

# **Watershed Approach to Toxics Assessment and Restoration (WATAR) Program**

## **2014 Progress Report Delaware Department of Natural Resources and Environmental Control**

### **WATAR TEAM:**

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**Introduction:** The Watershed Approach to Toxics Assessment and Restoration (WATAR) was conceived by DNREC in 2012 with the intention of building a bridge between the surface water toxics program and the site investigation and restoration program in Delaware. The focus of the WATAR program is surface waters, sediments, fish and other aquatic life impacted by toxics, the health of fish and shellfish consumers, and the associated sources/sites responsible for those impacts. The concept was officially endorsed by DNREC leadership in the fall of 2012 following a series of briefings and the completion of a 5-year work plan. That plan placed considerable emphasis on the development of toxics TMDLs. The plan was rewritten in early 2013 in response to an EPA determination that PCB TMDLs were already in place for tributaries of the Delaware Estuary as a result of the Delaware Estuary PCB TMDLs. Importantly, the revised plan shifted the focus of WATAR from developing toxics TMDLs to implementing toxics TMDLs.

The revised WATAR work plan identified 10 specific activities that the WATAR Team would work on during 2014. Those 10 activities are listed below with a status report on each. In addition to the 10 items, there were several additional activities that arose during 2014 in which the WATAR Team became involved. Those activities are listed and discussed at the end of this progress report.

#### **1. Prioritize sites in pilot watershed for remediation**

**Status: Ongoing**

**Discussion:** This effort continues on multiple fronts. The results from the PCB mass loading analysis reports and the coordination with the City of Wilmington and New Castle County sewer-shed trackback projects have bolstered the effort. The driving force behind the prioritization of remediation at sites has been the WATAR watershed sampling results and the cooperative projects at Mirror Lake and Meco Drive / Little Mill Creek. The data have supported the remedial actions and restorations that have occurred at each site and in both cases have spurred interest in and action at proximal sites downstream of each project.

**2. Continue data compilation**

**Status:** Ongoing activity

**Discussion:** The Site Investigation and Restoration Section hired a full-time data Management Analyst. As of December 31, 2014, all WATAR data collected during 2013 and 2014 (thus far, as some data is still coming in) has been successfully entered into the EQUIS database. As the team focuses on project areas and prioritized sites, relevant historical data have been added to the EQUIS database on an accelerated schedule. Each watershed that has been sampled as part of this effort has had all relevant historical site data collected for input into EQUIS.

**3. Update/clarify 303(d) listing protocols for toxics in advance of 2014 listing decisions. Use protocols and readily available and existing toxics data to update list of watersheds impaired by toxics.**

**Status:** A document entitled “Methodology for Determining Impaired Waters by Toxic Pollutants” was completed by DNREC in July, 2014.

**Discussion:** The document will be included as part of Delaware’s final 2014 Integrated Assessment.

**4. Update QAPP for 2014 toxics monitoring**

**Status:** Completed

**Discussion:** In the summer of 2014, Delaware published a Request for Proposals/Invitation to Bid (RFP/ITB) to obtain specialty laboratory services to support the WATAR program. Based upon a review team’s recommendation, AXYS Analytical was selected to provide the services and was awarded a three-year contract with two optional 1-yr extensions. The proposal and associated contract define the laboratory methods, including quality assurance measures, to be used by AXYS in analyzing WATAR samples. Methods used to collect the samples (water, sediment and fish) were detailed in a project-specific Sampling and Analysis Plan (SAP), completed in the fall of 2014, prior to sampling (see next item).

**5. Perform toxics monitoring in the Appoquinimink and Army Creek watersheds in accordance with the QAPP**

**Status:** Completed

**Discussion:** Surface water, sediment and fish tissue samples were successfully collected from the Appoquinimink and Army Creek watersheds between October 6, 2014 and October 31, 2014. Personnel from the Division of Watershed Stewardship, Division of Waste and Hazardous Substances, Division of Water, and the Division of Fish and Wildlife all contributed to the sampling campaign.

