

OPERATION, MAINTENANCE AND REPLACEMENT PLAN
FOR
NUMINE TREATMENT SYSTEM
PROJECT NO. AMD 03(0743)101.1
COWANSHANNOCK TOWNSHIP, ARMSTRONG COUNTY

INTRODUCTION:

This is the Operation, Maintenance and Replacement (OM&R) Plan for a passive Acid Mine Drainage (AMD) Treatment System located in Cowanshannock Township, Armstrong County, Pennsylvania, collectively known as the Numine Treatment System. This passive AMD treatment system involves the collection and treatment of an acid mine drainage discharge that is emanating from the base of a reclaimed deep mine coal refuse pile and is degrading Cowanshannock Creek, which is a trout-stocked fishery. The AMD treatment system identified in this agreement and its accompanying OM&R plan is as follows:

The AMD treatment system consists of an initial mixing pond, a wetland, limestone treatment pond, sediment/flushing pond with concrete baffels and a large retention pond (a.k.a. White Lake), a diversion ditch, a collection channel, flow control structures and rock-lined spillways. Included with the construction of the treatment system is the relocation of a ten-inch (10") PVC pipe from an existing settling pond that collects surface run-off from the surrounding area, by-passes the AMD treatment system and discharges into a limestone channel.

All structures on this AMD treatment system are classified as Class (A) Structures, which means that any structure failure on this system will not cause loss of life or serious damage to homes, buildings, utilities, highways or railroads.

The Sponsors of these projects are:

- Cowanshannock Creek Watershed Association (CCWA). Primary responsibilities are general maintenance, minor repairs, water sample collections and monitoring.
- Bureau of Abandoned Mine Reclamation (BAMR), Cambria Office, DEP. Primary responsibilities are providing technical support, major repairs, helping in maintenance of items, which require considerable time and dollar amount or are beyond the capabilities of the CCWA to accomplish at the time and replacement of structures.

The Sponsors are responsible for the operation and maintenance of all structures so this AMD treatment system continues to function smoothly. This AMD treatment system was designed, based on the best available knowledge and technology, by the Cambria Office staff of BAMR. It must be recognized that the technology of passively treating AMD is relatively new. All structures were designed for a long life span with minimal operation and maintenance inputs by the Sponsors. However, in order for these structures to perform to their design capabilities, periodic inspection and maintenance is required to maximize performance.

BAMR will also provide the CCWA with a complete set of “as-built” drawings including all details for the AMD treatment system. These drawings will answer many questions about buried facilities, pond depths, spillway elevation, pipe lengths and slopes, piping arrangements, stone size, size and location of each cell, location of each monitoring point, etc.

OPERATIONS:

Site specific instruction:

To maintain the engineering integrity of all facilities, they should be inspected after all major rain events, earthquakes, droughts, or other natural or man-made occurrences that may affect the performance or integrity of the structure, or at least annually. A qualified person (inspector) shall perform the inspection. This inspector should prepare a detailed inspection report addressing all problems soon after each inspection and it should be distributed as follows: one copy for the CCWA and three copies for the Cambria BAMR Office. The reports are due after each inspection or no later than December 1 of each year for the annual inspection. All materials used in repairing structures shall be of equal quality or better, and at least the same size, thickness, etc. as shown on the “as-built” drawings or as stated in the original specifications. The CCWA shall obtain prior BAMR approval for any repairs or modifications to the project.

Inspections including water sampling and flow measurements:

The facility should be inspected on a regular time interval as stated above. Water sampling and flow measurements should be completed according to the schedule specified in this OM&R plan.

Water sampling, flow measurements, and monitoring:

In order to assess the efficiency and performance of these systems, water quality monitoring of each component of the systems shall be completed according to the following schedule. The following water quality parameter shall be analyzed by the DEP lab or an approved laboratory using standard chemical testing procedures. If the CCWA prefers, BAMR will provide a collector sample identification (ID) number to be used for water testing at the DEP lab. Until CCWA finds an appropriate person to collect water samples, BAMR will collect water samples at this site.

Parameters – The following will be sampled:

PH	Manganese
Acidity	Sulfates
Alkalinity	Ferrous Iron
Aluminum	Total Iron
Specific Conductance	

Samples will be collected at the following five points:

Point #1 (MP1) seep discharge into collection pond

Point #2 (MP2) end of collection pond

Point #3 (MP3) end of wetlands/pipe discharge

Point #4 (MP4) treatment pond discharge into settling pond

Point #5 (MP5) settling pond discharge into White Lake

Flow measurements:

Flow depths should be measured when the water samples are collected at the sediment/flushing pond flow control structure outlet prior to flushing of the system.

Schedule for sampling:

All five sampling points will be sampled monthly until December 2005. From January 2006, until notified in writing from BAMR, samples can be collected once every three months.

Mechanical maintenance including flushing:

The top tier of the limestone treatment pond needs to be flushed once every month and the lower tier needs to be flushed once every six month. BAMR personnel will review the quality of the treated water and may change the frequency of the flushing. The flushed water should not be discharged directly into White Lake. Therefore, it may be necessary to add a stoplog in the sediment/flushing pond outlet flow control structure outlet, which BAMR will provide.

