Quest inspar
Pipeline Life Extension Specialists

CASE STUDY: CHEMICAL RESISTENCE

SUBJECT

Rehabilitation of Chemical Sewer – ***PipeArmor 100S***

Hazard

A chemical plant producing cellulose acetate had a chemical sewer that was at risk of leaking effluent. The VCP system was in a deteriorated condition with radial and longitudinal cracks and separated joints with cracks along the radius of the pipe. The effluent presented a high risk environmental hazard to both ground water and the local river.

Process Environment

Effluent	Concentrations of sulfuric, acetic and ferric acids combined with acetone, toluene and MEK
Process Temperature	180°F to 250°F
Operating Pressure	60 psi

Serviced Pipeline

- 1,300 linear feet (LF) of 6” 8”, 10” VCP pipe along with 9 manholes.

Challenges

- The acidic/solvents concentration of the effluent was extremely corrosive to potential liner materials.
- Temperature resistance was required to sustain viable performance long term at high temperatures.

Solution and Process

- Candidate lining materials CIPP, epoxy-resins, HDPE and the polyurea were subjected to 30 day immersion in a full concentration of effluent to test for degree of chemical and heat resistance. Only the polyurea remained unremarkable. The other materials fully or partially deteriorated during the test cycle.
- The pipe system was cleaned via abrasive pigging and swabbing, and profiled, followed with the robotic installation of polyurea (PipeArmor 100S equivalent) at a thickness of 250 mil (0.25”) producing a long lasting, durable monolithic liner as a chemical resistant shield to wall erosion.

Findings / Results

- The liner sealed all cracks and perforations. The chemical sewer has been in full service 24 hours a day, seven days a week since the application in 2005, and has operated without process or environmental incident. The river adjoining the plant, which would have been impacted in circumstances of a leak, is a vibrant economic staple for the local economy as a major recreational destination for fishing and kayaking.

Pre-Rehabiliated Pipeline Condition

After Rehabiliation