**6. Conduct public workshop(s) on draft HSCA Sediment Guidance and prepare summary of public comments received**

**Status:** Not Completed

**Discussion:** HSCA Sediment Guidance development has been initiated but has not progressed as quickly as originally anticipated. Time constraints exist with WATAR Team personnel to continue other (non-WATAR) project work as necessary, and priorities for personnel time shift accordingly. As such, the HSCA Sediment Guidance has not gotten the projected attention to date. It is anticipated that major progress will be made in 2015 with regard to draft guidance document development. Despite the delay in developing guidance, several assessments of toxics in sediments were completed by the WATAR Team in 2014, including but not limited to: PCBs in Mirror Lake; PAHs in the Delaware River and Bay; mercury in the Delaware River; and chlorobenzenes in Red Lion

Creek. These assessments have detailed the process that will be incorporated into the HSCA sediment guidance. It is a matter of taking the project work and creating from them the procedures that were used to complete the assessments.

**7. Continue to provide technical assistance to the City of Wilmington and the New Castle County Department of Special Services on the City's PCB trackback effort**

**Status:** Ongoing

**Discussion:** The water quality specialist from the City of Wilmington who was responsible for implementing the City's PCB trackback effort took a job elsewhere. The City hired an outside consultant to help organize and implement the trackback work. Several conference calls were held between the consultant, the DRBC and the DNREC to get the work back on track, which it appears to be as of the end of 2014. In addition to assisting the City, monthly to quarterly interaction also occurred between the WATAR Team, New Castle County Special Services and personnel from BASF. As part of previous City of Wilmington PCB trackback efforts, BASF, who manufactures organic pigments and discharges process wastewater to the regional sewer collection system, was identified as potentially and inadvertently producing PCBs. BASF holds a pretreatment permit issued by New Castle County Special Services (NCCSS). NCCSS instructed BASF to perform an internal PCB trackback study at their pigment manufacturing facility in Newport. BASF is conducting that study based on a work plan approved by the County, DNREC and the DRBC.

**8. Continue development of web-based mapping utility**

**Status:** Ongoing (Refocus)

**Discussion:** A web-based mapping utility was envisioned to share data generated by WATAR sampling, as part of both site investigations and from special assessment projects that the team conducted. The desired outcome was that all parties would be able to use the same data and complete assessments to the same standard as the WATAR Team. The desired mapping utility has been discussed within the WATAR group and with information technology experts since the preparation of the WATAR work plan. While the technology exists and the expertise is available, a few roadblocks were encountered as we attempted to implement the mapping utility and to sustain it over the long run.

The funding line in the WATAR work plan provides sufficient resources to complete a pilot of a web-based mapping utility. It does not provide sufficient funds for ongoing maintenance of the utility, which we have learned is significant. A request has not been made for ongoing maintenance since there is another obstacle that appears to present more over-arching concerns.

The WATAR Team has approached several vendors to develop a scope of work for the mapping utility. The most recent was with the University of Delaware, Department of Geography. Many vendors with the required expertise, such as UD, strongly recommend that any work product that they are requested to maintain is housed on the UD servers (because the State of Delaware firewall is so robust). From past experience, they noted that computer-based work products often receive a few years of support, then tend to stagnate due to the absence of funding for ongoing maintenance. The representatives from UD noted that upper management at DNREC and UD had been meeting to address these concerns through the development of a Memorandum of Understanding between the two groups to create, maintain, update, and promote the longevity of new computer-based projects. The WATAR Team has elected to delay a more complex effort for a web-based mapping utility and instead develop another interface that offers the same outcome.

The WATAR Team will develop a "static" map utility that depicts each of the 303(d) toxics-listed watersheds. This map will have points of interest that will link either to watershed fact sheets or to the existing Delaware Watersheds webpage at <http://delawarewatersheds.org/>. Another point of

interest will be the sites that have been assessed to determine the PCB mass loading for groundwater and overland flow pathways. Each project that has grown out of the WATAR initiative or is currently utilizing the watershed approach to site remediation will be depicted as well. The WATAR sampling events will be depicted by each sampling station, as practicable, and the ability to request data for a certain area or projects will be provided. This approach allows the WATAR Team to provide complete and contextually based data rather than serving data that could be viewed piecemeal and without context, potentially leading to incorrect conclusions.

