BARRIER WALL INSTALLATION WITHIN THE VERMILION RIVER

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Commonwealth Edison (ComEd) and Nicor Gas have been working to return to productive use a property that was the site of a Former Manufactured Gas Plant located in Streator, Illinois. The plant was located alongside the Vermilion River that runs through the center of this community. Several tar seeps into the river were observed across from a town park and water access area. Geo-Con, Inc. was retained to conduct the construction activities at the site including the installation of a permanent barrier wall. This poster presentation will highlight the activities of turning this former MGP site into a community Greenspace.

The Vermilion River meanders northward through the community of Streator, Illinois (approximately 85 miles southwest of Chicago). Seasonal rainfall and snowmelt varies the river's depth and velocity from low flow, nearly dry conditions to several feet in depth at nearly 100 cubic feet per second. The riverbed is sandstone with rock outcrops that overlay a shale bed. The former MGP plant was situated atop a thirty-foot embankment adjacent to the river. It was operational in the late 1800's and early 1900's. ComEd currently operates a substation on a segment of the property but it was largely abandoned and overgrown. A residential section of the community surrounds the property. Over the last several years ComEd has embarked on a proactive remediation of several of their sites in order to reduce the health risk associated with the contamination of MGP sites. ThermoRetec was assigned the investigation of this particular site. The site investigation revealed that the seepage into the river from seven distinct areas along the bank was NAPL migrating through fissures in the sandstone layers. Site topography, the river's geology and the height of the river banks, some approaching 30 feet on less than 1:1 slopes, provided a challenge for remedial activities. The nature of the seepage did allow for complete removal of the source material and this was done previously with the removal of the in-ground gasholders. The remedial design was to intercept the NAPL flow into the river, collect and treat the material until testing proved that the NAPL had ceased.

Close coordination with the Illinois EPA, Corps of Engineers, Commonwealth Edison, Design Consultants (ThermoRetec) and the local community was required and achieved in order to provide the necessary permits to construct the recovery trench design proposed. It was decided that a 500 linear foot recovery trench would be installed along the inside edge of the river into the sandstone layers using 80 mil HDPE membrane as a barrier. The liner barrier would be installed in a single lift and placed within the 20 foot deep trench. The recovery trench would contain several sump boxes to allow closure of various segments of the trench should it be appropriate. The associated piping would be placed along the embankment into a manifold system that would convey the contaminated water and NAPL to a permanent treatment facility located onsite. The facility would have an oil-water

separator, sand filters, bag filters and carbon filters. The discharge would be to the local POTW.

Geo-Con was awarded the contract in late spring of 2000 and commenced site activities in July 2000. As the site was overgrown, landclearing activities for approximately three (3) acres were required. This included construction of an access road down to the river edge as well as lay down areas for a 75-gallon/min temporary water treatment plant, assembly area for a 250,000-pound rock trencher, decontamination area and material storage. Prior to barrier wall construction, approximately 12,000 cubic yards of material was removed from the surface and embankment slopes to stabilize them as well as provide the correct centerline alignment for the trench. Several below ground structures were found including a tar well, water intake structure and foundations to the former plant facilities.

Access to the river bottom was critical for the trenching operation. In order to work in a dry environment, a portable river diversion system was installed for the entire length of the project; 1200 lineal feet. Once the area was prepped and surveyed, the rock-trenching machine was moved onto the centerline where it commenced digging to the required 20 foot depth. The spoil from the operation was win-rowed to the outside of the trench for removal. This operation took 4 days. Trench cleanout of the residual bottom losses took an additional 5 days. Water intrusion was a concern for the project team as the fractured nature of the rock was unknown completely. Several 6-inch pumps were readied in anticipation of flooding. Initially, this did not occur but over a few days the trench filled from seepage from the river side of the work area. It was noted after several pumping attempts that a large open solution cavity had opened in the corner of the trench and water was pouring in making it impossible to keep up with it. A concrete plug was poured in the area to stop the water flow. In that it was in the corner of the trench, the reduction in trench length and affect on barrier installation methodology was insignificant. A 12 inch concrete mud mat (2000 psi) was installed next to provide a sloping base for the NAPL to the sumps which were installed on 150 foot spacing.

The installation of the barrier required coordination between 2 excavators that were used to suspend the 80 mil HDPE after it had been pieced together. There were 23 weld seams that required testing and approval prior to placement in the trench. In order to weigh down the bottom edge such that it would fall into the trench, 1 ½ inch solid rod was attached to the bottom in welded stirrups. The 500 foot continuous sheet was suspended above one end of the trench and lowered into place; tied off to the portable diversion structure to ensure proper depth. This same procedure was done for the entire length of the barrier fabric over a period of 4 hours. The filling of the trench with gravel was done after the installation of the sump boxes. Once the sump system was installed, the outer edge of the HDPE was lain over the trench and welded to the liner that covered the slope embankment to a level equal to the 25 year flood stage. The two liners, in the trench and up the slope, assured ComEd that the seeping NAPL would be contained and directed to the gravel in the trench and collected for treatment.

The pipe transport equipment consisted of three separate systems connected to a manifold pipe at the top of the slope then transported by a single line to the treatment facility. The

slope was covered by a 6-inch layer of bedding sand and riprap stone to the flood zone level. The remainder of the site had an engineered barrier of 3 feet of clean borrow material lain down. This material was seeded until final determination of the park needs was established.

The efforts undertaken by ComEd, ThermoRetec and Geo-Con were not as simplistic as described herein. Numerous changes to the water treatment system, water infiltration into the platform area, elevation difficulties in the trench, difficult caprock plus union issues all made for an interesting challenge for all concerned. In addition, this technology had not been utilized previously at MGP sites with seepage into a river. All in all a successful project was completed where the owner, engineer and contractor worked to eliminate a potential health risk.