

CASE STUDY – PCB, PAH, AND PETROLEUM IMPACTED SOIL AND SEDIMENT REMEDIATION

Client: State Contract, Delaware

Workscope: Excavation and offsite disposal of impacted soil and sediment followed by the installation of a permeable reactive barrier and impermeable geosynthetic clay liner to sequester contaminant mass and prevent contaminant discharge into a stormwater channel that flows to a surface water body.

Project Team:

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Project Size:

\$500,000

Project Description:

The Meco Drive Site consists of several properties along Meco Drive within an industrial area in Wilmington, Delaware. Reports dating back to 1986 describe events of free product or oil (atop the groundwater table) seeping into the drainage ditch (the “Meco Drive Ditch”) that crosses Meco Drive and discharges to Little Mill Creek. Environmental Alliance, Inc. (Alliance) designed a remedy to stop the seepage of oil (containing low-level PCBs and PAHs) from surrounding soils and sediment into the Meco Drive Ditch.

Following excavation and offsite disposal of impacted soil and sediment from the ditch banks and bed, Alliance installed bulk CETCO Organoclay® and CETCO Reactive Core Mat® (RCM) to provide a permeable reactive treatment barrier in the areas of the Meco Drive Ditch where oil impacts were found. A permeable reactive barrier allows groundwater to pass through while capturing the dissolved or phase separated contaminants, thereby performing a treatment function. The installed RCM membrane is pervious to water and contains Organoclay® that strongly adsorbs oil, PAHs, and PCBs. Alliance also installed CETCO Bentomat CL® impermeable clay liner overtop the RCM® to provide additional protective capacity against the future migration of oil into the Meco Drive Ditch. The amount of residual product at the Site that could potentially migrate on top of the water table to the Meco Drive Ditch was an indeterminate quantity. Organoclay® has a finite adsorptive capacity, and the amount of Organoclay® installed in the remedy was designed to adsorb an estimated quantity of residual product based upon available Site data. In the event the installed Organoclay® material reaches its adsorptive capacity and is no longer able to prevent the flow of oil through the RCM® membrane, the Bentomat CL® Liner material will block the flow of oil into the remediated Meco Drive Ditch. Monitoring wells were installed behind the Bentomat CL® liner, along the slope of the ditch bank in historical oil seep areas, to enable monitoring for the occurrence of, and/or allow further removal of, any residual oil that might accumulate behind the Bentomat CL® liner. No free product or evidence of staining from free product in the remediated portion of the Meco Drive Ditch has been observed during visual inspections conducted by Alliance following the installation of the remedy (Fall 2012). Alliance has completed three monitoring well gauging events, and no free product has been observed in any of the installed ditch monitoring wells. The remedy is functioning as intended and preventing the migration of residual free product into the Meco Drive ditch through the installation of the multifunction treatment and barrier system.

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View of the Mecco Drive Ditch Before and After Remedial Activities

Innovations:

- Wetlands permitting for hazardous material removal (Nationwide Permit #38).
- Surface water management and diversion within a tidally influenced stormwater drainage channel.
- Installation of Triton® Marine Mattresses filled with bulk CETCO Organoclay®.
- Installation of a permeable reactive treatment barrier (CETCO Organoclay® and RCM®) across the stormwater channel streambed and banks.
- Installation of an impermeable geosynthetic clay liner (CETCO Bentomat CL®) across the stormwater channel streambed and banks.
- Stormwater channel streambed and banks stabilization with Rip Rap stone.
- Material management and remedy installation within a very confined industrialized area without compromising day-to-day operations for area businesses.