#### **9. Continue tech transfer**

**Status:** Ongoing

**Discussion:** During 2014, the following actions or activities were conducted as they relate to technology transfer, which comes in many forms:

- Brought Brittany Sturgis, Watershed Assessment and Management Section, and Eileen Capitoli, Site Investigation and Restoration Section, onto the active WATAR Team.
- Shared WATAR approach with other local and regional stakeholders through presentations as listed below.
- Implemented permeable reactive barrier with innovative technology at Fort DuPont along with EPA concurrence.
- Developed and initiated a new PCB policy within SIRS to better characterize PCB impacts to surface waters using a more sensitive and accurate analytical method
- Furthered the acceptance of bioavailability concepts in remediation plans (e.g. South Wilmington Wetland Assessment).
- Coordinated with DNREC Division of Fish & Wildlife staff to implement sampling and remediation as part of their wetland restoration projects (mosquito ditches).
- Continue to prove the value of high resolution data collection, fingerprinting, and source identification as a means to prioritize site cleanups and implement TMDLs. Developed and distributed WATAR fliers (copy attached) at several local and national venues

#### **10. Progress Report and Accounting for items listed above**

**Status:** Completed

**Discussion:** This document represents the Progress Report for 2014.

**Other significant activities of the WATAR Team during 2014 are presented below.**

- **Meco Ditch Remediation Project:** A poster describing the remediation project was accepted for presentation at the Battelle 8<sup>th</sup> International Conference on Remediation and Management of Contaminated Sediment (held in early 2015).  
Operations and Maintenance of the ditch remedy occurred in 2014 which included groundwater well sampling, vegetation management and minor maintenance. The innovative removal and active barrier remedy has been successful in preventing the flow of PCB-containing free-phase petroleum from entering the waterway. Please see the Little Mill Creek Flood Risk Mitigation Project below for a description of supplemental remediation planned for 2015 to address sediments in Little Mill Creek contaminated by historic release from Meco Ditch.
- **Little Mill Creek Flood Risk Mitigation Project:** The Little Mill Creek Flood Risk Mitigation project (Project) spearheaded by the US Army Corps of Engineers (USACE), the New Castle Conservation District (NCCD), DNREC, and New Castle County commenced in 2014. The project involves excavation and removal of bank soils and creek sediments to increase hydraulic storage capacity and decrease flooding of nearby properties. Planning for the project relied heavily on the expertise of the WATAR Team to determine the nature and extent of contamination in the sediments to be excavated. The WATAR Team also ensured that remedial action in Meco Ditch occurred well before initiation of the Little Mill Creek project so that Meco Ditch would not recontaminate the completed Little Mill Creek project. Another major WATAR effort during 2014 involved an emergency sampling event along the banks of the Little Mill Creek following the discovery of soil contamination in the first reach that was excavated. The WATAR Team coordinated with the USACE and NCCD to develop and implement a sampling plan to fully characterize all bank soils slated for excavation. Fortunately for the project partners, the extent of elevated concentration was limited to the first reach excavated. The remaining areas that were sampled did contain some environmental contamination above SIRS screening levels. However, in an innovative approach, WATAR Team members performed a risk assessment using the Risk Assessment Information System (RAIS) to determine, by sampling cell, if the material was suitable for placement at the Combined Disposal Facility (CDF) at Wilmington Harbor South. The WATAR Team and the USACE determined that the material was suitable for disposal at the CDF, which ultimately saved over a million dollars in potential disposal costs. The work of the WATAR Team also got the project back on track, which had been suspended pending resolution of the soil contamination issue. Another innovative feature of the Little Mill Creek project involves application of activated carbon to contaminated sediments in Little Mill Creek directly adjacent to and downstream of the Meco Ditch remediation project. Those sediments were contaminated based upon historic releases from Meco Ditch and they will be remediated as part of the Little Mill Creek project. The WATAR Team worked with the USACE to define the area that needs to be treated with activated carbon, the appropriate dose, and how the carbon should be incorporated into the sediments. This information was included in contract specifications for the overall project. The activated carbon addition is expected to occur in the spring of 2015.
- **NVF Zinc Remediation:** The WATAR Team continued to monitor zinc concentrations in the Red Clay Creek, track compliance with the zinc TMDL and NVF Wasteload Allocation, and provide management of the NVF Yorklyn site cleanup and oversight of the redevelopment effort. Approximately 68.5 tons of zinc-containing solid waste (non-hazardous), 2,800 pounds of corrosives/acids, 300 pounds of aluminum nitrate and 55 gallons of hypochlorite were removed and properly disposed of by DNREC contractors from the former NVF facility in 2014.

In addition to the existing zinc recovery wells on the site, two new ground-water recovery wells will be installed at the site in early 2015 in an area where zinc reclamation and wooden tanks of strong acid existed at the former NVF facility. Data collected in 2014 indicated that groundwater beneath this area of the site contained significant amounts of dissolved zinc. It is estimated that the two new wells will recover approximately 120 pounds of additional zinc per day upon initial startup. DNREC anticipates that the addition of the new wells and recovery of zinc from this “hotspot” will drastically reduce the length of time (and consequently costs) that the ground-water zinc recovery system will need to operate at the site.

