

CASE STUDY

LEAKING OIL/WATER SEPARATORS BROUGHT BACK INTO ENVIRONMENTAL COMPLIANCE

Basins Rehabilitated and Resealed with Quadex® GeoKrete® Geopolymer and Quadex Structure Guard® Epoxy for Private Oil and Gas Company

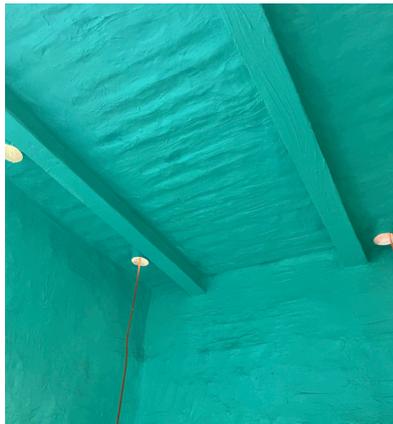
THE CHALLENGE

A private oil and gas company in the Mountain West region of the United States found that two 5,000 to 6,000 FT³ | 140 to 170 m³ American Petroleum Institute oil-water separator basins (API basins) were experiencing infiltration/exfiltration in violation of environmental performance requirements. The company had previously attempted to resolve the issue with another manufacturer's epoxy, but that lining was now bubbling and leaking.

The project required the isolation and bypass, heavy cleaning, and preparation of the API basins, as well as relining that was:

- Compatible with the conditions found within the API basins and the product limitations of the oil and gas facility's safety requirements
- Able to stop the infiltration of oil into the structures from the surrounding soils, or in the case of the top slab, prevent gases from leaking out into atmosphere
- Capable of repairing the structures with a service life of up to 50 years

The environmental necessity of the project demanded efficient action, which would force teams to work through harsh winter conditions, requiring shrouding and heating to maintain appropriate temperatures for rehabilitation.



VORTEX



PROJECT SNAPSHOT

PROJECT

API Basin Rehabilitation

OWNER

Private Oil and Gas Company

PROBLEM

Oil-water separator basins were leaking in violation of environmental requirements. The project required the isolation/bypass, heavy cleaning, preparation, and lining of API basins with moisture/airtight reinforced system, and coating of the exterior top slabs.

CONTRACTOR

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TIMING

June - December 2022

VORTEX PRODUCTS USED



- Structure Guard®
- GeoKrete®
- E240
- E100

CASE STUDY

THE SOLUTION

A third-party engineering firm, in conjunction with Vortex Industrial's in-house engineering support, laid out design and rehabilitation methodology.

The interiors of Basins 1 and 2 had previously been coated with another manufacturer's epoxy, which was now failing. The project team decided it was best to make use of the remaining portions of the other manufacturer's liner where it remained intact, while preparing the failing sections with a new coating of 100 mil | 2.5mm Quadex® Structure Guard® epoxy. This initial composite liner provided a vapor and moisture barrier within the structure.

To create an additional barrier to oil seepage and a more predictable surface for further rehabilitation, the crew filled ceiling corrugations and hard corners and applied 1" | 25mm of GeoKrete geopolymer. A C-Grid carbon fiber reinforcement mesh was also anchored within the GeoKrete, further securing it into place. The structure was then top-coated with 250 mil | 6.4mm of Structure Guard epoxy, as a final vapor/moisture and protective barrier. Relying on Vortex's broad lineup of solutions simplified the process, as ancillary products are designed to work with Vortex's primary coating and lining materials. This provides predictability in product interactions, maximizing performance and minimizing compatibility concerns.

Exterior cleaning revealed oil stains and cracks in the original concrete on top of the structures. The host roof was ground and grouted, and then refinished with a layering of Quadex E240 Epoxy basecoat, hand broadcasted quartz sand aggregate for traction, and a Quadex E100 Epoxy topcoat.

EXPANDED SCOPE

The customer was so impressed with the work on Basins 1 and 2 that they added scope to repair the topcoat on Basin 3, which had been previously coated with another manufacturer's product and was beginning to crack. With limited time to complete this add-on scope, the team decided to recoat the basin using the competing manufacturer's material. They spent additional time on preparation, layering on fiber patching material in trouble spots. As budget becomes available, Vortex Industrial has proposed rehabilitating the interior of Basin 3 and replacing the exterior topcoat with the Quadex System used on the other Basins.

IMPACT

1

Basin interiors were repaired and relined with a multi-layered approach with Quadex® GeoKrete® Geopolymer reinforced with carbon fiber mesh and Quadex Structure Guard® epoxy to create a **moisture/air barrier**; concrete exteriors were cleaned and layered with Quadex E240 Epoxy base coat with quartz for **improved traction** and top coated with Quadex E100 Epoxy.

2

The **customer was so impressed with the work** they expanded the scope to include provisional repairs to the exterior top surface of an additional basin.

3

The newly airtight API basins required use of a previously installed pressure balancing system that had **sat unused due to previous leakage**.

THE RESULTS

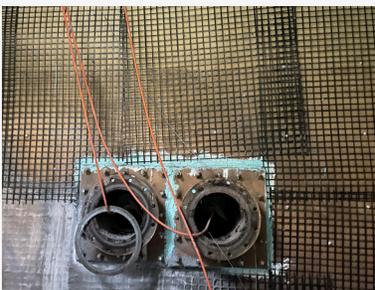
Because Vortex Companies offers a large range of products and services solutions — encompassing diverse technologies that prioritize value, performance and durability under one roof — sourcing for materials and expertise was streamlined and simple. This was further enhanced through Vortex Companies' in-house Engineering support coupled with external third-party designers.

The API basins were brought back into compliance, relieving regulatory stress on the customer and ensuring a cleaner, safer environment. In fact, maintenance staff found that the resealed basins were now so airtight they had to make use of a pressure balancing system which had been previously installed on the basins, but never put into use because enough air escaped as the water surface elevation fluctuated throughout the day.

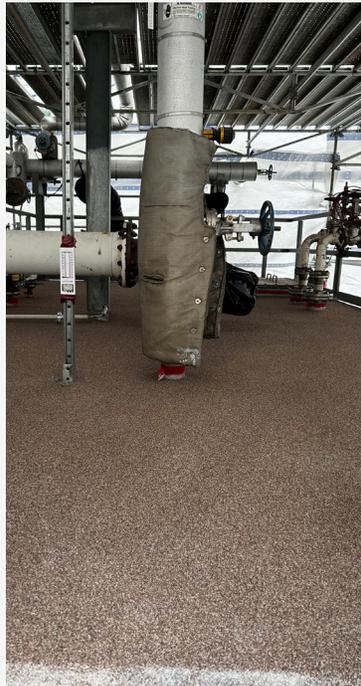
BEFORE | DURING | AFTER



Structure Guard® applied to provide vapor and moisture barrier within the structure.



Carbon fiber reinforcement mesh was anchored within the GeoKrete® for added strength and stability.



Final patched, repaired top exterior of basin, coated with final application of Quadex E100 Epoxy topcoat and Quadex E240 Epoxy and broadcast quartz applications.



Oil stains and cracks in the original concrete on top of the structures coated with first application of Quadex E240 Epoxy and broadcast with quartz.