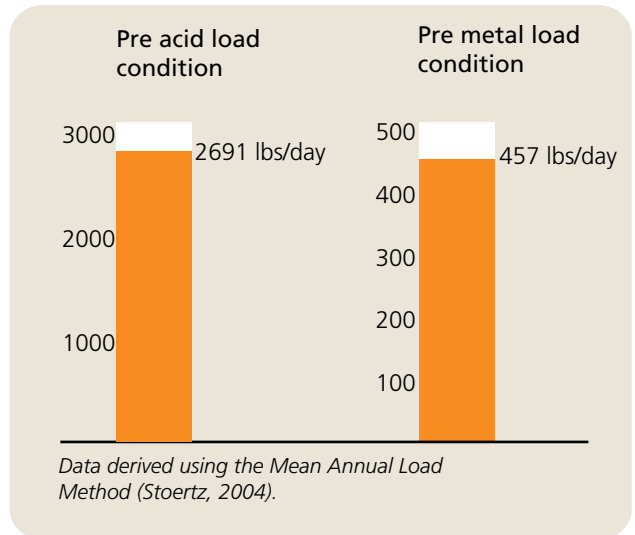


Pre-construction



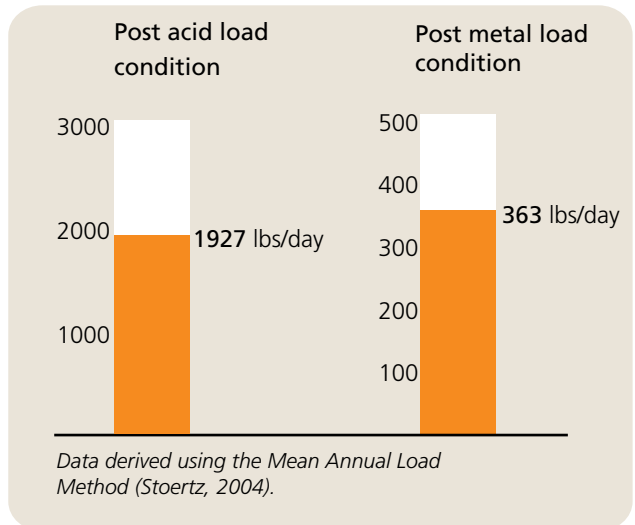
Exposed mine pit floor  
Photo by Brett Laverty



Post-construction



Middleton Run limestone channels  
Photo by Ian Hughes



Middleton Run/Salem Road Project is located in Section 15 of Milton Township in Jackson County and lies within the 14-digit HUC unit #05090101050030. The site is 60 acres and is located in the Little Raccoon Creek subwatershed. The design was completed by GAI Consultants Inc. and Bergmann Associates for \$193,283. The treatment approach for this site was to install open limestone channels, steel slag channels, reclamation, and a limestone leach bed. The major consideration for this design was to eliminate all water storage, create contours for positive drainage, cover toxic materials, and generate alkalinity.

The goal of the design was to reduce 100 percent of the acidity loading discharging into Little Raccoon Creek. The acidity has been reduced by 29 percent from the project discharge. Construction was complete November 15, 2005, by Stockmeister Enterprises Inc. for a cost of \$687,913. The funding source, for the project design and construction were ODNR-DMRM and Ohio EPA. Figures 3 and 4 (shown on page 3) estimate approximately 764 lbs/day of acid and 94 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

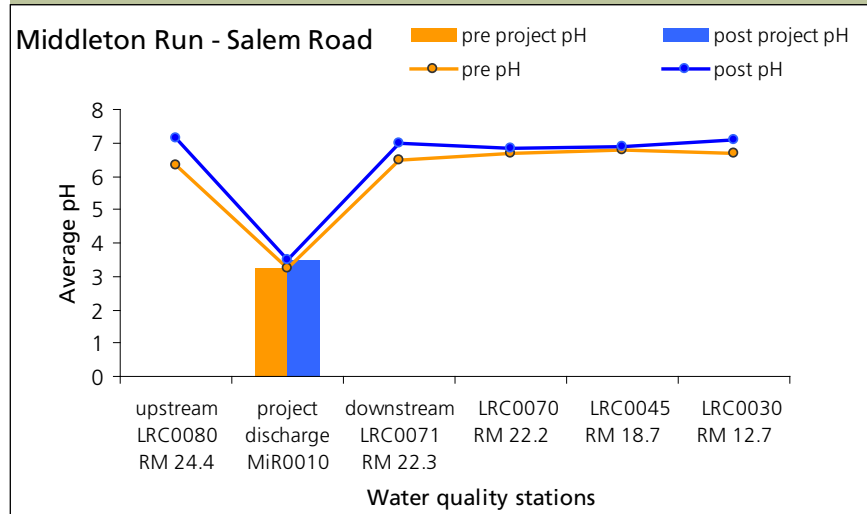
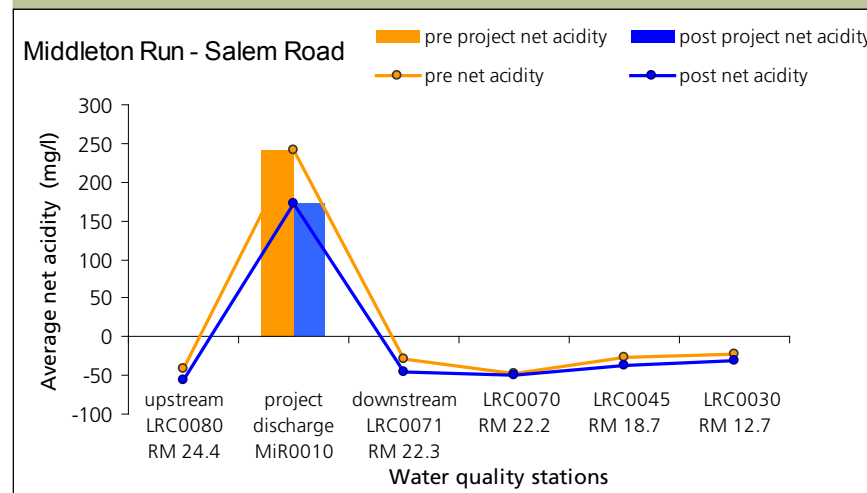