- **Fort DuPont Permeable Reactive Barrier:** As part of a USEPA Emergency Removal project to collect and dispose of lead (and other metal) waste associated with a former landfill along the Delaware River at the Fort DuPont site in Delaware City, the WATAR Team proposed the use of a reactive material to fill an upland groundwater interceptor trench (instead of the clay plug originally proposed by USEPA) to act as a permeable reactive barrier. The idea was to passively capture dissolved lead flowing towards the Delaware River from contaminated groundwater left on site. A product called Apatite II, essentially crushed Alaskan fish bone, was used to backfill the upland trench. Apatite II has been shown to sequester several metals, including lead, and has sorption capacities that will likely never be exceeded at the site. The product is used more commonly to treat acid mine drainage in the Western United States, and has never been used in Delaware. DNREC-SIRS will monitor the effectiveness of the Apatite II in association with the Fort DuPont HSCA site.
- **Update: Pilot Study of Polycyclic Aromatic Hydrocarbons in the Delaware Estuary:** The Delaware Estuary is one of the largest petroleum shipping corridors in the United States. Occasionally, large petroleum spills occur which impact the system over space and time. Many small spills can have a similar effect as well. Assessing the impact is hampered by the lack of detailed and up-to-date baseline information on the presence and distribution of polycyclic aromatic hydrocarbons (PAHs) in the Estuary. The WATAR Team, in conjunction with Delaware’s Natural Resource Damage Assessment (NRDA) Program, an external consultant and a specialty laboratory designed and executed a study to obtain current baseline PAH data in Zones 5 and 6 of the Estuary. The work included: the collection of bulk sediment samples; deployment of semipermeable membrane devices (SPMDs) in the sediments and water column; sediment toxicity testing; benthic invertebrate community analysis; and detailed data analyses. All results were consistent and indicated that baseline conditions were non-toxic at the sites sampled. Methods used and results are fully documented in the following report:

Greene R., and Burton W., 2014. Natural Resource Damage Assessment Baseline Study Delaware Estuary Polycyclic Aromatic Hydrocarbon (PAH) 2013 Study, SIRS Project No. DE-1325. Delaware Department of Natural Resources and Environmental Control, New Castle, DE and Versar, Inc, Columbia, MD.

- **Mirror Lake Post-Treatment Monitoring:** Data collected in October/November 2014, one year after placement of the activated carbon product, SediMite™ into the sediments of Mirror Lake is still being processed. Some data has been analyzed, however, including passive sampler data from the sediment and surface water, and fish tissue from several species caught in the lake. The data obtained so far indicate that an approximate 60% (+/- 5%) reduction in PCB concentration has been achieved in sediment, surface water and resident fish species. This is a significant outcome that indicates the treatment is working as expected.

Several presentations were given in 2014, both locally and nationally, related to the Mirror Lake Remediation and Restoration Project:

- Cargill, John (2014), Remediation and Restoration of Mirror Lake, Dover: Oral Presentation: Region 3 Directors Meeting, Lancaster, PA, September 2014.
  - Cargill, John (2014), Mirror Lake Carbon Project Update: Oral Presentation: Sediment Management Working Group Symposium, Washington, DC, November 2014.
  - E.R. Patmont, U. Ghosh, J. Cargill, R. Greene (2014), Bioaccumulation Monitoring and Modeling of PCBs after the First Full-Scale Application of Activated Carbon to a 5-Acre lake in Dover, DE. Platform Presentation: SETAC North America 35<sup>th</sup> Annual Meeting, Vancouver, BC, Canada.
- **UCONN Mercury Study Report:** DNREC worked with the DRBC and researchers from the University of Connecticut to study the biogeochemical cycling and bioaccumulation of mercury in Zone 5 of the Delaware Estuary. Specialized testing revealed that sediments are important in converting inorganic mercury (mostly harmless) to methylmercury (bioaccumulative and toxic) and that methylmercury production follows a seasonal cycle. Furthermore, the testing demonstrated a 70% reduction in dissolved mercury concentrations in the water column over the past decade and an associated drop in mercury concentrations in striped bass collected from the study area over the same period. This information was used to remove mercury as a contaminant of concern in Delaware's fish advisory for Zone 5 and to remove mercury from Delaware's 303(d) list of impaired waters for Zone 5. Full details of the study are available in the following report:
    - Mason R, Balcom P, Gosnell K, Ortiz V, Dimento B, Schartup A. 2014. Sources and Biogeochemical Cycling of Methylmercury and Mercury in the Sub-tidal Reaches of the Delaware River Estuary. Report prepared by the University of Connecticut, Department of Marine Sciences, Groton, CT for the Delaware Department of Natural Resources and Environmental Control, Dover, DE.

