Water Tanks Treated

By Stephanie Marie Chizik

Photos courtesy of Volatile Free, Inc.

The Lake County Public Water District decided that their two holding tanks, which had been without maintenance for 20 years, needed to be updated. The water treatment plant — located near the shore of Lake Michigan — is capable of supplying 6,000,000 gallons of drinking water a day to Zion, Winthrop Harbor, and the Illinois Department of Natural Resources. With that many whistles to wet and a failing coating system, it should be no surprise that the plant decided to re-insulate and recoat their two 200,000-gallon solid contact units, or water tanks, clarifier control building, and catwalk between the tanks.

With water approaching the treatment facility's two tanks from outside (from Lake Michigan) and from the inside with the treated water, the tanks were ripe for rust.

After putting up with water-saturated foam for years, the district finally started to look for bids to replace the failing system. They chose Premium Protective Coatings, Inc., (PPC) of Winthrop Harbor — the only spray polyurethane foam (SPF) insulation system to bid on the job — to help. Located three miles down the road, the crewmen at the PPC headquarters, which received the Lake County plant's treated water, were invested in the job.

Rust-Be-Gone

When PPC's four-man team arrived on the jobsite, the treatment plant had started the work. They had removed dirt four-feet deep around the base of the tanks to allow the PPC team access to the entire surfaces of both tanks, which included their foundations. Uncovering the base of the tanks helped to ensure that all sides of the tanks were available for insulation and coating. With all of the surfaces exposed, the first thing for the PPC crew to tackle was removing the original, untouched foam.

"The hardest part of the job was stripping off the old foam," PPC's Vice President, Terry Crowder, said. To do this, they had to cut the foam in three-inch-wide strips with a Sawzall and then peel it off the steel. It took the crew a full week to remove the old foam completely. This was largely due to the height of the tanks.

For 20 years, the Lake County Public Water District left their two holding tanks alone. As a water treatment plant located near the shore of Lake Michigan, the tanks experienced a lot of water-related damage…inside and out. With the cities of Zion and Winthrop Harbor and the Illinois Department of Natural Resources all depending on the plant's fresh drinking water, an update needed to be made. Premium Protective Coatings, Inc. (PPC) was called to the rescue.

The first step for PPC's four-man crew was to remove the old, damaged insulation. When the crew arrived on the jobsite, the plant had dug out the bottom 4' of soil surrounding the tanks so that the crew could access the entire surface. To expose the steel, the crew cut 3"-wide strips of the old insulation and pulled them off the tanks. It took the crew a week to remove all of the old foam, and took nine 30-yard Dumpsters to dispose of the waste.

for Water Damage

Much of the difficulty on this jobsite came from the height of the tanks. At 40' tall, each layer needed to be completed while on lifts. This meant that the crew had to wear proper safety gear the entire time. Both the sprayers and helpers wore harnesses beneath their Tyvek suits while working on the lifts. They also wore either full-face respirators or respirators and goggles, depending on the job. With almost the entire 16,000 square foot job completed off the ground, safety was crucial.

With the tanks stripped, the PPC crew was able to remove any leftover dust or particles with an Airman compressor. Finally, the tanks were ready for their new insulation system. Each morning, the crew designated one area to attack with the next two steps: blast and prime. They used a Black Beauty abrasive blast to remove any remaining rust. But because they didn't want to leave any bare steel exposed, any section that was blasted needed to be followed with primer that same day.

The PPC crew then came in and applied Volatile Free, Inc.'s (VFI) 1003 moisture cure primer at 6-8 mils. They achieved the thickness of the primer in one pass with a Graco airless spray pump and 415 tip. The crew traveled around the tanks blasting and priming one section at a time until the entire surface was completely covered with red primer. Compared to removing the old insulation, this stage was a breeze…even while working two tanks at once.

At 40-feet tall, everything — from the stripping of the old insulation to spray-applying the coating on the tanks, control building, and catwalk — had to be done while on lifts. The crew used two Houlette lifts (with two men on each lift) to reach the tops of the tanks. With roughly 16,000 square feet to re-insulate, the PPC crew decided upon a simple strategy: Strip one tank while spraying the other. This meant working both tanks at one time, but on different stages. Working the tanks simultaneously meant PPC was able to avoid wasting any downtime, which also meant that coordination was key.

"We were jumping back and forth there for a little bit," Crowder explained. However, having an overlap seemed to work for this SPF crew. They managed to finish the entire job — stripping, re-insulating, and recoating the buildings — in a mere four months.

