

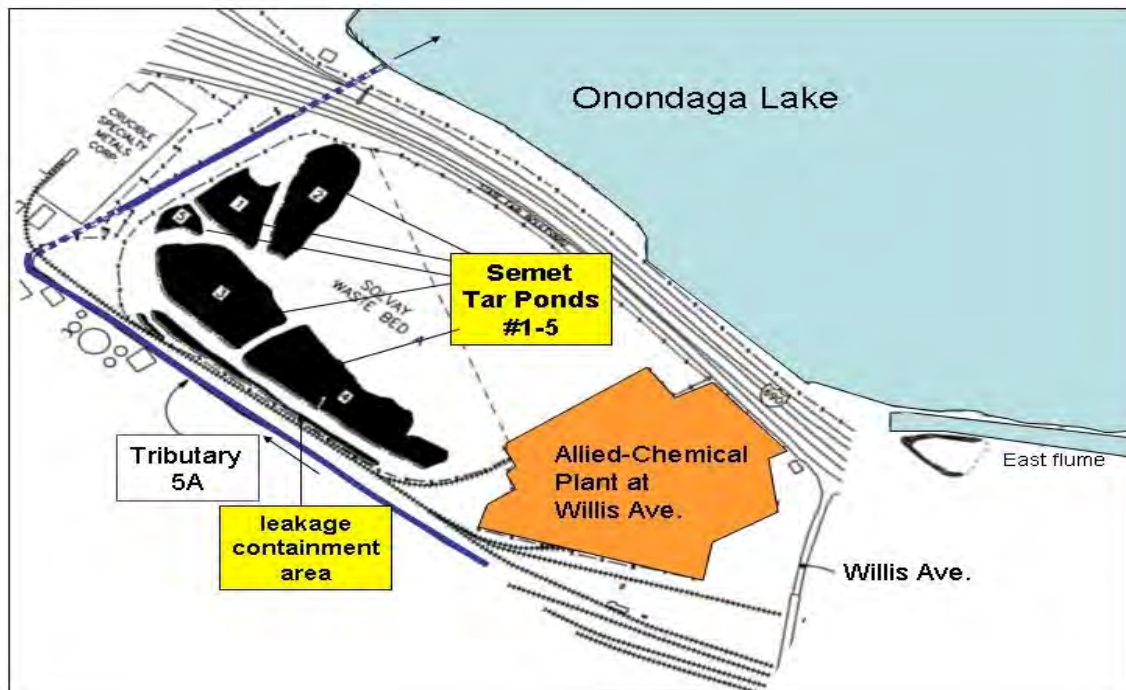
New Waste Concepts, Inc.

NWCI

Project Profile

Project: Semet Tar Ponds Remediation, Geddes, NY
Date of Project: 2010 – 2017 (on going)
Contracting Engineers: O'Brien & Gere

GENERAL DESCRIPTION:



Description

The Semet Residue Ponds (a.k.a. "Tar Beds") site is located in the town of Geddes, approximately 400 feet south of Onondaga Lake. The site has five irregularly-shaped ponds containing approximately 80 million gallons of acidic ($\text{pH} < 1$) tar wastes from a benzol production plant. Between 1917 and 1970, the Semet-Solvay Division of Allied Chemical & Dye (now Honeywell International, Inc.) used the ponds as depositories for tar wastes generated at its BTX (Benzol) Plant located immediately to the south. In addition, two narrow "containment areas" were created to control leakage along the southern edge of the site.

Recent (2009) investigations indicate that the actual volume of wastes is considerably less than 80 million gallons.

The waste resulted after the acid washing of coke light oil during the production of benzene, toluene, naphthalene, xylene, and "motor benzol."

Prior to construction of the Semet Residue Ponds, the site (aka Wastebed A) was used for the disposal of Solvay Process waste. The dikes bordering the ponds were reportedly built from fill materials including concrete rubble, old electrolytic cell parts, ashes, cinders, soil, Solvay Waste, bricks, and stone. Tributary 5A originates from natural springs south of the site, and flows along the south and west sides of the site before discharging into Onondaga Lake. The surrounding area is industrial with the nearest residential area about 0.5 miles to the south. Leakage from the site has resulted in the contamination of off-site soils, groundwater, and the sediments of Onondaga Lake.



Figure 1. Aerial photo taken on June 22, 1966, showing Semet Residue Ponds and adjacent Willis Ave plant (a separate Superfund sub-site).



Environmental Issues

The primary contaminants at the site include:

- benzene, toluene, ethylbenzene, xylenes (BTEX)
- naphthalene (a "low-weight" PAH)
- mercury and other metals
- diphenylethanes

The site presents a significant environmental threat due to the leakage of the Semet residue into underlying soils, and high levels of contaminants in groundwater. The Semet waste material lies below the water table and is therefore in direct contact with the groundwater. In addition, the tarry waste has been observed seeping out of the basins along the slope adjacent to the railroad tracks near Tributary 5A. Contaminants from this site also entered the lake via the 1-690 storm drains, which collect some contaminated groundwater in this area. These storm drains have been intercepted or plugged. Prior to construction of a barrier wall, the site was contributing contamination to Onondaga Lake, via contaminated groundwater which flows into the lake. Groundwater, which is highly contaminated with BTEX compounds, naphthalene, and several metals, also flows into Tributary 5A, which flows into the lake. Monitoring of Tributary 5A documents the transport of organic compounds (BTEX, naphthalene) and mercury and other metals from the vicinity of the Semet Residue Ponds site. The organic compounds are believed to have originated from the Semet Residue Ponds site. The mercury is believed to have migrated from the Willis Avenue and/or Semet Residue Ponds sites. Other metals (e.g., chromium, copper, and nickel) may have originated from the Crucible Materials Corporation plant.

