Abrasion Resistant Pipeline Coating

Featuring K5™

Project:
Apply K5™ Polyurea Coating on a Gas Pipeline, to be installed underneath a riverbed.

Location:
The Balonne River in the Surat Basin, Queensland, Australia

Client:
Origin Energy

Applicator:
Vulcan Coatings

System:
K5™ Polyurea

Total Area:
180 Meters (590.6 ft.) of 100nb HDD Mild Steel Pipe
15 Pipes - 12 Meters (39.37 ft.) Welded end to end

Completion Date:
April 2009

PROBLEM:
Origin Energy needed a durable coating to protect a gas pipeline being installed under a large river bed. The coating had to be able to withstand the heavy abrasion associated with pulling the pipe through a curved Horizontal Directional Drill (HDD) hole underneath the river. The coating must also protect the pipe against corrosion, including exposure to soil with high sulfate levels.

SOLUTION:
The project manager considered several options, including 'taping or wrapping' coatings, epoxies, polyurethanes and hybrid polyurea coatings. All of these options were eliminated due to their inability to withstand severe abrasion conditions from being driven through the river bed. These conditions were especially problematic for taping or wraping systems due to multiple seams (weak points). The project manager decided to use SPI's ultra-high strength K5™ polyurea due to its superior abrasion resistance and good elongation properties. In addition, the K5™ coating system creates a seamless, monolithic membrane that provides a durable barrier against corrosion and sulfate rich soil. The contractor abrasive blasted the gas pipeline to clean the surface and achieve a minimum 5 mil anchor profile for adhesion purposes. Next, 80 mils of K5™ polyurea was spray applied to the gas pipeline.

RESULTS:
The gas pipeline was dragged through the 180m hole underneath the river. Inspections showed there were no signs of damage. The project manager said, "I would recommend K5™ for any similar coating application."

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Evaporation Pit Liner

Featuring Polyshield HT™

Project:
Evaporation Pit Liner

Location:
Boulder, WY

Applicator:
FD Thomas

System:
30 mil POLYSHIELD HT™
on Amoco 2044 (Secondary Containment)
Topcoat of 30 mil POLYSHIELD HT™
on Amoco 2044 (Primary Containment)

Total Area:
510,000 square feet

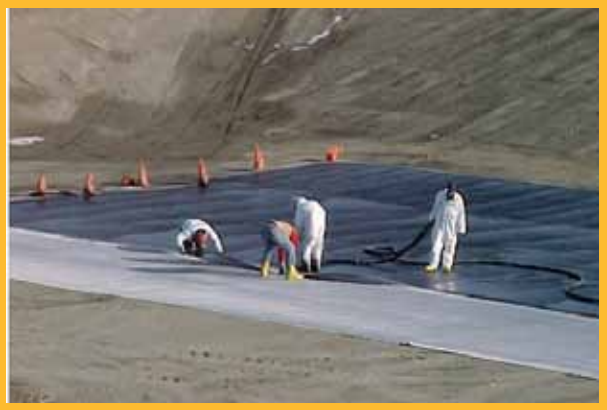
Completion Date:
January 2002

PROBLEM:
The newly constructed evaporation containment pits were built in nearby proximity to a group of oil fields. Evaporation pits are used as primary and secondary containment of oil field brim. In this case, they are used to facilitate proper clean-up and disposal of oily water produced by the drilling process.

SOLUTION:
This large, complex project needed a dependable solution in place that would also have the ability to detect any leaks. The answer to this challenge involved utilizing a unique design with a polyethylene grid between a basecoat and topcoat of SPI's Polyshield HT™. This created primary and secondary containment layers that were divided into cells. Each cell was able to be electronically monitored for leaks that may occur between the primary and secondary linings.

Polyshield HT™ was chosen for its durability and seamless composition. The applicator sprayed a basecoat of 30 mil of Polyshield HT™ over the Amoco 2044 geo-textile fabric. This was followed by the placement of a polyethylene grid, and then a topcoat of 30 mil of Polyshield HT™ was sprayed over the Amoco 2044 geo-textile fabric.