Figure 2. Pre and Post Acidity



As a result of the Middleton Run/Salem Road project, the pH and net acidity has improved downstream of the reclamation site for 11 miles. Pre-construction data showed pH in the range of 3.2 – 6.7 downstream of the project. However, after installation of the Middleton Run/Salem Road reclamation project, post-construction data shows pH in the range of 3.5 – 7.0 downstream of the project discharge. The net acidity concentrations decreased by 29 percent at the project discharge creating net alkaline conditions continuing for 11 miles downstream to station LRC0030.

### 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 1/29/1997 to 3/7/2005 for pre-construction and from 1/31/2006 to 6/30/2007 for post-construction.

Figure 3. Acid Load Reduction

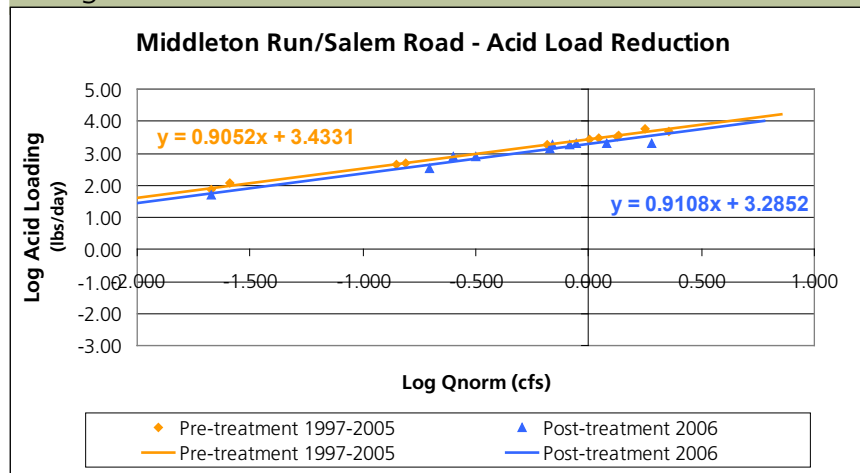
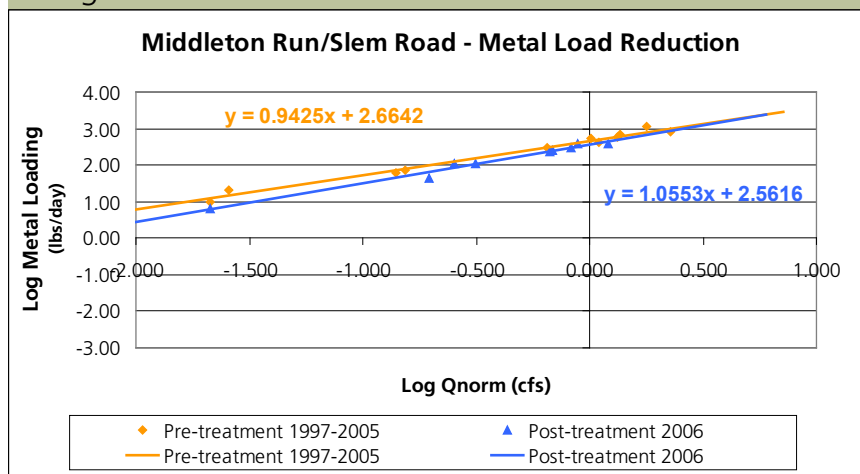


Figure 4. Metal Load Reduction



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.