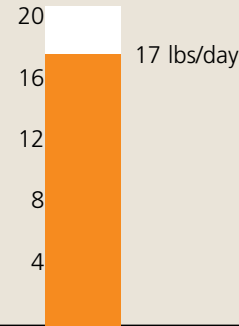


Pre-construction

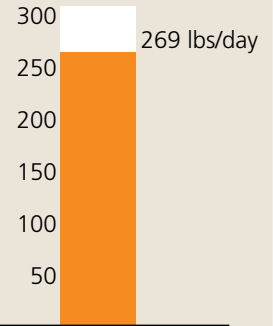


Underground mine entrance
Photo by Brett Laverty

Pre acid load condition



Pre metal load condition



Data derived using the Mean Annual Load Method (Stoertz, 2004).

Post-construction

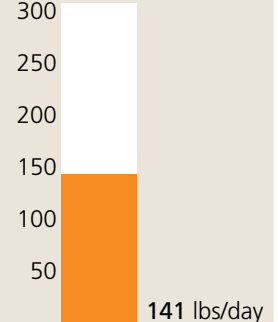


Jaymar Steel Slag Leach Bed
Photo by Brett Laverty

Post acid load condition



Post metal load condition



Data derived using the Mean Annual Load Method (Stoertz, 2004).

Mulga Run Reclamation Project is located in Section 10 of Milton Township in Jackson County and lies within the 14-digit HUC unit #05090101050030. The site is 6.8 acres and is located in the Little Raccoon Creek subwatershed. The design was completed by ATC Associates for \$247,127. The treatment approach for this site was to install two steel slag leach beds and conduct a wetland enhancement project. The major consideration for this design was to attempt to treat entire basin with steel slag leach beds and wetland instead of treating all acid mine drainage sites in the basin. Mulga Run discharge was sometimes net alkaline; however, the site was also capable of producing acid spikes (3000 lbs/day) throughout the year. The goal of the design was to reduce 100 percent of the acid spikes and create consistent net alkaline water discharging into

Little Raccoon Creek. The project goal was met by 100 percent. One problem encountered during the project was one section of the township road and a private residence height was increased to reduce the flood risk adjacent to the project site. Construction was complete August 30, 2004, by Stockmeister Enterprises for a cost of \$440,783. The major responsibility of the construction company was to complete all reclamation activities described in the project design. The funding source, for this the project design were Ohio EPA and ODNR-DMRM and for construction the sources were ODNR-DMRM, OEPA and OSM-ACSI. Figure, 3 and 4 (shown on page 3) estimate approximately 17 lbs/day of acid and 128 lbs/day of metals were reduced from entering into Little Raccoon Creek as a result of this AMD reclamation project.

Water quality report

Water quality data was collected at the project discharge as well as multiple stations pre- and post-construction. The graphs below show changes in pH (Figure 1) and acidity (Figure 2) along the mainstem of the receiving stream upstream and downstream of the project discharge as a result of the AMD reclamation project.

Figure 1. Pre and Post pH

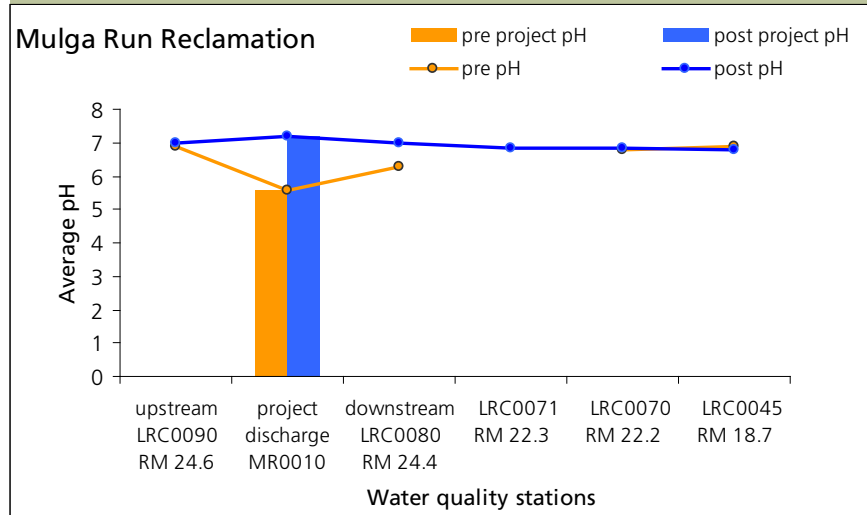
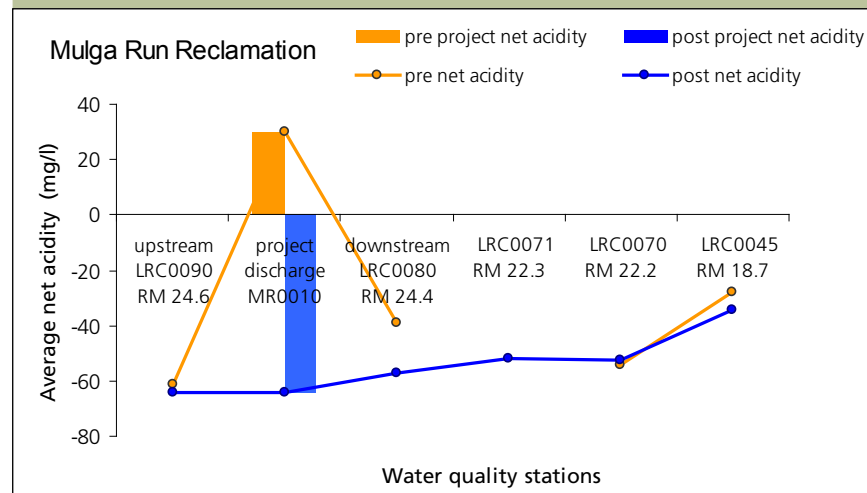