Flushing sequence:

By using the valve ranch, open the two valves for the top tier treatment pipes simultaneously; these valves are located in the embankment along the treatment ponds. As soon as these valves are open, the water will flush out into the sediment/flushing pond. Because of the high aluminum content of the discharge, the flush water will look milky white. Once the plume of milky water nears the outlet structure, install two stoplogs in the outlet structure. Allow the water to flow until the flush water has cleared. Once the flush water has cleared, close the valves. Use the same procedure for the lower tier pipes when appropriate. Separate gate valves are provided for the bottom tier of the treatment system. These gate valves have been located as shown on the "as-built" drawings and are marked along the embankment in the field.

Note: It will be necessary to return the water level in the sediment/flushing pond to its original level prior to flushing. After the flushing procedure, wait a few days—then remove one or two stoplogs or rearrange them to help lower the water level in this pond.

MAINTENANCE:

The BAMR staff will be responsible for performing the maintenance of items listed under this section. The CCWA will be responsible for minor routine maintenance for listed items. The CCWA will also be responsible to inform BAMR, if possible in writing, for items that require BAMR's help.

Removal and disposal of accumulated precipitate or sediment:

Settling ponds:

Eroding soil particles and precipitate from chemical reactions will fill the settling ponds. All settling ponds shall be maintained by removing collected precipitate when the volume of the settling pond is reduced by one half. Accumulated precipitate can be disposed within the project area. BAMR will help CCWA in cleaning. Inlet and outflow points shall be maintained so that they are stable and clear of debris and any obstructions and no erosion is occurring.

Litter control:

Water inlet area for all structures should be free from sediment, leaves and any other foreign objects. This is very important for the efficient operation of the system.

Maintenance of channels; industrial cleaning of pipes; repairing damage after major storm events; and repairing cracks or leaks:

Permanent seeding:

The permanent seeding on the site shall be limed, fertilized and reseeded as necessary to maintain a stable nonerosive ground cover on the site.

Spillways and outfall ditches:

These structures shall be maintained so that they are stable and not eroding. The channels shall be kept free of any obstructions or debris that restrict water flow in the channel. Ditches that carry acid mine drainage shall be cleaned out when precipitate reduces the capacity by one half. Particular attention should be paid to the stability of these rock waterways to assure that there is no rock movement.

Access road and pipe culverts:

The access road and pipe culverts under the road shall be maintained so that the site can be easily accessed for maintenance and monitoring. The pipe culverts shall be kept free of any obstructions. The gate shall be kept locked so that unauthorized vehicular access is controlled.

Piping:

Pipes carrying discharge water shall be maintained by cleaning precipitate from the pipes if flow through the pipes is reduced by 25 percent. If CCWA personnel need help in cleaning blocked pipes, BAMR personnel will help in this task.

Adding limestone, compost, sand or gravel:

After a few years of operation, some structures in this system may need limestone, compost and sand or gravel for efficient functioning. CCWA personnel should inform BAMR staff in writing about this kind of service.

Repairing vandalism damage:

Any damage to this system done by vandalism should be fixed immediately for proper functioning of this system. CCWA personnel should inform BAMR immediately about this kind of damage and let BAMR know if their help is needed in repair work.

Adjusting grades on outlet structures:

Periodically, grades on outlet structures should be adjusted for proper functioning of the system. CCWA personnel should let BAMR know if they suspect this kind of problem.

REPLACEMENT:

BAMR will be responsible for items listed in this section. The system has a long designed life expectancy. Once that design life is exceeded, much of the system will need to be recharged or replaced. Replacement will involve much of the same effort originally needed to construct the system. Changes in technology and water quality and quantity will need to be considered to determine if the size and/or design of the system must be changed. Replacement considerations include:

Estimating BMP (Best Management Practice) design life; determining replacement responsibility, including a successor, in the event of the original project Sponsor's inability to carry out these responsibilities; determining approximate costs for the following possible needs: removing accumulated sediments, replacing defective valves, water control structures, re-sizing the system to accommodate changed water quality or quantity, recharging organic matter tier on wetlands and recharging limestone rock.

The signing of this Operation, Maintenance and Replacement (O, M & R) Plan by an authorized representative of the Sponsors indicates that the Sponsors have reviewed the O, M & R plan for the NuMine AMD Treatment System and concur with the assigned responsibilities and obligations.

IN WITNESS WHEREOF, the sponsors hereto have hereunto set their hands and seals the day and year written here.

Signing of this plan was completed on November 7, 2005

WITNESS:

Bureau of Abandoned Mine Reclamation
Cambria Office
Department Of Environmental Protection

P. J. Shsh

J. Scott Horrell
J. Scott Horrell, Environmental Program Manager

Cowanshannock Creek Watershed Association (CCWA)
P.O. Box 307,
Rural Valley, PA 16249

Pamela Meade President

Pam Meade
President