

# Marcellus Hydrofracture Makeup Water Sulfate Scale Control

Obtaining the amount and quality of water needed for makeup of hydrofracture water will become a greater challenge as the Marcellus gas shale is fully developed in the next 5 to 15 years. The many acid mine water (AMD) discharges from former coal mines, which are scattered throughout Marcellus shale area, form a large potential water source for hydrofracture makeup water. While this water can be easily and economically treated for removal of scale forming cations like iron, aluminum, and calcium; it will still contain high levels, 100 to 2000 mg/l, of sulfate anion, which can form unwanted scale with the large amounts of barium, calcium, and strontium salts present in the Marcellus formation.

ProChemTech International can address this quality water supply challenge for you by providing the following goods and services:

- **Development of water supplies from acid mine water (AMW) sources providing a total package, including as needed:**

- site selection
- process design
- permitting
- engineering design and specification
- complete equipment packages
- construction supervision
- system start-up and de-bug
- operator training



ProChemTech has designed and constructed over 200 industrial water and wastewater projects since 1987 ranging from design - equipment packages to complete turn-key installations. Many of these projects were unique water treatment, recycle, and reuse systems and have been constructed for firms such as Morgan Advanced Materials, General Electric, Osram Sylvania, MuRata Electronics, Litton Electron Devices, Sony, and Corning Glass. Specific acid mine water experience covers the Brandy Camp AMW facility, designed and constructed for the PADEP in 2003, and the Blue Valley AMW – Fish Culture Station facility, designed and constructed for the Toby Creek Watershed Association in 2005.

The company is well known in the industrial water and wastewater management field and has a solid record of innovation as demonstrated by projects such as the first membrane potable water facility in Pennsylvania, first application of inclined plate clarifier technology to acid mine water treatment, and the Blue Valley AMW-Fish Culture Station, where treated AMW is used to raise trout.

- **SulfaStop scale inhibitors for prevention of barium, calcium, and strontium sulfate scale formation when high sulfate content treated acid mine drainage water is used as hydrofracture makeup water**

- ProChemTech has been a leading water management firm since 1987 and has developed many advanced technologies for control of scale in extreme water systems such as the Marcellus hydrofracture process
- the SulfaStop products have been developed to be both very effective and **environmentally safe, they contain no hazardous chemicals**
- on-site application assistance in use of SulfaStop products

Senior staff average 35+ years experience in the water management field, more than any similar firm in the country. This expertise is used to devise the best process and chemistry for obtaining the needed amount of quality water from any source in the most economical way possible.

Our Brockway facility can build, right here in the middle of the Marcellus gas shale, all the water processing equipment and systems needed to provide the quality and quantity of water needed for successful hydrofracture jobs. Large multimedia filters are one example of our complete equipment line. All equipment can be provided trailer mounted, skidded, or for concrete floor placement.





Our expertise ranges from extensive experience with all types of membrane units; microfilter, ultrafilter, nanofilter and reverse osmosis; to the pretreatment equipment and chemical feeds needed to keep this type of equipment “on-line”.

Proprietary inclined plate clarifier design combined with our unmatched expertise in precipitation chemistry provides an economical means to treat acid mine water for reuse. Used for treatment of acid mine water, our clarifier technology produces treated water with a turbidity less than 1 ntu, without any filtration.



One of our two chemical manufacturing facilities is located at the Brockway site, again right in the middle of the Marcellus gas field, so getting SulfaStop products when and where needed will present no problem for tightly scheduled hydrofracture jobs.

**ProChemTech International, Inc.**  
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