

IPEX Industrial Case Study:

IPEX Guardian Double Containment Piping System Ensures Safe Transport of Untreated Frac Water at CAES Facility.



A joint venture between ACI Energy, Inc., an investment holding company, and Altela, Inc., a water desalination company, Clarion Altela Environmental Services (CAES) opened in November 2012 to recycle frac water* from the Marcellus and Utica Shale Basins, which stretch across much of Pennsylvania and Ohio. The CAES facility treats the frac water and ultimately turns it into clean distilled water that is the same quality as rainwater for reuse by the oil and gas industry. Safe disposal of frac water has been a serious challenge in the region as high volumes of this water were being driven long distances by large trucks to injection wells in Ohio. CAES offers a lower

cost and environmentally safe alternative with the added benefit of reducing truck traffic along Pennsylvania and Ohio roads by an estimated 150,000 truck miles per month.

Due to the chemicals and saline present in frac water, a double containment piping system was required to transport the frac water from incoming tank trucks to holding ponds and from there to the treatment processing equipment at CAES. "Frac water recycling is a fairly new process, and the project didn't

start out requiring a double containment system for the piping. During approvals, the Department of Environmental Protection decided to require double containment for any area where buried pipes would be transporting untreated frac water. This was to prevent any possibility of leakage into the surrounding soil," explains Walter Smith, former

mechanical engineer with Mid Penn Engineering who designed the system. "Once the piping went inside the facility, we were able to transition to a single wall system"

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Lake Randall

President of Mid Penn Engineering

For the double-containment piping, the IPEX Guardian™ system was chosen, which consisted of a 10" PVC Schedule 80 carrier by 14" PVC Schedule 40 containment. From there, the size of the system reduced as it entered the pre-treatment area and eventually transitioned to a smaller single-wall PVC Schedule 80 system, also from IPEX.





According to Lake Randall, president of Mid Penn Engineering, the IPEX Guardian Double Containment Piping System offered a far better value over other alternatives that require installing separate containment and carrier piping. “The IPEX Guardian system not only saves on installation, but it is also a higher standard for leak prevention,” he says. “PVC is resistant to chemicals, while still being able to handle the pressures of a pumping system like what was used at CAES.”

Having never worked with any double-containment system, the Guardian system was Mid Penn Engineering’s first exposure to an IPEX product. “IPEX did an excellent job of responding to the requirements of the project and answering any questions. The deadlines were very tight on the CAES project, and IPEX was able to get us the product we needed, when we needed it,” said Smith. “We also required solvent cementing certification and installation training for the installers. I’ve dealt with a lot of vendors in my lifetime, and I would have to give IPEX an ‘A+’ on all accounts. They were helpful and provided excellent customer service. I never felt ignored, and when the project was moving quickly, they were there.”

Harrington Industrial Plastics’ Pittsburgh branch was also instrumental in coordinating on-time and accurate delivery of the Guardian components, resulting in a smooth, efficient

installation. They worked closely with IPEX to set up the comprehensive onsite training for the installers that went a long way in ensuring a high-quality, leak-free installation.

“Guardian is a good product, and we had very little difficulty with it,” says Dan Luton, owner and president of Luton Plumbing and Heating who installed the system. “Harrington Plastics jumped through hoops for us and worked with IPEX to get us the material quickly, enabling our crews to meet the very tight schedule. The training that IPEX provided was also very helpful. They showed us some tricks to help ease installation, and once we got the hang of it, we were able to get a lot of pipe in the ground in a short amount of time.”

The IPEX Guardian Double Containment Piping System was installed at CAES without a single leak. Since the first truck load of frac water arrived, the system has helped to reliably transport frac water through an innovative recycling process that ultimately allows for reuse of precious water resources.

To reduce system installation and maintenance costs, the IPEX Guardian system features a patented Centra-Lok™ design, reducing the required joints by 40-60% compared to traditional double-containment systems. And less joints means less potential for problems and greater overall system integrity.



For more than 25 years, IPEX Guardian Systems have been the benchmark in double containment. Made from PVC and Corzan® CPVC, these systems offer a complete line of pipe, fittings, valves and leak detection that is considered unmatched in the industry. IPEX Guardian Systems are available in sizes 1/2" x 2" up to 18" x 24".

***About Frac Water:** Frac water is a mixture of water, sand and chemicals used during hydraulic fracturing to create fissures in shale and access natural gas. While the water and sand in frac water is considered safe, various toxic chemicals are also added to help dissolve minerals and break down the shale. In addition to the toxic chemicals, significant amounts of water are used during hydraulic fracturing, which can cause water shortage issues in some areas. An average well generally requires about 8 million gallons during its lifetime, while some of the largest hydraulic fracturing projects can use up to 5 million gallons. Fortunately, initiatives to recycle frac water are now underway.