Figure 2. Pre and Post Acidity



As a result of the Mulga Run Reclamation project, the pH and net acidity has improved downstream of the reclamation site for 2.1 miles. Pre-construction data showed pH in the range of 5.5 – 6.9 downstream of the project. However, after installation of the Mulga Run Reclamation project, post-construction data shows pH in the range of 6.8 – 7.1 downstream of the project discharge. The net acidity concentrations decreased, showing net alkaline conditions continuing for 5.7 miles downstream to station LRC0045.

Water Quality – load reductions

Using the Mean Annual Load Method (Stoertz, 2004) acid and metal load reduction occurring at this project were plotted and shown in Figure 3 and 4. Acidity, iron, aluminum and discharge were measured pre- and post-construction at the project discharge from 1/1/1998 to 8/1/2003 for pre-construction and from 9/1/2004 to 06/30/2007 for post-construction.

Figure 3. Acid Load Reduction

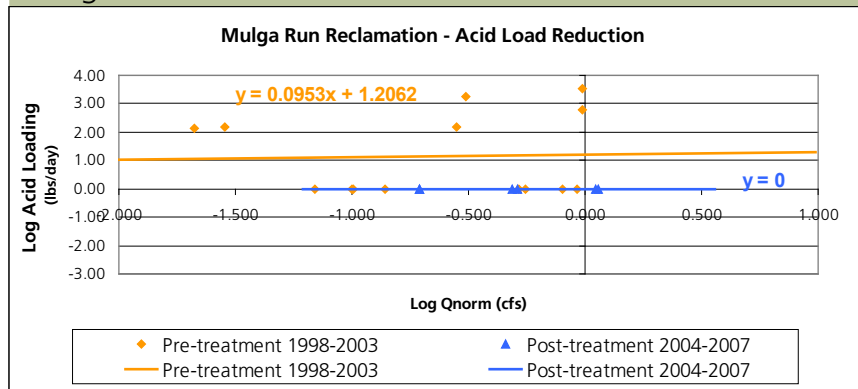
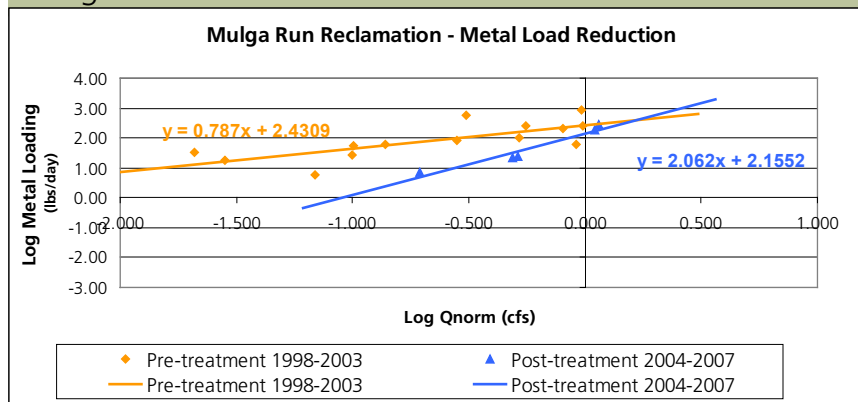


Figure 4. Metal Load Reduction



The trendline in Figure 3 for pre-treatment acid loading is not well-defined due to the sporadic chemical water quality conditions at the Mulga Run site. Sometimes net alkaline conditions were present, and sometimes acid spikes were produced (3000 lbs/day). The goal of this project was to decrease acidity and eliminate the acid spikes from entering into Little Raccoon Creek. Figure 3 shows these variations during the pre-treatment time period and shows 100 percent acid load reduction during post-treatment.

Stoertz, Mary W. and Douglas H. Green, 2004. Mean Annual Acidity Load: A Performance Measure to Evaluate Acid Mine Drainage Remediation. Ohio Department of Natural Resources Conservation and Restoration Innovations 2004 Applied Research Conference at Ohio University.