A journal article was also being drafted in late 2014 to document the work. That article is expected to be published in 2015.

- **Delaware Children's Museum PCB:** The WATAR Team provided technical support on a redevelopment project at the Delaware Children's Museum along the tidal Christina River in Wilmington. The proposed redevelopment involved significant earth moving to create a miniature golf course. PCBs were discovered in some of the soils on site. Mass balance modeling revealed some concern with PCB release to the Christina River during construction. The WATAR Team determined that the low concentrations of PCBs in soil would not exceed a surface water criterion in an erosion and overland flow scenario, nor through leaching from groundwater. The PCBs and other site contaminants were capped in place with an impervious barrier. Further, a Long Term Stewardship Requirement is being implemented which will effectively prevent site-related contaminants from reaching the adjacent Christina River.

- South Wilmington Wetland Assessment Project:** The South Wilmington Wetlands Area (SWWA) is a large remediation, restoration and flood mitigation project along the tidal Christina River in south Wilmington. The WATAR Team is providing comments and technical support to the designers of this project to ensure the remediation portion of the project meets criteria and objectives. The project reached the final design and feasibility study phase in 2014. Supplemental sampling based upon the final design has defined the new “final” grade following excavation. This new final grade was sampled and the material is currently undergoing analysis to determine the toxicity of the material using worms as the receptor to determine site-specific bioavailability of PCBs at the site. This analysis follows the WATAR approach to determine if the presence of PCBs in the environment combined with the site-specific characteristics poses a risk to ecological receptors or not. The application of this bioavailability analysis is expected to provide information that will inform decisions at this certified brownfield site.
- Supplemental Focused Feasibility Study – Amtrak Former Refueling Facility:** DNREC, specifically WATAR Team members, and USEPA TSCA spent considerable time in 2014 reviewing the Focused Feasibility Study Report and risk assessments submitted by Amtrak’s consultant for the site. This site represents one of the largest, if not *the* largest, contributor of PCBs to the Brandywine Creek and the Delaware Estuary. DNREC and USEPA TSCA do not agree with all of the technical content in the report and are in discussions with Amtrak about moving forward with remedial action plans.
- Former CitiSteel/EVRAZ Claymont Steel Remedial Investigation:** During 2014, WATAR Team members developed a Facility Evaluation Work Plan to investigate potential releases from operation of the former EVRAZ Claymont Steel facility in Claymont, adjacent to the tidal Delaware River. The investigation was designed in the style of WATAR, to investigate surface waters and sediments in the creeks that bisect the site, in addition to upland soil sampling to verify sources of contamination. Work was halted by the purchase of the site by a subsidiary of Environmental Liability Transfer, Inc. Currently, a Voluntary Cleanup Program agreement has been signed between ELT and DNREC for completion of a Remedial Investigation through Certificate of Completion of Remedy for all unacceptable risk to human health and ecological receptors from releases at the site. DNREC will oversee the entire assessment/remediation, which will be guided by WATAR Team members.
- HSCA Policy on PCB analysis:** DNREC-SIRS staff, including WATAR Team members, developed a policy to change the default analytical method for PCBs in soil, groundwater, surface water and sediment to USEPA Method 680. The method change will allow for detection of total PCBs at a site, as opposed to only detecting non-weathered Aroclor mixtures by USEPA Method 8082. This change provides a better analysis to determine if PCBs are present in the environment even when in a weathered state. Under certain situations, including for samples collected from sites that drain to 303(d) listed impaired waterways, USEPA Method 1668 will be required. USEPA Method 1668 is a more sensitive, accurate and expensive method that provides the ability to “fingerprint “ PCBs and then track back to a specific source. This policy change is significant and will result in much better quantification of PCB sources that remain in the environment.
- I-495 Arsenic Investigation/UD Partnership:** WATAR Team members negotiated a mutually beneficial partnership with Dr. Don Sparks at the University of Delaware in 2014 to better characterize arsenic contamination at a site adjacent to the Christina River at the Port of Wilmington. Dr. Sparks, an international recognized expert in soil chemistry, and his students are speciating arsenic from sediment and soil samples collected at the Halby Chemical Superfund Site and the Potts Property HSCA site to help determine the source of elevated arsenic concentrations



detected in a drainage ditch that parallels I-495 near the Port of Wilmington. In return for the high level analytical work, DNREC is facilitating access to one area of the Potts Property site for UD researchers to study the potential effect of sea level rise on metals contamination. Work is ongoing; results of the work conducted for DNREC and USEPA will be presented in early 2015.

