



Kalp Mine Drainage Remediation Project

The Anna and Steve Gdosky Indian Creek Restoration Project

Prior to construction of this passive mine drainage treatment system, 184 million gallons of mine water annually would enter Indian Creek from the Kalp discharge from the abandoned Melcroft #1 mine. This discharge was responsible for the deposition of 76,800 pounds (38.5 tons) of iron in the creek each year. It was also responsible for 42% of the acid load and 31 % of the iron load for the entire watershed. It marred Indian Creek for a distance of ten miles. Local homeowners experienced mine drainage in their yards and basements and small discharges along Route 711 had buckled and damaged the road.

Because of its impact on adjacent homes, properties, public highways, and the high potential for a mine pool blowout, the Melcroft #1 mine pool had long been recognized as a health and safety problem by the Pennsylvania Bureau of Abandoned Mine Reclamation and the federal Office of Surface Mining.



Phase I lowered the mine pool by using an innovative technology called in-seam directional drilling. Through in-seam directional drilling, the original discharge was relocated to an area close to where land had been acquired for the construction of a passive treatment system.

During the summer of 2005 holes were drilled approximately perpendicular to the coal outcrop to capture the mine water. Valves were installed to adjust flow and approximately 30 feet of the mine pool was gradually and permanently removed reducing the potential for a mine pool blowout. Chemical treatment was

utilized to reduce the acidity of the mine water. Other seeps and discharges including the original discharge point for the mine were eliminated.

Phase II consisted of the construction of a permanent passive treatment system. The system utilizes a design developed by the federal Natural Resources Conservation Service (NRCS), and consists of three alkalinity producing vertical flow wetlands, two settling basins, and a mitigation wetland. The discharge enters the treatment system in the up-flow wetland where it comes into the system underneath a limestone bed adding alkalinity raising the pH level of the water. Increasing the pH allows metals to precipitate out of solution. The water is transported to the first settling basin where the water is slowed down utilizing baffles to increase the detention time so more metals can fall out of solution. The water is then sent to one of the two vertical flow wetlands where additional treatment occurs as the water interacts with compost increasing the alkalinity causing additional metals to precipitate out. From the vertical flow wetlands the water is transferred to the final settling basin and then discharged into Indian Creek.

Total Price Tag for this project was over \$3.4 million and was provided by PA DEP, OSM, NRCS, and local and private foundations, including Western Pennsylvania Watershed Program and MWA.

Kalp Mine Drainage Treatment System		
<i>(Water sampling results from 5/2012)</i>		
PARAMETERS	KALPDBRAW	SB2
Aluminum	8.175 mg/L	.513 mg/L
Alkalinity	0 mg/L	0 mg/L
Calcium	109 mg/L	164 mg/L
Iron	13.1 mg/L	3.776 mg/L
Ferrous Iron	5.68 mg/L	0.200 mg/L
Acidity	124.4 mg/L	-20.8 mg/L
Magnesium	29.7 mg/L	30.8 mg/L
Manganese	1.687 mg/L	1.409 mg/L
pH	3.3	6.9
Sulfate	456 mg/L	485.7 mg/L

LEGEND

ST. STATION, PILE, #
ID IN THE DRAWING

BM NO.	ELEVATION	DESCRIPTION	N. COORDINATE	E. COORDINATE
BM 1	1407.72	5" P. B.M. WITH CAP	263939.50	1505069.85
BM 2	1404.03	5" W. B.M. WITH CAP	264606.33	1507672.21
1-1002	1429.69	10" X 12" X 16"	264607.28	1507268.82
1-1007	1413.11	10" X 16"	264565.85	1507450.90
1-1012	1407.29	10" X 16"	263659.13	1505652.35

CONSTRUCTION LIMIT
PROPERTY LINE
STREAM CHANNEL
CULVERT OPEN

BENCH MARK LOCATION
GATE WALK LOCATION
UTILITY POLE
GRADE PAUL
WATER LEVEL CONTROL STRUCTURE
ROCK LINED WATERWAY
DRAINILE LOCATION
TOP OF DAM

5' SCALE OF THE BENCH MARK LOCATIONS
IF NOT SHOWN ON THIS PLAN VIEW
IF SHEET #7 FOR THE VERTICAL FLOW
WETLANDS PIPE LAYOUTS AND DETAILS