RESULTS:
The facility owner was very satisfied with the new containment system that was put into place. They now have a tough, reliable Polyurea containment liner and leak detection system in place that will last for years. Due to the success with this key project, the facility owner awarded additional project work for containing drilling slurry (sand and water) in late 2007.



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Steel Pipe and Corrosion Protection

Featuring Polyshield HT™

Project:
Suban Gas Pipeline

Location:
Suban
South Sumatra
Indonesia

Owner:
Gulf Oil Company

Applicator:
Sandvig PTE, Ltd.

System:
POLYSHIELD HT™ with
AE-4 (Adhesion Enhancer)

Total Area:
Approximately
231,377 square feet

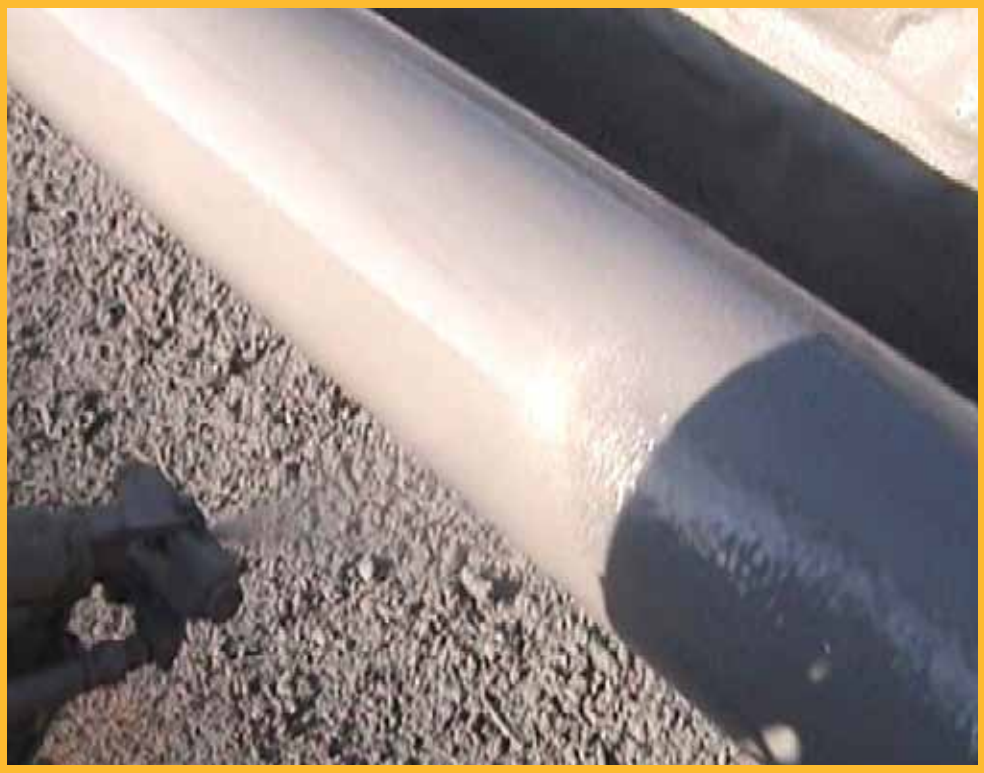
Completion date:
September 2002

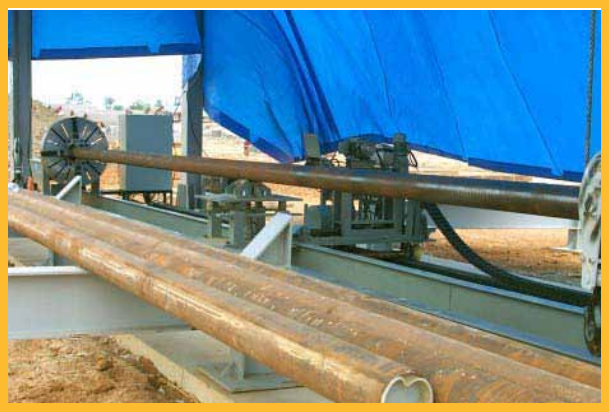
PROBLEM:
The owner needed a tough, corrosion resistant coating to line the outside of steel gasline pipes. In addition, the location of the gas pipeline deep in the jungles of Indonesia posed a huge challenge for accessing the eleven miles of gas pipeline.