- **Interface between WATAR Team and Delaware's Toxics in Biota Committee (Fish Advisories):**  
The WATAR Team, in accordance with its 5-year plan, collects fish tissue samples from priority Delaware watersheds impacted by toxics. The Delaware Toxics in Biota Committee reviews such data and makes recommendations to the Secretary of DNREC and the Secretary of the Department of Health and Social Services (DHSS) when new or revised fish consumption advisories may be needed. Based on fish tissue data that the WATAR Team had collected in the fall of 2013, DNREC and DHSS issued revised fish consumption advisories for the Chesapeake & Delaware Canal, the Red Lion Creek, and the Saint Jones River watersheds. The revised advisories were announced on July 3, 2014 (<http://www.dnrec.delaware.gov/fw/Fisheries/Pages/Advisories.aspx>). Overall, the revisions reflect long-term improvements and lower risk associated with consuming fish from these waters.
- **WATAR Related Presentations:** Members of the WATAR Team conducted presentations as described below in 2014:
  - Richard Greene, John Cargill, Todd Keyser, Upal Ghosh, David Velinsky, and Chris Sommerfield (2014), Toxics in the Saint Jones Watershed: Past, Present and Future. Poster Presentation: Delaware National Estuarine Research Reserve Research Symposium, March 2014. This same poster was also presented at the 2014 National Forum on Contaminants in Fish, held in Alexandria, VA, September 22-24, 2014.
  - John Cargill (2014), Remediation and Restoration of Mirror Lake, Dover: Oral Presentation: Region 3 Directors Caucus, Lancaster, PA, September 2014.
  - John Cargill (2014), Mirror Lake Carbon Project Update: Oral Presentation: Sediment Management Working Group Symposium, Washington, DC, November 2014.
  - John Cargill, Todd Keyser (2014) Watershed Approach to Toxics Assessment and Restoration – Addressing Chemical Contaminants and Legacy Pollutants in Delaware Waterways: Oral Presentation: Division of Waste and Hazardous Substances All-Hands Meeting, Dover, DE March 10, 2014.
  - Todd Keyser (2014) Watershed Approach to Toxics Assessment and Restoration – Addressing Chemical Contaminants and Legacy Pollutants: Oral Presentation: EPA/DNREC Water Program 106 Grant Work-Plan Meeting, New Castle, DE January 15, 2014.
  - E.R. Patmont, U. Ghosh, J. Cargill, R. Greene (2014), Bioaccumulation Monitoring and Modeling of PCBs after the First Full-Scale Application of Activated Carbon to a 5-Acre lake in Dover, DE. Platform Presentation: SETAC North America 35<sup>th</sup> Annual Meeting, Vancouver, BC, Canada.
- **WATAR Related Awards:** Members of the WATAR Team received the following award in 2014:  
Office of Environmental Protection Outstanding Team Award for Mirror Lake -  
*Rick Greene and John Cargill led the Mirror Lake Remediation and Restoration Project in the fall of 2013. Mirror Lake was impacted by several chemicals, including PCBs, dioxins and furans, mercury and PAHs. It has had a fish advisory since 1988. The project involved both remediation of the contamination and also creating a new wetlands area. An innovative*

*project was designed to place activated carbon in the form of pellets into the system to sequester the contaminants.*

*The team had to get approval from the City of Dover, the Silver Lake Commission, and the Army Corps of Engineers to complete the project. They worked with staff from all DNREC Divisions in the design, planning and execution of the project. They obtained volunteer help not only from the Department, but also from AmeriCorps and the Sussex County Correctional Boot Camp, and a local shelter. They talked to elected officials, the press, as well as local residents and business owners. They helped design equipment to spread the carbon, coordinate volunteers, put together a budget and cobbled together the funding, hired and oversaw the work of consultants and contractors, conducted before and after monitoring and participated in the physical labor to get it all done.*

*This project represented the largest application of SediMite anywhere in the US and the first State led project of its kind anywhere in the nation.*