Emissions of volatile compounds (e.g. BTEX and others) into the air have historically been a problem at this site.

What's being done to address the problem?

In March 2002, a Record of Decision was issued for the Semet Residue Ponds subsite. The \$50 million plan included the excavation of the Semet pond waste and on-site processing of the residue into benzene, light oil, and a soft tar product to be converted into driveway sealer. However, it was later determined that market conditions for driveway sealer made this option untenable. A modification of the remedy, which would allow for the residue to be converted to a material to be burned for energy recovery, was evaluated under a focused Feasibility Study performed by Honeywell. A draft focused FS report was submitted in July 2006.

Field activities conducted in 2009 to determine the thickness of the residue in the Semet Tar ponds indicate that the volume of material in the ponds is considerably less than previously estimated. As a result, USEPA states that "other alternatives to address the pond material may be considered."

Honeywell has already constructed a groundwater treatment system which is now treating groundwater collected at the barrier wall. Design of a groundwater collection system adjacent to Tributary 5A is underway.

Several Interim Remedial Measures (IRMs) have been completed:

June 1997 - all five tar ponds were covered, thereby greatly reducing odors.

2003 - 2007 - Interstate-690 storm drains were cleaned, re-routed and/or modified.

Summer of 2007 - a barrier wall and groundwater collection system was installed to stop the flow of contaminated groundwater from the site, and the adjacent Willis Avenue Site, to Onondaga Lake.

These are unique compounds formed during the acid-washing step in the Semet process. Not much is known about their toxicity.

NEW WASTE CONCEPTS INVOLVEMENT:

New Waste Concepts (NWC) was asked by O'Brian & Gere to be involved in the project based upon the work done at the Sydney Tarponds project. Our involvement was requested for the following reasons:

- The longer term cementitious product which had been used for coating the SEMET ponds throughout the winter was a more labor intensive application process and the engineers were looking for a product which would work well but be easier to apply.

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- The Engineers were also looking for a product which would not have an exothermic reaction so that the product could be applied as needed to control VOC and Odors.
- The engineers were also looking for a product which would be applied when the ponds were covered with a 4-8 inch layer of water from seasonal rains, and which would still be in place when the water evaporated.



O'Brien & Gere found that NWC's ConCover 180 NS with HydraGuard satisfied all of the above criteria beginning in 2013.

Applying ConCover 180 NS with HydraGuard over Water:

NWC's CC180 NS because of its density and cellulose fibre content can remain intact as it settles through the water column to the contaminated sediment below. NWC uses the same technology with CC180 NS as it has done with AquaBlok, one of its previous inventions which patents have been sold to AquaBlok Ltd. With CC180 NS and HydraGuard, we are not using an aggregate core surrounded by a polymer and clay blend to create the barrier. The NS formulation creates a thick, dense material with a fibre inner weave, that holds itself together as it passes through the water column and settles on top of the contaminated sediment.



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This dense coating when the water evaporates remains in place as a seal holding in VOC's and odors that might otherwise escape if the coating was not applied.

The product which was used was ConCover 180 with HydraGuard. The HydraGuard added is an acrylic polymer and vinyl acetate blend, which makes the ConCover 180 blend a hydrophobic mixture.

Odor Control Products and Equipment were also Evaluated

Suppressing odors during and immediately after the excavation of the contaminants. During the excavation, NWC used its powerful SWAT TF series equipment which allowed both the misting and spray application of its odor neutralizing products (Odor Lieutenant, Odor Corporal and Odor Sergeant). The photo below shows how a single machine can provide for both topical and misting application of NWC's odor neutralizing compounds.



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The ConCover 180 NS with HydraGuard was used following the excavation. Thickness and viscosity of the contaminated sediment allowed the CC180 NS with HydraGuard to sit on the surface. As a result, the spray application of the cover material created a VOC and odor suppressing seal on the surface of the contaminated sediment (see photo below).



ADVANTAGES OF CONCOVER 180:

- Durability: This product survives rains and being submerged where ponding occurred in flat areas
- Impermeability: This product helps create a vapor seal over the surface of contaminated sediment. That vapor seal restricts evaporation of moisture carrying odorous compounds, volatilization of odorous and harmful compounds, and reduces the penetration of water into the soil.
- Short blending time: 20 minutes of blending
- Non-carcinogenic: cementitious materials are often carcinogenic, and can be potentially harmful to human health. Check out the MSDS sheet on Portland Cement.

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- No exothermic reaction: ConCover 180 NS generates no exothermic reaction, whereas cement based products can range between 25 – 110 degree exothermic reactions, which can burn the skin. ConCover 180 NS can remain in the application equipment tank after mixing for several days without setting or hardening. As a result – it can be applied when and as needed. Any product which has an exothermic reaction to drive off moisture does have a set time and is not available to spray when needed.
- Simple Clean up: Cleaning up the tank on a CAPS machine is as simple as refilling the tank with water for the next days beginning load and run the mechanical mixing auger, and circulation pump through the can and spray hose when used, back into the tank. This compared to the Rusmar process or Posishell process is much simpler.
- Spray Distance: Density of CC180 and power of CAPS machine sprays 100 ft+

ADDITIONAL PHOTOS:

CC180 with HydraGuard and brown pigment



Area where removal of tar material occurred