SOLUTION:
Polyshield HT™ was chosen due to its high tensile strength, rapid cure time, and ability to form a seamless membrane to the pipeline. To help overcome the logistical challenges, SPI provided expertise for setting up an automated lathe to spray the pipes. Utilizing a time saving field joint application and the automated spray lathe allowed for same day backfilling. The result of this crucial process saved considerable time and money.

The exterior surface preparation, approximately 11 miles of 12", 16", & 18" gas pipeline, consisted of wire wheel abrasion and a MEK or Acetone wash. Polyshield HT™ with AE4 (adhesion enhancer) was sprayed at a thickness of 60 mils. No primer was needed due to the use of AE-4 adhesion enhancer, allowing the Polyshield HT™ to bond directly to the steel.

RESULTS:
The Gulf Oil Company through working in partnership with the applicator and SPI were able to protect their valuable gas pipeline investment and not over-inflate the project cost.





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Tank Farm Containment Linings

Featuring Polyshield SS-100®

Project:
Petro-Chemical Tank Farms

Location:
Alaska

Owner:
Petro Marine

Applicator:
H.P.C. Urethane

System:
Polyshield SS-100®
over Geo-textile Fabric

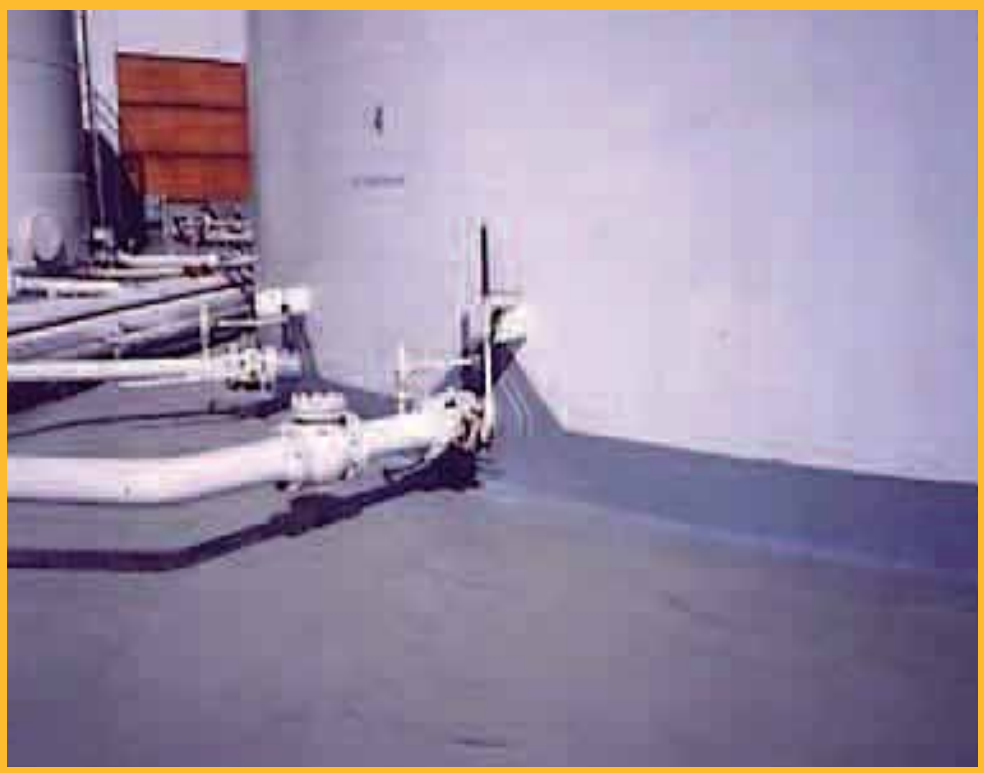
Total Area:
Approximately
70,000 square feet

