatment plants and FracPure mobile on-site treatment units to provide 100 percent frack water recycling, production brine disposal, pit water filtration and disposal, and source water supply.

For more information on Integrated Water Technologies, please visit www.integratedwatertech.com *[1].*

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