For the first week, the PPC crew stripped all of the old foam. By the time the old foam on both tanks had been stripped and disposed of, they had filled nine 30-yard Dumpsters. The tanks were ready to be insulated, but by the end of the week, the crew had walked into a new challenge: the parking situation.

With only four employees, managing the parked cars at the water treatment plant was much easier than on many other jobs. Because the treatment plant was computer-operated, it only required a few people to operate. With an average of four cars in the parking lot each day that needed protection from overspray, the PPC crew merely had to coordinate their spray schedule with the employees' work schedules. PPC let the district's employees know when the day's parking location changed — depending on the wind forecast — to ensure no cars were in the overspray zone.

Plan of Attack

Like the stripping of the old coatings, the PPC crew tackled the primer — their first layer of the new system — strategically. In the morning, the crew first needed to clean off any dust that may have collected on the tanks overnight. They used an Airman compressor to blow all particles off the surfaces. With the tanks' surfaces clean, the crew was able to move on to the next two steps (rolled into one).

Each morning, after the dirt was cleaned off the tanks, the crew chose one area to attack. Depending on the wind, they chose a section that they knew they could finish — blast and prime — in one day. They used Black Beauty abrasive blast to remove all of the leftover rust on the substrate. With that area prepped, the crew then applied the primer to the blasted steel. They used the Volatile Free, Inc., (VFI) primer as a rust-inhibitor, which, after the results from the tanks' first coating system, was used to make sure everything was done to repel rust from forming on the steel surface. The VFI 1003 moisture cure primer was applied at six to eight mils in one

JOB at a GLANCE

RE-INSULATING WATER TANKS

PROJECT:

Re-insulating two 200,000-gallon tanks at the Lake County Public Water District

COATINGS CONTRACTOR:

Premium Protective Coatings, Inc.
43360 Willow Hollow Lane
Winthrop Harbor, IL 60096
(847) 693-6931
www.premiumprotectivecoating.com

with:
Volatile Free, Inc. (VFI)
19500 Janacek Court
Brookfield, WI 53045
(800) 307-9218
www.volatilefree.com

SIZE OF CONTRACTOR:

A 4-person crew worked this project

PRIME CLIENT:

Lake County Public Water Department
500 17th St
Zion, IL 60099
(847) 746-2052

SUBSTRATE:

Steel

SUBSTRATE CONDITION:

Rusted; no maintenance done in 20 years

SIZE:

Roughly 16,000 sq. ft.

DURATION:

4 months

UNUSUAL FACTORS:

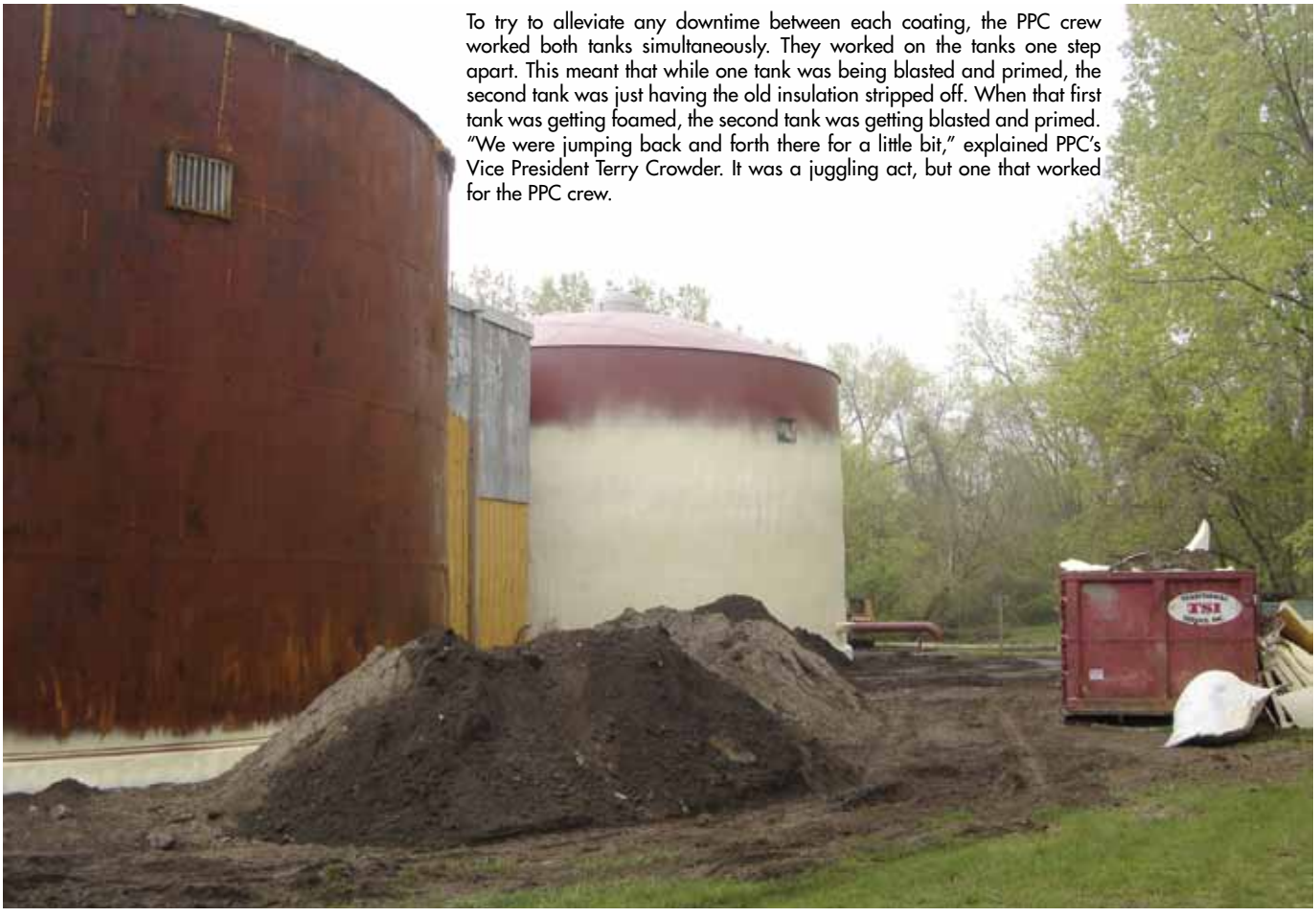
- Coordinate spray schedule with employees' work schedules
- Had to work within a 10' area between the tanks and treatment building

MATERIALS/PROCESS:

- Stripped the old foam off the tanks with Sawzall, filling 9 30-yard Dumpsters
- Applied VFI 1003 moisture cure primer at 6-8 mils in 1 pass using a Graco airless spray pump with a 415 tip
- Applied 1.5" of VFI 730 SPF using a Gusmer 1600, FoamCat, and Probler gun with .02 tip
- Applied VFI 540R polyurea hybrid, aliphatic, elastomeric basecoat in 1 pass to achieve 30 to 40 mils using a Glascraft MX2 and a Probler gun with .02 tip
- Applied VFI 277 beige topcoat at 12 mils

SAFETY CONSIDERATIONS:

- The crew wore 3M face respirators, safety glasses, and Tyvek suits



To try to alleviate any downtime between each coating, the PPC crew worked both tanks simultaneously. They worked on the tanks one step apart. This meant that while one tank was being blasted and primed, the second tank was just having the old insulation stripped off. When that first tank was getting foamed, the second tank was getting blasted and primed. "We were jumping back and forth there for a little bit," explained PPC's Vice President Terry Crowder. It was a juggling act, but one that worked for the PPC crew.

Before the crew could spray-apply the tanks with SPF, they first needed to hang tarps on the treatment building. Sitting a mere 10' away, overspray was a real concern. They used clamps to secure the tarp to the building. To protect the plant employees' cars in the nearby parking lot, the SPF crew coordinated their spray schedule with the plant's work schedule. Luckily, with only four employees working at the plant each day, coordinating a changing parking location was manageable.

The spray foam — VFI 730 — enabled the insulation to reach every crevice of the tanks. To do this, the crew used a Gusmer 1600, FoamCat, and Probler guns, and a .02 tip. They sprayed 2.5" onto the entire tank. Then, to protect the SPF from UV damage and to make the surface tacky, the crew applied a flash coat of the 1003 primer. Before the basecoat went on, the PPC crew grinded any high spots around the tanks, including the seams. This assured that the tanks would receive a smooth and uniform finished look.

pass to the tanks using a Graco airless spray pump with a 415 tip.

Each day the crew removed rust and primed a different section and different amount of the tank until the entire surface was complete. This method allowed the crew to close each day without any exposed or blasted steel overnight; any surface that had been blasted was primed before the PPC crew left for the night.

