

REMOVAL OF PCB-CONTAMINATED SEDIMENT

SUPERFUND: FORMER PAPER MILL—PLAINWELL, MI

One of three major river superfund sites, the Kalamazoo River project involved removal of contaminated sediment from the riverbed and surrounding flood plain areas near the Plainwell Dam, the former site of paper mills dating back to 1895.

The first two phases of the project were awarded to Terra Contracting and identified 13 removal areas involving 120,000 cubic yards of compacted sediment estimated to contain 4,400 pounds of polychlorinated biphenyls (PCBs).

Phase One began in March of 2007 with Terra clearing several acres of vegetation and mature forests prior to building 3,000 feet of access roads. Terra recycled the by-products of the clearing process to support road construction, this reduced waste that required off-site disposal by several hundred yards. Crews then constructed a cofferdam downstream to divert water so that a portion of the Plainwell Dam could be removed, allowing better control of the water level to facilitate excavation.

Using long-reach excavators equipped with GPS, Terra crews systematically removed contaminated sediment and soils from the riverbed and adjoining banks. The GPS system allowed Terra's operators to excavate to the design grades determined by the project engineer's digital terrain model with a high degree of accuracy. Trucks then transported the material to a staging pad. The staging pad contained a liner and thick layer of stone, which allowed the wet material to drain. Water was collected in a sump, pumped through a carbon filter treatment system to remove contaminants, then pumped into frac tanks where it was tested before discharge. A portion of the sediment was run through a pug mill, where it was stabilized by mixing with a drying agent such as cement or CKD, and trucked to a solid waste landfill. Phase One was completed at the end of 2007.

During Phase Two, a challenging aspect of the project was that approximately 500 linear feet of river required shore to shore excavation, where the river was approximately 150 feet wide in this area. To accomplish this feat, Terra utilized sheet piling installed from a barge to divide the river into halves to divert the river current to facilitate the contaminated sediment removal accessed from both shore and barge.



Another challenging aspect was that Terra had to construct a temporary dam and several sheet piling diversion walls to control river flow to allow the removal of an old earthen berm, contaminated soils, and sediments and then re-divert the river to remove the original dam.

In the third quarter of 2008, Terra had to react to flood levels on the river that resulted from heavy rains in the area. Terra personnel had to go into emergency mode to contain the flood damage that was causing severe erosion on the river. For 11 straight days, the crew worked under extreme conditions and did what was necessary to save the Plainwell Dam. Normal excavation activities resumed and continued through the end of December.



BEFORE FLOOD



AFTER FLOOD

Phase Two was completed by the end of 2008. It involved excavation behind the Plainwell Dam to remove an additional 83,000 cubic yards of sediment, including small islands located in the mainstream of the river. Sheet piling for diversion walls was installed to divert the river current away from the shore areas during excavation. In addition to long-reach excavators, Terra crews deployed barge-mounted cranes to remove all contaminated sediment.

Upon completion water once again flowed freely through the western channel of the river which was once the dam. All in all, approximately 15,000 feet of river bank was restored using backfill, topsoil and rock.

Terra received praise from all parties on the quality and excellence of the work completed on this superfund project. In addition, Terra crew members logged tens of thousands of man hours on the project without a lost-time accident, a testimony to Terra's commitment to the LPS (Loss Prevention System) program.