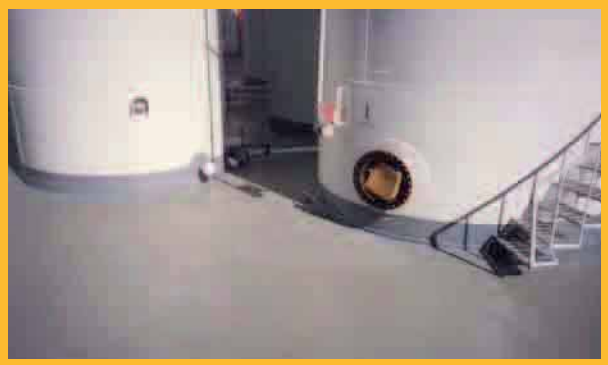
Completion Date:
Fall 1996

PROBLEM:
Petro Marine was looking for a containment liner that could be easily monitored. Other containment systems require liners to be buried under sand, gravel, or earth. They needed a system that could be exposed to the environment without fear of degradation or cracks. This contract involved six tank farms in coastal Alaska. Each battery contains numerous tanks and piping for a variety of fuels.

SOLUTION:
All floors and walls are concrete and received 100 mils of Polyshield SS-100® over Amoco #4599 geo-textile fabric. The perimeter of the tanks were abraded, primed, and masked to approximately 1' above the floor. The geo-textile fabric was used to counter-flash over tank chines, as an expansion joint. Polyshield SS-100® was then sprayed on to the geo-textile fabric up to the masked line on the tanks, forming a seamless liner. The Polyshield SS-100® Containment Lining System is typically anchored around the perimeter, eliminating the need for ballast sand. Petro Marine's Project Manager stated, "Since the Polyshield SS-100® system does not require sand ballast, it is easy to visually monitor leaks. In the event of a spill, there is no contaminated sand to remove prior to cleanup."

RESULTS:
Petro Marine stated,"After looking for several years into liners for tank farms, we have found Polyshield SS-100® with geo-textile to be the best liner system on the market today." The owner was pleased with the application and awarded the contractor 14 additional tank farms, that were completed in 1997.





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Chemical Resistant Lining – Storage Tanks

Featuring PTU™

Project:
Tank Bottom Linings
(Primary Containment)
54,000 Barrel Capacity

Location:
Birmingham, AL

Owner:
Allied Energy Corporation

Applicator:
SMC Commercial Services, Inc.

Consultant:
Abbott Consulting &
Coating Inspections

Coating System:
PTU™ Chemical
Resistant Polyurea

Total Area:
7,500 sq ft

Start Date:
March 2, 2009

Date of Completion:
March 20, 2009

PROBLEM:

Allied Energy Corporation needed a corrosion-resistant protective liner to coat the interior of a 90' diameter tank. The tank was used to store a Trans-Mix of Diesel and Unleaded Gasoline before being processed to usable fuel.

SOLUTION:

In preparation for application of PTU™, the tank was abrasive blasted to remove rust scale, allowing an API tank bottom inspection to be performed. After this inspection, the tank was re-cleaned by power washing per SSPC-SP1 Solvent Cleaning and re-blasted per SSPC-SP6 Commercial Blast Specifications. The tank was then tested for soluble salt contents. The salt level was very high and a solution was used to remove it. Once the solution was applied, it was removed by 4,000 psi power washing and the surface was retested for salts. This brought the salt level down below 5 ppm and the surface was again abrasive blasted per SSPC-SP5 White Metal Blast to achieve at least a 5 mil anchor profile. PTU™ chemical resistant polyurea coating was then applied at 100 mils to the tank bottom and four feet up from the first ring on the wall. The termination line was achieved by using the innovative SPI Stand-off Masking procedure. This method facilitated easy removal of the masking following the application of PTU™.

RESULTS:

Applied Energy Corporation previously used PTU™ successfully on six storage tanks. These tanks were used to store various fuels of Bio-Diesel, Unleaded Gasoline, and Diesel Fuel with a capacity of 12,000 barrels to 54,000 barrels. The owner felt confident using the same product to provide a protective lining to coat this tank, and is very pleased with its performance.

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