Out with the Old

Although the PPC team figured out a strategy that worked for their application process, the layout of the treatment plant still remained a challenge. With such a small area to work in, the SPF crew was concerned about overspray. With a mere 10 feet between the water tanks and treatment building, the working conditions at times were tight. To accommodate the proximity of the treatment plant, the crew made sure to cover the facing side of the building with a plastic tarp while spraying. They hung the tarp with clamps to secure it to the building. This helped to ensure that the treatment building's appearance would achieve PPC's standards.

With the entire surface primed, the team needed to come back in with the SPF. First, they applied the VFI 730 spray foam in two passes to the concrete foundation of the tank, which had been previously pressure-washed and primed, too. By finishing the foundation at the base of the tanks first, the plant was then able to come in, replace the dirt that had been removed initially, and level the ground. This gave the PPC crew flat ground between the tanks and the treatment building on which to work.

To accommodate for this tight space, the crew used a plywood "deck" for support in this 10-foot clearance. On top of the deck they placed a rented Skyjack electric scissor lift from Burris Equipment. They used this solid surface, as well as a Gusmer 1600, FoamCat, and Probler gun with .02 tip, to insulate the tanks.

By spray-applying the insulation, the foam was able to conform around the arches of the substrate. This allowed the PPC team to insulate the tanks with a gapless system, which helped to accommodate the need for a surface that wouldn't allow condensation to collect. With 160 feet of hose, the crew sprayed two-and-a-half inches of SPF to the rest of the tanks.

At the end of each day before heading home, the crew quickly sprayed a one- to three-mil flash coat of the 1003 primer over the foam. This primer, which was applied with a Graco airless sprayer

The crew gave the tank one more flash of foam and primer to make sure everything was completely uniform before moving onto the next layer. With the tanks' surfaces as smooth and balanced as possible, the crew was ready to apply the basecoat. They applied VFI's 540R polyurea hybrid, aliphatic, elastomeric coating. They used a Glascraft MX2 and a Probler gun with .02 tip to achieve 30-40 mils. The tanks needed one final coating to complete the new insulation system.

The topcoat was VFI's 277, custom-mixed a beige color to match the water plant's façade. The PPC crew applied 12 mils of the topcoat before dropping the overspray drapes and heading home. With all four steps — primer, SPF, basecoat, and topcoat — of the insulation system complete, the tanks should last for years to come. All in all, this coating "upgrade" was a success for Premium Protective Coatings, the Lake County Water District, and the surrounding towns.

and 415 tip, made the surface tacky and protected the foam from sun damage that evening and the next morning.

With the tanks completely foamed, all that the PPC crew had left (in regard to the SPF) was to handle the finished look of the identical side-by-side tanks.

To help achieve the desired uniform, smooth look, the PPC crew assessed the foamed surface for an extra step before moving on to the basecoat. They used a 3M 50-grit grinder disk to grind down any high spots. It took the crew two days to achieve an even surface, which not only helped achieve an identical finish, but it also helped to prep the tanks for the basecoat.

The PPC crew used VFI's 540R polyurea hybrid, aliphatic, elastomeric basecoat. This layer went on in one pass to achieve a finish of 30 to 40 mils. In this stage, the PPC crew used a Glascraft MX2 and a Probler gun with .02 tip. They also used the same safety equipment that they'd been using throughout the re-insulating process: 3M face respirators, safety glasses, and Tyvek suits. It took the crew four days to apply the basecoat completely and then another two days to finish with the topcoat — a custom-mixed beige to match the water plant.

As far as Crowder was concerned, the VFI 277 beige topcoat — which went on at 12 mils — gave the tanks a necessary "upgrade." Not only did the crew get rid of the old, off-white finish that was originally on the tanks, they also achieved a near-perfect match to the treatment building next door. It seems that the old coating system wasn't just ineffective after 20 years; it was also unattractive!

"After it [the job] was all done," Crowder said, "we raked and cleaned it all." The PPC crew unclamped the over-spray tarps, dropped them down, and threw them in the Dumpsters with the old coating.

With the old finish gone, the new tanks, control building, and catwalk were ready to go. By the end of the summer, the Lake County Public Water District had a new and improved water treatment center. With the new coating system, the hope is that it will last for years to come. If the district treats their tanks in the next 10 years like they treat their water, then the new insulation and coating system should make a lasting impression. ***SF***